EN

Stand 04/2017

THE BIG BLOCK

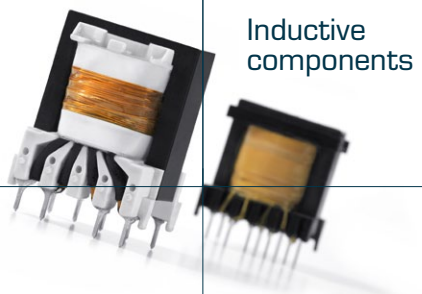
Product line Transformers / Power supplies / Reactors / EMI filters

Transformers

Power supplies

Reactors and EMI filters

Inductive components



BLOCK

block.eu

BLOCK – perfecting power

Factory 1, Verden – 30 000 m² production area

Factory 2, Verden – 2 500 m² production area

38
LOCATIONS WORLDWIDE

Factory USA – 2500 m² production area

perfecting power

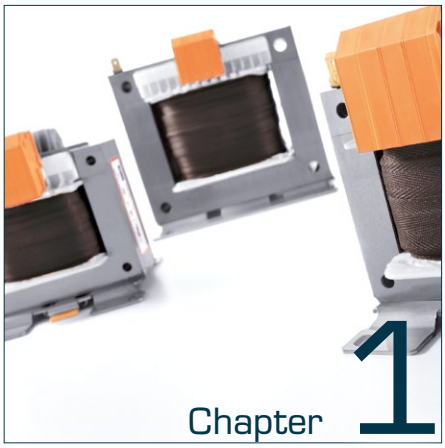
BLOCK's products and solutions guarantee maximum voltage and power supply quality in every single area of business and industry. Encompassing over 2500 standard products as well as a myriad of customized solutions, our extensive product portfolio is a reliable choice for customers throughout the world who want exactly the right amount of power and power quality.

Our transformers, power supplies, reactors and interference filters, not to mention our other innovative products and solutions, improve the efficiency of devices, plants, control facilities and systems by minimizing the wear and tear these experience, extending their service life and enabling them to use energy in a way that is more efficient and cost-effective.

All BLOCK products are developed and produced in-house, from the research and development phase to production and quality assurance, right through to certification. At our in-house testing lab, we perform tests relating to electromagnetic compatibility (EMC) and device safety, as well as simulating environmental influences.

Through our unswerving commitment to providing customers with everything they need from a single source, we can respond to even the most unconventional demands using an approach that is highly flexible, prompt and creative.

CONTENT



Chapter 1

Transformers

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Chapter 2

Power supplies

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Reactors/EMI filters

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Line reactors


Detuned reactors


Harmonic filters

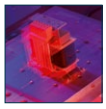

Radio interference suppression filters


Voltage stabilizers


Motor reactors


Sine filters


EMC tests


Mechanical tests


Environmental simulations

BLOCK PARTS

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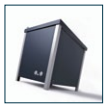

Sheet-metal enlosures


Magnet wires and litz wires

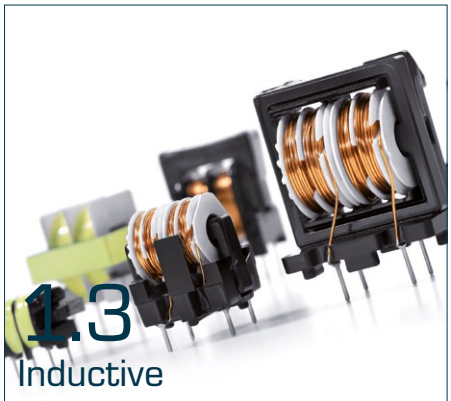

Insulating sleevings

OVERVIEW OF SECTIONS

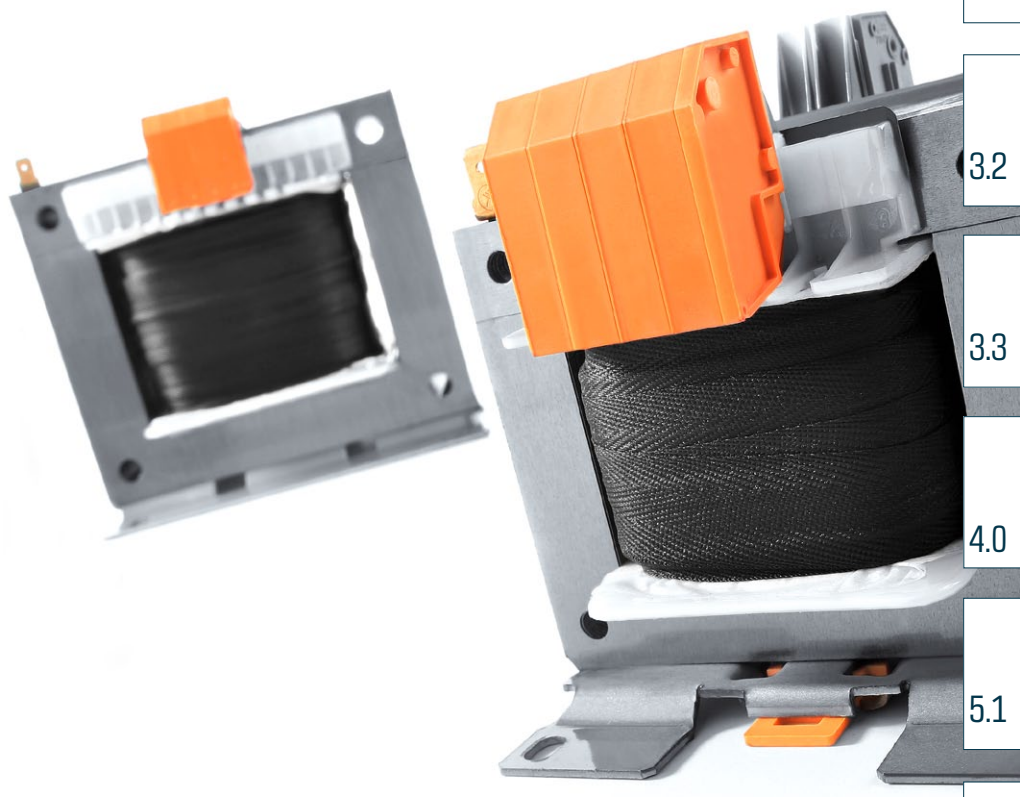
PRODUCTS
Transformers

1.1 Transformers

1.2 PCB transformers



1.3 Inductive components



PRODUCTS
Power supplies

2.1
Switched mode power supplies

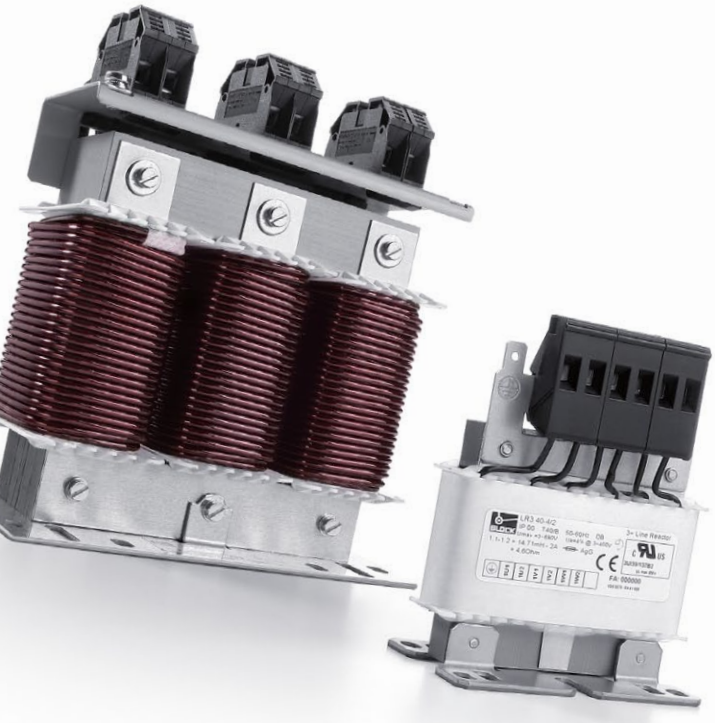
2.2 Transformer power supplies

PRODUCTS
Reactors / EMI filter

3.1 Line-side suppression

3.2 Motor-side suppression

3.3 Test laboratory



PRODUKTE
ENCLOSURES AND ACCESSORIES

4 Enclosures & Accessories


BLOCK
BGUK 30
IP23
BLOCK
BGUK 2
IP23

BLOCK – perfecting power

Contacts around the globe.

Commercial relationships reaching all four corners of the globe have long been a reality here at BLOCK. When it comes to connecting to the grid, our products are the first choice in many countries. With six BLOCK companies as well as numerous national and international agencies situated right across the globe, we successfully supply international markets with transformers, reactors, EMC filter, switched mode power supplies, and much more.

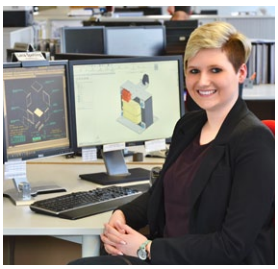
Well over half of our deliveries are exported to destinations throughout the world. This being the case, it goes without saying that precise knowledge of the technical requirements and standards of individual countries is a must. That's why all the key national and international marks of conformity are applied to BLOCK products.

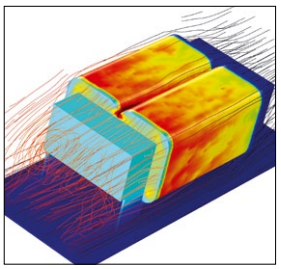
Comprehensive warehousing facilities ensure items are available quickly, keeping downtimes to a minimum, whilst our logistics system gets them to our customers without delay.

BLOCK – perfecting power

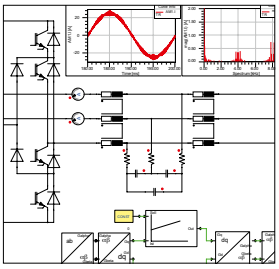
Research and Development

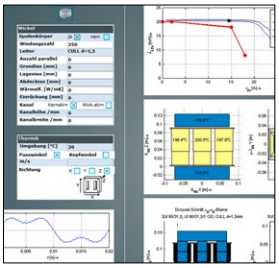
Every day, more than 60 engineers and specialists on our Research and Development department search for new ways to solve technical challenges using the laws of physics. In addition to this, our own fundamental research is continually facing new challenges, particularly as there is an active knowledge transfer involved between fundamental and applied research. Through their efforts, we are able to maintain a high standard of quality and keep building on our competitive advantage through innovation.





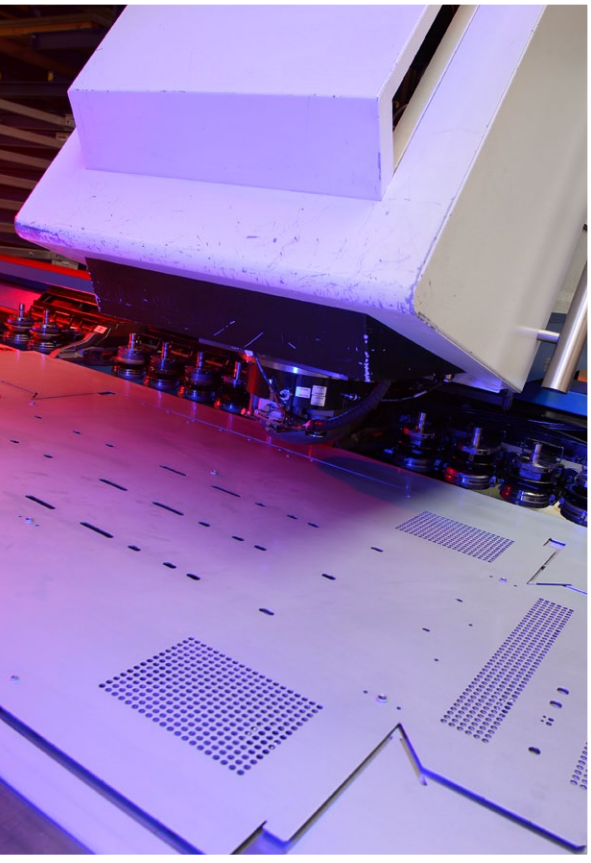
Left: 3D CAD construction
Right: FEM COMSOL Multiphysics



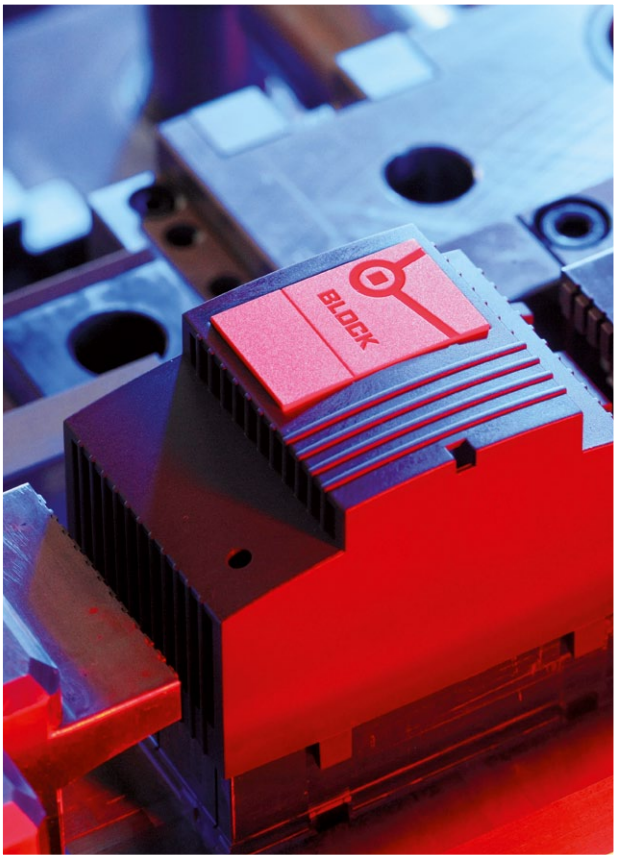


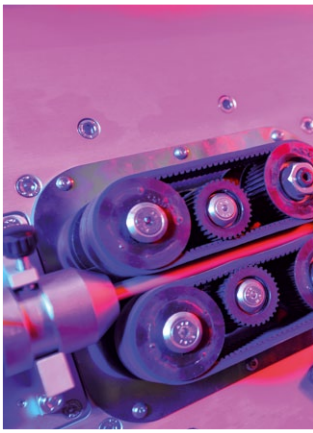
Left: simulation software Ansys Simplorer
Right: BLOCK's propriatary calculation system „taid" für inductive coiled products

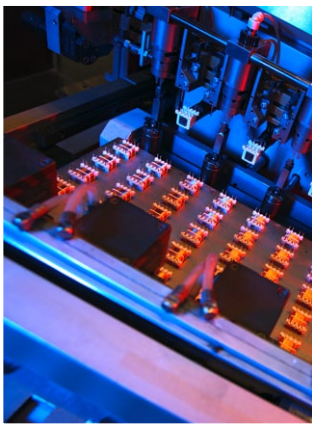
2500 m² metalworking



Plastic injection moulding with in-house toolmaking facilities



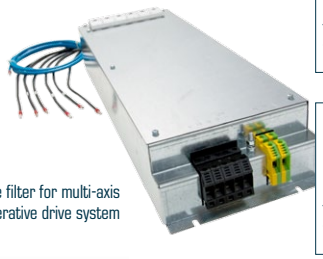




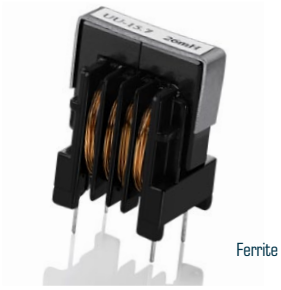
Individual customer solutions

Our practical collaborative work with industry means that we here at BLOCK are continually able to develop sophisticated solutions. Due to our unique vertical range of manufacture as well as our unparalleled technological expertise, we can address individual customer requirements and problems directly. The result is applications tailored specifically to our customers, which are ultimately transformed into products at our prototyping facilities. Our cutting-edge machinery means we have the tools to produce both individual and series-manufactured items cost-effectively and with a short lead time. So we can make specific customer requirements a reality.

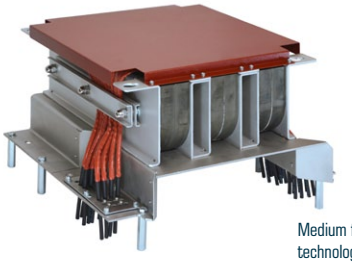
BLOCK CUSTOM MADE



Interference filter for multi-axis regenerative drive system



Ferrite components



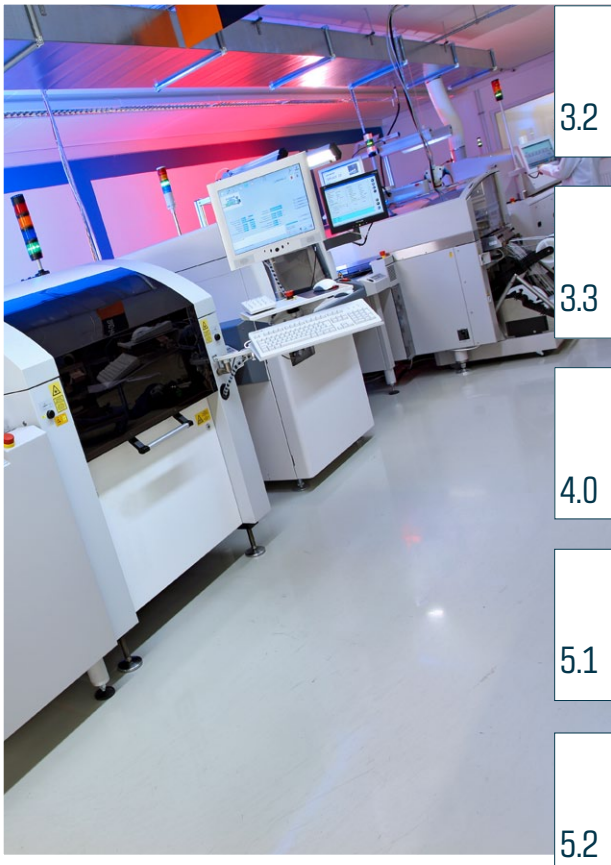
Medium frequency transformer for railway technology, resistant to environmental influences

LCL filter reactor for high switching frequency ripple

Top: Automated cable assembly
Bottom: Fully automatic coil production for small transformers

Europe's largest low-voltage winding machine combining foil and wire winding

State-of-the-art production lines: SMD printed circuit board manufacturing



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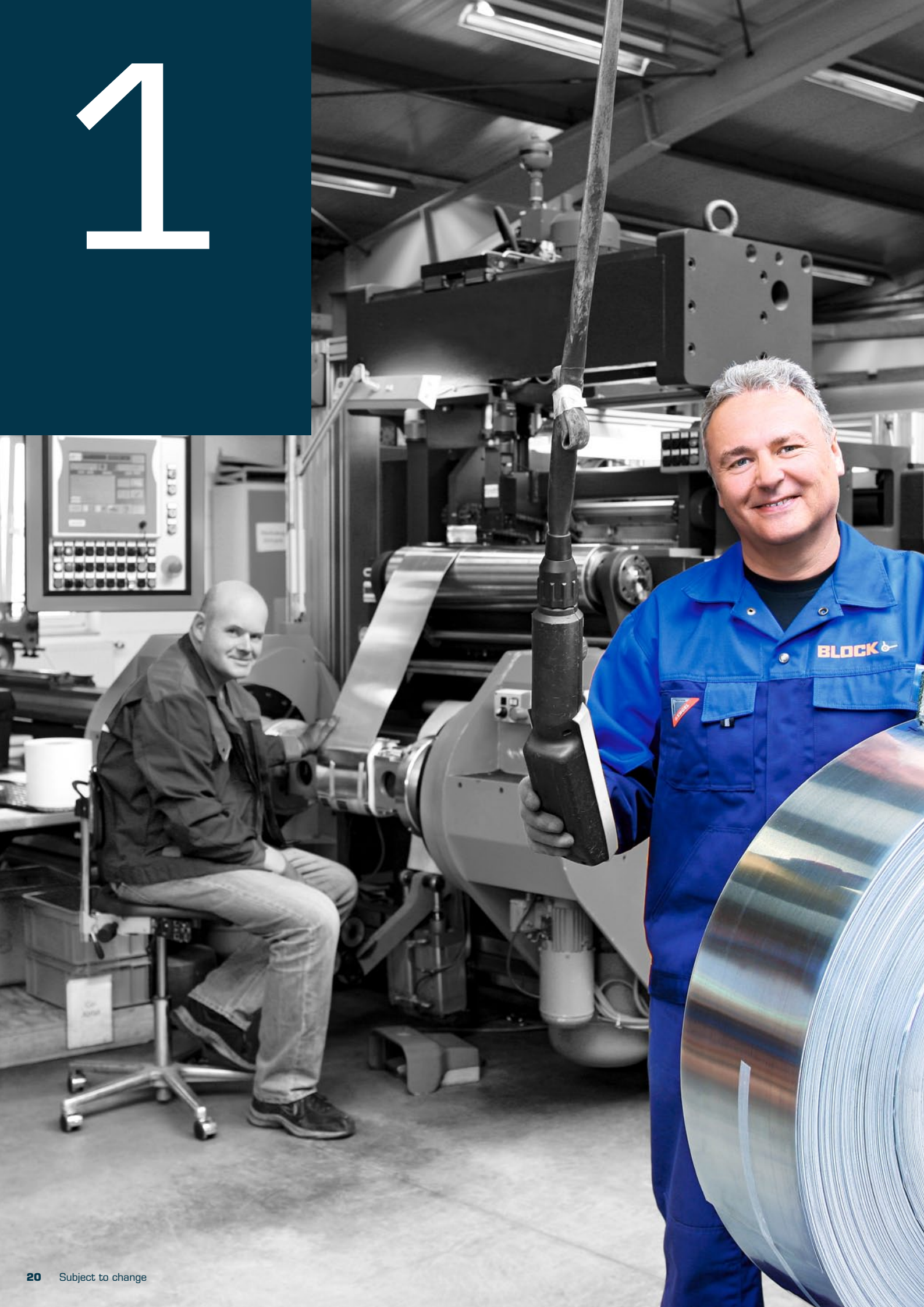
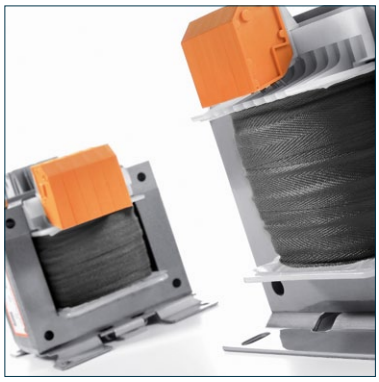
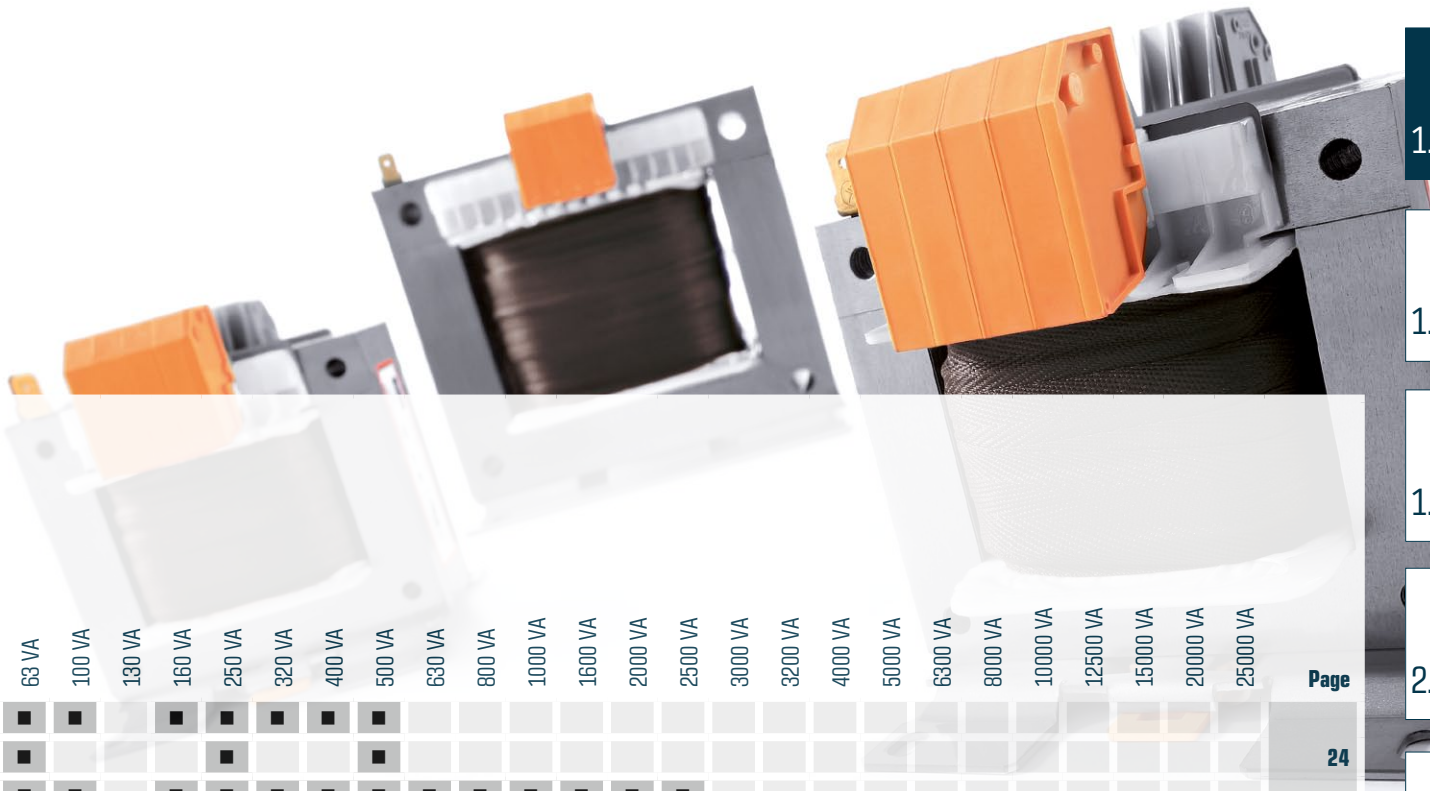




OVERVIEW
CONTROL TRANSFORMERS

Type	Features	Rated input voltage	Rated output voltage
STE	Cage-clamp terminals, DIN-Rail clamp included up to 250 VA	230 V, tappings for ± 5 %	24 V
		400 V, tappings for ± 5 %	24 V
		400 V, tappings for ± 5 %	230 V
STEU	Dual input voltage, cage-clamp terminals, DIN-Rail clamp included up to 250 VA	230 and 400 V, tappings for ± 5 %	2 x 12 V
			2 x 24 V
			2 x 115 V
USTE	Universal input voltages, cage-clamp terminals, DIN-Rail clamp included up to 250 VA	208, 230, 380, 400, 415, 440, 460, 480, 500, 525, 550, 575, 600 V	2 x 12 V
			2 x 115 V
ST	Screw-type terminals	230 V, tappings for ± 5 %	12 V
		230 V, tappings for ± 5 %	24 V
		230 V, tappings for ± 5 %	42 V
		230 V, tappings for ± 5 %	110 V
		230 V, tappings for ± 5 %	230 V
		400 V, tappings for ± 5 %	24 V
		400 V, tappings for ± 5 %	42 V
		400 V, tappings for ± 5 %	230 V
		440 V, tappings for ± 5 %	230 V
		500 V, tappings for ± 5 %	230 V
		690 V, tappings for ± 5 %	230 V
STU	Universal input voltages, screw-type terminals	210, 230, 250, 380, 400, 420, 440, 460, 480, 500, 520, 540 V	24 V
			2 x 115 V
STSU	Dual input voltage, low-inrush current	230 and 400 V	2 x 12 V, 2 x 24 V, 2 x 115 V
TT1	Horizontal design	219/230/241 V	24 V
		380/400/420 V	42 V
			2 x 115 V
BUST	Low height, screw-type terminals	230 V, tappings for ± 5 %	24 V
		230 V, tappings for ± 5 %	2 x 115 V
		400 V, tappings for ± 5 %	42 V
		400 V, tappings for ± 5 %	2 x 115 V
		440 V, tappings for ± 5 %	2 x 115 V
		500 V, tappings for ± 5 %	2 x 115 V



20 VA	40 VA	63 VA	100 VA	130 VA	160 VA	250 VA	320 VA	400 VA	500 VA	630 VA	800 VA	1000 VA	1600 VA	2000 VA	2500 VA	3000 VA	3200 VA	4000 VA	5000 VA	6300 VA	8000 VA	10000 VA	12500 VA	15000 VA	20000 VA	25000 VA	Page
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Control- and safety isolating- resp. isolating transformer
STE

General Data

Rated input voltage 230 - 400 Vac
Rated output voltage 24 - 230 Vac
Rated power 63 - 2500 VA
Insulation class B
Maximum ambient temperature 40 °C
Efficiency up to 95 %
Degree of protection IP 00

Advantages

Very good switch-on behaviour thanks to reduced starting currents
High performance for the volume thanks to compact design
Primary side ±5 % tappings for voltage adjustment
Very good corrosion protection and low noise thanks to vacuum impregnation
Quick to cable up thanks to the use of spring-clamp terminals
Contact protected screw connection terminals complying with UVV BGV A3
Simple mounting thanks to robust metal footplate with oval slots
Up to 250 VA with combination footplate for bolted and rail mounting

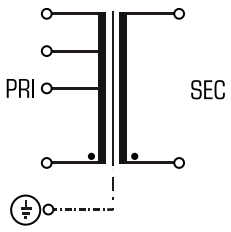
Applications

As a control transformer for the electrical isolation of the input and output sides.The construction of the transformer to supply control systems according to VDE 0113 is designed.

As an isolating transformer for the safe electrical isolation of the input and output sides. The transformer may be used to set up protective separation as a protective measure in accordance with VDE 0100.

As a safety isolating transformer for the safe electrical isolation of the input and output sides. The transformer is suitable for creating SELV and PELV circuits because of the limit on the output voltage.

Sample application



Standards

Control transformer
to: VDE 0570 Teil 2-2, DIN EN 61558-2-2, EN 61558-2-2, IEC 61558-2-2, UL 5085-1/-2, CSA 22.2 No.66

Safety isolating transformer
to: VDE 0570 Teil 2-6, DIN EN 61558-2-6, EN 61558-2-6, IEC 61558-2-6, UL 5085-1/-2, CSA 22.2 No.66

Isolating transformer
to: VDE 0570 Part2-4, DIN EN 61558-2-4, EN 61558-2-4, IEC 61558-2-4, UL 5085-1/-2, CSA 22.2 No.66

Approvals

UL 5085-1/-2, CSA 22.2 No.66

Control- and safety isolating- resp. isolating transformer
STE

Electrical data

Typ	STE 63/23/24	STE 63/4/24	STE 63/4/23	STE 100/23/24	STE 100/4/23	STE 160/23/24
Input						
Rated input voltage	230 Vac	400 Vac	400 Vac	230 Vac	400 Vac	230 Vac
Tappings Input	±5 %	±5 %	±5 %	±5 %	±5 %	±5 %
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	24 Vac	24 Vac	230 Vac	24 Vac	230 Vac	24 Vac
Rated power VDE (DB cos phi=1)	63 VA	63 VA	63 VA	100 VA	100 VA	160 VA
Rated power VDE (KB cos phi=0.5)	175 VA	175 VA	175 VA	310 VA	310 VA	490 VA
No-load voltage (app. x factor)	1.10	1.10	1.10	1.07	1.07	1.06
Efficiency	87.0 %	87.0 %	87.0 %	87.0 %	87.0 %	90.0 %
Standards						
Classification	Control- and safety isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
PRI Fusing recommendation by circuit breaker with tripping characteristic type 20 x Irated related to set)						
Setting range	0.25 - 0.40 A	0.16 - 0.25 A	0.16 - 0.25 A	0.40 - 0.63 A	0.25 - 0.40 A	0.63 - 1.00 A
Setting value	0.35 A	0.20 A	0.20 A	0.50 A	0.29 A	0.78 A
Order numbers						
Order Number	**STE 63/23/24**	**STE 63/4/24**	**STE 63/4/23**	**STE 100/23/24**	**STE 100/4/23**	**STE 160/23/24**

Control- and safety isolating- resp. isolating transformer
STE

Electrical data

Typ	STE 160/4/23	STE 250/23/24	STE 250/4/24	STE 250/4/23	STE 320/23/24	STE 320/4/23
Input						
Rated input voltage	400 Vac	230 Vac	400 Vac	400 Vac	230 Vac	400 Vac
Tappings Input	±5 %	±5 %	±5 %	±5 %	±5 %	±5 %
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	230 Vac	24 Vac	24 Vac	230 Vac	24 Vac	230 Vac
Rated power VDE (DB cos phi=1)	160 VA	250 VA	250 VA	250 VA	320 VA	320 VA
Rated power VDE (KB cos phi=0.5)	490 VA	850 VA	850 VA	850 VA	1.120 VA	1.120 VA
No-load voltage (app. x factor)	1.06	1.07	1.07	1.07	1.05	1.05
Efficiency	90.0 %	90.0 %	90.0 %	90.0 %	91.0 %	91.0 %
Standards						
Classification	Control- and isolating transformer	Control- and safety isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
PRI Fusing recommendation by circuit breaker with tripping characteristic type 20 x Irated related to set)						
Setting range	0.40 - 0.63 A	1.00 - 1.60 A	0.63 - 1.00 A	0.63 - 1.00 A	1.00 - 1.60 A	0.63 - 1.00 A
Setting value	0.45 A	1.20 A	0.70 A	0.70 A	1.50 A	0.88 A
Order numbers						
Order Number	**STE 160/4/23**	**STE 250/23/24**	**STE 250/4/24**	**STE 250/4/23**	**STE 320/23/24**	**STE 320/4/23**

Control- and safety isolating- resp. isolating transformer
STE

Electrical data

Typ	STE 400/23/24	STE 400/4/23	STE 500/23/24	STE 500/4/24	STE 500/4/23	STE 630/4/23
Input						
Rated input voltage	230 Vac	400 Vac	230 Vac	400 Vac	400 Vac	400 Vac
Tappings Input	±5 %	±5 %	±5 %	±5 %	±5 %	±5 %
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	24 Vac	230 Vac	24 Vac	24 Vac	230 Vac	230 Vac
Rated power VDE (DB cos phi=1)	400 VA	400 VA	500 VA	500 VA	500 VA	630 VA
Rated power VDE (KB cos phi=0.5)	1.440 VA	1.440 VA	2.000 VA	2.000 VA	2.000 VA	2.350 VA
No-load voltage (app. x factor)	1.05	1.05	1.05	1.05	1.05	1.03
Efficiency	92.0 %	92.0 %	93.0 %	93.0 %	93.0 %	93.0 %
Standards						
Classification	Control- and safety isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer	Control- and isolating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
PRI Fusing recommendation by circuit breaker with tripping characteristic type 20 x Irated related to set)						
Setting range	1.60 - 2.50 A	1.00 - 1.60 A	1.60 - 2.50 A	1.00 - 1.60 A	1.00 - 1.60 A	1.60 - 2.50 A
Setting value	1.90 A	1.10 A	2.40 A	1.40 A	1.40 A	1.70 A
Order numbers						
Order Number	**STE 400/23/24**	**STE 400/4/23**	**STE 500/23/24**	**STE 500/4/24**	**STE 500/4/23**	**STE 630/4/23**

Control- and safety isolating- resp. isolating transformer
STE

Electrical data

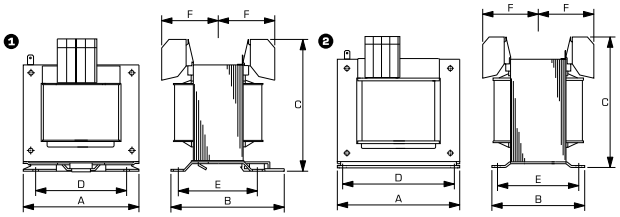
Typ	STE 800/4/23	STE 1000/4/23	STE 1600/4/23	STE 2000/4/23	STE 2500/4/23
Input					
Rated input voltage	400 Vac	400 Vac	400 Vac	400 Vac	400 Vac
Tappings Input	±5 %	±5 %	±5 %	±5 %	±5 %
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output					
Rated output voltage	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac
Rated power VDE (DB cos phi=1)	800 VA	1.000 VA	1.600 VA	2.000 VA	2.500 VA
Rated power VDE (KB cos phi=0.5)	3.400 VA	5.000 VA	7.800 VA	10.900 VA	12.500 VA
No-load voltage (app. x factor)	1.03	1.02	1.02	1.02	1.01
Efficiency	93.0 %	94.0 %	94.0 %	95.0 %	95.0 %
Standards					
Classification	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer
Approvals					
Approvals	cURus	cURus	cURus	cURus	cURus
Environment					
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Safety and protection					
Type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
PRI Fusing recommendation by circuit breaker with tripping characteristic type 20 x Irated related to set)					
Setting range	1.60 - 2.50 A	2.50 - 4.00 A	4.00 - 6.30 A	4.00 - 6.30 A	6.30 - 10.00 A
Setting value	2.10 A	2.60 A	4.20 A	5.20 A	6.40 A
Order numbers					
Order Number	**STE 800/4/23**	**STE 1000/4/23**	**STE 1600/4/23**	**STE 2000/4/23**	**STE 2500/4/23**

Control- and safety isolating- resp. isolating transformer
STE

Mechanical data 30

Typ	Terminals	Fixing method	Fixing screws	Weight	Dimension picture (in mm)	A	B	C	D	E	F
STE 63/23/24	Spring clamp terminal, PE 6.3 x 0.8	Dual purpose base plate also for installation on mounting rails	M4	1.20 kg	1	78	85	88	64	64	46
STE 63/4/24	Spring clamp terminal, PE 6.3 x 0.8	Dual purpose base plate also for installation on mounting rails	M4	1.20 kg	1	78	85	88	64	64	46
STE 63/4/23	Spring clamp terminal, PE 6.3 x 0.8	Dual purpose base plate also for installation on mounting rails	M4	1.20 kg	1	78	85	88	64	64	46
STE 100/23/24	Spring clamp terminal, PE 6.3 x 0.8	Dual purpose base plate also for installation on mounting rails	M4	2.00 kg	1	84	85	96	64	64	54.5
STE 100/4/23	Spring clamp terminal, PE 6.3 x 0.8	Dual purpose base plate also for installation on mounting rails	M4	2.00 kg	1	84	85	96	64	64	54.5
STE 160/23/24	Spring clamp terminal, PE 6.3 x 0.8	Dual purpose foot plate also for installation on mounting rails	M5	2.90 kg	1	96	102	104	84	87	56
STE 160/4/23	Spring clamp terminal, PE 6.3 x 0.8	Dual purpose base plate also for installation on mounting rails	M5	2.90 kg	1	96	102	104	84	87	56
STE 250/23/24	Spring clamp terminal, PE 6.3 x 0.8	Dual purpose base plate also for installation on mounting rails	M5	3.50 kg	1	96	102	104	84	87	62.5
STE 250/4/24	Spring clamp terminal, PE 6.3 x 0.8	Dual purpose base plate also for installation on mounting rails	M5	3.50 kg	1	96	102	104	84	87	62.5
STE 250/4/23	Spring clamp terminal, PE 6.3 x 0.8	Dual purpose base plate also for installation on mounting rails	M5	3.50 kg	1	96	102	104	84	87	62.5
STE 320/23/24	Spring clamp terminal, PE 6.3 x 0.8	Base plate	M5	4.30 kg	2	105	103	110	81	86	63
STE 320/4/23	Spring clamp terminal, PE 6.3 x 0.8	Base plate	M5	4.30 kg	2	105	103	110	81	86	63
STE 400/23/24	Spring clamp terminal, PE 6.3 x 0.8	Base plate	M5	5.00 kg	2	120	104	121	90	86	60
STE 400/4/23	Spring clamp terminal, PE 6.3 x 0.8	Base plate	M5	5.00 kg	2	120	104	121	90	86	60
STE 500/23/24	Spring clamp terminal, PE 6.3 x 0.8	Base plate	M5	6.50 kg	2	120	124	121	90	106	71
STE 500/4/24	Spring clamp terminal, PE 6.3 x 0.8	Base plate	M5	6.50 kg	2	120	124	121	90	106	71
STE 500/4/23	Spring clamp terminal, PE 6.3 x 0.8	Base plate	M5	6.50 kg	2	120	124	121	90	106	71
STE 630/4/23	Spring clamp terminal, PE 6.3 x 0.8	Base plate	M6	7.80 kg	2	150	113	143	122	91	59
STE 800/4/23	Spring clamp terminal, PE 6.3 x 0.8	Base plate	M6	9.90 kg	2	150	130	143	122	107.5	65
STE 1000/4/23	Spring clamp terminal, PE 6.3 x 0.8	Base plate	M6	13.10 kg	2	150	156	143	122	134	82
STE 1600/4/23	Spring clamp terminal, PE 6.3 x 0.8	Base plate	M8	18.00 kg	2	192	145	180.5	156	117	72
STE 2000/4/23	Spring clamp terminal, PE 6.3 x 0.8	Base plate	M8	21.80 kg	2	192	161	180.5	156	136	80
STE 2500/4/23	Spring clamp terminal, PE 6.3 x 0.8	Base plate	M8	25.50 kg	2	192	179	180.5	156	151	91

Dimension pictures



Control- and safety isolating- resp. isolating transformer
STEU

General Data

Rated input voltage 230 and 400 Vac
Rated output voltage 24 - 230 Vac
Rated power 63 - 2500 VA
Insulation class B
Maximum ambient temperature 40 °C
Efficiency up to 94 %
Degree of protection IP 00

Advantages

Dual input voltage 230 and 400 Vac
Very good switch-on behaviour thanks to reduced starting currents
High performance for the volume thanks to compact design
Primary side ±15 V tappings for voltage adjustment
Very good corrosion protection and low noise thanks to vacuum impregnation
Quick to cable up thanks to the use of spring-clamp terminals
Contact protected screw connection terminals complying with UVV BGV A3
Simple mounting thanks to robust metal footplate with oval slots
Up to 250 VA with combination footplate for bolted and rail mounting

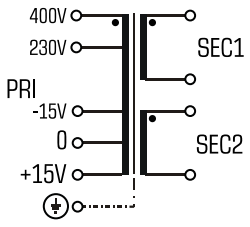
Applications

As a control transformer for the electrical isolation of the input and output sides. The construction of the transformer to supply control systems according to VDE 0113 is designed.

As an isolating transformer for the safe electrical isolation of the input and output sides. The transformer may be used to set up protective separation as a protective measure in accordance with VDE 0100.

As a safety transformer for the safe electrical isolation of the input and output sides. The transformer is suitable for creating SELV and PELV circuits because of the limit on the output voltage.

Sample application



Standards

Control transformer
to: VDE 0570 Teil 2-2, DIN EN 61558-2-2, EN 61558-2-2, IEC 61558-2-2, UL 5085-1/-2, CSA 22.2 No.66

Safety isolating transformer
to: VDE 0570 Teil 2-6, DIN EN 61558-2-6, EN 61558-2-6, IEC 61558-2-6, UL 5085-1/-2, CSA 22.2 No.66

Isolating transformer
to: VDE 0570 Part2-4, DIN EN 61558-2-4, EN 61558-2-4, IEC 61558-2-4, UL 5085-1/-2, CSA 22.2 No.66

Approvals

UL 5085-1/-2, CSA 22.2 No.66

Control- and safety isolating- resp. isolating transformer
STEU

Electrical data

Typ	STEU 63/48	STEU 63/24	STEU 63/23	STEU 100/48	STEU 100/24	STEU 100/23
Input						
Rated input voltage	230/400 Vac	230/400 Vac	230/400 Vac	230/400 Vac	230/400 Vac	230/400 Vac
Tappings Input	±15 V	±15 V	±15 V	±15 V	±15 V	±15 V
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	2x24 Vac	2 x 12 Vac	2 x 115 Vac	2x24 Vac	2 x 12 Vac	2 x 115 Vac
Rated power VDE (DB cos phi=1)	63 VA	63 VA	63 VA	100 VA	100 VA	100 VA
Rated power VDE (KB cos phi=0.5)	175 VA	175 VA	175 VA	310 VA	310 VA	175 VA
No-load voltage (app. x factor)	1.10	1.10	1.10	1.07	1.07	1.07
Efficiency	86.0 %	86.0 %	86.0 %	86.0 %	86.0 %	86.0 %
Standards						
Classification	Control- and safety isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
PRI Fusing recommendation by circuit breaker with tripping characteristic type 20 x Irated related to set)						
Setting range 230 ±15 Vac	0.25 - 0.40 A	0.25 - 0.40 A	0,25 - 0,40 A	0.40 - 0.63 A	0.40 - 0.63 A	0.40 - 0.63 A
Setting value 230 ±15 Vac	0.35 A	0.35 A	0.35 A	0.50 A	0.50 A	0.50 A
Setting range 400 ±15 Vac	0.16 - 0.25 A	0.16 - 0.25 A	0,16 - 0,25 A	0.25 - 0.40 A	0.25 - 0.40 A	0.25 - 0.40 A
Setting value 400 ±15 Vac	0.20 A	0.20 A	0.20 A	0.29 A	0.29 A	0.29 A
Order numbers						
Order Number	**STEU 63/48**	**STEU 63/24**	**STEU 63/23**	**STEU 100/48**	**STEU 100/24**	**STEU 100/23**

Control- and safety isolating- resp. isolating transformer
STEU

Electrical data

Typ	STEU 160/48	STEU 160/24	STEU 160/23	STEU 250/48	STEU 250/24	STEU 250/23
Input						
Rated input voltage	230/400 Vac	230/400 Vac	230/400 Vac	230/400 Vac	230/400 Vac	230/400 Vac
Tappings Input	±15 V	±15 V	±15 V	±15 V	±15 V	±15 V
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	2x24 Vac	2 x 12 Vac	2 x 115 Vac	2x24 Vac	2 x 12 Vac	2 x 115 Vac
Rated power VDE (DB cos phi=1)	160 VA	160 VA	160 VA	250 VA	250 VA	250 VA
Rated power VDE (KB cos phi=0.5)	490 VA	490 VA	490 VA	850 VA	850 VA	850 VA
No-load voltage (app. x factor)	1.10	1.10	1.10	1.07	1.07	1.07
Efficiency	86.0 %	86.0 %	86.0 %	88.0 %	88.0 %	88.0 %
Standards						
Classification	Control- and isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
PRI Fusing recommendation by circuit breaker with tripping characteristic type 20 x Irated related to set)						
Setting range 230 ±15 Vac	0.63 - 1.00 A	0.63 - 1.00 A	0.63 - 1.00 A	1.00 - 1.60 A	1.00 - 1.60 A	1.00 - 1.60 A
Setting value 230 ±15 Vac	0.80 A	0.80 A	0.80 A	1.20 A	1.20 A	1.20 A
Setting range 400 ±15 Vac	0.40 - 0.63 A	0.40 - 0.63 A	0.40 - 0.63 A	0.63 - 1.00 A	0.63 - 1.00 A	0.63 - 1.00 A
Setting value 400 ±15 Vac	0.46 A	0.46 A	0.46 A	0.70 A	0.70 A	0.70 A
Order numbers						
Order Number	**STEU 160/48**	**STEU 160/24**	**STEU 160/23**	**STEU 250/48**	**STEU 250/24**	**STEU 250/23**

Control- and safety isolating- resp. isolating transformer
STEU

Electrical data

Typ	STEU 320/48	STEU 320/24	STEU 320/23	STEU 400/24	STEU 400/23	STEU 500/48
Input						
Rated input voltage	230/400 Vac	230/400 Vac	230/400 Vac	230/400 Vac	230/400 Vac	230/400 Vac
Tappings Input	±15 V	±15 V	±15 V	±15 V	±15 V	±15 V
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	2x24 Vac	2 x 12 Vac	2 x 115 Vac	2 x 12 Vac	2 x 115 Vac	2x24 Vac
Rated power VDE (DB cos phi=1)	320 VA	320 VA	320 VA	400 VA	400 VA	500 VA
Rated power VDE (KB cos phi=0.5)	1.120 VA	1.120 VA	1.120 VA	1.440 VA	1.440 VA	2.000 VA
No-load voltage (app. x factor)	1.07	1.07	1.07	1.04	1.04	1.04
Efficiency	90.0 %	90.0 %	90.0 %	90.0 %	90.0 %	92.0 %
Standards						
Classification	Control- and isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer	Control- and isolating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
PRI Fusing recommendation by circuit breaker with tripping characteristic type 20 x Irated related to set)						
Setting range 230 ±15 Vac	1.00 - 1.60 A	1.00 - 1.60 A	1.00 - 1.60 A	1.60 - 2.50 A	1.60 - 2.50 A	1.60 - 2.50 A
Setting value 230 ±15 Vac	1.50 A	1.50 A	1.50 A	1.90 A	1.90 A	2.40 A
Setting range 400 ±15 Vac	0.63 - 1.00 A	0.63 - 1.00 A	0.63 - 1.00 A	1.00 - 1.60 A	1.00 - 1.60 A	1.00 - 1.60 A
Setting value 400 ±15 Vac	0.88 A	0.88 A	0.88 A	1.10 A	1.10 A	1.40 A
Order numbers						
Order Number	**STEU 320/48**	**STEU 320/24**	**STEU 320/23**	**STEU 400/24**	**STEU 400/23**	**STEU 500/48**

Control- and safety isolating- resp. isolating transformer
STEU

Electrical data

Typ	STEU 500/24	STEU 500/23	STEU 630/24	STEU 630/23	STEU 800/48	STEU 800/24
Input						
Rated input voltage	230/400 Vac	230/400 Vac	230/400 Vac	230/400 Vac	230/400 Vac	230/400 Vac
Tappings Input	±15 V	±15 V	±15 V	±15 V	±15 V	±15 V
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	2 x 12 Vac	2 x 115 Vac	2 x 12 Vac	2 x 115 Vac	2x24 Vac	2 x 12 Vac
Rated power VDE (DB cos phi=1)	500 VA	500 VA	630 VA	630 VA	800 VA	800 VA
Rated power VDE (KB cos phi=0.5)	2.000 VA	2.000 VA	2.350 VA	2.350 VA	3.400 VA	3.400 VA
No-load voltage (app. x factor)	1.04	1.04	1.04	1.04	1.03	1.03
Efficiency	92.0 %	92.0 %	92.0 %	92.0 %	94.0 %	94.0 %
Standards						
Classification	Control- and safety isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
PRI Fusing recommendation by circuit breaker with tripping characteristic type 20 x Irated related to set)						
Setting range 230 ±15 Vac	1.60 - 2.50 A	1.60 - 2.50 A	2.50 - 4.00 A	2.50 - 4.00 A	2.50 - 4.00 A	2.50 - 4.00 A
Setting value 230 ±15 Vac	2.40 A	2.40 A	3.00 A	3.00 A	3.70 A	3.70 A
Setting range 400 ±15 Vac	1.00 - 1.60 A	1.00 - 1.60 A	1.60 - 2.50 A	1.60 - 2.50 A	1.60 - 2.50 A	1.60 - 2.50 A
Setting value 400 ±15 Vac	1.40 A	1.40 A	1.70 A	1.70 A	2.20 A	2.20 A
Order numbers						
Order Number	**STEU 500/24**	**STEU 500/23**	**STEU 630/24**	**STEU 630/23**	**STEU 800/48**	**STEU 800/24**

Control- and safety isolating- resp. isolating transformer
STEU

Electrical data

Typ	STEU 800/23	STEU 1000/48	STEU 1000/24	STEU 1000/23	STEU 1600/23	STEU 2000/23
Input						
Rated input voltage	230/400 Vac	230/400 Vac	230/400 Vac	230/400 Vac	230/400 Vac	230/400 Vac
Tappings Input	±15 V	±15 V	±15 V	±15 V	±15 V	±15 V
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	2 x 115 Vac	2x24 Vac	2 x 12 Vac	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac
Rated power VDE (DB cos phi=1)	800 VA	1.000 VA	1.000 VA	1.000 VA	1.600 VA	2.000 VA
Rated power VDE (KB cos phi=0.5)	3.400 VA	5.000 VA	5.000 VA	5.000 VA	7.800 VA	10.900 VA
No-load voltage (app. x factor)	1.03	1.03	1.03	1.03	1.01	1.02
Efficiency	94.0 %	94.0 %	94.0 %	94.0 %	94.0 %	94.0 %
Standards						
Classification	Control- and isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
PRI Fusing recommendation by circuit breaker with tripping characteristic type 20 x Irated related to set)						
Setting range 230 ±15 Vac	2.50 - 4.00 A	4.00 - 6.30 A	4.00 - 6.30 A	4.00 - 6.30 A	6.30 - 10.00 A	8.00 - 10.00 A
Setting value 230 ±15 Vac	3.70 A	4.60 A	4.60 A	4.60 A	7.30 A	9.10 A
Setting range 400 ±15 Vac	1.60 - 2.50 A	2.50 - 4.00 A	2.50 - 4.00 A	2.50 - 4.00 A	4.00 - 6.30 A	4.00 - 6.30 A
Setting value 400 ±15 Vac	2.20 A	2.70 A	2.70 A	2.70 A	4.20 A	5.20 A
Order numbers						
Order Number	**STEU 800/23**	**STEU 1000/48**	**STEU 1000/24**	**STEU 1000/23**	**STEU 1600/23**	**STEU 2000/23**

Control- and safety isolating- resp. isolating transformer
STEU

Electrical data

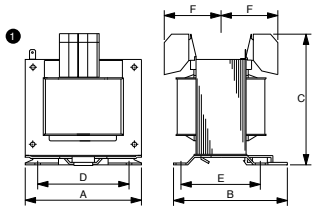
Typ	STEU 2500/23
Input	
Rated input voltage	230/400 Vac
Tappings Input	±15 V
Frequency range	50 - 60 Hz
Output	
Rated output voltage	2 x 115 Vac
Rated power VDE (DB cos phi=1)	2.500 VA
Rated power VDE (KB cos phi=0.5)	12.400 VA
No-load voltage (app. x factor)	1.02
Efficiency	94.0 %
Standards	
Classification	Control- and isolating transformer
Approvals	
Approvals	cURus
Environment	
Ambient temperature max.	40 °C
Type of cooling	self-cooling
Safety and protection	
Type	Open type
Insulation class	VDE=B, UL=class 130
Protection index	IP 00
Safety class (prepared)	I
Short circuit strength	non-short-circuit proof
PRI Fusing recommendation by circuit breaker with tripping characteristic type 20 x Irated related to set)	
Setting range 230 ±15 Vac	10.00 - 16.00 A
Setting value 230 ±15 Vac	11.20 A
Setting range 400 ±15 Vac	6.30 - 10.00 A
Setting value 400 ±15 Vac	6.50 A
Order numbers	
Order Number	**STEU 2500/23**

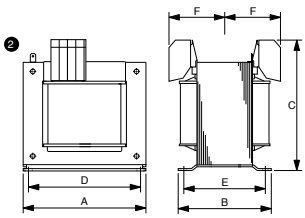
Control- and safety isolating- resp. isolating transformer
STEU

Mechanical data 30

Typ	Terminals	Fixing method	Fixing screws	Weight	Dimension picture (in mm)	A	B	C	D	E	F
STEU 63/48	Spring terminal, PE 6.3 x 0.8	Dual purpose base plate also for installation on mounting rails	M4	1.3 kg	1	84	85	88	64	64	46
STEU 63/24	Spring terminal, PE 6.3 x 0.8	Dual purpose base plate also for installation on mounting rails	M4	1.3 kg	1	84	85	88	64	64	46
STEU 63/23	Spring terminal, PE 6.3 x 0.8	Dual purpose base plate also for installation on mounting rails	M4	1.3 kg	1	84	85	88	64	64	46
STEU 100/48	Spring terminal, PE 6.3 x 0.8	Dual purpose base plate also for installation on mounting rails	M4	2.1 kg	1	84	85	96	64	64	54.5
STEU 100/24	Spring terminal, PE 6.3 x 0.8	Dual purpose base plate also for installation on mounting rails	M4	2.1 kg	1	84	85	96	64	64	54.5
STEU 100/23	Spring terminal, PE 6.3 x 0.8	Dual purpose base plate also for installation on mounting rails	M4	2.1 kg	1	84	85	96	64	64	54.5
STEU 160/48	Spring terminal, PE 6.3 x 0.8	Dual purpose base plate also for installation on mounting rails	M5	2.9 kg	1	96	102	104	84	87	56
STEU 160/24	Spring terminal, PE 6.3 x 0.8	Dual purpose base plate also for installation on mounting rails	M5	2.9 kg	1	96	102	104	84	87	56
STEU 160/23	Spring terminal, PE 6.3 x 0.8	Dual purpose base plate also for installation on mounting rails	M5	2.9 kg	1	96	102	104	84	87	56
STEU 250/48	Spring terminal, PE 6.3 x 0.8	Dual purpose base plate also for installation on mounting rails	M5	3.6 kg	1	96	125	105	84	87	62.5
STEU 250/24	Spring terminal, PE 6.3 x 0.8	Dual purpose base plate also for installation on mounting rails	M5	3.6 kg	1	96	102	104	84	87	62.5
STEU 250/23	Spring terminal, PE 6.3 x 0.8	Dual purpose base plate also for installation on mounting rails	M5	3.6 kg	1	96	125	105	84	87	62.5
STEU 320/48	Spring terminal, PE 6.3 x 0.8	Base plate	M5	4.3 kg	2	120	107	121	90	74	55
STEU 320/24	Spring terminal, PE 6.3 x 0.8	Base plate	M5	4.3 kg	2	120	107	121	90	74	55
STEU 320/23	Spring terminal, PE 6.3 x 0.8	Base plate	M5	4.3 kg	2	120	107	121	90	74	55
STEU 400/24	Spring terminal, PE 6.3 x 0.8	Base plate	M5	5.3 kg	2	120	104	121	90	86	60
STEU 400/23	Spring terminal, PE 6.3 x 0.8	Base plate	M5	5.3 kg	2	120	104	121	90	86	60
STEU 500/48	Spring terminal, PE 6.3 x 0.8	Base plate	M5	7.7 kg	2	120	124	121	90	106	71
STEU 500/24	Spring terminal, PE 6.3 x 0.8	Base plate	M5	7.7 kg	2	120	124	121	90	106	71
STEU 500/23	Spring terminal, PE 6.3 x 0.8	Base plate	M5	7.7 kg	2	120	124	121	90	106	71
STEU 630/24	Spring terminal, PE 6.3 x 0.8	Base plate	M6	7.9 kg	2	150	113	143	122	91	59

Dimension pictures



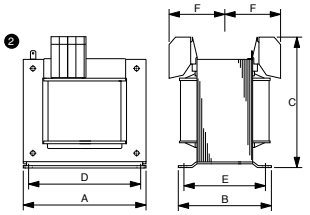


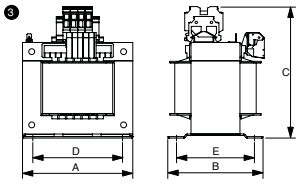
Control- and safety isolating- resp. isolating transformer
STEU

Mechanical data 30

Typ	Terminals	Fixing method	Fixing screws	Weight	Dimension picture (in mm)	A	B	C	D	E	F
STEU 630/23	Spring terminal, PE 6.3 x 0.8	Base plate	M6	7.9 kg	2	150	117	148	122	91	59
STEU 800/48	Spring terminal, PE 6.3 x 0.8	Base plate	M6	10.3 kg	2	150	130	143	122	107.5	65
STEU 800/24	Spring terminal, PE 6.3 x 0.8	Base plate	M6	10.3 kg	3	150	130	180	122	106	-
STEU 800/23	Spring terminal, PE 6.3 x 0.8	Base plate	M6	10.3 kg	2	150	130	143	122	107.5	65
STEU 1000/48	Spring terminal, PE 6.3 x 0.8	Base plate	M6	13.3 kg	2	150	156	143	122	134	82
STEU 1000/24	Spring terminal, PE 6.3 x 0.8	Base plate	M6	13.3 kg	2	150	180	185	122	134	82
STEU 1000/23	Spring terminal, PE 6.3 x 0.8	Base plate	M6	13.3 kg	2	150	156	143	122	134	82
STEU 1600/23	Spring terminal, PE 6.3 x 0.8	Base plate	M8	21.0 kg	2	192	161	185	155	133	80
STEU 2000/23	Spring terminal, PE 6.3 x 0.8	Base plate	M8	25.5 kg	2	192	183	185	156	155	91
STEU 2500/23	Spring terminal, PE 6.3 x 0.8	Base plate	M8	27.0 kg	2	192	190	185	156	161	94

Dimension pictures





Universal control- and safety isolating- resp. isolating transformer
USTE

General Data

Rated input voltage 208 - 600 Vac
Rated output voltage 24 - 230 Vac
Rated power 100 - 3200 VA
Insulation class B
Maximum ambient temperature 40 °C
Efficiency up to 96 %
Degree of protection IP 00

Advantages

Universal input voltages 208 to 600 Vac
Very good switch-on behaviour thanks to reduced starting currents
High performance for the volume thanks to compact design
Very good corrosion protection and low noise thanks to vacuum impregnation
Quick to cable up thanks to the use of spring-clamp terminals
Contact protected screw connection terminals complying with UVV BGV A3
Simple mounting thanks to robust metal footplate with oval slots
Up to 250 VA with combination footplate for bolted and rail mounting

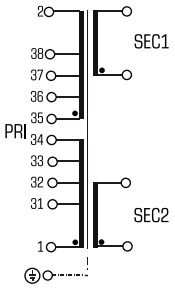
Applications

As a control transformer for the electrical isolation of the input and output sides. The construction of the transformer to supply control systems according to VDE 0113 is designed.

As an isolating transformer for the safe electrical isolation of the input and output sides. The transformer may be used to set up protective separation as a protective measure in accordance with VDE 0100.

As a safety isolating transformer for the safe electrical isolation of the input and output sides. The transformer is suitable for creating SELV and PELV circuits because of the limit on the output voltage.

Sample application



Standards

Control transformer
to: VDE 0570 Teil 2-2, DIN EN 61558-2-2, EN 61558-2-2, IEC 61558-2-2, UL 5085-1/-2, CSA 22.2 No.66

Safety isolating transformer
to: VDE 0570 Teil 2-6, DIN EN 61558-2-6, EN 61558-2-6, IEC 61558-2-6, UL 5085-1/-2, CSA 22.2 No.66

Isolating transformer
to: VDE 0570 Part2-4, DIN EN 61558-2-4, EN 61558-2-4, IEC 61558-2-4, UL 5085-1/-2, CSA 22.2 No.66

Approvals

UL 5085-1/-2, CSA 22.2 No.66

Universal control- and safety isolating- resp. isolating transformer
USTE

Electrical data

Typ	USTE 100/2x12	USTE 100/2x115	USTE 250/2x12	USTE 250/2x115	USTE 400/2x12	USTE 400/2x115
Input						
Rated input voltage	208 Vac/230 Vac/380 Vac 400 Vac/415 Vac/440 Vac 460 Vac/480 Vac/500 Vac 525 Vac/550 Vac/575 Vac 600 Vac	208 Vac/230 Vac/380 Vac 400 Vac/415 Vac/440 Vac 460 Vac/480 Vac/500 Vac 525 Vac/550 Vac/575 Vac 600 Vac	208 Vac/230 Vac/380 Vac 400 Vac/415 Vac/440 Vac 460 Vac/480 Vac/500 Vac 525 Vac/550 Vac/575 Vac 600 Vac	208 Vac/230 Vac/380 Vac 400 Vac/415 Vac/440 Vac 460 Vac/480 Vac/500 Vac 525 Vac/550 Vac/575 Vac 600 Vac	208 Vac/230 Vac/380 Vac 400 Vac/415 Vac/440 Vac 460 Vac/480 Vac/500 Vac 525 Vac/550 Vac/575 Vac 600 Vac	208 Vac/230 Vac/380 Vac 400 Vac/415 Vac/440 Vac 460 Vac/480 Vac/500 Vac 525 Vac/550 Vac/575 Vac 600 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	2x12 Vac	2x115 Vac	2x12 Vac	2x115 Vac	2x12 Vac	2x115 Vac
Rated power VDE (DB cos phi=1)	100 VA	100 VA	250 VA	250 VA	400 VA	400 VA
Rated power VDE (KB cos phi=0.5)	310 VA	310 VA	850 VA	850 VA	1.440 VA	1.440 VA
No-load voltage (app. x factor)	1.07	1.07	1.07	1.07	1.05	1.05
Efficiency	87.0 %	87.0 %	90.0 %	90.0 %	92.0 %	92.0 %
Standards						
Classification	Control- and safety isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
PRI Fusing recommendation by circuit breaker with tripping characteristic type 20 x Irated related to set)						
Setting range 208 - 230 Vac	0.63 - 1.00 A	0.63 - 1.00 A	1.00 - 1.60 A	1.00 - 1.60 A	1.60 - 2.50 A	1.60 - 2.50 A
Setting value 208 - 230 Vac	0.63 A	0.63 A	1.30 A	1.30 A	2.10 A	2.10 A
Setting range 380 - 415 Vac	0.25 - 0.40 A	0.25 - 0.40 A	0.63 - 1.00 A	0.63 - 1.00 A	1.00 - 1.60 A	1.00 - 1.60 A
Setting value 380 - 415 Vac	0.34 A	0.34 A	0.71 A	0.71 A	1.10 A	1.10 A
Setting range 440 +20 Vac	0.25 - 0.40 A	0.25 - 0.40 A	0.63 - 1.00 A	0.63 - 1.00 A	1.00 - 1.60 A	1.00 - 1.60 A
Setting value 440 +20 Vac	0.31 A	0.31 A	0.64 A	0.64 A	1.00 A	1.00 A
Setting range 500 -20/+25 Vac	0.25 - 0.40 A	0.25 - 0.40 A	0.40 - 0.63 A	0.40 - 0.63 A	0.63 - 1.00 A	0.63 - 1.00 A
Setting value 500 -20/+25 Vac	0.27 A	0.27 A	0.57 A	0.57 A	0.90 A	0.90 A
Setting range 575 ±25 Vac	0.16 - 0.25 A	0.16 - 0.25 A	0.40 - 0.63 A	0.40 - 0.63 A	0.63 - 1.00 A	0.63 - 1.00 A
Setting value 575 ±25 Vac	0.24 A	0.24 A	0.50 A	0.50 A	0.81 A	0.81 A
Order numbers						
Order Number	**USTE 100/2x12**	**USTE 100/2x115**	**USTE 250/2x12**	**USTE 250/2x115**	**USTE 400/2x12**	**USTE 400/2x115**

Universal control- and safety isolating-resp. isolating transformer
USTE

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Electrical data

Typ	USTE 630/2x12	USTE 630/2x115	USTE 800/2x115	USTE 1000/2x115	USTE 1200/2x115	USTE 1600/2x115
Input						
Rated input voltage	208 Vac/230 Vac/380 Vac 400 Vac/415 Vac/440 Vac 460 Vac/480 Vac/500 Vac 525 Vac/550 Vac/575 Vac 600 Vac	208 Vac/230 Vac/380 Vac 400 Vac/415 Vac/440 Vac 460 Vac/480 Vac/500 Vac 525 Vac/550 Vac/575 Vac 600 Vac	208 Vac/230 Vac/380 Vac 400 Vac/415 Vac/440 Vac 460 Vac/480 Vac/500 Vac 525 Vac/550 Vac/575 Vac 600 Vac	208 Vac/230 Vac/380 Vac 400 Vac/415 Vac/440 Vac 460 Vac/480 Vac/500 Vac 525 Vac/550 Vac/575 Vac 600 Vac	208 Vac/230 Vac/380 Vac 400 Vac/415 Vac/440 Vac 460 Vac/480 Vac/500 Vac 525 Vac/550 Vac/575 Vac 600 Vac	208 Vac/230 Vac/380 Vac 400 Vac/415 Vac/440 Vac 460 Vac/480 Vac/500 Vac 525 Vac/550 Vac/575 Vac 600 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	2x12 Vac	2x115 Vac	2x115 Vac	2x115 Vac	2x115 Vac	2x115 Vac
Rated power VDE (DB cos phi=1)	630 VA	630 VA	800 VA	1.000 VA	1.200 VA	1.600 VA
Rated power VDE (KB cos phi=0.5)	2.350 VA	2.350 VA	3.400 VA	5.000 VA	5.000 VA	7.800 VA
No-load voltage (app. x factor)	1.03	1.03	1.03	1.02	1.02	1.02
Efficiency	93.0 %	93.0 %	93.0 %	94.0 %	94.0 %	94.0 %
Standards						
Classification	Control- and safety isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
PRI Fusing recommendation by circuit breaker with tripping characteristic type 20 x Irated related to set)						
Setting range 208 - 230 Vac	2.50 - 4.00 A	2.50 - 4.00 A	2.50 - 4.00 A	4.00 - 6.30 A	4.00 - 6.30 A	6.30 - 10.00 A
Setting value 208 - 230 Vac	3.20 A	3.20 A	3.90 A	5.00 A	5.00 A	7.50 A
Setting range 380 - 415 Vac	1.60 - 2.50 A	1.60 - 2.50 A	1.60 - 2.50 A	2.50 - 4.00 A	2.50 - 4.00 A	4.00 - 6.30 A
Setting value 380 - 415 Vac	1.70 A	1.70 A	2.20 A	2.70 A	2.70 A	4.10 A
Setting range 440 +20 Vac	1.00 - 1.60 A	1.00 - 1.60 A	1.60 - 2.50 A	1.60 - 2.50 A	1.60 - 2.50 A	2.50 - 4.00 A
Setting value 440 +20 Vac	1.50 A	1.50 A	1.90 A	2.40 A	2.40 A	3.70 A
Setting range 500 -20/+25 Vac	1.00 - 1.60 A	1.00 - 1.60 A	1.60 - 2.50 A	1.60 - 2.50 A	1.60 - 2.50 A	2.50 - 4.00 A
Setting value 500 -20/+25 Vac	1.30 A	1.30 A	1.70 A	2.20 A	2.20 A	3.30 A
Setting range 575 ±25 Vac	1.00 - 1.60 A	1.00 - 1.60 A	1.00 - 1.60 A	1.60 - 2.50 A	1.60 - 2.50 A	2.50 - 4.00 A
Setting value 575 ±25 Vac	1.20 A	1.20 A	1.50 A	1.90 A	1.90 A	2.90 A
Order numbers						
Order Number	**USTE 630/2x12**	**USTE 630/2x115**	**USTE 800/2x115**	**USTE 1000/2x115**	**USTE 1200/2x115**	**USTE 1600/2x115**

1.1
1.2
1.3
2.1
2.2
3.1
3.2
3.3
4.0
5.1
5.2

Universal control- and safety isolating- resp. isolating transformer
USTE

Electrical data

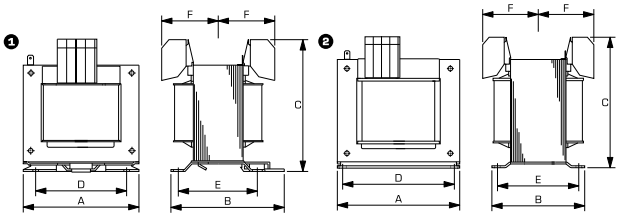
Typ	USTE 2500/2x115	USTE 3200/2x115
Input		
Rated input voltage	208 Vac/230 Vac/380 Vac 400 Vac/415 Vac/440 Vac 460 Vac/480 Vac/500 Vac 525 Vac/550 Vac/575 Vac 600 Vac	208 Vac/230 Vac/380 Vac 400 Vac/415 Vac/440 Vac 460 Vac/480 Vac/500 Vac 525 Vac/550 Vac/575 Vac 600 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz
Output		
Rated output voltage	2x115 Vac	2x115 Vac
Rated power VDE (DB cos phi=1)	2.500 VA	3.200 VA
Rated power VDE (KB cos phi=0.5)	12.500 VA	14.400 VA
No-load voltage (app. x factor)	1.01	1.02
Efficiency	95.0 %	96.0 %
Standards		
Classification	Control- and isolating transformer	Control- and isolating transformer
Approvals		
Approvals	cURus	cURus
Environment		
Ambient temperature max.	40 °C	40 °C
Type of cooling	self-cooling	self-cooling
Safety and protection		
Type	Open type	Open type
Insulation class	VDE=B, UL=class 130	VDE=B, UL=class 130
Protection index	IP 00	IP 00
Safety class (prepared)	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof
PRI Fusing recommendation by circuit breaker with tripping characteristic type 20 x Irated related to set)		
Setting range 208 - 230 Vac	10.00 - 16.00 A	10.00 - 16.00 A
Setting value 208 - 230 Vac	12.50 A	15.20 A
Setting range 380 - 415 Vac	6.30 - 10.00 A	6.30-10.00 A
Setting value 380 - 415 Vac	6.90 A	8.40 A
Setting range 440 +20 Vac	4.00 - 6.30 A	6.30-10.00 A
Setting value 440 +20 Vac	6.10 A	7.50 A
Setting range 500 -20/+25 Vac	4.00 - 6.30 A	6.30-10.00 A
Setting value 500 -20/+25 Vac	5.20 A	6.50 A
Setting range 575 ±25 Vac	4.00 - 6.30 A	4.00 - 6.30 A
Setting value 575 ±25 Vac	4.70 A	5.80 A
Order numbers		
Order Number	**USTE 2500/2x115**	**USTE 3200/2x115**

Universal control- and safety isolating- resp. isolating transformer
USTE

Mechanical data 30

Typ	Terminals	Fixing method	Fixing screws	Weight	Dimension picture (in mm)	A	B	C	D	E	F
USTE 100/2x12	Spring terminals, PE 6.3 x 0.8	Dual purpose base plate also for installation on mounting rails	M4	2.1 kg	1	84	85	96	64	64	54.5
USTE 100/2x115	Spring terminals, PE 6.3 x 0.8	Dual purpose base plate also for installation on mounting rails	M4	2.1 kg	1	84	85	96	64	64	54.5
USTE 250/2x12	Spring terminals, PE 6.3 x 0.8	Dual purpose base plate also for installation on mounting rails	M5	3.6 kg	1	96	102	104	84	87	62.5
USTE 250/2x115	Spring terminals, PE 6.3 x 0.8	Dual purpose base plate also for installation on mounting rails	M5	3.6 kg	1	96	102	104	84	87	62.5
USTE 400/2x12	Spring terminals, PE 6.3 x 0.8	Base plate	M5	5.3 kg	2	120	104	121	90	86	60
USTE 400/2x115	Spring terminals, PE 6.3 x 0.8	Base plate	M5	5.3 kg	2	120	104	121	90	86	60
USTE 630/2x12	Spring terminals, PE 6.3 x 0.8	Base plate	M6	7.9 kg	2	150	113	143	122	91	59
USTE 630/2x115	Spring terminals, PE 6.3 x 0.8	Base plate	M6	7.9 kg	2	150	113	143	122	91	59
USTE 800/2x115	Spring terminals, PE 6.3 x 0.8	Base plate	M6	10.9 kg	2	150	130	143	122	108	68
USTE 1000/2x115	Spring terminals, PE 6.3 x 0.8	Base plate	M6	13.8 kg	2	150	156	143	122	134	82
USTE 1200/2x115	Spring terminals, PE 6.3 x 0.8	Base plate	M6	13.8 kg		-	-	-	-	-	-
USTE 1600/2x115	Spring terminals, PE 6.3 x 0.8	Base plate	M8	20.8 kg	2	192	145	180.5	156	117	72
USTE 2500/2x115	Spring terminals, PE 6.3 x 0.8	Base plate	M8	26.3 kg	2	192	190	180.5	156	161	94
USTE 3200/2x115	Spring terminals, PE 6.3 x 0.8	Base plate	M10	39.0 kg	2	231	220	250	180	148	92

Dimension pictures



Control- and safety isolating- resp. isolating transformer
ST

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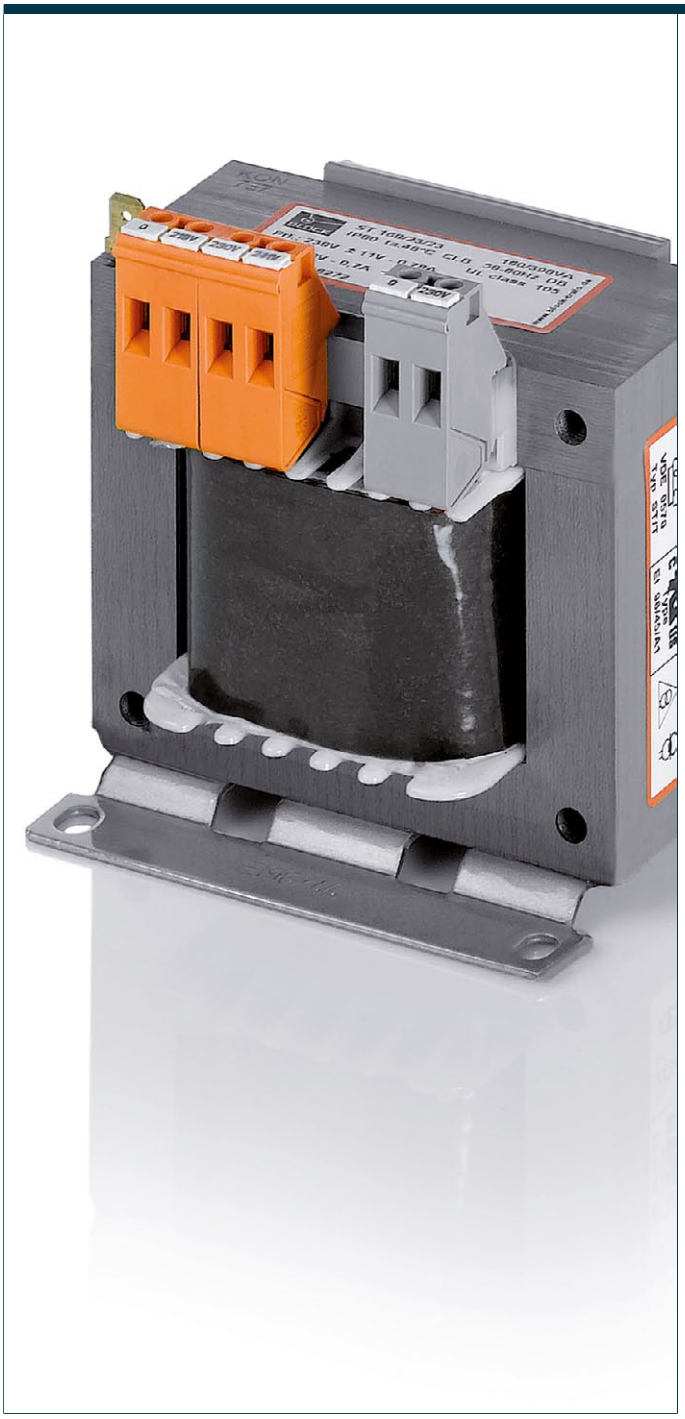


General Data

Rated input voltage 230 - 690 Vac
Rated output voltage 12 - 230 Vac
Rated power 20 - 2500 VA
Insulation class B
Maximum ambient temperature 40 °C
Efficiency up to 96 %
Degree of protection IP 00

Advantages

Very good switch-on behaviour thanks to reduced starting currents
High performance for the volume thanks to compact design
Primary side ±5 % tappings for voltage adjustment
Very good corrosion protection and low noise thanks to vacuum impregnation
Contact protected screw connection terminals complying with UVV BGV A3
Simple mounting thanks to robust metal footplate with oval slots

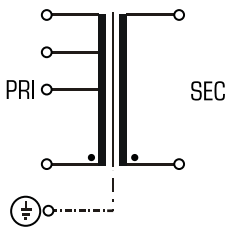
Applications

As a control transformer for the electrical isolation of the input and output sides.The construction of the transformer to supply control systems according to VDE 0113 is designed.

As an isolating transformer for the safe electrical isolation of the input and output sides. The transformer may be used to set up protective separation as a protective measure in accordance with VDE 0100.

As a safety isolating transformer for the safe electrical isolation of the input and output sides. The transformer is suitable for creating SELV and PELV circuits because of the limit on the output voltage.

Sample application



Standards

Control transformer
to: VDE 0570 Teil 2-2, DIN EN 61558-2-2, EN 61558-2-2, IEC 61558-2-2, UL 5085-1/-2, CSA 22.2 No.66

Safety isolating transformer
to: VDE 0570 Teil 2-6, DIN EN 61558-2-6, EN 61558-2-6, IEC 61558-2-6, UL 5085-1/-2, CSA 22.2 No.66

Isolating transformer
to: VDE 0570 Part2-4, DIN EN 61558-2-4, EN 61558-2-4, IEC 61558-2-4, UL 5085-1/-2, CSA 22.2 No.66

Approvals

ENEC 10 (VDE), UL 5085-1/-2, CSA 22.2 No.66

Control- and safety isolating- resp. isolating transformer
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Electrical data

Typ	ST 20/23/12	ST 20/23/24	ST 20/23/23	ST 20/4/23	ST 63/23/12	ST 63/23/24
Input						
Rated input voltage	230 Vac	230 Vac	230 Vac	400 Vac	230 Vac	230 Vac
Tappings Input	±5 %	±5 %	±5 %	±5 %	±5 %	±5 %
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	12 Vac	24 Vac	230 Vac	230 Vac	12 Vac	24 Vac
Rated power VDE (DB cos phi=1)	20 VA	20 VA	20 VA	20 VA	63 VA	63 VA
Rated power VDE (KB cos phi=0.5)	42 VA	42 VA	42 VA	42 VA	110 VA	110 VA
No-load voltage (app. x factor)	1.10	1.10	1.10	1.10	1.10	1.10
Efficiency	81.0 %	81.0 %	81.0 %	81.0 %	84.0 %	84.0 %
Standards						
Classification	Safety isolating transformer	Safety isolating transformer	Isolating transformer	Isolating transformer	Control- and safety isolating transformer	Control- and safety isolating transformer
Approvals						
Approvals	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
PRI Fusing recommendation by circuit breaker with tripping characteristic type 20 x Irated related to set)						
Setting range	0.10 - 0.16 A	0.10 - 0.16 A	0.10 - 0.16 A	0.10 - 0.16 A	0.25 - 0.40 A	0.25 - 0.40 A
Setting value	0.11 A	0.11 A	0.11 A	0.10 A	0.33 A	0.33 A
Order numbers						
Order Number	**ST 20/23/12**	**ST 20/23/24**	**ST 20/23/23**	**ST 20/4/23**	**ST 63/23/12**	**ST 63/23/24**

Control- and safety isolating- resp. isolating transformer
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Electrical data

Typ	ST 63/23/23	ST 63/4/24	ST 63/4/42	ST 63/4/23	ST 63/44/23	ST 63/69/23
Input						
Rated input voltage	230 Vac	400 Vac	400 Vac	400 Vac	440 Vac	690 Vac
Tappings Input	±5 %	±5 %	±5 %	±5 %	±5 %	±5 %
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	230 Vac	24 Vac	42 Vac	230 Vac	230 Vac	230 Vac
Rated power VDE (DB cos phi=1)	63 VA	63 VA	63 VA	63 VA	63 VA	63 VA
Rated power VDE (KB cos phi=0.5)	110 VA	110 VA	110 VA	110 VA	110 VA	110 VA
No-load voltage (app. x factor)	1.10	1.10	1.10	1.10	1.10	1.10
Efficiency	84.0 %	84.0 %	84.0 %	84.0 %	84.0 %	84.0 %
Standards						
Classification	Control- and isolating transformer	Control- and safety isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer
Approvals						
Approvals	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	-
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	B
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
PRI Fusing recommendation by circuit breaker with tripping characteristic type 20 x Irated related to set)						
Setting range	0.25 - 0.40 A	0.16 - 0.25 A	0.16 - 0.25 A	0.16 - 0.25 A	0.16 - 0.25 A	0.10 - 0.16 A
Setting value	0.33 A	0.19 A	0.19 A	0.19 A	0.17 A	0.10 A
Order numbers						
Order Number	**ST 63/23/23**	**ST 63/4/24**	**ST 63/4/42**	**ST 63/4/23**	**ST 63/44/23**	**ST 63/69/23**

Control- and safety isolating- resp. isolating transformer
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Electrical data

Typ	ST 100/23/12	ST 100/23/24	ST 100/23/23	ST 100/4/24	ST 100/4/23	ST 100/69/23
Input						
Rated input voltage	230 Vac	230 Vac	230 Vac	400 Vac	400 Vac	690 Vac
Tappings Input	±5 %	±5 %	±5 %	±5 %	±5 %	±5 %
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	12 Vac	24 Vac	230 Vac	24 Vac	230 Vac	230 Vac
Rated power VDE (DB cos phi=1)	100 VA	100 VA	100 VA	100 VA	100 VA	100 VA
Rated power VDE (KB cos phi=0.5)	225 VA	225 VA	225 VA	225 VA	225 VA	225 VA
No-load voltage (app. x factor)	1.10	1.10	1.10	1.10	1.10	1.10
Efficiency	86.0 %	86.0 %	86.0 %	86.0 %	86.0 %	86.0 %
Standards						
Classification	Control- and safety isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer	Control- and isolating transformer
Approvals						
Approvals	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	-
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	B
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
PRI Fusing recommendation by circuit breaker with tripping characteristic type 20 x Irated related to set)						
Setting range	0.40 - 0.63 A	0.40 - 0.63 A	0.40 - 0.63 A	0.25 - 0.40 A	0.25 - 0.40 A	0.15 - 0.25 A
Setting value	0.50 A	0.50 A	0.50 A	0.29 A	0.29 A	0.18 A
Order numbers						
Order Number	**ST 100/23/12**	**ST 100/23/24**	**ST 100/23/23**	**ST 100/4/24**	**ST 100/4/23**	**ST 100/69/23**

Control- and safety isolating- resp. isolating transformer
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Electrical data

Typ	ST 130/23/24	ST 130/23/11	ST 130/4/23	ST 130/69/23	ST 160/23/24	ST 160/23/23
Input						
Rated input voltage	230 Vac	230 Vac	400 Vac	690 Vac	230 Vac	230 Vac
Tappings Input	±5 %	±5 %	±5 %	±5 %	±5 %	±5 %
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	24 Vac	110 Vac	230 Vac	230 Vac	24 Vac	230 Vac
Rated power VDE (DB cos phi=1)	130 VA	130 VA	130 VA	130 VA	160 VA	160 VA
Rated power VDE (KB cos phi=0.5)	300 VA	300 VA	300 VA	300 VA	390 VA	390 VA
No-load voltage (app. x factor)	1.10	1.10	1.10	1.10	1.10	1.09
Efficiency	86.0 %	86.0 %	86.0 %	86.0 %	86.0 %	87.0 %
Standards						
Classification	Control- and safety isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer
Approvals						
Approvals	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	-	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	B	VDE=B, UL=class 105	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
PRI Fusing recommendation by circuit breaker with tripping characteristic type 20 x Irated related to set)						
Setting range	0.63 - 1.00 A	0.63 - 1.00 A	0.25 - 0.40 A	0.16 - 0.25 A	0.63 - 1.00 A	0.63 - 1.00 A
Setting value	0.64 A	0.64 A	0.37 A	0.23 A	0.78 A	0.78 A
Order numbers						
Order Number	**ST 130/23/24**	**ST 130/23/11**	**ST 130/4/23**	**ST 130/69/23**	**ST 160/23/24**	**ST 160/23/23**

Control- and safety isolating- resp. isolating transformer
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Electrical data

Typ	ST 160/4/24	ST 160/4/23	ST 160/69/23	ST 250/23/12	ST 250/23/24	ST 250/23/42
Input						
Rated input voltage	400 Vac	400 Vac	690 Vac	230 Vac	230 Vac	230 Vac
Tappings Input	±5 %	±5 %	±5 %	±5 %	±5 %	±5 %
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	24 Vac	230 Vac	230 Vac	12 Vac	24 Vac	42 Vac
Rated power VDE (DB cos phi=1)	160 VA	160 VA	160 VA	250 VA	250 VA	250 VA
Rated power VDE (KB cos phi=0.5)	390 VA	390 VA	390 VA	555 VA	555 VA	555 VA
No-load voltage (app. x factor)	1.09	1.09	1.09	1.08	1.08	1.08
Efficiency	87.0 %	87.0 %	87.0 %	90.0 %	90.0 %	90.0 %
Standards						
Classification	Control- and safety isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer	Control- and safety isolating transformer	Control- and safety isolating transformer
Approvals						
Approvals	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	-	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105	B	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
PRI Fusing recommendation by circuit breaker with tripping characteristic type 20 x Irated related to set)						
Setting range	0.40 - 0.63 A	0.40 - 0.63 A	0.25 - 0.40 A	1.00 - 1.60 A	1.00 - 1.60 A	1.00 - 1.60 A
Setting value	0.45 A	0.45 A	0.28 A	1.20 A	1.20 A	1.20 A
Order numbers						
Order Number	**ST 160/4/24**	**ST 160/4/23**	**ST 160/69/23**	**ST 250/23/12**	**ST 250/23/24**	**ST 250/23/42**

Control- and safety isolating- resp. isolating transformer
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Electrical data

Typ	ST 250/23/23	ST 250/4/23	ST 250/44/23	ST 250/69/23	ST 320/23/24	ST 320/23/23
Input						
Rated input voltage	230 Vac	400 Vac	440 Vac	690 Vac	230 Vac	230 Vac
Tappings Input	±5 %	±5 %	±5 %	±5 %	±5 %	±5 %
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	230 Vac	230 Vac	230 Vac	230 Vac	24 Vac	230 Vac
Rated power VDE (DB cos phi=1)	250 VA	250 VA	250 VA	250 VA	320 VA	320 VA
Rated power VDE (KB cos phi=0.5)	555 VA	555 VA	555 VA	555 VA	810 VA	810 VA
No-load voltage (app. x factor)	1.08	1.08	1.08	1.08	1.06	1.06
Efficiency	90.0 %	90.0 %	90.0 %	90.0 %	91.0 %	91.0 %
Standards						
Classification	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer
Approvals						
Approvals	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	-	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	B	VDE=B, UL=class 105	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
PRI Fusing recommendation by circuit breaker with tripping characteristic type 20 x Irated related to set)						
Setting range	1.00 - 1.60 A	0.63 - 1.00 A	0.63 - 1.00 A	0.40 - 0.63 A	1.00 - 1.60 A	1.00 - 1.60 A
Setting value	1.20 A	0.69 A	0.63 A	0.43 A	1.50 A	1.50 A
Order numbers						
Order Number	**ST 250/23/23**	**ST 250/4/23**	**ST 250/44/23**	**ST 250/69/23**	**ST 320/23/24**	**ST 320/23/23**

Control- and safety isolating- resp. isolating transformer
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Electrical data

Typ	ST 320/4/23	ST 320/69/23	ST 400/23/24	ST 400/23/23	ST 400/4/24	ST 400/4/23
Input						
Rated input voltage	400 Vac	690 Vac	230 Vac	230 Vac	400 Vac	400 Vac
Tappings Input	±5 %	±5 %	±5 %	±5 %	±5 %	±5 %
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	230 Vac	230 Vac	24 Vac	230 Vac	24 Vac	230 Vac
Rated power VDE (DB cos phi=1)	320 VA	320 VA	400 VA	400 VA	400 VA	400 VA
Rated power VDE (KB cos phi=0.5)	810 VA	810 VA	1.020 VA	1.020 VA	1.020 VA	1.020 VA
No-load voltage (app. x factor)	1.06	1.06	1.06	1.06	1.06	1.06
Efficiency	91.0 %	91.0 %	91.0 %	91.0 %	91.0 %	91.0 %
Standards						
Classification	Control- and isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer
Approvals						
Approvals	cURus, ENEC 10 (VDE)	-	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 105	B	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
PRI Fusing recommendation by circuit breaker with tripping characteristic type 20 x Irated related to set)						
Setting range	0.63 - 1.00 A	0.40 - 0.63 A	1.60 - 2.50 A	1.60 - 2.50 A	1.00 - 1.60 A	1.00 - 1.60 A
Setting value	0.88 A	0.55 A	1.90 A	1.90 A	1.10 A	1.10 A
Order numbers						
Order Number	**ST 320/4/23**	**ST 320/69/23**	**ST 400/23/24**	**ST 400/23/23**	**ST 400/4/24**	**ST 400/4/23**

Control- and safety isolating- resp. isolating transformer
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Electrical data

Typ	ST 400/69/23	ST 500/23/23	ST 500/4/23	ST 500/44/23	ST 500/69/23	ST 630/4/23
Input						
Rated input voltage	690 Vac	230 Vac	400 Vac	440 Vac	690 Vac	400 Vac
Tappings Input	±5 %	±5 %	±5 %	±5 %	±5 %	±5 %
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac
Rated power VDE (DB cos phi=1)	400 VA	500 VA	500 VA	500 VA	500 VA	630 VA
Rated power VDE (KB cos phi=0.5)	1.020 VA	1.370 VA	1.370 VA	1.370 VA	1.370 VA	1.540 VA
No-load voltage (app. x factor)	1.06	1.05	1.05	1.05	1.05	1.05
Efficiency	91.0 %	91.0 %	91.0 %	91.0 %	91.0 %	92.0 %
Standards						
Classification	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer
Approvals						
Approvals	-	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	-	cURus, ENEC 10 (VDE)
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	B	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	B	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
PRI Fusing recommendation by circuit breaker with tripping characteristic type 20 x Irated related to set)						
Setting range	0.63 - 1.00 A	1.60 - 2.50 A	1.00 - 1.60 A	1.00 - 1.60 A	0.63 - 1.00 A	1.60 - 2.50 A
Setting value	0.65 A	2.40 A	1.40 A	1.20 A	0.80 A	1.70 A
Order numbers						
Order Number	**ST 400/69/23**	**ST 500/23/23**	**ST 500/4/23**	**ST 500/44/23**	**ST 500/69/23**	**ST 630/4/23**

Control- and safety isolating- resp. isolating transformer
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Electrical data

Typ	ST 630/69/23	ST 800/23/23	ST 800/4/23	ST 800/44/23	ST 800/69/23	ST 1000/23/23
Input						
Rated input voltage	690 Vac	230 Vac	400 Vac	440 Vac	690 Vac	230 Vac
Tappings Input	±5 %	±5 %	±5 %	±5 %	±5 %	±5 %
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac
Rated power VDE (DB cos phi=1)	630 VA	800 VA	800 VA	800 VA	800 VA	1.000 VA
Rated power VDE (KB cos phi=0.5)	1.540 VA	2.000 VA	2.000 VA	2.000 VA	2.000 VA	3.120 VA
No-load voltage (app. x factor)	1.05	1.04	1.04	1.04	1.04	1.03
Efficiency	92.0 %	92.0 %	92.0 %	92.0 %	92.0 %	94.0 %
Standards						
Classification	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer
Approvals						
Approvals	-	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	-	cURus, ENEC 10 (VDE)
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	B	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	B	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
PRI Fusing recommendation by circuit breaker with tripping characteristic type 20 x Irated related to set)						
Setting range	1.00 - 1.60 A	2.50 - 4.00 A	1.60 - 2.50 A	1.60 - 2.50 A	1.00 - 1.60 A	4.00 - 6.30 A
Setting value	1.00 A	3.70 A	2.10 A	2.00 A	1.24 A	4.60 A
Order numbers						
Order Number	**ST 630/69/23**	**ST 800/23/23**	**ST 800/4/23**	**ST 800/44/23**	**ST 800/69/23**	**ST 1000/23/23**

Control- and safety isolating- resp. isolating transformer
ST

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Electrical data

Typ	ST 1000/4/23	ST 1000/44/23	ST 1000/5/23	ST 1000/69/23	ST 1600/4/23	ST 1600/69/23
Input						
Rated input voltage	400 Vac	440 Vac	500 Vac	690 Vac	400 Vac	690 Vac
Tappings Input	±5 %	±5 %	±5 %	±5 %	±5 %	±5 %
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac
Rated power VDE (DB cos phi=1)	1.000 VA	1.000 VA	1.000 VA	1.000 VA	1.600 VA	1.600 VA
Rated power VDE (KB cos phi=0.5)	3.120 VA	3.120 VA	3.120 VA	3.120 VA	7.800 VA	7.800 VA
No-load voltage (app. x factor)	1.03	1.03	1.03	1.03	1.03	1.03
Efficiency	94.0 %	94.0 %	94.0 %	94.0 %	94.0 %	94.0 %
Standards						
Classification	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer
Approvals						
Approvals	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	-	cURus, ENEC 10 (VDE)	-
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	B	VDE=B, UL=class 130	B
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
PRI Fusing recommendation by circuit breaker with tripping characteristic type 20 x Irated related to set)						
Setting range	2.50 - 4.00 A	1.60 - 2.50 A	1.60 - 2.50 A	1.60 - 2.50 A	4.00 - 6.30 A	1.60 - 2.50 A
Setting value	2.70 A	2.40 A	2.20 A	1.60 A	4.30 A	2.50 A
Order numbers						
Order Number	**ST 1000/4/23**	**ST 1000/44/23**	**ST 1000/5/23**	**ST 1000/69/23**	**ST 1600/4/23**	**ST 1600/69/23**

Control- and safety isolating- resp. isolating transformer
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Electrical data

Typ	ST 2000/4/23	ST 2000/69/23	ST 2500/4/23	ST 2500/69/23
Input				
Rated input voltage	400 Vac	690 Vac	400 Vac	690 Vac
Tappings Input	±5 %	±5 %	±5 %	±5 %
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output				
Rated output voltage	230 Vac	230 Vac	230 Vac	230 Vac
Rated power VDE (DB cos phi=1)	2.000 VA	2.000 VA	2.500 VA	2.500 VA
Rated power VDE (KB cos phi=0.5)	10.900 VA	10.900 VA	12.400 VA	12.400 VA
No-load voltage (app. x factor)	1.03	1.03	1.03	1.03
Efficiency	96.0 %	96.0 %	96.0 %	96.0 %
Standards				
Classification	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer
Approvals				
Approvals	cURus, ENEC 10 (VDE)	-	cURus, ENEC 10 (VDE)	-
Environment				
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling
Safety and protection				
Type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 130	B	VDE=B, UL=class 130	B
Protection index	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
PRI Fusing recommendation by circuit breaker with tripping characteristic type 20 x Irated related to set)				
Setting range	4.00 - 6.30 A	2.50 - 4.00 A	6.30 - 10.00 A	4,00 - 6,30 A
Setting value	5.30 A	3.00 A	6.50 A	4.00 A
Order numbers				
Order Number	**ST 2000/4/23**	**ST 2000/69/23**	**ST 2500/4/23**	**ST 2500/69/23**

Control- and safety isolating- resp. isolating transformer
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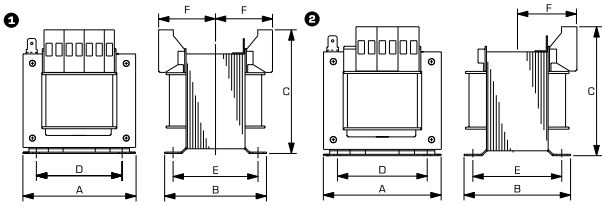
Mechanical data 30

Typ	Terminals	Fixing method	Fixing screws	Weight	Dimension picture (in mm)	A	B	C	D	E	F
ST 20/23/12	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	0.70 kg	1	66	56	81	50	44.5	42
ST 20/23/24	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	0.70 kg	1	66	56	81	50	44.5	42
ST 20/23/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	0.70 kg	1	66	56	81	50	44.5	42
ST 20/4/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	0.70 kg	1	66	56	81	50	44.5	42
ST 63/23/12	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	1.10 kg	1	78	60	89	56	48.5	44
ST 63/23/24	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	1.10 kg	1	78	60	89	56	48.5	44
ST 63/23/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	1.10 kg	1	78	60	89	56	48.5	44
ST 63/4/24	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	1.10 kg	1	78	60	89	56	48.5	44
ST 63/4/42	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	1.10 kg	1	78	60	89	56	48.5	44
ST 63/4/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	1.10 kg	1	78	60	89	56	48.5	44
ST 63/44/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	1.10 kg	1	78	60	89	56	48.5	44
ST 63/69/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	1.10 kg	1	78	60	89	56	48.5	44
ST 100/23/12	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	2.00 kg	2	84	76	95	64	63.5	53
ST 100/23/24	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	2.00 kg	2	84	76	95	64	63.5	53
ST 100/23/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	2.00 kg	2	84	76	95	64	63.5	53
ST 100/4/24	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	2.00 kg	2	84	76	95	64	63.5	53
ST 100/4/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	2.00 kg	2	84	76	95	64	63.5	53
ST 100/69/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	2.00 kg	1	84	87	91	64	63.5	53
ST 130/23/24	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	2.30 kg	2	96	78	105	84	63.5	48
ST 130/23/11	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	2.30 kg	2	96	78	105	84	63.5	48
ST 130/4/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	2.30 kg	2	96	78	105	84	63.5	48
ST 130/69/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	2.30 kg	2	96	78	105	84	63.5	48
ST 160/23/24	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	2.80 kg	2	96	88	103	84	73	53
ST 160/23/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	2.80 kg	2	96	88	103	84	73	53
ST 160/4/24	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	2.80 kg	2	96	88	103	84	73	53
ST 160/4/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	2.80 kg	2	96	88	103	84	73	53
ST 160/69/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	2.80 kg	2	96	88	103	84	73	53
ST 250/23/12	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	3.50 kg	2	96	103	105	84	86.5	61
ST 250/23/24	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	3.50 kg	2	96	103	105	84	86.5	61
ST 250/23/42	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	3.50 kg	2	96	103	105	84	86.5	61
ST 250/23/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	3.50 kg	2	96	103	105	84	86.5	61
ST 250/4/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	3.50 kg	2	96	103	105	84	86.5	61
ST 250/44/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	3.50 kg	2	96	103	105	84	86.5	61
ST 250/69/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	3.50 kg	2	96	103	105	84	86.5	61
ST 320/23/24	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	4.30 kg	2	105	103	114	80	83	61
ST 320/23/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	4.30 kg	2	105	103	114	80	83	61
ST 320/4/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	4.30 kg	2	105	103	114	80	83	61
ST 320/69/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	4.30 kg	2	105	103	114	80	83	61
ST 400/23/24	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	5.00 kg	2	120	110	123	90	85	57
ST 400/23/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	5.00 kg	2	120	110	123	90	85	57
ST 400/4/24	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	5.00 kg	2	120	110	123	90	85	57
ST 400/4/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	5.00 kg	2	120	110	123	90	85	57
ST 400/69/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	5.00 kg	2	120	102	123	90	85	57
ST 500/23/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	6.60 kg	2	120	122	123	90	104	68
ST 500/4/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	6.60 kg	2	120	122	123	90	104	68
ST 500/44/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	6.60 kg	2	120	122	123	90	104	68
ST 500/69/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	6.60 kg	2	120	122	123	90	104	68

Dimension pictures



Control- and safety isolating- resp. isolating transformer
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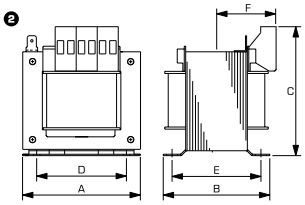
Mechanical data

Typ	Terminals	Fixing method	Fixing screws	Weight	Dimension picture (in mm)	A	B	C	D	E	F
ST 630/4/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M6	7.70 kg	2	150	111	148	122	90	56
ST 630/69/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M6	7.70 kg	2	150	111	148	122	90	56
ST 800/23/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M6	9.80 kg	2	150	128	148	122	106	63
ST 800/4/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M6	9.80 kg	2	150	128	148	122	106	63
ST 800/44/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M6	9.80 kg	2	150	128	148	122	106	63
ST 800/69/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M6	9.80 kg	2	150	128	148	122	106	63
ST 1000/23/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M6	13.10 kg	2	150	154	148	122	130	77
ST 1000/4/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M6	13.10 kg	2	150	154	148	122	130	77
ST 1000/44/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M6	13.10 kg	2	150	154	148	122	130	77
ST 1000/5/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M6	13.10 kg	2	150	154	148	122	130	77
ST 1000/69/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M6	13.10 kg	2	150	154	148	122	130	77
ST 1600/4/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M8	16.80 kg	2	192	146	182	156	119	65
ST 1600/69/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M8	16.80 kg	2	192	146	182	156	119	65
ST 2000/4/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M8	21.00 kg	2	192	162	182	156	135	73
ST 2000/69/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M8	21.00 kg	2	192	162	182	156	135	73
ST 2500/4/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M8	25.50 kg	2	192	185	185	156	157	84
ST 2500/69/23	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	25.50 kg	2	192	185	185	156	157	84

Dimension pictures

2



Universal control- and safety isolating- resp. isolating transformer
STU

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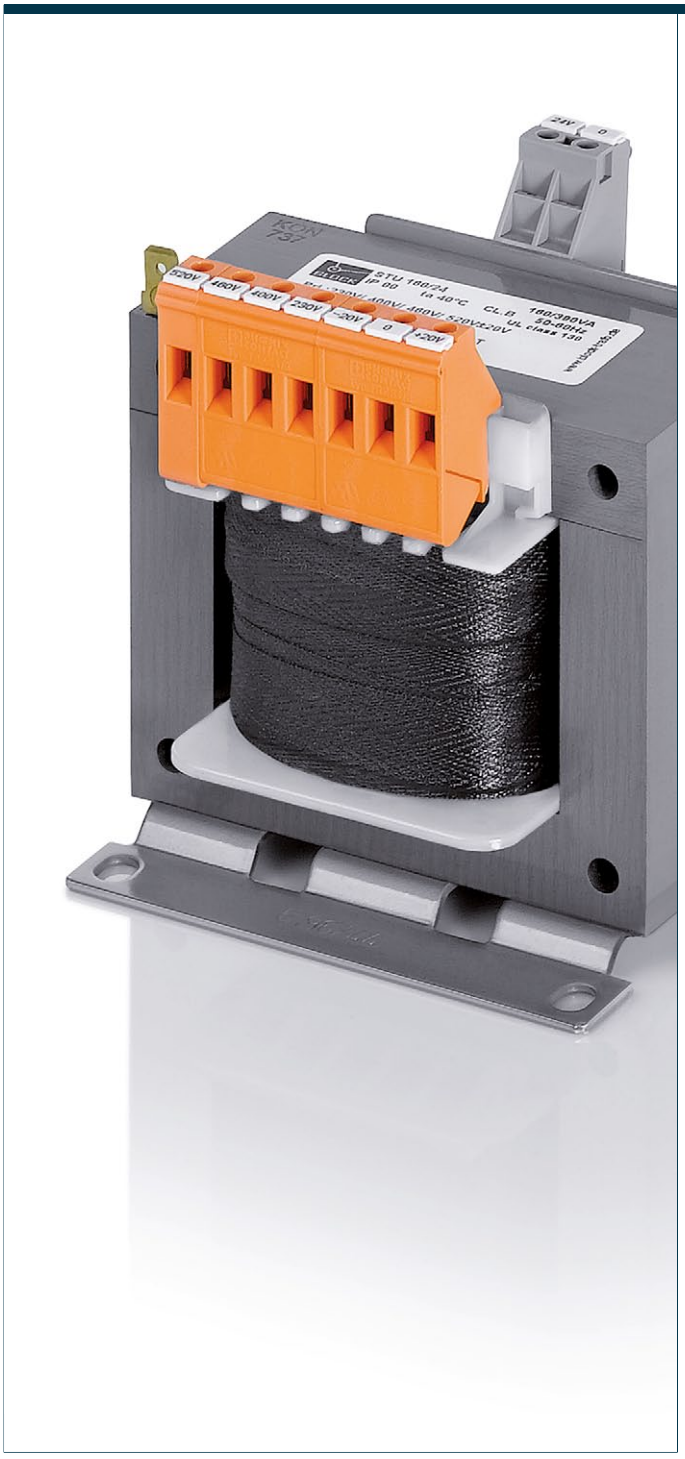


General Data

Rated input voltage 210 - 540 Vac
Rated output voltage 24 - 230 Vac
Rated power 63 - 2500 VA
Insulation class B
Maximum ambient temperature 40 °C
Efficiency up to 95 %
Degree of protection IP 00

Advantages

Universal input voltages 210 to 540 Vac
Very good switch-on behaviour thanks to reduced starting currents
High performance for the volume thanks to compact design
Very good corrosion protection and low noise thanks to vacuum impregnation
Contact protected screw connection terminals complying with UVV BGV A3
Simple mounting thanks to robust metal footplate with oval slots

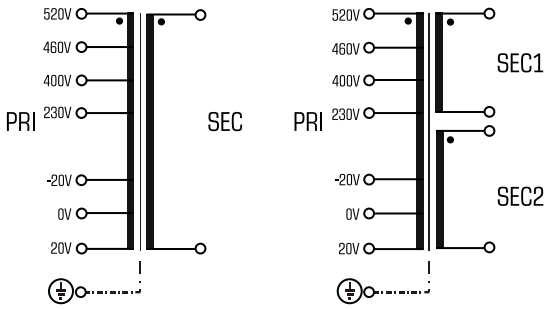
Applications

As a control transformer for the electrical isolation of the input and output sides.The construction of the transformer to supply control systems according to VDE 0113 is designed.

As an isolating transformer for the safe electrical isolation of the input and output sides. The transformer may be used to set up protective separation as a protective measure in accordance with VDE 0100.

As a safety isolating transformer for the safe electrical isolation of the input and output sides. The transformer is suitable for creating SELV and PELV circuits because of the limit on the output voltage.

Sample application



Standards

Control transformer
to: VDE 0570 Teil 2-2, DIN EN 61558-2-2, EN 61558-2-2, IEC 61558-2-2, UL 5085-1/-2, CSA 22.2 No.66

Safety isolating transformer
to: VDE 0570 Teil 2-6, DIN EN 61558-2-6, EN 61558-2-6, IEC 61558-2-6, UL 5085-1/-2, CSA 22.2 No.66

Isolating transformer
to: VDE 0570 Part2-4, DIN EN 61558-2-4, EN 61558-2-4, IEC 61558-2-4, UL 5085-1/-2, CSA 22.2 No.66

Approvals

ENEC 10 (VDE), UL 5085-1/-2, CSA 22.2 No.66

Universal control- and safety isolating- resp. isolating transformer
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Electrical data

Typ	STU 63/24	STU 63/2x115	STU 100/24	STU 100/2x115	STU 130/24	STU 130/2x115
Input						
Rated input voltage	210 Vac/230 Vac/250 Vac 380 Vac/400 Vac/420 Vac 440 Vac/460 Vac/480 Vac 500 Vac/520 Vac/540 Vac	210 Vac/230 Vac/250 Vac 380 Vac/400 Vac/420 Vac 440 Vac/460 Vac/480 Vac 500 Vac/520 Vac/540 Vac	210 Vac/230 Vac/250 Vac 380 Vac/400 Vac/420 Vac 440 Vac/460 Vac/480 Vac 500 Vac/520 Vac/540 Vac	210 Vac/230 Vac/250 Vac 380 Vac/400 Vac/420 Vac 440 Vac/460 Vac/480 Vac 500 Vac/520 Vac/540 Vac	210 Vac/230 Vac/250 Vac 380 Vac/400 Vac/420 Vac 440 Vac/460 Vac/480 Vac 500 Vac/520 Vac/540 Vac	210 Vac/230 Vac/250 Vac 380 Vac/400 Vac/420 Vac 440 Vac/460 Vac/480 Vac 500 Vac/520 Vac/540 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	24 Vac	2x115 Vac	24 Vac	2x115 Vac	24 Vac	2x115 Vac
Rated power VDE (DB cos phi=1)	63 VA	63 VA	100 VA	100 VA	130 VA	130 VA
Rated power VDE (KB cos phi=0.5)	110 VA	110 VA	225 VA	225 VA	300 VA	300 VA
No-load voltage (app. x factor)	1.10	1.10	1.10	1.10	1.10	1.10
Efficiency	84.0 %	84.0 %	86.0 %	86.0 %	86.0 %	86.0 %
Standards						
Classification	Control- and safety isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer
Approvals						
Approvals	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
PRI Fusing recommendation by circuit breaker with tripping characteristic type 20 x Irated related to set)						
Setting range 230 ±20 Vac	0.25 - 0.40 A	0.25 - 0.40 A	0.40 - 0.63 A	0.40 - 0.63 A	0.63 - 1.00 A	0.63 - 1.00 A
Setting value 230 ±20 Vac	0.30 A	0.30 A	0.53 A	0.53 A	0.66 A	0.66 A
Setting range 400 ±20 Vac	0.16 - 0.25 A	0.16 - 0.25 A	0.25 - 0.40 A	0.25 - 0.40 A	0.40 - 0.63 A	0.25 - 0.40 A
Setting value 400 ±20 Vac	0.20 A	0.20 A	0.31 A	0.31 A	0.38 A	0.38 A
Setting range 460 ±20 Vac	0.16 - 0.25 A	0.16 - 0.25 A	0.25 - 0.40 A	0.25 - 0.40 A	0.25 - 0.40 A	0.25 - 0.40 A
Setting value 460 ±20 Vac	0.17 A	0.17 A	0.27 A	0.27 A	0.33 A	0.33 A
Setting range 520 ±20 Vac	0.10 - 0.16 A	0.10 - 0.16 A	0.16 - 0.25 A	0.16 - 0.25 A	0.25 - 0.40 A	0.25 - 0.40 A
Setting value 520 ±20 Vac	0.15 A	0.15 A	0.24 A	0.24 A	0.30 A	0.30 A
Order numbers						
Order Number	**STU 63/24**	**STU 63/2x115**	**STU 100/24**	**STU 100/2x115**	**STU 130/24**	**STU 130/2x115**

1.1 1.2 1.3 2.1 2.2 3.1 3.2 3.3 4.0 5.1 5.2

Universal control- and safety isolating-resp. isolating transformer
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Electrical data

Typ	STU 160/24	STU 160/2x115	STU 250/24	STU 250/2x115	STU 400/24	STU 400/2x115
Input						
Rated input voltage	210 Vac/230 Vac/250 Vac 380 Vac/400 Vac/420 Vac 440 Vac/460 Vac/480 Vac 500 Vac/520 Vac/540 Vac	210 Vac/230 Vac/250 Vac 380 Vac/400 Vac/420 Vac 440 Vac/460 Vac/480 Vac 500 Vac/520 Vac/540 Vac	210 Vac/230 Vac/250 Vac 380 Vac/400 Vac/420 Vac 440 Vac/460 Vac/480 Vac 500 Vac/520 Vac/540 Vac	210 Vac/230 Vac/250 Vac 380 Vac/400 Vac/420 Vac 440 Vac/460 Vac/480 Vac 500 Vac/520 Vac/540 Vac	210 Vac/230 Vac/250 Vac 380 Vac/400 Vac/420 Vac 440 Vac/460 Vac/480 Vac 500 Vac/520 Vac/540 Vac	210 Vac/230 Vac/250 Vac 380 Vac/400 Vac/420 Vac 440 Vac/460 Vac/480 Vac 500 Vac/520 Vac/540 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	24 Vac	2x115 Vac	24 Vac	2x115 Vac	24 Vac	2x115 Vac
Rated power VDE (DB cos phi=1)	160 VA	160 VA	250 VA	250 VA	400 VA	400 VA
Rated power VDE (KB cos phi=0.5)	390 VA	390 VA	555 VA	555 VA	1.020 VA	1.020 VA
No-load voltage (app. x factor)	1.09	1.09	1.08	1.08	1.06	1.06
Efficiency	87.0 %	87.0 %	90.0 %	90.0 %	91.0 %	91.0 %
Standards						
Classification	Control- and safety isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer
Approvals						
Approvals	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
PRI Fusing recommendation by circuit breaker with tripping characteristic type 20 x Irated related to set)						
Setting range 230 ±20 Vac	0.63 - 1.00 A	0.63 - 1.00 A	1.00 - 1.60 A	1.00 - 1.60 A	1.60 - 2.50 A	1.60 - 2.50 A
Setting value 230 ±20 Vac	0.80 A	0.80 A	1.20 A	1.20 A	1.90 A	1.90 A
Setting range 400 ±20 Vac	0.40 - 0.63 A	0.40 - 0.63 A	0.63 - 1.00 A	0.63 - 1.00 A	1.00 - 1.60 A	1.00 - 1.60 A
Setting value 400 ±20 Vac	0.50 A	0.50 A	0.70 A	0.70 A	1.10 A	1.10 A
Setting range 460 ±20 Vac	0.40 - 0.63 A	0.40 - 0.63 A	0.40 - 0.63 A	0.40 - 0.63 A	1.00 - 1.60 A	1.00 - 1.60 A
Setting value 460 ±20 Vac	0.40 A	0.40 A	0.60 A	0.60 A	1.00 A	1.00 A
Setting range 520 ±20 Vac	0.25 - 0.40 A	0.25 - 0.40 A	0.40 - 0.63 A	0.40 - 0.63 A	0.63 - 1.00 A	0.63 - 1.00 A
Setting value 520 ±20 Vac	0.30 A	0.30 A	0.50 A	0.50 A	0.90 A	0.90 A
Order numbers						
Order Number	**STU 160/24**	**STU 160/2x115**	**STU 250/24**	**STU 250/2x115**	**STU 400/24**	**STU 400/2x115**

Universal control- and safety isolating-resp. isolating transformer
STU

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Electrical data

Typ	STU 500/24	STU 500/2x115	STU 630/24	STU 630/2x115	STU 800/24	STU 800/2x115
Input						
Rated input voltage	210 Vac/230 Vac/250 Vac 380 Vac/400 Vac/420 Vac 440 Vac/460 Vac/480 Vac 500 Vac/520 Vac/540 Vac	210 Vac/230 Vac/250 Vac 380 Vac/400 Vac/420 Vac 440 Vac/460 Vac/480 Vac 500 Vac/520 Vac/540 Vac	210 Vac/230 Vac/250 Vac 380 Vac/400 Vac/420 Vac 440 Vac/460 Vac/480 Vac 500 Vac/520 Vac/540 Vac	210 Vac/230 Vac/250 Vac 380 Vac/400 Vac/420 Vac 440 Vac/460 Vac/480 Vac 500 Vac/520 Vac/540 Vac	210 Vac/230 Vac/250 Vac 380 Vac/400 Vac/420 Vac 440 Vac/460 Vac/480 Vac 500 Vac/520 Vac/540 Vac	210 Vac/230 Vac/250 Vac 380 Vac/400 Vac/420 Vac 440 Vac/460 Vac/480 Vac 500 Vac/520 Vac/540 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	24 Vac	2x115 Vac	24 Vac	2x115 Vac	24 Vac	2x115 Vac
Rated power VDE (DB cos phi=1)	500 VA	500 VA	630 VA	630 VA	800 VA	800 VA
Rated power VDE (KB cos phi=0.5)	1.370 VA	1.370 VA	1.540 VA	1.540 VA	2.000 VA	2.000 VA
No-load voltage (app. x factor)	1.05	1.05	1.05	1.05	1.04	1.04
Efficiency	91.0 %	91.0 %	92.0 %	92.0 %	92.0 %	92.0 %
Standards						
Classification	Control- and safety isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer
Approvals						
Approvals	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
PRI Fusing recommendation by circuit breaker with tripping characteristic type 20 x Irated related to set)						
Setting range 230 ±20 Vac	1.60 - 2.50 A	1.60 - 2.50 A	2.50 - 4.00 A	2.50 - 4.00 A	2.50 - 4.00 A	2.50 - 4.00 A
Setting value 230 ±20 Vac	2.30 A	2.30 A	3.00 A	3.00 A	3.70 A	3.70 A
Setting range 400 ±20 Vac	1.00 - 1.60 A	1.00 - 1.60 A	1.60 - 2.50 A	1.60 - 2.50 A	1.60 - 2.50 A	1.60 - 2.50 A
Setting value 400 ±20 Vac	1.40 A	1.40 A	1.70 A	1.70 A	2.10 A	2.10 A
Setting range 460 ±20 Vac	1.00 - 1.60 A	1.00 - 1.60 A	1.00 - 1.60 A	1.00 - 1.60 A	1.60 - 2.50 A	1.60 - 2.50 A
Setting value 460 ±20 Vac	1.20 A	1.20 A	1.50 A	1.50 A	1.70 A	1.70 A
Setting range 520 ±20 Vac	1.00 - 1.60 A	1.00 - 1.60 A	1.00 - 1.60 A	1.00 - 1.60 A	1.60 - 2.50 A	1.60 - 2.50 A
Setting value 520 ±20 Vac	1.00 A	1.00 A	1.30 A	1.30 A	1.60 A	1.60 A
Order numbers						
Order Number	**STU 500/24**	**STU 500/2x115**	**STU 630/24**	**STU 630/2x115**	**STU 800/24**	**STU 800/2x115**

Universal control- and safety isolating-resp. isolating transformer
STU

Electrical data

Typ	STU 1000/2x115	STU 1600/2x115	STU 2000/2x115	STU 2500/2x115
Input				
Rated input voltage	210 Vac/230 Vac/250 Vac 380 Vac/400 Vac/420 Vac 440 Vac/460 Vac/480 Vac 500 Vac/520 Vac/540 Vac	210 Vac/230 Vac/250 Vac 380 Vac/400 Vac/420 Vac 440 Vac/460 Vac/480 Vac 500 Vac/520 Vac/540 Vac	210 Vac/230 Vac/250 Vac 380 Vac/400 Vac/420 Vac 440 Vac/460 Vac/480 Vac 500 Vac/520 Vac/540 Vac	210 Vac/230 Vac/250 Vac 380 Vac/400 Vac/420 Vac 440 Vac/460 Vac/480 Vac 500 Vac/520 Vac/540 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output				
Rated output voltage	2x115 Vac	2x115 Vac	2x115 Vac	2x115 Vac
Rated power VDE (DB cos phi=1)	1.000 VA	1.600 VA	2.000 VA	2.500 VA
Rated power VDE (KB cos phi=0.5)	3.120 VA	3.800 VA	5.770 VA	6.200 VA
No-load voltage (app. x factor)	1.03	1.03	1.02	1.02
Efficiency	94.0 %	94.0 %	95.0 %	95.0 %
Standards				
Classification	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer
Approvals				
Approvals	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)	cURus, ENEC 10 (VDE)
Environment				
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling
Safety and protection				
Type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
PRI Fusing recommendation by circuit breaker with tripping characteristic type 20 x Irated related to set)				
Setting range 230 ±20 Vac	4.00 - 6.30 A	6.30 - 10.00 A	8.00 - 12.00 A	10.00 - 16.00 A
Setting value 230 ±20 Vac	4.60 A	7.30 A	9.10 A	11.20 A
Setting range 400 ±20 Vac	2.50 - 4.00 A	4.00 - 6.30 A	4.00 - 6.30 A	6.30 - 10.00 A
Setting value 400 ±20 Vac	2.60 A	4.20 A	5.20 A	6.50 A
Setting range 460 ±20 Vac	1.60 - 2.50 A	2.50 - 4.00 A	4.00 - 6.30 A	4.00 - 6.30 A
Setting value 460 ±20 Vac	2.30 A	3.70 A	4.50 A	5.60 A
Setting range 520 ±20 Vac	1.60 - 2.50 A	2.50 - 4.00 A	4.00 - 6.30 A	4.00 - 6.30 A
Setting value 520 ±20 Vac	2.00 A	3.20 A	4.00 A	5.00 A
Order numbers				
Order Number	**STU 1000/2x115**	**STU 1600/2x115**	**STU 2000/2x115**	**STU 2500/2x115**

Universal control- and safety isolating- resp. isolating transformer **STU**

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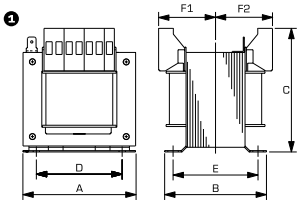
Mechanical data

Typ	Terminals	Fixing method	Fixing screws	Weight	Dimension picture (in mm)	A	B	C	D	E	F1	F2
STU 63/24	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	1.5 kg	1	84	70	95	64	50	38	38
STU 63/2x115	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	1.5 kg	1	84	64	94	64	50	38	38
STU 100/24	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	2.0 kg	1	84	76	94	64	63.5	45	45
STU 100/2x115	Screw-type terminals, PE 6.3 x 0.8	Base plate	M4	2.0 kg	1	84	76	94	64	63.5	45	45
STU 130/24	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	2.3 kg	1	96	78	105	84	63.5	39	39
STU 130/2x115	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	2.3 kg	1	96	78	105	84	63.5	39	39
STU 160/24	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	2.8 kg	1	96	88	105	84	73	46	46
STU 160/2x115	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	2.8 kg	1	96	88	105	84	73	46	46
STU 250/24	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	4.1 kg	1	120	92	123	90	74	46	46
STU 250/2x115	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	4.1 kg	1	120	92	123	90	74	46	46
STU 400/24	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	5.4 kg	1	120	102	123	90	85	50	67
STU 400/2x115	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	5.4 kg	1	120	102	123	90	85	50	58
STU 500/24	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	7.0 kg	1	150	122	126	90	104	60	77
STU 500/2x115	Screw-type terminals, PE 6.3 x 0.8	Base plate	M5	7.0 kg	1	120	122	123	90	104	60	68
STU 630/24	Screw-type terminals, PE 6.3 x 0.8	Base plate	M6	7.9 kg	1	150	111	149	122	90	47	65
STU 630/2x115	Screw-type terminals, PE 6.3 x 0.8	Base plate	M6	7.9 kg	1	150	111	149	122	90	47	56
STU 800/24	Screw-type terminals, PE 6.3 x 0.8	Base plate	M6	10.3 kg	1	150	139	150	122	106	54	74
STU 800/2x115	Screw-type terminals, PE 6.3 x 0.8	Base plate	M6	10.3 kg	1	150	128	149	122	106	54	65
STU 1000/2x115	Screw-type terminals, PE 6.3 x 0.8	Base plate	M6	13.5 kg	1	150	154	149	122	130	68	77
STU 1600/2x115	Screw-type terminals, PE 6.3 x 0.8	Base plate	M8	17.8 kg	1	192	145	182	156	120	86	66
STU 2000/2x115	Screw-type terminals, PE 6.3 x 0.8	Base plate	M8	22.4 kg	1	192	180	182	156	150	82	83
STU 2500/2x115	Screw-type terminals, PE 6.3 x 0.8	Base plate	M8	25.3 kg	1	192	185	182	156	160	87	88

Dimension pictures

1



Control- and safety isolating- resp. isolating transformer with shielding winding
STSU

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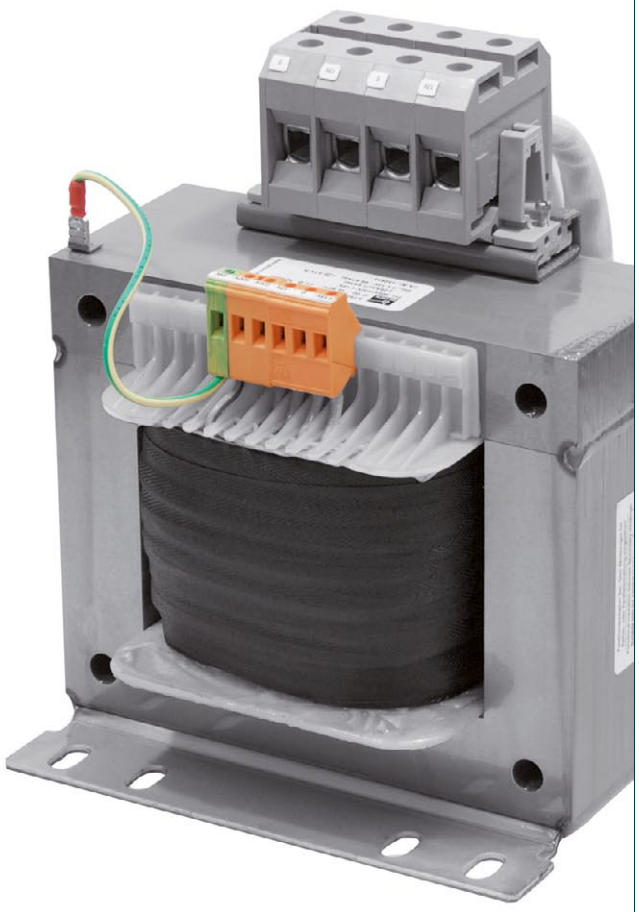


General Data

Rated input voltage 230 and 400 Vac
Rated output voltage 24 - 230 Vac
Rated power 40 - 2500 VA
Insulation class B
Maximum ambient temperature 40 °C
Efficiency up to 94 %
Degree of protection IP 00

Advantages

Dual input voltage 230 and 400 Vac
Shielding winding between input and output
Very good switch-on behaviour thanks to reduced starting currents
High performance for the volume thanks to compact design
Primary side ±15 V tappings for voltage adjustment
Very good corrosion protection and low noise thanks to vacuum impregnation
Contact protected screw connection terminals complying with UVV BGV A3
Simple mounting thanks to robust metal footplate with oval slots
63 - 250 VA with combination footplate for bolted and rail mounting

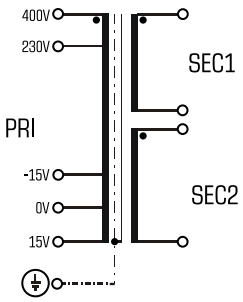
Applications

As a control transformer for the electrical isolation of the input and output sides.The construction of the transformer to supply control systems according to VDE 0113 is designed.

As an isolating transformer for the safe electrical isolation of the input and output sides. The transformer may be used to set up protective separation as a protective measure in accordance with VDE 0100.

As a safety transformer for the safe electrical isolation of the input and output sides. The transformer is suitable for creating SELV and PELV circuits because of the limit on the output voltage.

Sample application



Standards

Control transformer
to: VDE 0570 Teil 2-2, DIN EN 61558-2-2, EN 61558-2-2, IEC 61558-2-2, UL 5085-1/-2, CSA 22.2 No.66

Safety isolating transformer
to: VDE 0570 Teil 2-6, DIN EN 61558-2-6, EN 61558-2-6, IEC 61558-2-6, UL 5085-1/-2, CSA 22.2 No.66

Isolating transformer
to: VDE 0570 Part2-4, DIN EN 61558-2-4, EN 61558-2-4, IEC 61558-2-4, UL 5085-1/-2, CSA 22.2 No.66

Approvals

UL 5085-1/-2, CSA 22.2 No.66

Control- and safety isolating- resp. isolating transformer with shielding winding
STSU

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Electrical data

Typ	STSU 40/23	STSU 40/24	STSU 40/48	STSU 63/23
Input				
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Tappings Input	±15 V	±15 V	±15 V	±15 V
Rated input voltage	230/400 Vac	230/400 Vac	230/400 Vac	230/400 Vac
Output				
Rated output voltage	2x115 Vac	2x12 Vac	2x24 Vac	2x115 Vac
Rated power VDE (DB cos phi=1)	40 VA	40 VA	40 VA	63 VA
Rated power VDE (KB cos phi=0.5)				175 VA
No-load voltage (app. x factor)	1.10	1.10	1.10	1.10
Secondary circuit	2	2	2	2
Efficiency	81.6 %	81.5 %	81.6 %	85.5 %
Standards				
Classification	Isolating transformer	Safety isolating transformer	Control- and isolating transformer	Control- and isolating transformer
Approvals				
Approvals	cURus	cURus	cURus	cURus
Environment				
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C
Safety and protection				
Type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130
Protection index	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Order numbers				
Order Number	**STSU 40/23**	**STSU 40/24**	**STSU 40/48**	**STSU 63/23**

Control- and safety isolating- resp. isolating transformer with shielding winding
STSU

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Electrical data

Typ	STSU 63/24	STSU 63/48	STSU 100/23	STSU 100/24
Input				
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Tappings Input	±15 V	±15 V	±15 V	±15 V
Rated input voltage	230/400 Vac	230/400 Vac	230/400 Vac	230/400 Vac
Output				
Rated output voltage	2x12 Vac	2x24 Vac	2x115 Vac	2x12 Vac
Rated power VDE (DB cos phi=1)	63 VA	63 VA	100 VA	100 VA
Rated power VDE (KB cos phi=0.5)	175 VA	175 VA	310 VA	310 VA
No-load voltage (app. x factor)	1.10	1.10	1.09	1.08
Secondary circuit	2	2	2	2
Efficiency	82.4 %	85.2 %	85.0 %	87.0 %
Standards				
Classification	Control- and safety isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer
Approvals				
Approvals	cURus	cURus	cURus	cURus
Environment				
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C
Safety and protection				
Type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130
Protection index	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Order numbers				
Order Number	**STSU 63/24**	**STSU 63/48**	**STSU 100/23**	**STSU 100/24**

Control- and safety isolating- resp. isolating transformer with shielding winding
STSU

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Electrical data

Typ	STSU 100/48	STSU 160/23	STSU 160/24	STSU 160/48
Input				
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Tappings Input	±15 V	±15 V	±15 V	±15 V
Rated input voltage	230/400 Vac	230/400 Vac	230/400 Vac	230/400 Vac
Output				
Rated output voltage	2x24 Vac	2x115 Vac	2x12 Vac	2x24 Vac
Rated power VDE (DB cos phi=1)	100 VA	160 VA	160 VA	160 VA
Rated power VDE (KB cos phi=0.5)	310 VA			
No-load voltage (app. x factor)	1.10	1.08	1.10	1.10
Secondary circuit	2	2	2	2
Efficiency	84.5 %	87.4 %	88.2 %	88.0 %
Standards				
Classification	Control- and isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer
Approvals				
Approvals	cURus	cURus	cURus	cURus
Environment				
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C
Safety and protection				
Type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130
Protection index	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Order numbers				
Order Number	**STSU 100/48**	**STSU 160/23**	**STSU 160/24**	**STSU 160/48**

Control- and safety isolating- resp. isolating transformer with shielding winding
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Electrical data

Typ	STSU 250/23	STSU 250/24	STSU 250/48	STSU 400/23
Input				
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Tappings Input	±15 V	±15 V	±15 V	±15 V
Rated input voltage	230/400 Vac	230/400 Vac	230/400 Vac	230/400 Vac
Output				
Rated output voltage	2x115 Vac	2x12 Vac	2x24 Vac	2x115 Vac
Rated power VDE (DB cos phi=1)	250 VA	250 VA	250 VA	400 VA
Rated power VDE (KB cos phi=0.5)	850 VA	850 VA	850 VA	1.440 VA
No-load voltage (app. x factor)	1.07	1.07	1.07	1.04
Secondary circuit	2	2	2	2
Efficiency	89.4 %	88.4 %	88.7 %	91.2 %
Standards				
Classification	Control- and isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer	Control- and isolating transformer
Approvals				
Approvals	cURus	cURus	cURus	cURus
Environment				
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C
Safety and protection				
Type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130
Protection index	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Order numbers				
Order Number	**STSU 250/23**	**STSU 250/24**	**STSU 250/48**	**STSU 400/23**

Control- and safety isolating- resp. isolating transformer with shielding winding
STSU

BLOCK Website

Electrical data

Typ	STSU 400/24	STSU 400/48	STSU 630/23	STSU 630/24
Input				
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Tappings Input	±15 V	±15 V	±15 V	±15 V
Rated input voltage	230/400 Vac	230/400 Vac	230/400 Vac	230/400 Vac
Output				
Rated output voltage	2x12 Vac	2x24 Vac	2x115 Vac	2x12 Vac
Rated power VDE (DB cos phi=1)	400 VA	400 VA	630 VA	630 VA
Rated power VDE (KB cos phi=0.5)	1.440 VA	1.440 VA	2.350 VA	2.350 VA
No-load voltage (app. x factor)	1.04	1.04	1.04	1.04
Secondary circuit	2	2	2	2
Efficiency	91.0 %	91.4 %	92.4 %	92.4 %
Standards				
Classification	Control- and safety isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer
Approvals				
Approvals	cURus	cURus	cURus	cURus
Environment				
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C
Safety and protection				
Type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130
Protection index	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Order numbers				
Order Number	**STSU 400/24**	**STSU 400/48**	**STSU 630/23**	**STSU 630/24**

Control- and safety isolating- resp. isolating transformer with shielding winding
STSU

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Electrical data

Typ	STSU 630/48	STSU 1000/23	STSU 1000/24	STSU 1000/48
Input				
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Tappings Input	±15 V	±15 V	±15 V	±15 V
Rated input voltage	230/400 Vac	230/400 Vac	230/400 Vac	230/400 Vac
Output				
Rated output voltage	2x24 Vac	2x115 Vac	2x12 Vac	2x24 Vac
Rated power VDE (DB cos phi=1)	630 VA	1.000 VA	1.000 VA	1.000 VA
Rated power VDE (KB cos phi=0.5)	2.350 VA	5.000 VA	5.000 VA	5.000 VA
No-load voltage (app. x factor)	1.04	1.03	1.03	1.02
Secondary circuit	2	2	2	2
Efficiency	92.4 %	93.6 %	93.5 %	93.5 %
Standards				
Classification	Control- and isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer
Approvals				
Approvals	cURus	cURus	cURus	cURus
Environment				
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C
Safety and protection				
Type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130
Protection index	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Order numbers				
Order Number	**STSU 630/48**	**STSU 1000/23**	**STSU 1000/24**	**STSU 1000/48**

Control- and safety isolating- resp. isolating transformer with shielding winding
STSU

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Electrical data

Typ	STSU 1600/23	STSU 2000/23	STSU 2500/23
Input			
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Tappings Input	±15 V	±15 V	±15 V
Rated input voltage	230/400 Vac	230/400 Vac	230/400 Vac
Output			
Rated output voltage	2x115 Vac	2x115 Vac	2x115 Vac
Rated power VDE (DB cos phi=1)	1.600 VA	2.000 VA	2.500 VA
Rated power VDE (KB cos phi=0.5)	7.800 VA	10.900 VA	12.400 VA
No-load voltage (app. x factor)	1.02	1.02	1.02
Secondary circuit	2	2	2
Efficiency	94.5 %	95.0 %	96.4 %
Standards			
Classification	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer
Approvals			
Approvals	cURus	cURus	cURus
Environment			
Type of cooling	self-cooling	self-cooling	self-cooling
Ambient temperature max.	40 °C	40 °C	40 °C
Safety and protection			
Type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130
Protection index	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Order numbers			
Order Number	**STSU 1600/23**	**STSU 2000/23**	**STSU 2500/23**

Control- and safety isolating- resp. isolating transformer with shielding winding
STSU

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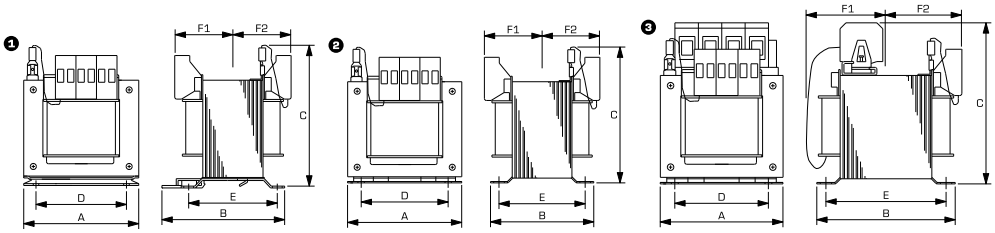
30 Mechanical data

Typ	Terminals	Fixing method	Fixing screws	Weight	Dimension picture (in mm)	A	B	C	D	E	F1	F2	F	G
STSU 40/23	Screw-type terminals	Base plate	M4	1.00 kg	2	66	82	78	50	55	41	41	41	41
STSU 40/24	Screw-type terminals	Base plate	M4	1.00 kg	2	66	82	78	50	55	41	41	41	41
STSU 40/48	Screw-type terminals	Base plate	M4	1.00 kg	2	66	82	78	50	55	41	41	41	41
STSU 63/23	Screw-type terminals	Dual purpose foot plate also for installation on mounting rails	M4	1.30 kg	1	84	89	88	64	64	37	52	37	37
STSU 63/24	Screw-type terminals	Dual purpose foot plate also for installation on mounting rails	M4	1.30 kg	1	84	89	88	64	64	37	52	37	37
STSU 63/48	Screw-type terminals	Dual purpose foot plate also for installation on mounting rails	M4	1.30 kg	1	84	89	88	64	64	37	52	37	37
STSU 100/23	Screw-type terminals	Dual purpose foot plate also for installation on mounting rails	M4	2.10 kg	1	84	97	96	64	64	46	51	46	46
STSU 100/24	Screw-type terminals	Dual purpose foot plate also for installation on mounting rails	M4	2.10 kg	1	84	97	96	64	64	46	51	46	46
STSU 100/48	Screw-type terminals	Dual purpose foot plate also for installation on mounting rails	M4	2.10 kg	1	84	97	96	64	64	46	51	46	46
STSU 160/23	Screw-type terminals	Dual purpose foot plate also for installation on mounting rails	M5	2.80 kg	1	96	102	104	84	87	51	51	51	51
STSU 160/24	Screw-type terminals	Dual purpose foot plate also for installation on mounting rails	M5	2.90 kg	1	96	102	104	84	87	51	51	51	51
STSU 160/48	Screw-type terminals	Dual purpose foot plate also for installation on mounting rails	M5	2.90 kg	1	96	102	104	84	87	51	51	51	51
STSU 250/23	Screw-type terminals	Dual purpose foot plate also for installation on mounting rails	M5	3.60 kg	1	96	102	104	84	87	53	53	53	53
STSU 250/24	Screw-type terminals	Dual purpose foot plate also for installation on mounting rails	M5	3.60 kg	1	96	102	104	84	87	53	53	53	53
STSU 250/48	Screw-type terminals	Dual purpose foot plate also for installation on mounting rails	M5	3.60 kg	1	96	102	104	84	87	53	53	53	53
STSU 400/23	Screw-type terminals	Base plate	M5	5.30 kg	2	120	110	123	90	85	50	57	50	57
STSU 400/24	Screw-type terminals	Base plate	M5	5.30 kg	2	120	110	123	90	85	50	57	50	57
STSU 400/48	Screw-type terminals	Base plate	M5	5.30 kg	2	120	110	123	90	85	50	57	50	57
STSU 630/23	Screw-type terminals	Base plate	M6	8.00 kg	2	150	112	150	122	90	49	56	49	56
STSU 630/24	Screw-type terminals	Base plate	M6	8.00 kg	3	150	122	153	122	90	49	66	49	66
STSU 630/48	Screw-type terminals	Base plate	M6	8.00 kg	2	150	112	150	122	90	49	56	49	56
STSU 1000/23	Screw-type terminals	Base plate	M6	13.60 kg	2	150	156	150	122	134	71	71	71	71
STSU 1000/24	Screw-type terminals	Base plate	M6	13.60 kg	3	150	174	190	122	134	71	70	71	70
STSU 1000/48	Screw-type terminals	Base plate	M6	13.60 kg	2	150	156	150	122	134	71	78	71	78
STSU 1600/23	Screw-type terminals	Base plate	M8	21.00 kg	2	192	161	185	156	133	65	65	65	65
STSU 2000/23	Screw-type terminals	Base plate	M8	26.00 kg	2	192	183	185	156	155	76	76	76	76
STSU 2500/23	Screw-type terminals	Base plate	M8	26.30 kg	2	192	189	185	156	161	79	79	79	79

Dimension pictures



Control transformer
BUST

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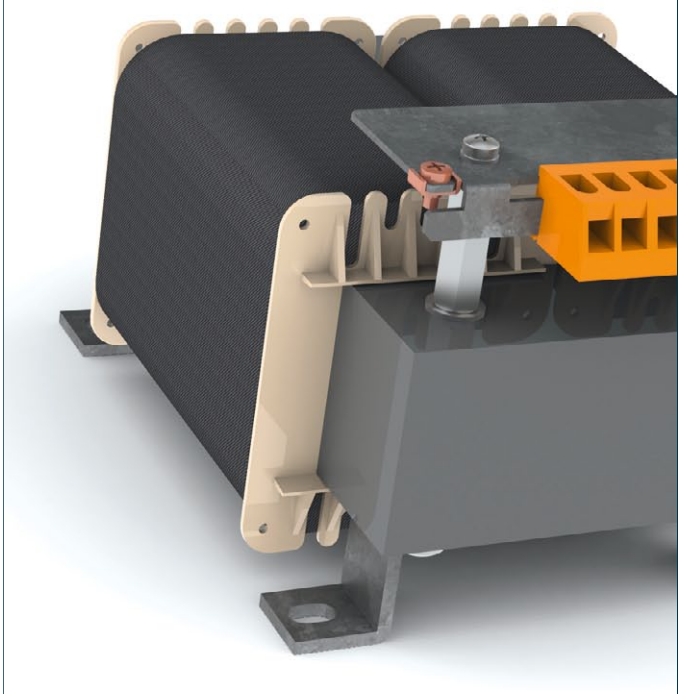


General Data

Rated input voltage 230 - 500 Vac
Rated output voltage 24 - 230 Vac
Rated power 1000 - 10000 VA
Insulation class B
Maximum ambient temperature 40 °C
Efficiency up to 96.8 %
Degree of protection IP 00

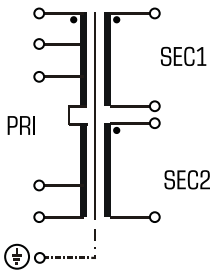
Advantages

High performance for the volume thanks to compact design
Primary side ±5 % tappings for voltage adjustment
Very good corrosion protection and low noise thanks to vacuum impregnation
Contact protected screw connection terminals complying with UVV BGV A3
Low height

Applications

Control transformer for the electrical isolation of the input and output sides. The design of the transformer makes it suitable for the supply of control systems complying with VDE 0113.

Sample application



Standards

Control transformer
to: VDE 0570 Teil 2-2, DIN EN 61558-2-2, EN 61558-2-2, IEC 61558-2-2, UL 5085-1/-2, CSA 22.2 No.66

Approvals

UL 5085-1/-2, CSA 22.2 No.66

Control transformer
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Electrical data

Typ	BUST 1000/23/24	BUST 1000/4/23	BUST 1600/23/24	BUST 1600/4/42	BUST 1600/4/23	BUST 2000/23/23
Input						
Rated input voltage	230 Vac	400 Vac	230 Vac	400 Vac	400 Vac	230 Vac
Tappings Input	±5 %	±5 %	±5 %	±5 %	±5 %	±5 %
Low-inrush current	typ. rated current up to 12 times	typ. rated current up to 12 times	typ. rated current up to 12 times	typ. rated current up to 12 times	typ. rated current up to 12 times	typ. rated current up to 12 times
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	24 Vac	2x115 Vac	24 Vac	42 Vac	2x115 Vac	2x115 Vac
Rated power VDE (DB cos phi=1)	1.000 VA	1.000 VA	1.600 VA	1.600 VA	1.600 VA	2.000 VA
Rated power VDE (KB cos phi=0.5)	2.500 VA	2.500 VA	4.300 VA	4.300 VA	4.300 VA	5.300 VA
Efficiency	92.6 %	92.5 %	93.5 %	93.3 %	93.2 %	93.7 %
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
PRI Fusing recommendation by circuit breaker with tripping characteristic type 20 x Irated related to set)						
Setting range	4.00 - 6.30 A	2.50 - 4.00 A	6.30 - 10.00 A	4.00 - 6.30 A	4.00 - 6.30 A	8.00 - 12.00 A
Setting value	4.70 A	2.70 A	7.40 A	4.30 A	4.30 A	9.30 A
Order numbers						
Order Number	**BUST 1000/23/24**	**BUST 1000/4/23**	**BUST 1600/23/24**	**BUST 1600/4/42**	**BUST 1600/4/23**	**BUST 2000/23/23**

Control transformer
BUST

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Electrical data

Typ	BUST 2000/4/23	BUST 2500/4/23	BUST 3000/4/23	BUST 3000/44/23	BUST 3000/5/23	BUST 4000/23/23
Input						
Rated input voltage	400 Vac	400 Vac	400 Vac	440 Vac	500 Vac	230 Vac
Tappings Input	±5 %	±5 %	±5 %	±5 %	±5 %	±5 %
Low-inrush current	typ. rated current up to 12 times	typ. rated current up to 12 times	typ. rated current up to 12 times	typ. rated current up to 12 times	typ. rated current up to 12 times	typ. rated current up to 12 times
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	2x115 Vac	2x115 Vac	2x115 Vac	2x115 Vac	2x115 Vac	2x115 Vac
Rated power VDE (DB cos phi=1)	2.000 VA	2.500 VA	3.000 VA	3.000 VA	3.000 VA	4.000 VA
Rated power VDE (KB cos phi=0.5)	5.300 VA	6.900 VA	8.900 VA	8.900 VA	8.900 VA	11.000 VA
Efficiency	93.9 %	94.8 %	95.3 %	95.4 %	95.3 %	95.4 %
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
PRI Fusing recommendation by circuit breaker with tripping characteristic type 20 x Irated related to set)						
Setting range	4.00 - 6.30 A	6.30 - 10.00 A	6.30 - 10.00 A	6.30 - 10.00 A	6.30 - 10.00 A	16.00 - 20.00 A
Setting value	5.30 A	6.50 A	7.80 A	7.10 A	6.30 A	18.10 A
Order numbers						
Order Number	**BUST 2000/4/23**	**BUST 2500/4/23**	**BUST 3000/4/23**	**BUST 3000/44/23**	**BUST 3000/5/23**	**BUST 4000/23/23**

Control transformer
BUST

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Electrical data

Typ	BUST 4000/4/23	BUST 4000/44/23	BUST 5000/23/23	BUST 5000/4/23	BUST 6300/4/23	BUST 6300/44/23
Input						
Rated input voltage	400 Vac	440 Vac	230 Vac	400 Vac	400 Vac	440 Vac
Tappings Input	±5 %	±5 %	±5 %	±5 %	±5 %	±5 %
Low-inrush current	typ. rated current up to 12 times	typ. rated current up to 12 times	typ. rated current up to 12 times	typ. rated current up to 12 times	typ. rated current up to 12 times	typ. rated current up to 12 times
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	2x115 Vac	2x115 Vac	2x115 Vac	2x115 Vac	2x115 Vac	2x115 Vac
Rated power VDE (DB cos phi=1)	4.000 VA	4.000 VA	5.000 VA	5.000 VA	6.300 VA	6.300 VA
Rated power VDE (KB cos phi=0.5)	11.000 VA	11.000 VA	15.700 VA	15.700 VA	16.000 VA	16.000 VA
Efficiency	95.4 %	95.4 %	95.8 %	95.7 %	96.2 %	96.4 %
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
PRI Fusing recommendation by circuit breaker with tripping characteristic type 20 x Irated related to set)						
Setting range	8.00 - 12.00 A	6.30 - 10.00 A	20.00 - 25.00 A	10.00 - 16.00 A	16.00 - 20.00 A	10.00 - 16.00 A
Setting value	10.40 A	9.00 A	22.00 A	12.90 A	16.20 A	14.80 A
Order numbers						
Order Number	**BUST 4000/4/23**	**BUST 4000/44/23**	**BUST 5000/23/23**	**BUST 5000/4/23**	**BUST 6300/4/23**	**BUST 6300/44/23**

Control transformer
BUST

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Electrical data

Typ	BUST 6300/5/23	BUST 8000/4/23	BUST 10000/4/23
Input			
Rated input voltage	500 Vac	400 Vac	400 Vac
Tappings Input	±5 %	±5 %	±5 %
Low-inrush current	typ. rated current up to 12 times	typ. rated current up to 12 times	typ. rated current up to 12 times
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output			
Rated output voltage	2x115 Vac	2x115 Vac	2x115 Vac
Rated power VDE (DB cos phi=1)	6.300 VA	8.000 VA	10.000 VA
Rated power VDE (KB cos phi=0.5)	16.000 VA	26.500 VA	27.000 VA
Efficiency	96.3%	96.5 %	96.8 %
Approvals			
Approvals	cURus	cURus	cURus
Environment			
Ambient temperature max.	40 °C	40 °C	40 °C
Type of cooling	self-cooling	self-cooling	self-cooling
Safety and protection			
Type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130
Protection index	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
PRI Fusing recommendation by circuit breaker with tripping characteristic type 20 x Irated related to set)			
Setting range	10.00 - 16.00 A	20.00 - 25.00 A	20.00 - 25.00 A
Setting value	13.00 A	21.00 A	25.00 A
Order numbers			
Order Number	**BUST 6300/5/23**	**BUST 8000/4/23**	**BUST 10000/4/23**

Control transformer
BUST

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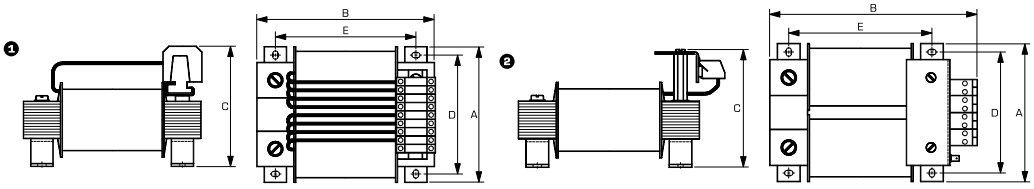
Mechanical data 30

Typ	Terminals	Fixing method	Fixing screws	Weight	Dimension picture (in mm)	A	B	C	D	E
BUST 1000/23/24	Screw-type terminals	Foot brackets	M5	10.00 kg	1	150	220	130	126	152
BUST 1000/4/23	Screw-type terminals	Foot brackets	M5	10.00 kg	2	150	220	130	126	152
BUST 1600/23/24	Screw-type terminals	Foot brackets	M6	16.00 kg	1	180	245	156	146	176
BUST 1600/4/42	Screw-type terminals	Foot brackets	M6	16.00 kg	1	180	245	156	146	176
BUST 1600/4/23	Screw-type terminals	Foot brackets	M6	16.00 kg	2	180	245	156	146	176
BUST 2000/23/23	Screw-type terminals	Foot brackets	M6	19.00 kg	2	200	275	175	174	200
BUST 2000/4/23	Screw-type terminals	Foot brackets	M6	19.00 kg	2	200	275	175	174	200
BUST 2500/4/23	Screw-type terminals	Foot brackets	M6	25.00 kg	2	200	275	175	174	200
BUST 3000/4/23	Screw-type terminals	Foot brackets	M6	28.00 kg	2	200	255	215	174	200
BUST 3000/44/23	Screw-type terminals	Foot brackets	M6	28.00 kg	2	200	255	215	174	200
BUST 3000/5/23	Screw-type terminals	Foot brackets	M6	28.00 kg	2	200	255	215	174	200
BUST 4000/23/23	Screw-type terminals	Foot brackets	M8	37.00 kg	2	240	325	175	204	240
BUST 4000/4/23	Screw-type terminals	Foot brackets	M8	37.00 kg	2	240	325	175	204	240
BUST 4000/44/23	Screw-type terminals	Foot brackets	M8	37.00 kg	2	240	325	175	204	240
BUST 5000/23/23	Screw-type terminals	Foot brackets	M8	41.00 kg	2	240	325	190	204	240
BUST 5000/4/23	Screw-type terminals	Foot brackets	M8	41.00 kg	2	240	325	190	204	240
BUST 6300/4/23	Screw-type terminals	Foot brackets	M8	58.00 kg	2	280	350	220	234	280
BUST 6300/44/23	Screw-type terminals	Foot brackets	M8	58.00 kg	2	280	350	220	234	280
BUST 6300/5/23	Screw-type terminals	Foot brackets	M8	58.00 kg	2	280	350	220	234	280
BUST 8000/4/23	Screw-type terminals	Foot brackets	M8	72.00 kg	2	280	350	250	234	280
BUST 10000/4/23	Screw-type terminals	Foot brackets	M10	86.00 kg	2	320	400	245	264	320

Dimension pictures



Control- and safety isolating- resp. isolating transformer
TT1

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General Data

Rated input voltage 219 Vac - 525 Vac
Rated output voltage 24, 42, 2 x 115 Vac
Rated power 1000 - 25000 VA
Insulation class F
Maximum ambient temperature 40 °C
Efficiency up to 98 %
Degree of protection IP 00, IPXXB on request
Optionally adapted package for higher degrees of protection

Advantages

Safe galvanic isolation
Patented assembly technology
Very good corrosion protection and low noise thanks to vacuum impregnation
Primary side ±5 % tappings for voltage adjustment
Fixed, contact protected screw connection terminals complying with UVV BGV A3
Multifunctional fixing rail with 8 oval slots
Space saving, thanks to horizontal design
Integrated crane eyes
Non-slip terminals

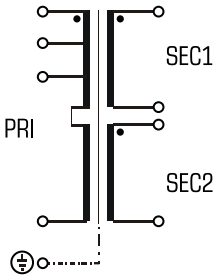
Applications

Isolating transformer for the safe electrical isolation of the input and output sides. The transformer may be used to set up protective separation as a protective measure in accordance with VDE 0100.

As a control transformer for the electrical isolation of the input and output sides.The construction of the transformer to supply control systems according to VDE 0113 is designed.

As a safety isolating transformer for the safe electrical isolation of the input and output sides. The transformer is suitable for creating SELV and PELV circuits because of the limit on the output voltage.

Sample application



Standards

Control transformer
to: VDE 0570 Teil 2-2, DIN EN 61558-2-2, EN 61558-2-2, IEC 61558-2-2, UL 5085-1/-2, CSA 22.2 No.66
Isolating transformer
to: VDE 0570 Part 2-4, DIN EN 61558-2-4, EN 61558-2-4, IEC 61558-2-4, UL 5085-1/-2, CSA 22.2 No.66
Safety isolating transformer
to: VDE 0570 Part 2-6, DIN EN 61558-2-6, EN 61558-2-6, IEC 61558-2-6, UL 5085-1/-2, CSA 22.2 No.66

Approvals

UL 5085, UL 1561, CSA 22.2 (E 103521)

Control- and safety isolating- resp. isolating transformer
TT1

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Electrical data

Typ	TT1 1-4-23	TT1 1-23-24	TT1 1,6-4-23	TT1 1,6-4-42	TT1 1,6-23-24	TT1 2-4-23
Input						
Rated input current	2,9 A /2,7 A /2,6 Aac	4,9 A /4,7A /4,5 Aac	4,5 A /4,3 A /4,1 Aac	4,5 A /4,3 A /4,1 Aac	7,8 A /7,4 A /7,1 A	5,6 A /5,3 A /5,1 Aac
Rated input voltage	380/400/420 Vac	219/230/241 Vac	380/400/420 Vac	380/400/420 Vac	219/230/241 Vac	380/400/420 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output current	4,3 Aac	41,7 Aac	7 Aac	38,1 Aac	67 Aac	8,7 Aac
Rated output voltage	2 x 115 Vac	24 Vac	2 x 115 Vac	42 Vac	24 Vac	2 x 115 Vac
Rated power VDE (DB cos phi=1)	1.000 VA	1.000 VA	1.600 VA	1.600 VA	1.600 VA	2.000 VA
Rated power VDE (KB cos phi=0.5)	2.270 VA	2.300 VA	4.080 VA	4.000 VA	4.260 VA	5.480 VA
Short circuit voltage uK	ca. 7,2%	ca. 7,3%	ca. 5,6%	ca. 5,6%	ca. 5,4%	ca. 5,0%
Vector group	Iii0	Iii0	Iii0	Iii0	Iii0	Iii0
Efficiency	92%	92%	93 %	93 %	93 %	94%
Standards						
Classification	Control- and isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	AN	AN	AN	AN	AN	AN
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=F, UL=class 155	VDE=F, UL=class 155	VDE=F, UL=class 155	VDE=F, UL=class 155	VDE=F, UL=class 155	VDE=F, UL=class 155
Protection index	IP 00 IPXXB on request	IP 00 IPXXB on request	IP 00 IPXXB on request	IP 00 IPXXB on request	IP 00 IPXXB on request	IP 00 IPXXB on request
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Order numbers						
Order Number	**TT1 1-4-23**	**TT1 1-23-24**	**TT1 1,6-4-23**	**TT1 1,6-4-42**	**TT1 1,6-23-24**	**TT1 2-4-23**

Control- and safety isolating- resp. isolating transformer
TT1

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Electrical data

Typ	TT1 2-23-24	TT1 2,5-4-23	TT1 2,5-4-42	TT1 2,5-23-24	TT1 3-4-23	TT1 3-5-23
Input						
Rated input current	9,6 A /9,2 A /8,8 Aac	7,0 A /6,6A /6,3 Aac	6,9 A /6,6A /6,3 Aac	12,0 A /11,5 A /10,9 Aac	8,3 A /7,9 A /7,5 Aac	6,7 A /6,3 A /6,0 Aac
Rated input voltage	219/230/241 Vac	380/400/420 Vac	380/400/420 Vac	219/230/241 Vac	380/400/420 Vac	475/500/525 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output current	83 Aac	10,9 Aac	59,5 Aac	104 Aac	13,1 Aac	13,1 Aac
Rated output voltage	24 Vac	2 x 115 Vac	42 Vac	24 Vac	2 x 115 Vac	2 x 115 Vac
Rated power VDE (DB cos phi=1)	2.000 VA	2.500 VA	2.500 VA	2.500 VA	3.000 VA	3.000 VA
Rated power VDE (KB cos phi=0.5)	5.430 VA	6.560 VA	6.470 VA	6.470 VA	8.500 VA	8.500 VA
Short circuit voltage uK	ca. 5,0%	ca. 4,8 %	ca. 4,8 %	ca. 4,8 %	ca. 4,2 %	ca. 4,0%
Vector group	Iii0	Iii0	Iii0	Iii0	Iii0	Iii0
Efficiency	94 %	94 %	94 %	94 %	95 %	95 %
Standards						
Classification	Control- and safety isolating transformer	Control- and isolating transformer	Control- and safety isolating transformer	Control- and safety isolating transformer	Control- and isolating transformer	Control- and isolating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	AN	AN	AN	AN	AN	AN
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=F, UL=class 155	VDE=F, UL=class 155	VDE=F, UL=class 155	VDE=F, UL=class 155	VDE=F, UL=class 155	VDE=F, UL=class 155
Protection index	IP 00 IPXXB on request	IP 00 IPXXB on request	IP 00 IPXXB on request	IP 00 IPXXB on request	IP 00 IPXXB on request	IP 00 IPXXB on request
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Order numbers						
Order Number	**TT1 2-23-24**	**TT1 2,5-4-23**	**TT1 2,5-4-42**	**TT1 2,5-23-24**	**TT1 3-4-23**	**TT1 3-5-23**

Control- and safety isolating- resp. isolating transformer
TT1

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Electrical data

Typ	TT1 3-44-23	TT1 4-4-23	TT1 4-5-23	TT1 4-44-23	TT1 5-4-23	TT1 5-5-23
Input						
Rated input current	7,6 A /7,2 A /6,9 Aac	11,1 A /10,6 A /10,0 Aac	8,9 A /8,4 A /8,0 Aac	10,1 A /9,6 A /9,1 Aac	13,7 A /13,0 A /12,4 Aac	11,0 A /10,5 A /10,0 Aac
Rated input voltage	418/440/462 Vac	380/400/420 Vac	475/500/525 Vac	418/440/462 Vac	380/400/420 Vac	475/500/525 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output current	13,1 Aac	17,4 Aac	17,4 Aac	17,4 Aac	21,7 Aac	21,7 Aac
Rated output voltage	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac
Rated power VDE (DB cos phi=1)	3.000 VA	4.000 VA	4.000 VA	4.000 VA	5.000 VA	5.000 VA
Rated power VDE (KB cos phi=0.5)	8.500 VA	12.450 VA	12.450 VA	12.450 VA	16.400 VA	16.400 VA
Short circuit voltage uK	ca. 4,2%	ca. 4,0%	ca. 4,1%	ca. 4,0 %	ca. 3,3%	ca. 3,2%
Vector group	Iii0	Iii0	Iii0	Iii0	Iii0	Iii0
Efficiency	95 %	95 %	95 %	95 %	95 %	95 %
Standards						
Classification	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	AN	AN	AN	AN	AN	AN
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=F, UL=class 155	VDE=F, UL=class 155	VDE=F, UL=class 155	VDE=F, UL=class 155	VDE=F, UL=class 155	VDE=F, UL=class 155
Protection index	IP 00 IPXXB on request	IP 00 IPXXB on request	IP 00 IPXXB on request	IP 00 IPXXB on request	IP 00 IPXXB on request	IP 00 IPXXB on request
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Order numbers						
Order Number	**TT1 3-44-23**	**TT1 4-4-23**	**TT1 4-5-23**	**TT1 4-44-23**	**TT1 5-4-23**	**TT1 5-5-23**

Control- and safety isolating- resp. isolating transformer
TT1

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Electrical data

Typ	TT1 5-44-23	TT1 6,3-4-23	TT1 6,3-5-23	TT1 6,3-44-23	TT1 8-4-23	TT1 8-5-23
Input						
Rated input current	12,5 A /11,9 A / 11,3 Aac	17,1 A /16,3 A/ 15,5 Aac	13,8 A /13,1 A /12,5 Aac	15,7 A /14,9 A /14,2 Aac	21,8 A / 20,7 A /19,7 Aac	17,5 A /16,6 A /15,9 Aac
Rated input voltage	418/440/462 Vac	380/400/420 Vac	475/500/525 Vac	418/440/462 Vac	380/400/420 Vac	475/500/525 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output current	21,7 Aac	27,4 Aac	27,4 Aac	27,4 Aac	34,8 Aac	34,8 Aac
Rated output voltage	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac
Rated power VDE (DB cos phi=1)	5.000 VA	6.300 VA	6.300 VA	6.300 VA	8.000 VA	8.000 VA
Rated power VDE (KB cos phi=0.5)	16.400 VA	21.500 VA	21.500 VA	21.500 VA	28.000 VA	28.000 VA
Short circuit voltage uK	ca. 3,3%	ca. 2,8%	ca. 2,8%	ca. 2,8%	ca. 2,7%	ca. 2,7%
Vector group	Iii0	Iii0	Iii0	Iii0	Iii0	Iii0
Efficiency	95 %	96 %	96 %	96 %	96 %	96 %
Standards						
Classification	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	AN	AN	AN	AN	AN	AN
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=F, UL=class 155	VDE=F, UL=class 155	VDE=F, UL=class 155	VDE=F, UL=class 155	VDE=F, UL=class 155	VDE=F, UL=class 155
Protection index	IP 00 IPXXB on request	IP 00 IPXXB on request	IP 00 IPXXB on request	IP 00 IPXXB on request	IP 00 IPXXB on request	IP 00 IPXXB on request
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Order numbers						
Order Number	**TT1 5-44-23**	**TT1 6,3-4-23**	**TT1 6,3-5-23**	**TT1 6,3-44-23**	**TT1 8-4-23**	**TT1 8-5-23**

Control- and safety isolating- resp. isolating transformer
TT1

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Electrical data

Typ	TT1 8-44-23	TT1 10-4-23	TT1 10-5-23	TT1 10-44-23	TT1 12,5-4-23	TT1 15-4-23
Input						
Rated input current	19,9 A /18,9 A /18,0 Aac	27,2 A /25,7 A /24,4 Aac	21,6 A /20,5 A /19,6 Aac	24,2 A /23,2 A /22,2 Aac	33,4 A /31,9 A /30,6 Aac	40,2 A /37,7 A /35,5 Aac
Rated input voltage	418/440/462 Vac	380/400/420 Vac	475/500/525 Vac	418/440/462 Vac	380/400/420 Vac	380/400/420 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output current	34,8 Aac	43,5 Aac	43,5 Aac	43,5 Aac	54,4 Aac	65,2 Aac
Rated output voltage	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac
Rated power VDE (DB cos phi=1)	8.000 VA	10.000 VA	10.000 VA	10.000 VA	12.500 VA	15.000 VA
Rated power VDE (KB cos phi=0.5)	28.000 VA	34.300 VA	34.300 VA	34.300 VA	41.800 VA	59.000 VA
Short circuit voltage uK	ca. 2,7%	ca. 1,5%	ca. 1,5%	ca. 1,5%	ca. 1,3%	ca. 1,1%
Vector group	Iii0	Iii0	Iii0	Iii0	Iii0	Iii0
Efficiency	96%	97 %	97 %	97 %	95.5 %	ca. 98 %
Standards						
Classification	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer	Control- and isolating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	AN	AN	AN	AN	AN	AN
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=F, UL=class 155	VDE=F, UL=class 155	VDE=F, UL=class 155	VDE=F, UL=class 155	VDE=F, UL=class 155	VDE=F, UL=class 155
Protection index	IP 00 IPXXB on request	IP 00 IPXXB on request	IP 00 IPXXB on request	IP 00 IPXXB on request	IP 00 IPXXB on request	IP 00 IPXXB on request
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Order numbers						
Order Number	**TT1 8-44-23**	**TT1 10-4-23**	**TT1 10-5-23**	**TT1 10-44-23**	**TT1 12,5-4-23**	**TT1 15-4-23**

Control- and safety isolating- resp. isolating transformer
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Electrical data

Typ	TT1 20-4-23	TT1 25-4-23
Input		
Rated input current	53,6 A /50,6 A /48 Aac	65,7 A /63,2 A /60,9 Aac
Rated input voltage	380/400/420 Vac	380/400/420 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz
Output		
Rated output current	87 Aac	109 Aac
Rated output voltage	2 x 115 Vac	2 x 115 Vac
Rated power VDE (DB cos phi=1)	20.000 VA	25.000 VA
Rated power VDE (KB cos phi=0.5)	85.800 VA	133.000 VA
Short circuit voltage uK	ca. 1%	ca. 0,9%
Vector group	Iii0	Iii0
Efficiency	ca. 98 %	
Standards		
Classification	Control- and isolating transformer	Control- and isolating transformer
Approvals		
Approvals	cURus	cURus
Environment		
Ambient temperature max.	40 °C	40 °C
Type of cooling	AN	AN
Safety and protection		
Type	Open type	Open type
Insulation class	VDE=F, UL=class 155	VDE=F, UL=class 155
Protection index	IP 00 IPXXB on request	IP 00 IPXXB on request
Safety class (prepared)	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof
Order numbers		
Order Number	**TT1 20-4-23**	**TT1 25-4-23**

Control- and safety isolating- resp. isolating transformer
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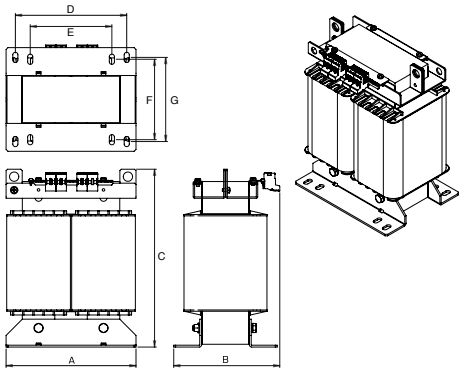
30 Mechanical data

Typ	Terminals	Fixing method	Fixing screws	Core type	Weight	Dimension picture (in mm)	A	B	C	D	E	F	G
TT1 1-4-23	Screw-type terminal	Fixing rail	M6	UI 114/40	9.1 kg	1	150	125	220	104	100	71	98
TT1 1-23-24	Screw-type terminal	Fixing rail	M6	UI 114/40	9.1 kg	1	150	140	220	104	100	71	98
TT1 1,6-4-23	Screw-type terminal	Fixing rail	M6	UI 120/61	13.8 kg	1	160	145	230	110	100	89	115
TT1 1,6-4-42	Screw-type terminal	Fixing rail	M6	3UI 132/72	13.8 kg	2	160	145	260	110	100	89	115
TT1 1,6-23-24	Screw-type terminal	Fixing rail	M6	UI 120/61	13.5 kg	2	160	145	265	110	100	89	115
TT1 2-4-23	Screw-type terminal	Fixing rail	M10	UI 132/60	17.0 kg	1	175	140	245	128	112	90	114
TT1 2-23-24	Screw-type terminal	Fixing rail	M10	UI 132/60	17.0 kg	2	175	140	285	128	112	90	114
TT1 2,5-4-23	Screw-type terminal	Fixing rail	M12	3UI 180/78	18.5 kg	1	200	155	275	140	112	94	120
TT1 2,5-4-42	Screw-type terminal	Fixing rail	M10	3UI 180/78	0.0 kg	2	200	155	310	140	112	94	120
TT1 2,5-23-24	Screw-type terminal	Fixing rail	M12	3UI 180/78	20.0 kg	2	200	155	315	140	112	94	120
TT1 3-4-23	Screw-type terminal	Fixing rail	M10	UI 150/65	24.0 kg	1	200	165	275	140	112	107	133
TT1 3-5-23	Screw-type terminal	Fixing rail	M10	UI 150/65	24.0 kg	1	200	165	275	140	112	107	133
TT1 3-44-23	Screw-type terminal	Fixing rail	M10	UI 150/65	24.0 kg	1	200	165	275	140	112	107	133
TT1 4-4-23	Screw-type terminal	Fixing rail	M10	UI 180/63	31.0 kg	1	240	165	335	200	144	125	125
TT1 4-5-23	Screw-type terminal	Fixing rail	M10	UI 180/63	31.0 kg	1	240	165	335	200	144	125	125
TT1 4-44-23	Screw-type terminal	Fixing rail	M10	UI 180/63	31.0 kg	1	240	165	335	200	144	125	-
TT1 5-4-23	Screw-type terminal	Fixing rail	M10	UI 180/63	39.0 kg	1	240	195	335	200	144	140	140
TT1 5-5-23	Screw-type terminal	Fixing rail	M10	UI 180/78	39.0 kg	1	240	195	335	200	144	140	140
TT1 5-44-23	Screw-type terminal	Fixing rail	M10	UI 180/78	39.0 kg	1	240	195	335	200	144	140	140
TT1 6,3-4-23	Screw-type terminal	Fixing rail	M10	3UI 240/140	48.0 kg	1	240	210	335	200	144	155	155
TT1 6,3-5-23	Screw-type terminal	Fixing rail	M10	UI 180/93	48.0 kg	1	240	210	335	200	144	155	155
TT1 6,3-44-23	Screw-type terminal	Fixing rail	M10	UI 180/93	48.0 kg	1	240	210	335	200	144	155	155
TT1 8-4-23	Screw-type terminal	Fixing rail	M10	UI 210/88	60.0 kg	1	280	215	385	240	176	158	166
TT1 8-5-23	Screw-type terminal	Fixing rail	M10	UI 210/88	60.0 kg	1	280	215	385	240	176	158	166
TT1 8-44-23	Screw-type terminal	Fixing rail	M10	UI 210/88	60.0 kg	1	280	215	385	240	176	158	166
TT1 10-4-23	Screw-type terminal	Fixing rail	M10	UI 210/103	75.0 kg	1	280	230	385	240	176	173	181
TT1 10-5-23	Screw-type terminal	Fixing rail	M10	UI 210 /103	75.0 kg	1	280	230	385	240	176	173	181
TT1 10-44-23	Screw-type terminal	Fixing rail	M10	UI 210/103	75.0 kg	1	280	230	385	240	176	173	181
TT1 12,5-4-23	Screw-type terminal	Fixing rail	M12	3UI 180/63	105.0 kg	2	320	250	460	270	196	184	210
TT1 15-4-23	Screw-type terminal	Fixing rail	M12	UI 240/110	98.0 kg	2	320	250	470	270	196	184	210
TT1 20-4-23	Screw-type terminal	Fixing rail	M12	UI 240/140	133.0 kg	2	320	280	470	270	196	214	240
TT1 25-4-23	Screw-type terminal	Fixing rail	M12	UI 240/170	153.0 kg	2	320	310	490	270	196	244	270

Dimension pictures

1



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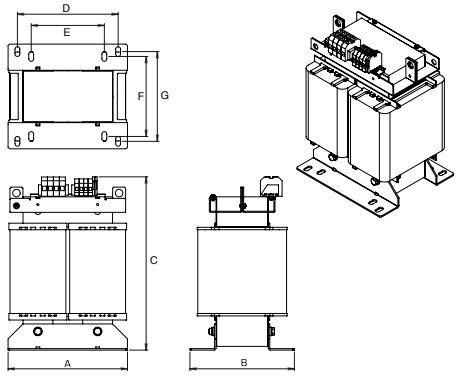
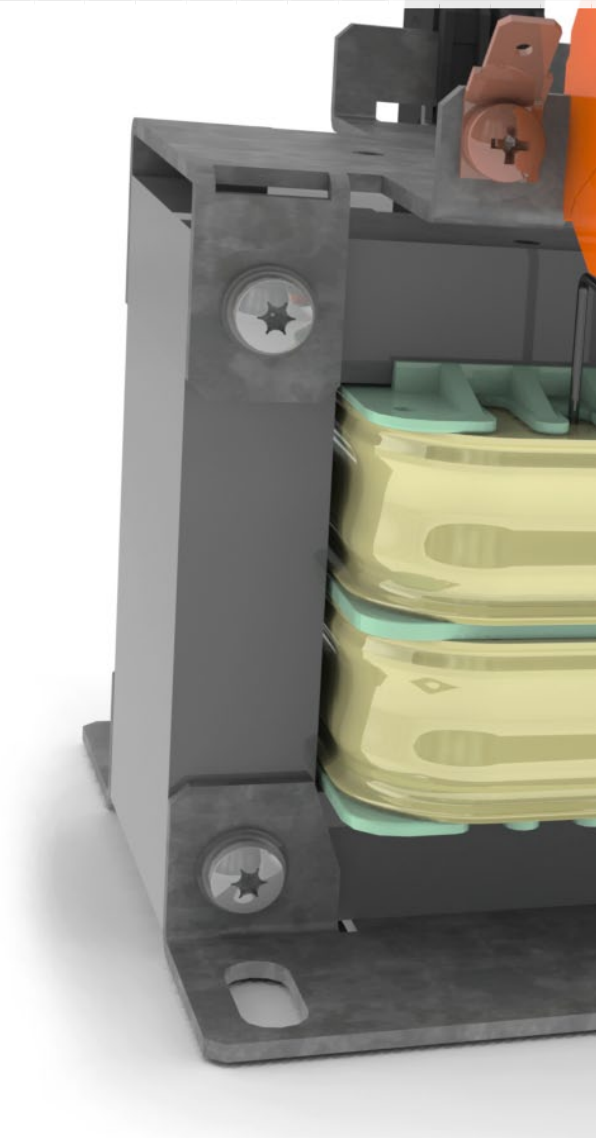


OVERVIEW
SEPARATING TRANSFORMERS

Type	Features	Rated input voltage	Rated output voltage	50 VA	75 VA	100 VA	150 VA	200 VA	250 VA	300 VA	350 VA	500 VA
CT	Versions with US-fuseholder or DIN rail for additional components are available	2 x 240 V	120 V	■	■	■	■	■	■	■	■	■
			24 V	■	■	■	■	■	■	■	■	
		600 V	120 V	■	■	■	■	■	■	■	■	■
			24 V	■	■	■	■	■	■	■	■	



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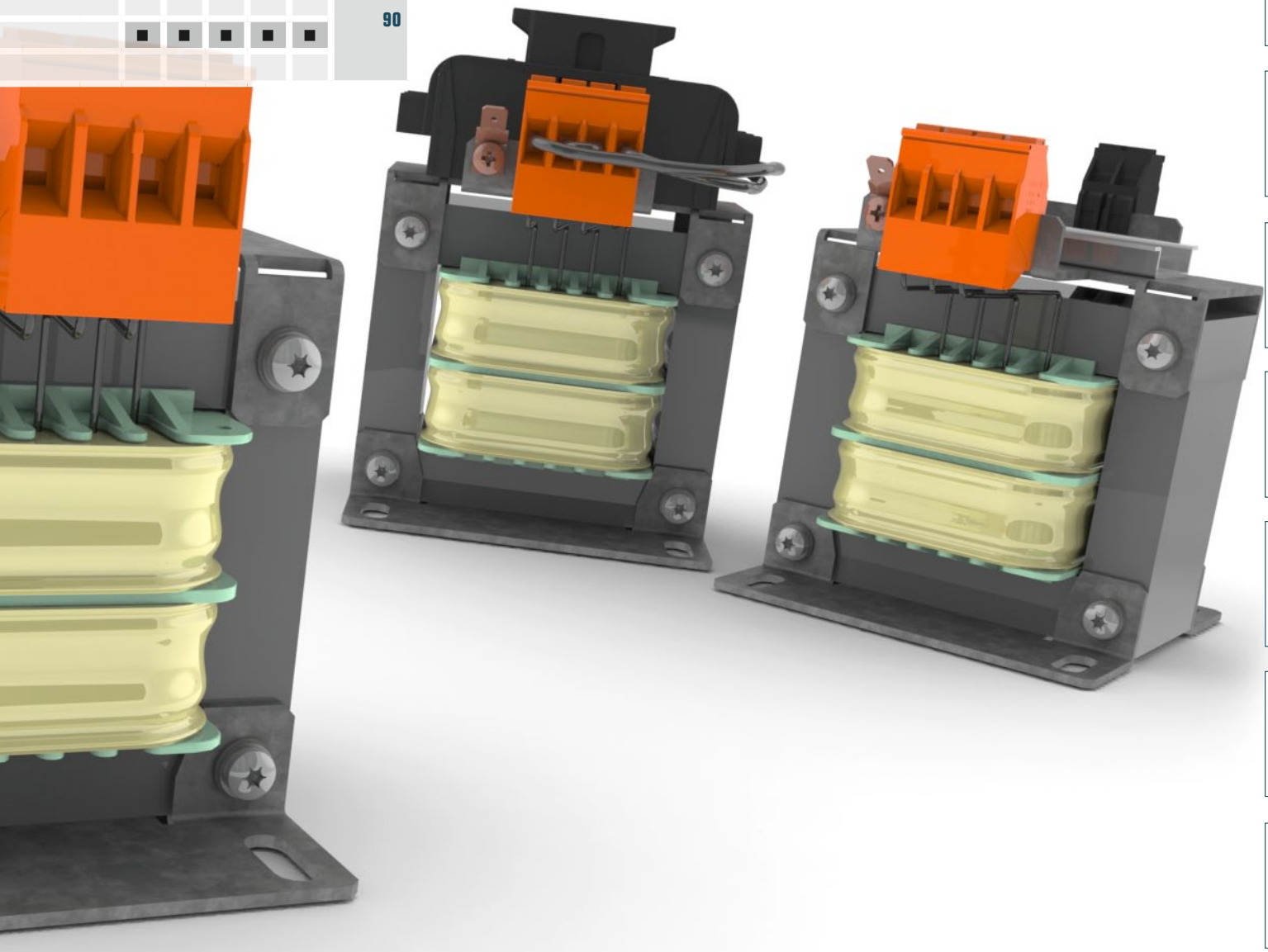
750 VA	1000 VA	1500 VA	2000 VA	2500 VA	Page
■	■	■	■	■	90
■	■	■	■	■	



Separating transformer
CT

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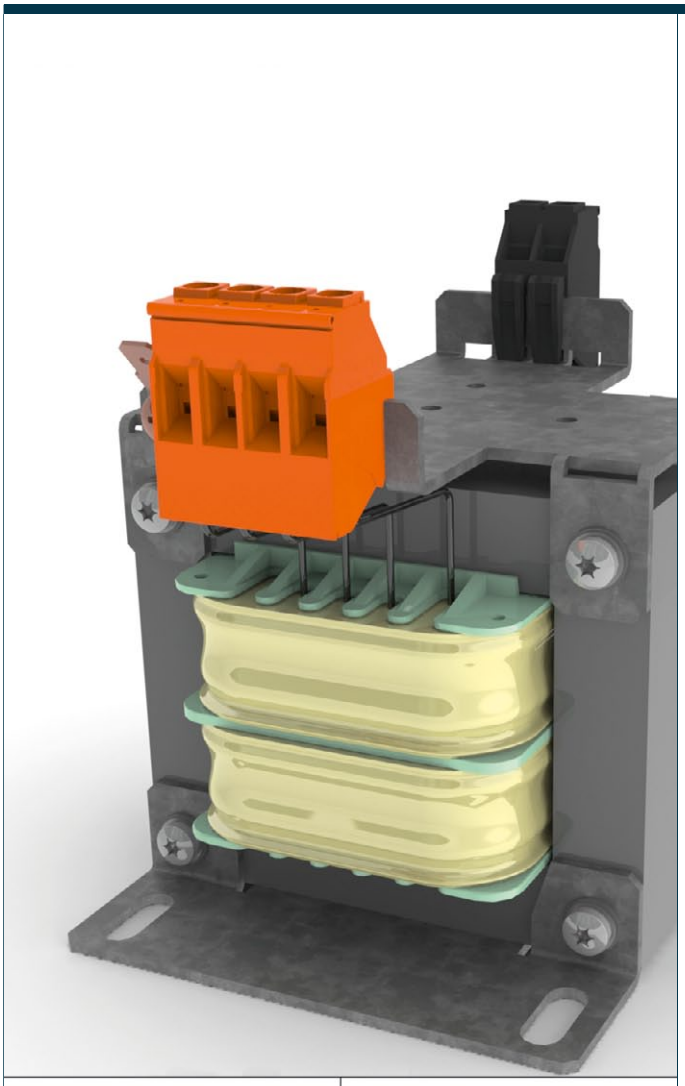
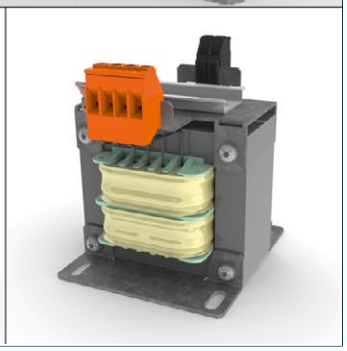




General Data

Rated input voltage 2 x 240 V or 600 V
Rated output voltage 24 V, 120 V
Rated power 50 - 2500 VA
Insulation class B
Maximum ambient temperature 40 °C
Efficiency up to 95 %
Degree of protection IP 00

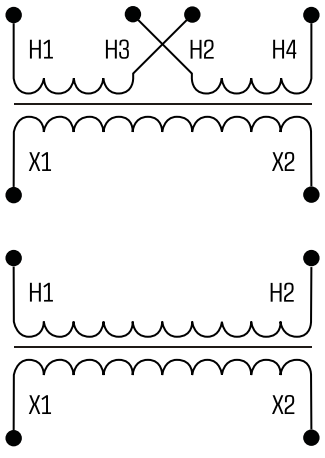
Advantages

Fused versions available
Versions with DIN rail for additional components available
Contact protected screw connection terminals
Jumpers included for primary voltage selection
Impregnated for max. protection
Up to 2500 VA

Applications

As a control transformer for the electrical isolation of the input and output sides.The construction of the transformer to supply control systems according to VDE 0113 is designed.

Sample application



Standards

Separating transformer
to: EN 61558 part 1 with part 2-1, UL 5085-1/-2;2:2, CSA 22.2 No. 66

Approvals

EN 61558, UL 5085-1/-2, CSA 22.2 No 66

Separating transformer
CT

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Electrical data

Typ	CT-005-048-12-0	CT-005-048-12-1	CT-005-048-12-2	CT-005-048-24-0	CT-005-048-24-1	CT-005-048-24-2
Special features						
Characteristics	-	Fused version	with DIN rail for additional components	-	Fused version	with DIN rail for additional components
Input						
Rated input voltage	2 x 240 Vac	2 x 240 Vac	2 x 240 Vac	2 x 240 Vac	2 x 240 Vac	2 x 240 Vac
Rated input current	2 x 0,13 Aac	2 x 0,13 Aac	2 x 0,13 Aac	2 x 0,13 Aac	2 x 0,13 Aac	2 x 0,13 Aac
Frequency Range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	120 Vac	120 Vac	120 Vac	24 Vac	24 Vac	24 Vac
Rated Power	50 VA	50 VA	50 VA	50 VA	50 VA	50 VA
No-load voltage (app. x factor)	1.13	1.13	1.13	1.13	1.13	1.13
Efficiency	81.0 %	81.0 %	81.0 %	81.0 %	81.0 %	81.0 %
Standards						
Classification	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Ambient temperature	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Core	EI 66/34,7	EI 66/34,7	EI 66/34,7	EI 66/34,7	EI 66/34,7	EI 66/34,7

Separating transformer
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Electrical data

Typ	CT-005-060-12-0	CT-005-060-12-1	CT-005-060-12-2	CT-005-060-24-0	CT-005-060-24-1	CT-005-060-24-2
Special features						
Characteristics	-	Fused version	with DIN rail for additional components	-	Fused version	with DIN rail for additional components
Input						
Rated input voltage	600 Vac	600 Vac	600 Vac	600 Vac	600 Vac	600 Vac
Rated input current	0,10 Aac	0,10 Aac	0,10 Aac	0,10 Aac	0,10 Aac	0,10 Aac
Frequency Range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	120 Vac	120 Vac	120 Vac	24 Vac	24 Vac	24 Vac
Rated Power	50 VA	50 VA	50 VA	50 VA	50 VA	50 VA
No-load voltage (app. x factor)	1.13	1.13	1.13	1.13	1.13	1.13
Efficiency	81.0 %	81.0 %	81.0 %	81.0 %	81.0 %	81.0 %
Standards						
Classification	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Ambient temperature	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Core	EI 66/34,7	EI 66/34,7	EI 66/34,7	EI 66/34,7	EI 66/34,7	EI 66/34,7

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Electrical data

Typ	CT-007-048-12-0	CT-007-048-12-1	CT-007-048-12-2	CT-007-048-24-0	CT-007-048-24-1	CT-007-048-24-2
Special features						
Characteristics	-	Fused version	with DIN rail for additional components	-	Fused version	with DIN rail for additional components
Input						
Rated input voltage	2 x 240 Vac	2 x 240 Vac	2 x 240 Vac	2 x 240 Vac	2 x 240 Vac	2 x 240 Vac
Rated input current	2 x 0,19 Aac	2 x 0,19 Aac	2 x 0,19 Aac	2 x 0,19 Aac	2 x 0,19 Aac	2 x 0,19 Aac
Frequency Range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	120 Vac	120 Vac	120 Vac	24 Vac	24 Vac	24 Vac
Rated Power	75 VA	75 VA	75 VA	75 VA	75 VA	75 VA
No-load voltage (app. x factor)	1.16	1.16	1.16	1.16	1.16	1.16
Efficiency	82.0 %	82.0 %	82.0 %	82.0 %	82.0 %	82.0 %
Standards						
Classification	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Ambient temperature	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Core	EI 78/27,5	EI 78/27,5	EI 78/27,5	EI 78/27,5	EI 78/27,5	EI 78/27,5

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Electrical data

Typ	CT-007-060-12-0	CT-007-060-12-1	CT-007-060-12-2	CT-007-060-24-0	CT-007-060-24-1	CT-007-060-24-2
Special features						
Characteristics	-	Fused version	with DIN rail for additional components	-	Fused version	with DIN rail for additional components
Input						
Rated input voltage	600 Vac	600 Vac	600 Vac	600 Vac	600 Vac	600 Vac
Rated input current	0,15 Aac	0,15 Aac	0,15 Aac	0,15 Aac	0,15 Aac	0,15 Aac
Frequency Range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	120 Vac	120 Vac	120 Vac	24 Vac	24 Vac	24 Vac
Rated Power	75 VA	75 VA	75 VA	75 VA	75 VA	75 VA
No-load voltage (app. x factor)	1.16	1.16	1.16	1.16	1.16	1.16
Efficiency	82.0 %	82.0 %	82.0 %	82.0 %	82.0 %	82.0 %
Standards						
Classification	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Ambient temperature	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Core	EI 78/27,5	EI 78/27,5	EI 78/27,5	EI 78/27,5	EI 78/27,5	EI 78/27,5

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Electrical data

Typ	CT-010-048-12-0	CT-010-048-12-1	CT-010-048-12-2	CT-010-048-24-0	CT-010-048-24-1	CT-010-048-24-2
Special features						
Characteristics	-	Fused version	with DIN rail for additional components	-	Fused version	with DIN rail for additional components
Input						
Rated input voltage	2 x 240 Vac	2 x 240 Vac	2 x 240 Vac	22 x 240 Vac	2 x 240 Vac	2 x 240 Vac
Rated input current	2 x 0,25 Aac	2 x 0,25 Aac	2 x 0,25 Aac	2 x 0,25 Aac	2 x 0,25 Aac	2 x 0,25 Aac
Frequency Range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	120 Vac	120 Vac	120 Vac	24 Vac	24 Vac	24 Vac
Rated Power	100 VA	100 VA	100 VA	100 VA	100 VA	100 VA
No-load voltage (app. x factor)	1.13	1.13	1.13	1.13	1.13	1.13
Efficiency	84.0 %	84.0 %	84.0 %	84.0 %	84.0 %	84.0 %
Standards						
Classification	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Ambient temperature	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Core	EI 78/36,5	EI 78/36,5	EI 78/36,5	EI 78/36,5	EI 78/36,5	EI 78/36,5

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Electrical data

Typ	CT-010-060-12-0	CT-010-060-12-1	CT-010-060-12-2	CT-010-060-24-0	CT-010-060-24-1	CT-010-060-24-2
Special features						
Characteristics	-	Fused version	with DIN rail for additional components	-	Fused version	with DIN rail for additional components
Input						
Rated input voltage	600 Vac	600 Vac	600 Vac	600 Vac	600 Vac	600 Vac
Rated input current	0,2 Aac	0,2 Aac	0,2 Aac	0,2 Aac	0,2 Aac	0,2 Aac
Frequency Range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	120 Vac	120 Vac	120 Vac	24 Vac	24 Vac	24 Vac
Rated Power	100 VA	100 VA	100 VA	100 VA	100 VA	100 VA
No-load voltage (app. x factor)	1.13	1.13	1.13	1.13	1.13	1.13
Efficiency	84.0 %	84.0 %	84.0 %	84.0 %	84.0 %	84.0 %
Standards						
Classification	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Ambient temperature	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Core	EI 78/36,5	EI 78/36,5	EI 78/36,5	EI 78/36,5	EI 78/36,5	EI 78/36,5

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Electrical data

Typ	CT-015-048-12-0	CT-015-048-12-1	CT-015-048-12-2	CT-015-048-24-0	CT-015-048-24-1	CT-015-048-24-2
Special features						
Characteristics	-	Fused version	with DIN rail for additional components	-	Fused version	with DIN rail for additional components
Input						
Rated input voltage	2 x 240 Vac	2 x 240 Vac	2 x 240 Vac	2 x 240 Vac	2 x 240 Vac	2 x 240 Vac
Rated input current	2 x 0,36 Aac	2 x 0,36 Aac	2 x 0,36 Aac	2 x 0,36 Aac	2 x 0,36 Aac	2 x 0,36 Aac
Frequency Range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	120 Vac	120 Vac	120 Vac	24 Vac	24 Vac	24 Vac
Rated Power	150 VA	150 VA	150 VA	150 VA	150 VA	150 VA
No-load voltage (app. x factor)	1.10	1.10	1.10	1.10	1.10	1.10
Efficiency	86.0 %	86.0 %	86.0 %	86.0 %	86.0 %	86.0 %
Standards						
Classification	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Ambient temperature	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Core	EI 96/35,7	EI 96/35,7	EI 96/35,7	EI 96/35,7	EI 96/35,7	EI 96/35,7

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Electrical data

Typ	CT-015-060-12-0	CT-015-060-12-1	CT-015-060-12-2	CT-015-060-24-0	CT-015-060-24-1	CT-015-060-24-2
Special features						
Characteristics	-	Fused version	with DIN rail for additional components	-	Fused version	with DIN rail for additional components
Input						
Rated input voltage	600 Vac	600 Vac	600 Vac	600 Vac	600 Vac	600 Vac
Rated input current	0,29 Aac	0,29 Aac	0,29 Aac	0,29 Aac	0,29 Aac	0,29 Aac
Frequency Range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	120 Vac	120 Vac	120 Vac	24 Vac	24 Vac	24 Vac
Rated Power	150 VA	150 VA	150 VA	150 VA	150 VA	150 VA
No-load voltage (app. x factor)	1.10	1.10	1.10	1.10	1.10	1.10
Efficiency	86.0 %	86.0 %	86.0 %	86.0 %	86.0 %	86.0 %
Standards						
Classification	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Ambient temperature	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Core	EI 96/35,7	EI 96/35,7	EI 96/35,7	EI 96/35,7	EI 96/35,7	EI 96/35,7

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Electrical data

Typ	CT-020-048-12-0	CT-020-048-12-1	CT-020-048-12-2	CT-020-048-24-0	CT-020-048-24-1	CT-020-048-24-2
Special features						
Characteristics	-	Fused version	with DIN rail for additional components	-	Fused version	with DIN rail for additional components
Input						
Rated input voltage	2 x 240 Vac	2 x 240 Vac	2 x 240 Vac	2 x 240 Vac	2 x 240 Vac	2 x 240 Vac
Rated input current	2 x 0,47 Aac	2 x 0,47 Aac	2 x 0,47 Aac	2 x 0,47 Aac	2 x 0,47 Aac	2 x 0,47 Aac
Frequency Range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	120 Vac	120 Vac	120 Vac	24 Vac	24 Vac	24 Vac
Rated Power	200 VA	200 VA	200 VA	200 VA	200 VA	200 VA
No-load voltage (app. x factor)	1.09	1.09	1.09	1.09	1.09	1.09
Efficiency	88.0 %	88.0 %	88.0 %	88.0 %	88.0 %	88.0 %
Standards						
Classification	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Ambient temperature	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Core	EI 96/45,7	EI 96/45,7	EI 96/45,7	EI 96/45,7	EI 96/45,7	EI 96/45,7

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Electrical data

Typ	CT-020-060-12-0	CT-020-060-12-1	CT-020-060-12-2	CT-020-060-24-0	CT-020-060-24-1	CT-020-060-24-2
Special features						
Characteristics	-	Fused version	with DIN rail for additional components	-	Fused version	with DIN rail for additional components
Input						
Rated input voltage	600 Vac	600 Vac	600 Vac	600 Vac	600 Vac	600 Vac
Rated input current	0,37 Aac	0,37 Aac	0,37 Aac	0,37 Aac	0,37 Aac	0,37 Aac
Frequency Range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	120 Vac	120 Vac	120 Vac	24 Vac	24 Vac	24 Vac
Rated Power	200 VA	200 VA	200 VA	200 VA	200 VA	200 VA
No-load voltage (app. x factor)	1.09	1.09	1.09	1.09	1.09	1.09
Efficiency	88.0 %	88.0 %	88.0 %	88.0 %	88.0 %	88.0 %
Standards						
Classification	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Ambient temperature	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Core	EI 96/45,7	EI 96/45,7	EI 96/45,7	EI 96/45,7	EI 96/45,7	EI 96/45,7

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Electrical data

Typ	CT-025-048-12-0	CT-025-048-12-1	CT-025-048-12-2	CT-025-048-24-0	CT-025-048-24-1	CT-025-048-24-2
Special features						
Characteristics	-	Fused version	with DIN rail for additional components	-	Fused version	with DIN rail for additional components
Input						
Rated input voltage	2 x 240 Vac	2 x 240 Vac	2 x 240 Vac	2 x 240 Vac	2 x 240 Vac	2 x 240 Vac
Rated input current	2 x 0,58 Aac	2 x 0,58 Aac	2 x 0,58 Aac	2 x 0,58 Aac	2 x 0,58 Aac	2 x 0,58 Aac
Frequency Range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	120 Vac	120 Vac	120 Vac	24 Vac	24 Vac	24 Vac
Rated Power	250 VA	250 VA	250 VA	250 VA	250 VA	250 VA
No-load voltage (app. x factor)	1.07	1.07	1.07	1.07	1.07	1.07
Efficiency	89.0 %	89.0 %	89.0 %	89.0 %	89.0 %	89.0 %
Standards						
Classification	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Ambient temperature	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Core	EI 96/59,7	EI 96/59,7	EI 96/59,7	EI 96/59,7	EI 96/59,7	EI 96/59,7

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Electrical data

Typ	CT-025-060-12-0	CT-025-060-12-1	CT-025-060-12-2	CT-025-060-24-0	CT-025-060-24-1	CT-025-060-24-2
Special features						
Characteristics	-	Fused version	with DIN rail for additional components	-	Fused version	with DIN rail for additional components
Input						
Rated input voltage	600 Vac	600 Vac	600 Vac	600 Vac	600 Vac	600 Vac
Rated input current	0,47 Aac	0,47 Aac	0,47 Aac	0,47 Aac	0,47 Aac	0,47 Aac
Frequency Range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	120 Vac	120 Vac	120 Vac	24 Vac	24 Vac	24 Vac
Rated Power	250 VA	250 VA	250 VA	250 VA	250 VA	250 VA
No-load voltage (app. x factor)	1.07	1.07	1.07	1.07	1.07	1.07
Efficiency	89.0 %	89.0 %	89.0 %	89.0 %	89.0 %	89.0 %
Standards						
Classification	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Ambient temperature	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Core	EI 96/59,7	EI 96/59,7	EI 96/59,7	EI 96/59,7	EI 96/59,7	EI 96/59,7

Separating transformer
CT

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Electrical data

Typ	CT-030-048-12-0	CT-030-048-12-1	CT-030-048-12-2	CT-030-048-24-0	CT-030-048-24-1	CT-030-048-24-2
Special features						
Characteristics	-	Fused version	with DIN rail for additional components	-	Fused version	with DIN rail for additional components
Input						
Rated input voltage	2 x 240 Vac	2 x 240 Vac	2 x 240 Vac	2 x 240 Vac	2 x 240 Vac	2 x 240 Vac
Rated input current	2 x 0,70 Aac	2 x 0,70 Aac	2 x 0,70 Aac	2 x 0,70 Aac	2 x 0,70 Aac	2 x 0,70 Aac
Frequency Range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	120 Vac	120 Vac	120 Vac	24 Vac	24 Vac	24 Vac
Rated Power	300 VA	300 VA	300 VA	300 VA	300 VA	300 VA
No-load voltage (app. x factor)	1.08	1.08	1.08	1.08	1.08	1.08
Efficiency	89.0 %	89.0 %	89.0 %	89.0 %	89.0 %	89.0 %
Standards						
Classification	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Ambient temperature	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Core	EI 120/41,7	EI 120/41,7	EI 120/41,7	EI 120/41,7	EI 120/41,7	EI 120/41,7

Separating transformer
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Electrical data

Typ	CT-030-060-12-0	CT-030-060-12-1	CT-030-060-12-2	CT-030-060-24-0	CT-030-060-24-1	CT-030-060-24-2
Special features						
Characteristics	-	Fused version	with DIN rail for additional components	-	Fused version	with DIN rail for additional components
Input						
Rated input voltage	600 Vac	600 Vac	600 Vac	600 Vac	600 Vac	600 Vac
Rated input current	0,55 Aac	0,55 Aac	0,55 Aac	0,55 Aac	0,55 Aac	0,55 Aac
Frequency Range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	120 Vac	120 Vac	120 Vac	24 Vac	24 Vac	24 Vac
Rated Power	300 VA	300 VA	300 VA	300 VA	300 VA	300 VA
No-load voltage (app. x factor)	1.08	1.08	1.08	1.08	1.08	1.08
Efficiency	89.0 %	89.0 %	89.0 %	89.0 %	89.0 %	89.0 %
Standards						
Classification	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Ambient temperature	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Core	EI 120/41,7	EI 120/41,7	EI 120/41,7	EI 120/41,7	EI 120/41,7	EI 120/41,7

Separating transformer
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Electrical data

Typ	CT-035-048-12-0	CT-035-048-12-1	CT-035-048-12-2	CT-035-048-24-0	CT-035-048-24-1	CT-035-048-24-2
Special features						
Characteristics	-	Fused version	with DIN rail for additional components	-	Fused version	with DIN rail for additional components
Input						
Rated input voltage	2 x 240 Vac	2 x 240 Vac	2 x 240 Vac	2 x 240 Vac	2 x 240 Vac	2 x 240 Vac
Rated input current	2 x 0,81 Aac	2 x 0,81 Aac	2 x 0,81 Aac	2 x 0,81 Aac	2 x 0,81 Aac	2 x 0,81 Aac
Frequency Range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	120 Vac	120 Vac	120 Vac	24 Vac	24 Vac	24 Vac
Rated Power	350 VA	350 VA	350 VA	350 VA	350 VA	350 VA
No-load voltage (app. x factor)	1.07	1.07	1.07	1.07	1.07	1.07
Efficiency	91.0 %	91.0 %	91.0 %	91.0 %	91.0 %	91.0 %
Standards						
Classification	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Ambient temperature	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Core	EI 120/50,7	EI 120/50,7	EI 120/50,7	EI 120/50,7	EI 120/50,7	EI 120/50,7

Separating transformer
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Electrical data

Typ	CT-035-060-12-0	CT-035-060-12-1	CT-035-060-12-2	CT-035-060-24-0	CT-035-060-24-1	CT-035-060-24-2
Special features						
Characteristics	-	Fused version	with DIN rail for additional components	-	Fused version	with DIN rail for additional components
Input						
Rated input voltage	600 Vac	600 Vac	600 Vac	600 Vac	600 Vac	600 Vac
Rated input current	0,65 Aac	0,65 Aac	0,65 Aac	0,65 Aac	0,65 Aac	0,65 Aac
Frequency Range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	120 Vac	120 Vac	120 Vac	24 Vac	24 Vac	24 Vac
Rated Power	350 VA	350 VA	350 VA	350 VA	350 VA	350 VA
No-load voltage (app. x factor)	1.07	1.07	1.07	1.07	1.07	1.07
Efficiency	91.0 %	91.0 %	91.0 %	91.0 %	91.0 %	91.0 %
Standards						
Classification	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Ambient temperature	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Core	EI 120/50,7	EI 120/50,7	EI 120/50,7	EI 120/50,7	EI 120/50,7	EI 120/50,7

Separating transformer
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Electrical data

Typ	CT-050-048-12-0	CT-050-048-12-1	CT-050-048-12-2	CT-050-060-12-0	CT-050-060-12-1	CT-050-060-12-2
Special features						
Characteristics	-	Fused version	with DIN rail for additional components	-	Fused version	with DIN rail for additional components
Input						
Rated input voltage	2 x 240 Vac	2 x 240 Vac	2 x 240 Vac	600 Vac	600 Vac	600 Vac
Rated input current	2 x 1,13 Aac	2 x 1,13 Aac	2 x 1,13 Aac	0,91 Aac	0,91 Aac	0,91 Aac
Frequency Range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	120 Vac	120 Vac	120 Vac	120 Vac	120 Vac	120 Vac
Rated Power	500 VA	500 VA	500 VA	500 VA	500 VA	500 VA
No-load voltage (app. x factor)	1.06	1.06	1.06	1.06	1.06	1.06
Efficiency	91.0 %	91.0 %	91.0 %	91.0 %	91.0 %	91.0 %
Standards						
Classification	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Ambient temperature	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Core	EI 120/73,7	EI 120/73,7	EI 120/73,7	EI 120/73,7	EI 120/73,7	EI 120/73,7

Separating transformer
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Electrical data

Typ	CT-075-048-12-0	CT-075-048-12-1	CT-075-048-12-2	CT-075-060-12-0	CT-075-060-12-1	CT-075-060-12-2
Special features						
Characteristics	-	Fused version	with DIN rail for additional components	-	Fused version	with DIN rail for additional components
Input						
Rated input voltage	2 x 240 Vac	2 x 240 Vac	2 x 240 Vac	600 Vac	600 Vac	600 Vac
Rated input current	2 x 1,69 Aac	2 x 1,69 Aac	2 x 1,69 Aac	2 x 1,35 Aac	2 x 1,35 Aac	2 x 1,35 Aac
Frequency Range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	120 Vac	120 Vac	120 Vac	120 Vac	120 Vac	120 Vac
Rated Power	750 VA	750 VA	750 VA	750 VA	750 VA	750 VA
No-load voltage (app. x factor)	1.05	1.05	1.05	1.05	1.05	1.05
Efficiency	93.0 %	93.0 %	93.0 %	93.0 %	93.0 %	93.0 %
Standards						
Classification	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Ambient temperature	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Core	EI 150N/66,6	EI 150N/66,6	EI 150N/66,6	EI 150N/66,6	EI 150N/66,6	EI 150N/66,6

Separating transformer
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Electrical data

Typ	CT-100-048-12-0	CT-100-048-12-1	CT-100-048-12-2	CT-100-060-12-0	CT-100-060-12-1	CT-100-060-12-2
Special features						
Characteristics	-	Fused version	with DIN rail for additional components	-	Fused version	with DIN rail for additional components
Input						
Rated input voltage	2 x 240 Vac	2 x 240 Vac	2 x 240 Vac	600 Vac	600 Vac	600 Vac
Rated input current	2 x 2,3 Aac	2 x 2,3 Aac	2 x 2,3 Aac	1,8 Aac	1,8 Aac	1,8 Aac
Frequency Range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	120 Vac	120 Vac	120 Vac	120 Vac	120 Vac	120 Vac
Rated Power	1000 VA	1000 VA	1000 VA	1000 VA	1000 VA	1000 VA
No-load voltage (app. x factor)	1.05	1.05	1.05	1.05	1.05	1.05
Efficiency	93.0 %	93.0 %	93.0 %	93.0 %	93.0 %	93.0 %
Standards						
Classification	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Ambient temperature	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Core	EI 174/52	EI 174/52	EI 174/52	EI 174/52	EI 174/52	EI 174/52

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Electrical data

Typ	CT-150-048-12-0	CT-150-048-12-1	CT-150-048-12-2	CT-150-060-12-0	CT-150-060-12-1	CT-150-060-12-2
Special features						
Characteristics	-	Fused version	with DIN rail for additional components	-	Fused version	with DIN rail for additional components
Input						
Rated input voltage	2 x 240 Vac	2 x 240 Vac	2 x 240 Vac	600 Vac	600 Vac	600 Vac
Rated input current	2 x 3,3 Aac	2 x 3,3 Aac	2 x 3,3 Aac	2,6 Aac	2,6 Aac	2,6 Aac
Frequency Range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	120 Vac	120 Vac	120 Vac	120 Vac	120 Vac	120 Vac
Rated Power	1500 VA	1500 VA	1500 VA	1500 VA	1500 VA	1500 VA
No-load voltage (app. x factor)	1.04	1.04	1.04	1.04	1.04	1.04
Efficiency	94.0 %	94.0 %	94.0 %	94.0 %	94.0 %	94.0 %
Standards						
Classification	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Ambient temperature	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Core	EI 192/66	EI 192/66	EI 192/66	EI 192/66	EI 192/66	EI 192/66

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Electrical data

Typ	CT-200-048-12-0	CT-200-048-12-1	CT-200-048-12-2	CT-200-060-12-0	CT-200-060-12-1	CT-200-060-12-2
Special features						
Characteristics	-	Fused version	with DIN rail for additional components	-	Fused version	with DIN rail for additional components
Input						
Rated input voltage	2 x 240 Vac	2 x 240 Vac	2 x 240 Vac	600 Vac	600 Vac	600 Vac
Rated input current	2 x 4,3 Aac	2 x 4,3 Aac	2 x 4,3 Aac	3,4 Aac	3,4 Aac	3,4 Aac
Frequency Range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	120 Vac	120 Vac	120 Vac	120 Vac	120 Vac	120 Vac
Rated Power	2000 VA	2000 VA	2000 VA	2000 VA	2000 VA	2000 VA
No-load voltage (app. x factor)	1.03	1.03	1.03	1.03	1.03	1.03
Efficiency	95.0 %	95.0 %	95.0 %	95.0 %	95.0 %	95.0 %
Standards						
Classification	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Ambient temperature	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Core	EI 192/82	EI 192/82	EI 192/82	EI 192/82	EI 192/82	EI 192/82

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Electrical data

Typ	CT-250-048-12-0	CT-250-048-12-1	CT-250-048-12-2	CT-250-060-12-0	CT-250-060-12-1	CT-250-060-12-2
Special features						
Characteristics	-	Fused version	with DIN rail for additional components	-	Fused version	with DIN rail for additional components
Input						
Rated input voltage	2 x 240 Vac	2 x 240 Vac	2 x 240 Vac	600 Vac	600 Vac	600 Vac
Rated input current	2 x 5,2 Aac	2 x 5,2 Aac	2 x 5,2 Aac	4,2 Aac	4,2 Aac	4,2 Aac
Frequency Range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	120 Vac	120 Vac	120 Vac	120 Vac	120 Vac	120 Vac
Rated Power	2500 VA	2500 VA	2500 VA	2500 VA	2500 VA	2500 VA
No-load voltage (app. x factor)	1.03	1.03	1.03	1.03	1.03	1.03
Efficiency	95.0 %	95.0 %	95.0 %	95.0 %	95.0 %	95.0 %
Standards						
Classification	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer	Separating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling	self-cooling
Ambient temperature	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C	max. 40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130	B, class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Core	EI 192/100	EI 192/100	EI 192/100	EI 192/100	EI 192/100	EI 192/100

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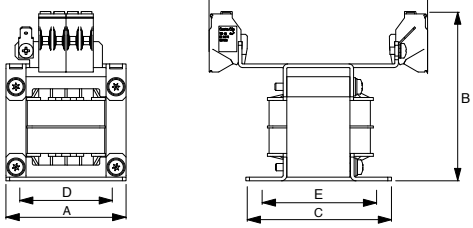
Mechanical data

Typ	Dimension picture (in mm)	A	A1	B	B1	C	D	E	F1	F2	F	Weight
CT-005-048-12-0	1	66	-	92.7	-	80	50.8	63.5	-	-	120	1.00 kg
CT-005-048-12-1	2	66	75.7	92.7	95.4	80	50.8	63.5	60	60	-	1.00 kg
CT-005-048-12-2	3	66	-	92.7	-	80	50.8	63.5	-	-	120	1.00 kg
CT-005-048-24-0	1	66	-	92.7	-	80	50.8	63.5	-	-	120	1.00 kg
CT-005-048-24-1	2	66	75.7	92.7	95.4	80	50.8	63.5	60	60	-	1.00 kg
CT-005-048-24-2	3	66	-	92.7	-	80	50.8	63.5	-	-	120	1.00 kg

Dimension pictures

1



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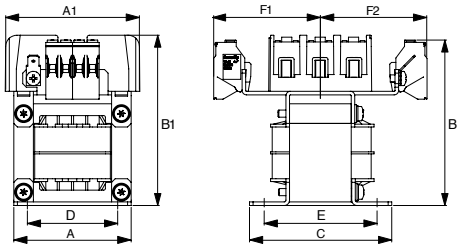

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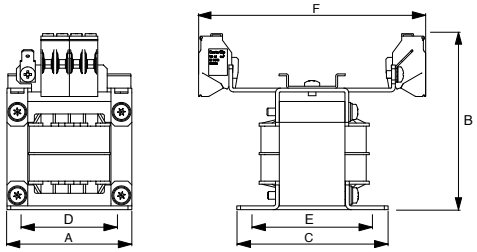

Separating transformer
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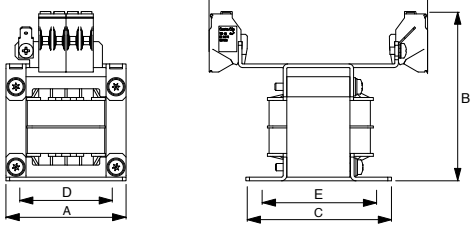
Mechanical data 30

Typ	Dimension picture (in mm)	A	A1	B	B1	C	D	E	F1	F2	F	Weight
CT-005-060-12-0	1	66	-	92.7	-	80	50.8	63.5	-	-	120	1.00 kg
CT-005-060-12-1	2	66	75.7	92.7	95.4	80	50.8	63.5	60	60	-	1.00 kg
CT-005-060-12-2	3	66	-	92.7	-	80	50.8	63.5	-	-	120	1.00 kg
CT-005-060-24-0	1	66	-	92.7	-	80	50.8	63.5	-	-	120	1.00 kg
CT-005-060-24-1	2	66	75.7	92.7	95.4	80	50.8	63.5	60	60	-	1.00 kg
CT-005-060-24-2	3	66	-	92.7	-	80	50.8	63.5	-	-	120	1.00 kg

Dimension pictures

1



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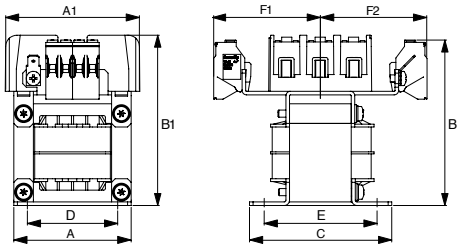

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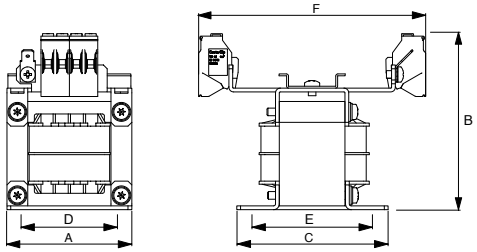


Separating transformer
CT

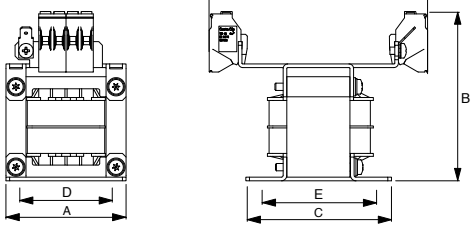
BLOCK Website

Mechanical data

Typ	Dimension picture (in mm)	A	A1	B	B1	C	D	E	F1	F2	F	Weight
CT-007-048-12-0	1	78	-	102.7	-	79	66	63.5	-	-	112.8	1.10 kg
CT-007-048-12-1	2	78	78	102.7	105.4	79	66	63.5	56.4	56.4	-	1.10 kg
CT-007-048-12-2	3	78	-	102.7	-	79	66	63.5	-	-	112.8	1.10 kg
CT-007-048-24-0	1	78	-	102.7	-	79	66	63.5	-	-	112.8	1.10 kg
CT-007-048-24-1	2	78	78	102.7	105.4	79	66	63.5	56.4	56.4	-	1.10 kg
CT-007-048-24-2	3	78	-	102.7	-	79	66	63.5	-	-	112.8	1.10 kg

Dimension pictures

1



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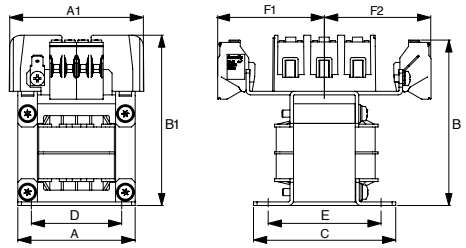

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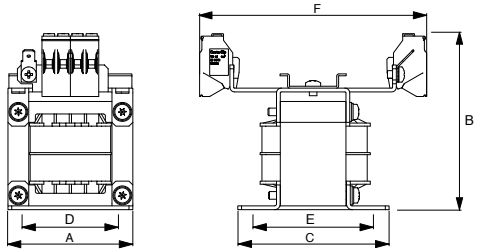


Separating transformer
CT

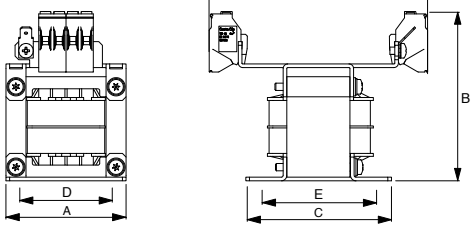
BLOCK Website

Mechanical data 30

Typ	Dimension picture (in mm)	A	A1	B	B1	C	D	E	F1	F2	F	Weight
CT-007-060-12-0	1	78	-	102.7	-	79	66	63.5	-	-	112.8	1.10 kg
CT-007-060-12-1	2	78	78	102.7	105.4	79	66	63.5	56.4	56.4	-	1.10 kg
CT-007-060-12-2	3	78	-	102.7	-	79	66	63.5	-	-	112.8	1.10 kg
CT-007-060-24-0	1	78	-	102.7	-	79	66	63.5	-	-	112.8	1.10 kg
CT-007-060-24-1	2	78	78	102.7	105.4	79	66	63.5	56.4	56.4	-	1.10 kg
CT-007-060-24-2	3	78	-	102.7	-	79	66	63.5	-	-	112.8	1.10 kg

Dimension pictures

1



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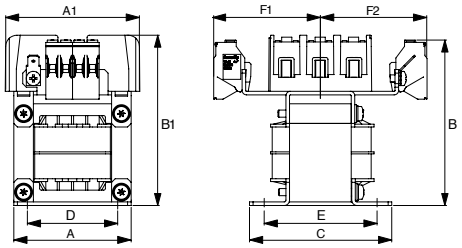

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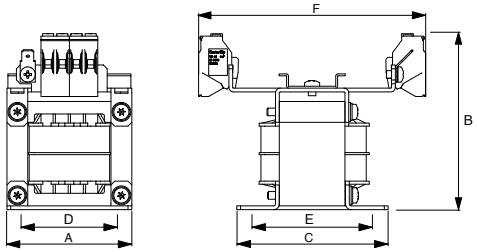


Separating transformer
CT

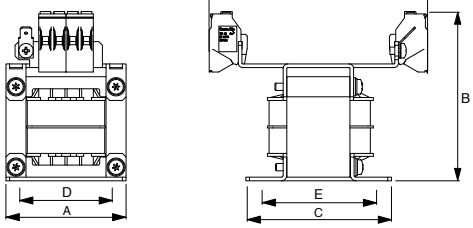
BLOCK Website

Mechanical data

Typ	Dimension picture (in mm)	A	A1	B	B1	C	D	E	F1	F2	F	Weight
CT-010-048-12-0	1	78	-	102.7	-	82	66	66	-	-	121.8	1.50 kg
CT-010-048-12-1	2	78	78	102.7	105.4	82	66	66	60.9	60.9	-	1.50 kg
CT-010-048-12-2	3	78	-	102.7	-	82	66	66	-	-	121.8	1.50 kg
CT-010-048-24-0	1	78	-	102.7	-	82	66	66	-	-	121.8	1.50 kg
CT-010-048-24-1	2	78	78	102.7	105.4	82	66	66	60.9	60.9	-	1.50 kg
CT-010-048-24-2	3	78	-	102.7	-	82	66	66	-	-	121.8	1.50 kg

Dimension pictures

1



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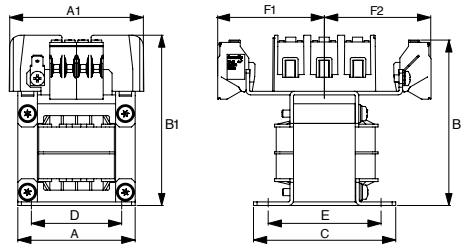

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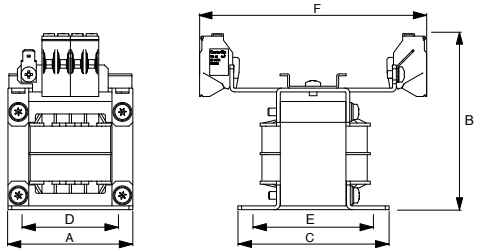


Separating transformer
CT

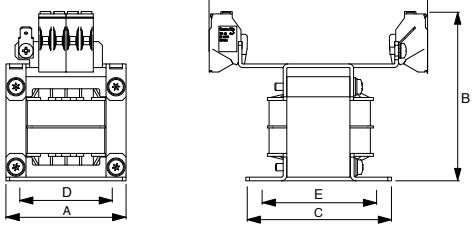
BLOCK Website

Mechanical data 30

Typ	Dimension picture (in mm)	A	A1	B	B1	C	D	E	F1	F2	F	Weight
CT-010-060-12-0	1	78	-	102.7	-	82	66	66	-	-	121.8	1.50 kg
CT-010-060-12-1	2	78	78	102.7	105.4	82	66	66	60.9	60.9	-	1.50 kg
CT-010-060-12-2	3	78	-	102.7	-	82	66	66	-	-	121.8	1.50 kg
CT-010-060-24-0	1	78	-	102.7	-	82	66	66	-	-	121.8	1.50 kg
CT-010-060-24-1	2	78	78	102.7	105.4	82	66	66	60.9	60.9	-	1.50 kg
CT-010-060-24-2	3	78	-	102.7	-	82	66	66	-	-	121.8	1.50 kg

Dimension pictures

1



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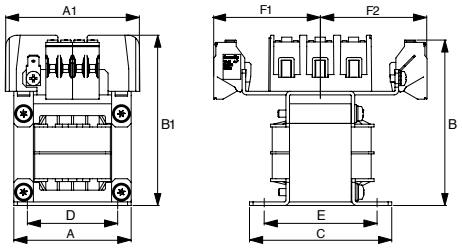

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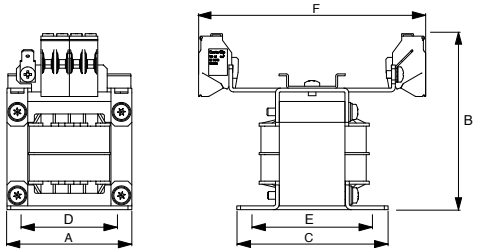

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CT

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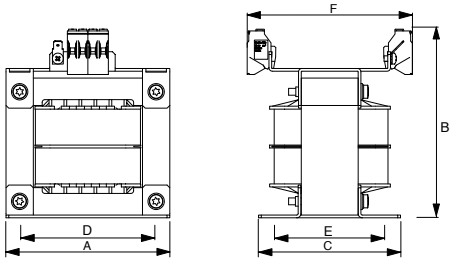
Mechanical data

Typ	Dimension picture (in mm)	A	A1	B	B1	C	D	E	F1	F2	F	Weight
CT-015-048-12-0	4	96	-	117.7	-	100	80	76.2	-	-	117	2.20 kg
CT-015-048-12-1	5	96	96	117.7	120.4	100	80	76.2	58.5	58.5	-	2.20 kg
CT-015-048-12-2	6	96	-	117.7	-	100	80	76.2	-	-	117	2.20 kg
CT-015-048-24-0	4	96	-	117.7	-	100	80	76.2	-	-	117	2.20 kg
CT-015-048-24-1	5	96	96	117.7	120.4	100	80	76.2	58.5	58.5	-	2.20 kg
CT-015-048-24-2	6	96	-	117.7	-	100	80	76.2	-	-	117	2.20 kg

Dimension pictures

4



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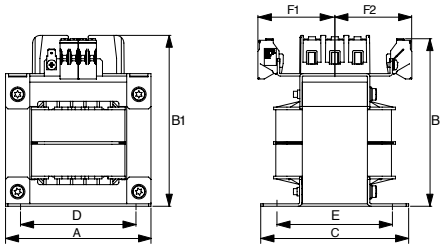

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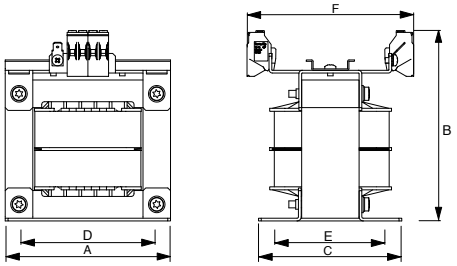

Separating transformer
CT

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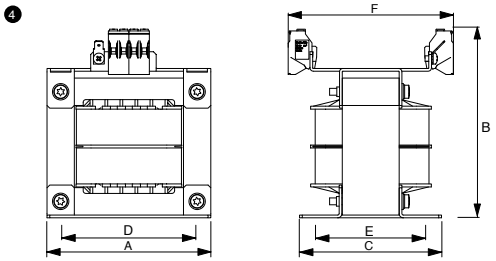
30 Mechanical data

Typ	Dimension picture (in mm)	A	A1	B	B1	C	D	E	F1	F2	F	Weight
CT-015-060-12-0	4	96	-	117.7	-	100	80	76.2	-	-	117	2.20 kg
CT-015-060-12-1	5	96	96	117.7	120.4	100	80	76.2	58.5	58.5	-	2.20 kg
CT-015-060-12-2	6	96	-	117.7	-	100	80	76.2	-	-	117	2.20 kg
CT-015-060-24-0	4	96	-	117.7	-	100	80	76.2	-	-	117	2.20 kg
CT-015-060-24-1	5	96	96	117.7	120.4	100	80	76.2	58.5	58.5	-	2.20 kg
CT-015-060-24-2	6	96	-	117.7	-	100	80	76.2	-	-	117	2.20 kg

Dimension pictures

4



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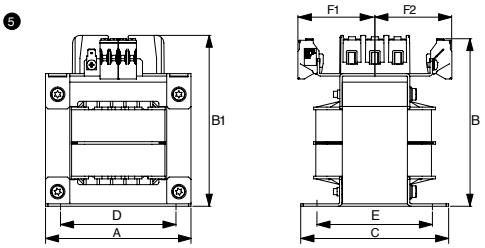

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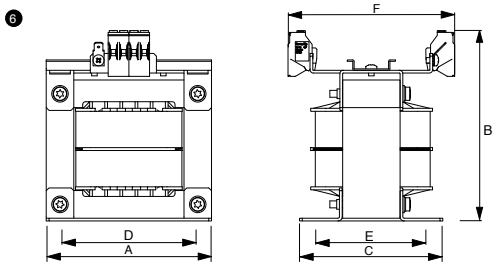


Separating transformer
CT

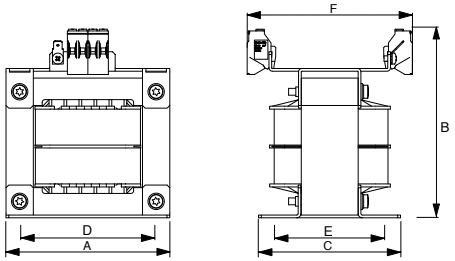
BLOCK Website

Mechanical data

Typ	Dimension picture (in mm)	A	A1	B	B1	C	D	E	F1	F2	F	Weight
CT-020-048-12-0	4	96	-	117.7	-	108	80	84	-	-	125	2.80 kg
CT-020-048-12-1	5	96	96	117.7	120.4	108	80	84	62.5	62.5	-	2.80 kg
CT-020-048-12-2	6	96	-	117.7	-	108	80	84	-	-	125	2.80 kg
CT-020-048-24-0	4	96	-	117.7	-	108	80	84	-	-	125	2.80 kg
CT-020-048-24-1	5	96	96	117.7	120.4	108	80	84	62.5	62.5	-	2.80 kg
CT-020-048-24-2	6	96	-	117.7	-	108	80	84	-	-	125	2.80 kg

Dimension pictures

4



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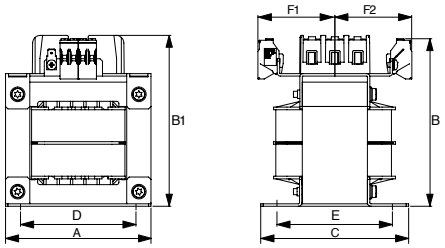

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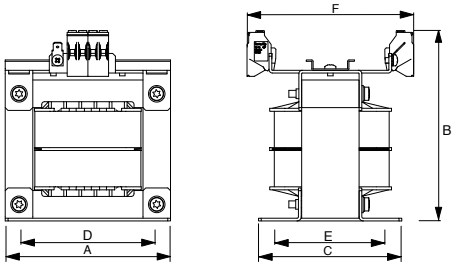


Separating transformer
CT

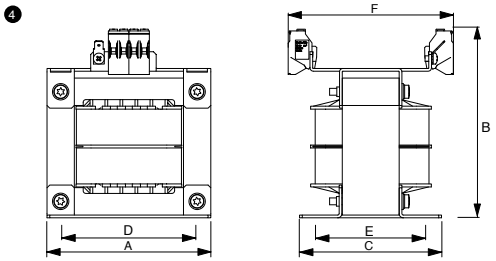
BLOCK Website

Mechanical data

Typ	Dimension picture (in mm)	A	A1	B	B1	C	D	E	F1	F2	F	Weight
CT-020-060-12-0	4	96	-	117.7	-	108	80	84	-	-	125	2.80 kg
CT-020-060-12-1	5	96	96	117.7	120.4	108	80	84	62.5	62.5	-	2.80 kg
CT-020-060-12-2	6	96	-	117.7	-	108	80	84	-	-	125	2.80 kg
CT-020-060-24-0	4	96	-	117.7	-	108	80	84	-	-	125	2.80 kg
CT-020-060-24-1	5	96	96	117.7	120.4	108	80	84	62.5	62.5	-	2.80 kg
CT-020-060-24-2	6	96	-	117.7	-	108	80	84	-	-	125	2.80 kg

Dimension pictures

4



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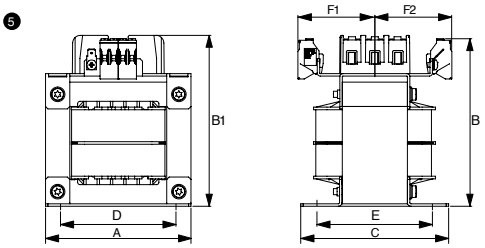

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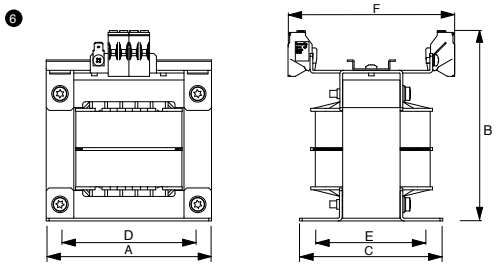


Separating transformer
CT

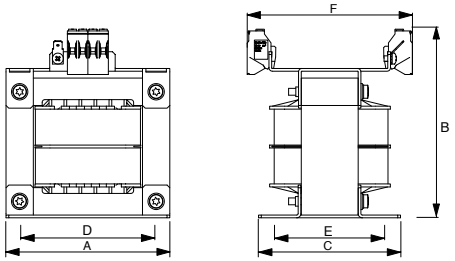
BLOCK Website

Mechanical data

Typ	Dimension picture (in mm)	A	A1	B	B1	C	D	E	F1	F2	F	Weight
CT-025-048-12-0	4	96	-	117.7	-	122	80	99	-	-	123	3.50 kg
CT-025-048-12-1	5	96	96	117.7	120.4	122	80	99	61.5	61.5	-	3.50 kg
CT-025-048-12-2	6	96	-	117.7	-	122	80	99	-	-	123	3.50 kg
CT-025-048-24-0	4	96	-	117.7	-	122	80	99	-	-	123	3.50 kg
CT-025-048-24-1	5	96	96	117.7	120.4	122	80	99	61.5	61.5	-	3.50 kg
CT-025-048-24-2	6	96	-	117.7	-	122	80	99	-	-	123	3.50 kg

Dimension pictures

4



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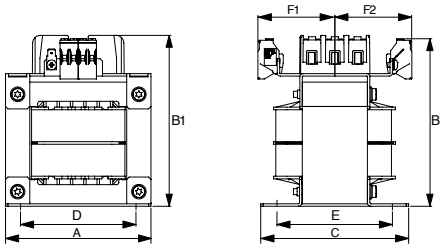

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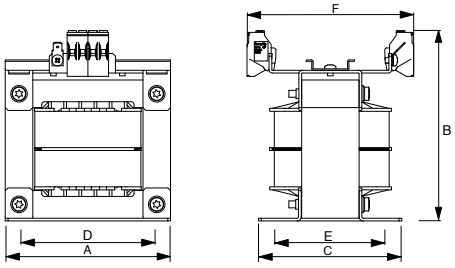


Separating transformer
CT

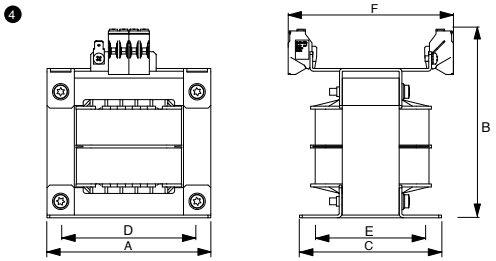
BLOCK Website

Mechanical data 30

Typ	Dimension picture (in mm)	A	A1	B	B1	C	D	E	F1	F2	F	Weight
CT-025-060-12-0	4	96	-	117.7	-	122	80	99	-	-	123	3.50 kg
CT-025-060-12-1	5	96	96	117.7	120.4	122	80	99	61.5	61.5	-	3.50 kg
CT-025-060-12-2	6	96	-	117.7	-	122	80	99	-	-	123	3.50 kg
CT-025-060-24-0	4	96	-	117.7	-	122	80	99	-	-	123	3.50 kg
CT-025-060-24-1	5	96	96	117.7	120.4	122	80	99	61.5	61.5	-	3.50 kg
CT-025-060-24-2	6	96	96	117.7	117.7	122	80	99	61.5	61.5	-	3.50 kg

Dimension pictures

4



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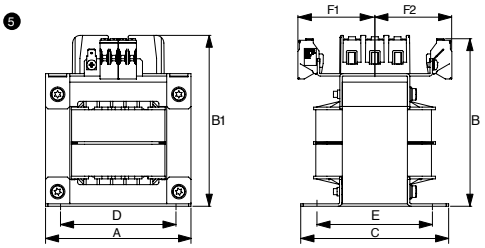

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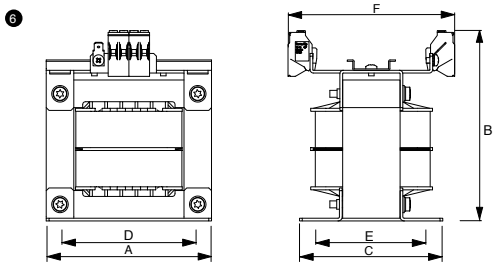


Separating transformer
CT

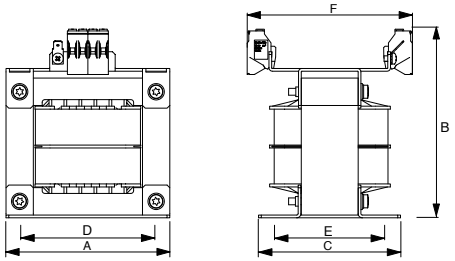
BLOCK Website

Mechanical data

Typ	Dimension picture (in mm)	A	A1	B	B1	C	D	E	F1	F2	F	Weight
CT-030-048-12-0	4	120	-	137.7	-	104	95	80	-	-	121	4.00 kg
CT-030-048-12-1	5	120	120	137.7	140.4	104	95	80	60.5	60.5	-	4.00 kg
CT-030-048-12-2	6	120	-	137.7	-	104	95	80	-	-	121	4.00 kg
CT-030-048-24-0	4	120	-	137.7	-	104	95	80	-	-	121	4.00 kg
CT-030-048-24-1	5	120	120	137.7	140.4	104	95	80	60.5	60.5	-	4.00 kg
CT-030-048-24-2	6	120	-	137.7	-	104	95	80	-	-	121	4.00 kg

Dimension pictures

4



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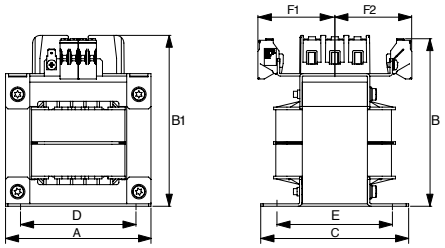

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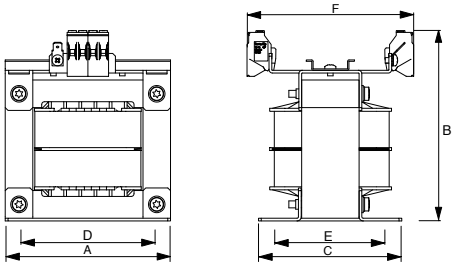


Separating transformer
CT

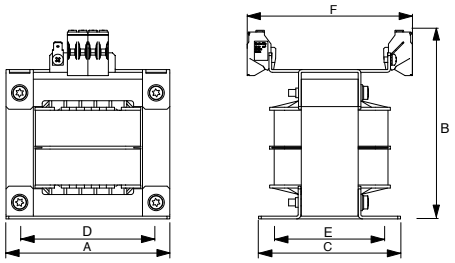
BLOCK Website

Mechanical data 30

Typ	Dimension picture (in mm)	A	A1	B	B1	C	D	E	F1	F2	F	Weight
CT-030-060-12-0	4	120	-	137.7	-	104	95	80	-	-	121	4.00 kg
CT-030-060-12-1	5	120	120	137.7	140.4	104	95	80	60.5	60.5	-	4.00 kg
CT-030-060-12-2	5	120	-	137.7	-	104	95	80	-	-	121	4.00 kg
CT-030-060-24-0	4	120	-	137.7	-	104	95	80	-	-	121	4.00 kg
CT-030-060-24-1	5	120	120	137.7	140.4	104	95	80	60.5	60.5	-	4.00 kg
CT-030-060-24-2	6	120	-	137.7	-	104	95	80	-	-	121	4.00 kg
CT-035-048-12-0	4	120	-	137.7	-	122	95	95	-	-	127	5.00 kg
CT-035-048-12-1	5	120	120	137.7	140.4	122	95	95	63.5	63.5	-	5.00 kg
CT-035-048-12-2	6	120	-	137.7	-	122	95	95	-	-	127	5.00 kg

Dimension pictures

4



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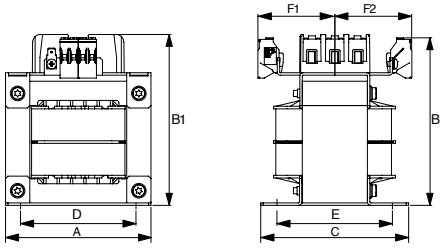

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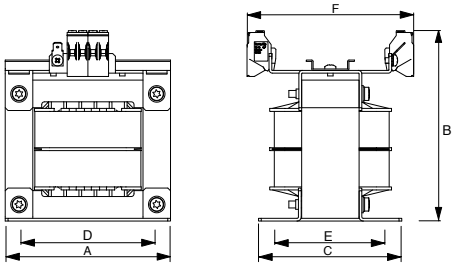


Separating transformer
CT

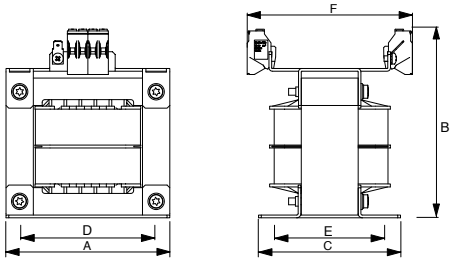
BLOCK Website

Mechanical data

Typ	Dimension picture (in mm)	A	A1	B	B1	C	D	E	F1	F2	F	Weight
CT-035-048-24-0	4	120	-	137.7	-	122	95	95	-	-	127	5.00 kg
CT-035-048-24-1	5	120	120	137.7	140.4	122	95	95	63.5	63.5	-	5.00 kg
CT-035-048-24-2	6	120	-	137.7	-	122	95	95	-	-	127	5.00 kg
CT-035-060-12-0	4	120	-	137.7	-	122	95	95	-	-	127	5.00 kg
CT-035-060-12-1	5	120	120	137.7	140.4	122	95	95	63.5	63.5	-	5.00 kg
CT-035-060-12-2	6	120	-	137.7	-	122	95	95	-	-	127	5.00 kg

Dimension pictures

4



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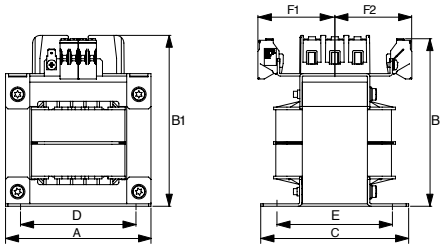

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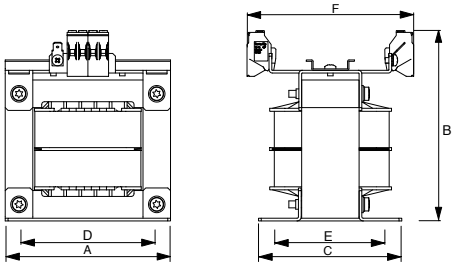


Separating transformer
CT

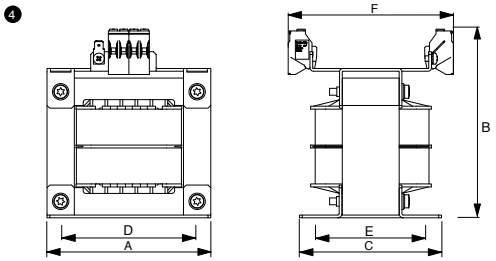
BLOCK Website

30 Mechanical data

Typ	Dimension picture (in mm)	A	A1	B	B1	C	D	E	F1	F2	F	Weight
CT-035-060-24-0	4	120	-	137.7	-	122	95	95	-	-	127	5.00 kg
CT-035-060-24-1	5	120	120	137.7	140.4	122	95	95	63.5	63.5	-	5.00 kg
CT-035-060-24-2	6	120	-	137.7	-	122	95	95	-	-	127	5.00 kg
CT-050-048-12-0	4	120	-	137.7	-	145	95	114	-	-	137	6.80 kg
CT-050-048-12-1	5	120	120	137.7	140.4	145	95	114	68.5	68.5	-	6.80 kg
CT-050-048-12-2	6	120	-	137.7	-	145	95	114	-	-	137	6.80 kg

Dimension pictures

4



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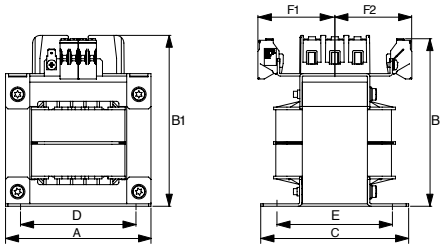

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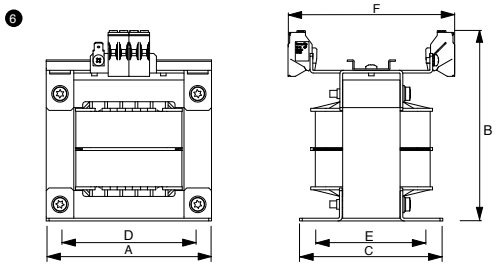


Separating transformer
CT

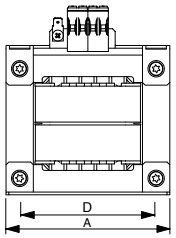
BLOCK Website

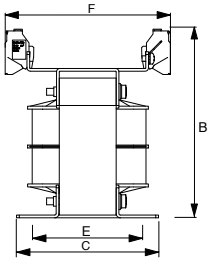
Mechanical data

Typ	Dimension picture (in mm)	A	A1	B	B1	C	D	E	F1	F2	F	Weight
CT-050-060-12-0	4	120	-	137.7	-	145	95	114	-	-	137	6.80 kg
CT-050-060-12-1	5	120	120	137.7	140.4	145	95	114	68.5	68.5	-	6.80 kg
CT-050-060-12-2	6	120	-	137.7	-	145	95	114	-	-	137	6.80 kg
CT-075-048-12-0	4	150	-	162.7	-	140	112	109	-	-	132	9.80 kg
CT-075-048-12-1	5	150	150	162.7	165.4	140	112	109	66	66	-	9.80 kg
CT-075-048-12-2	6	150	-	162.7	-	140	112	109	-	-	132	9.80 kg

Dimension pictures

4





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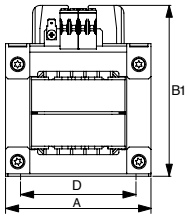

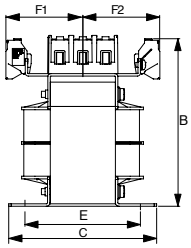

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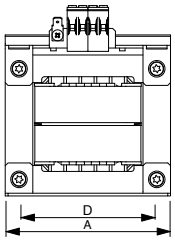
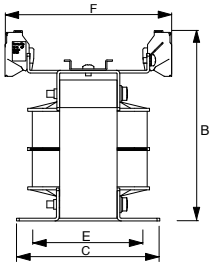




Separating transformer
CT

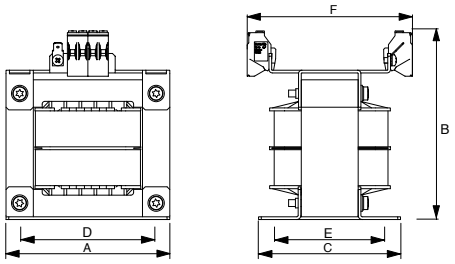
BLOCK Website

Mechanical data 30

Typ	Dimension picture (in mm)	A	A1	B	B1	C	D	E	F1	F2	F	Weight
CT-075-060-12-0	4	150	-	162.7	-	140	112	109	-	-	132	9.80 kg
CT-075-060-12-1	5	150	150	162.7	165.4	140	112	109	66	66	-	9.80 kg
CT-075-060-12-2	6	150	-	162.7	-	140	112	109	-	-	132	9.80 kg
CT-100-048-12-0	4	174	-	183.2	-	145	140	113	-	-	122	11.20 kg
CT-100-048-12-1	5	174	174	183.2	185.9	145	140	113	61	61	-	11.20 kg
CT-100-048-12-2	5	174	-	183.2	-	145	140	113	-	-	122	11.20 kg
CT-100-060-12-0	4	174	-	183.2	-	145	140	113	-	-	122	11.20 kg
CT-100-060-12-1	5	174	174	183.2	185.9	145	140	113	61	61	-	11.20 kg

Dimension pictures

4



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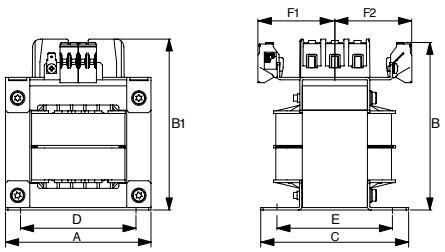

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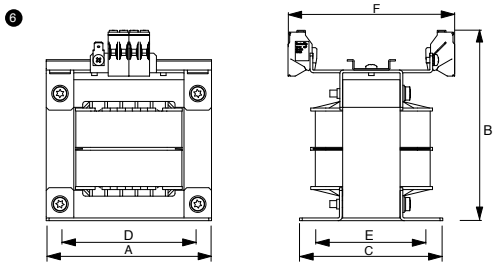


Separating transformer
CT

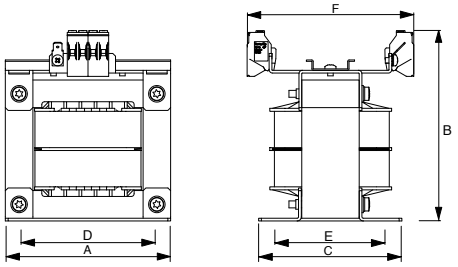
BLOCK Website

Mechanical data

Typ	Dimension picture (in mm)	A	A1	B	B1	C	D	E	F1	F2	F	Weight
CT-100-060-12-2	6	174	-	183.2	-	145	140	113	-	-	122	11.20 kg
CT-150-048-12-0	7	192	-	198.2	-	165	152.4	127	-	-	130	16.70 kg
CT-150-048-12-1	8	192	192	198.2	200.9	165	152.4	127	65	65	-	16.70 kg
CT-150-048-12-2	9	192	-	198.2	-	165	152.4	127	-	-	130	16.70 kg
CT-150-060-12-0	7	192	-	198.2	-	165	152	127	-	-	130	16.70 kg
CT-150-060-12-1	8	192	192	198.2	200.9	165	152.4	127	65	65	-	16.70 kg

Dimension pictures

6



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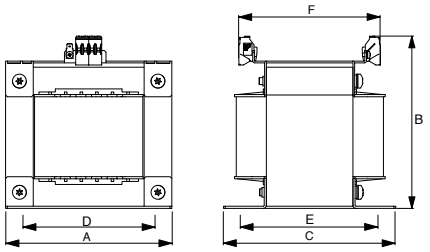

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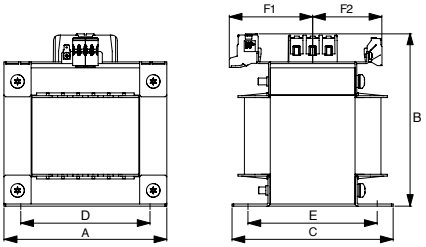

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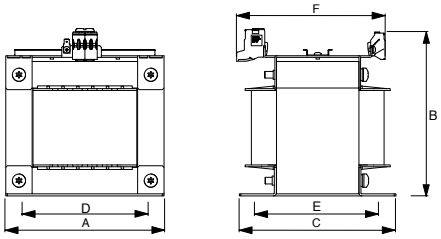


Separating transformer
CT

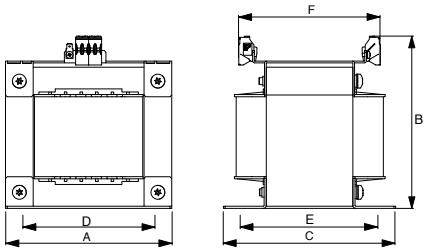
BLOCK Website

30 Mechanical data

Typ	Dimension picture (in mm)	A	A1	B	B1	C	D	E	F1	F2	F	Weight
CT-150-060-12-2	9	192	-	198.2	-	165	152.4	127	-	-	130	16.70 kg
CT-200-048-12-0	7	192	-	202.4	-	180	152.4	140	-	-	162.1	21.00 kg
CT-200-048-12-1	8	192	192	202.4	202.4	180	152.4	140	89.3	72.8	-	21.00 kg
CT-200-048-12-2	9	192	-	202.4	-	180	152.4	140	-	-	162.1	21.00 kg
CT-200-060-12-0	7	192	-	202.4	-	180	152.4	140	-	-	162.1	21.00 kg
CT-200-060-12-1	8	192	192	202.4	202.4	180	152.4	140	89.3	72.8	-	21.00 kg

Dimension pictures

7



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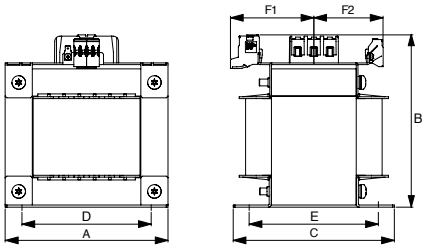

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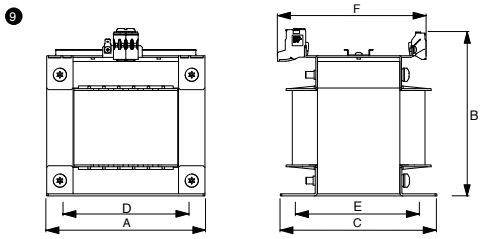


Separating transformer
CT

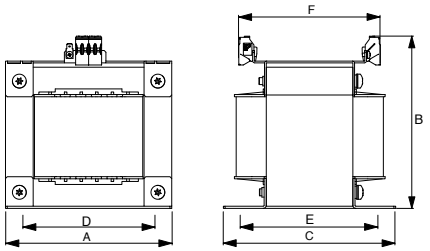
BLOCK Website

Mechanical data

Typ	Dimension picture (in mm)	A	A1	B	B1	C	D	E	F1	F2	F	Weight
CT-200-060-12-2	9	192	-	202.4	-	180	152.4	140	-	-	162.1	21.00 kg
CT-250-048-12-0	7	192	-	202.4	-	190	152.4	152.4	-	-	180.1	25.80 kg
CT-250-048-12-1	8	192	192	202.4	202.4	190	152.4	152.4	98.3	81.8	-	25.80 kg
CT-250-048-12-2	9	192	-	202.4	-	190	152.4	152.4	-	-	180.1	25.80 kg
CT-250-060-12-0	7	192	-	202.4	-	190	152.4	152.4	-	-	180.1	25.80 kg
CT-250-060-12-1	8	192	192	202.4	202.4	190	152.4	152.4	98.3	81.8	-	25.80 kg

Dimension pictures

7



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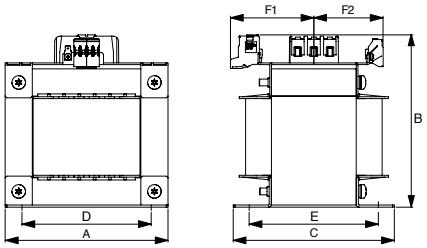

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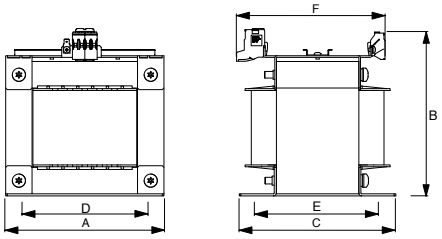


Separating transformer
CT

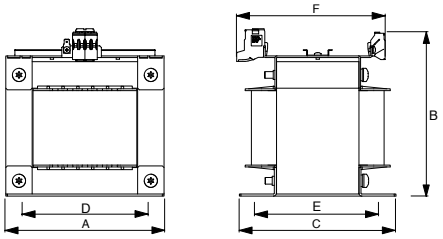
BLOCK Website

Mechanical data

Typ	Dimension picture (in mm)	A	A1	B	B1	C	D	E	F1	F2	F	Weight
CT-250-060-12-2	9	192	-	202.4	-	190	152.4	152.4	-	-	180.1	25.80 kg

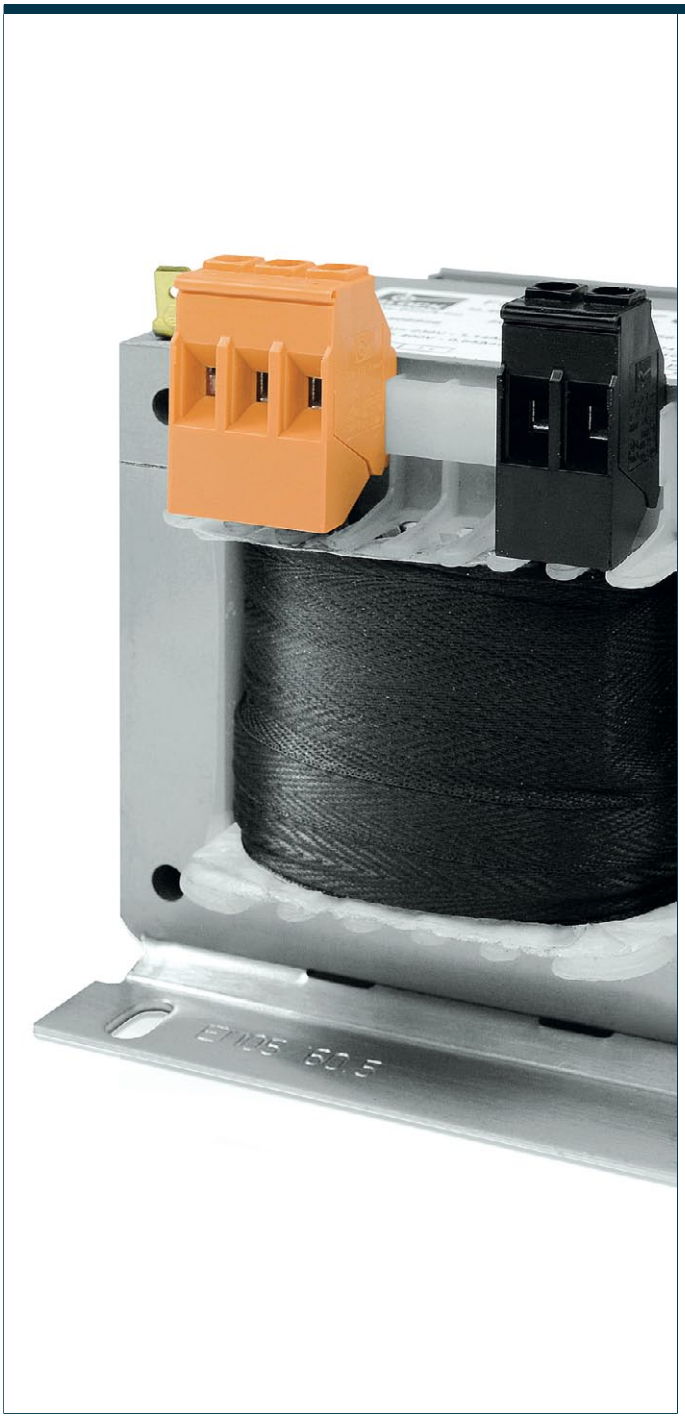
Dimension pictures

9



FAIL-SAFE transformer
FST

BLOCK Website



General Data

Rated input voltage 230 V / 400 V
Rated output voltage 24 V / 230 V
Rated power 100 VA / 160 VA / 250 VA
Insulation class B
Max. ambient temperature 40 °C
Protection index IP 00

Advantages

With integrated FAIL-SAFE protection
High performance per volume thanks to compact design
Very good switch-on behaviour thanks to reduced starting currents
May be operated at 50 - 60 Hz
Very good corrosion protection and low noise thanks to vacuum impregnation
Primary side for input voltage 230 V and 400 V
100 VA and 160 VA versions for mounting with integrated DIN rail mounting in compliance with DIN 50022

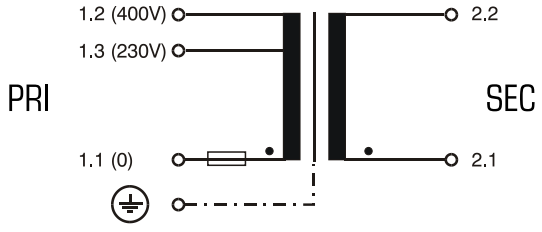
Applications

FAIL-SAFE transformer as a control transformer for electrical isolations of the input and output sides. The transformer is designed to provide control in compliance with EN 60204

FAIL-SAFE transformer as an isolating transformer for the safe electrical isolation of the input and output sides. The transformer may be used to set up protective separation as a protective measure in accordance with VDE 0100.

FAIL-SAFE transformer as a safety transformer to secure electrical isolation of the input and output sides. By limiting the output voltage, this transformer is suitable for the construction of both SELV and PELV electrical circuits.

Sample application



Standards

FAIL-SAFE control and safety transformer to: EN 61558 part 1 with part 2-2 and part 2-6

FAIL-SAFE voltage control and isolating transformer to: EN 61558 part 1 with part 2-2 and part 2-4

Approvals

ENEC 10 (VDE)

FAIL-SAFE transformer
FST

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Electrical data

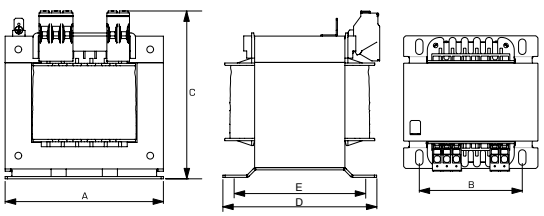
Typ	FST 100/23	FST 100/24	FST 160/23	FST 160/24	FST 250/23	FST 250/24
Input						
Rated input current	0,49 A / 0,28 Aac	0,49 A / 0,28 Aac	0,77 A / 0,45 Aac	0,77 A / 0,45 Aac	1,14 A / 0,65 Aac	1,14 A / 0,65 Aac
Rated input voltage	230 Vac / 400 Vac	230 Vac / 400 Vac	230 Vac / 400 Vac	230 Vac / 400 Vac	230 Vac / 400 Vac	230 Vac / 400 Vac
Switch-on time	100%	100%	100%	100%	100%	100%
Frequency Range	50-60 Hz	50-60 Hz	50-60 Hz	50-60 Hz	50-60 Hz	50-60 Hz
Output						
Rated output current	0,43 Aac	4,17 Aac	0,695 Aac	6,67 Aac	1,09 Aac	10,41 Aac
Rated output voltage	230 Vac	24 Vac	230 Vac	24 V	230 Vac	24 Vac
Rated power VDE (DB cos phi=1)	100 VA	100 VA	160 VA	160 VA	250 VA	250 VA
Rated power VDE (KB cos phi=0.5)	220 VA	220 VA	320 VA	320 VA	490 VA	490 VA
Vector group	Ii0	Ii0	Ii0	Ii0	Ii0	Ii0
Power loss	14.0 W	14.0 W	20.8 W	20.8 W	27.0 W	25.5 W
Standards						
Classification	Control- and safety isolating transformer	Control- and safety isolating transformer	Control- and safety isolating transformer	Control- and safety isolating transformer	Control- and safety isolating transformer	Control- and safety isolating transformer
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Type of cooling	AN	AN	AN	AN	AN	AN
Safety and protection						
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Insulation class	B	B	B	B	B	B
Order numbers						
Order Number	**FST 100/23**	**FST 100/24**	**FST 160/23**	**FST 160/24**	**FST 250/23**	**FST 250/24**

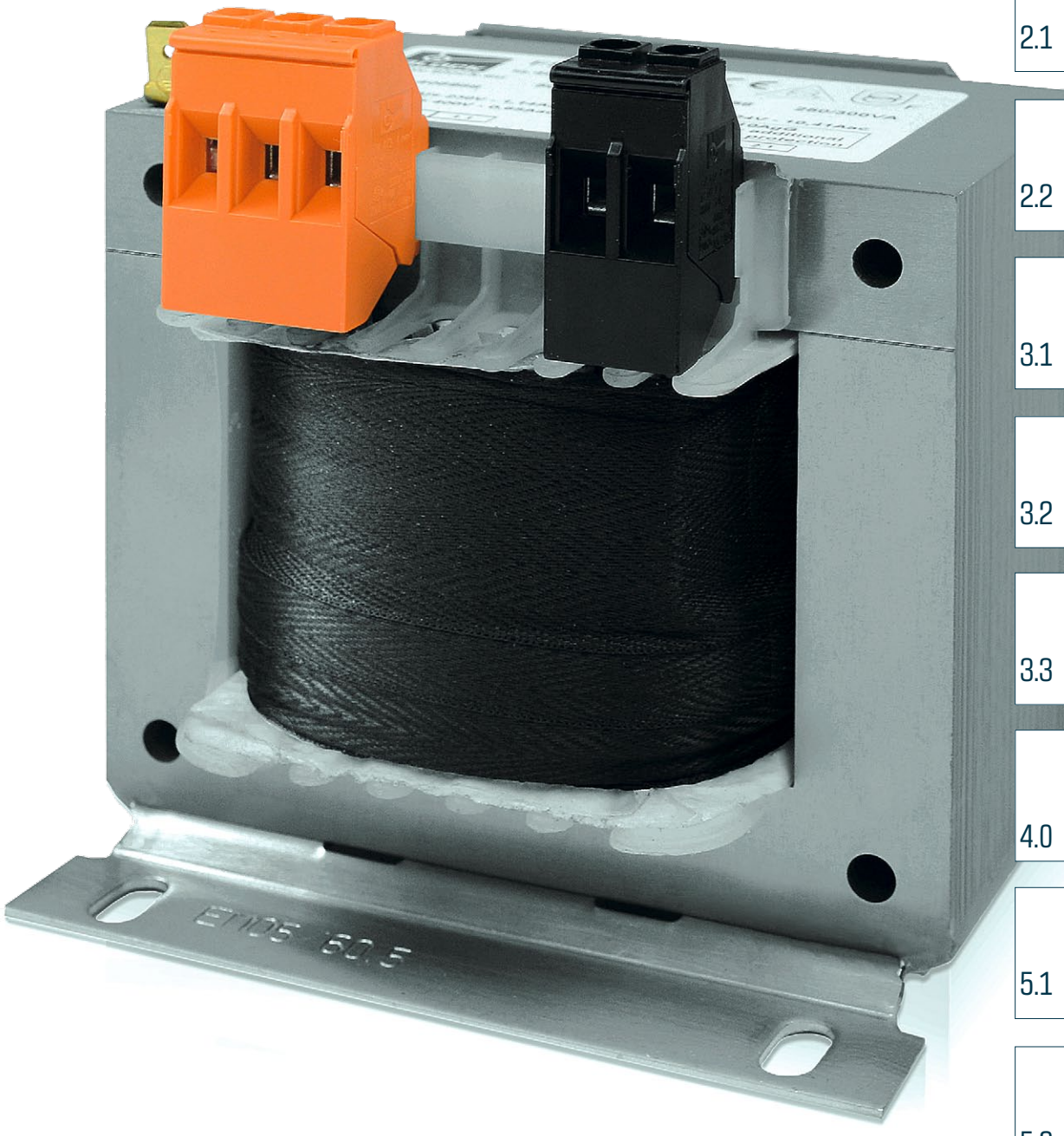
Mechanical data

Terminal and mounting						
DIN rail mounting	✔	✔	✔	✔	-	-
Terminals PE	Tab connector, 6.3 x 0.8 mm	Tab connector, 6.3 x 0.8 mm	Tab connector, 6.3 x 0.8 mm	Tab connector, 6.3 x 0.8 mm	Tab connector, 6.3 x 0.8 mm	Tab connector, 6.3 x 0.8 mm
Terminals Output	Screw terminal 4 mm²	Screw terminal 4 mm²	Screw terminal 4 mm²	Screw terminal 4 mm²	Screw terminal 4 mm²	Screw terminal 4 mm²
Terminals Input	Screw terminal 4 mm²	Screw terminal 4 mm²	Screw terminal 4 mm²	Screw terminal 4 mm²	Screw terminal 4 mm²	Screw terminal 4 mm²
Measures and weights						
Dimension (W x H x D)	84 x 94 x 83 mm	84 x 94 x 83 mm	96 x 102 x 102 mm	96 x 102 x 102 mm	105 x 112 x 106 mm	105 x 112 x 106 mm
Core type	EI 84/43,5	EI 84/43,5	EI 96/45,7	EI 96/45,7	EI 105/60,5	EI 105/60,5
Weight	2.00 kg	2.00 kg	2.90 kg	2.90 kg	4.30 kg	4.30 kg
Cu-Weight	0.40 kg	0.40 kg	0.60 kg	0.60 kg	0.80 kg	0.80 kg
Dimension picture (in mm)	❶	❶	❶	❶	❶	❶
A	84	84	96	96	105	105
B	64	64	84	84	80.5	80.5
C	94	94	102	102	112	112
D	83	83	102	102	106	106
E	64	64	87	87	86	86

Dimension pictures

❶




EI105 60.5

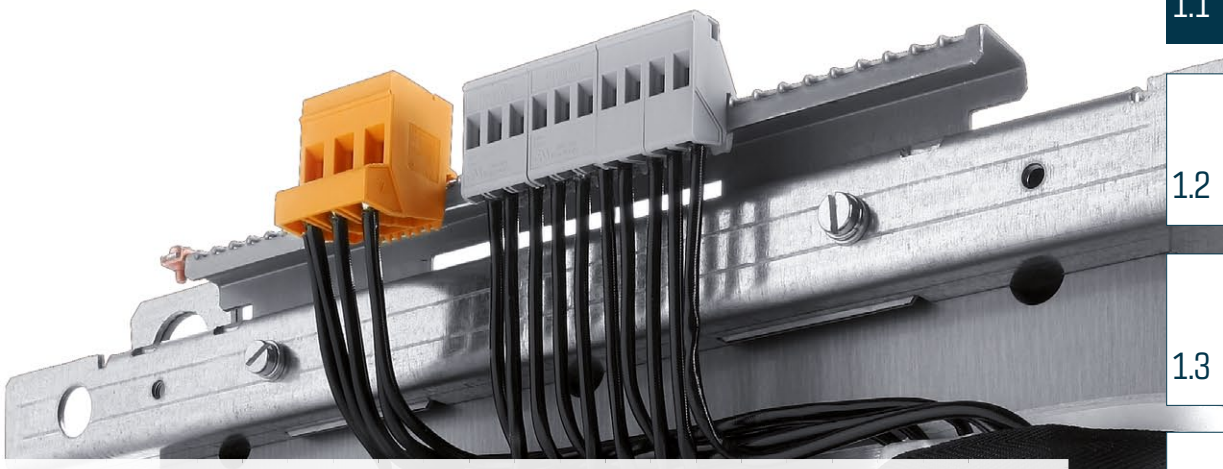
OVERVIEW ISOLATING TRANSFORMERS / INTERFERENCE SUPPRESSING TRANSFORMERS

Isolating transformers

	Type	Features	Rated input voltage	Rated output voltage	60 VA	100 VA	160 VA	200 VA	250 VA	300 VA	500 VA	630 VA	630 VA	800 VA	1000 VA	1600 VA
1-phase	TIM	In housing, IP 20	230 Vac	2 x 115 Vac	■	■		■		■	■			■	■	
1-phase	ETTK	Resin encapsulation, IP 67, for portable application	230 Vac	230 Vac			■		■			■	■		■	■
1-phase	TTML	For medical rooms, horizontal	230 Vac	115 Vac and 230 Vac												
1-phase	TTMS	For medical rooms, vertical	230 Vac	115 Vac and 230 Vac												
1-phase	TTIT	For creating a monitored IT main	230 Vac	230 Vac												
3-phase	TT3	IP 00 or up to IP 23 in housing	3 x 400 Vac	3 x 400 Vac ± 5 %											■	
3-phase	TT3 Neo	IP 00, in housing possible	3 x 400 Vac	3 x 400 Vac												

Interference suppressing transformers

	Type	Features	Rated input voltage	Rated output voltage	60 VA	100 VA	150 VA	200 VA	400 VA	Page
1-phase	STT	For portable application	230 Vac	230 Vac		■		■	■	163
1-phase	SMTT	Isolating transformer, for portable application	230 Vac	230 Vac			■			165



2500 VA	3150 VA	4000 VA	5000 VA	6300 VA	8000 VA	10000 VA	12500 VA	16000 VA	20000 VA	25000 VA	30000 VA	40000 VA	50000 VA	63000 VA	80000 VA	100000 VA	125000 VA	160000 VA	200000 VA	250000 VA	315000 VA	400000 VA	500000 VA	630000 VA	800000 VA	1000000 VA	Page
																											140
■																											143
	■	■	■	■	■																						157
	■	■	■	■	■																						159
■																											161
■			■	■	■	■	■	■	■	■	■																146
						■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	151

Isolating transformer
TIM

BLOCK Website

General Data

Rated input voltage 230 Vac
Rated output voltage 2 x 115 Vac
Rated power 60 - 1000 VA
Insulation class A or B
Maximum ambient temperature 40 °C
Efficiency up to 95 %
Degree of protection IP 20

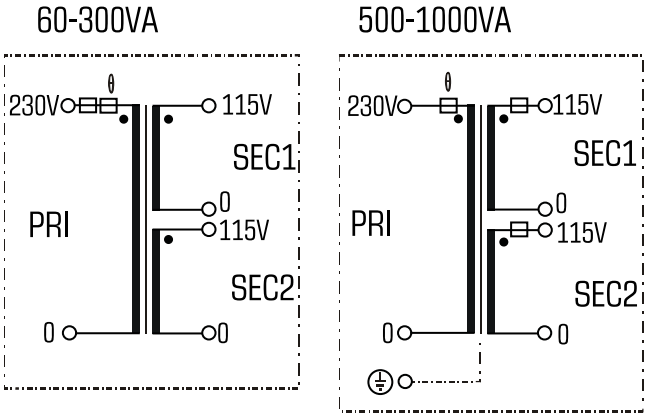
Advantages

Safe galvanic isolation
Integrated short-circuit and overload protection
Double output voltage for series or parallel connection
Very good moisture protection and low noise thanks to XtraDenseFill resin encapsulation (up to 300 VA)
Screw terminals under cover with strain relief

Applications

Isolating transformer for the safe electrical isolation of the input and output sides. The transformer may be used to set up protective separation as a protective measure in accordance with VDE 0100.

Sample applications



Standards

Isolating transformer
to: VDE 0570 Part 2-4, DIN EN 61558-2-4, EN 61558-2-4, IEC 61558-2-4

Approvals

VDE

Isolating transformer
TIM

BLOCK Website

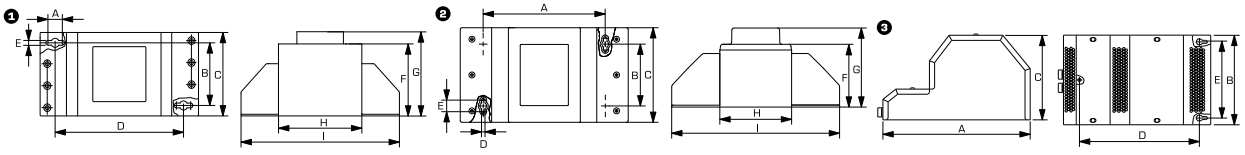
Electrical data

Typ	TIM 60	TIM 100	TIM 200	TIM 300	TIM 500	TIM 800
Input						
Rated input voltage	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac
Rated Power	60 VA	100 VA	200 VA	300 VA	500 VA	800 VA
No-load voltage (app. x factor)	1.15	1.08	1.07	1.05	1.02	1.02
No-load loss (typ.)	3.30 W	4.90 W	7.40 W	14.00 W	18.00 W	31.00 W
Efficiency	83.5 %	87.5 %	89.5 %	91.0 %	92.0 %	94.0 %
Approvals						
Approvals	VDE	VDE	VDE	VDE	VDE, cURus	VDE, cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Resin encapsulated transformer	Resin encapsulated transformer	Resin encapsulated transformer	Resin encapsulated transformer	Encapsulated in metal housing	Encapsulated in metal housing
Insulation class	A	A	A	A	B	B
Protection index	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20
Safety class	II	II	II	II	I	I
Short circuit strength	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof
Test voltage	5000 Vac, 50 Hz	5000 Vac, 50 Hz	5000 Vac, 50 Hz	5000 Vac, 50 Hz	3750 Vac, 50 Hz	3750 Vac, 50 Hz
Order numbers						
Order Number	**TIM 60**	**TIM 100**	**TIM 200**	**TIM 300**	**TIM 500**	**TIM 800**

Mechanical data

Terminal and mounting						
Terminals	Screw-type terminals	Screw-type terminals	Screw-type terminals	Screw-type terminals	Screw-type terminals	Screw-type terminals
Fixing method	Fixing holes in the terminal connection compartment	Fixing holes in the terminal connection compartment	Fixing holes in the terminal connection compartment	Fixing holes in the terminal connection compartment	Fixing holes in the housing	Fixing holes in the housing
Measures and weights						
Weight	1.55 kg	2.00 kg	3.60 kg	4.90 kg	9.10 kg	15.60 kg
Dimension picture (in mm)	❶	❶	❷	❷	❸	❸
A	14.2	14.2	167	167	283	283
B	58	58	76	76	176	200
C	77	77	117	117	150	166
D	135	135	4.3	4.3	245	245
E	4.3	4.3	14	14	123	148
F	65	65	77	100	-	-
G	76	76	97	117	-	-
H	90	90	97	97	-	-
I	166	166	223	223	-	-

Dimension pictures



Isolating transformer
TIM

BLOCK Website

Electrical data

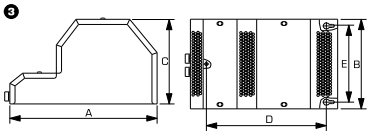
Typ	TIM 1000
Input	
Rated input voltage	230 Vac
Frequency range	50 - 60 Hz
Output	
Rated output voltage	2 x 115 Vac
Rated Power	1000 VA
No-load voltage (app. x factor)	1.02
No-load loss (typ.)	27.00 W
Efficiency	95.0 %
Approvals	
Approvals	VDE, cURus
Environment	
Ambient temperature max.	40 °C
Safety and protection	
Type	Encapsulated in metal housing
Insulation class	B
Protection index	IP 20
Safety class	I
Short circuit strength	non-inherently short-circuit proof
Test voltage	3750 Vac, 50 Hz
Order numbers	
Order Number	**TIM 1000**

Mechanical data

Terminal and mounting	
Terminals	Screw-type terminals
Fixing method	Fixing holes in the housing
Measures and weights	
Weight	17.10 kg
Dimension picture (in mm)	❸
A	283
B	200
C	166
D	245
E	148
F	-
G	-
H	-
I	-

Dimension pictures

❸



Isolating transformer
ETTK

BLOCK Website

General Data

Rated input voltage 230 Vac
Rated output voltage 230 Vac
Rated power 160 - 2500 VA
Insulation class A
Maximum ambient temperature 40 °C
Degree of protection IP 67

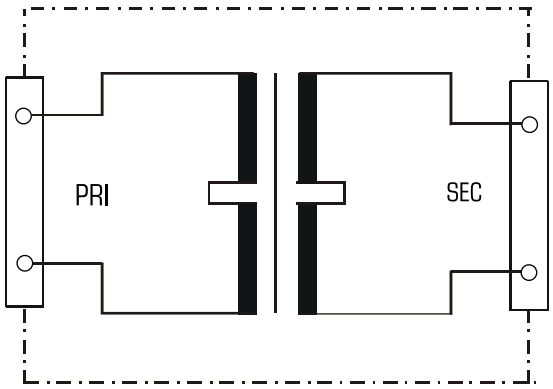
Advantages

Safe galvanic isolation
Integrated short-circuit and overload protection
Very good moisture protection and low noise thanks to resin encapsulation
High degree of protection
Carry handle, mains cable with safety plug, shockproof socket for portable application

Applications

Isolating transformer for the safe electrical isolation of the input and output sides. The transformer may be used to set up protective separation as a protective measure in accordance with VDE 0100.

Sample application



Standards

Isolating transformer
to: VDE 0570 Part 2-4, DIN EN 61558-2-4, EN 61558-2-4, IEC 61558-2-4

Approvals

EAC

Isolating transformer
ETTK

BLOCK Website

Electrical data

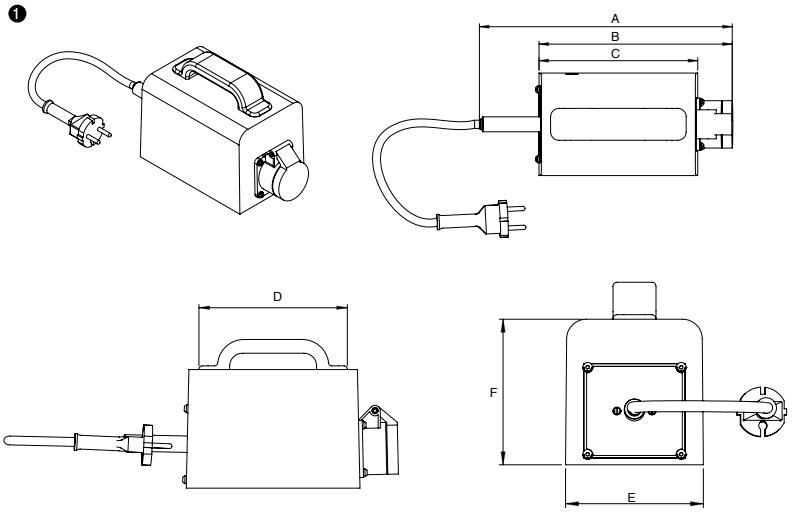
Typ	ETTK 160	ETTK 250	ETTK 630	ETTK 1000	ETTK 1600	ETTK 2500
Input						
Rated input voltage	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac
Rated Power	160 VA	250 VA	630 VA	1000 VA	1600 VA	2500 VA
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Resin encapsulated transformer	Resin encapsulated transformer	Resin encapsulated transformer	Resin encapsulated transformer	Resin encapsulated transformer	Resin encapsulated transformer
Insulation class	A	A	A	A	A	A
Protection index	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
Safety class	II	II	II	II	II	II
Short circuit strength	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof
Test voltage	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz
Order numbers						
Order Number	**ETTK 160**	**ETTK 250**	**ETTK 630**	**ETTK 1000**	**ETTK 1600**	**ETTK 2500**

Mechanical data

Typ	Terminals Input	Terminals Output	Weight	Dimension (W x H x D)	Dimension picture (in mm)	A	B	C	D	E	F	G
ETTK 160	Mains connecting cable with Schuko plug	Shockproof socket	5.80 kg	105 x 160 x 170 mm	1	255	196	168	140	105	122	-
ETTK 250	Mains connecting cable with Schuko plug	Shockproof socket	9.40 kg	120 x 185 x 200 mm	1	283	255	192	141	119	150	-
ETTK 630	Mains connecting cable with Schuko plug	Shockproof socket	16.40 kg	120 x 230 x 300 mm	1	378	320	293	198	115	190	-
ETTK 1000	Mains connecting cable with Schuko plug	Shockproof socket	21.00 kg	140 x 230 x 300 mm	1	385	330	298	198	138	190	-

Dimension pictures

1



Isolating transformer
ETTK

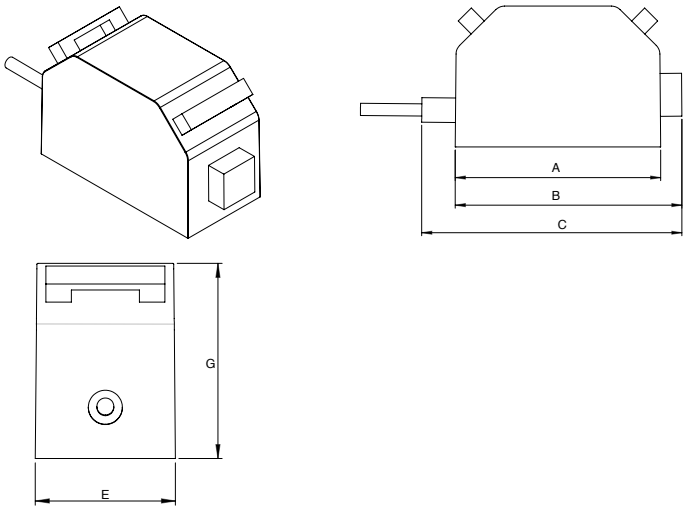
BLOCK Website

Mechanical data

Typ	Terminals Input	Terminals Output	Weight	Dimension (W x H x D)	Dimension picture (in mm)	A	B	C	D	E	F	G
ETTK 1600	Mains connecting cable with Schuko plug	Shockproof socket	35.80 kg	170 x 225 x 340 mm	❷	335	370	425	-	165	-	230
ETTK 2500	Mains connecting cable with Schuko plug	Shockproof socket	39.00 kg	170 x 225 x 340 mm	❷	335	370	425	-	165	-	230

Dimension pictures

❷



Isolating transformer
TT3

BLOCK Website

General Data

Rated input voltage 3 x 400 Vac
Rated output voltage 3 x 400 Vac
Rated power 1000 - 30000 VA
Insulation class F
Maximum ambient temperature 50 °C
Efficiency up to 97.5 %
Degree of protection IP 00 or IP 23
Optionally adapted package for higher degrees of protection

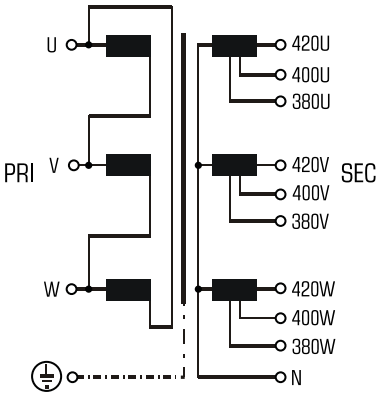
Advantages

Safe galvanic isolation
Patented assembly technology to lower heat losses
Very good corrosion protection and low noise thanks to vacuum impregnation
Secondary side ±5 % tappings for voltage adjustment
Fixed, contact protected screw connection terminals complying with UVV BGV A3
Multifunctional fixing rails with 12 oval slots
Enlarged fixing rail for easy installation from above
Integrated crane eyes

Applications

Isolating transformer for the safe electrical isolation of the input and output sides. The transformer may be used to set up protective separation as a protective measure in accordance with VDE 0100.

Sample application



Standards

Isolating transformer
to: VDE 0570 Part2-4, DIN EN 61558-2-4, EN 61558-2-4, IEC 61558-2-4, UL 5085-1/-2, CSA 22.2 No.66

Approvals

UL 5085, UL 1561, CSA 22.2 (E 103521)

Isolating transformer
TT3

BLOCK Website

Electrical data

Typ	TT3 1-4-4	TT3 2,5-4-4	TT3 2,5-69-4	TT3 5-4-4	TT3 6,3-4-4	TT3 8-4-4
Input						
Rated input voltage	3 x 400 Vac	3 x 400 Vac	3 x 690 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Tappings Output (±)	±5 %	±5 %	±5 %	±5 %	±5 %	±5 %
Rated Power	1000 VA	2500 VA	2500 VA	5000 VA	6300 VA	8000 VA
Rated current	3 x 1.52 Aac (3 x 380 Vac) 3 x 1.44 Aac (3 x 400 Vac) 3 x 1.38 Aac (3 x 420 Vac)	3 x 3.8 Aac (3 x 380 Vac) 3 x 3.7 Aac (3 x 400 Vac) 3 x 3.5 Aac (3 x 420 Vac)	3 x 3.8 Aac (3 x 380 Vac) 3 x 3.7 Aac (3 x 400 Vac) 3 x 3.5 Aac (3 x 420 Vac)	3 x 7.6 Aac (3 x 380 Vac) 3 x 7.2 Aac (3 x 400 Vac) 3 x 6.9 Aac (3 x 420 Vac)	3 x 9.6 Aac (3 x 380 Vac) 3 x 9.1 Aac (3 x 400 Vac) 3 x 8.6 Aac (3 x 420 Vac)	3 x 12.2 Aac (3 x 380 Vac) 3 x 11.5 Aac (3 x 400 Vac) 3 x 11 Aac (3 x 420 Vac)
Short circuit voltage	6.4 %	3.7 %	3,8 %	3.6 %	2.8 %	2.2 %
Power loss	92.0 W	155.0 W	155.0 W	275.0 W	290.0 W	320.0 W
Vector group	Dyn 5	Dyn 5	Dyn 5	Dyn 5	Dyn 5	Dyn 5
Efficiency	91.5 %	94.3 %	94.3 %	94.7 %	95.5 %	96 %
Approvals						
Approvals	cURus	cURus	-	cURus	cURus	cURus
Environment						
Ambient temperature max.	50 °C	50 °C	50 °C	50 °C	50 °C	50 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=F, UL=class 155	VDE=F, UL=class 155	F (155°C)	VDE=F, UL=class 155	VDE=F, UL=class 155	VDE=F, UL=class 155
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Order numbers						
Recommended enclosure	BGUK 20	BGE-050	BGE-050	BGE-065	BGE-065	BGE-065
Order Number	**TT3 1-4-4**	**TT3 2,5-4-4**	**TT3 2,5-69-4**	**TT3 5-4-4**	**TT3 6,3-4-4**	**TT3 8-4-4**

Isolating transformer
TT3

BLOCK Website

Electrical data

Typ	TT3 10-4-4	TT3 10-69-4	TT3 12,5-4-4	TT3 16-4-4	TT3 20-4-4	TT3 20-69-4
Input						
Rated input voltage	3 x 400 Vac	3 x 690 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 690 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Tappings Output (±)	±5 %	±5 %	±5 %	±5 %	±5 %	±5 %
Rated Power	10000 VA	10000 VA	12,500 VA	16000 VA	20000 VA	20000 VA
Rated current	3 x 15.1 Aac (3 x 380 Vac) 3 x 14.4 Aac (3 x 400 Vac) 3 x 13.8 Aac (3 x 420 Vac)	3 x 15,1 Aac (3 x 380 Vac) 3 x 14,4 Aac (3 x 400 Vac) 3 x 13,8 Aac (3 x 420 Vac)	3 x 19 Aac (3 x 380 Vac) 3 x 18 Aac (3 x 400 Vac) 3 x 17,2 Aac (3 x 420 Vac)	3 x 24.4 Aac (3 x 380 Vac) 3 x 23.1 Aac (3 x 400 Vac) 3 x 22 Aac (3 x 420 Vac)	3 x 30.4 Aac (3 x 380 Vac) 3 x 28.9 Aac (3 x 400 Vac) 3 x 27.5 Aac (3 x 420 Vac)	3 x 38.1 Aac (3 x 380 Vac) 3 x 36.1 Aac (3 x 400 Vac) 3 x 34.4 Aac (3 x 420 Vac)
Short circuit voltage	1.9 %	2.0 %	1.65 %	1.5 %	1.5 %	1.9 %
Power loss	350.0 W	350.0 W	380.0 W	500.0 W	525.0 W	632.0 W
Vector group	Dyn 5	Dyn 5	Dyn 5	Dyn 5	Dyn 5	Dyn 5
Efficiency	96.5 %	97.5 %	97 %	97 %	97.5 %	97.5 %
Approvals						
Approvals	cURus	-	cURus	cURus	cURus	-
Environment						
Ambient temperature max.	50 °C	50 °C	50 °C	50 °C	50 °C	50 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=F, UL=class 155	F (155°C)	VDE=F, UL=class 155	VDE=F, UL=class 155	VDE=F, UL=class 155	VDE=F, UL=class 155
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Order numbers						
Recommended enclosure				BGE-080	BGE-080	BGE-080
Order Number	**TT3 10-4-4**	**TT3 10-69-4**	**TT3 12,5-4-4**	**TT3 16-4-4**	**TT3 20-4-4**	**TT3 20-69-4**

Isolating transformer
TT3

BLOCK Website

Electrical data

Typ	TT3 25-4-4	TT3 25-69-4	TT3 30-4-4
Input			
Rated input voltage	3 x 400 Vac	3 x 690 Vac	3 x 400 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output			
Rated output voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Tappings Output (±)	±5 %	±5 %	±5 %
Rated Power	25000 VA	25000 VA	30000 VA
Rated current	3 x 38.1 Aac (3 x 380 Vac) 3 x 36.1 Aac (3 x 400 Vac) 3 x 34.4 Aac (3 x 420 Vac)	3 x 38.1 Aac (3 x 380 Vac) 3 x 36.1 Aac (3 x 400 Vac) 3 x 34.4 Aac (3 x 420 Vac)	3 x 45.7 Aac (3 x 380 Vac) 3 x 43.3 Aac (3 x 400 Vac) 3 x 41.3 Aac (3 x 420 Vac)
Short circuit voltage	1.2 %	1.2 %	1.7 %
Power loss	604.0 W	624.0 W	770.0 W
Vector group	Dyn 5	Dyn 5	Dyn 5
Efficiency	97.5 %	97.5 %	97.5 %
Approvals			
Approvals	cURus	-	cURus
Environment			
Ambient temperature max.	50 °C	50 °C	50 °C
Safety and protection			
Type	Open type	Open type	Open type
Insulation class	VDE=F, UL=class 155	F (155°C)	VDE=F, UL=class 155
Protection index	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Order numbers			
Recommended enclosure	BGE-080	BGE-080	BGE-080
Order Number	**TT3 25-4-4**	**TT3 25-69-4**	**TT3 30-4-4**

Isolating transformer
TT3

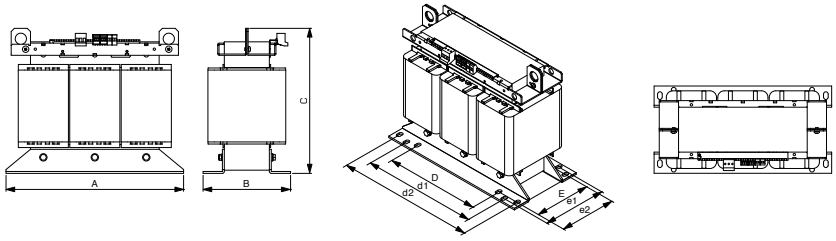
BLOCK Website

30 Mechanical data

Typ	Terminals	Fixing method	Fixing screws	Weight	Core type	Dimension picture (in mm)	A	B	C	D	d1	d2	E	e1	e2	F	G	H	I	J	K	L
TT3 1-4-4	Screw-type terminal	Fixing rail	M6	15.00 kg	3UI 114/40	1	267	125	215	176	180	249	71	79	98	-	-	-	-	-	-	-
TT3 2,5-4-4	Screw-type terminal	Fixing rail	M8	32.00 kg	3UI 132/72	1	315	165	250	200	215	292	102	124	126	-	-	-	-	-	-	-
TT3 2,5-69-4	Screw-type terminal	Fixing rail	M8	29.00 kg	3UI 132/72	1	315	165	250	200	215	292	102	124	126	-	-	-	-	-	-	-
TT3 5-4-4	Screw-type terminal	Fixing rail	M8	48.00 kg	3UI 180/63	1	410	155	355	264	310	388	125	125	115	-	-	-	-	-	-	-
TT3 6,3-4-4	Screw-type terminal	Fixing rail	M8	55.00 kg	3UI 180/63	1	410	175	360	264	310	388	125	125	115	-	-	-	-	-	-	-
TT3 8-4-4	Screw-type terminal	Fixing rail	M8	67.00 kg	3UI 180/78	1	410	180	360	264	310	388	140	140	130	-	-	-	-	-	-	-
TT3 10-4-4	Screw-type terminal	Fixing rail	M10	87.00 kg	3UI 210/73	1	480	192	400	316	370	450	143	151	133	-	-	-	-	-	-	-
TT3 10-69-4	Screw-type terminal	Fixing rail	M10	87.00 kg	3UI 240/140	1	480	192	400	316	370	450	143	151	133	-	-	-	-	-	-	-
TT3 12,5-4-4	Screw-type terminal	Fixing rail	M10	115.00 kg	3UI 210/103	1	480	222	400	316	370	450	173	181	163	-	-	-	-	-	-	-
TT3 16-4-4	Screw-type terminal	Fixing rail	M12	150.00 kg	3UI 240/110	1	550	267	510	356	430	516	184	210	182	-	-	-	-	-	-	-
TT3 20-4-4	Screw-type terminal	Fixing rail	M12	180.00 kg	3UI 240/140	1	550	297	510	356	430	516	214	240	212	-	-	-	-	-	-	-
TT3 20-69-4	Screw-type terminal	Fixing rail	M12	180.00 kg	3UI 240/140	1	550	297	510	356	430	516	214	240	212	-	-	-	-	-	-	-
TT3 25-4-4	Screw-type terminal	Fixing rail	M12	205.00 kg	3UI 240/140	1	550	297	510	356	430	516	214	240	212	-	-	-	-	-	-	-
TT3 25-69-4	Screw-type terminal	Fixing rail	M12	218.00 kg	3UI 240/140	1	550	300	510	356	430	516	214	240	212	-	-	-	-	-	-	-
TT3 30-4-4	Screw-type terminal	Fixing rail	M12	230.00 kg	3UI 240/170	2	550	320	480	356	430	516	244	270	242	-	-	-	-	-	-	-

Dimension pictures

1



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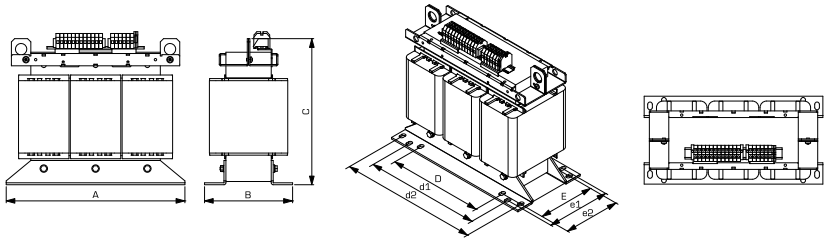


Isolating transformer
TT3 Neo

BLOCK Website

General Data

Rated input voltage 3 x 400 Vac
Rated output voltage 3 x 400 Vac
Rated power 10 kVA - 1 MVA
Insulation class F
Maximum ambient temperature 40 °C
Degree of protection IP 00

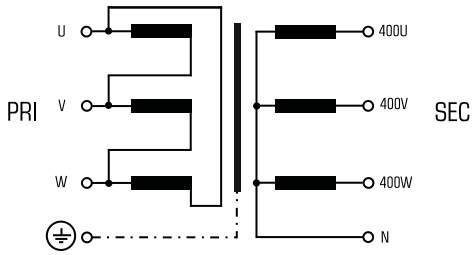
Advantages

Safe galvanic isolation
Very good corrosion protection and low noise thanks to vacuum impregnation
Very good discharging of thermal losses by means of optimally arranged cooling channels within the coils
Integrated crane eyes
If desired, the transformers can be realised in individual voltages

Applications

Isolating transformer for the safe electrical isolation of the input and output sides. The transformer may be used to set up protective separation as a protective measure in accordance with VDE 0100.

Sample application



Standards

Isolating transformer
to: VDE 0570 part 2-4, DIN EN 61558 part 1 with part 2-4

Approvals

Isolating transformer
TT3 Neo

BLOCK Website

Electrical data

Typ	TT3-A010-4040-0	TT3-A016-4040-0	TT3-A020-4040-0	TT3-A025-4040-0	TT3-A030-4040-0	TT3-A040-4040-0
Input						
Rated input voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated Power	10.000 VA	16.000 VA	20.000 VA	25.000 VA	30.000 VA	40.000 VA
Output rated current	3 x 14,4 A	3 x 23,1 A	3 x 28.9 A	3 x 36.1 A	3 x 43,3 A	3 x 57.7 A
Short circuit voltage	5,2 %	4,4 %	4 %	3,3 %	3.7 %	4,3 %
Vector group	Dyn 5	Dyn 5	Dyn 5	Dyn 5	Dyn 5	Dyn 5
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	F	F	F	F	F	F
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Order numbers						
Recommended enclosure	BGE-065	BGE-080	BGE-080	BGE-080	BGE-080	BGE-085
Order Number	**TT3-A010-4040-0**	**TT3-A016-4040-0**	**TT3-A020-4040-0**	**TT3-A025-4040-0**	**TT3-A030-4040-0**	**TT3-A040-4040-0**

Isolating transformer
TT3 Neo

BLOCK Website

Electrical data

Typ	TT3-A050-4040-0	TT3-A063-4040-0	TT3-A080-4040-0	TT3-A100-4040-0	TT3-A125-4040-0	TT3-A160-4040-0
Input						
Rated input voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated Power	50.000 VA	63.000 VA	80.000 VA	100.000 VA	125.000 VA	160.000 VA
Output rated current	3 x 72,1 A	3 x 90.9 A	3 x 115.4 A	3 x 144,3 A	3 x 180.4 A	3 x 230.9 A
Short circuit voltage	5,1 %	4,1 %	4,9 %	4,9 %	4,4 %	4,6 %
Vector group	Dyn 5	Dyn 5	Dyn 5	Dyn 5	Dyn 5	Dyn 5
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	F	F	F	F	F	F
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Order numbers						
Recommended enclosure	BGE-085	BGE-085	BGE-115	BGE-115	BGE-115	BGE-130
Order Number	**TT3-A050-4040-0**	**TT3-A063-4040-0**	**TT3-A080-4040-0**	**TT3-A100-4040-0**	**TT3-A125-4040-0**	**TT3-A160-4040-0**

Isolating transformer
TT3 Neo

BLOCK Website

Electrical data

Typ	TT3-A200-4040-0	TT3-A250-4040-0	TT3-A315-4040-0	TT3-A400-4040-0	TT3-A500-4040-0	TT3-A630-4040-0
Input						
Rated input voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated Power	200.000 VA	250.000 VA	315.000 VA	400.000 VA	500.000 VA	630.000 VA
Output rated current	3 x 288.6 A	3 x 360.7 A	3 x 454.5 A	3 x 577.2 A	3 x 721.5 A	3 x 909.1 A
Short circuit voltage	4,1 %	3.6 %	3,2 %	3,2 %	3,3 %	3 %
Vector group	Dyn 5	Dyn 5	Dyn 5	Dyn 5	Dyn 5	Dyn 5
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	F	F	F	F	F	F
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Order numbers						
Recommended enclosure	BGE-130	BGE-130	BGE-130	BGE-150	BGE-150	BGE-150
Order Number	**TT3-A200-4040-0**	**TT3-A250-4040-0**	**TT3-A315-4040-0**	**TT3-A400-4040-0**	**TT3-A500-4040-0**	**TT3-A630-4040-0**

Isolating transformer
TT3 Neo

BLOCK Website

Electrical data

Typ	TT3-A800-4040-0	TT3C1000-4040-0
Input		
Rated input voltage	3 x 400 Vac	3 x 400 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz
Output		
Rated output voltage	3 x 400 Vac	3 x 400 Vac
Rated Power	800.000 VA	1 MVA
Output rated current	3 x 1154 A	3 x 1443 A
Short circuit voltage	2.4 %	3 %
Vector group	Dyn 5	Dyn 5
Environment		
Ambient temperature max.	40 °C	40 °C
Safety and protection		
Type	Open type	Open type
Insulation class	F	F
Protection index	IP 00	IP 00
Safety class (prepared)	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof
Order numbers		
Recommended enclosure		
Order Number	**TT3-A800-4040-0**	**TT3C1000-4040-0**

Isolating transformer
TT3 Neo

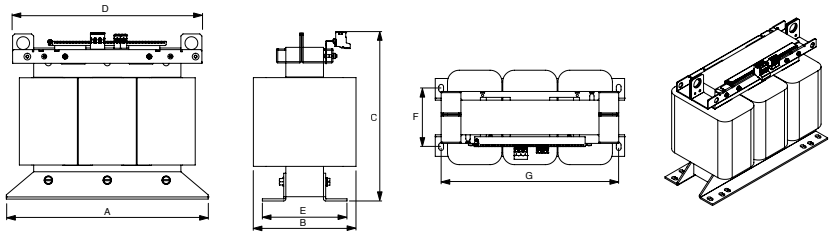
BLOCK Website

Mechanical data 30

Typ	Terminals	Fixing method	Weight	Core type	Dimension picture (in mm)	A	B	C	D	E	F	G
TT3-A010-4040-0	Screw-type terminal input 10 mm², output 4 mm²	Fixing rail	74.00 kg	3UI 210/88	1	480	240	400	450	198	148	450
TT3-A016-4040-0	Screw-type terminal 10 mm²	Fixing rail	119.00 kg	3UI 240/110	1	552	270	460	-	-	-	-
TT3-A020-4040-0	Screw-type terminal 10 mm²	Fixing rail	122.00 kg	3UI 240/110	1	552	300	460	525	245	182	516
TT3-A025-4040-0	Screw-type terminal 10 mm²	Fixing rail	154.00 kg	3UI 240/140	1	552	300	460	-	-	-	-
TT3-A030-4040-0	Screw-type terminal 10 mm²	Fixing rail	160.00 kg	3UI 240/140	1	552	300	460	-	-	-	-
TT3-A040-4040-0	Screw-type terminal 16 mm²	Fixing rail	161.00 kg	3UC 454/110	3	550	300	550	-	-	-	-
TT3-A050-4040-0	Screw-type terminal 35 mm²	Fixing rail	192.00 kg	3UC 504/125	3	620	350	570	-	-	-	-
TT3-A063-4040-0	Screw-type terminal 35 mm²	Fixing rail	267.00 kg	3UC 504/175	3	620	380	570	-	-	-	-
TT3-A080-4040-0	Screw-type terminal 35 mm²	Fixing rail	300.00 kg	3UC 594/125	3	740	340	790	-	-	-	-
TT3-A100-4040-0	Screw-type terminal 70 mm²	Fixing rail	359.00 kg	3UC 594/150	3	740	370	790	661	-	250	600
TT3-A125-4040-0	Screw-type terminal 70 mm²	Fixing rail	410.00 kg	3UC 594/175	3	740	400	805	-	-	-	-
TT3-A160-4040-0	Screw-type terminal 150 mm²	Fixing rail	455.00 kg	3UC 719/125	3	890	360	985	-	-	-	-
TT3-A200-4040-0	Screw-type terminal 240 mm²	Fixing rail	541.00 kg	3UC 719/150	3	890	470	920	-	-	-	-
TT3-A250-4040-0	Ø11 mm busbar hole	Fixing rail	710.00 kg	3UC 814/150	3	1000	530	1040	-	-	-	-
TT3-A315-4040-0	Ø11 mm busbar hole	Fixing rail	825.00 kg	3UC 814/175	3	1000	555	1040	-	-	-	-
TT3-A400-4040-0	Ø11 mm busbar hole	Fixing rail	1068.00 kg	3UC 864/200	3	1075	580	1100	-	-	-	-
TT3-A500-4040-0	Ø13 mm busbar hole	Fixing rail	1353.00 kg	3UC 864/250	3	1075	630	1100	-	-	-	-
TT3-A630-4040-0	2x Ø13 mm busbar hole	Fixing rail	1616.00 kg	3UC 864/300	3	1075	710	1100	-	-	-	-
TT3-A800-4040-0	4x Ø13 mm busbar hole	Fixing rail	2100.00 kg	3UC 864/300	5	1170	545	1150	-	-	460	1000
TT3C1000-4040-0	4x Ø13 mm busbar hole	Fixing rail	2700.00 kg	3UC 864/300	5	1170	545	1150	-	-	460	1000

Dimension pictures

1



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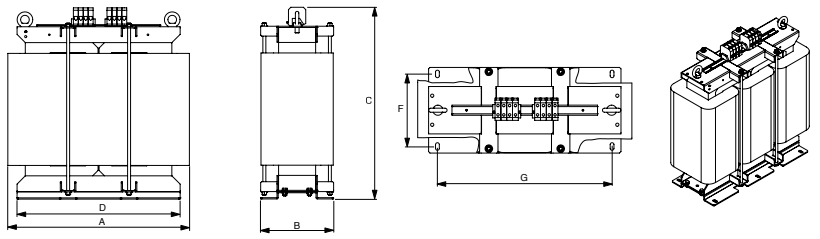

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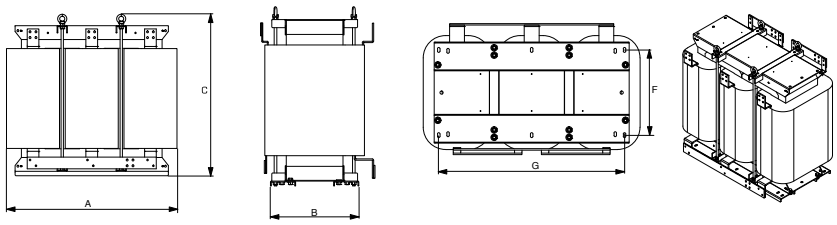
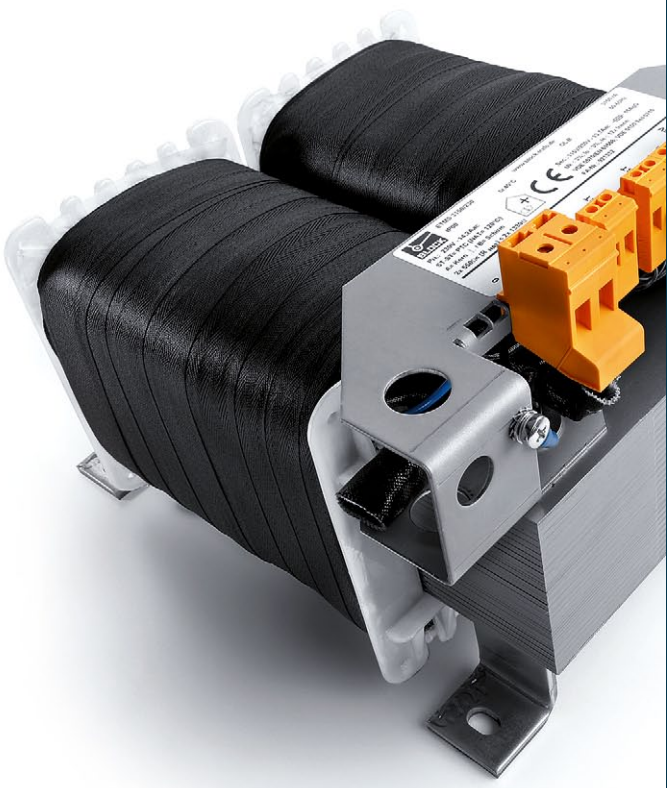


Isolating transformer for supply of medical rooms
TTML

BLOCK Website



General Data

Rated input voltage 230 Vac
Rated output voltage 115 and 230 Vac
Rated power 3150 - 8000 VA
Insulation class B
Maximum ambient temperature 40 °C
Efficiency up to 97 %
Degree of protection IP 00

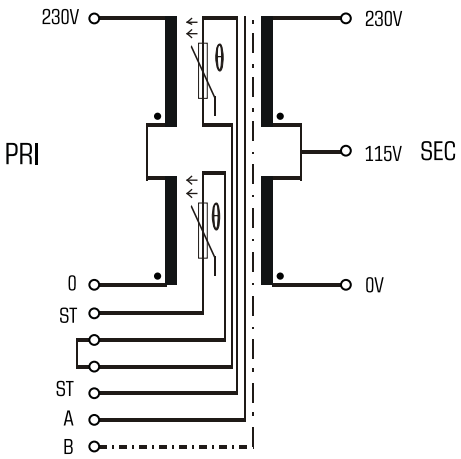
Advantages

Safe galvanic isolation
PTC resistor built into every coil to set up an external monitoring unit for protection against overload
Very good switch-on behaviour thanks to reduced starting currents
Very high efficiency
Very low short circuit voltage
Very low idle current
Very good corrosion protection and low noise thanks to BLOCKIMPEX vacuum impregnation
Contact protected screw connection terminals complying with UVV BGV A3
Low height

Applications

Isolating transformer for supply of medical rooms of the User group 2.

Sample application



Standards

Isolating transformer for supply of medical rooms
to: VDE 0570 Part 2-15, VDE 0100 Part 710, DIN EN 61558-2-15, EN 61558-2-15

Approvals

EAC

Isolating transformer for supply of medical rooms
TTML

BLOCK Website

Electrical data

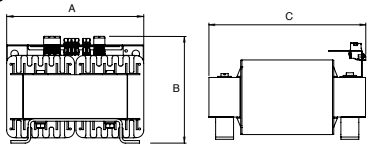
Typ	TTML 3150/230	TTML 4000/230	TTML 5000/230	TTML 6300/230	TTML 8000/230
Input					
Rated input voltage	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac
Low-inrush current	≤12 x INom	≤12 x INom	≤12 x INom	≤12 x INom	≤12 x INom
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output					
Rated output voltage	115 and 230 Vac	115 and 230 Vac	115 and 230 Vac	115 and 230 Vac	115 and 230 Vac
Rated Power	3150 VA	4000 VA	5000 VA	6300 VA	8000 VA
Short circuit voltage	≤3 %	≤3 %	≤3 %	≤3 %	≤3 %
No-load current	≤3 %	≤3 %	≤3 %	≤3 %	≤3 %
Efficiency	97.0 %	97.0 %	97.0 %	97.0 %	97.0 %
Environment					
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection					
Type	Open type	Open type	Open type	Open type	Open type
Insulation class	B	B	B	B	B
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	II	II	II	II	II
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Test voltage	3.75 kVac	3.75 kVac	3.75 kVac	3.75 kVac	3.75 kVac
Order numbers					
Order Number	**TTML 3150/230**	**TTML 4000/230**	**TTML 5000/230**	**TTML 6300/230**	**TTML 8000/230**

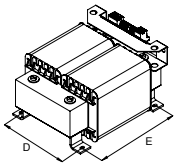
Mechanical data

Terminal and mounting					
Terminals	Screw-type terminal 10 mm², Screw-type terminal 4 mm²	Screw-type terminal 10 mm², Screw-type terminal 4 mm²	Screw-type terminal 10 mm², Screw-type terminal 4 mm²	Screw-type terminal 10 mm², Screw-type terminal 4 mm²	Screw-type terminal 10 mm², Screw-type terminal 4 mm²
Fixing method	Fixing rail	Fixing rail	Fixing rail	Fixing rail	Fixing rail
Fixing screws	M8	M8	M8	M8	M8
Measures and weights					
Weight	50.00 kg	55.00 kg	60.00 kg	67.00 kg	75.00 kg
Dimension picture (in mm)	❷	❷	❷	❷	❷
A	245	275	275	275	275
B	200	200	210	225	240
C	300	350	350	350	350
D	204	234	234	234	234
E	240	280	280	280	280

Dimension pictures

❶





Isolating transformer for supply of medical rooms
TTMS

BLOCK Website

General Data

Rated input voltage 230 Vac
Rated output voltage 115 and 230 Vac
Rated power 3150 - 8000 VA
Insulation class B
Maximum ambient temperature 40 °C
Efficiency up to 97 %
Degree of protection IP 00
Optionally adapted package for higher degrees of protection

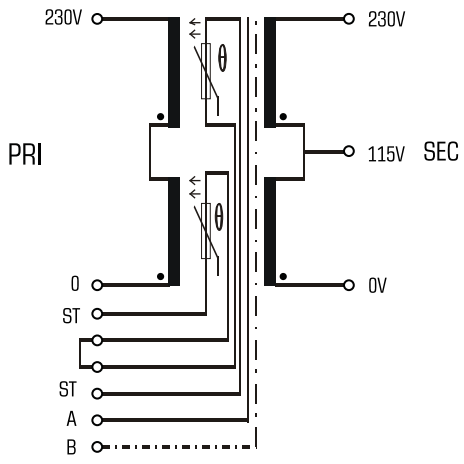
Advantages

Safe galvanic isolation
PTC resistor built into every coil to set up an external monitoring unit for protection against overload
Very good switch-on behaviour thanks to reduced starting currents
High efficiency
Low short-circuit voltage
Very low idle current
Very good corrosion protection and low noise thanks to vacuum impregnation
Contact protected screw connection terminals complying with UVV BGV A3
Simple mounting thanks to robust metal fixing rail with 8 oval slots

Applications

Isolating transformer for supply of medical rooms of the user group 2.

Sample application



Standards

Isolating transformer for supply of medical rooms
to: VDE 0570 Part 2-15, VDE 0100 Part 710, DIN EN 61558-2-15, EN 61558-2-15

Approvals

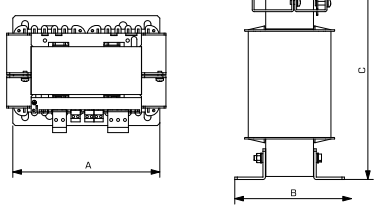
EAC

Isolating transformer for supply of medical rooms
TTMS

BLOCK Website

Typ	TTMS 3150/230	TTMS 4000/230	TTMS 5000/230	TTMS 6300/230	TTMS 8000/230
Electrical data					
Input					
Rated input voltage	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac
Low-inrush current	≤12 x INom	≤12 x INom	≤12 x INom	≤12 x INom	≤12 x INom
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output					
Rated output voltage	115/230 Vac	115/230 Vac	115/230 Vac	115/230 Vac	115/230 Vac
Rated Power	3.150 VA	4.000 VA	5.000 VA	6.300 VA	8.000 VA
Short circuit voltage	≤3 %	≤3 %	≤3 %	≤3 %	≤3 %
No-load current	≤3 %	≤3 %	≤3 %	≤3 %	≤3 %
Efficiency	97.0 %	97.0 %	97.0 %	97.0 %	97.0 %
Environment					
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection					
Type	Open type	Open type	Open type	Open type	Open type
Insulation class	B	B	B	B	B
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	II	II	II	II	II
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Test voltage	3.75 kVac	3.75 kVac	3.75 kVac	3.75 kVac	3.75 kVac
Order numbers					
Order Number	**TTMS 3150/230**	**TTMS 4000/230**	**TTMS 5000/230**	**TTMS 6300/230**	**TTMS 8000/230**
Mechanical data					
Terminal and mounting					
Terminals	Screw-type terminal 10 mm², Screw-type terminal 4 mm²	Screw-type terminal 10 mm², Screw-type terminal 4 mm²	Screw-type terminal 10 mm², Screw-type terminal 4 mm²	Screw-type terminal 10 mm², Screw-type terminal 4 mm²	Screw-type terminal 10 mm², Screw-type terminal 4 mm²
Fixing screws	M8	M8	M8	M8	M8
Fixing method	Fixing rail	Fixing rail	Fixing rail	Fixing rail	Fixing rail
Measures and weights					
Weight	50.00 kg	55.00 kg	60.00 kg	67.00 kg	75.00 kg
Dimension picture (in mm)	1	1	1	1	1
A	260	310	310	310	310
B	195	190	200	215	230
C	345	395	395	395	395

Dimension pictures



Isolating transformer with integrated insulation monitoring
TTIT

BLOCK Website

General Data

Rated input voltage 230 Vac
Rated output voltage 230 Vac
Rated power 2500 VA
Insulation class B
Maximum ambient temperature 40 °C
Efficiency up to 98 %
Degree of protection IP 54

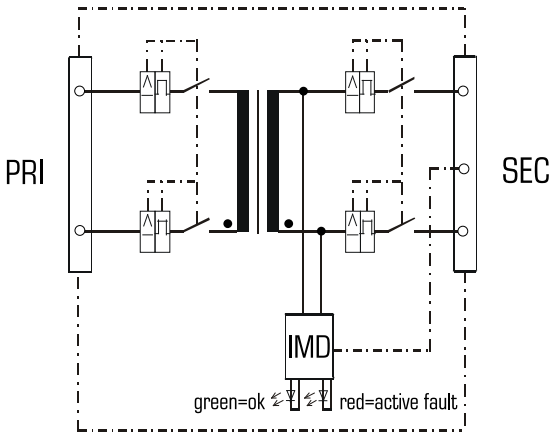
Advantages

Safe galvanic isolation
Visual status indicator
Integrated short circuit and overload protection
Very high efficiency
Very low idle current
High insulation strength, very good moisture protection and low noise thanks to XtraDenseFill resin encapsulation
High degree of protection
Carrying handles, mains connecting lead and socket for mobile use

Applications

Isolating transformer for mobile use for the safe electrical isolation of the input and output sides. The transformer can be used to build an IT network.

Sample application



Standards

Isolating transformer
to: VDE 0570 Part 2-4, DIN EN 61558-2-4, EN 61558-2-4, IEC 61558-2-4

Approvals

EAC

Isolating transformer with integrated insulation monitoring
TTIT

BLOCK Website

Electrical data

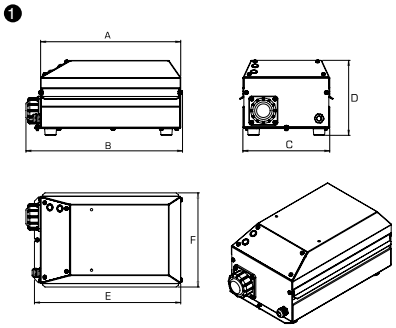
Typ	TTIT 2500
Input	
Rated input voltage	230 Vac
Low-inrush current	315 A
Frequency range	50 - 60 Hz
Output	
Rated output voltage	230 Vac
Rated Power	2.500 VA
Short circuit voltage	2.7 %
No-load current	0.6 Adc
Efficiency	98.0 %
Environment	
Ambient temperature max.	40 °C
Safety and protection	
Short circuit strength	short-circuit proof
Insulation class	B
Type	Encapsulated in metal housing
Protection index	IP 54
Safety class (prepared)	II
Test voltage	3.6 kVac
Order numbers	
Order Number	**TTIT 2500**

Mechanical data

Terminal and mounting	
Terminals Input	Mains connection cable with protected contact plug
Terminals Output	Protective contact socket
Measures and weights	
Weight	30.00 kg
Dimension (W x H x D)	250 x 180 x 410 mm
Cu-Weight	7.50 kg
Dimension picture (in mm)	❶
A	363
B	405
C	225
D	195
E	379
F	245

Dimension pictures

❶



Interference suppressing transformer
STT

BLOCK Website

General Data

Rated input voltage 230 Vac
Rated output voltage 230 Vac
Rated power 100 - 400 VA
Insulation class A
Maximum ambient temperature 40 °C
Efficiency up to 91 %
Degree of protection IP 44

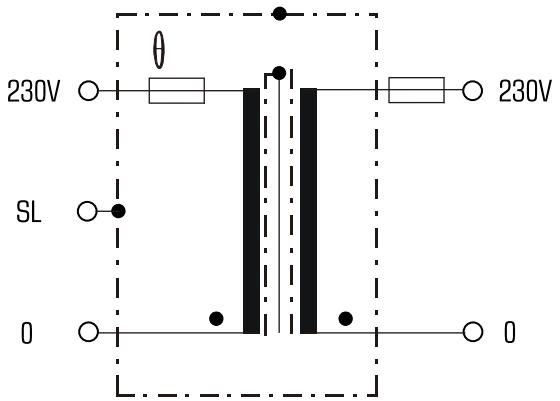
Advantages

Good attenuation against radio frequency interference and pulses
Low magnetic leakage field
Integrated short circuit and overload protection
Very good moisture protection and low noise thanks to resin encapsulation
High degree of protection
Carrying handle, mains connecting lead and socket for mobile use

Applications

Mains transformer complying with EN 61558-2-4 for portable application to minimize mains supply faults such as disturbing pulses and electrical noise.

Sample application



Standards

Mains transformer
to: VDE 0570 Teil 2-4, DIN EN 61558-2-4, EN 61558-2-4, IEC 61558-2-4

Approvals

EAC

Interference suppressing transformer
STT

BLOCK Website

Electrical data

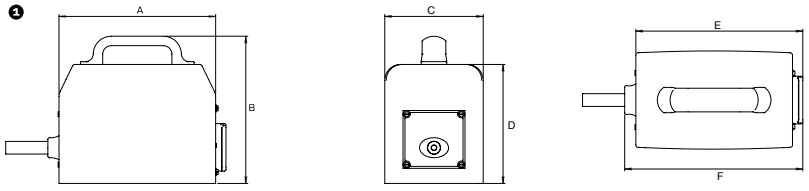
Typ	STT 100	STT 200	STT 400
Input			
Rated input voltage	230 Vac	230 Vac	230 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output			
Rated output voltage	230 Vac	230 Vac	230 Vac
Rated Power	100 VA	200 VA	400 VA
No-load voltage (app. x factor)	1.06	1.07	1.10
Leakage cur. (PRI-PE)	43 µA (typ.)	57 µA (typ.)	85 µA (typ.)
Leakage cur. (PRI-SEC)	16 µA (typ.)	26 µA (typ.)	41 µA (typ.)
Efficiency	89.0 %	90.0 %	92.0 %
Environment			
Ambient temperature max.	40 °C	40 °C	40 °C
Safety and protection			
Type	Enclosed	Enclosed	Enclosed
Insulation class	A	A	A
Protection index	IP 44	IP 44	IP 44
Safety class	I	I	I
Insulation res. (PRI-PE)	>10 GΩ (typ.)	>10 GΩ (typ.)	>10 GΩ (typ.)
Insulation res. (PRI-SEC)	>10 GΩ (typ.)	>10 GΩ (typ.)	>10 GΩ (typ.)
Coupling cap. (PRI-SEC)	172 pF (typ.)	262 pF (typ.)	390 pF (typ.)
Magn. 50 Hz stray f. (Encl.)	0.33 mT (typ.)	0.30 mT (typ.)	0.85 mT (typ.)
Short circuit strength	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof
Test voltage	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz
Order numbers			
Order Number	**STT 100**	**STT 200**	**STT 400**

Mechanical data

Terminal and mounting			
Terminals Input	Mains connecting cable with safety plug	Mains connecting cable with safety plug	Mains connecting cable with safety plug
Terminals Output	Protective contact socket	Protective contact socket	Protective contact socket
Measures and weights			
Weight	5.10 kg	8.00 kg	12.70 kg
Dimension (W x H x D)	105 x 125 x 170 mm	120 x 150 x 200 mm	120 x 175 x 300 mm
Dimension picture (in mm)	❶	❶	❶
A	170	197	295
B	165	190	220
C	105	125	110
D	130	150	175
E	180	210	310
F	235	225	365

Dimension pictures

❶



Interference suppressing isolating transformer
SMTT

BLOCK Website

General Data

Rated input voltage 230 Vac
Rated output voltage 230 Vac
Rated power 150 VA
Insulation class A
Maximum ambient temperature 40 °C
Efficiency up to 90 %
Degree of protection IP 40

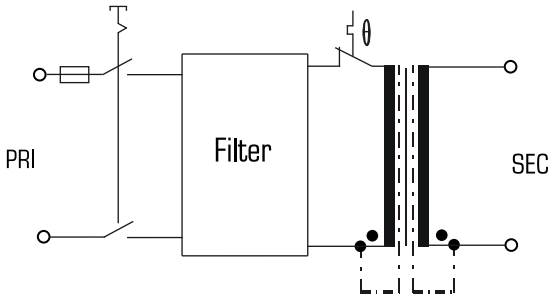
Advantages

Safe galvanic isolation
Low leakage current and high insulation resistance
Good attenuation against radio frequency interference and pulses
Low magnetic 50 Hz leakage field
Integrated short-circuit and overload protection
Very good moisture protection and low noise thanks to XtraDenseFill resin encapsulation
High degree of protection
Carry handle, mains cable with safety plug, shockproof socket for portable application

Applications

Isolating transformer for mobile use to minimize mains supply faults such as disturbing pulses and electrical noise.

Sample application



Standards

Isolating transformer
to: VDE 0570 Part 2-4, DIN EN 61558-2-4, EN 61558-2-4, IEC 61558-2-4

Approvals

EAC

Interference suppressing isolating transformer
SMTT

BLOCK Website

Electrical data

Typ	SMTT 150
Input	
Rated input voltage	230 Vac
Frequency range	50 - 60 Hz
Active-Power input	typ. 6.5 W (running at no load)
Output	
Rated output voltage	230 Vac
Rated Power	150 VA
Leakage cur. (PRI-PE)	9 µA (typ.)
Leakage cur. (PRI-SEC)	8 µA (typ.)
Efficiency	90.0 %
Environment	
Ambient temperature max.	40 °C
Safety and protection	
Type	Resin encapsulated transformer
Insulation class	A
Protection index	IP 40
Safety class	II
Coupling cap. (PRI-SEC)	90 pF (typ.)
Magn. 50 Hz stray f. (Encl.)	9.00 mT (typ.)
Short circuit strength	non-inherently short-circuit proof
Test voltage	5000 Vac, 50 Hz
Order numbers	
Order Number	**SMTT 150**

Interference suppressing isolating transformer
SMTT

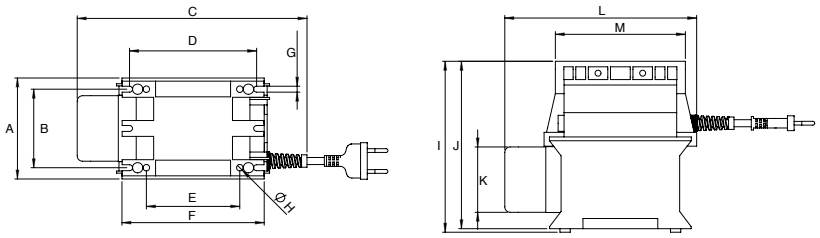
BLOCK Website

Mechanical data

Typ	Terminals Input	Terminals Output	Weight	Dimension picture (in mm)	A	B	C	D	E	F	G	H	I	J	K	L	M
SMTT 150	Mains connecting cable with safety plug	Protective contact socket	3.50 kg	❶	93.5	72.5	215	117	86	131	5.5	6	160	155	60.5	180	120

Dimension pictures

❶



OVERVIEW
SAFETY ISOLATING TRANSFORMERS

Safety isolating transformers

Type	Features	Rated input voltage	Rated output voltage	7,5 VA	10 VA	13 VA	18 VA	25 VA	28 VA	40 VA	50 VA	63 VA
EL	Free wiring	230 Vac	2 x 6 Vac	■		■	■		■		■	
			2 x 9 Vac	■		■	■		■		■	
			2 x 12 Vac	■		■	■		■		■	
			2 x 15 Vac	■		■	■		■		■	
			2 x 18 Vac	■		■	■		■		■	
			2 x 24 Vac									
ACT	In housing, DIN rail mounting	230 Vac	24 Vac		■			■				■
SIM	In housing, IP 20	230 Vac	2 x 12 Vac									■
EVKE	Resin encapsulation, IP 67/68	230 Vac	24 Vac					■		■		■
ETKEC	Resin encapsulation, for mobile use, CEE socket outlet, IP 44	230 Vac	24 Vac									

Safety isolating transformers for halogen lamps

Type	Features	Rated input voltage	Rated output voltage	60 W	105 W	150 W	200 W	250 W	300 W	Page
HIT	Screw-type terminals, resin encapsulation	230 Vac	11.3 - 11.5 Vac	■	■	■	■	■	■	182

BLOCK

100 VA	160 VA	200 VA	250 VA	300 VA	400 VA	500 VA	630 VA	800 VA	Page
■									170
■									
■									
■									
■									
■									172
■		■		■		■		■	174
■	■		■		■		■		176
■		■							179

Safety isolating transformer
EL

BLOCK Website

General Data

Rated input voltage 230 Vac
Rated output voltage 2 x 6 - 2 x 18 Vac
Rated power 7.5 - 100 VA
Insulation class E
Maximum ambient temperature 40 °C
Efficiency up to 88 %
Degree of protection IP 00

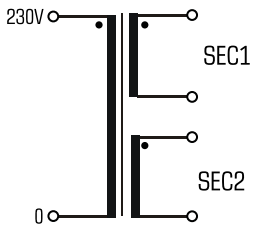
Advantages

- Solder tab for free wiring
- Very good corrosion protection and low noise thanks to vacuum impregnation
- Simple mounting thanks to robust metal footplate with oval slots

Applications

Safety isolating transformer for the safe electrical isolation of the input and output sides. The transformer is suitable for creating SELV and PELV circuits because of the limit on the output voltage.

Sample application



Standards

Safety isolating transformer
to: VDE 0570 Part 2-6, DIN EN 61558-2-6, EN 61558-2-6

Approvals

Safety isolating transformer
EL

BLOCK Website

Electrical data

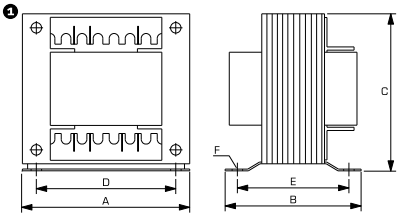
Typ	EL 7,5/..	EL 13/..	EL 18/..	EL 28/..	EL 50/..	EL 100/..
Input						
Rated input voltage	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage: Order no.	2x6 Vac: EL 7,5/6 2x9 Vac: EL 7,5/9 2x12 Vac: EL 7,5/12 2x15 Vac: EL 7,5/15 2x18 Vac: EL 7,5/18	2x6 Vac: EL 13/6 2x9 Vac: EL 13/9 2x12 Vac: EL 13/12 2x15 Vac: EL 13/15 2x18 Vac: EL 13/18	2x6 Vac: EL 18/6 2x9 Vac: EL 18/9 2x12 Vac: EL 18/12 2x15 Vac: EL 18/15 2x18 Vac: EL 18/18	2x6 Vac: EL 28/6 2x9 Vac: EL 28/9 2x12 Vac: EL 28/12 2x15 Vac: EL 28/15 2x18 Vac: EL 28/18	2x6 Vac: EL 50/6 2x9 Vac: EL 50/9 2x12 Vac: EL 50/12 2x15 Vac: EL 50/15 2x18 Vac: EL 50/18	2x9 Vac: EL 100/9 2x12 Vac: EL 100/12 2x15 Vac: EL 100/15 2x18 Vac: EL 100/18 2x24 Vac: EL 100/24
Rated Power	7,5 VA	13 VA	18 VA	28 VA	50 VA	100 VA
No-load voltage (app. x factor)	1.38	1.28	1.18	1.16	1.15	1.11
No-load loss (typ.)	2.00 W	2.20 W	2.70 W	3.10 W	3.50 W	4.70 W
Efficiency	62.0 %	67.0 %	72.0 %	77.0 %	81.0 %	88.0 %
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	E	E	E	E	E	E
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	II	II	II	II	II	II
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Overload protection	Typ PTC 880 (Accessory - available on request)	Typ PTC 872 (Accessory - available on request)	Typ PTC 860 (Accessory - available on request)	Typ PTC 850 (Accessory - available on request)	Typ PTC 840 (Accessory - available on request)	Typ PTC 810 (Accessory - available on request)
Test voltage	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz
Order numbers						
Order Number	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**

Mechanical data

Terminal and mounting						
Terminals	Solder tab for free wiring	Solder tab for free wiring	Solder tab for free wiring	Solder tab for free wiring	Solder tab for free wiring	Solder tab for free wiring
Fixing method	Base plate	Base plate	Base plate	Base plate	Base plate	Base plate
Fixing screws	M3	M3	M3	M3	M4	M4
Measures and weights						
Weight	0.26 kg	0.36 kg	0.50 kg	0.68 kg	0.97 kg	1.96 kg
Core type	EI 48/16,5	EI 54/18,8	EI 60/21	EI 60/30	EI 75/26,5	EI 84/43,5
Dimension picture (in mm)	❶	❶	❶	❶	❶	❶
A	48	54	60	60	75	84
B	39	40	47	56	59	80
C	45	50	55	55	67	76
D	40	45	50	50	62.5	64
E	32	30	32	42	45	63.5

Dimension pictures

❶



Safety isolating transformer
ACT

BLOCK Website

General Data

Rated input voltage 230 Vac
Rated output voltage 24 Vac
Rated power 10 - 100 VA
Insulation class B
Maximum ambient temperature 25 °C
Degree of protection IP 00

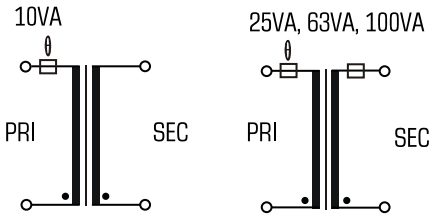
Advantages

- Integrated short-circuit and overload protection thanks to temperature fuse in the input and fuse in the output (ACT 10 only temperature fuse)
- Permanent corrosion protection, high insulation value and maximum electrical reliability thanks to XtraDenseFill resin encapsulation
- Robust plastic housing for rail mounting, e.g. in consumer units or meter mounting boards

Applications

Safety isolating transformer for the safe electrical isolation of the input and output sides. The transformer is suitable for creating SELV and PELV circuits because of the limit on the output voltage.

Sample application



Standards

Safety isolating transformer
to: VDE 0570 Part 2-6, DIN EN 61558-2-6, EN 61558-2-6, IEC 61558-2-6

Approvals

Safety isolating transformer
ACT

BLOCK Website

Electrical data

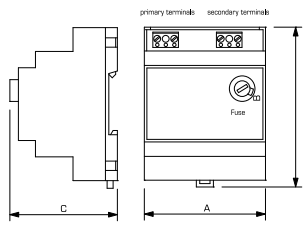
Typ	ACT 10	ACT 25	ACT 63	ACT 100
Input				
Rated input voltage	230 Vac	230 Vac	230 Vac	230 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output				
Rated output voltage	24 Vac	24 Vac	24 Vac	24 Vac
Rated Power	10 VA	25 VA	63 VA	100 VA
Environment				
Ambient temperature max.	25 °C	25 °C	25 °C	25 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling
Safety and protection				
Type	Resin encapsulated transformer	Resin encapsulated transformer	Resin encapsulated transformer	Resin encapsulated transformer
Insulation class	B	B	B	B
Protection index	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	II	II	II	II
Short circuit strength	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof
Test voltage	3750 Vac, 50 Hz	3750 Vac, 50 Hz	3750 Vac, 50 Hz	3750 Vac, 50 Hz
Order numbers				
Order Number	**ACT 10**	**ACT 25**	**ACT 63**	**ACT 100**

Mechanical data

Terminal and mounting				
Terminals	Screw-type terminal	Screw-type terminal	Screw-type terminal	Screw-type terminal
Fixing method	Panel installation on mounting rails	Panel installation on mounting rails	Panel installation on mounting rails	Panel installation on mounting rails
Measures and weights				
Weight	0.36 kg	0.95 kg	1.93 kg	1.93 kg
Dimension (W x H x D)	94 x 63 x 35 mm	94 x 63 x 106 mm	94 x 63 x 159 mm	94 x 63 x 159 mm
Dimension picture (in mm)	❶	❷	❸	❸
A	35	106	159	159
B	94	94	94	94
C	63	63	63	63

Dimension pictures

❶



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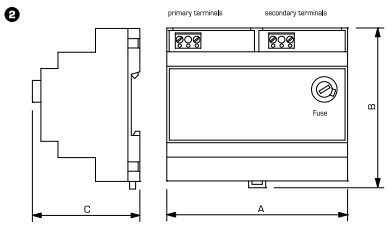

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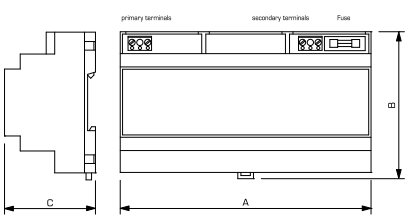


Safety isolating transformer
SIM

BLOCK Website

General Data

Rated input voltage 230 Vac
Rated output voltage 2 x 12 Vac
Rated power 60 - 800 VA
Insulation class A
Maximum ambient temperature 40 °C
Efficiency up to 95 %
Degree of protection IP 20

Advantages

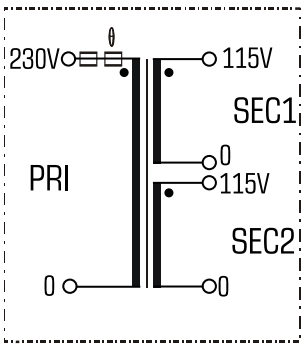
Integrated short-circuit and overload protection
Double output voltage for series or parallel connection
Very good moisture protection and low noise thanks to XtraDenseFill resin encapsulation (up to 300 VA)
Screw terminals under cover with strain relief

Applications

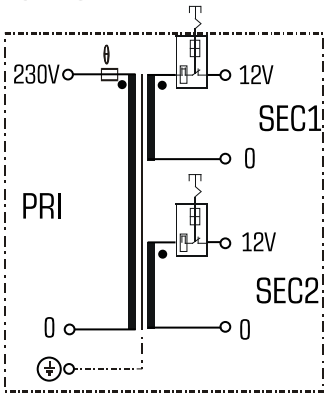
Safety isolating transformer for the safe electrical isolation of the input and output sides. The transformer is suitable for creating SELV and PELV circuits because of the limit on the output voltage.

Sample applications

60-300VA



500-800VA



Standards

Safety isolating transformer
to: VDE 0570 Part 2-6, DIN EN 61558-2-6, EN 61558-2-6, IEC 61558-2-6

Approvals

VDE

Safety isolating transformer
SIM

BLOCK Website

Electrical data

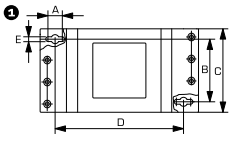
Typ	SIM 60	SIM 100	SIM 200	SIM 300	SIM 500	SIM 800
Input						
Rated input voltage	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	2 x 12 Vac	2 x 12 Vac	2 x 12 Vac	2 x 12 Vac	2 x 12 Vac	2 x 12 Vac
Rated Power	60 VA	100 VA	200 VA	300 VA	500 VA	800 VA
No-load voltage (app. x factor)	1.15	1.08	1.07	1.05	1.04	1.03
No-load loss (typ.)	3.30 W	4.90 W	7.40 W	14.00 W	18.00 W	27.00 W
Efficiency	83.5 %	87.5 %	89.5 %	91.0 %	92.0 %	95.0 %
Standards						
Classification	Safety isolating transformer	Safety isolating transformer	Safety isolating transformer	Safety isolating transformer	Safety isolating transformer	Safety isolating transformer
Approvals						
Approvals	VDE	VDE	VDE	VDE	VDE, cURus	VDE, cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Resin encapsulated transformer	Resin encapsulated transformer	Resin encapsulated transformer	Resin encapsulated transformer	Encapsulated in metal housing	Encapsulated in metal housing
Insulation class	A	A	A	A	B	B
Protection index	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20
Safety class	II	II	II	II	I	I
Short circuit strength	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof
Test voltage	5000 Vac, 50 Hz	5000 Vac, 50 Hz	5000 Vac, 50 Hz	5000 Vac, 50 Hz	3750 Vac, 50 Hz	3750 Vac, 50 Hz
Order numbers						
Order Number	**SIM 60**	**SIM 100**	**SIM 200**	**SIM 300**	**SIM 500**	**SIM 800**

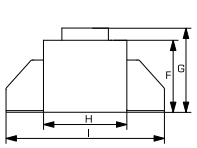
Mechanical data

Terminal and mounting						
Terminals	Screw-type terminal	Screw-type terminal	Screw-type terminal	Screw-type terminal	Screw-type terminal	Screw-type terminal
Fixing method	Fixing holes in the terminal connection compartment	Fixing holes in the terminal connection compartment	Fixing holes in the terminal connection compartment	Fixing holes in the terminal connection compartment	Fixing holes in housing	Fixing holes in housing
Measures and weights						
Weight	1.55 kg	2.00 kg	3.60 kg	4.90 kg	9.10 kg	15.60 kg
Dimension picture (in mm)	❶	❶	❷	❷	❸	❸
A	14.2	14.2	167	167	283	283
B	58	58	76	76	200	200
C	77	77	117	117	166	166
D	135	135	4.3	4.3	245	245
E	4.3	4.3	14	14	148	148
F	65	65	77	100	-	-
G	76	76	97	117	-	-
H	90	90	97	97	-	-
I	166	166	223	223	-	-

Dimension pictures

❶





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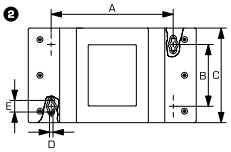

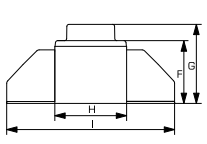

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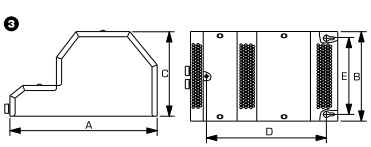


Safety isolating transformer
EVKE

BLOCK Website

General Data

Rated input voltage 230 Vac
Rated output voltage 24 Vac
Rated power 25 - 630 VA
Insulation class E
Maximum ambient temperature 40 °C
Degree of protection IP 67/68

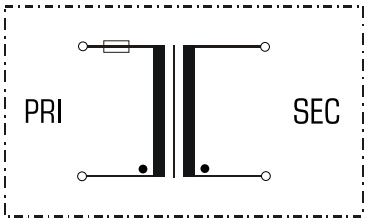
Advantages

Integrated short-circuit and overload protection
Very good moisture protection and low noise thanks to resin encapsulation
High degree of protection
Plastic fittings on terminals

Applications

Safety isolating transformer for the safe electrical isolation of the input and output sides. The transformer is suitable for creating SELV and PELV circuits because of the limit on the output voltage.

Sample application



Standards

Safety isolating transformer
to: VDE 0570 Part 2-6, DIN EN 61558-2-6, EN 61558-2-6, IEC 61558-2-6

Approvals

EAC

Safety isolating transformer
EVKE

BLOCK Website

Electrical data

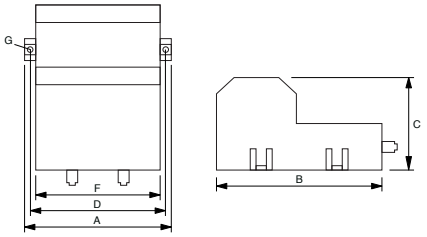
Typ	EVKE 25/24	EVKE 40/24	EVKE 100/24	EVKE 160/24	EVKE 250/24	EVKE 400/24
Input						
Rated input voltage	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	24 Vac	24 Vac	24 Vac	24 Vac	24 Vac	24 Vac
Rated Power	25 VA	40 VA	100 VA	160 VA	250 VA	400 VA
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Resin encapsulated transformer	Resin encapsulated transformer	Resin encapsulated transformer	Resin encapsulated transformer	Resin encapsulated transformer	Resin encapsulated transformer
Insulation class	E	E	E	E	E	E
Test voltage	3750 Vac, 50 Hz	3750 Vac, 50 Hz	3750 Vac, 50 Hz	3750 Vac, 50 Hz	3750 Vac, 50 Hz	3750 Vac, 50 Hz
Protection index	IP 68	IP 68	IP 68	IP 68	IP 68	IP 68
Safety class	II	II	II	II	II	II
Short circuit strength	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof
Order numbers						
Order Number	**EVKE 25/24**	**EVKE 40/24**	**EVKE 100/24**	**EVKE 160/24**	**EVKE 250/24**	**EVKE 400/24**

Mechanical data

Terminal and mounting						
Terminals	Plastic fittings on 2 x M16 terminals	Plastic fittings on 2 x M16 terminals	Plastic fittings on 2 x M16 terminals	Plastic fittings on 1 x M16, 1 x M20 terminals	Plastic fittings on 1 x M16, 1 x M20 terminals	Plastic fittings on 1 x M16, 1 x M20 terminals
Fixing method	Mounting lugs	Mounting lugs	Mounting lugs	Mounting lugs	Mounting lugs	Mounting lugs
Measures and weights						
Weight	0.98 kg	1.64 kg	2.80 kg	4.50 kg	6.50 kg	9.50 kg
Dimension picture (in mm)	❶	❶	❶	❶	❶	❷
A	106	120	145	150	150	195
B	140	150	180	190	190	255
C	68	78	90	105	105	130
D	88	102	123	125	125	172
E	-	-	-	-	-	120
F	75	89	105	108	108	155
G	6	6	6	6	6	6
H	-	-	-	-	-	30

Dimension pictures

❶



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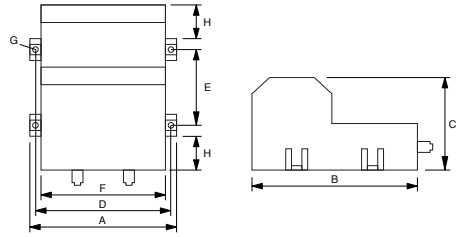


Safety isolating transformer
EVKE

BLOCK Website

Electrical data

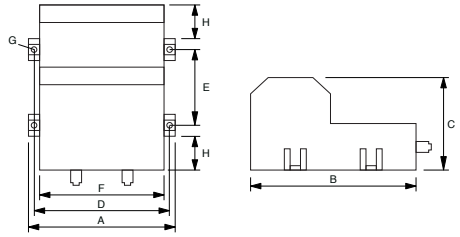
Typ	EVKE 630/24
Input	
Rated input voltage	230 Vac
Frequency range	50 - 60 Hz
Output	
Rated output voltage	24 Vac
Rated Power	630 VA
Environment	
Ambient temperature max.	40 °C
Safety and protection	
Type	Resin encapsulated transformer
Insulation class	E
Test voltage	3750 Vac, 50 Hz
Protection index	IP 68
Safety class	II
Short circuit strength	non-inherently short-circuit proof
Order numbers	
Order Number	**EVKE 630/24**

Mechanical data

Terminal and mounting	
Terminals	Plastic fittings on 1 x M20, 1 x M25 terminals
Fixing method	Mounting lugs
Measures and weights	
Weight	13.00 kg
Dimension picture (in mm)	❷
A	215
B	280
C	150
D	196
E	125
F	175
G	6
H	40

Dimension pictures

❷



Safety isolating transformer
ETKEC

BLOCK Website

General Data

Rated input voltage 230 Vac
Rated output voltage 24 Vac
Rated power 100 - 200 VA
Insulation class E
Maximum ambient temperature 40 °C
Degree of protection IP 44

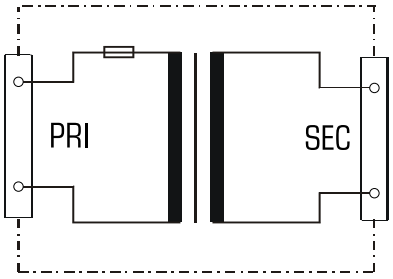
Advantages

- Integrated short circuit and overload protection
- Very good moisture protection and low noise thanks to resin encapsulation
- High degree of protection
- Carrying handle, mains connecting lead and CEE socket for mobile use

Applications

Safety isolating transformer for the safe electrical isolation of the input and output sides. The transformer is suitable for creating SELV and PELV circuits because of the limit on the output voltage.

Sample application



Standards

Safety isolating transformer
to: VDE 0570 Part 2-6, DIN EN 61558-2-6, EN 61558-2-6, IEC 61558-2-6

Approvals

EAC

Safety isolating transformer
ETKEC

BLOCK Website

Electrical data

Typ	ETKEC 100/24	ETKEC 200/24
Input		
Rated input voltage	230 Vac	230 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz
Output		
Rated output voltage	24 Vac	24 Vac
Rated Power	100 VA	200 VA
Environment		
Ambient temperature max.	40 °C	40 °C
Safety and protection		
Type	Resin encapsulated transformer	Resin encapsulated transformer
Insulation class	E	E
Protection index	IP 44	IP 44
Safety class	II	II
Short circuit strength	non-inherently short-circuit proof	non-inherently short-circuit proof
Test voltage	3750 Vac, 50 Hz	3750 Vac, 50 Hz
Order numbers		
Order Number	**ETKEC 100/24**	**ETKEC 200/24**

Safety isolating transformer
ETKEC

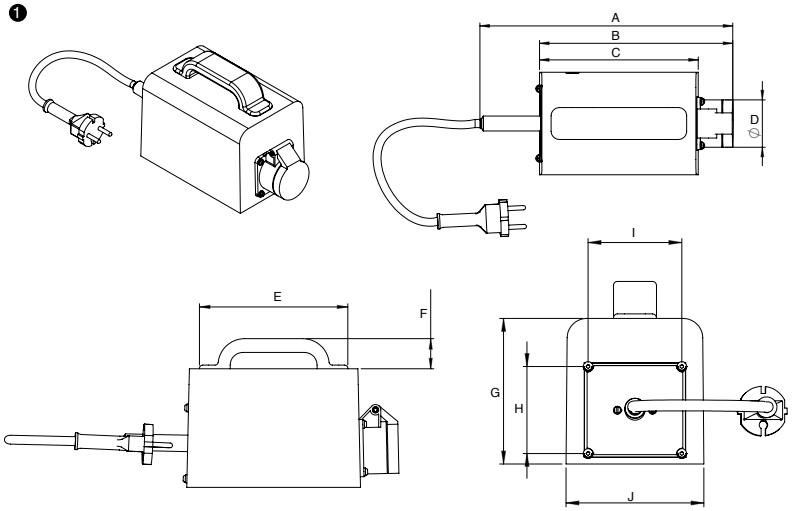
BLOCK Website

Mechanical data

Typ	Terminals Input	Terminals Output	Weight	Dimension (W x H x D)	Dimension picture (in mm)	A	B	C	D	E	F	G	H	I	J
ETKEC 100/24	Mains connecting cable with safety plug	CEE-socket	3.50 kg	110 x 120 x 265 mm	❶	261	200	164	49	140	29	112	67	72	106
ETKEC 200/24	Mains connecting cable with safety plug	2 CEE-sockets	6.70 kg	140 x 145 x 220 mm	❷	16.5	147.5	139	140	163	196	253	-	-	-

Dimension pictures

❶



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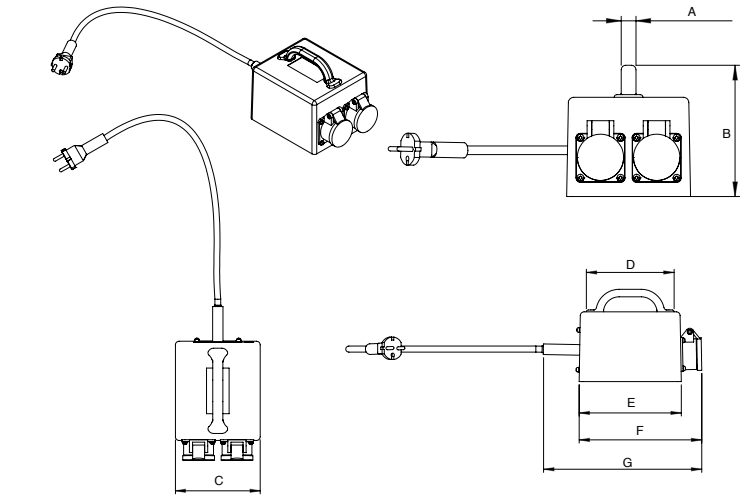


Safety isolating transformer for halogen lamps
HIT

BLOCK Website

General Data

Rated input voltage 230 Vac
Rated output voltage 11.3 - 11.5 Vac
Rated output 60 - 300 W
Insulation class A
Maximum ambient temperature 40 °C
Efficiency up to 92 %
Degree of protection IP 20

Advantages

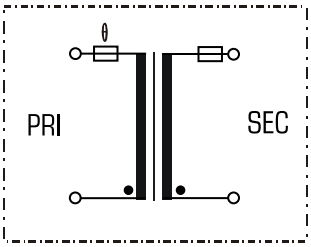
Integrated short circuit and overload protection
Very good moisture protection and low noise thanks to XtraDenseFill resin encapsulation
Screw terminals under cover with strain relief

Applications

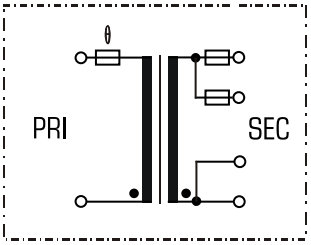
Safety isolating transformer for 12 V halogen lamps for the safe electrical isolation of the input and output sides. The transformer is suitable for creating SELV and PELV circuits because of the limit on the output voltage.

Sample application

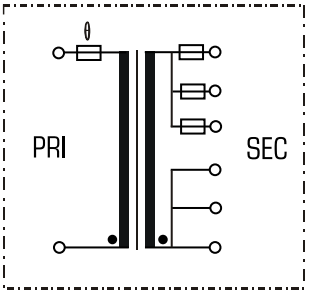
60VA, 105VA



200VA



150VA, 250VA, 300VA



Standards

Safety isolating transformer for halogen lamps
to: VDE 0570 Teil 2-6, DIN EN 61558-2-6, EN 61558-2-6, IEC 61558-2-6

Approvals

EAC

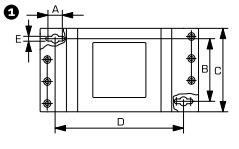
Safety isolating transformer for halogen lamps
HIT

BLOCK Website

Typ	HIT 60	HIT 105	HIT 150	HIT 200	HIT 250	HIT 300
Electrical data						
Input						
Rated input voltage	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	11.5 Vac	11.5 Vac	11.3 Vac	11.3 Vac	11.3 Vac	11.3 Vac
Number of SEC-Circuits	1	1	3	2	3	3
Rated current	4.80 A	8.40 A	3 x 4.00 A	2 x 8.00 A	2 x 8.00 A, 1 x 4.00 A	3 x 8.00 A
for Lamps power	60 W	105 W	150 W	200 W	250 W	300 W
Efficiency	85.5 %	87.0 %	89.0 %	90.0 %	90.0 %	92.0 %
Standards						
Classification	Safety isolating transformer	Safety isolating transformer	Safety isolating transformer	Safety isolating transformer	Safety isolating transformer	Safety isolating transformer
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Resin encapsulated transformer	Resin encapsulated transformer	Resin encapsulated transformer	Resin encapsulated transformer	Resin encapsulated transformer	Resin encapsulated transformer
Insulation class	A	A	A	A	A	A
Protection index	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20
Safety class	II	II	II	II	II	II
Short circuit strength	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof
Test voltage	5000 Vac, 50 Hz	5000 Vac, 50 Hz	5000 Vac, 50 Hz	5000 Vac, 50 Hz	5000 Vac, 50 Hz	5000 Vac, 50 Hz
Order numbers						
Order Number	**HIT 60**	**HIT 105**	**HIT 150**	**HIT 200**	**HIT 250**	**HIT 300**
Mechanical data						
Terminal and mounting						
Terminals	Screw-type terminals	Screw-type terminals	Screw-type terminals	Screw-type terminals	Screw-type terminals	Screw-type terminals
Fixing method	Fixing holes in the terminal connection compartment	Fixing holes in the terminal connection compartment	Fixing holes in the terminal connection compartment	Fixing holes in the terminal connection compartment	Fixing holes in the terminal connection compartment	Fixing holes in the terminal connection compartment
Measures and weights						
Weight	1.42 kg	2.00 kg	3.00 kg	3.55 kg	4.20 kg	5.00 kg
Dimension picture (in mm)	❶	❶	❷	❷	❷	❷
A	14.2	14.2	167	167	167	167
B	58	58	76	76	76	76
C	77	77	117	117	117	117
D	135	135	4.3	4.3	4.3	4.3
E	4.3	4.3	14	14	14	14
F	65	65	77	77	100	100
G	76	76	97	97	117	117
H	90	90	97	97	97	97
I	166	166	223	223	223	223

Dimension pictures

❶



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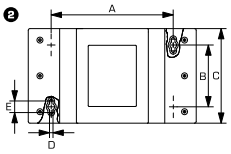

OVERVIEW AUTOTRANSFORMERS

	Type	Features	Rated input voltage	Rated output voltage	0.8 A	1.25 A
1-phase	AIM	In housing, IP 20	115 Vac	220, 230, 240 Vac	■	
			115 Vac	115 Vac		
			220, 230, 240 Vac	115, 220, 230, 240 Vac		
	ESP	For setting the speed of fan motors	230 Vac	80 Vac/115 Vac/130 Vac/150 Vac/170 Vac/190 Vac		
			400 Vac	140 Vac/170 Vac/200 Vac/235 Vac/270 Vac/310 Vac	■	
	ESS	Variable transformer	230 Vac	0 - 230 Vac	■	■
				0 - 230/250 Vac		
				0 - 230/260 Vac		
3-phase	DSP	For setting the speed of fan motors	3 x 400 Vac	3 x 240 Vac/3 x 230 Vac/3 x 190 Vac/3 x 170 Vac/3 x 130 Vac		

	Type	Features	Rated input voltage	Rated output voltage	150 VA	250 VA	350 VA	500 VA	1000 VA	2000 VA	3000 VA
1-phase	VT-EN	IP 00	110, 125, 230, 240 Vac	110, 125, 230, 240 Vac	■		■	■	■	■	■
	E-JET	For portable application	230 Vac	110 Vac		■		■	■		
	JET	For portable application	110 Vac	230 Vac		■		■	■		
3-phase	AT3	IP 00, optional IP 23 or IP 54 in housing	3 x 200/208 - 3 x 690	3 x 400 Vac						■	

1.5 A	1.6 A	1.8 A	2.0 A	2.5 A	2.8 A	3.0 A	3.15 A	3.20 A	3.60 A	4.00 A	5.00 A	5.40 A	5.80 A	6.00 A	6.30 A	8.00 A	9.00 A	10.00 A	15.00 A	16.00 A	18.00 A	20.00 A	Page
	■			■							■					■							
	■							■			■							■		■			186
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	■								■			■						■					
				■			■			■					■	■		■			■	■	212
		■					■				■					■						■	
■						■								■			■		■				210

3500 VA	10000 VA	15000 VA	25000 VA	45000 VA	70000 VA	110000 VA	160000 VA	250000 VA	Page
									188
									193
									195
■	■	■	■	■	■	■	■	■	198

Autotransformer
AIM

BLOCK Website

General Data

Rated input voltage 115/220/230/240 Vac
Rated output voltage 115/220/230/240 Vac
Rated output current 0.8 - 16 A
Insulation class A or B
Maximum ambient temperature 40 °C
Degree of protection IP 20

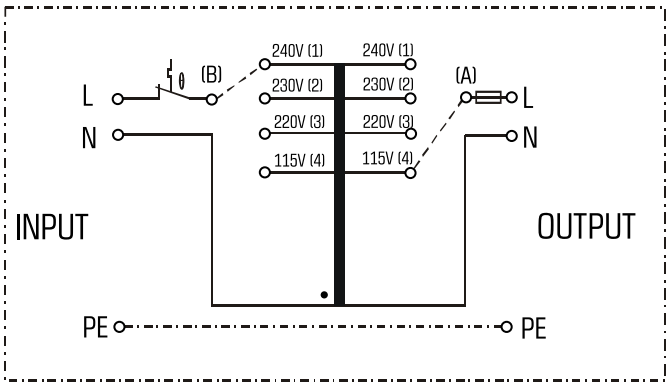
Advantages

Low weight and small size (compared to isolating transformers)
Integrated short-circuit and overload protection
Very high efficiency
Very good moisture protection and low noise thanks to XtraDenseFill resin encapsulation (AIM 1.8/8 - AIM 5.0/2.5)
Screw terminals under cover with strain relief

Applications

Autotransformer for adjustment of the voltage on the input and output sides with no requirement for electrical isolation.

Sample application



Standards

Autotransformer
to: VDE 0570 Part 2-13, DIN EN 61558-2-13, EN 61558-2-13, IEC 61558-2-13

Approvals

EAC

Autotransformer
AIM

BLOCK Website

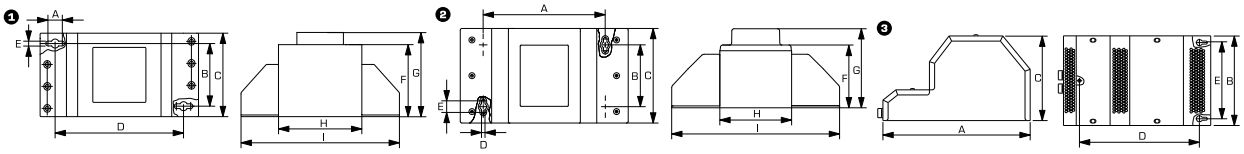
Electrical data

Typ	AIM 1,6/0,8	AIM 3,2/1,6	AIM 5,0/2,5	AIM 10/5	AIM 16/8
Input					
Rated input voltage	115 Vac/220 Vac 230 Vac/240 Vac	115 Vac/220 Vac 230 Vac/240 Vac	115 Vac/220 Vac 230 Vac/240 Vac	115 Vac/220 Vac 230 Vac/240 Vac	115 Vac/220 Vac 230 Vac/240 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output					
Rated output voltage	115 Vac/220 Vac 230 Vac/240 Vac	115 Vac/220 Vac 230 Vac/240 Vac	115 Vac/220 Vac 230 Vac/240 Vac	115 Vac/220 Vac 230 Vac/240 Vac	115 Vac/220 Vac 230 Vac/240 Vac
Rated output current	0.80 (PRI 115 / SEC 220, 230, 240); 1.60 (PRI 115 / SEC 115); 1.60 (PRI 220, 230, 240 / SEC 115, 220, 230, 240)	1.60 (PRI 115 / SEC 220, 230, 240); 3.20 (PRI 115 / SEC 115); 3.20 (PRI 220, 230, 240 / SEC 115, 220, 230, 240)	2.50 (PRI 115 / SEC 220, 230, 240); 5.00 (PRI 115 / SEC 115); 5.00 (PRI 220, 230, 240 / SEC 115, 220, 230, 240)	5.00 (PRI 115 / SEC 220, 230, 240); 10.00 (PRI 115 / SEC 115); 10.00 (PRI 220, 230, 240 / SEC 115, 220, 230, 240)	8.00 (PRI 115 / SEC 220, 230, 240); 16.00 (PRI 115 / SEC 115); 16.00 (PRI 220, 230, 240 / SEC 115, 220, 230, 240)
No-load loss (typ.)	4.70 W	6.70 W	11.80 W	18.00 W	21.00 W
Environment					
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection					
Type	Resin encapsulated transformer	Resin encapsulated transformer	Resin encapsulated transformer	Enclosed	Enclosed
Insulation class	A	A	A	B	B
Protection index	IP 20	IP 20	IP 20	IP 20	IP 20
Safety class	May be used in protection category I and II. When protection category I devices are equipped the protective conductor in the output must be connected with the lead-in protective conductor.	May be used in protection category I and II. When protection category I devices are equipped the protective conductor in the output must be connected with the lead-in protective conductor.	May be used in protection category I and II. When protection category I devices are equipped the protective conductor in the output must be connected with the lead-in protective conductor.	I	I
Short circuit strength	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof
Order numbers					
Order Number	**AIM 1,6/0,8**	**AIM 3,2/1,6**	**AIM 5,0/2,5**	**AIM 10/5**	**AIM 16/8**

Mechanical data

Terminal and mounting					
Terminals	Screw-type terminal	Screw-type terminal	Screw-type terminal	Screw-type terminal	Screw-type terminal
Fixing method	Fixing holes in the terminal connection compartment	Fixing holes in the terminal connection compartment	Fixing holes in the terminal connection compartment	Fixing holes in the housing	Fixing holes in the housing
Measures and weights					
Weight	2.1 kg	3.6 kg	5.0 kg	12.1 kg	16.5 kg
Dimension picture (in mm)	❶	❷	❷	❸	❸
A	14.2	167	167	283	283
B	58	76	76	200	200
C	77	117	117	166	165
D	135	4.3	4.3	245	245
E	4.3	14	14	148	148
F	65	77	100	-	-
G	76	97	117	-	-
H	90	97	97	-	-
I	166	223	223	-	-

Dimension pictures



Autotransformer
VT-EN

BLOCK Website

General Data

Rated input voltage 110/125/230/240 Vac
Rated output voltage 110/125/230/240 Vac
Rated power 150 - 3000 VA
Insulation class B or E
Maximum ambient temperature 40 °C
Degree of protection IP 00

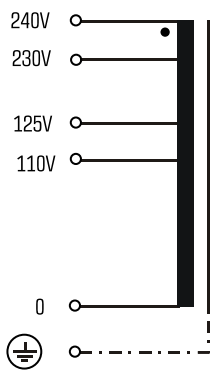
Advantages

Low weight and small size (compared to isolating transformers)
Very high efficiency
Very good moisture protection and low noise thanks to vacuum impregnation
Contact protected screw connection terminals complying with UVV BGV A3
Simple mounting thanks to robust metal fixing rail with oval slots

Applications

Autotransformer for adjustment of the voltage on the input and output sides with no requirement for electrical isolation.

Sample application



Standards

Autotransformer
to: VDE 0570 Teil 2-13, DIN EN 61558-2-13, EN 61558-2-13, IEC 61558-2-13, UL 5085-1/-2, CSA 22.2 No.66

Approvals

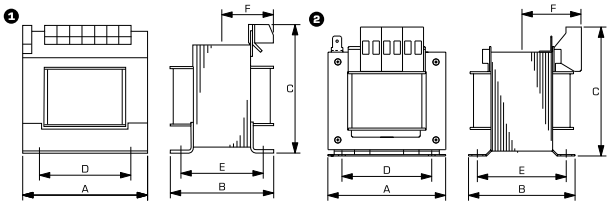
UL 5085-1/-2, CSA 22.2 No.66

Autotransformer
VT-EN

BLOCK Website

Typ	VT 15-EN	VT 35-EN	VT 50-EN	VT 100-EN	VT 200-EN	VT 300-EN
Input						
Rated input voltage	110 Vac/125 Vac 230 Vac/240 Vac	110 Vac/125 Vac 230 Vac/240 Vac	110 Vac/125 Vac 230 Vac/240 Vac	110 Vac/125 Vac 230 Vac/240 Vac	110 Vac/125 Vac 230 Vac/240 Vac	110 Vac/125 Vac 230 Vac/240 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	110 Vac/125 Vac 230 Vac/240 Vac	110 Vac/125 Vac 230 Vac/240 Vac	110 Vac/125 Vac 230 Vac/240 Vac	110 Vac/125 Vac 230 Vac/240 Vac	110 Vac/125 Vac 230 Vac/240 Vac	110 Vac/125 Vac 230 Vac/240 Vac
Rated Power	150 VA	350 VA	500 VA	1.000 VA	2.000 VA	3.000 VA
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	E	B	E	E	B	B
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Test voltage	2500 Vac, 50 Hz	2500 Vac, 50 Hz	2500 Vac, 50 Hz	2500 Vac, 50 Hz	2500 Vac, 50 Hz	2500 Vac, 50 Hz
Order numbers						
Order Number	**VT 15-EN**	**VT 35-EN**	**VT 50-EN**	**VT 100-EN**	**VT 200-EN**	**VT 300-EN**
Terminal and mounting						
Terminals	Screw-type terminal, PE 6.3 x 0.8	Screw-type terminal, PE 6.3 x 0.8	Screw-type terminal, PE 6.3 x 0.8	Screw-type terminal, PE 6.3 x 0.8	Screw-type terminal, PE 6.3 x 0.8	Screw-type terminal, PE 6.3 x 0.8
Fixing method	Base plate	Fixing rail	Base plate	Base plate	Fixing rail	Fixing rail
Measures and weights						
Weight	1.90 kg	3.30 kg	4.20 kg	7.80 kg	14.10 kg	19.40 kg
Dimension picture (in mm)	❷	❶	❷	❷	❶	❶
A	84	105	120	150	174	174
B	75	87	86	104	126	155
C	100	120	130	140	150	150
D	54	84	90	122	135	135
E	63	70	70	84	106	134
F	50	50	50	60	70	90

Dimension pictures



Autotransformer
ESP

BLOCK Website

General Data

Rated input voltage 230 or 400 Vac
Rated output voltage 80 - 310 Vac
Rated output current 0.8 - 18 A
Insulation class B
Maximum ambient temperature 40 °C
Degree of protection IP 00

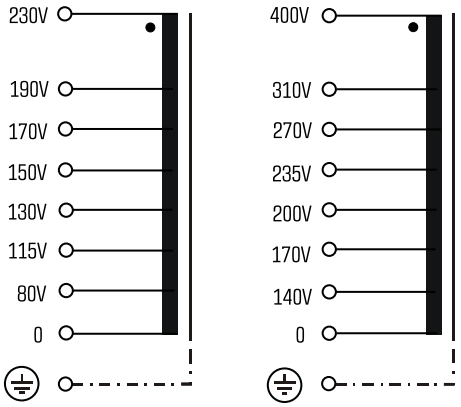
Advantages

Low weight and small size (compared to isolating transformers)
Very high efficiency
Very good moisture protection and low noise thanks to vacuum impregnation
Contact protected screw connection terminals complying with UVV BGV A3
Simple mounting thanks to robust metal footplate with oval slots

Applications

Autotransformer for example for setting the speed of single-phase fan motors.

Sample application



Standards

Autotransformer
to: VDE 0570 Teil 2-13, DIN EN 61558-2-13, EN 61558-2-13,
IEC 61558-2-13

Approvals

EAC

Autotransformer
ESP

BLOCK Website

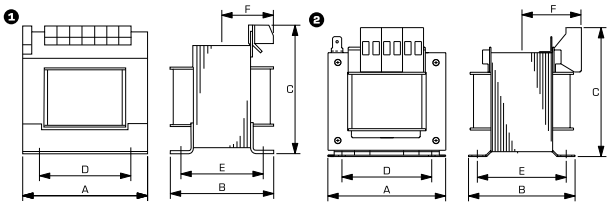
Electrical data

Typ	ESP 230/1,5	ESP 230/2,8	ESP 230/5,8	ESP 230/10	ESP 230/18	ESP 400/0,8
Input						
Rated input voltage	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac	400 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	80 Vac/115 Vac/130 Vac 150 Vac/170 Vac/190 Vac	80 Vac/115 Vac/130 Vac 150 Vac/170 Vac/190 Vac	80 Vac/115 Vac/130 Vac 150 Vac/170 Vac/190 Vac	80 Vac/115 Vac/130 Vac 150 Vac/170 Vac/190 Vac	80 Vac/115 Vac/130 Vac/ 150 Vac/170 Vac/190 Vac	140 Vac/170 Vac/200 Vac 235 Vac/270 Vac/310 Vac
Rated output current	1.50 A	2.80 A	5.80 A	10.00 A	18.00 A	0.80 A
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	B	B	B	B	B	B
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Order numbers						
Order Number	**ESP 230/1,5**	**ESP 230/2,8**	**ESP 230/5,8**	**ESP 230/10**	**ESP 230/18**	**ESP 400/0,8**

Mechanical data

Terminal and mounting						
Terminals	Screw-type terminals, PE 6.3 x 0.8	Screw-type terminals, PE 6.3 x 0.8	Screw-type terminals, PE 6.3 x 0.8	Screw-type terminals, PE 6.3 x 0.8	Screw-type terminals, PE 6.3 x 0.8	Screw-type terminals, PE 6.3 x 0.8
Fixing method	Fixing rail	Fixing rail	Base plate	Base plate	Fixing rail	Fixing rail
Fixing screws	M4	M5	M5	M6	M6	M4
Measures and weights						
Weight	1.5 kg	3.0 kg	4.3 kg	7.8 kg	11.5 kg	1.5 kg
Dimension picture (in mm)	❶	❶	❷	❷	❶	❶
A	84	105	120	150	174	84
B	75	85	91	112	120	75
C	100	118	130	135	150	100
D	64	84	90	122	135	64
E	50	62	70	84	85	50
F	42	45	48	58	60	42

Dimension pictures



Autotransformer
ESP

BLOCK Website

Electrical data

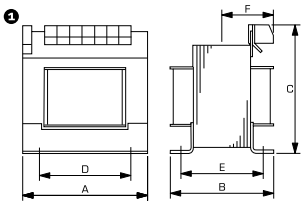
Typ	ESP 400/1,6	ESP 400/3,6	ESP 400/5,4	ESP 400/10
Input				
Rated input voltage	400 Vac	400 Vac	400 Vac	400 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output				
Rated output voltage	140 Vac/170 Vac/200 Vac 235 Vac/270 Vac/310 Vac	140 Vac/170 Vac/200 Vac 235 Vac/270 Vac/310 Vac	140 Vac/170 Vac/200 Vac 235 Vac/270 Vac/310 Vac	140 Vac/170 Vac/200 Vac 235 Vac/270 Vac/310 Vac
Rated output current	1.60 A	3.60 A	5.40 A	10.00 A
Environment				
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C
Safety and protection				
Type	Open type	Open type	Open type	Open type
Insulation class	B	B	B	B
Protection index	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Order numbers				
Order Number	**ESP 400/1,6**	**ESP 400/3,6**	**ESP 400/5,4**	**ESP 400/10**

Mechanical data

Terminal and mounting				
Terminals	Screw-type terminals, PE 6.3 x 0.8	Screw-type terminals, PE 6.3 x 0.8	Screw-type terminals, PE 6.3 x 0.8	Screw-type terminals, PE 6.3 x 0.8
Fixing method	Fixing rail	Fixing rail	Fixing rail	Fixing rail
Fixing screws	M5	M5	M6	M6
Measures and weights				
Weight	3.0 kg	4.3 kg	7.8 kg	11.5 kg
Dimension picture (in mm)	❶	❶	❶	❶
A	105	120	150	174
B	85	91	112	120
C	118	130	135	150
D	84	90	122	135
E	62	70	84	85
F	45	48	58	60

Dimension pictures

❶



Autotransformer
E-JET

BLOCK Website

General Data

Rated input voltage 230 Vac
Rated output voltage 110 Vac
Rated power 250 - 1000 VA
Insulation class A
Maximum ambient temperature 40 °C
Efficiency up to 96 %
Degree of protection IP 22

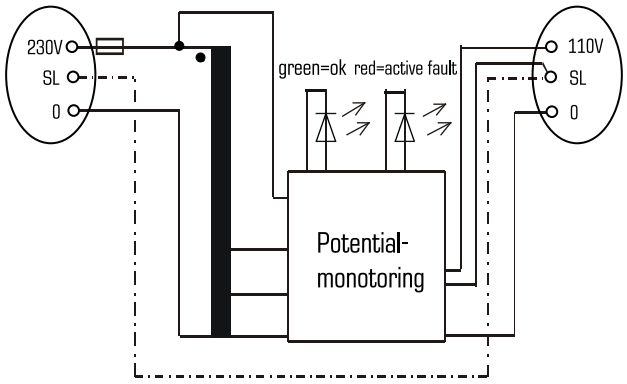
Advantages

Electronic potential monitoring by not connecting the output voltage until the protected contact plug is inserted correctly
Integrated short-circuit and overload protection
Very high efficiency
Very good moisture protection and low noise thanks to XtraDenseFill resin encapsulation
Carry handle, mains cable with safety plug, socket NEMA5-15 (USA) for portable application

Applications

Autotransformer for mobile use for the adjustment of the voltage in 230 Vac networks to 110 Vac equipment when no electrical isolation is required.

Sample application



Standards

Autotransformer
to: VDE 0570 Teil 2-13, DIN EN 61558-2-13, EN 61558-2-13,
IEC 61558-2-13

Approvals

EAC

Autotransformer
E-JET

BLOCK Website

Electrical data

Typ	E-JET 250	E-JET 500	E-JET 1000
Input			
Rated input voltage	230 Vac	230 Vac	230 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output			
Rated output voltage	110 Vac	110 Vac	110 Vac
Rated Power	250 VA	500 VA	1.000 VA
No-load voltage (app. x factor)	1.04	1.04	1.03
Efficiency	94.0 %	94.0 %	96.0 %
Environment			
Ambient temperature max.	40 °C	40 °C	40 °C
Safety and protection			
Type	Resin encapsulated transformer	Resin encapsulated transformer	Resin encapsulated transformer
Insulation class	A	A	A
Protection index	IP 22	IP 22	IP 22
Safety class	I	I	I
Short circuit strength	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof
Order numbers			
Order Number	**E-JET 250**	**E-JET 500**	**E-JET 1000**

Mechanical data

Terminal and mounting			
Terminals Input	Connecting cable with safety plug	Connecting cable with safety plug	Connecting cable with safety plug
Terminals Output	NEMA5-15 socket (USA)	NEMA5-15 socket (USA)	NEMA5-15 socket (USA)
Measures and weights			
Weight	3.10 kg	6.80 kg	9.90 kg
Dimension (W x H x D)	95 x 155 x 160 mm	126 x 192 x 180 mm	143 x 197 x 244 mm

Autotransformer
JET

BLOCK Website

General Data

Rated input voltage 110 Vac
Rated output voltage 230 Vac
Rated power 250 - 1000 VA
Insulation class A
Maximum ambient temperature 40 °C
Efficiency up to 96 %
Degree of protection IP 22

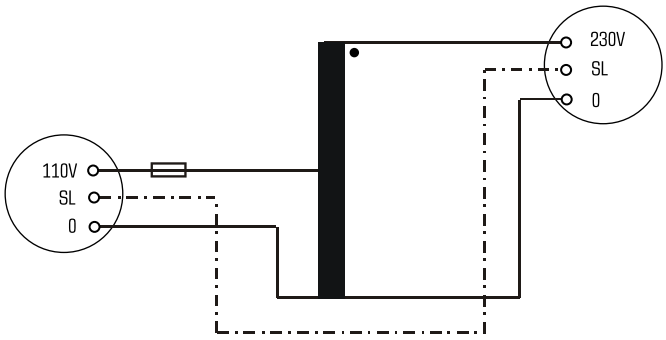
Advantages

Integrated short-circuit and overload protection
Very high efficiency
Very good moisture protection and low noise thanks to XtraDenseFill resin encapsulation
Carrying handle, mains connecting lead NEMA5-15 (USA) and socket for portable application

Applications

Autotransformer for portable application for the adjustment of the voltage in 110 Vac networks to 230 Vac equipment when no electrical isolation is required.

Sample application



Standards

Autotransformer
to: VDE 0570 Teil 2-13, DIN EN 61558-2-13, EN 61558-2-13, IEC 61558-2-13

Approvals

EAC

Autotransformer
JET

BLOCK Website

Electrical data

Typ	JET 250	JET 500	JET 1000
Input			
Rated input voltage	110 Vac	110 Vac	110 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output			
Rated output voltage	230 Vac	230 Vac	230 Vac
Rated Power	250 VA	500 VA	1.000 VA
No-load voltage (app. x factor)	1.04	1.04	1.03
Efficiency	94.0 %	91.0 %	96.0 %
Environment			
Ambient temperature max.	40 °C	40 °C	40 °C
Safety and protection			
Type	Resin encapsulated transformer	Resin encapsulated transformer	Resin encapsulated transformer
Insulation class	A	A	A
Protection index	IP 22	IP 22	IP 22
Safety class	I	I	I
Short circuit strength	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof
Order numbers			
Order Number	**JET 250**	**JET 500**	**JET 1000**

Autotransformer
JET

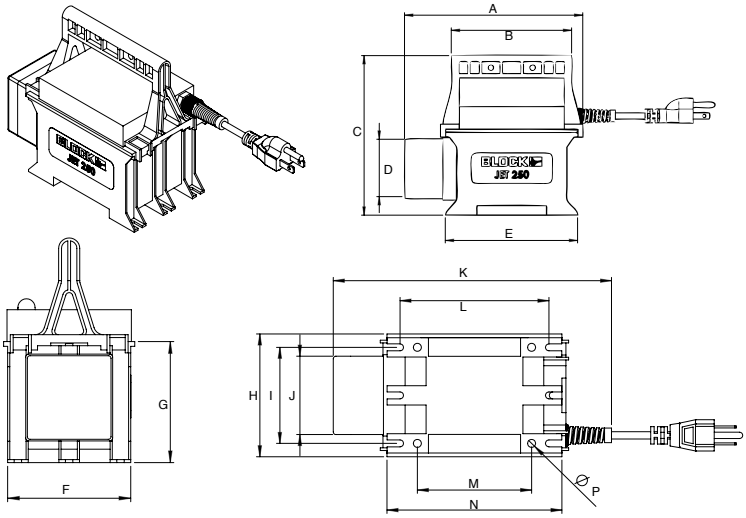
BLOCK Website

Mechanical data

Typ	Terminals Input	Terminals Output	Weight	Dimension picture (in mm)	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P
JET 250	Connecting cable with NEMAS-15 plug (USA)	Protective contact socket	3.1 kg	❶	180	119	160	56.8	130.8	86.5	85.1	92	72	58.8	210	111.5	85.5	131	6
JET 500	Connecting cable with NEMAS-15 plug (USA)	Protective contact socket	6.7 kg	❷	230	175	150	195	123	90	180	126	-	-	-	-	-	-	-
JET 1000	Connecting cable with NEMAS-15 plug (USA)	Protective contact socket	9.7 kg	❷	295	240	155	195	142	255	245	143	-	-	-	-	-	-	-

Dimension pictures

❶



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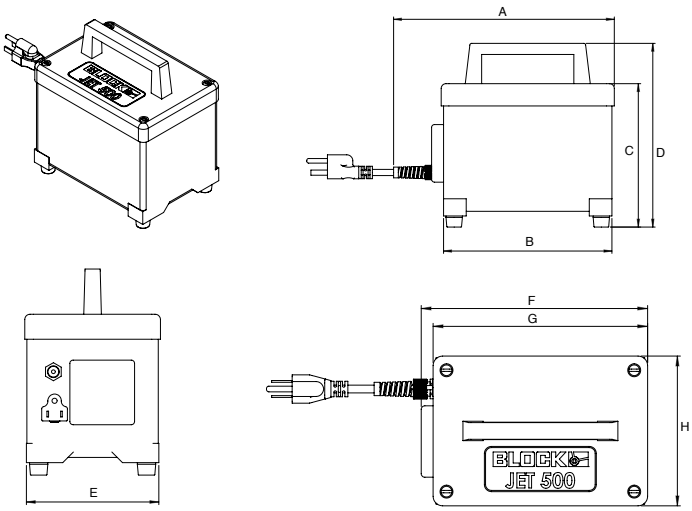
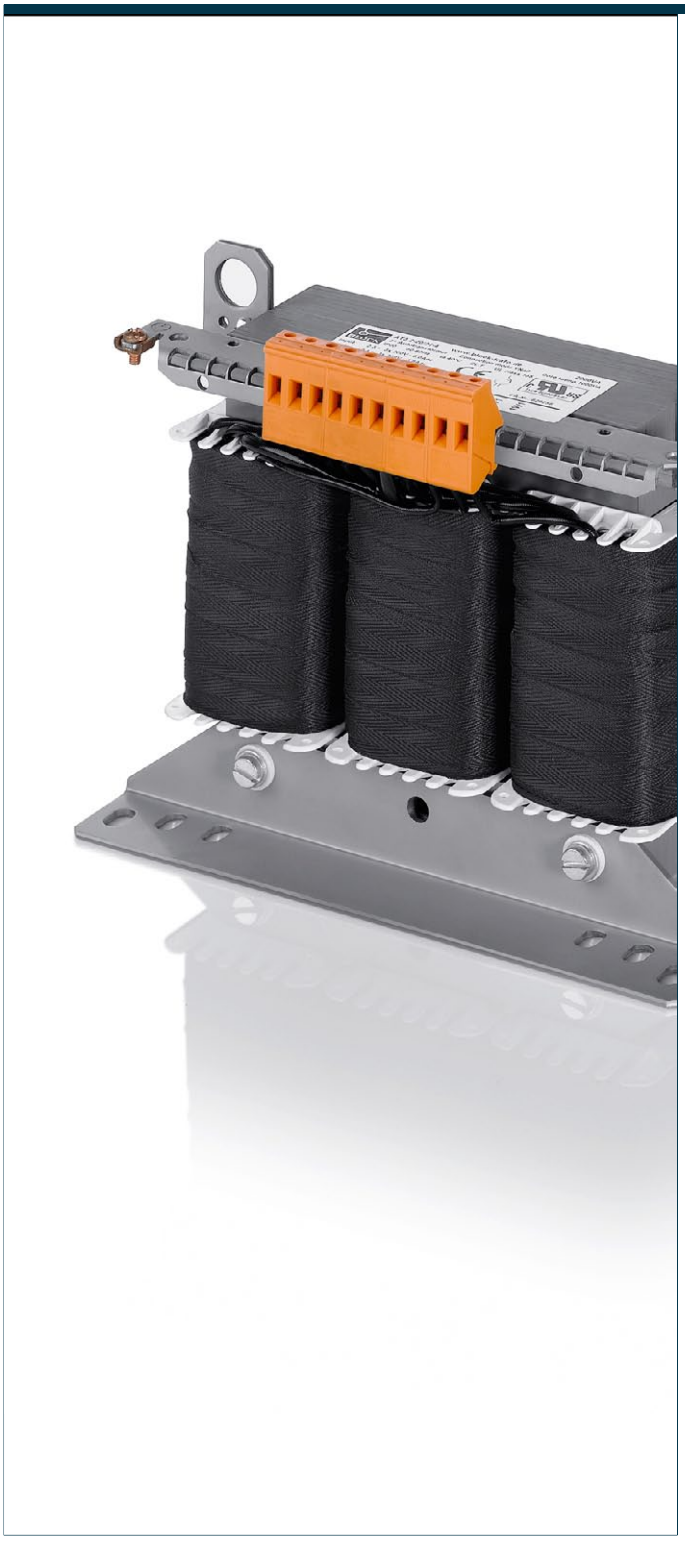


Autotransformer
AT3



General Data

Rated input voltage 3 x 200/208 - 3 x 690 Vac
Rated output voltage 3 x 400 Vac
Rated power 2000 - 250000 VA
Insulation class F
Maximum ambient temperature 40 °C
Efficiency up to 98 %
Degree of protection IP 00
Optionally adapted package for higher degrees of protection

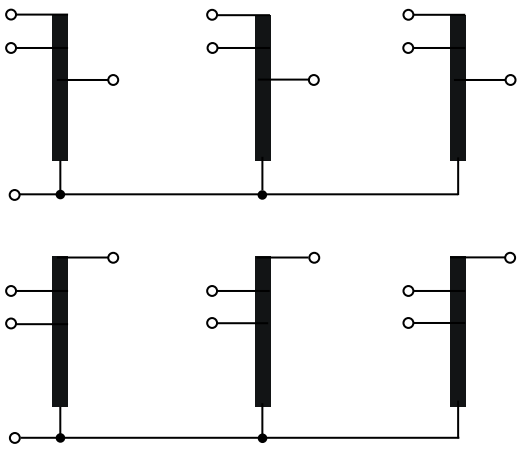
Advantages

Low weight and small size (compared to isolating transformers)
Very high efficiency
Patented assembly technology to lower heat losses
Very good corrosion protection and low noise thanks to vacuum impregnation
Fixed, contact protected screw connection terminals complying with UVV BGV A3
Multifunctional fixing rails with 12 oval slots
Enlarged fixing rail for easy installation from above
Integrated crane eyes

Applications

Autotransformer for adjustment of the voltage on the input and output sides with no requirement for electrical isolation.

Sample application



Standards

Autotransformer
to: VDE 0570 Teil 2-13, DIN EN 61558-2-13, EN 61558-2-13, IEC 61558-2-13, UL 5085-1/-2, CSA 22.2 No.66

Approvals

UL 5085-1/-2, CSA 22.2 No.66

Autotransformer
AT3

Electrical data

Typ	AT3 2-20/21-4	AT3 2-22/23-4	AT3 2-24/35-4	AT3 2-38/42-4	AT3 2-44/46-4	AT3 2-48/50-4
Input						
Rated input voltage	3 x 200/208 Vac	3 x 220/230 Vac	3 x 240/346 Vac	3 x 380/415 Vac	3 x 440/460 Vac	3 x 480/500 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated Power	2.000 VA	2.000 VA	2.000 VA	2.000 VA	2.000 VA	2.000 VA
Vector group	YNaO	YNaO	YNaO	YNaO	YNaO	YNaO
Efficiency	91.0 %	90.0 %	90.0 %	78.0 %	87.0 %	90.0 %
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	F	F	F	F	F	F
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Test voltage	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz
Order numbers						
Recommended enclosure	BGUK 10	BGUK 10	BGUK 10	BGUK 3	BGUK 10	BGUK 10
Order Number	**AT3 2-20/21-4**	**AT3 2-22/23-4**	**AT3 2-24/35-4**	**AT3 2-38/42-4**	**AT3 2-44/46-4**	**AT3 2-48/50-4**

Electrical data

Typ	AT3 2-58/60-4	AT3 2-69-4	AT3 3,5-20/21-4	AT3 3,5-22/23-4	AT3 3,5-24/35-4	AT3 3,5-38/42-4
Input						
Rated input voltage	3 x 575/600 Vac	3 x 600/690 Vac	3 x 200/208 Vac	3 x 220/230 Vac	3 x 240/346 Vac	3 x 380/415 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated Power	2.000 VA	2.000 VA	3.500 VA	3.500 VA	3.500 VA	3.500 VA
Vector group	YNaO	YNaO	YNaO	YNaO	YNaO	YNaO
Efficiency	88.0 %	90.0 %	93.0 %	93.0 %	91.0 %	86.0 %
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	F	F	F	F	F	F
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Test voltage	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz
Order numbers						
Recommended enclosure	BGUK 10	BGUK 10	BGUK 20	BGUK 20	BGUK 20	BGUK 10
Order Number	**AT3 2-58/60-4**	**AT3 2-69-4**	**AT3 3,5-20/21-4**	**AT3 3,5-22/23-4**	**AT3 3,5-24/35-4**	**AT3 3,5-38/42-4**

Autotransformer
AT3

ePLAN data portal | BLOCK Website

Electrical data

Typ	AT3 3,5-44/46-4	AT3 3,5-48/50-4	AT3 3,5-58/60-4	AT3 3,5-69-4	AT3 10-20/21-4	AT3 10-22/23-4
Input						
Rated input voltage	3 x 440/460 Vac	3 x 480/500 Vac	3 x 575/600 Vac	3 x 600/690 Vac	3 x 200/208 Vac	3 x 220/230 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated Power	3.500 VA	3.500 VA	3.500 VA	3.500 VA	10.000 VA	10.000 VA
Vector group	YNaO	YNaO	YNaO	YNaO	YNaO	YNaO
Efficiency	88.0 %	90.0 %	92.0 %	92.0 %	95.0 %	94.0 %
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	F	F	F	F	F	F
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Test voltage	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz
Order numbers						
Recommended enclosure	BGUK 10	BGUK 10	BGUK 20	BGUK 20	BGE-065	BGE-065
Order Number	**AT3 3,5-44/46-4**	**AT3 3,5-48/50-4**	**AT3 3,5-58/60-4**	**AT3 3,5-69-4**	**AT3 10-20/21-4**	**AT3 10-22/23-4**

Electrical data

Typ	AT3 10-24/35-4	AT3 10-38/42-4	AT3 10-44/46-4	AT3 10-48/50-4	AT3 10-58/60-4	AT3 10-69-4
Input						
Rated input voltage	3 x 240/346 Vac	3 x 380/415 Vac	3 x 440/460 Vac	3 x 480/500 Vac	3 x 575/600 Vac	3 x 600/690 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated Power	10.000 VA	10.000 VA	10.000 VA	10.000 VA	10.000 VA	10.000 VA
Vector group	YNaO	YNaO	YNaO	YNaO	YNaO	YNaO
Efficiency	95.0 %	84.0 %	91.0 %	93.0 %	94.0 %	95.0 %
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	F	F	F	F	F	F
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Test voltage	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz
Order numbers						
Recommended enclosure	BGE-065	BGUK 10	BGUK 20	BGUK 20	BGE-050	BGE-065
Order Number	**AT3 10-24/35-4**	**AT3 10-38/42-4**	**AT3 10-44/46-4**	**AT3 10-48/50-4**	**AT3 10-58/60-4**	**AT3 10-69-4**

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Electrical data

Typ	AT3 15-20/21-4	AT3 15-22/23-4	AT3 15-24/35-4	AT3 15-38/42-4	AT3 15-44/46-4	AT3 15-48/50-4
Input						
Rated input voltage	3 x 200/208 Vac	3 x 220/230 Vac	3 x 240/346 Vac	3 x 380/415 Vac	3 x 440/460 Vac	3 x 480/500 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated Power	15.000 VA	15.000 VA	15.000 VA	15.000 VA	15.000 VA	15.000 VA
Vector group	YNaO	YNaO	YNaO	YNaO	YNaO	YNaO
Efficiency	96.0 %	96.0 %	95.0 %	89.0 %	93.0 %	93.0 %
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	F	F	F	F	F	F
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Test voltage	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz
Order numbers						
Recommended enclosure	BGE-065	BGE-065	BGE-065	BGUK 10	BGUK 20	BGE-050
Order Number	**AT3 15-20/21-4**	**AT3 15-22/23-4**	**AT3 15-24/35-4**	**AT3 15-38/42-4**	**AT3 15-44/46-4**	**AT3 15-48/50-4**

Electrical data

Typ	AT3 15-58/60-4	AT3 15-69-4	AT3 25-20/21-4	AT3 25-22/23-4	AT3 25-24/35-4	AT3 25-38/42-4
Input						
Rated input voltage	3 x 575/600 Vac	3 x 600/690 Vac	3 x 200/208 Vac	3 x 220/230 Vac	3 x 240/346 Vac	3 x 380/415 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated Power	15.000 VA	15.000 VA	25.000 VA	25.000 VA	25.000 VA	25.000 VA
Vector group	YNaO	YNaO	YNaO	YNaO	YNaO	YNaO
Efficiency	95.0 %	95.0 %	97.0 %	96.0 %	96.0 %	90.0 %
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	F	F	F	F	F	F
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Test voltage	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz
Order numbers						
Recommended enclosure	BGE-065	BGE-065				BGUK 20
Order Number	**AT3 15-58/60-4**	**AT3 15-69-4**	**AT3 25-20/21-4**	**AT3 25-22/23-4**	**AT3 25-24/35-4**	**AT3 25-38/42-4**

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Typ	AT3 25-44/46-4	AT3 25-48/50-4	AT3 25-58/60-4	AT3 25-69-4	AT3 45-20/21-4	AT3 45-22/23-4
Input						
Rated input voltage	3 x 440/460 Vac	3 x 480/500 Vac	3 x 575/600 Vac	3 x 600/690 Vac	3 x 200/208 Vac	3 x 220/230 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated Power	25.000 VA	25.000 VA	25.000 VA	25.000 VA	45.000 VA	45.000 VA
Vector group	YNaO	YNaO	YNaO	YNaO	YNaO	YNaO
Efficiency	94.0 %	95.0 %	96.0 %	96.0 %	97.0 %	97.0 %
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	F	F	F	F	F	F
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Test voltage	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz
Order numbers						
Recommended enclosure	BGE-050	BGE-065			BGE-080	BGE-080
Order Number	**AT3 25-44/46-4**	**AT3 25-48/50-4**	**AT3 25-58/60-4**	**AT3 25-69-4**	**AT3 45-20/21-4**	**AT3 45-22/23-4**

Electrical data

Typ	AT3 45-24/35-4	AT3 45-38/42-4	AT3 45-44/46-4	AT3 45-48/50-4	AT3 45-58/60-4	AT3 45-69-4
Input						
Rated input voltage	3 x 240/346 Vac	3 x 380/415 Vac	3 x 440/460 Vac	3 x 480/500 Vac	3 x 575/600 Vac	3 x 600/690 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated Power	45.000 VA	45.000 VA	45.000 VA	45.000 VA	45.000 VA	45.000 VA
Vector group	YNaO	YNaO	YNaO	YNaO	YNaO	YNaO
Efficiency	97.0 %	92.0 %	95.0 %	96.0 %	97.0 %	97.0 %
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	-
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	F	F	F	F	F	F
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Test voltage	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz
Order numbers						
Recommended enclosure	BGE-080	BGE-050	BGE-065		BGE-080	BGE-080
Order Number	**AT3 45-24/35-4**	**AT3 45-38/42-4**	**AT3 45-44/46-4**	**AT3 45-48/50-4**	**AT3 45-58/60-4**	**AT3 45-69-4**

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Typ	AT3 70-20/21-4	AT3 70-22/23-4	AT3 70-24/35-4	AT3 70-38/42-4	AT3 70-44/46-4	AT3 70-48/50-4
Electrical data						
Input						
Rated input voltage	3 x 200/208 Vac	3 x 220/230 Vac	3 x 240/346 Vac	3 x 380/415 Vac	3 x 440/460 Vac	3 x 480/500 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated Power	70.000 VA	70.000 VA	70.000 VA	70.000 VA	70.000 VA	70.000 VA
Vector group	YNaO	YNaO	YNaO	YNaO	YNaO	YNaO
Efficiency	98.0 %	97.0 %	97.0 %	93.0 %	96.0 %	96.0 %
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	F	F	F	F	F	F
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Test voltage	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz
Order numbers						
Recommended enclosure	BGE-085	BGE-085	BGE-085	BGE-065		BGE-080
Order Number	**AT3 70-20/21-4**	**AT3 70-22/23-4**	**AT3 70-24/35-4**	**AT3 70-38/42-4**	**AT3 70-44/46-4**	**AT3 70-48/50-4**

Typ	AT3 70-58/60-4	AT3 70-69-4	AT3 110-20/21-4	AT3 110-22/23-4	AT3 110-24/35-4	AT3 110-38/42-4
Electrical data						
Input						
Rated input voltage	3 x 575/600 Vac	3 x 690 Vac	3 x 200/208 Vac	3 x 220/230 Vac	3 x 240/346 Vac	3 x 380/415 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated Power	70.000 VA	70.000 VA	110.000 VA	110.000 VA	110.000 VA	110.000 VA
Vector group	YNaO	YNaO	YNaO	YNaO	YNaO	YNaO
Efficiency	97.0 %	97.0 %	98.0 %	98.0 %	98.0 %	94.0 %
Approvals						
Approvals	cURus	-	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	F	F	F	F	F	F
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Test voltage	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz
Order numbers						
Recommended enclosure	BGE-080	BGE-080	BGE-085	BGE-085	BGE-085	BGE-065
Order Number	**AT3 70-58/60-4**	**AT3 70-69-4**	**AT3 110-20/21-4**	**AT3 110-22/23-4**	**AT3 110-24/35-4**	**AT3 110-38/42-4**

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Typ	AT3 110-44/46-4	AT3 110-48/50-4	AT3 110-58/60-4	AT3 110-69-4	AT3 160-20/21-4	AT3 160-22/23-4
Input						
Rated input voltage	3 x 440/460 Vac	3 x 480/500 Vac	3 x 575/600 Vac	3 x 690 Vac	3 x 200/208 Vac	3 x 220/230 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated Power	110.000 VA	110.000 VA	110.000 VA	110.000 VA	160.000 VA	160.000 VA
Vector group	YNaO	YNaO	YNaO	YNaO	YNaO	YNaO
Efficiency	96.0 %	97.0 %	97.0 %	98.0 %	98.0 %	98.0 %
Approvals						
Approvals	cURus	cURus	cURus	-	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	F	F	F	F	F	F
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Test voltage	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz
Order numbers						
Recommended enclosure	BGE-080	BGE-080	BGE-085	BGE-085	BGE-095	BGE-095
Order Number	**AT3 110-44/46-4**	**AT3 110-48/50-4**	**AT3 110-58/60-4**	**AT3 110-69-4**	**AT3 160-20/21-4**	**AT3 160-22/23-4**

Electrical data

Typ	AT3 160-24/35-4	AT3 160-38/42-4	AT3 160-44/46-4	AT3 160-48/50-4	AT3 160-58/60-4	AT3 160-69-4
Input						
Rated input voltage	3 x 240/346 Vac	3 x 380/415 Vac	3 x 440/460 Vac	3 x 480/500 Vac	3 x 575/600 Vac	3 x 690 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated Power	160.000 VA	160.000 VA	160.000 VA	160.000 VA	160.000 VA	160.000 VA
Vector group	YNaO	YNaO	YNaO	YNaO	YNaO	YNaO
Efficiency	98.0 %	94.0 %	96.0 %	97.0 %	98.0 %	98.0 %
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	-
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	F	F	F	F	F	F
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Test voltage	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz
Order numbers						
Recommended enclosure	BGE-095		BGE-085	BGE-085	BGE-085	BGE-095
Order Number	**AT3 160-24/35-4**	**AT3 160-38/42-4**	**AT3 160-44/46-4**	**AT3 160-48/50-4**	**AT3 160-58/60-4**	**AT3 160-69-4**

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Electrical data

Typ	AT3 250-20/21-4	AT3 250-22/23-4	AT3 250-24/35-4	AT3 250-38/42-4	AT3 250-44/46-4	AT3 250-48/50-4
Input						
Rated input voltage	3 x 200/208 Vac	3 x 220/230 Vac	3 x 240/346 Vac	3 x 380/415 Vac	3 x 440/460 Vac	3 x 480/500 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated Power	250.000 VA	250.000 VA	250.000 VA	250.000 VA	250.000 VA	250.000 VA
Vector group	YNaO	YNaO	YNaO	YNaO	YNaO	YNaO
Efficiency	98.0 %	98.0 %	98.0 %	95.0 %	96.0 %	98.0 %
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	F	F	F	F	F	F
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Test voltage	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz
Order numbers						
Recommended enclosure	BGE-130	BGE-130	BGE-095		BGE-095	BGE-095
Order Number	**AT3 250-20/21-4**	**AT3 250-22/23-4**	**AT3 250-24/35-4**	**AT3 250-38/42-4**	**AT3 250-44/46-4**	**AT3 250-48/50-4**

Electrical data

Typ	AT3 250-58/60-4	AT3 250-69-4
Input		
Rated input voltage	3 x 575/600 Vac	3 x 690 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz
Output		
Rated output voltage	3 x 400 Vac	3 x 400 Vac
Rated Power	250.000 VA	250.000 VA
Vector group	YNaO	YNaO
Efficiency	98.0 %	98.0 %
Approvals		
Approvals	cURus	-
Environment		
Ambient temperature max.	40 °C	40 °C
Safety and protection		
Type	Open type	Open type
Insulation class	F	F
Protection index	IP 00	IP 00
Safety class (prepared)	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof
Test voltage	4000 Vac, 50 Hz	4000 Vac, 50 Hz
Order numbers		
Recommended enclosure	BGE-095	BGE-130
Order Number	**AT3 250-58/60-4**	**AT3 250-69-4**

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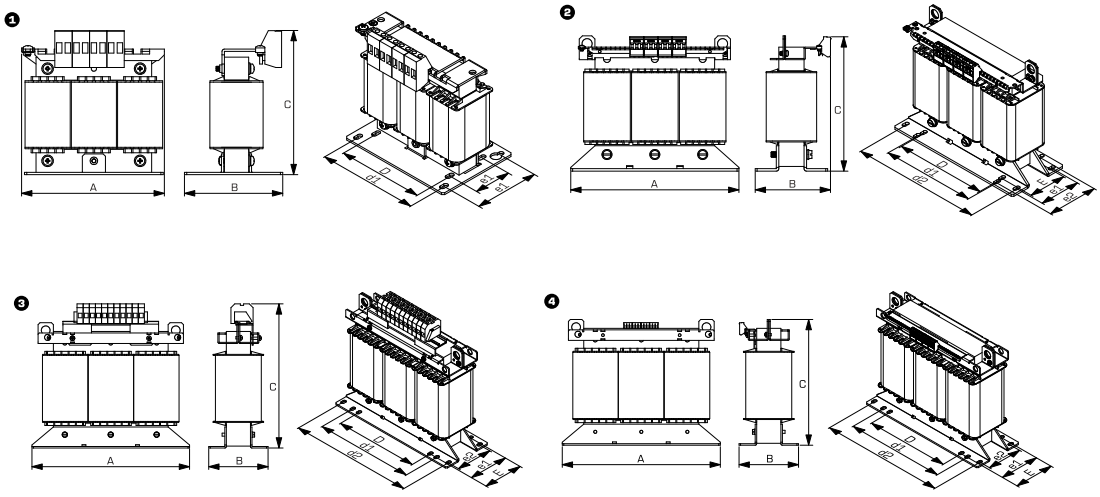
Mechanical data

Typ	Terminals	Fixing method	Fixing screws	Core type	Weight	Dimension picture (in mm)	A	B	C	D	d1	d2	E	e1	e2	F	G	H	I	J	K
AT3 2-20/21-4	Screw-type terminals	Fixing rail	M6	3 UI 90/51,5	10.5 kg	2	220	125	175	136	170	201	77	78	91	-	-	-	-	-	-
AT3 2-22/23-4	Screw-type terminals	Fixing rail	M6	3 UI 90/51,5	10.5 kg	2	220	125	175	136	170	201	77	78	91	-	-	-	-	-	-
AT3 2-24/35-4	Screw-type terminals	Fixing rail	M6	3 UI 90/41,5	9.8 kg	2	220	115	175	136	170	201	67	68	81	-	-	-	-	-	-
AT3 2-38/42-4	Screw-type terminals	Fixing rail	M4	3 UI 60/21	2.2 kg	1	125	85	125	90	105	-	39	70	-	-	-	-	-	-	-
AT3 2-44/46-4	Screw-type terminals	Fixing rail	M5	3 UI 75/26,5	4.1 kg	1	155	95	155	113	135	-	50	80	-	-	-	-	-	-	-
AT3 2-48/50-4	Screw-type terminals	Fixing rail	M5	3 UI 75/41,5	6.1 kg	1	155	110	155	113	135	-	65	95	-	-	-	-	-	-	-
AT3 2-58/60-4	Screw-type terminals	Fixing rail	M6	3 UI 90/31,5	7.5 kg	2	220	105	175	136	170	201	57	58	71	-	-	-	-	-	-
AT3 2-69-4	Screw-type terminals	Fixing rail	M6	3 UI 90/41,5	10.0 kg	2	220	115	175	136	170	201	67	68	81	-	-	-	-	-	-
AT3 3,5-20/21-4	Screw-type terminals	Fixing rail	M6	3 UI 114/64	20.0 kg	2	267	150	220	176	180	249	95	103	122	-	-	-	-	-	-
AT3 3,5-22/23-4	Screw-type terminals	Fixing rail	M6	3 UI 114/64	20.7 kg	2	267	150	220	176	180	249	95	103	122	-	-	-	-	-	-
AT3 3,5-24/35-4	Screw-type terminals	Fixing rail	M6	3 UI 114/40	14.5 kg	2	267	125	215	176	180	249	71	79	98	-	-	-	-	-	-
AT3 3,5-38/42-4	Screw-type terminals	Fixing rail	M5	3 UI 75/26,5	4.3 kg	1	155	95	155	113	135	-	50	80	-	-	-	-	-	-	-
AT3 3,5-44/46-4	Screw-type terminals	Fixing rail	M5	3 UI 75/41,5	6.1 kg	1	155	110	155	113	135	-	65	95	-	-	-	-	-	-	-
AT3 3,5-48/50-4	Screw-type terminals	Fixing rail	M6	3 UI 90/41,5	8.7 kg	2	220	115	175	136	170	201	67	68	81	-	-	-	-	-	-
AT3 3,5-58/60-4	Screw-type terminals	Fixing rail	M6	3 UI 114/40	14.2 kg	2	267	125	215	176	180	249	71	79	98	-	-	-	-	-	-
AT3 3,5-69-4	Screw-type terminals	Fixing rail	M6	3 UI 114/40	15.0 kg	2	267	125	215	176	180	249	71	79	98	-	-	-	-	-	-
AT3 10-20/21-4	Screw-type terminals	Fixing rail	M8	3 UI 150/77	47.6 kg	2	350	192	280	224	240	328	119	129	145	-	-	-	-	-	-
AT3 10-22/23-4	Screw-type terminals	Fixing rail	M8	3 UI 150/77	42.4 kg	2	350	192	280	224	240	328	119	129	145	-	-	-	-	-	-
AT3 10-24/35-4	Screw-type terminals	Fixing rail	M8	3 UI 150/65	39.3 kg	2	350	162	280	224	240	328	107	117	133	-	-	-	-	-	-
AT3 10-38/42-4	Screw-type terminals	Fixing rail	M6	3 UI 90/31,5	7.0 kg	2	220	105	175	136	170	201	57	58	71	-	-	-	-	-	-
AT3 10-44/46-4	Screw-type terminals	Fixing rail	M6	3 UI 114/40	14.4 kg	2	267	125	215	176	180	249	71	79	98	-	-	-	-	-	-
AT3 10-48/50-4	Screw-type terminals	Fixing rail	M6	3 UI 114/64	20.8 kg	2	267	150	220	176	180	249	95	103	122	-	-	-	-	-	-
AT3 10-58/60-4	Screw-type terminals	Fixing rail	M8	3 UI 132/72	32.1 kg	2	315	165	250	200	215	292	102	124	126	-	-	-	-	-	-
AT3 10-69-4	Screw-type terminals	Fixing rail	M8	3 UI 150/65	38.0 kg	2	350	162	280	224	240	328	107	117	133	-	-	-	-	-	-
AT3 15-20/21-4	Screw-type terminals	Fixing rail	M8	3 UI 180/78	67.6 kg	3	410	180	380	264	310	388	140	140	130	-	-	-	-	-	-
AT3 15-22/23-4	Screw-type terminals	Fixing rail	M8	3 UI 180/78	64.9 kg	4	410	195	345	264	310	388	140	140	130	-	-	-	-	-	-
AT3 15-24/35-4	Screw-type terminals	Fixing rail	M8	3 UI 180/63	54.4 kg	4	410	175	345	264	310	388	125	125	115	-	-	-	-	-	-

Dimension pictures



Autotransformer
AT3

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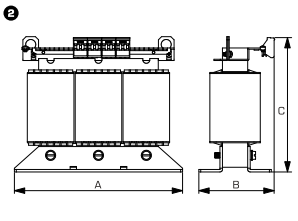
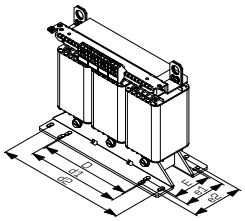
Mechanical data

Typ	Terminals	Fixing method	Fixing screws	Core type	Weight	Dimension picture (in mm)	A	B	C	D	d1	d2	E	e1	e2	F	G	H	I	J	K
AT3 15-38/42-4	Screw-type terminals	Fixing rail	M6	3 UI 90/51,1	10.0 kg	2	220	125	175	136	170	201	77	78	91	-	-	-	-	-	-
AT3 15-44/46-4	Screw-type terminals	Fixing rail	M6	3 UI 114/64	20.1 kg	2	267	150	215	176	180	249	95	103	122	-	-	-	-	-	-
AT3 15-48/50-4	Screw-type terminals	Fixing rail	M8	3 UI 132/72	29.4 kg	2	315	165	250	200	215	292	102	104	126	-	-	-	-	-	-
AT3 15-58/60-4	Screw-type terminals	Fixing rail	M8	3 UI 150/77	44.0 kg	2	350	177	280	224	240	328	119	129	145	-	-	-	-	-	-
AT3 15-69-4	Screw-type terminals	Fixing rail	M8	3 UI 180/63	58.0 kg	4	410	155	340	264	310	388	125	125	115	-	-	-	-	-	-
AT3 25-20/21-4	Screw-type terminals	Fixing rail	M10	3 UI 210/88	103.0 kg	3	480	220	440	316	370	450	158	166	148	-	-	-	-	-	-
AT3 25-22/23-4	Screw-type terminals	Fixing rail	M10	3 UI 210/88	99.3 kg	3	480	220	440	316	370	450	158	166	148	-	-	-	-	-	-
AT3 25-24/35-4	Screw-type terminals	Fixing rail	M10	3 UI 210/73	83.4 kg	3	480	180	430	316	370	450	143	151	133	-	-	-	-	-	-
AT3 25-38/42-4	Screw-type terminals	Fixing rail	M6	3 UI 114/40	15.0 kg	2	267	145	220	176	180	249	71	79	98	-	-	-	-	-	-
AT3 25-44/46-4	Screw-type terminals	Fixing rail	M8	3 UI 132/72	30.3 kg	2	315	185	255	200	215	292	102	124	126	-	-	-	-	-	-
AT3 25-48/50-4	Screw-type terminals	Fixing rail	M8	3 UI 150/77	44.0 kg	2	350	192	280	224	240	328	119	129	145	-	-	-	-	-	-
AT3 25-58/60-4	Screw-type terminals	Fixing rail	M10	3 UI 210/63	75.6 kg	4	480	182	395	316	370	450	133	141	123	-	-	-	-	-	-
AT3 25-69-4	Screw-type terminals	Fixing rail	M10	3 UI 210/73	83.0 kg	4	480	192	395	316	370	450	143	151	133	-	-	-	-	-	-
AT3 45-20/21-4	Screw-type terminals	Fixing rail	M12	3 UI 240/140	197.0 kg	3	550	290	510	356	430	516	214	240	212	-	-	-	-	-	-
AT3 45-22/23-4	Screw-type terminals	Fixing rail	M12	3 UI 240/110	162.0 kg	3	550	260	510	356	430	516	184	210	182	-	-	-	-	-	-
AT3 45-24/35-4	Screw-type terminals	Fixing rail	M12	3 UI 240/110	149.0 kg	3	550	260	510	356	430	516	184	210	182	-	-	-	-	-	-
AT3 45-38/42-4	Screw-type terminals	Fixing rail	M8	3 UI 132/46	23.9 kg	3	315	170	295	200	215	292	76	78	100	-	-	-	-	-	-
AT3 45-44/46-4	Screw-type terminals	Fixing rail	M8	3 UI 180/63	59.9 kg	3	410	155	380	264	310	388	125	125	115	-	-	-	-	-	-
AT3 45-48/50-4	Screw-type terminals	Fixing rail	M10	3 UI 210/63	77.3 kg	3	480	170	425	316	370	450	133	141	123	-	-	-	-	-	-
AT3 45-58/60-4	Screw-type terminals	Fixing rail	M12	3 UI 240/83	125.0 kg	3	550	240	480	356	430	516	157	183	155	-	-	-	-	-	-
AT3 45-69-4	Screw-type terminals	Fixing rail	M12	3 UI 240/110	116.0 kg	3	550	260	485	356	430	516	184	210	182	-	-	-	-	-	-
AT3 70-20/21-4	Screw-type terminals	Fixing rail	M12	3 UI 240/140	239.0 kg	3	550	290	520	356	430	516	214	240	212	-	-	-	-	-	-

Dimension pictures

2





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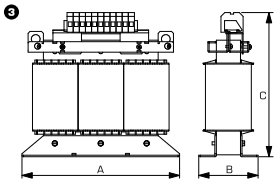

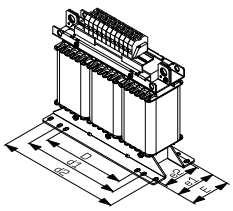

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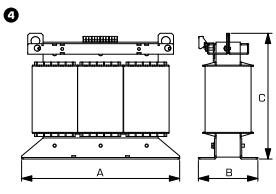
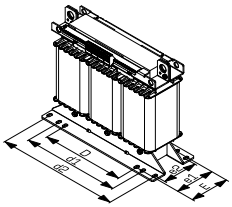




Autotransformer
AT3

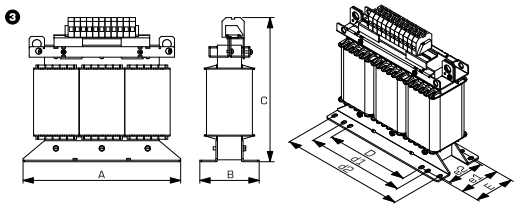
ePLAN data portal BLOCK Website

Mechanical data 30

Typ	Terminals	Fixing method	Fixing screws	Core type	Weight	Dimension picture (in mm)	A	B	C	D	d1	d2	E	e1	e2	F	G	H	I	J	K
AT3 70-22/23-4	Screw-type terminals	Fixing rail	M12	3 UI 240/140	218.0 kg	3	550	290	520	356	430	516	214	240	212	-	-	-	-	-	-
AT3 70-24/35-4	Screw-type terminals	Fixing rail	M12	3 UI 240/140	212.0 kg	3	550	290	520	356	430	516	214	240	212	-	-	-	-	-	-
AT3 70-38/42-4	Screw-type terminals	Fixing rail	M8	3 UI 150/65	38.9 kg	3	350	185	320	224	240	328	107	117	133	-	-	-	-	-	-
AT3 70-44/46-4	Screw-type terminals	Fixing rail	M10	3 UI 210/63	83.2 kg	3	480	195	440	316	370	450	133	141	123	-	-	-	-	-	-
AT3 70-48/50-4	Screw-type terminals	Fixing rail	M12	3 UI 240/83	123.0 kg	3	550	240	485	356	430	516	157	183	155	-	-	-	-	-	-
AT3 70-58/60-4	Screw-type terminals	Fixing rail	M12	3 UI 240/140	192.0 kg	3	550	290	485	356	430	516	214	240	212	-	-	-	-	-	-
AT3 70-69-4	Screw-type terminals	Fixing rail	M12	3 UI 240/140	199.0 kg	3	550	290	485	356	430	516	214	240	212	-	-	-	-	-	-
AT3 110-20/21-4	Screw-type terminals	Fixing rail	M12	3 UI 270/135	264.0 kg	5	530	430	500	180	490	-	200	-	-	-	-	-	-	-	-
AT3 110-22/23-4	Screw-type terminals	Fixing rail	M12	3 UI 270/120	258.0 kg	5	530	415	500	180	490	-	185	-	-	-	-	-	-	-	-
AT3 110-24/35-4	Screw-type terminals	Fixing rail	M12	3 UI 270/120	243.0 kg	5	530	400	500	180	490	-	185	-	-	-	-	-	-	-	-
AT3 110-38/42-4	Screw-type terminals	Fixing rail	M8	3 UI 180/63	54.4 kg	3	410	165	415	264	310	388	125	125	115	-	-	-	-	-	-
AT3 110-44/46-4	Screw-type terminals	Fixing rail	M12	3 UI 240/83	123.0 kg	3	550	240	520	356	430	516	157	183	155	-	-	-	-	-	-
AT3 110-48/50-4	Screw-type terminals	Fixing rail	M12	3 UI 240/110	166.0 kg	3	550	260	520	356	430	516	184	210	182	-	-	-	-	-	-
AT3 110-58/60-4	Screw-type terminals	Fixing rail	M12	3 UI 270/120	220.0 kg	5	530	380	500	180	490	-	185	-	-	-	-	-	-	-	-
AT3 110-69-4	Screw-type terminals	Fixing rail	M12	3 UI 270/120	251.0 kg	5	530	380	500	180	490	-	185	-	-	-	-	-	-	-	-
AT3 160-20/21-4	Screw-type terminals	Fixing rail	M12	3 UI 300/150	380.0 kg	6	600	420	635	200	540	-	215	-	-	-	-	-	-	-	-
AT3 160-22/23-4	Screw-type terminals	Fixing rail	M12	3 UI 300/125	336.0 kg	6	600	390	635	200	540	-	190	-	-	-	-	-	-	-	-
AT3 160-24/35-4	Screw-type terminals	Fixing rail	M12	3 UI 300/125	310.0 kg	6	600	390	635	200	540	-	190	-	-	-	-	-	-	-	-
AT3 160-38/42-4	Screw-type terminals	Fixing rail	M10	3 UI 210/63	82.0 kg	3	480	235	490	316	370	450	133	141	123	-	-	-	-	-	-
AT3 160-44/46-4	Screw-type terminals	Fixing rail	M12	3 UI 240/110	166.0 kg	3	550	260	545	356	430	516	184	210	182	-	-	-	-	-	-
AT3 160-48/50-4	Screw-type terminals	Fixing rail	M12	3 UI 240/140	213.0 kg	3	550	290	520	356	430	516	214	240	212	-	-	-	-	-	-
AT3 160-58/60-4	Screw-type terminals	Fixing rail	M12	3 UI 270/120	269.0 kg	5	545	400	500	180	490	-	185	-	-	-	-	-	-	-	-

Dimension pictures

3



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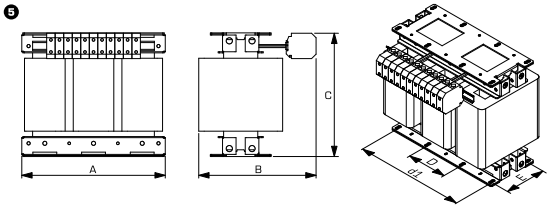

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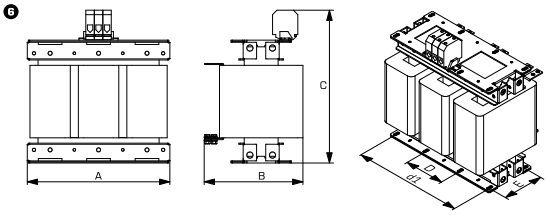


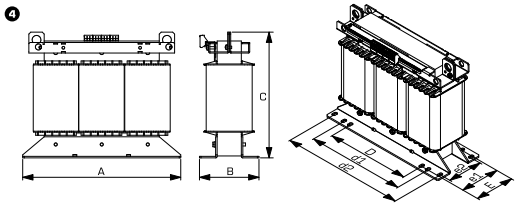
Autotransformer
AT3

Mechanical data

Typ	Terminals	Fixing method	Fixing screws	Core type	Weight	Dimension picture (in mm)	A	B	C	D	d1	d2	E	e1	e2	F	G	H	I	J	K
AT3 160-69-4	Screw-type terminals	Fixing rail	M12	3 UI 300/125	334.0 kg	5	600	480	550	200	540	-	190	-	-	-	-	-	-	-	-
AT3 250-20/21-4	Screw-type terminals	Fixing rail	M16	3 UI 375/150	545.0 kg	8	750	605	730	500	-	-	490	-	-	-	-	-	-	-	-
AT3 250-22/23-4	Screw-type terminals	Fixing rail	M16	3 UI 375/150	550.0 kg	8	750	605	730	500	-	-	490	-	-	-	-	-	-	-	-
AT3 250-24/35-4	Screw-type terminals	Fixing rail	M12	3 UI 300/175	439.0 kg	8	600	510	550	200	540	-	240	-	-	-	-	-	-	-	-
AT3 250-38/42-4	Screw-type terminals	Fixing rail	M10	3 UI 210/88	104.0 kg	4	480	270	395	316	370	450	158	166	148	-	-	-	-	-	-
AT3 250-44/46-4	Screw-type terminals	Fixing rail	M12	3 UI 270/120	210.0 kg	5	530	415	500	180	490	-	185	-	-	-	-	-	-	-	-
AT3 250-48/50-4	Screw-type terminals	Fixing rail	M12	3 UI 270/120	266.0 kg	5	530	415	500	180	490	-	185	-	-	-	-	-	-	-	-
AT3 250-58/60-4	Screw-type terminals	Fixing rail	M12	3 UI 300/150	390.0 kg	5	600	505	550	200	540	-	215	-	-	-	-	-	-	-	-
AT3 250-69-4	Screw-type terminals	Fixing rail	M16	3 UI 375/150	510.0 kg	8	750	605	730	500	-	-	490	-	-	-	-	-	-	-	-

Dimension pictures

4



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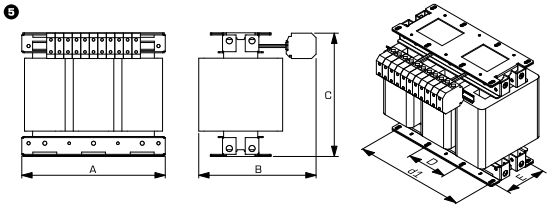

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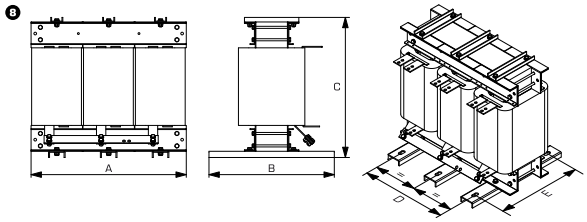

Autotransformer
DSP

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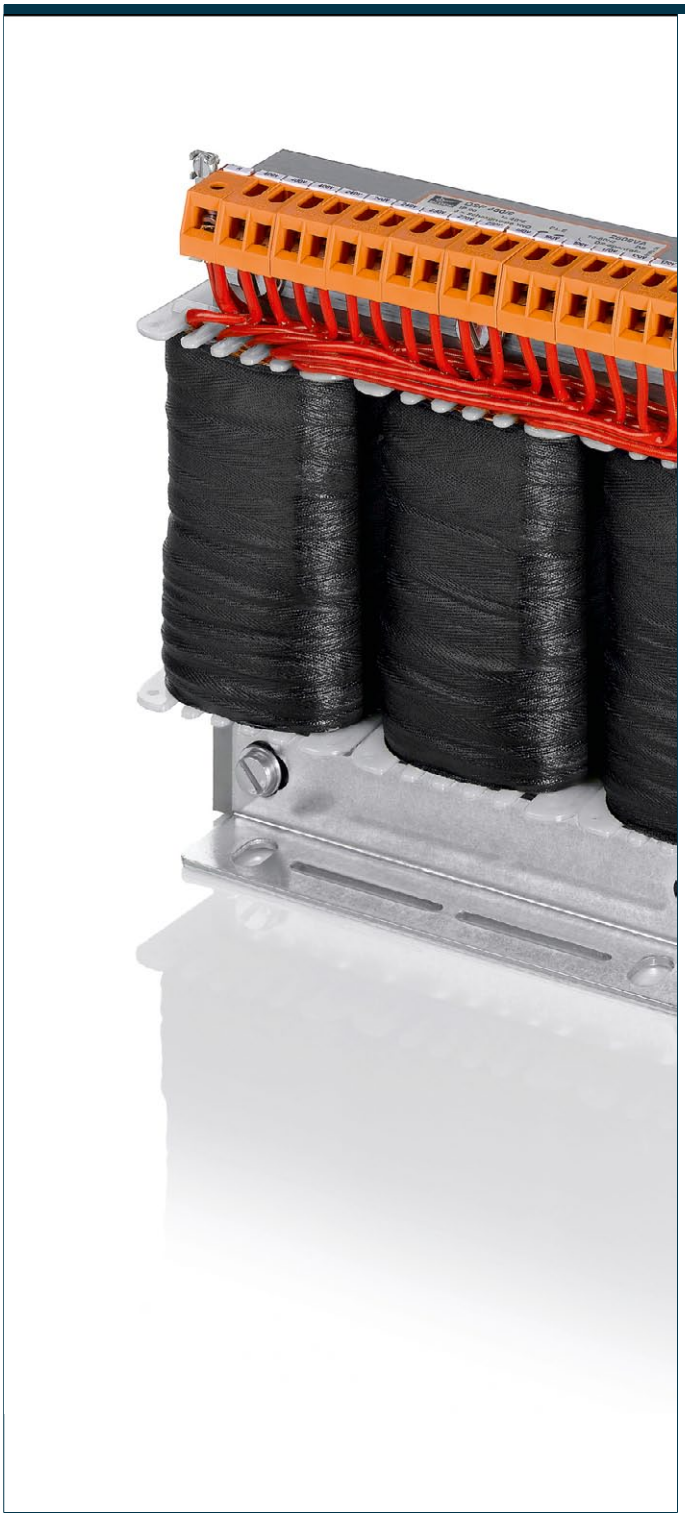


General Data

Rated input voltage 3 x 400 Vac
Rated output voltage 3 x 130 - 3 x 240 Vac (5 stages)
Rated current 3 x 1.5 - 3 x 15 A
Insulation class E
Maximum ambient temperature 40 °C
Degree of protection IP 00

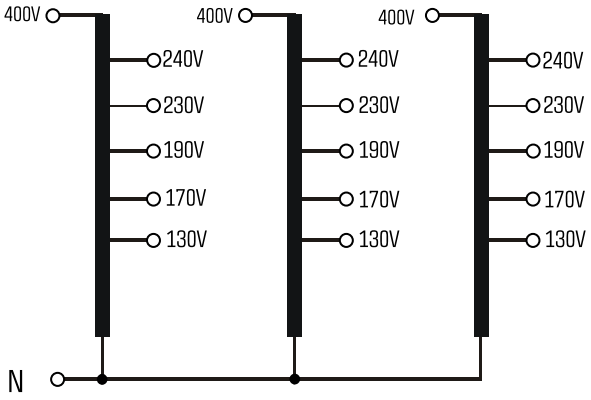
Advantages

Low weight and small size (compared to isolating transformers)
Very high efficiency
Very good moisture protection and low noise thanks to vacuum impregnation
Contact protected screw connection terminals complying with UVV BGV A3
Simple mounting thanks to robust metal fixing rail with oval slots

Applications

Autotransformer for example for setting the speed of single-phase fan motors.

Sample application



Standards

Autotransformer
to: VDE 0570 Teil 2-13, DIN EN 61558-2-13, EN 61558-2-13, IEC 61558-2-13

Approvals

EAC

Autotransformer
DSP

BLOCK Website

Electrical data

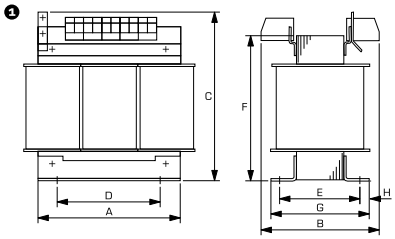
Typ	DSP 400/1,5	DSP 400/3	DSP 400/6	DSP 400/9	DSP 400/15
Input					
Rated input voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output					
Rated output voltage	3 x 240 Vac/3 x 230 Vac 3 x 190 Vac/3 x 170 Vac/3	3 x 240 Vac/3 x 230 Vac 3 x 190 Vac/3 x 170 Vac/3	3 x 240 Vac/3 x 230 Vac 3 x 190 Vac/3 x 170 Vac/3	3 x 240 Vac/3 x 230 Vac 3 x 190 Vac/3 x 170 Vac/3	3 x 240 Vac/3 x 230 Vac 3 x 190 Vac/3 x 170 Vac/3
Rated output current	3 x 1.5 A	3 x 3 A	3 x 6 A	3 x 9 A	3 x 15 A
Vector group	YNaO	YNaO	YNaO	YNaO	YNaO
Environment					
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection					
Insulation class	E	E	E	E	E
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Order numbers					
Order Number	**DSP 400/1,5**	**DSP 400/3**	**DSP 400/6**	**DSP 400/9**	**DSP 400/15**

Mechanical data

Safety and protection					
Type	Open type	Open type	Open type	Open type	Open type
Terminal and mounting					
Terminals	Screw-type terminals	Screw-type terminals	Screw-type terminals	Screw-type terminals	Screw-type terminals
Fixing method	Fixing rail	Fixing rail	Fixing rail	Fixing rail	Fixing rail
Fixing screws	M5	M6	M6	M8	M8
Measures and weights					
Weight	3.80 kg	6.50 kg	13.50 kg	17.80 kg	30.00 kg
Dimension picture (in mm)	❶	❶	❶	❶	❶
A	150	179	238	263	263
B	90	97	112	110	137
C	160	180	220	243	243
D	113	136	140	200	200
E	49	56	82	75	101
F	133	158	202	230	230
G	67	76	112	107	133
H	9	10	15.5	16	16

Dimension pictures

❶



Variable transformer
ESS

BLOCK Website

General Data

Rated input voltage 230 Vac
Rated output voltage 0 - 250 Vac
Rated current 0.8 - 20 A
Insulation class B
Maximum ambient temperature 45 °C
Degree of protection IP 00

Advantages

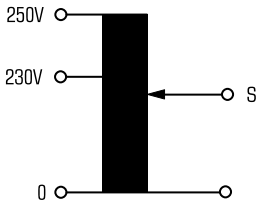
Stepless adjustment of the AC voltage from zero to the maximum value
Self-cleaning of the exposed contact tracks
4-point flange mounting
Rotary knobs and scales optionally available

Applications

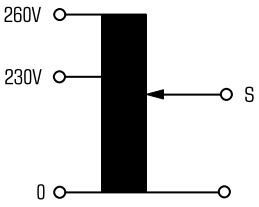
Variable auto transformer for continuous adjustment of AC voltages or currents under load.

Sample application

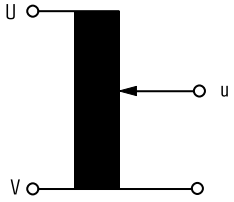
Serie 100



Serie 300



Serie 9000



Standards

Variable transformer
to: VDE 0552

Approvals

EAC

Variable transformer
ESS

BLOCK Website

Electrical data

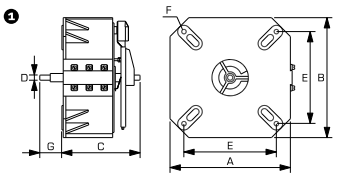
Typ	ESS 102	ESS 103	ESS 104	ESS 106	ESS 108	ESS 110
Input						
Rated input voltage	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Angle of rotation	320 °	320 °	320 °	320 °	320 °	320 °
Rated output voltage	0...230/250 Vac	0...230/250 Vac	0...230/250 Vac	0...230/250 Vac	0...230/250 Vac	0...230/250 Vac
Rated output current	2.00 A	3.15 A	4.00 A	6.30 A	8.00 A	10.00 A
Environment						
Ambient temperature max.	45 °C	45 °C	45 °C	45 °C	45 °C	45 °C
Safety and protection						
Insulation class	B	B	B	B	B	B
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Test voltage control spindle	4 kV	4 kV	4 kV	4 kV	4 kV	4 kV
Order numbers						
Order Number	**ESS 102**	**ESS 103**	**ESS 104**	**ESS 106**	**ESS 108**	**ESS 110**

Mechanical data

Terminal and mounting						
Terminals	Screw-type terminals	Screw-type terminals	Screw-type terminals	Screw-type terminals	Screw-type terminals	Screw-type terminals
Fixing method	4-point bolted flange joint	4-point bolted flange joint	4-point bolted flange joint	4-point bolted flange joint	4-point bolted flange joint	4-point bolted flange joint
Measures and weights						
Weight	2.60 kg	3.80 kg	3.80 kg	5.20 kg	7.80 kg	7.80 kg
Accessory						
Rotary knob (optional)	AZ 50/6-1	AZ 50/6-1	AZ 50/6-1	AZ 50/6-1	AZ 50/8-1	AZ 50/8-1
Scale (optional)	SK/120	SK/120	SK/120	SK/120	SK/120	SK/120
Dimension picture (in mm)	❶	❶	❶	❶	❶	❶
A	137	159	159	159	197	197
B	125	147	147	147	185	185
C	84	84	84	103	118	118
D	6	6	6	6	8	8
E	96	112	112	112	142	142
F	5.8	5.8	5.8	7	7	7
G	32	32	32	32	32	32

Dimension pictures

❶



Variable transformer
ESS

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Electrical data

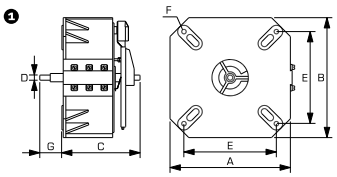
Typ	ESS 118	ESS 120	ESS 302	ESS 303	ESS 305	ESS 308
Input						
Rated input voltage	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Angle of rotation	320 °	320 °	320 °	320 °	320 °	320 °
Rated output voltage	0...230/250 Vac	0...230/250 Vac	0...230/260 Vac	0...230/260 Vac	0...230/260 Vac	0...230/260 Vac
Rated output current	18.00 A	20.00 A	1.80 A	3.15 A	5.00 A	8.00 A
Environment						
Ambient temperature max.	45 °C	45 °C	45 °C	45 °C	45 °C	45 °C
Safety and protection						
Insulation class	B	B	B	B	B	B
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Test voltage control spindle	4 kV	4 kV	4 kV	4 kV	4 kV	4 kV
Order numbers						
Order Number	**ESS 118**	**ESS 120**	**ESS 302**	**ESS 303**	**ESS 305**	**ESS 308**

Mechanical data

Terminal and mounting						
Terminals	Screw-type terminals	Screw-type terminals	Screw-type terminals	Screw-type terminals	Screw-type terminals	Screw-type terminals
Fixing method	4-point bolted flange joint	4-point bolted flange joint	4-point bolted flange joint	4-point bolted flange joint	4-point bolted flange joint	4-point bolted flange joint
Measures and weights						
Weight	14.00 kg	14.00 kg	2.60 kg	3.80 kg	5.20 kg	7.80 kg
Accessory						
Rotary knob (optional)	AZ 50/8-1	AZ 50/8-1	AZ 50/6-1	AZ 50/6-1	AZ 50/6-1	AZ 50/8-1
Scale (optional)	SK/120	SK/120	SK/120	SK/120	SK/120	SK/120
Dimension picture (in mm)	❶	❶	❶	❶	❶	❶
A	243	243	137	159	159	197
B	231	231	125	147	147	185
C	121	121	84	84	103	118
D	8	8	6	6	6	8
E	180	180	96	112	112	142
F	11	11	5.8	5.8	7	7
G	32	32	32	32	32	32

Dimension pictures

❶



Variable transformer
ESS

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Electrical data

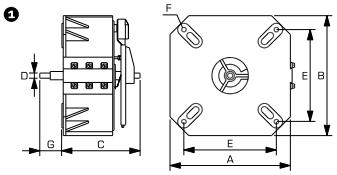
Typ	ESS 318	ESS 9008	ESS 9013
Input			
Rated input voltage	230 Vac	230 Vac	230 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output			
Angle of rotation	320 °	320 °	320 °
Rated output voltage	0...230/260 Vac	0...230 Vac	0...230 Vac
Rated output current	18.00 A	0.80 A	1.25 A
Environment			
Ambient temperature max.	45 °C	45 °C	45 °C
Safety and protection			
Insulation class	B	B	B
Protection index	IP 00	IP 00	IP 00
Test voltage control spindle	4 kV	4 kV	4 kV
Order numbers			
Order Number	**ESS 318**	**ESS 9008**	**ESS 9013**

Mechanical data

Terminal and mounting			
Terminals	Screw-type terminals	Screw-type terminals	Screw-type terminals
Fixing method	4-point bolted flange joint	Fixing hole	Fixing hole
Measures and weights			
Weight	14.00 kg	1.40 kg	1.40 kg
Accessory			
Rotary knob (optional)	AZ 50/8-1	AZ 50/6-1	AZ 50/6-1
Scale (optional)	SK/120	SK/85	SK/120
Dimension picture (in mm)	❶	❷	❷
A	243	94.5	94.5
B	231	98	95
C	121	58	58
D	8	6	6
E	180	-	-
F	11	3	3
G	32	23	28

Dimension pictures

❶



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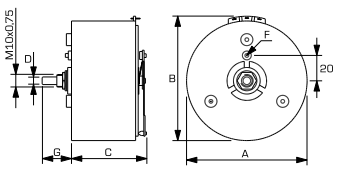
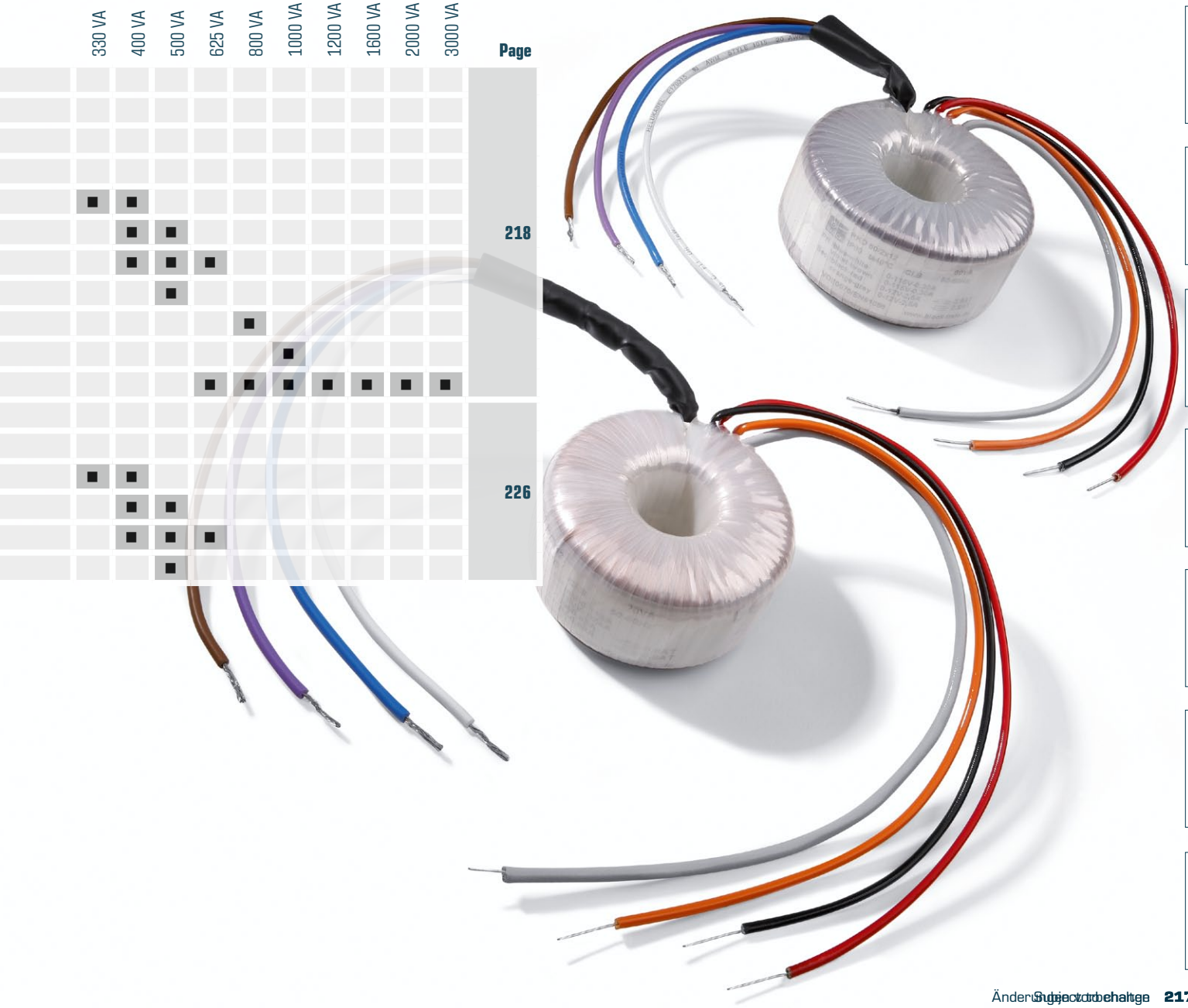


OVERVIEW
TOROIDAL TRANSFORMERS

Type	Features	Rated input voltage	Rated output voltage	15 VA	20 VA	30 VA	40 VA	50 VA	60 VA	80 VA	100 VA	120 VA	160 VA	200 VA	225 VA	250 VA	300 VA
RKD	Double input voltage	2 x 115 Vac	2 x 6 Vac	■		■	■		■								
			2 x 9 Vac	■		■	■		■		■	■					
			2 x 12 Vac	■	■	■	■	■	■	■	■	■	■	■	■	■	■
			2 x 15 Vac	■	■	■	■	■	■	■	■	■	■	■	■		
			2 x 18 Vac	■	■	■	■	■	■	■	■	■	■	■	■	■	■
			2 x 24 Vac		■	■	■	■	■	■	■	■	■	■	■	■	■
			2 x 30 Vac													■	
			2 x 35 Vac														
			2 x 40 Vac														
			2 x 50 Vac														
			2 x 115 Vac														
RTE	Integral temperature fuse	230 Vac	2 x 12 Vac	■	■	■	■	■	■	■	■	■	■	■	■	■	
			2 x 15 Vac	■	■	■	■	■	■	■	■	■	■	■	■		
			2 x 18 Vac	■	■	■	■	■	■	■	■	■	■	■	■	■	■
			2 x 24 Vac		■	■	■	■	■	■	■	■	■	■	■	■	■
			2 x 30 Vac													■	
			2 x 35 Vac														

330 VA	400 VA	500 VA	625 VA	800 VA	1000 VA	1200 VA	1600 VA	2000 VA	3000 VA	Page
	■	■								
	■	■	■							218
		■								
				■						
					■					
			■	■	■	■	■	■	■	
■	■									
	■	■								226
	■	■	■							
		■								



Toroidal safety isolating and isolating transformer
RKD

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General Data

Rated input voltage 2 x 115 Vac
Rated output voltage 2 x 6 - 2 x 115 Vac
Power 15 - 3000 VA
Insulation class B
Maximum ambient temperature 40 °C
Efficiency up to 98 %
Degree of protection IP 00

Advantages

Minimum size at high power
Low weight
Double input voltage for series or parallel connection
Minimal no-load losses
Outstanding temperature behaviour thanks to low magnetic leakage field
Very low noise field

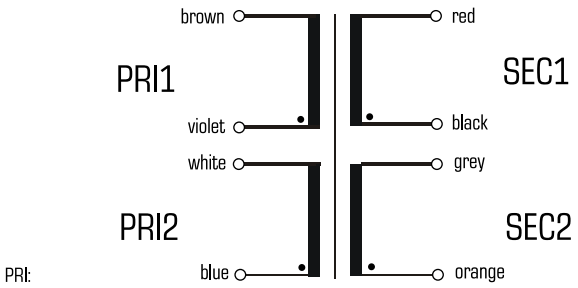
Applications

As a mains transformer for adjustment of the voltage and simple electrical isolation.

As an isolating transformer for the safe electrical isolation of the input and output sides. The transformer may be used to set up protective separation as a protective measure in accordance with VDE 0100.

As a safety isolating transformer for the safe electrical isolation of the input and output sides. The transformer is suitable for creating SELV and PELV circuits because of the limit on the output voltage.

Sample application



PRI:
Parallel connection (115V): brown with white/violet with blue
Series connection (230V): violet with white

SEC:
Parallel connection: red with gresy/black with orange
Series connection: black with grey

Standards

Mains transformer
to: VDE 0570 Teil 2-1, DIN EN 61558-2-1, EN 61558-2-1, IEC 61558-2-1, UL 5085-1/-2, CSA 22.2 No.66

Isolating transformer
to: VDE 0570 Part 2-4, DIN EN 61558-2-4, EN 61558-2-4, IEC 61558-2-4, UL 5085-1/-2, CSA 22.2 No.66

Safety isolating transformer
to: VDE 0570 Part 2-6, DIN EN 61558-2-6, EN 61558-2-6, IEC 61558-2-6, UL 5085-1/-2, CSA 22.2 No.66

Approvals

UL 5085-1/-2, CSA 22.2 No.66

Toroidal safety isolating and isolating transformer
RKD

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Electrical data

Typ	RKD 15/..	RKD 20/..	RKD 30/..	RKD 40/..
Input				
Rated input voltage	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output				
Rated output voltage: Order no.	2x6 Vac: RKD 15/2x6 2x9 Vac: RKD 15/2x9 2x12 Vac: RKD 15/2x12 2x15 Vac: RKD 15/2x15 2x18 Vac: RKD 15/2x18	2x12 Vac: RKD 20/2x12 2x15 Vac: RKD 20/2x15 2x18 Vac: RKD 20/2x18 2x24 Vac: RKD 20/2x24*	2x6 Vac: RKD 30/2x6 2x9 Vac: RKD 30/2x9 2x12 Vac: RKD 30/2x12 2x15 Vac: RKD 30/2x15 2x18 Vac: RKD 30/2x18 2x24 Vac: RKD 30/2x24**	2x6 Vac: RKD 40/2x6 2x9 Vac: RKD 40/2x9 2x12 Vac: RKD 40/2x12 2x15 Vac: RKD 40/2x15 2x18 Vac: RKD 40/2x18 2x24 Vac: RKD 40/2x24**
Rated Power	15 VA	20 VA	30 VA	40 VA
No-load voltage (app. x factor)	1.35	1.29	1.20	1.20
No-load loss (typ.)	0.30 W	0.33 W	0.45 W	0.45 W
Efficiency	73.0 %	77.0 %	80.0 %	82.0 %
Standards				
Classification	Safety isolating transformer	Safety isolating transformer *Mains transformer	Safety isolating transformer *Mains transformer	Safety isolating transformer **Isolating transformer
Approvals				
Approvals	cURus	cURus	cURus	cURus
Environment				
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C
Safety and protection				
Type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	II	II	II	II
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Test voltage	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz
Order numbers				
Order Number	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**

Toroidal safety isolating and isolating transformer
RKD

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Electrical data

Typ	RKD 50/..	RKD 60/..	RKD 80/..	RKD 100/..
Input				
Rated input voltage	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output				
Rated output voltage: Order no.	2x12 Vac: RKD 50/2x12 2x15 Vac: RKD 50/2x15 2x18 Vac: RKD 50/2x18 2x24 Vac: RKD 50/2x24**	2x6 Vac: RKD 60/2x6 2x9 Vac: RKD 60/2x9 2x12 Vac: RKD 60/2x12 2x15 Vac: RKD 60/2x15 2x18 Vac: RKD 60/2x18 2x24 Vac: RKD 60/2x24** 2x30 Vac: RKD 60/2x30**	2x12 Vac: RKD 80/2x12 2x15 Vac: RKD 80/2x15 2x18 Vac: RKD 80/2x18 2x24 Vac: RKD 80/2x24**	2x9 Vac: RKD 100/2x9 2x12 Vac: RKD 100/2x12 2x15 Vac: RKD 100/2x15 2x18 Vac: RKD 100/2x18 2x24 Vac: RKD 100/2x24** 2x30 Vac: RKD 100/2x30**
Rated Power	50 VA	60 VA	80 VA	100 VA
No-load voltage (app. x factor)	1.20	1.14	1.12	1.10
No-load loss (typ.)	0.40 W	0.70 W	1.00 W	0.90 W
Efficiency	82.5 %	85.0 %	86.0 %	88.0 %
Standards				
Classification	Safety isolating transformer **Isolating transformer	Safety isolating transformer **Isolating transformer	Safety isolating transformer **Isolating transformer	Safety isolating transformer **Isolating transformer
Approvals				
Approvals	cURus	cURus	cURus	cURus
Environment				
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C
Safety and protection				
Type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	II	II	II	II
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Test voltage	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz
Order numbers				
Order Number	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**

Toroidal safety isolating and isolating transformer
RKD

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Electrical data

Typ	RKD 120/..	RKD 160/..	RKD 200/..	RKD 225/..
Input				
Rated input voltage	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output				
Rated output voltage: Order no.	2x9 Vac: RKD 120/2x9 2x12 Vac: RKD 120/2x12 2x15 Vac: RKD 120/2x15 2x18 Vac: RKD 120/2x18 2x24 Vac: RKD 120/2x24** 2x30 Vac: RKD 120/2x30	2x12 Vac: RKD 160/2x12 2x15 Vac: RKD 160/2x15 2x18 Vac: RKD 160/2x18 2x24 Vac: RKD 160/2x24** 2x30 Vac: RKD 160/2x30 2x35 Vac: RKD 160/2x35	2x12 Vac: RKD 200/2x12 2x15 Vac: RKD 200/2x15 2x18 Vac: RKD 200/2x18 2x24 Vac: RKD 200/2x24**	2x12 Vac: RKD 225/2x12 2x15 Vac: RKD 225/2x15 2x18 Vac: RKD 225/2x18 2x24 Vac: RKD 225/2x24** 2x30 Vac: RKD 225/2x30**
Rated Power	120 VA	160 VA	200 VA	225 VA
No-load voltage (app. x factor)	1.08	1.08	1.08	1.07
No-load loss (typ.)	1.00 W	1.10 W	1.50 W	1.50 W
Efficiency	91.0 %	91.0 %	91.5 %	92.0 %
Standards				
Classification	Safety isolating transformer **Isolating transformer	Safety isolating transformer **Isolating transformer	Safety isolating transformer **Isolating transformer	Safety isolating transformer **Isolating transformer
Approvals				
Approvals	cURus	cURus	cURus	cURus
Environment				
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C
Safety and protection				
Type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	II	II	II	II
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Test voltage	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz
Order numbers				
Order Number	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**

Toroidal safety isolating and isolating transformer
RKD

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Electrical data

Typ	RKD 250/..	RKD 300/..	RKD 330/..	RKD 400/..
Input				
Rated input voltage	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output				
Rated output voltage: Order no.	2x12 Vac: RKD 250/2x12 2x18 Vac: RKD 250/2x18 2x24 Vac: RKD 250/2x24** 2x30 Vac: RKD 250/2x30**	2x12 Vac: RKD 300/2x12 2x18 Vac: RKD 300/2x18 2x24 Vac: RKD 300/2x24**	2x18 Vac: RKD 330/2x18	2x18 Vac: RKD 400/2x18 2x24 Vac: RKD 400/2x24** 2x30 Vac: RKD 400/2x30**
Rated Power	250 VA	300 VA	330 VA	400 VA
No-load voltage (app. x factor)	1.05	1.06	1.04	1.05
No-load loss (typ.)	2.10 W	2.50 W	2.50 W	3.20 W
Efficiency	93.0 %	92.5 %	94.0 %	93.5 %
Standards				
Classification	Safety isolating transformer **Isolating transformer	Safety isolating transformer **Isolating transformer	Safety isolating transformer	Safety isolating transformer **Isolating transformer
Approvals				
Approvals	cURus	cURus	cURus	cURus
Environment				
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C
Safety and protection				
Type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	II	II	II	II
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Test voltage	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz
Order numbers				
Order Number	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**

Toroidal safety isolating and isolating transformer
RKD

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Electrical data

Typ	RKD 500/..	RKD 625/..	RKD 800/..	RKD 1000/..
Input				
Rated input voltage	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output				
Rated output voltage: Order no.	2x24 Vac: RKD 500/2x24 2x30 Vac: RKD 500/2x30 2x35 Vac: RKD 500/2x35	2x30 Vac: RKD 625/2x30 2x115 Vac: RKD 625/2x115	2x40 Vac: RKD 800/2x40 2x115 Vac: RKD 800/2x115	2x50 Vac: RKD 1000/2x50 2x115 Vac: RKD 1000/2x115
Rated Power	500 VA	625 VA	800 VA	1000 VA
No-load voltage (app. x factor)	1.04	1.04	1.04	1.02
No-load loss (typ.)	3.40 W	4.90 W	5.30 W	6.50 W
Efficiency	95.0 %	95.0 %	96.0 %	96.0 %
Standards				
Classification	Isolating transformer	Isolating transformer	Isolating transformer	Isolating transformer
Approvals				
Approvals	cURus	cURus	cURus	cURus
Environment				
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C
Safety and protection				
Type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	II	II	II	II
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Test voltage	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz
Order numbers				
Order Number	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**

Toroidal safety isolating and isolating transformer
RKD

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Electrical data

Typ	RKD 1200/..	RKD 1600/..	RKD 2000/..	RKD 3000/..
Input				
Rated input voltage	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output				
Rated output voltage: Order no.	2x115 Vac: RKD 1200/2x115	2x115 Vac: RKD 1600/2x115	2x115 Vac: RKD 2000/2x115	2x115 Vac: RKD 3000/2x115
Rated Power	1200 VA	1600 VA	2000 VA	3000 VA
No-load voltage (app. x factor)	1.03	1.02	1.02	1.01
No-load loss (typ.)	7.50 W	9.60 W	10.40 W	12.70 W
Efficiency	96.0 %	97.0 %	97.0 %	98.0 %
Standards				
Classification	Isolating transformer	Isolating transformer	Isolating transformer	Isolating transformer
Approvals				
Approvals	cURus	cURus	cURus	cURus
Environment				
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C
Safety and protection				
Type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	II	II	II	II
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Test voltage	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz
Order numbers				
Order Number	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**

Toroidal safety isolating and isolating transformer
RKD

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Mechanical data

Typ	Fixing method	Terminals	Major diameter Ø	Outside diameter in the area of the wire lead Ø	Height without mounting	Weight
RKD 15/..	Mounting kit, M4 bolt	Connecting leads, 200 mm	58 mm	60 mm	27 mm	0.29 kg
RKD 20/..	Mounting kit, M4 bolt	Connecting leads, 200 mm	60 mm	62 mm	31 mm	0.32 kg
RKD 30/..	Mounting kit, M4 bolt	Connecting leads, 200 mm	68 mm	71 mm	31 mm	0.46 kg
RKD 40/..	Mounting kit, M6 bolt	Connecting leads, 200 mm	74 mm	77 mm	33 mm	0.52 kg
RKD 50/..	Mounting kit, M6 bolt	Connecting leads, 200 mm	77 mm	79 mm	39 mm	0.68 kg
RKD 60/..	Mounting kit, M6 bolt	Connecting leads, 200 mm	80 mm	83 mm	38 mm	0.75 kg
RKD 80/..	Mounting kit, M6 bolt	Connecting leads, 200 mm	88 mm	91 mm	43 mm	1.10 kg
RKD 100/..	Mounting kit, M6 bolt	Connecting leads, 200 mm	92 mm	94 mm	45 mm	1.20 kg
RKD 120/..	Mounting kit, M6 bolt	Connecting leads, 200 mm	94 mm	96 mm	46 mm	1.40 kg
RKD 160/..	Mounting kit, M6 bolt	Connecting leads, 200 mm	105 mm	107 mm	50 mm	1.70 kg
RKD 200/..	Mounting kit, M8 bolt	Connecting leads, 200 mm	113 mm	115 mm	51 mm	2.10 kg
RKD 225/..	Mounting kit, M8 bolt	Connecting leads, 200 mm	115 mm	117 mm	54 mm	2.30 kg
RKD 250/..	Mounting kit, M8 bolt	Connecting leads, 200 mm	114 mm	117 mm	54 mm	2.50 kg
RKD 300/..	Mounting kit, M8 bolt	Connecting leads, 200 mm	122 mm	126 mm	64 mm	3.10 kg
RKD 330/..	Mounting kit, M8 bolt	Connecting leads, 200 mm	124 mm	127 mm	65 mm	3.20 kg
RKD 400/..	Mounting kit, M8 bolt	Connecting leads, 200 mm	128 mm	131 mm	73 mm	4.10 kg
RKD 500/..	Mounting kit, M8 bolt	Connecting leads, 200 mm	140 mm	143 mm	68 mm	4.80 kg
RKD 625/..	Mounting kit, M8 bolt	Connecting leads, 200 mm	152 mm	154 mm	74 mm	6.10 kg
RKD 800/..	Mounting kit, M8 bolt	Connecting leads, 200 mm	170 mm	172 mm	72 mm	7.00 kg
RKD 1000/..	Mounting kit, M8 bolt	Connecting leads, 200 mm	168 mm	170 mm	85 mm	8.30 kg
RKD 1200/..	Remaining hole casting, with integrated mounting holes	Connecting leads, 200 mm	167 mm	170 mm	100 mm	9.80 kg
RKD 1600/..	Remaining hole casting, with integrated mounting holes	Connecting leads, 200 mm	202 mm	205 mm	105 mm	12.70 kg
RKD 2000/..	Remaining hole casting, with integrated mounting holes	Connecting leads, 200 mm	203 mm	206 mm	110 mm	15.00 kg
RKD 3000/..	Remaining hole casting, with integrated mounting holes	Connecting leads, 200 mm	216 mm	221 mm	125 mm	20.90 kg

Toroidal safety isolating and isolating transformer
RTE

BLOCK Website

General Data

Rated input voltage 230 Vac
Rated output voltage 2 x 12 - 2 x 35 Vac
Power 15 - 625 VA
Insulation class B
Maximum ambient temperature 40 °C
Efficiency up to 95 %
Degree of protection IP 00

Advantages

Minimum size at high output
Low weight
Double output voltage for series or parallel connection
Protected against overload by integral temperature fuse
Minimal no-load losses
Outstanding temperature behaviour thanks to low magnetic leakage field
Very low noise field

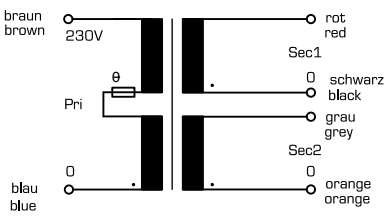
Applications

As a mains transformer for adjustment of the voltage and simple electrical isolation.

As an isolating transformer as specified in EN 61558-2-6 for the safe electrical isolation of the input and output sides. The transformer may be used to set up protective separation as a protective measure in accordance with VDE 0100.

As a safety isolating transformer as specified in EN 61558-2-6 for the safe electrical isolation of the input and output sides. The transformer is suitable for creating SELV and PELV circuits because of the limit on the output voltage.

Sample application



Parallelschaltung: rot mit grau / schwarz mit orange
Parallel connection: red with grey / black with orange

Reihenschaltung: schwarz mit grau
Series connection: black with grey

Standards

Mains transformer
to: VDE 0570 Teil 2-1, DIN EN 61558-2-1, EN 61558-2-1, IEC 61558-2-1, UL 5085-1/-2, CSA 22.2 No.66

Safety isolating transformer
to: VDE 0570 Teil 2-6, DIN EN 61558-2-6, EN 61558-2-6, IEC 61558-2-6, UL 5085-1/-2, CSA 22.2 No.66

Isolating transformer
to: VDE 0570 Part2-4, DIN EN 61558-2-4, EN 61558-2-4, IEC 61558-2-4, UL 5085-1/-2, CSA 22.2 No.66

Approvals

UL 5085-1/-2, CSA 22.2 No.66

Toroidal safety isolating and isolating transformer
RTE

BLOCK Website

Electrical data

Typ	RTE 15/..	RTE 20/..	RTE 30/..	RTE 40/..	RTE 50/..	RTE 60/..
Input						
Rated input voltage	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage: Order no.	2x12 Vac: RTE 15/2x12 2x15 Vac: RTE 15/2x15 2x18 Vac: RTE 15/2x18	2x12 Vac: RTE 20/2x12 2x15 Vac: RTE 20/2x15 2x18 Vac: RTE 20/2x18 2x24 Vac: RTE 20/2x24*	2x12 Vac: RTE 30/2x12 2x15 Vac: RTE 30/2x15 2x18 Vac: RTE 30/2x18 2x24 Vac: RTE 30/2x24*	2x12 Vac: RTE 40/2x12 2x15 Vac: RTE 40/2x15 2x18 Vac: RTE 40/2x18 2x24 Vac: RTE 40/2x24**	2x12 Vac: RTE 50/2x12 2x15 Vac: RTE 50/2x15 2x18 Vac: RTE 50/2x18 2x24 Vac: RTE 50/2x24**	2x12 Vac: RTE 60/2x12 2x15 Vac: RTE 60/2x15 2x18 Vac: RTE 60/2x18 2x24 Vac: RTE 60/2x24**
Rated Power	15 VA	20 VA	30 VA	40 VA	50 VA	60 VA
No-load voltage (app. x factor)	1.35	1.29	1.20	1.20	1.20	1.14
No-load loss (typ.)	0.30 W	0.33 W	0.45 W	0.45 W	0.40 W	0.70 W
Efficiency	73.0 %	77.0 %	80.0 %	82.0 %	82.5 %	85.0 %
Standards						
Classification	Safety isolating transformer	Safety isolating transformer *Mains transformer	Safety isolating transformer *Mains transformer	Safety isolating transformer **Isolating transformer	Safety isolating transformer **Isolating transformer	Safety isolating transformer **Isolating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	II	II	II	II	II	II
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Test voltage	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz
Order numbers						
Order Number	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**

Toroidal safety isolating and isolating transformer
RTE

BLOCK Website

Electrical data

Typ	RTE 80/..	RTE 100/..	RTE 120/..	RTE 160/..	RTE 200/..	RTE 225/..
Input						
Rated input voltage	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage: Order no.	2x12 Vac: RTE 80/2x12 2x15 Vac: RTE 80/2x15 2x18 Vac: RTE 80/2x18 2x24 Vac: RTE 80/2x24**	2x12 Vac: RTE 100/2x12 2x15 Vac: RTE 100/2x15 2x18 Vac: RTE 100/2x18 2x24 Vac: RTE 100/2x24**	2x12 Vac: RTE 120/2x12 2x15 Vac: RTE 120/2x15 2x18 Vac: RTE 120/2x18 2x24 Vac: RTE 120/2x24**	2x12 Vac: RTE 160/2x12 2x15 Vac: RTE 160/2x15 2x18 Vac: RTE 160/2x18 2x24 Vac: RTE 160/2x24**	2x12 Vac: RTE 200/2x12 2x15 Vac: RTE 200/2x15 2x18 Vac: RTE 200/2x18 2x24 Vac: RTE 200/2x24**	2x12 Vac: RTE 225/2x12 2x15 Vac: RTE 225/2x15 2x18 Vac: RTE 225/2x18 2x24 Vac: RTE 225/2x24**
Rated Power	80 VA	100 VA	120 VA	160 VA	200 VA	225 VA
No-load voltage (app. x factor)	1.12	1.10	1.08	1.08	1.08	1.07
No-load loss (typ.)	1.00 W	0.90 W	1.00 W	1.10 W	1.50 W	1.50 W
Efficiency	86.0 %	88.0 %	91.0 %	91.0 %	91.5 %	92.0 %
Standards						
Classification	Safety isolating transformer **Isolating transformer	Safety isolating transformer **Isolating transformer	Safety isolating transformer **Isolating transformer	Safety isolating transformer **Isolating transformer	Safety isolating transformer **Isolating transformer	Safety isolating transformer **Isolating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	II	II	II	II	II	II
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Test voltage	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz
Order numbers						
Order Number	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**

Toroidal safety isolating and isolating transformer
RTE

BLOCK Website

Electrical data

Typ	RTE 250/..	RTE 300/..	RTE 330/..	RTE 400/..	RTE 500/..	RTE 625/..
Input						
Rated input voltage	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage: Order no.	2x12 Vac: RTE 250/2x12 2x18 Vac: RTE 250/2x18 2x24 Vac: RTE 250/2x24** 2x30 Vac: RTE 250/2x30**	2x18 Vac: RTE 300/2x18 2x24 Vac: RTE 300/2x24**	2x18 Vac: RTE 330/2x18	2x18 Vac: RTE 400/2x18 2x24 Vac: RTE 400/2x24** 2x30 Vac: RTE 400/2x30**	2x24 Vac: RTE 500/2x24 2x30 Vac: RTE 500/2x30 2x35 Vac: RTE 500/2x35	2x30 Vac: RTE 625/2x30
Rated Power	250 VA	300 VA	330 VA	400 VA	500 VA	625 VA
No-load voltage (app. x factor)	1.05	1.06	1.04	1.05	1.04	1.04
No-load loss (typ.)	2.10 W	2.50 W	2.50 W	3.20 W	3.40 W	4.90 W
Efficiency	93.0 %	92.5 %	94.0 %	93.5 %	95.0 %	95.0 %
Standards						
Classification	Safety isolating transformer **Isolating transformer	Safety isolating transformer **Isolating transformer	Safety isolating transformer	Safety isolating transformer **Isolating transformer	Isolating transformer	Isolating transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	II	II	II	II	II	II
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Test voltage	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz
Order numbers						
Order Number	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**

Toroidal safety isolating and isolating transformer
RTE

BLOCK Website

30 Mechanical data

Typ	Fixing method	Terminals	Major diameter Ø	Outside diameter in the area of the wire lead Ø	Height without mounting	Weight
RTE 15/..	Mounting kit, M4 bolt	Connecting leads, 200 mm	58 mm	60 mm	27 mm	0.29 kg
RTE 20/..	Mounting kit, M4 bolt	Connecting leads, 200 mm	60 mm	62 mm	31 mm	0.32 kg
RTE 30/..	Mounting kit, M4 bolt	Connecting leads, 200 mm	68 mm	70 mm	31 mm	0.46 kg
RTE 40/..	Mounting kit, M6 bolt	Connecting leads, 200 mm	74 mm	77 mm	33 mm	0.52 kg
RTE 50/..	Mounting kit, M6 bolt	Connecting leads, 200 mm	77 mm	79 mm	39 mm	0.68 kg
RTE 60/..	Mounting kit, M6 bolt	Connecting leads, 200 mm	80 mm	83 mm	38 mm	0.75 kg
RTE 80/..	Mounting kit, M6 bolt	Connecting leads, 200 mm	88 mm	91 mm	43 mm	1.10 kg
RTE 100/..	Mounting kit, M6 bolt	Connecting leads, 200 mm	92 mm	94 mm	45 mm	1.20 kg
RTE 120/..	Mounting kit, M6 bolt	Connecting leads, 200 mm	94 mm	96 mm	46 mm	1.40 kg
RTE 160/..	Mounting kit, M6 bolt	Connecting leads, 200 mm	105 mm	107 mm	50 mm	1.70 kg
RTE 200/..	Mounting kit, M8 bolt	Connecting leads, 200 mm	113 mm	115 mm	51 mm	2.10 kg
RTE 225/..	Mounting kit, M8 bolt	Connecting leads, 200 mm	115 mm	117 mm	54 mm	2.30 kg
RTE 250/..	Mounting kit, M8 bolt	Connecting leads, 200 mm	114 mm	117 mm	54 mm	2.52 kg
RTE 300/..	Mounting kit, M8 bolt	Connecting leads, 200 mm	122 mm	126 mm	64 mm	3.10 kg
RTE 330/..	Mounting kit, M8 bolt	Connecting leads, 200 mm	124 mm	127 mm	65 mm	3.20 kg
RTE 400/..	Mounting kit, M8 bolt	Connecting leads, 200 mm	128 mm	131 mm	73 mm	4.10 kg
RTE 500/..	Mounting kit, M8 bolt	Connecting leads, 200 mm	140 mm	143 mm	68 mm	4.80 kg
RTE 625/..	Mounting kit, M8 bolt	Connecting leads, 200 mm	152 mm	154 mm	74 mm	6.10 kg

Inrush current limiter, current-controlled with no-load detection
ESG 6

BLOCK Website

General Data

- Rated voltage 110 - 230 Vac ±10 %
- Rated current 16 A, (UL: 12 A)
- Internal resistance 7.8 Ohms
- Maximum ambient temperature 40 °C
- Degree of protection IP 20

Advantages

- Dynamic limit times for optimum starting of consumers with high inrush currents
- Current-controlled with no-load detection, hence full current limit protection, even if momentarily switched back on
- Robust plastic housing for rail mounting, e.g. in consumer units or meter mounting boards

Applications

Inrush current limiting option for limiting the inrush current in power tools, transformers and other loads with high switch-on or inrush currents.

Approvals

Inrush current limiter, current-controlled with no-load detection
ESG 6

BLOCK Website

Electrical data

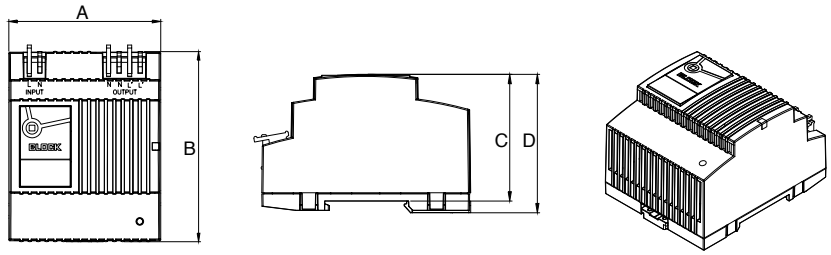
Typ	ESG 6
Operating data	
Rated voltage	110 - 230 Vac ±10 %
Rated frequency	50 - 60 Hz
Rated current	16 A, (UL: 12 A)
Environment	
Ambient temperature max.	40 °C
Safety and protection	
Safety	integrated, non-replaceable thermal fuse in the input circuit
Protection index	IP 20
Safety class (prepared)	II
Internal impedance	7.80 Ω
Order numbers	
Order Number	**ESG 6**

Mechanical data

Terminal and mounting	
Terminals Input	Spring clamp terminal max. 2.5 mm²
Terminals Output	Spring clamp terminal max. 2.5 mm²
Measures and weights	
Dimension (W x H x D)	72 x 90 x 59,2 mm
Weight	0.17 kg
Dimension picture (in mm)	❹
A	72
B	90
C	54.2
D	59.2

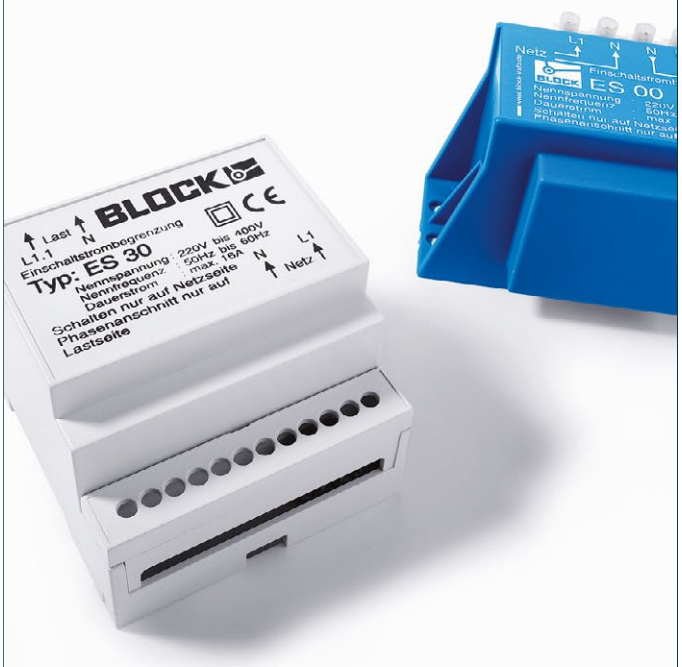
Dimension pictures

❶



Inrush current limiter
ES 00 / ES 30

BLOCK Website



General Data

- Rated voltage 220 - 400 Vac
- Maximum rated current 16 A
- Internal resistance 3.75 Ohms
- Maximum ambient temperature 40 °C
- Degree of protection IP 00 / IP 30

Advantages

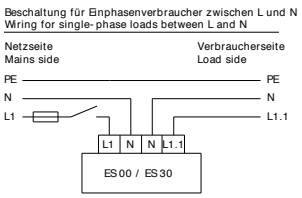
- Very good moisture protection thanks to XtraDenseFill resin encapsulation (ES30)
- ES 00: Robust plastic housing for screwed mounting
- ES 30: Robust plastic housing for rail mounting, e.g. in consumer units or meter mounting boards

Applications

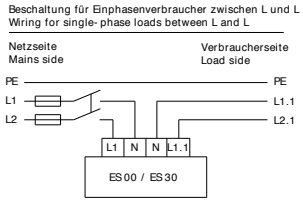
Inrush current limiting option for limiting the inrush current in transformers with high switch-on or inrush currents (not suited for electrical machinery or motors).

Sample applications

Beschaltung für Einphasenverbraucher zwischen L und N
Wiring for single-phase loads between L and N

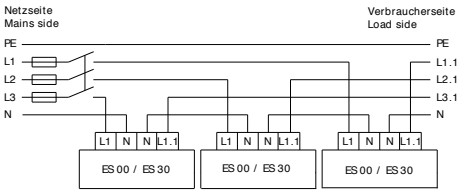


Beschaltung für Einphasenverbraucher zwischen L und L
Wiring for single-phase loads between L and L



Verbraucher dürfen nicht gegen L3 oder gegen N angeschlossen werden!
It's not allowed to connect loads against L3 or N!

Beschaltung für Drehstromverbraucher
Wiring for three-phase consumers



Inrush current limiter
ES 00 / ES 30

BLOCK Website

Electrical data

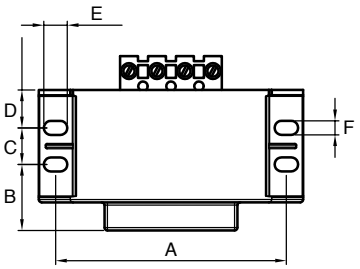
Typ	ES 00	ES 30
Operating data		
Rated voltage	220 - 400 Vac	220 - 400 Vac
Rated frequency	50 - 60 Hz	50 - 60 Hz
Rated current	max. 16 A	max. 16 A
Environment		
Ambient temperature max.	40 °C	40 °C
Safety and protection		
Type	Mounting lugs with fixing holes	Fixing holes and for panel installation on mounting rails
Protection index	IP 00	IP 30
Safety class (prepared)	II	II
Internal impedance	3.75 Ω	3.75 Ω
Safety	integrated, non-replaceable thermal fuse in the input circuit	integrated, non-replaceable thermal fuse in the input circuit
Order numbers		
Order Number	**ES 00**	**ES 30**

Mechanical data

Terminal and mounting		
Terminals	Screw terminal	Screw terminal
Fixing method	Fixing holes in the housing	DIN rail mounting
Measures and weights		
Weight	0.27 kg	0.47 kg
Dimension (W x H x D)	60 x 60 x 94 mm	71 x 90,4 x 58 mm
Dimension picture (in mm)	❶	❷
A	60	90.4
B	23.5	44.6
C	13	71
D	13.5	5
E	8.4	-
F	5	-

Dimension pictures

❶



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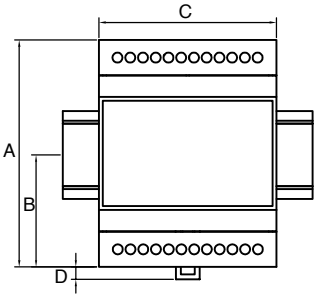


Inrush current limiter
ESG 1 / ESG 2

BLOCK Website

General Data

- Rated voltage 220 - 250 Vac
- Maximum rated current 16 A
- Internal resistance 3.75 Ohms
- Maximum ambient temperature 40 °C
- Degree of protection IP 20

Advantages

- Very good moisture protection thanks to XtraDenseFill resin encapsulation
- May be used anywhere for stationary and mobile applications
- ESG 1: Integrated safety plug and built-in safety socket
- ESG 2: 1.4 m connecting cable with safety plug and built-in safety socket

Applications

Inrush current limiting option for limiting the inrush current in transformers with high switch-on or inrush currents (not suited for electrical machinery or motors).

Inrush current limiter
ESG 1 / ESG 2

BLOCK Website

Electrical data

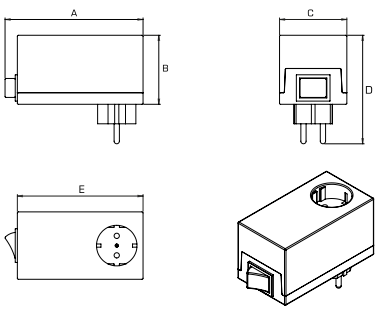
Typ	ESG 1	ESG 2
Operating data		
Rated voltage	220 - 250 Vac	220 - 250 Vac
Rated frequency	50 - 60 Hz	50 - 60 Hz
Rated current	max. 16 A	max. 16 A
Environment		
Ambient temperature max.	40 °C	40 °C
Safety and protection		
Safety	integrated, non-replaceable thermal fuse in the input circuit	integrated, non-replaceable thermal fuse in the input circuit
Type	Resin encapsulated transformer	Resin encapsulated transformer
Protection index	IP 20	IP 20
Safety class (prepared)	I	I
Internal impedance	3.75 Ω	3.75 Ω
Order numbers		
Order Number	**ESG 1**	**ESG 2**

Mechanical data

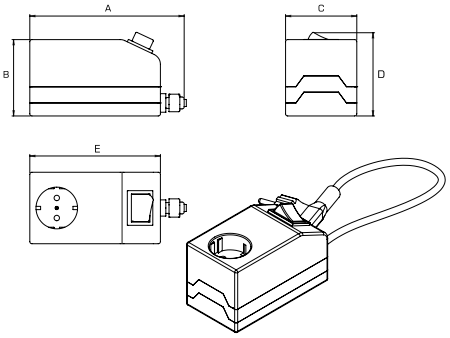
Terminal and mounting		
Terminals Input	Integrated safety plug	Mains connecting cable with safety plug
Terminals Output	Safety socket	Safety socket
Measures and weights		
Weight	0.40 kg	0.55 kg
Dimension (W x H x D)	64 x 132 x 65,5 mm	66 x 145 x 70,5 mm
Dimension picture (in mm)	❶	❷
A	132	145
B	65.5	70.5
C	64	66
D	105	80
E	119.5	121

Dimension pictures

❶



❷



Inrush current limiter, current-controlled with no-load detection
ESG 3 / ESG 7

BLOCK Website

General Data

- Rated voltage 230 Vac ±10 %
- Maximum rated current 16 A
- Internal resistance 7.8 Ohm
- Maximum ambient temperature 40 °C
- Degree of protection IP 65 (Enclosure); IP 44 (plug/connector)

Advantages

- Dynamic limit times for optimum inrush of loads with high inrush currents
- Current-controlled with no-load detection, hence full current limit protection, even if momentarily switched back on
- Very good moisture protection thanks to XtraDenseFill resin encapsulation
- May be used anywhere for stationary and mobile applications
- High degree of protection
- ESG 3: 2 x Mains cables with safety plug and with safety plug and safety coupling DIN 49440-1 (GER) for mobile use
- ESG 7: 2 x Mains cable with low-heat device connection C13 IEC 60321-1 (GER) for mobile use

Applications

Inrush current limiting option for limiting the inrush current in power tools, transformers and other loads with high switch-on or inrush currents.

Approvals

c UL us

Inrush current limiter, current-controlled with no-load detection
ESG 3 / ESG 7

BLOCK Website

Electrical data

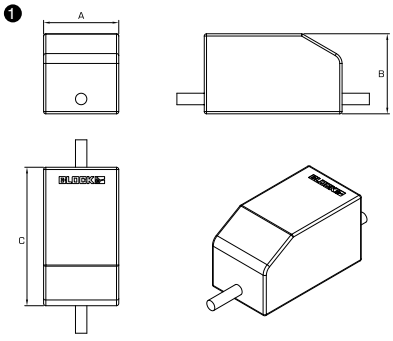
Typ	ESG 3	ESG 7
Operating data		
Rated voltage	230 Vac	230 Vac
Voltage range	99 ... 253 Vac	99 ... 264 Vac
Rated frequency	50 - 60 Hz	50 - 60 Hz
Rated current	16 A	10 A
Internal impedance	7.80 Ω	7.80 Ω
Approvals		
Approvals	-	cURus
Environment		
Ambient temperature max.	40 °C	40 °C
Safety and protection		
Safety	integrated, non-replaceable thermal fuse in the input circuit	integrated, non-replaceable thermal fuse in the input circuit
Type	Resin encapsulated transformer	Resin encapsulated transformer
Protection index	housing IP 65, housing connections IP 44	housing IP 65, housing connections IP 44
Safety class (prepared)	I	I
Order numbers		
Order Number	**ESG 3**	**ESG 7**

Mechanical data

Terminal and mounting		
Terminals Input	Mains connecting cable with DIN49440,1 protected contact plug DIN 49440-1 (GER)	Mains cable with low#heat device plug C14 IEC 60321#1
Terminals Output	Connecting cable with DIN49440,1 protected contact coupling DIN 49440-1 (GER)	Mains cable with low#heat device connection C13 IEC 60321#1 (GER) for mobile use
Measures and weights		
Weight	0.75 kg	0.75 kg
Dimension (W x H x D)	66 x 70 x 121 mm	66 x 70 x 121 mm
Dimension picture (in mm)	❶	❶
A	66	66
B	70	70
C	121	121

Dimension pictures

❶



Inrush current limiter, current-controlled with no-load detection
ESG 4 / ESG 5

BLOCK Website

General Data

Rated voltage 115 Vac (ESG 5), 230 Vac (ESG 4)
Rated current 13 A
Internal resistance 7.8 Ohms (ESG 4), 4.4 Ohms (ESG 5)
Maximum ambient temperature 40 °C
Degree of protection IP 65 (Enclosure); IP 20 (plug/connector)

Advantages

Dynamic limit times for optimum inrush of loads with high inrush currents
Current-controlled with no-load detection, hence full current limit protection, even if momentarily switched back on
Very good moisture protection thanks to XtraDenseFill resin encapsulation
May be used anywhere for stationary and mobile applications
High degree of protection
ESG 4: 2 x Connection cable with plug and coupling BS 1363 (UK) for mobile use
ESG 5: 2 x Connection cable with plug and coupling NEMA5-15 (USA) for mobile use

Applications

Inrush current limiting option for limiting the inrush current in power tools, transformers and other loads with high switch-on or inrush currents.

Approvals

c UL us

Inrush current limiter, current-controlled with no-load detection
ESG 4 / ESG 5

BLOCK Website

Electrical data

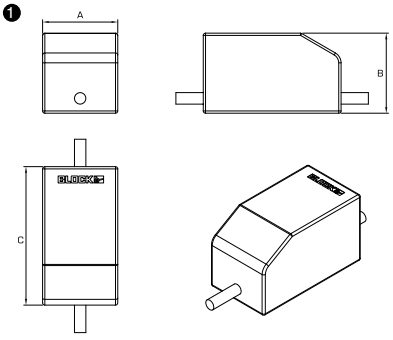
Typ	ESG 4	ESG 5
Operating data		
Rated voltage	230 Vac	115 Vac
Voltage range	99 ... 253 Vac	99 ... 132 Vac
Rated frequency	50 - 60 Hz	50 - 60 Hz
Rated current	13 A	13 A
Internal impedance	7.80 Ω	4.40 Ω
Approvals		
Approvals	-	cURus
Environment		
Ambient temperature max.	40 °C	40 °C
Safety and protection		
Safety	integrated, non-replaceable thermal fuse in the input circuit	integrated, non-replaceable thermal fuse in the input circuit
Type	Resin encapsulated transformer	Resin encapsulated transformer
Protection index	housing IP 65, housing connections IP 20	housing IP 65, housing connections IP 20
Safety class (prepared)	I	I
Order numbers		
Order Number	**ESG 4**	**ESG 5**

Mechanical data

Terminal and mounting		
Terminals Input	Connecting cable with BS 1363 protected contact plug (UK)	Connecting cable with NEMA5-15 protected contact plug (USA)
Terminals Output	Connecting cable with BS 1363 protected contact coupling (UK)	Connecting cable with NEMA5-15 protected contact coupling (USA)
Measures and weights		
Weight	0.75 kg	0.75 kg
Dimension (W x H x D)	66 x 70 x 121 mm	66 x 70 x 121 mm
Dimension picture (in mm)	❶	❶
A	66	66
B	70	70
C	121	121

Dimension pictures

❶



AC current supply for laboratories
BR

BLOCK Website

General Data

Rated input voltage 230 Vac
Rated output voltage 0 - 250 Vac
Rated power 350 - 2200 VA
Insulation class E
Maximum ambient temperature 40 °C
Efficiency up to 93 %
Internal resistance 1.80 - 4.96 Ohms
Self-cooling

Advantages

Non-inherently short-circuit proof
Analogue current and voltage indicator
Output circuit breakers may be operated from the front
Carry handle, mains cable with safety plug, shockproof socket for portable application

Applications

Isolating transformer with controllable output voltage for use in the laboratory.

Standards

Isolating transformer
to: VDE 0570 Part 2-4, DIN EN 61558-2-4, EN 61558-2-4, IEC 61558-2-4

Approvals

EAC

AC current supply for laboratories
BR

BLOCK Website

Electrical data

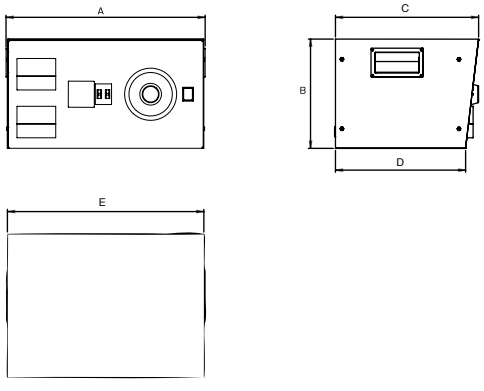
Typ	BR 351	BR 1000	BR 2200
Input			
Rated input voltage	230 Vac	230 Vac	230 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output			
Rated output voltage	0 - 250 Vac	0 - 250 Vac	0 - 250 Vac
Rated Power	350 VA	1.000 VA	2.200 VA
Efficiency	92.0 %	93.0 %	89.0 %
Environment			
Type of cooling	self-cooling	self-cooling	self-cooling
Ambient temperature max.	40 °C	40 °C	40 °C
Safety and protection			
Type	Enclosed	Enclosed	Enclosed
Internal impedance	4.96 Ω	2.25 Ω	1.80 Ω
Insulation class	E	E	E
Test voltage	3750 Vac, 50 Hz	3750 Vac, 50 Hz	3750 Vac, 50 Hz
Protection index	IP 20	IP 20	IP 20
Safety class	II	I	I
Short circuit strength	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof
Order numbers			
Order Number	**BR 351**	**BR 1000**	**BR 2200**

Mechanical data

Terminal and mounting			
Terminals Input	Mains connecting cable with safety plug	Mains connecting cable with safety plug	Mains connecting cable with safety plug
Terminals Output	Protective contact socket	Protective contact socket	Protective contact socket
Measures and weights			
Weight	13.00 kg	20.00 kg	45.00 kg
Dimension (W x H x D)	318 x 195 x 225 mm	400 x 195 x 250 mm	450 x 300 x 340 mm
Cu-Weight	1.00 kg	6.00 kg	9.00 kg
Dimension picture (in mm)	❶	❶	❶
A	315	400	460
B	184	182	251.5
C	203	235	330
D	188	220	300
E	308	391	453

Dimension pictures

❶



AC current supply for laboratories
BRS

BLOCK Website

General Data

Rated input voltage 230 Vac
Rated output voltage 0 - 250 Vac
Rated power 400 - 2200 VA
Insulation class B
Maximum ambient temperature 40 °C
Efficiency up to 93 %
Internal resistance 1.80 - 4.96 Ohms
Self-cooling

Advantages

RMS and peak values of current and voltage
Graphical visualisation of current and voltage curves
Other parameters: active, reactive and apparent power and power factor
Mains connection lead with safety plug, safety socket
Plug-in rack for installation in 19 inches cabinets

Applications

Isolating transformer with controllable output voltage for use in the laboratory.

Standards

Isolating transformer
to: VDE 0411 Teil 1, EN 61010-1, IEC 61010-1

Approvals

EAC

AC current supply for laboratories
BRS

BLOCK Website

Electrical data

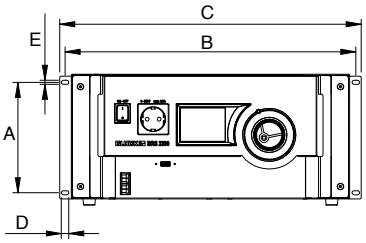
Typ	BRS 400	BRS 1000	BRS 2200
Operating data			
Rated frequency	50 Hz	50 Hz	50 Hz
Input			
Rated input voltage	230 Vac	230 Vac	230 Vac
Output			
Rated output voltage	0 - 250 Vac	0 - 250 Vac	0 - 250 Vac
Rated Power	400 VA	1000 VA	2200 VA
Efficiency	92.0 %	93.0 %	89.0 %
Environment			
Type of cooling	self-cooling	self-cooling	self-cooling
Safety and protection			
Type	Encapsulated in metal housing	Encapsulated in metal housing	Encapsulated in metal housing
Internal impedance	4.96 Ω	2.25 Ω	1.80 Ω
Insulation class	B	B	B
Test voltage	3750 Vac, 50 Hz	3750 Vac, 50 Hz	3750 Vac, 50 Hz
Protection index	IP 20	IP 20	IP 20
Safety class	I	I	I
Short circuit strength	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof
Order numbers			
Order Number	**BRS 400**	**BRS 1000**	**BRS 2200**

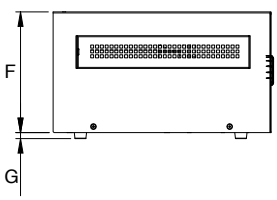
Mechanical data

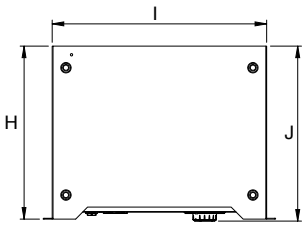
Terminal and mounting			
Terminals Input	Mains connecting cable with safety plug	Mains connecting cable with safety plug	Mains connecting cable with safety plug
Terminals Output	Protective contact socket	Protective contact socket	Protective contact socket
Measures and weights			
Weight	13.00 kg	20.00 kg	45.00 kg
Dimension (W x H x D)	482 x 143 x 364 mm	482 x 180 x 364 mm	482 x 210 x 364 mm
Cu-Weight	1.10 kg	3.60 kg	6.00 kg
Dimension picture (in mm)	❶	❶	❶
A	110	147	177
B	465	465	465
C	482	482	482
D	12	12	12
E	6.5	6.5	6.5
F	133	170	200
G	10	10	10
H	360	360	360
I	445	445	445
J	364	364	364

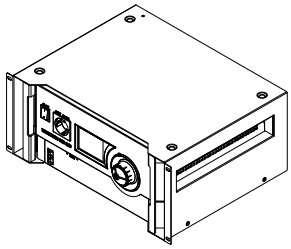
Dimension pictures

❶









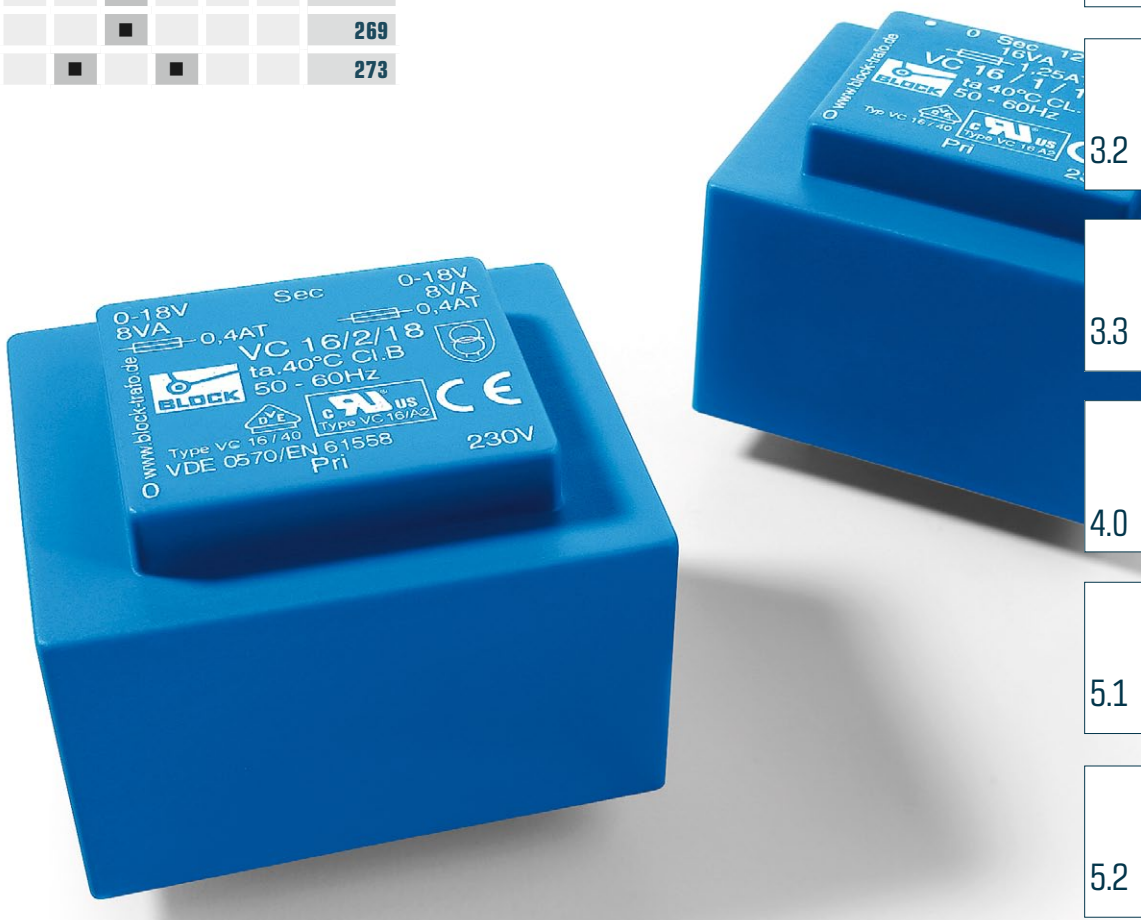

ON - OFF
0 - 250V max. 1,6Aac
V
mA
W
152
0
0
Konfig.
Grafik
Tabelle
BLOCK BRS 400
F2
ON - OFF
0 - 250V max. 4,0Aac
V
A
W
136
0.00
0
Konfig.
Grafik
Tabelle
BLOCK BRS 1000
F1
F2

OVERVIEW
PCB TRANSFORMERS

Type	Features	Rated input voltage	Rated output voltage	0.35 VA	0.5 VA	1.0 VA	1.2 VA	1.5 VA	2.0 VA	2.3 VA	2.8 VA	3.2 VA	4.5 VA
VB	Short-circuit proof, ta 70° C Cl.B	230 Vac	6 - 48 Vac	■	■	■	■	■	■	■	■	■	
AVB	Short-circuit proof, ta 70° C Cl.B, double input voltage	2 x 115 Vac	6 - 48 Vac	■	■	■		■	■	■		■	
VC	ta 40 – 60° C Cl.B	230 Vac	6 - 48 Vac									■	
VCM	With fixing points	230 Vac	6 - 48 Vac										
VR	Fixing by foot plate	230 Vac	8 - 36 Vac										■
PT	Short-circuit proof, fixing by foot plate	230 Vac	6 - 48 Vac										■
EP	Encapsulated bobbin	230 Vac	2 x 6 - 2 x 15 Vac										■

BLOCK

5.0 VA	7.5 VA	10.00 VA	13.00 VA	16.00 VA	18.00 VA	22.00 VA	25.00 VA	28.00 VA	30.00 VA	35.00 VA	36.00 VA	50.00 VA	Page
													248
													253
■		■		■									257
■		■		■			■				■	■	261
	■		■			■			■				265
	■		■			■			■				269
	■		■		■			■		■			273



Short-circuit proof PCB transformer
VB

BLOCK Website

General Data

Rated input voltage 230 Vac
Rated output voltage 6 - 2 x 24 Vac
Rated power 0.35 - 3.2 VA
Insulation class B
Maximum ambient temperature 70 °C (VB 3,2 max. 50 °C)
Efficiency up to 58 %
Degree of protection IP 00

Advantages

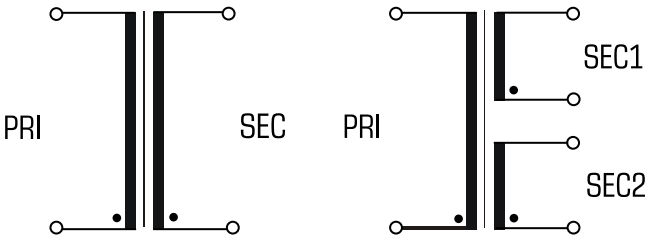
Minimum size at high output
Inherently short-circuit proof
Also with dual output voltage for series or parallel connection
Designed for high ambient temperatures
Permanent corrosion protection, high insulation value and maximum electrical reliability thanks to XtraDenseFill resin encapsulation
Self-extinguishing potting material

Applications

As a mains transformer for adjustment of the voltage and simple electrical isolation.

As a safety isolating transformer for the safe electrical isolation of the input and output sides. The transformer is suitable for creating SELV and PELV circuits because of the limit on the output voltage.

Sample application



Standards

Mains transformer
to: VDE 0570 Teil 2-1, DIN EN 61558-2-1, EN 61558-2-1, IEC 61558-2-1, UL 5085-1/-2, CSA 22.2 No.66

Safety isolating transformer
to: VDE 0570 Teil 2-6, DIN EN 61558-2-6, EN 61558-2-6, IEC 61558-2-6, UL 5085-1/-2, CSA 22.2 No.66

Approvals

VDE, UL 5085-1/-2, CSA 22.2 No.66

Short-circuit proof PCB transformer
VB

BLOCK Website

Electrical data

Typ	VB 0,35/1/..	VB 0,35/2/..	VB 0,5/1/..	VB 0,5/2/..	VB 1,0/1/..	VB 1,0/2/..
Input						
Rated input voltage	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage: Order no.	6 Vac: VB 0,35/1/6 9 Vac: VB 0,35/1/9 12 Vac: VB 0,35/1/12 15 Vac: VB 0,35/1/15 18 Vac: VB 0,35/1/18 24 Vac: VB 0,35/1/24	2x6 Vac: VB 0,35/2/6 2x8 Vac: VB 0,35/2/8 2x9 Vac: VB 0,35/2/9 2x12 Vac: VB 0,35/2/12 2x15 Vac: VB 0,35/2/15* 2x18 Vac: VB 0,35/2/18* 2x24 Vac: VB 0,35/2/24*	6 Vac: VB 0,5/1/6 8 Vac: VB 0,5/1/8 9 Vac: VB 0,5/1/9 12 Vac: VB 0,5/1/12 15 Vac: VB 0,5/1/15 18 Vac: VB 0,5/1/18 24 Vac: VB 0,5/1/24	2x6 Vac: VB 0,5/2/6 2x8 Vac: VB 0,5/2/8 2x9 Vac: VB 0,5/2/9 2x12 Vac: VB 0,5/2/12 2x15 Vac: VB 0,5/2/15* 2x18 Vac: VB 0,5/2/18* 2x24 Vac: VB 0,5/2/24*	6 Vac: VB 1,0/1/6 8 Vac: VB 1,0/1/8 9 Vac: VB 1,0/1/9 12 Vac: VB 1,0/1/12 15 Vac: VB 1,0/1/15 18 Vac: VB 1,0/1/18 24 Vac: VB 1,0/1/24	2x6 Vac: VB 1,0/2/6 2x8 Vac: VB 1,0/2/8 2x9 Vac: VB 1,0/2/9 2x12 Vac: VB 1,0/2/12 2x15 Vac: VB 1,0/2/15* 2x18 Vac: VB 1,0/2/18* 2x24 Vac: VB 1,0/2/24*
Rated Power	0,35 VA	0,35 VA	0,5 VA	0,5 VA	1 VA	1 VA
No-load voltage (app. x factor)	1.80	1.80	1.80	1.80	1.40	1.40
No-load loss (typ.)	1.30 W	1.30 W	1.10 W	1.10 W	0.90 W	0.90 W
Efficiency	30.0 %	30.0 %	40.0 %	40.0 %	55.0 %	55.0 %
Standards						
Classification	Safety isolating transformer	Safety isolating transformer *Mains transformer (without VDE mark)	Safety isolating transformer	Safety isolating transformer *Mains transformer (without VDE mark)	Safety isolating transformer	Safety isolating transformer *Mains transformer (without VDE mark)
Approvals						
Approvals	cURus, VDE	cURus, VDE	cURus, VDE	cURus, VDE	cURus, VDE	cURus, VDE
Environment						
Ambient temperature max.	70 °C	70 °C	70 °C	70 °C	70 °C	70 °C
Safety and protection						
Type	Encapsulated	Encapsulated	Encapsulated	Encapsulated	Encapsulated	Encapsulated
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	II	II	II	II	II	II
Short circuit strength	inherently short-circuit proof	inherently short-circuit proof	inherently short-circuit proof	inherently short-circuit proof	inherently short-circuit proof	inherently short-circuit proof
Order numbers						
Order Number	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**

Short-circuit proof PCB transformer
VB

BLOCK Website

Electrical data

Typ	VB 1,2/1/..	VB 1,2/2/..	VB 1,5/1/..	VB 1,5/2/..	VB 2,0/1/..	VB 2,0/2/..
Input						
Rated input voltage	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage: Order no.	6 Vac: VB 1,2/1/6 8 Vac: VB 1,2/1/8 9 Vac: VB 1,2/1/9 12 Vac: VB 1,2/1/12 15 Vac: VB 1,2/1/15 18 Vac: VB 1,2/1/18 24 Vac: VB 1,2/1/24	2x6 Vac: VB 1,2/2/6 2x8 Vac: VB 1,2/2/8 2x9 Vac: VB 1,2/2/9 2x12 Vac: VB 1,2/2/12 2x15 Vac: VB 1,2/2/15* 2x18 Vac: VB 1,2/2/18* 2x24 Vac: VB 1,2/2/24*	6 Vac: VB 1,5/1/6 8 Vac: VB 1,5/1/8 9 Vac: VB 1,5/1/9 12 Vac: VB 1,5/1/12 15 Vac: VB 1,5/1/15 18 Vac: VB 1,5/1/18 24 Vac: VB 1,5/1/24	2x6 Vac: VB 1,5/2/6 2x8 Vac: VB 1,5/2/8 2x9 Vac: VB 1,5/2/9 2x12 Vac: VB 1,5/2/12 2x15 Vac: VB 1,5/2/15* 2x18 Vac: VB 1,5/2/18* 2x24 Vac: VB 1,5/2/24*	6 Vac: VB 2,0/1/6 8 Vac: VB 2,0/1/8 9 Vac: VB 2,0/1/9 12 Vac: VB 2,0/1/12 15 Vac: VB 2,0/1/15 18 Vac: VB 2,0/1/18 24 Vac: VB 2,0/1/24	2x6 Vac: VB 2,0/2/6 2x8 Vac: VB 2,0/2/8 2x9 Vac: VB 2,0/2/9 2x12 Vac: VB 2,0/2/12 2x15 Vac: VB 2,0/2/15* 2x18 Vac: VB 2,0/2/18* 2x24 Vac: VB 2,0/2/24*
Rated Power	1,2 VA	1,2 VA	1,5 VA	1,5 VA	2 VA	2 VA
No-load voltage (app. x factor)	1.35	1.35	1.45	1.45	1.60	1.60
No-load loss (typ.)	1.00 W	1.00 W	1.00 W	1.00 W	1.95 W	1.95 W
Efficiency	57.0 %	57.0 %	57.0 %	57.0 %	43.0 %	43.0 %
Standards						
Classification	Safety isolating transformer	Safety isolating transformer *Mains transformer (without VDE mark)	Safety isolating transformer	Safety isolating transformer *Mains transformer (without VDE mark)	Safety isolating transformer	Safety isolating transformer *Mains transformer (without VDE mark)
Approvals						
Approvals	cURus, VDE	cURus, VDE	cURus, VDE	cURus, VDE	cURus, VDE	cURus, VDE
Environment						
Ambient temperature max.	70 °C	70 °C	70 °C	70 °C	70 °C	70 °C
Safety and protection						
Type	Encapsulated	Encapsulated	Encapsulated	Encapsulated	Encapsulated	Encapsulated
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	II	II	II	II	II	II
Short circuit strength	inherently short-circuit proof	inherently short-circuit proof	inherently short-circuit proof	inherently short-circuit proof	inherently short-circuit proof	inherently short-circuit proof
Order numbers						
Order Number	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**

Short-circuit proof PCB transformer
VB

BLOCK Website

Electrical data

Typ	VB 2,3/1/..	VB 2,3/2/..	VB 2,8/1/..	VB 2,8/2/..	VB 3,2/1/..	VB 3,2/2/..
Input						
Rated input voltage	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage: Order no.	6 Vac: VB 2,3/1/6 8 Vac: VB 2,3/1/8 9 Vac: VB 2,3/1/9 12 Vac: VB 2,3/1/12 15 Vac: VB 2,3/1/15 18 Vac: VB 2,3/1/18 24 Vac: VB 2,3/1/24	2x6 Vac: VB 2,3/2/6 2x8 Vac: VB 2,3/2/8 2x9 Vac: VB 2,3/2/9 2x12 Vac: VB 2,3/2/12 2x15 Vac: VB 2,3/2/15* 2x18 Vac: VB 2,3/2/18* 2x24 Vac: VB 2,3/2/24*	6 Vac: VB 2,8/1/6 8 Vac: VB 2,8/1/8 9 Vac: VB 2,8/1/9 12 Vac: VB 2,8/1/12 15 Vac: VB 2,8/1/15 18 Vac: VB 2,8/1/18 24 Vac: VB 2,8/1/24	2x6 Vac: VB 2,8/2/6 2x8 Vac: VB 2,8/2/8 2x9 Vac: VB 2,8/2/9 2x12 Vac: VB 2,8/2/12 2x15 Vac: VB 2,8/2/15* 2x18 Vac: VB 2,8/2/18* 2x24 Vac: VB 2,8/2/24*	6 Vac: VB 3,2/1/6 8 Vac: VB 3,2/1/8 9 Vac: VB 3,2/1/9 12 Vac: VB 3,2/1/12 15 Vac: VB 3,2/1/15 18 Vac: VB 3,2/1/18 24 Vac: VB 3,2/1/24	2x6 Vac: VB 3,2/2/6 2x8 Vac: VB 3,2/2/8 2x9 Vac: VB 3,2/2/9 2x12 Vac: VB 3,2/2/12 2x15 Vac: VB 3,2/2/15* 2x18 Vac: VB 3,2/2/18* 2x24 Vac: VB 3,2/2/24*
Rated Power	2,3 VA	2,3 VA	2,8 VA	2,8 VA	3,2 VA	3,2 VA
No-load voltage (app. x factor)	1.60	1.60	1.80	1.80	1.70	1.70
No-load loss (typ.)	1.20 W	1.20 W	0.90 W	0.90 W	0.80 W	0.80 W
Efficiency	52.0 %	52.0 %	57.0 %	57.0 %	53.0 %	53.0 %
Standards						
Classification	Safety isolating transformer	Safety isolating transformer *Mains transformer (without VDE mark)	Safety isolating transformer	Safety isolating transformer *Mains transformer (without VDE mark)	Safety isolating transformer	Safety isolating transformer *Mains transformer (without VDE mark)
Approvals						
Approvals	cURus, VDE	cURus, VDE	cURus, VDE	cURus, VDE	cURus, VDE	cURus, VDE
Environment						
Ambient temperature max.	70 °C	70 °C	70 °C	70 °C	50 °C	50 °C
Safety and protection						
Type	Encapsulated	Encapsulated	Encapsulated	Encapsulated	Encapsulated	Encapsulated
Insulation class	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	II	II	II	II	II	II
Short circuit strength	inherently short-circuit proof	inherently short-circuit proof	inherently short-circuit proof	inherently short-circuit proof	inherently short-circuit proof	inherently short-circuit proof
Order numbers						
Order Number	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**

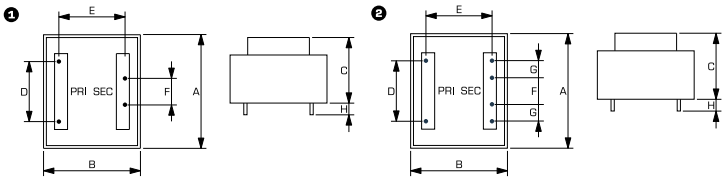
Short-circuit proof PCB transformer
VB

BLOCK Website

Mechanical data 30

Typ	Terminals	Pin (ø)	Core type	Weight	Dimension picture (in mm)	A	B	C	D	E	F	G	H
VB 0,35/1/..	Pins for printed circuit boards	0.6 mm	EE 20/6,1	0.02 kg	1	22	22.7	15	15	15	5	-	5
VB 0,35/2/..	Pins for printed circuit boards	0.6 mm	EE 20/6,1	0.02 kg	2	22	22.7	15	15	15	5	5	5
VB 0,5/1/..	Pins for printed circuit boards	0.6 mm	EE 20/10,5	0.04 kg	1	22	22.7	19	15	15	5	-	5
VB 0,5/2/..	Pins for printed circuit boards	0.6 mm	EE 20/10,5	0.04 kg	2	22	22.7	19	15	15	5	5	5
VB 1,0/1/..	Pins for printed circuit boards	0.8 mm	EI 30/10,5	0.07 kg	1	32.3	27.3	21.8	20	20	10	-	5
VB 1,0/2/..	Pins for printed circuit boards	0.8 mm	EI 30/10,5	0.07 kg	2	32.3	27.3	21.8	20	20	10	5	5
VB 1,2/1/..	Pins for printed circuit boards	0.8 mm	EI 30/12,5	0.08 kg	1	32.3	27.3	23.8	20	20	10	-	5
VB 1,2/2/..	Pins for printed circuit boards	0.8 mm	EI 30/12,5	0.08 kg	2	32.3	27.3	23.8	20	20	10	5	5
VB 1,5/1/..	Pins for printed circuit boards	0.8 mm	EI 30/12,5	0.08 kg	1	32.3	27.3	23.8	20	20	10	-	5
VB 1,5/2/..	Pins for printed circuit boards	0.8 mm	EI 30/12,5	0.08 kg	2	32.3	27.3	23.8	20	20	10	5	5
VB 2,0/1/..	Pins for printed circuit boards	0.8 mm	EI 30/15,5	0.10 kg	1	32.3	27.3	26.8	20	20	10	-	5
VB 2,0/2/..	Pins for printed circuit boards	0.8 mm	EI 30/15,5	0.10 kg	2	32.3	27.3	26.8	20	20	10	5	5
VB 2,3/1/..	Pins for printed circuit boards	0.8 mm	EI 30/18,0	0.11 kg	1	32.3	27.3	29	20	20	10	-	5
VB 2,3/2/..	Pins for printed circuit boards	0.8 mm	EI 30/18,0	0.11 kg	2	32.3	27.3	29	20	20	10	5	5
VB 2,8/1/..	Pins for printed circuit boards	0.8 mm	EI 30/23,0	0.14 kg	1	32.3	27.3	34	20	20	10	-	5
VB 2,8/2/..	Pins for printed circuit boards	0.8 mm	EI 30/23,0	0.14 kg	2	32.3	27.3	34	20	20	10	5	5
VB 3,2/1/..	Pins for printed circuit boards	0.8 mm	EI 38/16,5	0.17 kg	1	41	35	30.8	20	25	10	-	5
VB 3,2/2/..	Pins for printed circuit boards	0.8 mm	EI 38/16,5	0.17 kg	2	41	35	30.8	20	25	10	5	5

Dimension pictures



Short-circuit proof PCB transformer
AVB

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General Data

Rated input voltage 2 x 115 Vac
Rated output voltage 6 - 2 x 24 Vac
Rated power 0.35 - 3.2 VA
Insulation class B
Maximum ambient temperature 70 °C (AVB 3,2 max. 50 °C)
Efficiency up to 59 %
Degree of protection IP 00

Advantages

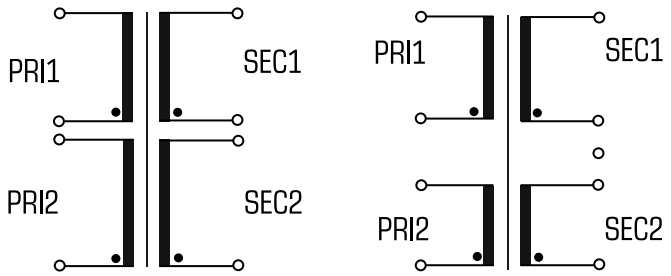
Minimum size at high output
Inherently short-circuit proof
Dual input voltage for series or parallel connection
Also with dual output voltage for series or parallel connection
Designed for high ambient temperatures
Permanent corrosion protection, high insulation value and maximum electrical reliability thanks to XtraDenseFill resin encapsulation
Self-extinguishing potting and hood material

Applications

As a mains transformer for adjustment of the voltage and simple electrical isolation.

As a safety transformer for the safe electrical isolation of the input and output sides. The transformer is suitable for creating SELV and PELV circuits because of the limit on the output voltage.

Sample application



Standards

Mains transformer
to: VDE 0570 Teil 2-1, DIN EN 61558-2-1, EN 61558-2-1, IEC 61558-2-1, UL 5085-1/-2, CSA 22.2 No.66

Safety isolating transformer
to: VDE 0570 Teil 2-6, DIN EN 61558-2-6, EN 61558-2-6, IEC 61558-2-6, UL 5085-1/-2, CSA 22.2 No.66

Approvals

UL 5085-1/-2, CSA 22.2 No.66

Short-circuit proof PCB transformer
AVB

BLOCK Website

Electrical data

Typ	AVB 0,35/2/..	AVB 0,5/2/..	AVB 1,0/2/..	AVB 1,5/2/..	AVB 2,0/2/..	AVB 2,3/2/..
Input						
Rated input voltage	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage: Order no.	2x6 Vac: AVB 0,35/2/6 2x9 Vac: AVB 0,35/2/9 2x12 Vac: AVB 0,35/2/12 2x18 Vac: AVB 0,35/2/18* 2x24 Vac: AVB 0,35/2/24*	2x6 Vac: AVB 0,5/2/6 2x8 Vac: AVB 0,5/2/8 2x9 Vac: AVB 0,5/2/9 2x12 Vac: AVB 0,5/2/12 2x15 Vac: AVB 0,5/2/15* 2x18 Vac: AVB 0,5/2/18* 2x24 Vac: AVB 0,5/2/24*	2x6 Vac: AVB 1,0/2/6 2x9 Vac: AVB 1,0/2/9 2x12 Vac: AVB 1,0/2/12 2x15 Vac: AVB 1,0/2/15 2x18 Vac: AVB 1,0/2/18* 2x24 Vac: AVB 1,0/2/24*	2x6 Vac: AVB 1,5/2/6 2x8 Vac: AVB 1,5/2/8 2x9 Vac: AVB 1,5/2/9 2x12 Vac: AVB 1,5/2/12 2x15 Vac: AVB 1,5/2/15 2x18 Vac: AVB 1,5/2/18* 2x24 Vac: AVB 1,5/2/24*	2x12 Vac: AVB 2,0/2/12	2x6 Vac: AVB 2,3/2/6 2x9 Vac: AVB 2,3/2/9 2x12 Vac: AVB 2,3/2/12 2x15 Vac: AVB 2,3/2/15 2x18 Vac: AVB 2,3/2/18* 2x24 Vac: AVB 2,3/2/24*
Rated Power	0,35 VA	0,5 VA	1 VA	1,5 VA	2 VA	2,3 VA
No-load voltage (app. x factor)	1.80	1.80	1.32	1.39	1.43	1.43
No-load loss (typ.)	1.30 W	1.10 W	0.90 W	1.00 W	0.90 W	0.90 W
Efficiency	30.0 %	40.0 %	55.0 %	57.0 %	43.0 %	59.0 %
Standards						
Classification	Safety isolating transformer *Mains transformer	Safety isolating transformer *Mains transformer	Safety isolating transformer *Mains transformer	Safety isolating transformer *Mains transformer	Safety isolating transformer	Safety isolating transformer *Mains transformer
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	70 °C	70 °C	70 °C	70 °C	70 °C	70 °C
Safety and protection						
Type	Encapsulated	Encapsulated	Encapsulated	Encapsulated	Encapsulated	Encapsulated
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	II	II	II	II	II	II
Short circuit strength	inherently short-circuit proof	inherently short-circuit proof	inherently short-circuit proof	inherently short-circuit proof	inherently short-circuit proof	inherently short-circuit proof
Order numbers						
Order Number	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**

Short-circuit proof PCB transformer
AVB

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Electrical data

Typ	AVB 2,3/2/..	AVB 3,2/2/..
Input		
Rated input voltage	2 x 115 Vac	2 x 115 Vac
Rated frequency	50 - 60 Hz	50 - 60 Hz
Output		
Rated output voltage: Order no.	2x8 Vac: AVB 2,3/2/8	2x6 Vac: AVB 3,2/2/6 2x9 Vac: AVB 3,2/2/9 2x12 Vac: AVB 3,2/2/12 2x15 Vac: AVB 3,2/2/15 2x18 Vac: AVB 3,2/2/18 2x24 Vac: AVB 3,2/2/24*
Rated Power	2,3 VA	3,2 VA
No-load voltage (app. x factor)	1.43	1.57
No-load loss (typ.)	0.90 W	1.00 W
Efficiency	59.0 %	58.0 %
Standards		
Classification	Safety isolating transformer	Safety isolating transformer *Mains transformer
Approvals		
Approvals	cURus	cURus
Environment		
Ambient temperature max.	70 °C	50 °C
Safety and protection		
Type	Encapsulated	Encapsulated
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105
Protection index	IP 00	IP 00
Safety class (prepared)	II	II
Short circuit strength	inherently short-circuit proof	inherently short-circuit proof
Order numbers		
Order Number	**see rated output voltage**	**see rated output voltage**

Short-circuit proof PCB transformer
AVB

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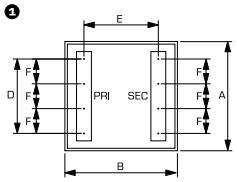
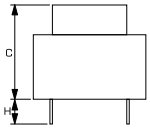
30 Mechanical data

Typ	Terminals	Pin (ø)	Core type	Weight	Dimension picture (in mm)	A	B	C	D	E	F	G	H
AVB 0,35/2/..	Pins for printed circuit boards	0.6	EE 20/6,1	0.02 kg	1	22	22.7	15	15	15	5	-	5
AVB 0,5/2/..	Pins for printed circuit boards	0.6	EE 20/10,5	0.04 kg	1	22	22.7	19	15	15	5	-	5
AVB 1,0/2/..	Pins for printed circuit boards	0.8	EI 30/10,5	0.07 kg	2	32.3	27.3	21.8	20	20	10	5	5
AVB 1,5/2/..	Pins for printed circuit boards	0.8	EI 30/12,5	0.08 kg	2	32.3	27.3	23.8	20	20	10	5	5
AVB 2,0/2/..	Pins for printed circuit boards	0.8	EI 30/15,5	0.10 kg	2	32.3	27.3	26.8	20	20	10	5	5
AVB 2,3/2/..	Pins for printed circuit boards	0.8	EI 30/18	0.10 kg	2	32.3	27.3	29	20	20	10	5	5
AVB 2,3/2/..	Pins for printed circuit boards	0.8	EI 30/18	0.11 kg	2	32.3	27.3	39	20	20	10	5	5
AVB 3,2/2/..	Quick connect terminals	0.6 x 0.8	EI 38/16,5	0.17 kg	2	41	35	30.8	20	25	10	5	5

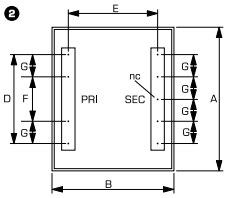
Dimension pictures

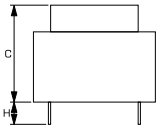
1





2





PCB transformer
vc

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General Data

Rated input voltage 230 Vac
Rated output voltage 6 - 2 x 24 Vac
Rated power 3.2 - 16 VA
Insulation class B
Maximum ambient temperature 40 - 60 °C
Efficiency up to 76 %
Degree of protection IP 00

Advantages

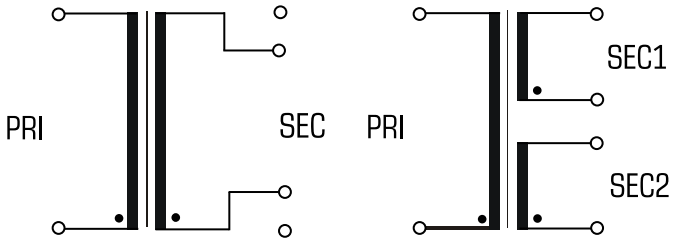
- Minimum size at high output
- Also with dual output voltage for series or parallel connection
- Permanent corrosion protection, high insulation value and maximum electrical reliability thanks to XtraDenseFill resin encapsulation
- Self-extinguishing potting material

Applications

As a mains transformer for adjustment of the voltage and simple electrical isolation.

As a safety transformer for the safe electrical isolation of the input and output sides. The transformer is suitable for creating SELV and PELV circuits because of the limit on the output voltage.

Sample applications



Standards

Mains transformer
to: VDE 0570 Teil 2-1, DIN EN 61558-2-1, EN 61558-2-1, IEC 61558-2-1, UL 5085-1/-2, CSA 22.2 No.66

Safety isolating transformer
to: VDE 0570 Teil 2-6, DIN EN 61558-2-6, EN 61558-2-6, IEC 61558-2-6, UL 5085-1/-2, CSA 22.2 No.66

Approvals

VDE, UL 5085-1/-2, CSA 22.2 No.66

PCB transformer
VC

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Electrical data

Typ	VC 3,2/1/...	VC 3,2/2/...	VC 5,0/1/...	VC 5,0/2/...	VC 10/1/...	VC 10/2/...
Input						
Rated input voltage	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage: Order no.	6 Vac: VC 3,2/1/6 8 Vac: VC 3,2/1/8 9 Vac: VC 3,2/1/9 12 Vac: VC 3,2/1/12 15 Vac: VC 3,2/1/15 18 Vac: VC 3,2/1/18 24 Vac: VC 3,2/1/24	2x6 Vac: VC 3,2/2/6 2x8 Vac: VC 3,2/2/8 2x9 Vac: VC 3,2/2/9 2x12 Vac: VC 3,2/2/12 2x15 Vac: VC 3,2/2/15 2x18 Vac: VC 3,2/2/18* 2x24 Vac: VC 3,2/2/24*	6 Vac: VC 5,0/1/6 8 Vac: VC 5,0/1/8 9 Vac: VC 5,0/1/9 12 Vac: VC 5,0/1/12 15 Vac: VC 5,0/1/15 18 Vac: VC 5,0/1/18 24 Vac: VC 5,0/1/24	2x6 Vac: VC 5,0/2/6 2x8 Vac: VC 5,0/2/8 2x9 Vac: VC 5,0/2/9 2x12 Vac: VC 5,0/2/12 2x15 Vac: VC 5,0/2/15 2x18 Vac: VC 5,0/2/18 2x24 Vac: VC 5,0/2/24*	6 Vac: VC 10/1/6 8 Vac: VC 10/1/8 9 Vac: VC 10/1/9 12 Vac: VC 10/1/12 15 Vac: VC 10/1/15 18 Vac: VC 10/1/18 24 Vac: VC 10/1/24	2x6 Vac: VC 10/2/6 2x8 Vac: VC 10/2/8 2x9 Vac: VC 10/2/9 2x12 Vac: VC 10/2/12 2x15 Vac: VC 10/2/15 2x18 Vac: VC 10/2/18 2x24 Vac: VC 10/2/24*
Rated Power	3,2 VA	3,2 VA	5 VA	5 VA	10 VA	10 VA
No-load voltage (app. x factor)	1.50	1.50	1.25	1.25	1.25	1.25
No-load loss (typ.)	1.00 W	1.00 W	1.50 W	1.50 W	1.60 W	1.60 W
Efficiency	60.0 %	60.0 %	68.0 %	68.0 %	74.0 %	74.0 %
Standards						
Classification	Safety isolating transformer	Safety isolating transformer *Mains transformer (without VDE mark)	Safety isolating transformer	Safety isolating transformer *Mains transformer (without VDE mark)	Safety isolating transformer	Safety isolating transformer *Mains transformer (without VDE mark)
Approvals						
Approvals	cURus, VDE	cURus, VDE	cURus, VDE	cURus, VDE	cURus, VDE	cURus, VDE
Environment						
Ambient temperature max.	60 °C	60 °C	50 °C	50 °C	40 °C	40 °C
Safety and protection						
Type	Encapsulated	Encapsulated	Encapsulated	Encapsulated	Encapsulated	Encapsulated
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	II	II	II	II	II	II
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Order numbers						
Order Number	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**

PCB transformer
VC

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Electrical data

Typ	VC 16/1/...	VC 16/2/...
Input		
Rated input voltage	230 Vac	230 Vac
Rated frequency	50 - 60 Hz	50 - 60 Hz
Output		
Rated output voltage: Order no.	6 Vac: VC 16/1/6 8 Vac: VC 16/1/8 9 Vac: VC 16/1/9 12 Vac: VC 16/1/12 15 Vac: VC 16/1/15 18 Vac: VC 16/1/18 24 Vac: VC 16/1/24	2x6 Vac: VC 16/2/6 2x8 Vac: VC 16/2/8 2x9 Vac: VC 16/2/9 2x12 Vac: VC 16/2/12 2x15 Vac: VC 16/2/15 2x18 Vac: VC 16/2/18 2x24 Vac: VC 16/2/24*
Rated Power	16 VA	16 VA
No-load voltage (app. x factor)	1.24	1.24
No-load loss (typ.)	1.80 W	1.80 W
Efficiency	76.0 %	76.0 %
Standards		
Classification	Safety isolating transformer	Safety isolating transformer *Mains transformer (without VDE mark)
Approvals		
Approvals	cURus, VDE	cURus, VDE
Environment		
Ambient temperature max.	40 °C	40 °C
Safety and protection		
Type	Encapsulated	Encapsulated
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105
Protection index	IP 00	IP 00
Safety class (prepared)	II	II
Short circuit strength	non-short-circuit proof	non-short-circuit proof
Order numbers		
Order Number	**see rated output voltage**	**see rated output voltage**

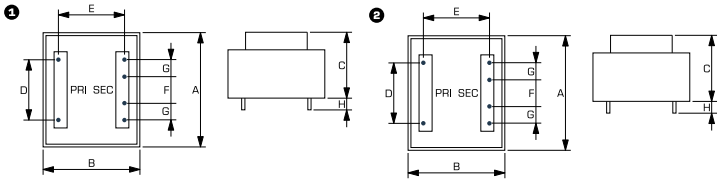
PCB transformer
VC

BLOCK Website

Mechanical data 30

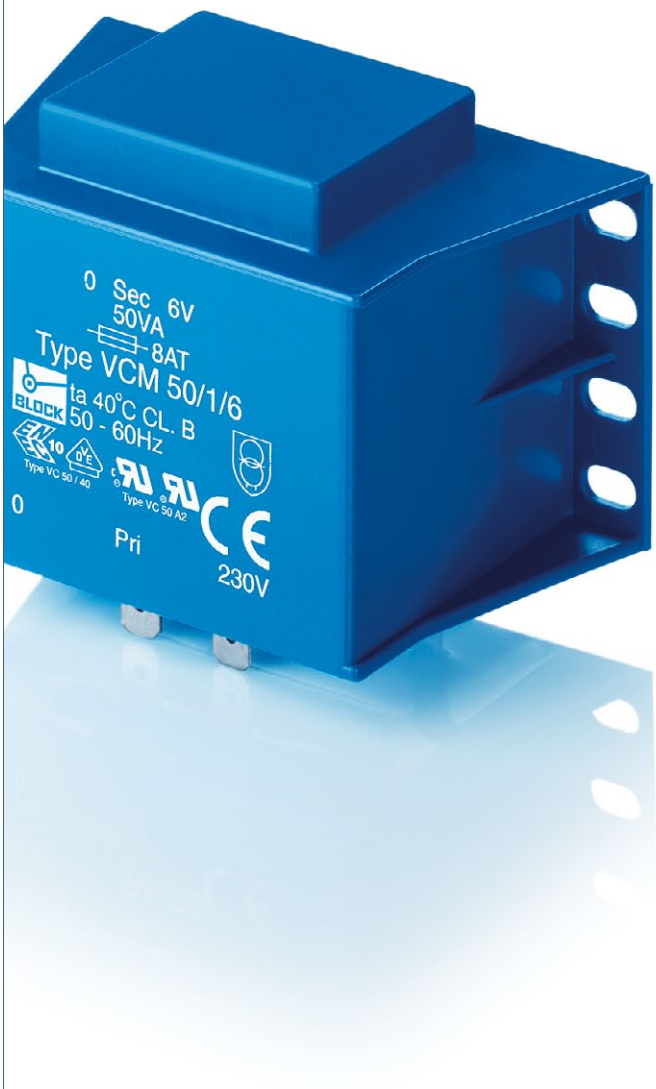
Typ	Terminals	Pin (ø)	Core type	Weight	Dimension picture (in mm)	A	B	C	D	E	F	G	H
VC 3,2/1/...	Pins for printed circuit boards	0.8 mm	EI 38/13,5	0.15 kg	1	41	35	28.1	20	25	10	5	5
VC 3,2/2/...	Pins for printed circuit boards	0.8 mm	EI 38/13,5	0.15 kg	2	41	35	28.1	20	25	10	5	5
VC 5,0/1/...	Pins for printed circuit boards	0.8 mm	EI 42/14,8	0.19 kg	1	44	37	33	25	25	15	5	5
VC 5,0/2/...	Pins for printed circuit boards	0.8 mm	EI 42/14,8	0.19 kg	2	44	37	33	25	25	15	5	5
VC 10/1/...	Pins for printed circuit boards	0.8 mm	EI 48/16,8	0.28 kg	1	51	43	34.6	25	27.5	15	5	7
VC 10/2/...	Pins for printed circuit boards	0.8 mm	EI 48/16,8	0.28 kg	2	51	43	34.6	25	27.5	15	5	7
VC 16/1/...	Pins for printed circuit boards	0.8 mm	EI 54/18,8	0.42 kg	1	57	48	39	30	30	20	5	7.5
VC 16/2/...	Pins for printed circuit boards	0.8 mm	EI 54/18,8	0.42 kg	2	57	48	39	30	30	20	5	7.5

Dimension pictures



PCB transformer, mountable
VCM

BLOCK Website



General Data

Rated input voltage 230 Vac
Rated output voltage 6 - 2 x 24 Vac
Rated power 5 - 50 VA
Insulation class B
Maximum ambient temperature 40 - 50 °C
Efficiency up to 87 %
Degree of protection IP 00

Advantages

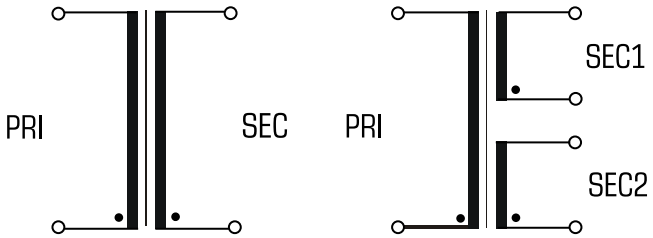
- Minimum size at high output
- Also with dual output voltage for series or parallel connection
- Permanent corrosion protection, high insulation value and maximum electrical reliability thanks to XtraDenseFill resin encapsulation
- Self-extinguishing potting material
- Additional mounting option with tabs on the housing

Applications

As a mains transformer for adjustment of the voltage and simple electrical isolation.

As a safety isolating transformer for the safe electrical isolation of the input and output sides. The transformer is suitable for creating SELV and PELV circuits because of the limit on the output voltage.

Sample application



Standards

Mains transformer
to: VDE 0570 Teil 2-1, DIN EN 61558-2-1, EN 61558-2-1, IEC 61558-2-1, UL 5085-1/-2, CSA 22.2 No.66

Isolating transformer
to: VDE 0570 Part 2-4, DIN EN 61558-2-4, EN 61558-2-4, IEC 61558-2-4, UL 5085-1/-2, CSA 22.2 No.66

Safety isolating transformer
to: VDE 0570 Part 2-6, DIN EN 61558-2-6, EN 61558-2-6, IEC 61558-2-6, UL 5085-1/-2, CSA 22.2 No.66

Approvals

VDE, UL 5085-1/-2, CSA 22.2 No.66

PCB transformer, mountable
VCM

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Electrical data

Typ	VCM 5,0/1/..	VCM 5,0/2/..	VCM 10/1/..	VCM 10/2/..	VCM 16/1/..	VCM 16/2/..
Input						
Rated input voltage	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage: Order no.	6 Vac: VCM 5,0/1/6 8 Vac: VCM 5,0/1/8 9 Vac: VCM 5,0/1/9 12 Vac: VCM 5,0/1/12 15 Vac: VCM 5,0/1/15 18 Vac: VCM 5,0/1/18 24 Vac: VCM 5,0/1/24	2x6 Vac: VCM 5,0/2/6 2x8 Vac: VCM 5,0/2/8 2x9 Vac: VCM 5,0/2/9 2x12 Vac: VCM 5,0/2/12 2x15 Vac: VCM 5,0/2/15 2x18 Vac: VCM 5,0/2/18 2x24 Vac: VCM 5,0/2/24*	6 Vac: VCM 10/1/6 8 Vac: VCM 10/1/8 9 Vac: VCM 10/1/9 12 Vac: VCM 10/1/12 15 Vac: VCM 10/1/15 18 Vac: VCM 10/1/18 24 Vac: VCM 10/1/24	2x6 Vac: VCM 10/2/6 2x8 Vac: VCM 10/2/8 2x9 Vac: VCM 10/2/9 2x12 Vac: VCM 10/2/12 2x15 Vac: VCM 10/2/15 2x18 Vac: VCM 10/2/18 2x24 Vac: VCM 10/2/24*	6 Vac: VCM 16/1/6 8 Vac: VCM 16/1/8 9 Vac: VCM 16/1/9 12 Vac: VCM 16/1/12 15 Vac: VCM 16/1/15 18 Vac: VCM 16/1/18 24 Vac: VCM 16/1/24	2x6 Vac: VCM 16/2/6 2x8 Vac: VCM 16/2/8 2x9 Vac: VCM 16/2/9 2x12 Vac: VCM 16/2/12 2x15 Vac: VCM 16/2/15 2x18 Vac: VCM 16/2/18 2x24 Vac: VCM 16/2/24*
Rated Power	5 VA	5 VA	10 VA	10 VA	16 VA	16 VA
No-load voltage (app. x factor)	1.25	1.25	1.25	1.25	1.24	1.24
No-load loss (typ.)	1.50 W	1.50 W	1.60 W	1.60 W	1.80 W	1.80 W
Efficiency	68.0 %	68.0 %	74.0 %	74.0 %	76.0 %	76.0 %
Standards						
Classification	Safety isolating transformer	Safety isolating transformer *Mains transformer (without VDE mark)	Safety isolating transformer	Safety isolating transformer *Mains transformer (without VDE mark)	Safety isolating transformer	Safety isolating transformer *Mains transformer (without VDE mark)
Approvals						
Approvals	cURus, VDE	cURus, VDE	cURus, VDE	cURus, VDE	cURus, VDE	cURus, VDE
Environment						
Ambient temperature max.	50 °C	50 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Encapsulated	Encapsulated	Encapsulated	Encapsulated	Encapsulated	Encapsulated
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	II	II	II	II	II	II
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Order numbers						
Order Number	**see output voltage**	**see output voltage**	**see output voltage**	**see output voltage**	**see output voltage**	**see output voltage**

PCB transformer, mountable
VCM

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Electrical data

Typ	VCM 25/1/..	VCM 25/2/..	VCM 36/1/..	VCM 36/2/..	VCM 50/1/..	VCM 50/2/..
Input						
Rated input voltage	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage: Order no.	6 Vac: VCM 25/1/6 8 Vac: VCM 25/1/8 9 Vac: VCM 25/1/9 12 Vac: VCM 25/1/12 15 Vac: VCM 25/1/15 18 Vac: VCM 25/1/18 24 Vac: VCM 25/1/24	2x6 Vac: VCM 25/2/6 2x8 Vac: VCM 25/2/8 2x9 Vac: VCM 25/2/9 2x12 Vac: VCM 25/2/12 2x15 Vac: VCM 25/2/15 2x18 Vac: VCM 25/2/18 2x24 Vac: VCM 25/2/24*	6 Vac: VCM 36/1/6 8 Vac: VCM 36/1/8 9 Vac: VCM 36/1/9 12 Vac: VCM 36/1/12 15 Vac: VCM 36/1/15 18 Vac: VCM 36/1/18 24 Vac: VCM 36/1/24	2x6 Vac: VCM 36/2/6 2x8 Vac: VCM 36/2/8 2x9 Vac: VCM 36/2/9 2x12 Vac: VCM 36/2/12 2x15 Vac: VCM 36/2/15 2x18 Vac: VCM 36/2/18 2x24 Vac: VCM 36/2/24**	6 Vac: VCM 50/1/6 8 Vac: VCM 50/1/8 9 Vac: VCM 50/1/9 12 Vac: VCM 50/1/12 15 Vac: VCM 50/1/15 18 Vac: VCM 50/1/18 24 Vac: VCM 50/1/24	2x6 Vac: VCM 50/2/6 2x8 Vac: VCM 50/2/8 2x9 Vac: VCM 50/2/9 2x12 Vac: VCM 50/2/12 2x15 Vac: VCM 50/2/15 2x18 Vac: VCM 50/2/18 2x24 Vac: VCM 50/2/24**
Rated Power	25 VA	25 VA	36 VA	36 VA	50 VA	50 VA
No-load voltage (app. x factor)	1.12	1.12	1.11	1.11	1.09	1.09
No-load loss (typ.)	2.50 W	2.50 W	2.60 W	2.60 W	3.80 W	3.80 W
Efficiency	82.0 %	82.0 %	83.0 %	83.0 %	87.0 %	87.0 %
Standards						
Classification	Safety isolating transformer	Safety isolating transformer *Mains transformer (without VDE mark)	Safety isolating transformer	Safety isolating transformer **isolating transformer (without VDE mark)	Safety isolating transformer	Safety isolating transformer **isolating transformer (without VDE mark)
Approvals						
Approvals	cURus, VDE	cURus, VDE	cURus, VDE	cURus, VDE	cURus, VDE	cURus, VDE
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Encapsulated	Encapsulated	Encapsulated	Encapsulated	Encapsulated	Encapsulated
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	II	II	II	II	II	II
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Order numbers						
Order Number	**see output voltage**	**see output voltage**	**see output voltage**	**see output voltage**	**see output voltage**	**see output voltage**

PCB transformer, mountable
VCM

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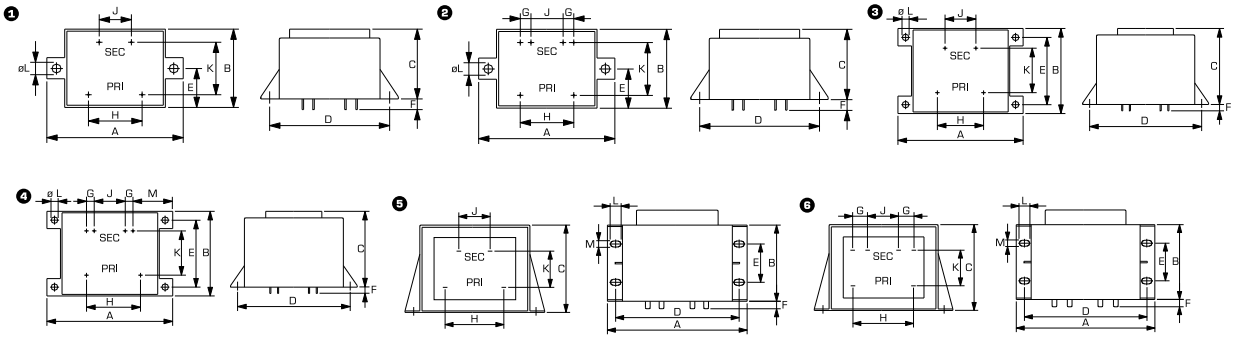
Mechanical data 30

Typ	Fixing method	Terminals	Pin (ø)	Core type	Weight	Dimension picture (in mm)	A	B	C	D	E	F	G	H	J	K	L	M
VCM 5,0/1/..	Fixing points on the case	Pins for PCB	0.8 mm	EI 42/14,8	0.19 kg	1	64	37	32.3	55	18.5	5	-	25	15	25	4.2	-
VCM 5,0/2/..	Fixing points on the case	Pins for PCB	0.8 mm	EI 42/14,8	0.19 kg	2	64	37	32.3	55	18.5	5	5	25	15	25	4.2	-
VCM 10/1/..	Fixing points on the case	Pins for PCB	0.8 mm	EI 48/16,8	0.28 kg	1	69	42.2	34.6	60	21.1	5	-	25	15	27.5	4.2	-
VCM 10/2/..	Fixing points on the case	Pins for PCB	0.8 mm	EI 48/16,8	0.28 kg	2	69	42.2	34.6	60	21.1	5	5	25	15	27.5	4.2	-
VCM 16/1/..	Fixing points on the case	Pins for PCB	0.8 mm	EI 54/18,8	0.42 kg	3	75.2	47.1	39	65	37.5	5	-	30	20	30	4.2	-
VCM 16/2/..	Fixing points on the case	Pins for PCB	0.8 mm	EI 54/18,8	0.42 kg	4	75.2	47.1	39	65	37.5	5	5	30	20	30	4.2	23.3
VCM 25/1/..	Fixing points on the case	Pins for PCB	0.8 mm	EI 60/25,5	0.61 kg	3	81.2	55	49.2	72.5	43.5	6.5	-	30	20	32.5	4.2	-
VCM 25/2/..	Fixing points on the case	Pins for PCB	0.8 mm	EI 60/25,5	0.61 kg	4	81.2	55	49.2	72.5	43.5	6.5	5	30	20	32.5	4.2	26
VCM 36/1/..	Fixing points on the case	Pins for PCB	0.8 mm	EI 66/23,0	0.75 kg	3	87.2	60	48.5	77.5	47.5	5	-	35	25	35	4.2	-
VCM 36/2/..	Fixing points on the case	Pins for PCB	0.8 mm	EI 66/23,0	0.75 kg	4	87.2	61	48.5	77.5	47.5	5	5	35	20	35	4.2	31
VCM 50/1/..	Fixing points on the case	Quick connect terminals	PRI 4.8 x 0.8 mm, SEC 6.3 x 0.8 mm	EI 66/34,5	0.99 kg	5	94	61	58.5	82	37.5	9	-	35	15	35	8.3	4.8
VCM 50/2/..	Fixing points on the case	Quick connect terminals	PRI 4.8 x 0.8 mm, SEC 6.3 x 0.8 mm	EI 66/34,5	0.99 kg	6	94	61	58.5	82	37.5	9	10	35	15	35	8.3	4.8

Dimension pictures



PCB transformer
VR

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General Data

Rated input voltage 230 Vac
Rated output voltage 8 - 2 x 18 Vac
Rated power 4.5 - 30 VA
Insulation class B
Maximum ambient temperature 40 °C
Efficiency up to 84 %
Degree of protection IP 00

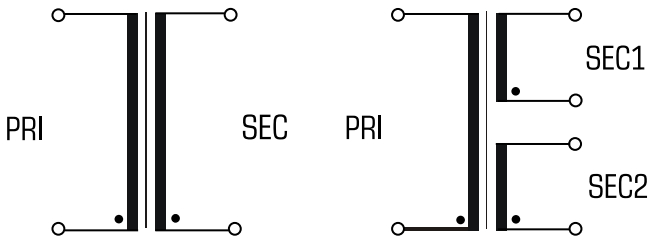
Advantages

Minimum size at high output
Also with double output voltage for series or parallel connection
Permanent corrosion protection, high insulation value and maximum electrical reliability thanks to XtraDenseFill resin encapsulation
Self-extinguishing potting material
Space saving installation thanks to additional screw mounting in the base plate

Applications

Safety transformer for the safe electrical isolation of the input and output sides. The transformer is suitable for creating SELV and PELV circuits because of the limit on the output voltage.

Sample application



Standards

Safety isolating transformer
to: VDE 0570 Teil 2-6, DIN EN 61558-2-6, EN 61558-2-6, IEC 61558-2-6, UL 5085-1/-2, CSA 22.2 No.66

Approvals

VDE, UL 5085-1/-2, CSA 22.2 No.66

PCB transformer
VR

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Electrical data

Typ	VR 4,5/1/..	VR 4,5/2/..	VR 7,5/1/..	VR 7,5/2/..	VR 13/1/..	VR 13/2/..
Input						
Rated input voltage	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage: Order no.	8 Vac: VR 4,5/1/8 9 Vac: VR 4,5/1/9 12 Vac: VR 4,5/1/12 15 Vac: VR 4,5/1/15 18 Vac: VR 4,5/1/18 24 Vac: VR 4,5/1/24	2x8 Vac: VR 4,5/2/8 2x9 Vac: VR 4,5/2/9 2x12 Vac: VR 4,5/2/12 2x15 Vac: VR 4,5/2/15 2x18 Vac: VR 4,5/2/18	8 Vac: VR 7,5/1/8 9 Vac: VR 7,5/1/9 12 Vac: VR 7,5/1/12 15 Vac: VR 7,5/1/15 18 Vac: VR 7,5/1/18 24 Vac: VR 7,5/1/24	2x8 Vac: VR 7,5/2/8 2x9 Vac: VR 7,5/2/9 2x12 Vac: VR 7,5/2/12 2x15 Vac: VR 7,5/2/15 2x18 Vac: VR 7,5/2/18	8 Vac: VR 13/1/8 9 Vac: VR 13/1/9 12 Vac: VR 13/1/12 15 Vac: VR 13/1/15 18 Vac: VR 13/1/18 24 Vac: VR 13/1/24	2x8 Vac: VR 13/2/8 2x9 Vac: VR 13/2/9 2x12 Vac: VR 13/2/12 2x15 Vac: VR 13/2/15 2x18 Vac: VR 13/2/18
Rated Power	4,5 VA	4,5 VA	7,5 VA	7,5 VA	13 VA	13 VA
No-load voltage (app. x factor)	1.27	1.27	1.18	1.18	1.19	1.19
No-load loss (typ.)	1.50 W	1.50 W	1.30 W	1.30 W	1.30 W	1.30 W
Efficiency	69.0 %	69.0 %	76.0 %	76.0 %	78.0 %	78.0 %
Standards						
Classification	Safety isolating transformer	Safety isolating transformer	Safety isolating transformer	Safety isolating transformer	Safety isolating transformer	Safety isolating transformer
Approvals						
Approvals	cURus, VDE	cURus, VDE	cURus, VDE	cURus, VDE	cURus, VDE	cURus, VDE
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Encapsulated	Encapsulated	Encapsulated	Encapsulated	Encapsulated	Encapsulated
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	II	II	II	II	II	II
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Order numbers						
Order Number	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**

PCB transformer
VR

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Electrical data

Typ	VR 22/1/..	VR 22/2/..	VR 30/1/..	VR 30/2/..
Input				
Rated input voltage	230 Vac	230 Vac	230 Vac	230 Vac
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output				
Rated output voltage: Order no.	8 Vac: VR 22/1/8 9 Vac: VR 22/1/9 12 Vac: VR 22/1/12 15 Vac: VR 22/1/15 18 Vac: VR 22/1/18 24 Vac: VR 22/1/24	2x8 Vac: VR 22/2/8 2x9 Vac: VR 22/2/9 2x12 Vac: VR 22/2/12 2x15 Vac: VR 22/2/15 2x18 Vac: VR 22/2/18	8 Vac: VR 30/1/8 9 Vac: VR 30/1/9 12 Vac: VR 30/1/12 15 Vac: VR 30/1/15 18 Vac: VR 30/1/18 24 Vac: VR 30/1/24	2x8 Vac: VR 30/2/8 2x9 Vac: VR 30/2/9 2x12 Vac: VR 30/2/12 2x15 Vac: VR 30/2/15 2x18 Vac: VR 30/2/18
Rated Power	22 VA	22 VA	30 VA	30 VA
No-load voltage (app. x factor)	1.15	1.15	1.11	1.11
No-load loss (typ.)	2.40 W	2.40 W	2.50 W	2.50 W
Efficiency	80.0 %	80.0 %	84.0 %	84.0 %
Standards				
Classification	Safety isolating transformer	Safety isolating transformer	Safety isolating transformer	Safety isolating transformer
Approvals				
Approvals	cURus, VDE	cURus, VDE	cURus, VDE	cURus, VDE
Environment				
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C
Safety and protection				
Type	Encapsulated	Encapsulated	Encapsulated	Encapsulated
Insulation class	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105	VDE=B, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	II	II	II	II
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Order numbers				
Order Number	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**

PCB transformer
VR

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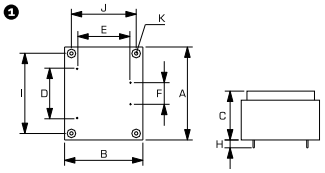
Mechanical data 30

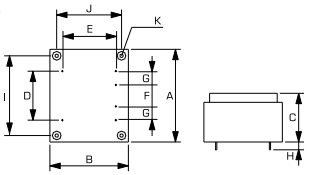
Typ	Fixing method	Terminals	Pin (ø)	Core type	Weight	Dimension picture (in mm)	A	B	C	D	E	F	G	H	I	J	K
VR 4,5/1/..	Additional fixing by self-tapping screws	Pins for PCB	0.8 mm	EI 42/14,8	0.19 kg	1	44	37	33	25	25	15	-	5	35	28	2.5
VR 4,5/2/..	Additional fixing by self-tapping screws	Pins for PCB	0.8 mm	EI 42/14,8	0.19 kg	2	44	37	33	25	25	15	5	5	35	28	2.5
VR 7,5/1/..	Additional fixing by self-tapping screws	Pins for PCB	0.8 mm	EI 48/16,8	0.28 kg	1	51	43	36	25	27.5	15	-	5	40	32	2.5
VR 7,5/2/..	Additional fixing by self-tapping screws	Pins for PCB	0.8 mm	EI 48/16,8	0.28 kg	2	51	43	36	25	27.5	15	5	5	40	32	2.5
VR 13/1/..	Additional fixing by self-tapping screws	Pins for PCB	0.8 mm	EI 54/18,8	0.42 kg	1	56	47	40	30	30	20	-	5	47.5	37.5	2.5
VR 13/2/..	Additional fixing by self-tapping screws	Pins for PCB	0.8 mm	EI 54/18,8	0.42 kg	2	56	47	40	30	30	20	5	5	47.5	37.5	2.5
VR 22/1/..	Additional fixing by self-tapping screws	Pins for PCB	0.8 mm	EI 60/21	0.57 kg	1	64	54	46	30	32.5	10	-	5	52.5	40	2.5
VR 22/2/..	Additional fixing by self-tapping screws	Pins for PCB	0.8 mm	EI 60/21	0.57 kg	2	64	54	46	30	32.5	10	10	5	52.5	40	2.5
VR 30/1/..	Additional fixing by self-tapping screws	Pins for PCB	0.8 mm	EI 60/30,5	0.78 kg	1	64	54	55	30	32.5	10	-	5	52.5	40	2.5
VR 30/2/..	Additional fixing by self-tapping screws	Pins for PCB	0.8 mm	EI 60/30,5	0.78 kg	2	64	54	55	30	32.5	10	10	5	52.5	40	2.5

Dimension pictures

1



2



Short-circuit proof PCB transformer
PT

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General Data

Rated input voltage 230 Vac
Rated output voltage 6 - 2 x 24 Vac
Rated power 4.5 - 30 VA
Insulation class E
Maximum ambient temperature 40 °C
Efficiency up to 83 %
Degree of protection IP 00

Advantages

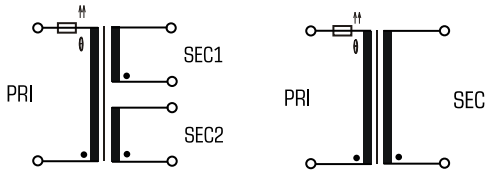
- Minimum size at high output
- Integrated overload protection using PTC in the input
- Also with dual output voltage for series or parallel connection
- Permanent corrosion protection, high insulation value and maximum electrical reliability thanks to XtraDenseFill resin encapsulation
- Self-extinguishing potting material
- Space saving installation thanks to additional screw mounting in the base plate

Applications

As a mains transformer for adjustment of the voltage and simple electrical isolation.

Safety transformer for the safe electrical isolation of the input and output sides. The transformer is suitable for creating SELV and PELV circuits because of the limit on the output voltage.

Sample application



Standards

Mains transformer
to: VDE 0570 Teil 2-1, DIN EN 61558-2-1, EN 61558-2-1, IEC 61558-2-1, UL 5085-1/-2, CSA 22.2 No.66

Safety isolating transformer
to: VDE 0570 Teil 2-6, DIN EN 61558-2-6, EN 61558-2-6, IEC 61558-2-6, UL 5085-1/-2, CSA 22.2 No.66

Approvals

VDE, UL 5085-1/-2, CSA 22.2 No.66

Short-circuit proof PCB transformer
PT

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Electrical data

Typ	PT 4,5/1/..	PT 4,5/2/..	PT 7,5/1/..	PT 7,5/2/..	PT 13/1/..	PT 13/2/..
Input						
Rated input voltage	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage: Order no.	6 Vac: PT 4,5/1/6 8 Vac: PT 4,5/1/8 9 Vac: PT 4,5/1/9 12 Vac: PT 4,5/1/12 15 Vac: PT 4,5/1/15 18 Vac: PT 4,5/1/18 24 Vac: PT 4,5/1/24	2x6 Vac: PT 4,5/2/6 2x8 Vac: PT 4,5/2/8 2x9 Vac: PT 4,5/2/9 2x12 Vac: PT 4,5/2/12 2x15 Vac: PT 4,5/2/15 2x18 Vac: PT 4,5/2/18 2x24 Vac: PT 4,5/2/24*	6 Vac: PT 7,5/1/6 8 Vac: PT 7,5/1/8 9 Vac: PT 7,5/1/9 12 Vac: PT 7,5/1/12 15 Vac: PT 7,5/1/15 18 Vac: PT 7,5/1/18 24 Vac: PT 7,5/1/24	2x6 Vac: PT 7,5/2/6 2x8 Vac: PT 7,5/2/8 2x9 Vac: PT 7,5/2/9 2x12 Vac: PT 7,5/2/12 2x15 Vac: PT 7,5/2/15 2x18 Vac: PT 7,5/2/18 2x24 Vac: PT 7,5/2/24*	6 Vac: PT 13/1/6 8 Vac: PT 13/1/8 9 Vac: PT 13/1/9 12 Vac: PT 13/1/12 15 Vac: PT 13/1/15 18 Vac: PT 13/1/18 24 Vac: PT 13/1/24	2x6 Vac: PT 13/2/6 2x8 Vac: PT 13/2/8 2x9 Vac: PT 13/2/9 2x12 Vac: PT 13/2/12 2x15 Vac: PT 13/2/15 2x18 Vac: PT 13/2/18 2x24 Vac: PT 13/2/24*
Rated Power	4,5 VA	4,5 VA	7,5 VA	7,5 VA	13 VA	13 VA
No-load voltage (app. x factor)	1.32	1.32	1.21	1.21	1.23	1.23
No-load loss (typ.)	1.50 W	1.50 W	1.30 W	1.30 W	1.30 W	1.30 W
Efficiency	65.0 %	65.0 %	65.0 %	65.0 %	73.0 %	73.0 %
Standards						
Classification	Safety isolating transformer	Safety isolating transformer *Mains transformer (without VDE mark)	Safety isolating transformer	Safety isolating transformer *Mains transformer (without VDE mark)	Safety isolating transformer	Safety isolating transformer *Mains transformer (without VDE mark)
Approvals						
Approvals	cURus, VDE	cURus, VDE	cURus, VDE	cURus, VDE	cURus, VDE	cURus, VDE
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Encapsulated	Encapsulated	Encapsulated	Encapsulated	Encapsulated	Encapsulated
Insulation class	VDE=E, UL=class 105	VDE=E, UL=class 105	VDE=E, UL=class 105	VDE=E, UL=class 105	VDE=E, UL=class 105	VDE=E, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	II	II	II	II	II	II
Short circuit strength	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof
Order numbers						
Order Number	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**

Short-circuit proof PCB transformer
PT

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Electrical data

Typ	PT 22/1/..	PT 22/2/..	PT 30/1/..	PT 30/2/..
Input				
Rated input voltage	230 Vac	230 Vac	230 Vac	230 Vac
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output				
Rated output voltage: Order no.	6 Vac: PT 22/1/6 8 Vac: PT 22/1/8 9 Vac: PT 22/1/9 12 Vac: PT 22/1/12 15 Vac: PT 22/1/15 18 Vac: PT 22/1/18 24 Vac: PT 22/1/24	2x6 Vac: PT 22/2/6 2x8 Vac: PT 22/2/8 2x9 Vac: PT 22/2/9 2x12 Vac: PT 22/2/12 2x15 Vac: PT 22/2/15 2x18 Vac: PT 22/2/18	6 Vac: PT 30/1/6 8 Vac: PT 30/1/8 9 Vac: PT 30/1/9 12 Vac: PT 30/1/12 15 Vac: PT 30/1/15 18 Vac: PT 30/1/18 24 Vac: PT 30/1/24	2x6 Vac: PT 30/2/6 2x8 Vac: PT 30/2/8 2x9 Vac: PT 30/2/9 2x12 Vac: PT 30/2/12 2x15 Vac: PT 30/2/15 2x18 Vac: PT 30/2/18
Rated Power	22 VA	22 VA	30 VA	30 VA
No-load voltage (app. x factor)	1.19	1.19	1.13	1.13
No-load loss (typ.)	2.40 W	2.40 W	2.30 W	2.30 W
Efficiency	77.0 %	77.0 %	83.0 %	83.0 %
Standards				
Classification	Safety isolating transformer	Safety isolating transformer	Safety isolating transformer	Safety isolating transformer
Approvals				
Approvals	cURus, VDE	cURus, VDE	cURus, VDE	cURus, VDE
Environment				
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C
Safety and protection				
Type	Encapsulated	Encapsulated	Encapsulated	Encapsulated
Insulation class	VDE=E, UL=class 105	VDE=E, UL=class 105	VDE=E, UL=class 105	VDE=E, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	II	II	II	II
Short circuit strength	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof
Order numbers				
Order Number	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**

Short-circuit proof PCB transformer
PT

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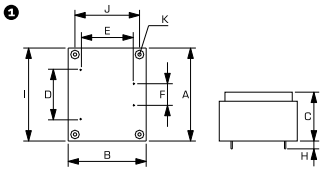
Mechanical data 30

Typ	Terminals	Pin Ø	Core type	Weight	Dimension picture (in mm)	A	B	C	D	E	F	G	H	I	J	K
PT 4,5/1/..	Pins for PCB	0.8 mm	EI 42/14,8	0.19 kg	1	44	37	33	25	25	15	-	5	35	28	2.5
PT 4,5/2/..	Pins for PCB	0.8 mm	EI 42/14,8	0.19 kg	2	44	37	33	25	25	15	5	5	35	28	2.5
PT 7,5/1/..	Pins for PCB	0.8 mm	EI 48/16,8	0.28 kg	1	51	43	36	25	27.5	15	-	7	40	32	2.5
PT 7,5/2/..	Pins for PCB	0.8 mm	EI 48/16,8	0.28 kg	2	51	43	36	25	27.5	15	5	7	40	32	2.5
PT 13/1/..	Pins for PCB	0.8 mm	EI 54/18,8	0.42 kg	1	56	47	40	30	30	20	-	7	47.5	37.5	2.5
PT 13/2/..	Pins for PCB	0.8 mm	EI 54/18,8	0.42 kg	2	56	47	40	30	30	20	5	7	47.5	37.5	2.5
PT 22/1/..	Pins for PCB	0.8 mm	EI 60/21	0.57 kg	1	64	54	46	30	32.5	10	-	7	52.5	40	2.5
PT 22/2/..	Pins for PCB	0.8 mm	EI 60/21	0.57 kg	2	64	54	46	30	32.5	10	10	7	52.5	40	2.5
PT 30/1/..	Pins for PCB	0.8 mm	EI 60/30,5	0.78 kg	1	64	54	55	30	32.5	10	-	7	52.5	40	2.5
PT 30/2/..	Pins for PCB	0.8 mm	EI 60/30,5	0.78 kg	2	64	54	55	30	32.5	10	10	7	52.5	40	2.5

Dimension pictures

1



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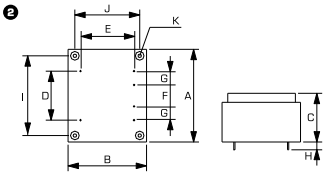

PCB transformer
EP

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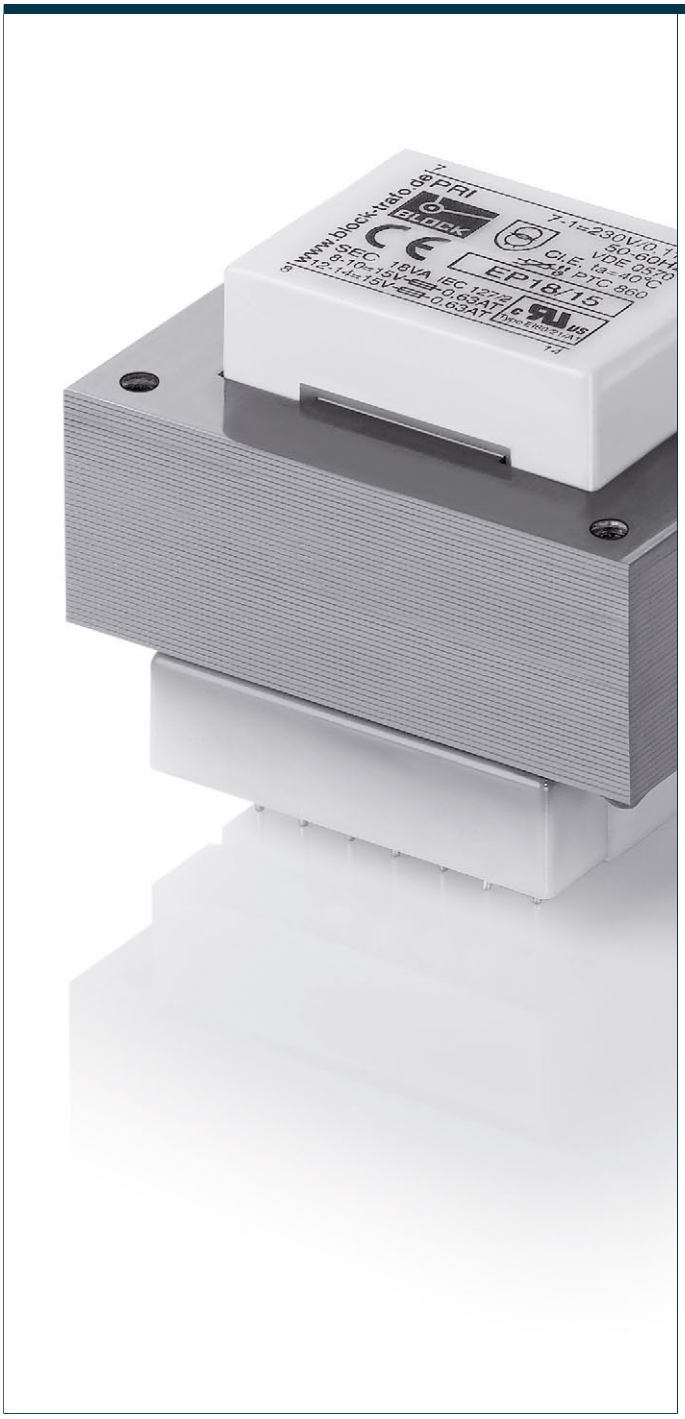


General Data

Rated input voltage 230 Vac
Rated output voltage 2 x 6 - 2 x 15 Vac
Rated power 4.5 - 35 VA
Insulation class E
Maximum ambient temperature 40 °C
Efficiency up to 79 %
Degree of protection IP 00

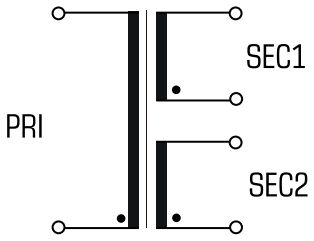
Advantages

Minimum size at high output
Double output voltage for series or parallel connection
Very good moisture protection and low noise thanks to vacuum impregnation
Contact protected on the circuit board thanks to covered solder pin strips
Stable connection technology with injected round wire soldering pins
Additional mounting option with holes in the core

Applications

Safety isolating transformer for the safe electrical isolation of the input and output sides. The transformer is suitable for creating SELV and PELV circuits because of the limit on the output voltage.

Sample application



Standards

Safety isolating transformer
to: VDE 0570 Teil 2-6, DIN EN 61558-2-6, EN 61558-2-6, IEC 61558-2-6, UL 5085-1/-2, CSA 22.2 No.66

Approvals

EAC

PCB transformer
EP

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Electrical data

Typ	EP 4,5/..	EP 7,5/..	EP 13/..	EP 18/..	EP 28/..	EP 35/..
Input						
Rated input voltage	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage: Order no.	2x15 Vac: EP 4,5/15	2x6 Vac: EP 7,5/6 2x9 Vac: EP 7,5/9 2x12 Vac: EP 7,5/12	2x12 Vac: EP 13/12 2x15 Vac: EP 13/15	2x12 Vac: EP 18/12 2x15 Vac: EP 18/15	2x12 Vac: EP 28/12 2x15 Vac: EP 28/15	2x9 Vac: EP 35/9 2x12 Vac: EP 35/12
Rated Power	4.5 VA	7.5 VA	13.0 VA	18.0 VA	28.0 VA	35.0 VA
No-load voltage (app. x factor)	1.51	1.38	1.28	1.16	1.18	1.15
No-load loss (typ.)	1.90 W	2.00 W	2.20 W	2.70 W	2.70 W	3.90 W
Efficiency	56.0 %	62.0 %	67.0 %	72.0 %	77.0 %	79.0 %
Standards						
Classification	Safety isolating transformer	Safety isolating transformer	Safety isolating transformer	Safety isolating transformer	Safety isolating transformer	Safety isolating transformer
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	E	E	E	E	E	E
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	II	II	II	II	II	II
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Overload protection	Typ PTC 890 (Accessory - available on request)	Typ PTC 880 (Accessory - available on request)	Typ PTC 872 (Accessory - available on request)	Typ PTC 860 (Accessory - available on request)	Typ PTC 850 (Accessory - available on request)	Typ PTC 850 (Accessory - available on request)
Order numbers						
Order Number	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**

PCB transformer
EP

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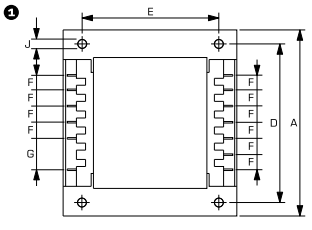
Mechanical data

Typ	Fixing method	Terminals	Core type	Weight	Dimension picture (in mm)	A	B	C	D	E	F	G	H	J	K	L	M
EP 4,5/..	Holes in the core package	Pins for PCB	EI 42/14,8	0.16 kg	2	42	35.5	30	35	28	5	12.5	25	3.5	4	0.8	7.5
EP 7,5/..	Holes in the core package	Pins for PCB	EI 48/16,5	0.25 kg	1	48	43	35	40	32	5	10	27.5	3.5	4	0.8	-
EP 13/..	Holes in the core package	Pins for PCB	EI 54/18,8	0.35 kg	1	54	45	40	45	36	5	10	30	3.5	4	0.8	-
EP 18/..	Holes in the core package	Pins for PCB	EI 60/21	0.48 kg	1	60	50	43	50	40	5	10	32.5	3.5	4	0.8	-
EP 28/..	Holes in the core package	Pins for PCB	EI 60/30	0.66 kg	1	60	50	53	50	40	5	10	32.5	3.5	4	0.8	-
EP 35/..	Holes in the core package	Pins for PCB	EI 66/30,5	0.80 kg	1	66	55	55	55	44	5	10	35	4.5	4	0.8	-

Dimension pictures

1



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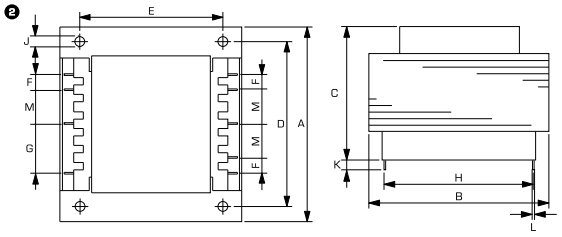

OVERVIEW
LOW PROFILE TRANSFORMERS

Type	Featurea	Rated input voltage	Rated output voltage	2.0 VA	4.0 VA	6.0 VA	8.0 VA	10.0 VA	12.0 VA	14.0 VA	18.0 VA	24.0 VA	30.0 VA
FL	Double input voltage, ta 40 °C	2 x 115 Vac	2 x 5 - 2 x 24 Vac	■	■	■	■	■		■	■	■	■
FLD	Short-circuit proof, double input voltage, ta 40 °C	2 x 115 Vac	2 x 6 - 2 x 18 Vac		■	■			■		■	■	
FLE	Short-circuit proof	230 Vac	2 x 6 - 2 x 18 Vac		■	■			■		■	■	

BLOCK

35.0 VA	42.0 VA	48.0 VA	52.0 VA	Page
	■		■	278
■		■		282
■				286

Low profile transformer
FL

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General Data

Rated input voltage 2 x 115 Vac
Rated output voltage 2 x 5 - 2 x 24 Vac
Rated power 2 - 52 VA
Insulation class E
Maximum ambient temperature 40 °C
Efficiency up to 81 %
Degree of protection IP 00

Advantages

Minimum size at high output
Low height
Dual input voltage for series or parallel connection
Dual output voltage for series or parallel connection
Permanent corrosion protection, high insulation value and maximum electrical reliability thanks to XtraDenseFill resin encapsulation
Self-extinguishing potting material

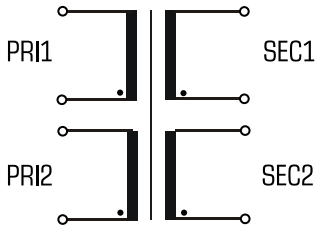
Applications

As a mains transformer for adjustment of the voltage and simple electrical isolation.

As an isolating transformer for the safe electrical isolation of the input and output sides. The transformer may be used to set up protective separation as a protective measure in accordance with VDE 0100.

As a safety isolating transformer for the safe electrical isolation of the input and output sides. The transformer is suitable for creating SELV and PELV circuits because of the limit on the output voltage.

Sample application



Standards

Mains transformer
to: VDE 0570 Teil 2-1, DIN EN 61558-2-1, EN 61558-2-1, IEC 61558-2-1, UL 5085-1/-2, CSA 22.2 No.66

Isolating transformer
to: VDE 0570 Part 2-4, DIN EN 61558-2-4, EN 61558-2-4, IEC 61558-2-4, UL 5085-1/-2, CSA 22.2 No.66

Safety isolating transformer
to: VDE 0570 Part 2-6, DIN EN 61558-2-6, EN 61558-2-6, IEC 61558-2-6, UL 5085-1/-2, CSA 22.2 No.66

Approvals

ENEC 10 (VDE), UL 5085-1/-2, CSA 22.2 No.66

Low profile transformer
FL

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Electrical data

Typ	FL 2/..	FL 4/..	FL 6/..	FL 8/..	FL 10/..	FL 14/..
Input						
Rated input voltage	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage: Order no.	2x5 Vac: FL 2/5 2x6 Vac: FL 2/6 2x8 Vac: FL 2/8 2x9 Vac: FL 2/9 2x12 Vac: FL 2/12 2x15 Vac: FL 2/15 2x24 Vac: FL 2/24*	2x6 Vac: FL 4/6 2x8 Vac: FL 4/8 2x9 Vac: FL 4/9 2x12 Vac: FL 4/12 2x15 Vac: FL 4/15 2x18 Vac: FL 4/18 2x24 Vac: FL 4/24*	2x5 Vac: FL 6/5 2x6 Vac: FL 6/6 2x8 Vac: FL 6/8 2x9 Vac: FL 6/9 2x12 Vac: FL 6/12 2x15 Vac: FL 6/15 2x18 Vac: FL 6/18 2x24 Vac: FL 6/24*	2x6 Vac: FL 8/6 2x8 Vac: FL 8/8 2x9 Vac: FL 8/9 2x12 Vac: FL 8/12 2x15 Vac: FL 8/15 2x18 Vac: FL 8/18 2x24 Vac: FL 8/24*	2x5 Vac: FL 10/5 2x6 Vac: FL 10/6 2x8 Vac: FL 10/8 2x9 Vac: FL 10/9 2x12 Vac: FL 10/12 2x15 Vac: FL 10/15 2x18 Vac: FL 10/18 2x24 Vac: FL 10/24*	2x5 Vac: FL 14/5 2x6 Vac: FL 14/6 2x8 Vac: FL 14/8 2x9 Vac: FL 14/9 2x12 Vac: FL 14/12 2x15 Vac: FL 14/15 2x18 Vac: FL 14/18 2x24 Vac: FL 14/24*
Rated Power	2 VA	4 VA	6 VA	8 VA	10 VA	14 VA
No-load voltage (app. x factor)	1.35	1.35	1.35	1.22	1.32	1.28
No-load loss (typ.)	0.60 W	0.90 W	1.20 W	1.30 W	1.10 W	1.20 W
Efficiency	66.0 %	66.0 %	69.0 %	76.0 %	72.0 %	74.0 %
Standards						
Classification	Safety isolating transformer *Mains transformer (without VDE mark)	Safety isolating transformer	Safety isolating transformer *Mains transformer (without VDE mark)	Safety isolating transformer *Mains transformer (without VDE mark)	Safety isolating transformer *Mains transformer (without VDE mark)	Safety isolating transformer *Mains transformer (without VDE mark)
Approvals						
Approvals	cURus, VDE	cURus, VDE	cURus, VDE	cURus, VDE	cURus, VDE	cURus, VDE
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Encapsulated	Encapsulated	Encapsulated	Encapsulated	Encapsulated	Encapsulated
Insulation class	VDE=E, UL=class 105	VDE=E, UL=class 105	VDE=E, UL=class 105	VDE=E, UL=class 105	VDE=E, UL=class 105	VDE=E, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	II	II	II	II	II	II
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Order numbers						
Order Number	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**

Low profile transformer
FL

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Electrical data

Typ	FL 18/..	FL 24/..	FL 30/..	FL 42/..	FL 52/..
Input					
Rated input voltage	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output					
Rated output voltage: Order no.	2x5 Vac: FL 18/5 2x6 Vac: FL 18/6 2x8 Vac: FL 18/8 2x9 Vac: FL 18/9 2x12 Vac: FL 18/12 2x15 Vac: FL 18/15 2x18 Vac: FL 18/18 2x24 Vac: FL 18/24*	2x5 Vac: FL 24/5 2x6 Vac: FL 24/6 2x8 Vac: FL 24/8 2x9 Vac: FL 24/9 2x12 Vac: FL 24/12 2x15 Vac: FL 24/15 2x18 Vac: FL 24/18 2x24 Vac: FL 24/24*	2x5 Vac: FL 30/5 2x6 Vac: FL 30/6 2x8 Vac: FL 30/8 2x9 Vac: FL 30/9 2x12 Vac: FL 30/12 2x15 Vac: FL 30/15 2x18 Vac: FL 30/18 2x24 Vac: FL 30/24**	2x5 Vac: FL 42/5 2x6 Vac: FL 42/6 2x8 Vac: FL 42/8 2x9 Vac: FL 42/9 2x12 Vac: FL 42/12 2x15 Vac: FL 42/15 2x18 Vac: FL 42/18 2x24 Vac: FL 42/24**	2x5 Vac: FL 52/5 2x6 Vac: FL 52/6 2x8 Vac: FL 52/8 2x9 Vac: FL 52/9 2x12 Vac: FL 52/12 2x15 Vac: FL 52/15 2x18 Vac: FL 52/18 2x24 Vac: FL 52/24**
Rated Power	18 VA	24 VA	30 VA	42 VA	52 VA
No-load voltage (app. x factor)	1.22	1.20	1.17	1.16	1.12
No-load loss (typ.)	1.50 W	1.60 W	1.70 W	3.50 W	4.00 W
Efficiency	77.0 %	77.0 %	81.0 %	81.0 %	81.0 %
Standards					
Classification	Safety isolating transformer *Mains transformer (without VDE mark)	Safety isolating transformer *Mains transformer (without VDE mark)	Safety isolating transformer **isolating transformer (without VDE mark)	Safety isolating transformer **isolating transformer (without VDE mark)	Safety isolating transformer **isolating transformer (without VDE mark)
Approvals					
Approvals	cURus, VDE	cURus, VDE	cURus, VDE	cURus, VDE	cURus, VDE
Environment					
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection					
Type	Encapsulated	Encapsulated	Encapsulated	Encapsulated	Encapsulated
Insulation class	VDE=E, UL=class 105	VDE=E, UL=class 105	VDE=E, UL=class 105	VDE=E, UL=class 105	VDE=E, UL=class 105
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	II	II	II	II	II
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Order numbers					
Order Number	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**

Low profile transformer
FL

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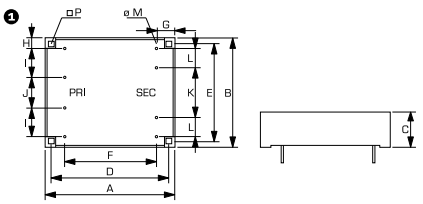
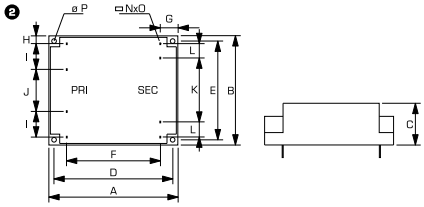
Mechanical data

Typ	Terminals	Core type	Weight	Dimension picture (in mm)	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
FL 2/..	Pins for PCB	UI 30/5,5	0.12 kg	1	53	44	17.6	47.5	37.5	35	9	4.5	10	15	25	5	0.8	-	-	2.5
FL 4/..	Pins for PCB	UI 30/7,5	0.15 kg	1	53	44	19.6	47.5	37.5	35	9	4.5	10	15	25	5	0.8	-	-	2.5
FL 6/..	Pins for PCB	UI 30/10,5	0.18 kg	1	53	44	22.6	47.5	37.5	35	9	4.5	10	15	25	5	0.8	-	-	2.5
FL 8/..	Pins for PCB	UI 30/16,5	0.25 kg	1	53	44	28.6	47.5	37.5	35	9	4.5	10	15	25	5	0.8	-	-	2.5
FL 10/..	Pins for PCB	UI 39/8	0.28 kg	1	68	57	22.8	62.5	50	45	11.5	5.5	15	16	26	10	0.8	-	-	2.5
FL 14/..	Pins for PCB	UI 39/10,2	0.32 kg	1	68	57	24.4	62.5	50	45	11.5	5.5	15	16	26	10	0.8	-	-	2.5
FL 18/..	Pins for PCB	UI 39/13,5	0.38 kg	1	68	57	27.6	62.5	50	45	11.5	5.5	15	16	26	10	0.8	-	-	2.5
FL 24/..	Pins for PCB	UI 39/17	0.45 kg	1	68	57	31.4	62.5	50	45	11.5	5.5	15	16	26	10	0.8	-	-	2.5
FL 30/..	Pins for PCB	UI 39/21	0.53 kg	1	68	57	35.8	62.5	50	45	11.5	5.5	15	16	26	10	0.8	-	-	2.5
FL 42/..	Pins for PCB	UI 48/17	0.72 kg	2	83.5	70	39	75	60	53.5	15	6.5	15	27	37	10	-	0.5	1	3.1
FL 52/..	Pins for PCB	UI 48/26	0.98 kg	2	86.5	70	49	75	60	53.5	16.5	6.5	15	27	37	10	-	0.5	1	3.1

Dimension pictures





Short-circuit proof low profile transformer
FLD

BLOCK Website

General Data

Rated input voltage 2 x 115 Vac
Rated output voltage 2 x 6 - 2 x 18 Vac
Rated power 4 - 48 VA
Insulation class E
Maximum ambient temperature 40 °C
Efficiency up to 79 %
Degree of protection IP 00

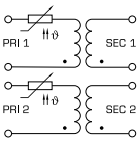
Advantages

Minimum size at high output
Low height
Integrated overload protection using PTC in the input
Double input voltage for series or parallel connection
Double output voltage for series or parallel connection
Permanent corrosion protection, high insulation value and maximum electrical reliability thanks to XtraDensiFill resin encapsulation
Self-extinguishing potting material

Applications

As a safety isolating transformer for the safe electrical isolation of the input and output sides. The transformer is suitable for creating SELV and PELV circuits because of the limit on the output voltage.

Circuit Diagram



Standards

Safety isolating transformer
to: VDE 0570 Part 2-6, DIN EN 61558-2-6, EN 61558-2-6, IEC 61558-2-6

Approvals

VDE (EN 61347)

Short-circuit proof low profile transformer
FLD

BLOCK Website

Electrical data

Typ	FLD 4/..	FLD 6/..	FLD 12/..	FLD 18/..	FLD 24/..	FLD 35/..
Input						
Rated input voltage	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac	2 x 115 Vac
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage: Order no.	2x6 Vac: FLD 4/6 2x8 Vac: FLD 4/8 2x9 Vac: FLD 4/9 2x12 Vac: FLD 4/12 2x15 Vac: FLD 4/15 2x18 Vac: FLD 4/18	2x6 Vac: FLD 6/6 2x8 Vac: FLD 6/8 2x9 Vac: FLD 6/9 2x12 Vac: FLD 6/12 2x15 Vac: FLD 6/15 2x18 Vac: FLD 6/18	2x6 Vac: FLD 12/6 2x8 Vac: FLD 12/8 2x9 Vac: FLD 12/9 2x12 Vac: FLD 12/12 2x15 Vac: FLD 12/15 2x18 Vac: FLD 12/18	2x6 Vac: FLD 18/6 2x8 Vac: FLD 18/8 2x9 Vac: FLD 18/9 2x12 Vac: FLD 18/12 2x15 Vac: FLD 18/15 2x18 Vac: FLD 18/18	2x6 Vac: FLD 24/6 2x8 Vac: FLD 24/8 2x9 Vac: FLD 24/9 2x12 Vac: FLD 24/12 2x15 Vac: FLD 24/15 2x18 Vac: FLD 24/18	2x6 Vac: FLD 35/6 2x8 Vac: FLD 35/8 2x9 Vac: FLD 35/9 2x12 Vac: FLD 35/12 2x15 Vac: FLD 35/15 2x18 Vac: FLD 35/18
Rated Power	4 VA	6 VA	12 VA	18 VA	24 VA	35 VA
No-load voltage (app. x factor)	1.37	1.33	1.31	1.30	1.25	1.20
No-load loss (typ.)	0.80 W	1.30 W	1.80 W	2.00 W	2.90 W	3.20 W
Efficiency	70.0 %	72.0 %	73.0 %	75.0 %	75.0 %	78.0 %
Standards						
Classification	Safety isolating transformer	Safety isolating transformer	Safety isolating transformer	Safety isolating transformer	Safety isolating transformer	Safety isolating transformer
Approvals						
Approvals	ENEC 10 (VDE)	ENEC 10 (VDE)	ENEC 10 (VDE)	ENEC 10 (VDE)	ENEC 10 (VDE)	ENEC 10 (VDE)
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Encapsulated	Encapsulated	Encapsulated	Encapsulated	Encapsulated	Encapsulated
Insulation class	E	E	E	E	E	E
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	II	II	II	II	II	II
Short circuit strength	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof
Order numbers						
Order Number	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**

Short-circuit proof low profile transformer
FLD

BLOCK Website

Electrical data

Typ	FLD 48/..
Input	
Rated input voltage	2 x 115 Vac
Rated frequency	50 - 60 Hz
Output	
Rated output voltage: Order no.	2x6 Vac: FLD 48/6 2x8 Vac: FLD 48/8 2x9 Vac: FLD 48/9 2x12 Vac: FLD 48/12 2x15 Vac: FLD 48/15 2x18 Vac: FLD 48/18
Rated Power	48 VA
No-load voltage (app. x factor)	1.20
No-load loss (typ.)	4.50 W
Efficiency	79.0 %
Standards	
Classification	Safety isolating transformer
Approvals	
Approvals	ENEC 10 (VDE)
Environment	
Ambient temperature max.	40 °C
Safety and protection	
Type	Encapsulated
Insulation class	E
Protection index	IP 00
Safety class (prepared)	II
Short circuit strength	non-inherently short-circuit proof
Order numbers	
Order Number	**see rated output voltage**

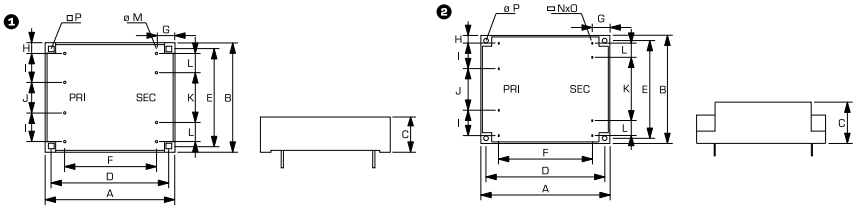
Short-circuit proof low profile transformer
FLD

BLOCK Website

Mechanical data 30

Typ	Terminals	Core type	Weight	Dimension picture (in mm)	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
FLD 4/..	Pins for printed circuit boards	UI 30/10,5	0.18 kg	1	53	44	22.6	47.5	37.5	35	9	4.5	10	15	25	5	0.8	-	-	2.5
FLD 6/..	Pins for printed circuit boards	UI 30/16,5	0.25 kg	1	53	44	28.6	47.5	37.5	35	9	4.5	10	15	25	5	0.8	-	-	2.5
FLD 12/..	Pins for printed circuit boards	UI 39/13,5	0.37 kg	1	68	57	27.6	62.5	50	45	11.5	5.5	15	16	26	10	0.8	-	-	2.5
FLD 18/..	Pins for printed circuit boards	UI 39/17,0	0.45 kg	1	68	57	31.4	62.5	50	45	11.5	5.5	15	16	26	10	0.8	-	-	2.5
FLD 24/..	Pins for printed circuit boards	UI 39/21,0	0.53 kg	1	68	57	35.8	62.5	50	45	11.5	5.5	15	16	26	10	0.8	-	-	2.5
FLD 35/..	Pins for printed circuit boards	UI 48/17,0	0.74 kg	2	83.5	70	39	75	60	53.5	15	6.5	15	27	37	10	-	0.5	1	3
FLD 48/..	Pins for printed circuit boards	UI 48/26,0	1.02 kg	2	86.5	70	49	75	60	53	17	6.5	15	27	37	10	-	0.5	1	3

Dimension pictures



Short-circuit proof low profile transformer
FLE

BLOCK Website

General Data

Rated input voltage 230 Vac
Rated output voltage 2 x 6 - 2 x 18 Vac
Rated power 4 - 35 VA
Insulation class E
Maximum ambient temperature 40 °C
Efficiency up to 78 %
Degree of protection IP 00

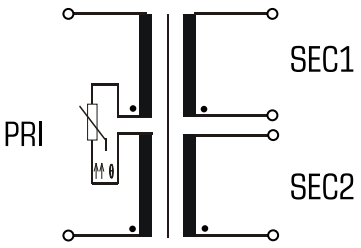
Advantages

Minimum size at high output
Low height
Integrated overload protection using PTC in the input
Double output voltage for series or parallel connection
Permanent corrosion protection, high insulation value and maximum electrical reliability thanks to XtraDenseFill resin encapsulation
Self-extinguishing potting material

Applications

As a safety isolating transformer for the safe electrical isolation of the input and output sides. The transformer is suitable for creating SELV and PELV circuits because of the limit on the output voltage.

Sample application



Standards

Safety isolating transformer
to: VDE 0570 Part 2-6, DIN EN 61558-2-6, EN 61558-2-6, IEC 61558-2-6

Approvals

VDE

Short-circuit proof low profile transformer
FLE

BLOCK Website

Electrical data

Typ	FLE 4/..	FLE 6/..	FLE 12/..	FLE 18/..	FLE 24/..	FLE 35/..
Input						
Rated input voltage	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output						
Rated output voltage: Order no.	2x6 Vac: FLE 4/6 2x8 Vac: FLE 4/8 2x9 Vac: FLE 4/9 2x12 Vac: FLE 4/12 2x15 Vac: FLE 4/15 2x18 Vac: FLE 4/18	2x6 Vac: FLE 6/6 2x8 Vac: FLE 6/8 2x9 Vac: FLE 6/9 2x12 Vac: FLE 6/12 2x15 Vac: FLE 6/15 2x18 Vac: FLE 6/18	2x6 Vac: FLE 12/6 2x8 Vac: FLE 12/8 2x9 Vac: FLE 12/9 2x12 Vac: FLE 12/12 2x15 Vac: FLE 12/15 2x18 Vac: FLE 12/18	2x6 Vac: FLE 18/6 2x8 Vac: FLE 18/8 2x9 Vac: FLE 18/9 2x12 Vac: FLE 18/12 2x15 Vac: FLE 18/15 2x18 Vac: FLE 18/18	2x6 Vac: FLE 24/6 2x8 Vac: FLE 24/8 2x9 Vac: FLE 24/9 2x12 Vac: FLE 24/12 2x15 Vac: FLE 24/15 2x18 Vac: FLE 24/18	2x6 Vac: FLE 35/6 2x8 Vac: FLE 35/8 2x9 Vac: FLE 35/9 2x12 Vac: FLE 35/12 2x15 Vac: FLE 35/15 2x18 Vac: FLE 35/18
Rated Power	4 VA	6 VA	12 VA	18 VA	24 VA	35 VA
No-load voltage (app. x factor)	1.37	1.33	1.31	1.30	1.25	1.20
No-load loss (typ.)	0.80 W	1.30 W	1.80 W	2.00 W	2.90 W	3.20 W
Efficiency	70.0 %	72.0 %	73.0 %	75.0 %	75.0 %	78.0 %
Standards						
Classification	Safety isolating transformer	Safety isolating transformer	Safety isolating transformer	Safety isolating transformer	Safety isolating transformer	Safety isolating transformer
Approvals						
Approvals	VDE	VDE	VDE	VDE	VDE	VDE
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Encapsulated	Encapsulated	Encapsulated	Encapsulated	Encapsulated	Encapsulated
Insulation class	E	E	E	E	E	E
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	II	II	II	II	II	II
Short circuit strength	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof	non-inherently short-circuit proof
Order numbers						
Order Number	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**	**see rated output voltage**

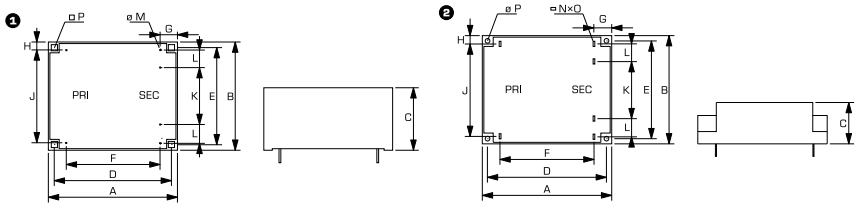
Short-circuit proof low profile transformer
FLE

BLOCK Website

Mechanical data 30

Typ	Terminals	Core type	Weight	Dimension picture (in mm)	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P
FLE 4/..	Pins for PCB	UI 30/10,5	0.18 kg	1	53	44	22.6	47.5	37.5	35	9	4.5	35	25	5	0.8	-	-	2.5
FLE 6/..	Pins for PCB	UI 30/16,5	0.25 kg	1	53	44	28.6	47.5	37.5	35	9	4.5	35	25	5	0.8	-	-	2.5
FLE 12/..	Pins for PCB	UI 39/13,5	0.37 kg	1	68	57	27.6	62.5	50	45	11.5	5.5	46	26	10	0.8	-	-	2.5
FLE 18/..	Pins for PCB	UI 39/17,0	0.45 kg	1	68	57	31.4	62.5	50	45	11.5	5.5	46	26	10	0.8	-	-	2.5
FLE 24/..	Pins for PCB	UI 39/21	0.53 kg	1	68	57	35.8	62.5	50	45	11.5	5.5	46	26	10	0.8	-	-	2.5
FLE 35/..	Pins for PCB	UI 48/17,0	0.74 kg	2	83.5	70	39	75	60	53.5	15	6.5	57	37	10	-	0.5	1	3

Dimension pictures

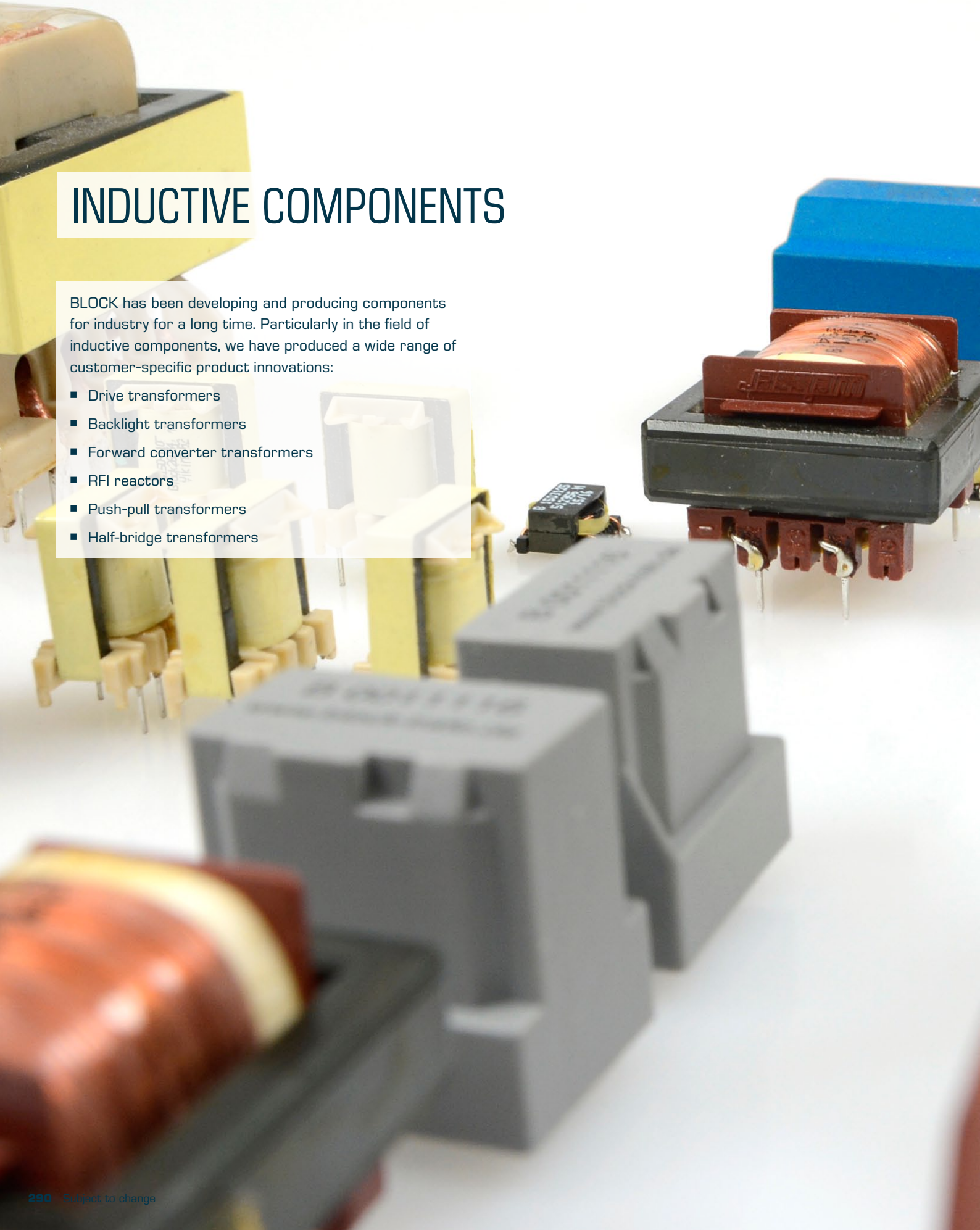



SEC
35 VA
0 - 6V
17,5VA
50-60Hz
ta 40°C Cl.E
BLOCK
www.block-trafo.de
FLE 35 / 6
CE
HV-Test 5000V
PRI
230V
0
SEC
12VA
0 - 12V
6VA
BLOCK
www.block-trafo.de
FLE 12 / 12
PRI

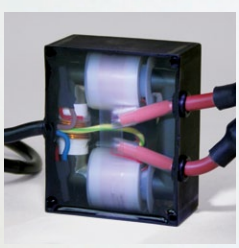
INDUCTIVE COMPONENTS

BLOCK has been developing and producing components for industry for a long time. Particularly in the field of inductive components, we have produced a wide range of customer-specific product innovations:

- Drive transformers
- Backlight transformers
- Forward converter transformers
- RFI reactors
- Push-pull transformers
- Half-bridge transformers



- High-voltage transformers
- Series inductors
- Iron powder core chokes
- PFC reactors
- SMPS transformers
- Storage reactors
- Current-compensated chokes up to 320 A
- Current sensors
- Current converters
- TinySwitch transformers
- TOPSwitch transformers

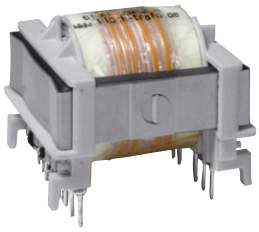


BLOCK CUSTOM MADE

Components for switched mode power supplies

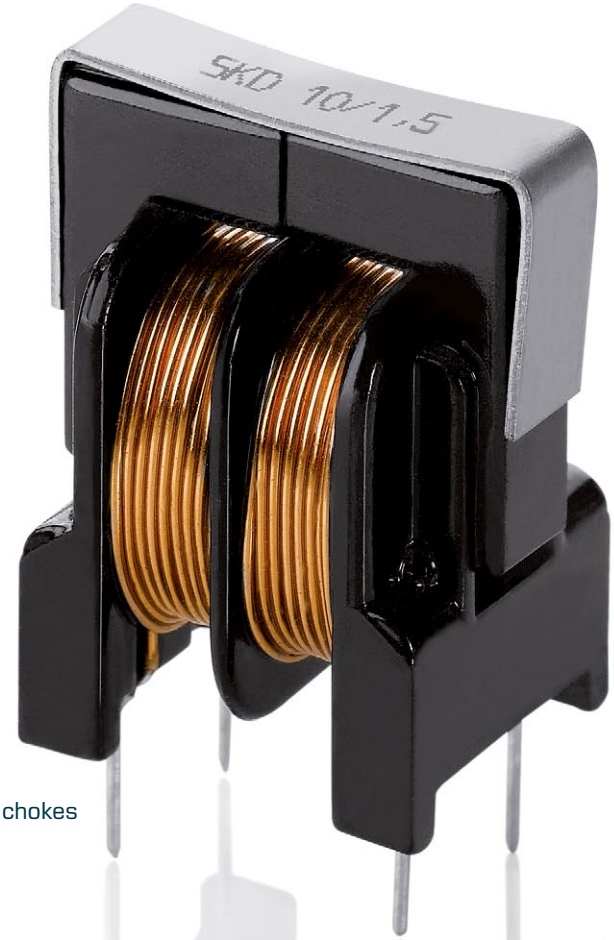
- Input voltages up to 10 kVac
- Output voltages up to 10 kVac
- Power up to 100 kW
- Frequencies up to 300 kHz
- Core forms E, ETD, EFD, PQ etc.
- UL-insulating system Class B, Class F

Push-pull transformer



Sample data

Input rated voltage 400 Vac	Switching 66 kHz
Output rated voltage 14 Vac	Core size ETD 39
Power 280 W	Standard EN 60950
Inductance 4.26 mH	



RFI chokes

- Current compensated chokes
- Linear series chokes
- Ring core chokes
- Rod core chokes
- UL-insulating system Class B, Class F
- also with housing

Current compensated ring core choke

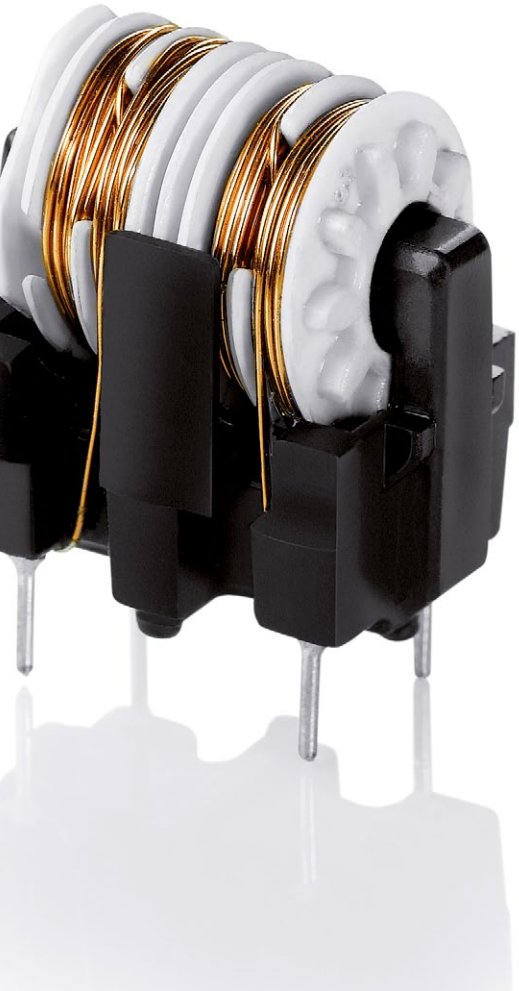
Sample data

Rated voltage 250 Vac	Inductance 2 x 3.3 mH
Rated current 4 A	Standard EN 61558

BLOCK experience

When it comes to inductive components you will find BLOCK an efficient partner. The smallest batches or large-scale production are our strength. Alongside product performance in the smallest spaces and precision workmanship, the following market requirements are also increasing:

- Environmental sustainability
- Recyclable
- The latest quality standards
- EMC guidelines



Storage reactors

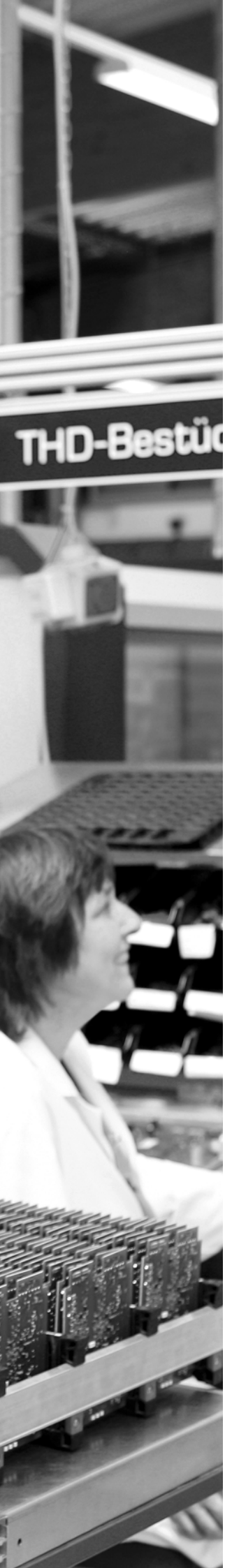
Step down storage choke

Sample data

Inductance 740 µH @ 7 A	Switching 130 kHz
Input voltage max. 625 Vac	Core E 42/15 (Kool Mµ®)
Output voltage 200 Vac	UL-insulating system Class B
Power 1.2 kW	

- Input voltages up to 10 kVac
- Output voltages up to 10 kVac
- Power up to 100 kW
- Core materials e.g. Ferrit, Iron powder
- Core forms E, ETD, EFD, PQ etc.
- UL-insulating system Class B, Class F

2



OVERVIEW
SWITCHED MODE POWER SUPPLIES

POWER ECO LINE

POWER **ECO LINE**

Small yet efficient module for compact controllers

POWER MINI

POWER **MINI**

Efficient power supply in compact plastic casing for versatile use

POWER PRINT

POWER **PRINT**

Smallest power supply for assembly on printed circuit boards

POWER COMPACT

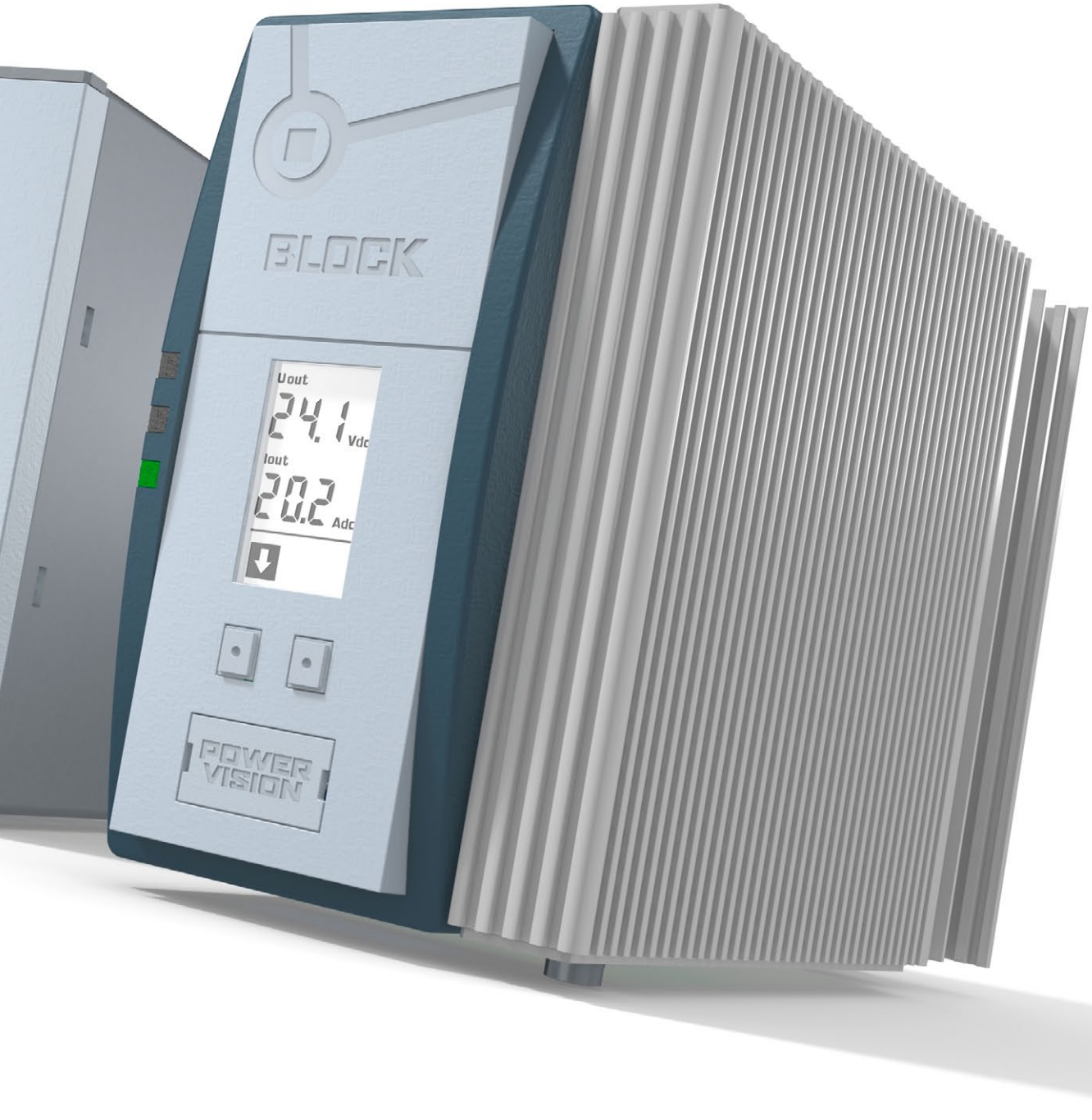
POWER **COMPACT**

Optimized for the core task of power and voltage supply

POWER VISION

POWER **VISION**

The high performer for demanding tasks



POWER AT A GLANCE

Type	Power Vision **Economy 1ph**	Power Vision **Economy 3ph**	Power Vision **Basic**	Power Vision **Line**	Power Vision **AS-i**	Power Compact **1ph**	Power Compact **2ph**	Power Compact **3ph**	Power Mini **1ph/2ph**	Power Eco Line (Neo)	Power Print	
	■	■	■	■	■	■	■	■	■	■	■	Can be used worldwide through wide-range input
	■	■	■	■	■	■	■	■	■	■		Parallel operation for increased power
	■	■	■	■	■	■	■	*	■	■	■	Internal line fuses
	■	■	■	■	■	■	■	■	■	■	■	Stabilized output voltage
	■	■	■	■	■	■	■	■	■	■		Adjustable output voltage
	■	■	■	■	■	■	■	■	■	■		Status LED
	■	■	■	■	■							Top Boost for reliable start-up of loads with high inrush currents and quick tripping of circuit breakers up to C characteristic
	■	■	■	■	■		*	*				Power Boost for reliable start-up of loads with high inrush current
						■	■	■				Current peaks for the quick tripping of ciruit breakers up to B characteristic
		■	■	■			■	■	*			Permanent 2-phase operation
	■	■			■	■	■	■				"DC OK" message via potential-free contact
			■	■					■			"DC OK" message via active signal contacts
	■	■										Stand-by-input
			■	■								Display for easy start-up
			■	■								RS-232 interface
			■	■								DC current and voltage monitoring
				■								AC power input monitoring
						■	■	■	■			Push-in direct plug-in technology
	■	■	■	■	■					■		Plug-in spring-loaded connection technology
	■	■	■	■		■	■	■	■	■		UL certification
						■	■	■	■	■		GL certification
						*			*			In compliance with domestic appliance EN 60335-1
									*			NEC CLass 2 power supply (max. 100 W)
Seite	**321**	**343**	**347**	**350**	**326**	**316**	**335**	**338**	**311**	**303**	**329**	

* Only for specific power supplies

POWER AT A GLANCE

	Output rated voltage	Output voltage range	Type	Input voltage range	0 – 20 W	20 – 30 W	40 – 60 W	70 – 100 W	120 W	180 – 240 W	450 – 480 W	750 – 960 W	Page
1-phase	5 V	5 – 24 Vdc	Power Print	85 – 264 Vac	0.8 A								329
		4.5 – 8.5 Vdc	Power Eco Line	85 – 264 Vac		5.5 A							303
	9 V	5 – 24 Vdc	Power Print	85 – 264 Vac	0.45 A								329
	12 V	5 – 24 Vdc	Power Print	85 – 264 Vac	0.34 A								329
		11 – 18 Vdc	Power Vision Economy	85 – 264 Vac				6 A	10 A	15 A			321
		11.5 – 15 Vdc	Power Compact	85 – 264 Vac						15 A			316
		11.5 – 14.5 Vdc	Power Mini	85 – 264 Vac		2 A	4 A	7 A					311
		10.5 – 15.5 Vdc	Power Eco Line	85 – 264 Vac		2 A	4 A	6.5 A					303
	18 V	15.5 – 19 Vdc	Power Eco Line	85 – 264 Vac	1.1 A		2.5 A						303
		5 – 24 Vdc	Power Print	85 – 264 Vac	0.23 A								329
	24 V	22 – 29.5 Vdc	Power Vision Economy	85 – 264 Vac				3 A	5 A	10 A	20 A		321
		23 – 28.5 Vdc	Power Compact	85 – 264 Vac					5 A	10 A	20 A		316
		23 – 28.5 Vdc	Power Mini	85 – 264 Vac		1 A	2 A	3.8/4 A					311
		22.8 – 26.4 Vdc	Power Eco Line / Neo	85 – 264 Vac		1.3 A	2.5 A	4 A					303
		5 – 24 Vdc	Power Print	85 – 264 Vac	0.17 A								329
	30 V	27 – 43 Vdc	Power Vision Economy	85 – 264 Vac							15 A		321
	30,5 V	29 – 32 Vdc	Power Vision AS-i	85 – 264 Vac				3 A					326
	48 V	33 – 52 Vdc	Power Vision Economy	85 – 264 Vac						5 A	10 A		321
		40 – 56 Vdc	Power Compact	85 – 264 Vac						5 A	10 A		316
		40 – 56 Vdc	Power Mini	85 – 264 Vac				2 A					311
2phase	24 V	23 – 28.5 Vdc	Power Compact	180 – 550 Vac					5 A	10 A			335
		23 – 28.5 Vdc	Power Mini	180 – 575 Vac				3.8 A					332
3-phase	24 V	22.8 – 28.8 Vdc	Power Vision Economy	340 – 550 Vac						10 A	20 A	40 A	343
		23 – 28.5 Vdc	Power Compact	320 – 575 Vac						10 A	20 A	40 A	338
		22.8 – 28.8 Vdc	Power Vision Basic	340 – 550 Vac						10 A	20 A	40 A	347
		22.8 – 28.8 Vdc	Power Vision Line	340 – 550 Vac						10 A	20 A	40 A	350
	30 V	27 – 43 Vdc	Power Vision Economy	340 – 550 Vac								25 A	343
	48 V	37 – 51 Vdc	Power Vision Economy	340 – 550 Vac							10 A	20 A	343
		40 – 56 Vdc	Power Compact	320 – 575 Vac								20 A	338
	60 V	40 – 61 Vdc	Power Compact	320 – 575 Vac								16 A	338

FEATURES ADDITIONAL MODULES

Type	PELR	PC RE	PVUC	PVUA	Combi UPS	
		Redundancy modules	Buffer modules	Uninterruptible power supplies		
	■	■	■	■	■	Status LED
	■	■	■			Parallel switching for increased power
			■	■	■	Active current limiting in the event of an error
				■	■	RS-232 interface
				■		DC current and voltage monitoring
				■		Display for current and voltage indication
				■		Active signal outputs for remote monitoring
		■	■	■	■	Isolated signal contact for remote monitoring
		■			■	Push-in direct plug-in technology
	■		■	■		Spring-loaded plug-in connection technology
				■	■	UL certification
					■	GL certification
Page	386	388	404	394	391	

BLOCK

FEATURES ELECTRONIC CIRCUIT BREAKERS

Type	Economy Smart	Economy Remote	Basic Smart	Basic Fix	EasyB	
	■	■				Thermomagnetic characteristic
			■			Active current limiting typ. 1.7 x I_{rated}
				*		Active current limiting typ. 1.3 x I_{rated}
				*	*	Active current limiting according to NEC Class 2 (100 W)
	■		■			Adjustable tripping current via current selector switch
		■				Adjustable tripping current via 2-wire-interface
	■	■	■	■		Status LED
	■	■	■	■		Remote switching "ON"/"OFF" for each channel
	■	■	■	■		Statustransmission "On"/"Off"/"Tripped" per channel
	■	■	■			Statustransmission "Overcurrent" per channel
	■	■	■	■		Transmission of "actual input voltage"/"adjusted tripping current" per channel
			■			Transmission of "adjusted tripping current" per channel
	■	■	■	■	■	Group alarm message for tripped channels
	■	■	■	■		Remote reset of tripped channels
	■	■	■	■		Push-in direct plug-in technology
	■	■	■	■		UL certification
	■	■	■	■		GL certification
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* Only for specific circuit breakers

PEL
Power supplies

Our powerful miniature units ensure optimum power supply for miniature controllers. Versions with a 5, 12, 18 and 24 V output voltage are available, enabling them to be used in a whole range of different ways - making them a powerful and flexible option that's still light and compact. Our real all-rounders, these power supply units are suitable for a highly diverse range of applications (solar, measurement and control technology as well as industrial and building automation). When hooked up to public supply mains, our primary switched-mode regulators ensure a secure connection - wherever they are used. The DIN rail mounting method and cage-clamp terminals make for quick and easy mounting.

Single-phase, primary switched mode power supply
PEL 230

General Data

- Input voltage range 85 - 264 Vac
- Output rated voltage 5 - 24 Vdc
- Output rated current 1.3 - 6.5 A
- Ambient temperature -25 °C to +55 °C
- Efficiency up to 88 %
- Protection index IP 20

Advantages

- Stabilised and adjustable output voltage
- DC OK signalling via LEDs
- Parallel connection option
- Service-friendly spring-loaded connector system
- Panel installation on mounting rails

Applications

Primary switched mode power supply is concentrated on the core task of voltage and current supply. Flat step profile optimised for installation in control panels in the building automation.

Standards

Primary switched mode power supply
to UL 60950, UL 508

Safety:
EN 61558-2-16, EN 60950-1

EMC:
EN 61204-3

Approvals

UL/CSA 60950 recognised (E213214), UL508 listed (E219022),
Germanischer Lloyd

Single-phase, primary switched mode power supply
PEL 230

Electrical data

Typ	PEL 230/5-5,5	PEL 230/12-2	PEL 230/12-4	PEL 230/12-6,5
Input				
Input rated voltage	100 - 240 Vac	100 - 240 Vac	100 - 240 Vac	100 - 240 Vac
Input voltage range	85 - 264 Vac (120 - 373 Vdc)	85 - 264 Vac (120 - 373 Vdc)	85 - 264 Vac (120 - 373 Vdc)	85 - 264 Vac (120 - 373 Vdc)
Input rated current (rated load)	0.9 / 0.5 A (110 / 230 Vac)	0.7 / 0.4 A (110 / 230 Vac)	0.9 / 0.5 A (110 / 230 Vac)	1.5 / 0.5 A (110 / 230 Vac)
Rated frequency range	44 - 66 Hz / 0 Hz	44 - 66 Hz / 0 Hz	44 - 66 Hz / 0 Hz	44 - 66 Hz / 0 Hz
Starting current limiter	<30 A, NTC	<30 A, NTC	<30 A, NTC	<30 A, NTC
Input fuse internal	2 A (slow-blow)	2 A (slow-blow)	2 A (slow-blow)	4 A
Recommended back-up fuse (circuit breaker)	6 A, 10 A, 16 A, characteristics B, C	6 A, 10 A, 16 A, characteristics B, C	6 A, 10 A, 16 A, characteristics B, C	6 A, 10 A, 16 A, characteristics B, C
Mains buffering (rated load)	10 / 80 ms	10 / 80 ms	10 / 80 ms	15 / 100 ms
Transient surge voltage protection	Varistor	Varistor	Varistor	Varistor
Output				
Output rated voltage	5 Vdc	12 Vdc	12 Vdc	12 Vdc
Output voltage range	4.5 - 8.5 Vdc	10.5 - 15.5 Vdc	10.5 - 15.5 Vdc	10.5 - 15.5 Vdc
Output rated current	5.50 A	2.00 A	4.00 A	6.50 A
Resistance to reverse feed max.	10 Vdc	25 Vdc	25 Vdc	25 Vdc
Overload behaviour	Constant current	Constant current	Constant current	Constant current
Ripple factor	typ. 100 mVss	typ. 100 mVss	typ. 100 mVss	typ. 100 mVss
Parallel connection	Yes	Yes	Yes	Yes
Serial operation	Yes	Yes	Yes	Yes
Efficiency	typ. 85 %	typ. 80 %	typ. 85 %	typ. 87 %
Signaling				
Power Good (DC OK)	LED green	LED green	LED green	LED green
Approvals				
Approvals	-	cURus, cULus, GL	cURus, cULus, GL	cURus, cULus, GL
Environment				
Ambient temperature	-25 °C to +55 °C	-25 °C to +55 °C	-25 °C to +55 °C	-25 °C to +55 °C
Storage temperature	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C
Derating	-3 %/K > +45 °C	-3 %/K > +45 °C	-3 %/K > +45 °C	-3 %/K > +45 °C
Current capacity by any mounting position	max. 3.5 A	max. 1.4 A	max. 2.4 A	max. 3.9 A
Safety and protection				
Protection index	IP 20	IP 20	IP 20	IP 20
Safety class	II, (in closed cabinet)	II, (in closed cabinet)	II, (in closed cabinet)	II, (in closed cabinet)
Order numbers				
Order Number	**PEL 230/5-5,5**	**PEL 230/12-2**	**PEL 230/12-4**	**PEL 230/12-6,5**

Single-phase, primary switched mode power supply
PEL 230

Electrical data

Typ	PEL 230/18-1,1	PEL 230/18-2,5	PEL 230/24-1,3	PEL 230/24-2,5
Input				
Input rated voltage	100 - 240 Vac	100 - 240 Vac	100 - 240 Vac	100 - 240 Vac
Input voltage range	85 - 264 Vac (120 - 373 Vdc)	85 - 264 Vac (120 - 373 Vdc)	85 - 264 Vac (120 - 373 Vdc)	85 - 264 Vac (120 - 373 Vdc)
Input rated current (rated load)	0.45 / 0.23 A (110 / 230 Vac)	0.72 / 0.42 A (110 / 230 Vac)	0.7 / 0.4 A (110 / 230 Vac)	1.4 / 0.6 A (110 / 230 Vac)
Rated frequency range	44 - 66 Hz / 0 Hz	44 - 66 Hz / 0 Hz	44 - 66 Hz / 0 Hz	44 - 66 Hz / 0 Hz
Starting current limiter	<30 A, NTC	<30 A, NTC	<30 A, NTC	<30 A, NTC
Input fuse internal	2 A (slow-blow)	4 A (slow-blow)	2 A (slow-blow)	2 A (slow-blow)
Recommended back-up fuse (circuit breaker)	6 A, 10 A, 16 A, characteristics B, C	6 A, 10 A, 16 A, characteristics B, C	6 A, 10 A, 16 A, characteristics B, C	6 A, 10 A, 16 A, characteristics B, C
Mains buffering (rated load)	10 / 80 ms	25 / 120 ms	10 / 80 ms	10 / 80 ms
Transient surge voltage protection	Varistor	Varistor	Varistor	Varistor
Output				
Output rated voltage	18 Vdc	18 Vdc	24 Vdc	24 Vdc
Output voltage range	15.5 - 19.0 Vdc	15 - 28 Vdc	22.8 - 26.4 Vdc	22.8 - 26.4 Vdc
Output rated current	1.10 A	2.50 A	1.30 A	2.50 A
Resistance to reverse feed max.	25 Vdc	35 Vdc	30 Vdc	30 Vdc
Overload behaviour	Constant current	Constant current	Constant current	Constant current
Ripple factor	typ. 100 mVss	typ. 50 mVss	typ. 100 mVss	typ. 100 mVss
Parallel connection	Yes	Yes	Yes	Yes
Serial operation	Yes	Yes	Yes	Yes
Efficiency	typ. 80 %	typ. 83 %	typ. 82 %	typ. 88 %
Signaling				
Power Good (DC OK)	LED green	LED green	LED green	LED green
Approvals				
Approvals	cURus, cULus, GL	cURus, cULus	cURus, cULus, GL	cURus, cULus, GL
Environment				
Ambient temperature	-25 °C to +55 °C	-25 °C to +55 °C	-25 °C to +55 °C	-25 °C to +55 °C
Storage temperature	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C
Derating	-3 %/K > +45 °C	-3 %/K > +45 °C	-3 %/K > +45 °C	-3 %/K > +45 °C
Current capacity by any mounting position	max. 0.8 A	max. 1.6 A	max. 0.9 A	max. 1.6 A
Safety and protection				
Protection index	IP 20	IP 20	IP 20	IP 20
Safety class	II, (in closed cabinet)	II, (in closed cabinet)	II, (in closed cabinet)	II, (in closed cabinet)
Order numbers				
Order Number	**PEL 230/18-1,1**	**PEL 230/18-2,5**	**PEL 230/24-1,3**	**PEL 230/24-2,5**

Single-phase, primary switched mode power supply
PEL 230

Electrical data

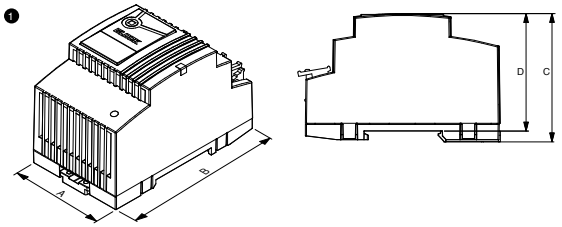
Typ	PEL 230/24-4
Input	
Input rated voltage	100 - 240 Vac
Input voltage range	85 - 264 Vac (120 - 373 Vdc)
Input rated current (rated load)	1.6 / 0.9 A (110 / 230 Vac)
Rated frequency range	44 - 66 Hz / 0 Hz
Starting current limiter	<30 A, NTC
Input fuse internal	4 A
Recommended back-up fuse (circuit breaker)	6 A, 10 A, 16 A, characteristics B, C
Mains buffering (rated load)	15 / 100 ms
Transient surge voltage protection	Varistor
Output	
Output rated voltage	24 Vdc
Output voltage range	22,8 - 26,4 Vdc
Output rated current	4.00 A
Resistance to reverse feed max.	30 Vdc
Overload behaviour	Constant current
Ripple factor	typ. 100 mVss
Parallel connection	Yes
Serial operation	Yes
Efficiency	typ. 88 %
Signaling	
Power Good (DC OK)	LED green
Approvals	
Approvals	cURus, cULus, GL
Environment	
Ambient temperature	-25 °C to +55 °C
Storage temperature	-25 °C to +85 °C
Derating	-3 %/K > +45 °C
Current capacity by any mounting position	max. 2.4 A
Safety and protection	
Protection index	IP 20
Safety class	II, (in closed cabinet)
Order numbers	
Order Number	**PEL 230/24-4**

Single-phase, primary switched mode power supply
PEL 230

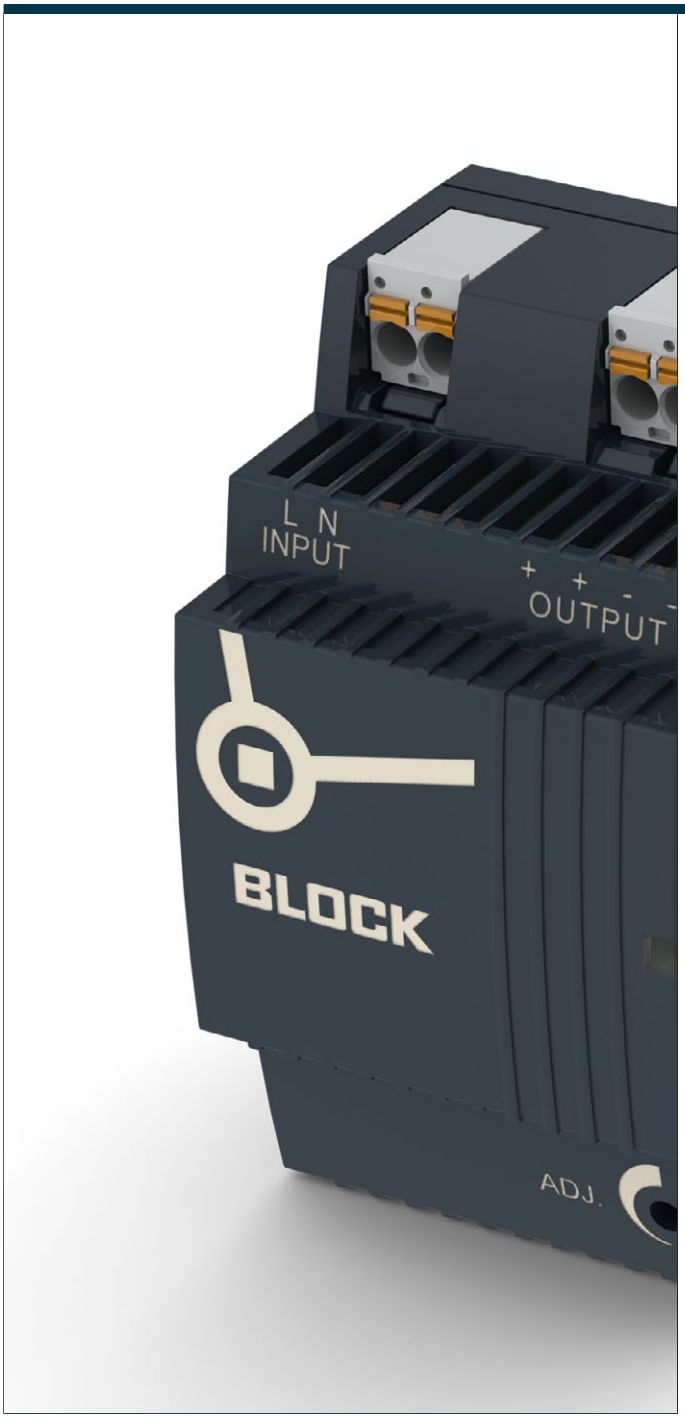
Mechanical data

Typ	Terminals input, (spring clamp terminal)	Terminals output, (spring clamp terminal)	Mounting position	Fixing method	Weight	Dimension picture (in mm)	A	B	C	D
PEL 230/5-5,5	max. 2.5 mm²	max. 2.5 mm²	vertical	DIN rail system TS35	0.24 kg	1	72	89	59	54
PEL 230/12-2	max. 2.5 mm²	max. 2.5 mm²	vertical	DIN rail system TS35	0.17 kg	1	54	89	59	54
PEL 230/12-4	max. 2.5 mm²	max. 2.5 mm²	vertical	DIN rail system TS35	0.24 kg	1	72	89	59	54
PEL 230/12-6,5	max. 2.5 mm²	max. 2.5 mm²	vertical	DIN rail system TS35	0.30 kg	1	90	89	59	54
PEL 230/18-1,1	max. 2.5 mm²	max. 2.5 mm²	vertical	DIN rail system TS35	0.17 kg	1	54	89	59	54
PEL 230/18-2,5	max. 2.5 mm²	max. 2.5 mm²	vertical	DIN rail system TS35	0.24 kg	1	72	89	59	54
PEL 230/24-1,3	max. 2.5 mm²	max. 2.5 mm²	vertical	DIN rail system TS35	0.17 kg	1	54	89	59	54
PEL 230/24-2,5	max. 2.5 mm²	max. 2.5 mm²	vertical	DIN rail system TS35	0.24 kg	1	72	89	59	54
PEL 230/24-4	max. 2.5 mm²	max. 2.5 mm²	vertical	DIN rail system TS35	0.30 kg	1	90	89	59	54

Dimension pictures



Single-phase, primary switched mode power supply
PEL Neo



General Data

- Input voltage range 85 - 264 Vac
- Output rated voltage 24 Vdc ± 2 %
- Output rated current 1.3 - 4 A
- Ambient temperature -25 °C to +55 °C
- Efficiency up to 88 %
- Protection index IP 20

Advantages

- Stabilised and adjustable output voltage
- DC OK signalling via LEDs
- Parallel connection option
- Push-in terminals
- Panel installation on mounting rails

Applications

Primary switched mode power supply is concentrated on the core task of voltage and current supply. Flat step profile optimised for installation in control panels in the building automation.

Standards

Primary switched mode power supply
to UL 60950, UL 508

Safety:
EN 61558-2-16, EN 60950-1

EMC:
EN 61204-3

Approvals

UL/CSA 60950 recognised (E213214), UL508 listed (E219022),
Germanischer Lloyd

Single-phase, primary switched mode power supply
PEL Neo

Electrical data

Typ	PEL-0124-013-0	PEL-0124-025-0	PEL-0124-040-0
Input			
Input rated voltage	100 - 240 Vac	100 - 240 Vac	100 - 240 Vac
Input voltage range	85 - 264 Vac (120 - 373 Vdc)	85 - 264 Vac (120 - 373 Vdc)	85 - 264 Vac (120 - 373 Vdc)
Input rated current (rated load)	0.7 / 0.4 A (110 / 230 Vac)	1.4 / 0.6 A (110 / 230 Vac)	1.6 / 0.9 A (110 / 230 Vac)
Rated frequency range	44 - 66 Hz / 0 Hz	44 - 66 Hz / 0 Hz	44 - 66 Hz / 0 Hz
Starting current limiter	<30 A, NTC	<30 A, NTC	<30 A, NTC
Input fuse internal	2 A (slow-blow)	2 A (slow-blow)	4 A
Recommended back-up fuse (circuit breaker)	6 A, 10 A, 16 A, characteristics B, C	6 A, 10 A, 16 A, characteristics B, C	6 A, 10 A, 16 A, characteristics B, C
Mains buffering (rated load)	10 / 80 ms	10 / 80 ms	15 / 100 ms
Transient surge voltage protection	Varistor	Varistor	Varistor
Output			
Output rated voltage	24 Vdc	24 Vdc	24 Vdc
Output voltage range	22.8 - 26.4 Vdc	22.8 - 26.4 Vdc	22,8 - 26,4 Vdc
Output rated current	1.30 A	2.50 A	4.00 A
Resistance to reverse feed max.	30 Vdc	30 Vdc	30 Vdc
Overload behaviour	Constant current	Constant current	Constant current
Ripple factor	typ. 100 mVss	typ. 100 mVss	typ. 100 mVss
Parallel connection	Yes	Yes	Yes
Serial operation	Yes	Yes	Yes
Efficiency	typ. 82 %	typ. 88 %	typ. 88 %
Signaling			
Power Good (DC OK)	LED green	LED green	LED green
Approvals			
Approvals	cURus, cULus, GL	cURus, cULus, GL	cURus, cULus, GL
Environment			
Ambient temperature	-25 °C to +55 °C	-25 °C to +55 °C	-25 °C to +55 °C
Storage temperature	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C
Derating	-3 %/K > +45 °C	-3 %/K > +45 °C	-3 %/K > +45 °C
Current capacity by any mounting position	max. 0.9 A	max. 1.6 A	max. 2.4 A
Safety and protection			
Protection index	IP 20	IP 20	IP 20
Safety class	II, (in closed cabinet)	II, (in closed cabinet)	II, (in closed cabinet)
Order numbers			
Order Number	**PEL-0124-013-0**	**PEL-0124-025-0**	**PEL-0124-040-0**

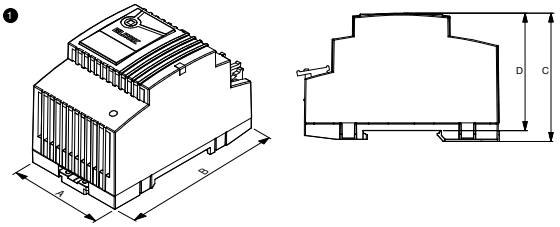
Single-phase, primary switched mode power supply
PEL Neo

30 Mechanical data

Typ	Terminals input (direct plug-in technology Push-in, pluggable)	Terminals output (direct plug-in technology Push-in, pluggable)	Fixing method	Mounting position	Weight	Dimension picture (in mm)	A	B	C	D
PEL-0124-013-0	max. 2,5 mm²	max. 2,5 mm²	DIN rail system TS35	vertical	0.17 kg	1	54	89	59	54
PEL-0124-025-0	max. 2,5 mm²	max. 2,5 mm²	DIN rail system TS35	vertical	0.24 kg	1	72	89	59	54
PEL-0124-040-0	max. 2,5 mm²	max. 2,5 mm²	DIN rail system TS35	vertical	0.30 kg	1	90	89	59	54

Dimension pictures

1



Single-phase, primary switched mode power supply
PM 1AC

General Data

- Input voltage range 85 - 264 Vac
- Nominal output voltage: DC 12 - 48 V
- Nominal output current: 1 - 20 A
- Ambient temperature -25 °C to +70 °C
- Conform to domestic appliances EN 60335-1
- Protection index IP 20
- Plastic housing

Advantages

- Stabilised and adjustable output voltage
- Low stand-by consumption <1 W
- Constant current limiting without overload shutdown
- DC OK signalling
- Parallel operation option
- Push-in terminals
- Panel installation on mounting rails
- In compliance with EN 60335-1

Applications

Efficient, primary switched mode power supply in slim plastic housing. A powerful and flexible option that's still light and compact. Our real all-rounders, these power supply units are suitable for a highly diverse range of applications in solar, measurement and control technology as well as industrial and building automation. The devices cover the lower and average power requirements from 25 W to 100 W. Versions with 12 V, 24 V, and 48 V are available, enabling a whole range of applications. A version with 3.8 A rated current is available for establishing NEC Class 2 circuits. All power supplies also comply with the EN 60335-1 standard for domestic appliances. The output voltage can be easily set using the rotary potentiometer on the front of the housing. The DIN rail fastening method and push-in connection terminals enable fast and secure mounting.

For applications in the medical field, power supplies are available with approval according to UL 60601-1.

Standards

Primary switched mode power supply
to UL 60950, UL 508

Safety:
EN 61558-2-16, EN 60950-1, EN 60335-1

EMC:
EN 61204-3

Approvals

UL/CSA 60950 recognised, UL508 listed, Germanischer Lloyd; Medical Netzteil: UL 60601-1 (3rd ed. 2MOPP)

Single-phase, primary switched mode power supply
PM 1AC

Typ	PM-0112-020-0	PM-0112-040-0	PM-0112-070-0	PM-0124-010-0
Special features				
Characteristics	-	-	-	-
Input				
Input rated voltage	100 - 240 Vac	100 - 240 Vac	100 - 240 Vac	100 - 240 Vac
Input voltage range	85 - 264 Vac (120 - 373 Vdc)	85 - 264 Vac (120 - 373 Vdc)	85 - 264 Vac (120 - 373 Vdc)	85 - 264 Vac (120 - 373 Vdc)
Input voltage derating	-2.5 %/Vac < 95 Vac	-2.5 %/Vac < 95 Vac	-2.5 %/Vac < 95 Vac	-2.5 %/Vac < 95 Vac
Rated frequency range	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz
Input rated current (rated load)	0.44 A (100 Vac) / 0.22 A (240 Vac)	0.83 A (100 Vac) / 0.41 A (240 Vac)	1.87 A (100 Vac) / 0.94 A (240 Vac)	0.43 A (100 Vac) / 0.2 A (240 Vac)
Starting current limiter	< 30 A, NTC	< 30 A, NTC	< 30 A, NTC	< 30 A, NTC
Switch-on time	1.5 s (100 Vac) / 0.4 s (230 Vac)	1.5 s (100 Vac) / 0.7 s (230 Vac)	0.5 s (100 Vac) / 0.3 s (230 Vac)	2.3 s (100 Vac) / 0.74 s (230 Vac)
Power factor	0.48	0.48	0.55	0.48
Input fuse internal	2 A	4 A	4 A	2 A
Recommended back-up fuse (circuit breaker)	6 A, 10 A, 16 A, characteristic B, C	6 A, 10 A, 16 A, characteristic B, C	6 A, 10 A, 16 A, characteristic B, C	6 A, 10 A, 16 A, characteristic B, C
Mains buffering (rated load)	15 ms (100 Vac) / 120 ms (230 Vac)	15 ms (100 Vac) / 120 ms (230 Vac)	15 ms (100 Vac) / 80 ms (230 Vac)	20 ms (100 Vac) / 120 ms (230 Vac)
Transient surge voltage protection	Varistor	Varistor	Varistor	Varistor
Output				
Output rated voltage	12 Vdc	12 Vdc	12 Vdc	24 Vdc
Output voltage range	11.5 – 14.5 Vdc	11.5 – 14.5 Vdc	11,5 – 14,5 Vdc	23 – 28,5 Vdc
Output rated current	2 A	4 A	7 A	1 A
Output limited current	2.2 ... 2.4 A (constant current)	4.4 ... 4.8 A (constant current)	7.7 ... 8 A (constant current)	1.25 ... 1.4 A (constant current)
Class 2 output (UL Limited Power Source, LPS)	✔	✔	-	✔
Parallel connection	Yes	Yes	Yes	Yes
Serial operation	Yes	Yes	Yes	Yes
Power dissipation, no load/rated load	0.7 W / 5,3 W (230 Vac)	<1 W / 8 W (230 Vac)	<1 W / 16.2 W (230 Vac)	< 1 W / 4 W (230 Vac)
Max. power losses	5.7 W (100 Vac / 12 V / 2 A)	9.1 W (100 Vac / 12 V / 4 A)	19.8 W (100 Vac / 12 V / 7 A)	5 W (100 Vac / 24 V / 1 A)
Ripple factor	typ. 20 mVss	typ. 20 mVss	typ. 20 mVss	typ. 20 mVss
Resistance to reverse feed max.	25 Vdc	25 Vdc	25 Vdc	35 Vdc
Over-voltage-protection	max. 35 Vdc	max. 35 Vdc	max. 32 Vdc	max. 39 Vdc
Efficiency	82 %	86 %	86 %	86 %
Signaling				
Status indicator	LED green Uout > typ. 10 Vdc LED lit permanently	LED green Uout > typ. 10 Vdc LED lit permanently	LED green Uout > typ. 10 Vdc LED lit permanently	LED green Uout > typ. 21.5 Vdc LED lit permanently
Signal output	Active high signal Uout > typ. 10 Vdc max. 40 mA@12 Vdc short circuit proof	Active high signal Uout > typ. 10 Vdc max. 40 mA@12 Vdc short circuit proof	Active high signal Uout > typ. 10 Vdc max. 40 mA@12 Vdc short circuit proof	Active high signal Uout > typ. 21.5 Vdc max. 20 mA@24 Vdc short circuit proof
Approvals				
Approvals	cURus, cULus, GL	cURus, cULus, GL	cURus, cULus, GL	cURus, cULus, GL
Environment				
Storage temperature	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C
Ambient temperature	-25° C to +70° C	-25° C to +70° C	-25° C to +70° C	-25° C to +70° C
Derating	-3 %/K > +50 °C	-3 %/K > +50 °C	-3 %/K > +50 °C	-3 %/K > +50 °C
Mounting position	horizontal for standard rail DIN TS35	horizontal for standard rail DIN TS35	horizontal for standard rail DIN TS35	horizontal for standard rail DIN TS35
Type of cooling	Natural convection	Natural convection	Natural convection	Natural convection
Required minimum spacing (left/right)	0 mm	0 mm	0 mm	0 mm
Required minimum spacing (over/under)	50 mm	50 mm	50 mm	50 mm
Safety and protection				
Protection index	IP 20	IP 20	IP 20	IP 20
Safety class	II, without PE connection	II, without PE connection	II, without PE connection	II, without PE connection
Order numbers				
Order Number	**PM-0112-020-0**	**PM-0112-040-0**	**PM-0112-070-0**	**PM-0124-010-0**

Single-phase, primary switched mode power supply
PM 1AC

Electrical data

Typ	PM-0124-020-0	PM-0124-020-4	PM-0124-038-0	PM-0124-040-0
Special features				
Characteristics	-	Suitable for the medical field	For establishing NEC Class 2 circuits	-
Input				
Input rated voltage	100 - 240 Vac	100 - 240 Vac	100 - 240 Vac	100 - 240 Vac
Input voltage range	85 - 264 Vac (120 - 373 Vdc)	85 - 264 Vac (120 - 373 Vdc)	85 - 264 Vac (120 - 373 Vdc)	85 - 264 Vac (120 - 373 Vdc)
Input voltage derating	-2.5 %/Vac < 95 Vac	-2.5 %/Vac < 95 Vac	-2.5 %/Vac < 95 Vac	-2.5 %/Vac < 95 Vac
Rated frequency range	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz
Input rated current (rated load)	0.73 A (100 Vac) / 0.37 A (240 Vac)	0,82 A (100 Vac) / 0,48 A (230 Vac)	1.5 A (100 Vac, 91 W) / 0.6 A (240 Vac, 91 W)	1.52 A (100 Vac) / 0.66 A (240 Vac)
Starting current limiter	< 30 A, NTC	< 30 A, NTC	< 30 A, NTC	< 30 A, NTC
Switch-on time	0.5 s (100 Vac) / 0.27 s (230 Vac)	0,5 s (100 Vac) / 0,27 s (230 Vac)	<0.5 s (100 Vac) / <0.2 s (230 Vac)	0.24 s (100 Vac) / 0.14 s (230 Vac)
Power factor	0,47	0,47	0.5	0.5
Input fuse internal	4 A	4 AT	4 A	4 A
Recommended back-up fuse (circuit breaker)	6 A, 10 A, 16 A, characteristic B, C	6 A, 10 A, 16 A, characteristic B, C	6 A, 10 A, 16 A, characteristic B, C	6 A, 10 A, 16 A, characteristic B, C
Mains buffering (rated load)	20 ms (100 Vac) / 120 ms (230 Vac)	20 ms (100 Vac) / 120 ms (230 Vac)	>15 ms (100 Vac) / >80 ms (230 Vac)	15 ms (100 Vac) / 80 ms (230 Vac)
Transient surge voltage protection	Varistor	Varistor	Varistor	Varistor
Output				
Output rated voltage	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Output voltage range	23 – 28.5 Vdc	23 - 28,5 Vdc	23 – 28.5 Vdc (> 24 Vdc constant capacity)	23 – 28.5 Vdc
Output rated current	2 A	2 A	3.8 A / NEC Class 2	4 A
Output limited current	2.2 ... 2.4 A (constant current)	2.2 ... 2.4 A (constant current)	3.8 ... 3.2 A (constant current, Class 2)	4.4 ... 4.7 A (constant current)
Class 2 output (UL Limited Power Source, LPS)	✔	-	✔	-
Parallel connection	Yes	Yes	Yes	Yes
Serial operation	Yes	Yes	Yes	Yes
Power dissipation, no load/rated load	< 1 W / 4 W (230 Vac)	< 1 W / 4 W (230 Vac)	2.8 W / 14 W (230 Vac)	< 1 W / 12 W (230 Vac)
Max. power losses	7 W (100 Vac / 24 V / 2 A)	7,0 W (100 Vac/ 24 V/ 2A)	<20 W (100 Vac / 91 W)	15 W (100 Vac / 24 V / 4 A)
Ripple factor	typ. 20 mVss	typ. 20mVss	typ. 20 mVss	typ. 20 mVss
Resistance to reverse feed max.	35 Vdc	35 Vdc	35 Vdc	35 Vdc
Over-voltage-protection	max. 37 Vdc	max. 37 Vdc	max. 40 Vdc	max. 40 Vdc
Efficiency	89 %	typ. 89 %	87 %	89 %
Signaling				
Status indicator	LED green Uout > typ. 21.5 Vdc LED lit permanently	LED green Uout > typ. 21.5 Vdc LED lit permanently	LED green Uout > typ. 21.5 Vdc LED lit permanently	LED green Uout > typ. 21.5 Vdc LED lit permanently
Signal output	Active high signal Uout > typ. 21.5 Vdc max. 20 mA@24 Vdc short circuit proof	Active high signal Uout > typ. 21.5 Vdc max. 20 mA@24 Vdc short circuit proof	Active high signal Uout > typ. 21.5 Vdc max. 20 mA@24 Vdc short circuit proof	Active high signal Uout > typ. 21.5 Vdc max. 20 mA@24 Vdc short circuit proof
Approvals				
Approvals	cURus, cULus, GL	cURus, cULus (UL 60601), GL	cURus, cULus, GL	cURus, cULus, GL
Environment				
Storage temperature	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C
Ambient temperature	-25° C to +70° C	-25° C to +70° C	-25° C to +70° C	-25° C to +70° C
Derating	-3 %/K > +50 °C	-3 %/K > +50 °C	-3 %/K > +50 °C	-3 %/K > +50 °C
Mounting position	horizontal for standard rail DIN TS35	horizontal for standard rail DIN TS35	horizontal for standard rail DIN TS35	horizontal for standard rail DIN TS35
Type of cooling	Natural convection	Natural convection	Natural convection	Natural convection
Required minimum spacing (left/right)	0 mm	0 mm	0 mm	0 mm
Required minimum spacing (over/under)	50 mm	50 mm	50 mm	50 mm
Safety and protection				
Protection index	IP 20	IP 20	IP 20	IP 20
Safety class	II, without PE connection	II, without PE connection	II, without PE connection	II, without PE connection
Order numbers				
Order Number	**PM-0124-020-0**	**PM-0124-020-4**	**PM-0124-038-0**	**PM-0124-040-0**

Single-phase, primary switched mode power supply
PM 1AC

Electrical data

Typ	PM-0148-020-0
Special features	
Characteristics	-
Input	
Input rated voltage	100 - 240 Vac
Input voltage range	85 - 264 Vac (120 - 373 Vdc)
Input voltage derating	-2.5 %/Vac < 95 Vac
Rated frequency range	44 Hz - 66 Hz / 0 Hz
Input rated current (rated load)	1.79 A (100 Vac) / 0.9 A (240 Vac)
Starting current limiter	< 30 A, NTC
Switch-on time	0.5 s (100 Vac) / 0.3 s (230 Vac)
Power factor	0.5
Input fuse internal	4 A
Recommended back-up fuse (circuit breaker)	6 A, 10 A, 16 A, characteristic B, C
Mains buffering (rated load)	15 ms (100 Vac) / 80 ms (230 Vac)
Transient surge voltage protection	Varistor
Output	
Output rated voltage	48 Vdc
Output voltage range	40 – 56 Vdc
Output rated current	2 A
Output limited current	2.2 ... 2.4 A (constant current)
Class 2 output (UL Limited Power Source, LPS)	-
Parallel connection	Yes
Serial operation	Yes
Power dissipation, no load/rated load	< 1 W / 16.2 W (230 Vac)
Max. power losses	19.8 W (100 Vac / 48 V / 2 A)
Ripple factor	typ. 20 mVss
Resistance to reverse feed max.	63 Vdc
Over-voltage-protection	max. 60 Vdc
Efficiency	86 %
Signaling	
Status indicator	LED green Uout > typ. 39 Vdc LED lit permanently
Signal output	Active high signal Uout > typ. 39 Vdc max. 10 mA@48 Vdc short circuit proof
Approvals	
Approvals	cURus, cULus, GL
Environment	
Storage temperature	-25 °C to +85 °C
Ambient temperature	-25° C to +70° C
Derating	-3 %/K > +50 °C
Mounting position	horizontal for standard rail DIN TS35
Type of cooling	Natural convection
Required minimum spacing (left/right)	0 mm
Required minimum spacing (over/under)	50 mm
Safety and protection	
Protection index	IP 20
Safety class	II, without PE connection
Order numbers	
Order Number	**PM-0148-020-0**

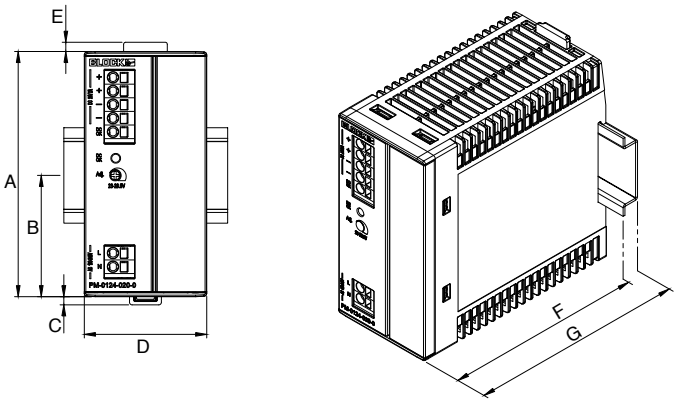
Single-phase, primary switched mode power supply
PM 1AC

Mechanical data 30

Typ	Terminals input (direct plug-in technology Push-in)	Terminals output (direct plug-in technology Push-in)	Terminals signalling (direct plug-in technology Push-in)	Dimension (W x H x D)	Weight	Dimension picture (in mm)	A	B	C	D	E	F	G
PM-0112-020-0	max 2,5 mm²	max 2,5 mm²	max 2,5 mm²	22.5 x 90 x 90.5 mm	0.13 kg	1	90	45	3	22.5	3.5	90.5	98
PM-0112-040-0	max 2,5 mm²	max 2,5 mm²	max 2,5 mm²	45 x 90 x 90.5 mm	0.21 kg	1	90	45	3	45	3.5	90.5	98
PM-0112-070-0	max 2,5 mm²	max 2,5 mm²	max 2,5 mm²	52 x 90 x 103.5 mm	0.40 kg	1	90	45	3	52	3.5	103.5	111
PM-0124-010-0	max 2,5 mm²	max 2,5 mm²	max 2,5 mm²	22.5 x 90 x 90.5 mm	0.13 kg	1	90	45	3	22.5	3.5	90.5	98
PM-0124-020-0	max 2,5 mm²	max 2,5 mm²	max 2,5 mm²	45 x 90 x 90.5 mm	0.21 kg	1	90	45	3	45	3.5	90.5	98
PM-0124-020-4	max 2,5 mm²	max 2,5 mm²	max 2,5 mm²	45 x 90 x 90,5 mm	0.24 kg	1	90	45	3	45	3.5	90.5	98
PM-0124-038-0	max 2,5 mm²	max 2,5 mm²	max 2,5 mm²	52 x 90 x 103.5 mm	0.39 kg	1	90	45	3	52	3.5	103.5	111
PM-0124-040-0	max 2,5 mm²	max 2,5 mm²	max 2,5 mm²	52 x 90 x 103.5 mm	0.39 kg	1	90	45	3	52	3.5	103.5	111
PM-0148-020-0	max 2,5 mm²	max 2,5 mm²	max 2,5 mm²	52 x 90 x 103.5 mm	0.39 kg	1	90	45	3	52	3.5	103.5	111

Dimension pictures

1



Single-phase, primary switched mode power supply
PC 1AC

General Data

- Nominal input voltage: AC 100 - 240 V
- Nominal output voltage: DC 12 - 48 V
- Nominal output current: 5 - 20 A
- Ambient temperature -25 °C to +70 °C
- Efficiency up to 93 %
- Protection index IP 20

Advantages

- Stabilised and adjustable output voltage
- Fast tripping of conventional circuit breakers
- DC OK signalling
- Parallel operation
- Push-in terminals
- Robust DIN rail mounting
- Resistant to transient overvoltages up to 4 kV

Applications

Power Compact combines the basic functionality of an economic switched mode power supply with key additional features to ensure high system availability. A powerful and flexible option that's still light and compact. Our real all-rounders, these power supply units are suitable for a highly diverse range of applications in solar, measurement and control technology and they really come into their own in industrial and building automation. The devices cover the average power requirement from 120 W to 480 W. Versions with 12 V, 24 V, and 48 V are available, which allow a range of applications. A version with 5 A rated current is available for a single or two-phase supply from 180 V to 550 V. The output voltage can be set easily using the rotary potentiometer on the front of the housing. The robust DIN rail fastening method and push-in connection terminals enable fast and secure mounting.

For applications in the medical field, power supplies are available with approval according to UL 60601-1.

Standards

Primary switched mode power supply
to UL 60950, UL 508

Safety:
EN 61558-2-16, EN 60950-1

EMC:
EN 61204-3

Approvals

UL/CSA 60950 recognised, UL508 listed, Germanischer Lloyd; Medical Netzteil: UL 60601-1 (3rd ed. 2MOPP)

Single-phase, primary switched mode power supply
PC 1AC

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Electrical data

Typ	PC-0112-150-0	PC-0124-050-0	PC-0124-050-4	PC-0124-100-0
Special features				
Characteristics	-	-	Suitable for the medical field	-
Input				
Input rated voltage	100 - 240 Vac	100 - 240 Vac	100 - 240 Vac	100 - 240 Vac
Input voltage range	85 - 264 Vac (120 - 372 Vdc)	85 - 264 Vac (120 - 372 Vdc)	85 - 264 Vac (120 - 372 Vdc)	85 - 264 Vac (120 - 372 Vdc)
Input voltage derating	-2.5 %/Vac < 100 Vac	-2.5 %/Vac < 97 Vac	-2,5 %/Vac < 97 Vac	-2.5 %/Vac < 100 Vac
Rated frequency range	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz
Input rated current (rated load)	2.07 A (100 Vac) / 0,95 A (230 Vac)	2.25 A (100 Vac) / 1.2 A (230 Vac)	2,3 A (100 Vac) / 1,24 A (230 Vac)	2.74 A (100 Vac) / 1.25 A (230 Vac)
Starting current limiter	< 30 A, NTC (active)	< 30 A, NTC	< 30 A, NTC (active)	< 30 A, NTC (active)
Switch-on time	0.71 s (100 Vac) / 0.43 s (230 Vac)	0.25 s (100 Vac) / 0.2 s (230 Vac)	0,25 s (100 Vac) / 0,2 s (230 Vac)	1.3 s (100 Vac) / 0.25 s (230 Vac)
Mains buffering (rated load)	28 ms (100 Vac) / 28 ms (230 Vac)	10 ms (100 Vac) / 80 ms (230 Vac)	10 ms (100 Vac) / 80 ms (230 Vac)	15 ms (100 Vac) / 17 ms (230 Vac)
Power factor	0.91 (active PFC)	0.5	0,47	0.92 (active PFC)
Input fuse internal	6.3 A	4 A	4AT	6.3 A
Recommended back-up fuse (circuit breaker)	10 A, 16 A, characteristic B, C	6 A, 10 A, 16 A, characteristic B, C	6A, 10 A, 16 A, characteristic B, C	10 A, 16 A, characteristic B, C
Transient surge voltage protection	Varistor	Varistor	Varistor	Varistor
Output				
Output rated voltage	12 Vdc	24 Vdc	24 Vdc	24 Vdc
Output voltage range	11.5 – 15 Vdc	23 – 28.5 Vdc	11,8 – 27,5 Vdc	23 – 28.5 Vdc
Output rated current	15 A	5 A	5 A	10 A
Output limited current	typ. 16.5 A (constant current)	typ. 5.5 A (constant current)	typ. 16.5 A (constant current)	typ. 11 A (constant current)
Tripping of LS circuit breakers	max. B4	max. B4	Yes	max. B6, C2
Parallel connection	Yes	Yes	Yes	Yes
Serial operation	Yes	Yes	Yes	Yes
Power dissipation, no load/rated load	4.4 W / 21.8 W (230 Vac)	1.2 / 14.6 W (230 Vac)	1,2 W / 14,6 W (230 Vac)	6.6 / 24.4 W (230 Vac)
Max. power losses	24.7 W (100 Vac / 12 V / 15 A)	19.4 W (100 Vac / 24 V / 5 A)	19,4 W (100 Vac / 24 V / 5 A)	31.3 W (100 Vac / 24 V / 10 A)
Ripple factor	typ. 35 mVss	typ. 30 mVss	typ. 30 mVss	typ. 50 mVss
Efficiency	typ. 90 %	typ. 89 %	typ. 89 %	typ. 91 %
Resistance to reverse feed max.	35 Vdc	35 Vdc	0 Vdc	35 Vdc
Over-voltage-protection	max. 20 Vdc	max. 41 Vdc	max. 41 Vdc	max. 40 Vdc
Signaling				
Typ. switching threshold for LED and signal output (DC OK)	-	-	LED: Uout > 11,2 V, signal output: Uout > 16 V (typ.)	-
Status indicator	LED green	LED green	LED green	LED green
Signal output	Relay contact	Relay contact	Relay contact, max. 30 V / 1 A	Relay contact
Approvals				
Approvals	cURus, cULus, GL	cURus, cULus, GL	cURus, cULus (UL 60601), GL	cURus, cULus, GL
Environment				
Type of cooling	natural convection	natural convection	natural convection	natural convection
Ambient temperature	-25 °C to +70 °C	-25 °C to +70 °C	-25 °C to +70 °C	-25 °C to +70 °C
Storage temperature	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C
Derating	-5 %/K > +60 °C @ 196 - 264 Vac -2.5 %/K > +50° C @ 85 - 195 Vac	-5 %/K > +60 °C @ 196 - 264 Vac -2.5 %/K > +50° C @ 85 - 195 Vac	-5 %/K > +60 °C @ 196 - 264 Vac -2.5 %/K > +50° C @ 85 - 195 Vac	-5 %/K > +60 °C @ 196 - 264 Vac -2.5 %/K > +50° C @ 85 - 195 Vac
Required minimum spacing (left/right)	0 mm	0 mm	0 mm	0 mm
Required minimum spacing (over/under)	50 mm	50 mm	50 mm	50 mm
Safety and protection				
Protection index	IP 20	IP 20	IP 20	IP 20
Safety class	I, with PE connection	I, with PE connection	I	I, with PE connection
Order numbers				
Order Number	**PC-0112-150-0**	**PC-0124-050-0**	**PC-0124-050-4**	**PC-0124-100-0**

Single-phase, primary switched mode power supply
PC 1AC

Typ	PC-0124-100-4	PC-0124-200-0	PC-0124-200-4	PC-0148-050-0
Special features				
Characteristics	Suitable for the medical field	-	Suitable for the medical field	-
Input				
Input rated voltage	100 - 240 Vac	100 - 240 Vac	100 - 240 Vac	100 - 240 Vac
Input voltage range	85 - 264 Vac (120 - 372 Vdc)	85 - 264 Vac (120 - 372 Vdc)	85 - 264 Vac (120 - 372 Vdc)	85 - 264 Vac (120 - 372 Vdc)
Input voltage derating	-2,5 %/Vac < 100 Vac	-2.5 %/Vac < 100 Vac	-2,5 %/Vac < 100 Vac	-2.5 %/Vac < 100 Vac
Rated frequency range	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz
Input rated current (rated load)	2,74 A (100 Vac) / 1,25 A (230 Vac)	5.56 A (100 Vac) / 2.23 A (230 Vac)	5,56 A (100 Vac) / 2,23 A (230 Vac)	2.68 A (100 Vac) / 1.19 A (230 Vac)
Starting current limiter	< 30 A, NTC	< 30 A, NTC (active)	< 30 A, NTC (active)	< 30 A, NTC (active)
Switch-on time	1,3 s (100 Vac) / 0,25 s (230 Vac)	0.45 s (100 Vac) / 0.2 s (230 Vac)	0,45 s (100 Vac) / 0,2 s (230 Vac)	0.68 s (100 Vac) / 0.31 s (230 Vac)
Mains buffering (rated load)	15 ms (100 Vac) / 17 ms (230 Vac)	20 ms (100 Vac) / 20 ms (230 Vac)	8 ms (100 Vac) / 20 ms (230 Vac)	21 ms (100 Vac) / 21 ms (230 Vac)
Power factor	0,92	0.98 (active PFC)	0,98	0.92 (active PFC)
Input fuse internal	6,3 AT	10 A	10 AT	6.3 A
Recommended back-up fuse (circuit breaker)	10 A, 16 A, characteristic B, C	10 A, 16 A, characteristic B, C	10 A, 16 A, characteristic B, C	10 A, 16 A, characteristic B, C
Transient surge voltage protection	Varistor	Varistor	Varistor	Varistor
Output				
Output rated voltage	24 Vdc	24 Vdc	24 Vdc	48 Vdc
Output voltage range	23 – 28,5 Vdc	23 – 28,5 Vdc	23 – 28,5 Vdc	40 – 56 Vdc
Output rated current	10 A	20 A	20 A	5 A
Output limited current	typ. 11 - 13 A (constant current)	typ. 22 A (constant current)	typ. 22 A (constant current)	typ. 5.5 A (constant current)
Tripping of LS circuit breakers	Yes	max. B6, C6, K4	Yes	max. B6, C4, K2
Parallel connection	Yes	Yes	Yes	Yes
Serial operation	Yes	Yes	Yes	Yes
Power dissipation, no load/rated load	6,6 W / 24,4 W (230 Vac)	7.2 / 42.4 W (230 Vac)	7,2 W / 42,4 W (230 Vac)	7 W / 40,8 W (230 Vac)
Max. power losses	31,3 W (100 Vac / 24 V / 10 A)	68.3 W (100 Vac / 24 V / 20 A)	68,3 W (100 Vac / 24 V / 10 A)	26,5 W (100 Vac / 48 V / 5 A)
Ripple factor	typ. 50 mVss	typ. 70 mVss	typ. 70 mVss	typ. 35 mVss
Efficiency	typ. 91 %	typ. 92 %	typ. 92 %	typ. 92 %
Resistance to reverse feed max.	0 Vdc	35 Vdc	0 Vdc	63 Vdc
Over-voltage-protection	max. 40 Vdc	max. 40 Vdc	max. 40 Vdc	max. 60 Vdc
Signaling				
Typ. switching threshold for LED and signal output (DC OK)	Uout > 21,5 V	-	Uout > 21,5 V	-
Status indicator	LED green	LED green	LED green	LED green
Signal output	Relay contact, max. 30 V / 1 A	Relay contact	Relay contact, max. 30 V / 1 A	Relay contact
Approvals				
Approvals	cURus, cULus (UL 60601), GL	cURus, cULus, GL	cURus, cULus (UL 60601), GL	cURus, cULus, GL
Environment				
Type of cooling	natural convection	natural convection	natural convection	natural convection
Ambient temperature	-25 °C to +70 °C	-25 °C to +70 °C	-25 °C to +70 °C	-25 °C to +70 °C
Storage temperature	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C
Derating	-5 %/K > +60 °C @ 196 - 264 Vac -2.5 %/K > +50° C @ 85 - 195 Vac	-5 %/K > +60 °C @ 196 - 264 Vac -2.5 %/K > +50° C @ 85 - 195 Vac	-5 %/K > +60 °C @ 196 - 264 Vac -2.5 %/K > +50° C @ 85 - 195 Vac	-5 %/K > +60 °C @ 196 - 264 Vac -2.5 %/K > +50° C @ 85 - 195 Vac
Required minimum spacing (left/right)	0 mm	0 mm	0 mm	0 mm
Required minimum spacing (over/under)	50 mm	50 mm	50 mm	50 mm
Safety and protection				
Protection index	IP 20	IP 20	IP 20	IP 20
Safety class	I	I, with PE connection	I	I, with PE connection
Order numbers				
Order Number	**PC-0124-100-4**	**PC-0124-200-0**	**PC-0124-200-4**	**PC-0148-050-0**

Single-phase, primary switched mode power supply
PC 1AC

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Electrical data

Typ	PC-0148-100-0
Special features	
Characteristics	-
Input	
Input rated voltage	100 - 240 Vac
Input voltage range	85 - 264 Vac (120 - 372 Vdc)
Input voltage derating	-2.5 %/Vac < 100 Vac
Rated frequency range	44 Hz - 66 Hz / 0 Hz
Input rated current (rated load)	5.15 A (100 Vac) / 2.22 A (230 Vac)
Starting current limiter	< 30 A, NTC (active)
Switch-on time	0.45 s (100 Vac) / 0.2 s (230 Vac)
Mains buffering (rated load)	20 ms (100 Vac) / 20 ms (230 Vac)
Power factor	0.92 (active PFC)
Input fuse internal	10 A
Recommended back-up fuse (circuit breaker)	10 A, 16 A, characteristic B, C
Transient surge voltage protection	Varistor
Output	
Output rated voltage	48 Vdc
Output voltage range	40 – 56 Vdc
Output rated current	10 A
Output limited current	typ. 11 A (constant current)
Tripping of LS circuit breakers	max. B6, C4, K2
Parallel connection	Yes
Serial operation	Yes
Power dissipation, no load/rated load	11.7 / 36.3 W (230 Vac)
Max. power losses	64.9 W (100 Vac / 48 V / 10 A)
Ripple factor	typ. 80 mVss
Efficiency	typ. 93 %
Resistance to reverse feed max.	63 Vdc
Over-voltage-protection	max. 60 Vdc
Signaling	
Typ. switching threshold for LED and signal output (DC OK)	-
Status indicator	LED green
Signal output	Relay contact
Approvals	
Approvals	cURus, cULus, GL
Environment	
Type of cooling	natural convection
Ambient temperature	-25 °C to +70 °C
Storage temperature	-25 °C to +85 °C
Derating	-5 %/K > +60 °C @ 196 - 264 Vac -2.5 %/K > +50° C @ 85 - 195 Vac
Required minimum spacing (left/right)	0 mm
Required minimum spacing (over/under)	50 mm
Safety and protection	
Protection index	IP 20
Safety class	I, with PE connection
Order numbers	
Order Number	**PC-0148-100-0**

Single-phase, primary switched mode power supply
PC 1AC

30 Mechanical data

Typ	Mounting position	Terminals signalling (direct plug-in technology Push-in)	Terminals output (direct plug-in technology Push-in)	Terminals input (direct plug-in technology Push-in)	Weight	Dimension (W x H x D)	Dimension picture (in mm)	A	B	C	D	E	F
PC-0112-150-0	horizontal for standard rail DIN TS35	max 2,5 mm²	max 2,5 mm²	max 2,5 mm²	0.93 kg	55 x 127 x 161 mm	1	127	63.5	3	55	153.5	161
PC-0124-050-0	horizontal for standard rail DIN TS35	max 2,5 mm²	max 2,5 mm²	max 2,5 mm²	0.59 kg	42 x 127 x 126 mm	1	127	63.5	3	42	118.5	126
PC-0124-050-4	horizontal for standard rail DIN TS35	-	max 2,5 mm²	-	0.65 kg	42 x 127 x 140.5 mm	1	127	63.5	3	42	133	140.5
PC-0124-100-0	horizontal for standard rail DIN TS35	max 2,5 mm²	max 2,5 mm²	max 2,5 mm²	0.93 kg	55 x 127 x 161 mm	1	127	53.5	3	55	153.5	161
PC-0124-100-4	horizontal for standard rail DIN TS35	-	max 2,5 mm²	-	0.65 kg	55 x 127 x 170 mm	1	127	63.5	3	55	162.5	170
PC-0124-200-0	horizontal for standard rail DIN TS35	max 2,5 mm²	max 2,5 mm²	max 2,5 mm²	1.60 kg	95 x 127 x 159 mm	1	127	63.5	3	95	151.5	159
PC-0124-200-4	horizontal for standard rail DIN TS35	-	max 2,5 mm²	-	1.70 kg	95 x 127 x 168 mm	1	127	63.5	3	95	160.5	168
PC-0148-050-0	horizontal for standard rail DIN TS35	max 2,5 mm²	max 2,5 mm²	max 2,5 mm²	0.93 kg	55 x 127 x 161 mm	1	127	63.5	3	55	153.5	161
PC-0148-100-0	horizontal for standard rail DIN TS35	max 2,5 mm²	max 2,5 mm²	max 2,5 mm²	1.60 kg	95 x 127 x 159 mm	1	127	63.5	3	95	151.5	159

Dimension pictures

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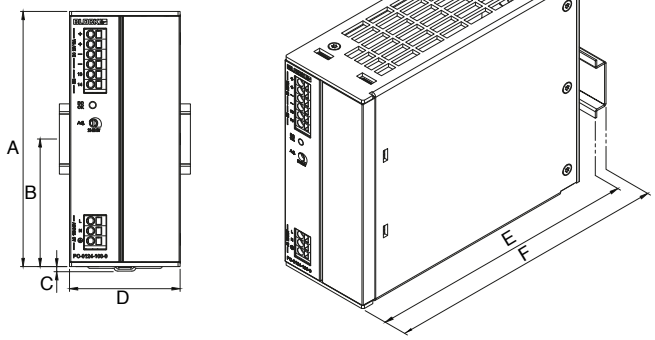


Single-phase, primary switched mode power supply, Economy
PVSE 230

General Data

- Input rated voltage 100 - 240 Vac
- Output rated voltage 12 - 48 Vdc
- Output rated current 3 - 20 A
- Ambient temperature -25 °C to +70 °C
- Efficiency up to 92 %

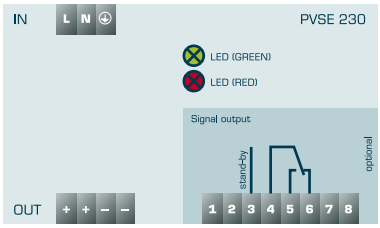
Advantages

- Stabilised and adjustable output voltage
- Up to 200 % Real Power Boost for 4 seconds
- Top Boost to trip conventional circuit breakers
- DC OK signalling
- Stand-by-input
- Parallel connection option
- Service-friendly spring-loaded connector system
- Optional with active inrush current limiter

Applications

Primary switched mode power supply with massive power reserves focussing on the key task of power supply.

Sample application



Standards

Primary switched mode power supply
to UL 60950, UL 508

Safety:
EN 61558-2-16, EN 60950-1

EMC:
EN 61204-3

Approvals

UL/CSA 60950 recognised (E213214), UL508 listed (E219022)

Single-phase, primary switched mode power supply, Economy
PVSE 230

Electrical data

Typ	PVSE 230/12-6	PVSE 230/12-10	PVSE 230/12-15	PVSE 230/24-3
Input				
Input rated voltage	100 - 240 Vac	100 - 240 Vac	100 - 240 Vac	100 - 240 Vac
Input rated current (rated load)	0.86 / 0.51 Aac (110 / 230 Vac)	1.7 / 0.97 Aac (110 / 230 Vac)	1.9 / 0.9 Aac (110 / 230 Vac)	0.86 / 0.51 Aac (110 / 230 Vac)
Input voltage range	85 - 264 Vac (120 - 373 Vdc)	85 - 264 Vac (120 - 373 Vdc)	85 - 264 Vac (120 - 373 Vdc)	85 - 264 Vac (120 - 373 Vdc)
Rated frequency range	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz
Starting current limiter	<30 A, NTC	<30 A, NTC	<8 A, active	<30 A, NTC
Input fuse internal	2 A (slow-blow)	4 A (slow-blow)	6.3 A (slow-blow)	2 A (slow-blow)
Recommended back-up fuse (circuit breaker)	6 A, 10 A, 16 A, characteristics B, C	6 A, 10 A, 16 A, characteristics B, C	10 A, 16 A, characteristics B, C	6 A, 10 A, 16 A, characteristics B, C
Harmonic correction	-	-	active	-
Mains buffering (rated load)	10 / 70 ms (110 / 230 Vac)	12 / 35 ms (110 / 230 Vac)	30 / 30 ms (110 / 230 Vac)	10 / 70 ms (110 / 230 Vac)
Transient surge voltage protection	Varistor	Varistor	Varistor	Varistor
Output				
Output rated voltage	12 Vdc	12 Vdc	12 Vdc	24 Vdc
Output voltage range	11 - 18 Vdc	11 - 18 Vdc	11 - 18 Vdc	22 - 29.5 Vdc
Resistance to reverse feed max.	25 Vdc	25 Vdc	25 Vdc	35 Vdc
Output rated current	6.00 A	10.00 A	15.00 A	3.00 A
Parallel connection	Yes	Yes	Yes	Yes
Power Boost	12 A / 4 s (9 A / 8 s)	20 A / 4 s (15 A / 8 s)	30 A / 4 s (22.5 A / 8 s)	6.5 A / 4 s (5.8 A / 8 s)
Overload behaviour	Constant current	Constant current	Constant current	Constant current
max. Power loss idling/nominal load	3.0 / 8.8 W	5.0 / 14.6 W	4.6 / 23.4 W	3.0 / 8.8 W
Serial operation	Yes	Yes	Yes	Yes
Efficiency	typ. 83 %	typ. 87.8 %	typ. 87 %	typ. 87.7 %
Ripple factor	typ. 70 mVss	typ. 70 mVss	typ. 70 mVss	typ. 70 mVss
Top Boost	21 A / 25 ms	60 A / 25 ms	55 A / 25 ms	14 A / 25 ms
Signaling				
Stand-by-input	Yes	Yes	Yes	Yes
Power Good (DC OK)	LED green, LED red	LED green, LED red	LED green, LED red	LED green, LED red
Potential free signal contact	Yes	Yes	Yes	Yes
Approvals				
Approvals	cURus, cULus	cURus, cULus	cURus, cULus	cURus, cULus
Environment				
Storage temperature	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C
Derating	-3 %/K > +50 °C, -5 %/Vac < 95 Vac	-3 %/K > +50 °C, -5 %/Vac < 95 Vac	-3 %/K > +50 °C, -1.5 %/Vac < 110 Vac	-3 %/K > +50 °C, -5 %/Vac < 95 Vac
Ambient temperature	-10 °C to +70 °C	-10 °C to +70 °C	-10 °C to +70 °C	-10 °C to +70 °C
Safety and protection				
Safety class	I, with PE connection	I, with PE connection	I, with PE connection	I, with PE connection
Protection index	IP 20	IP 20	IP 20	IP 20
Accessory				
Connector for signalling	PV-CON (optional)	PV-CON (optional)	PV-CON (optional)	PV-CON (optional)
Side DIN rail mounting	PV-TS35M (optional)	PV-TS35M (optional)	PV-TS35M (optional)	PV-TS35M (optional)
Direct screw fastening plate for lateral mounting	PV-WB2 (optional)	PV-WB2 (optional)	PV-WB2 (optional)	PV-WB2 (optional)
Order numbers				
Order Number	**PVSE 230/12-6**	**PVSE 230/12-10**	**PVSE 230/12-15**	**PVSE 230/24-3**

Single-phase, primary switched mode power supply, Economy
PVSE 230

ePLAN data portal | BLOCK Website

Electrical data

Typ	PVSE 230/24-3B	PVSE 230/24-5	PVSE 230/24-5B	PVSE 230/24-10
Input				
Input rated voltage	100 - 240 Vac	100 - 240 Vac	100 - 240 Vac	110 - 240 Vac
Input rated current (rated load)	0.86 / 0.51 A (110 / 230 Vac)	1.7 / 0.97 Aac (110 / 230 Vac)	1.7 /0.97 Aac (110 / 230 Vac)	2.5 / 1.2 Aac (110 / 230 Vac)
Input voltage range	85 - 264 Vac (120 - 373 Vdc)	85 - 264 Vac (120 - 373 Vdc)	85 - 264 Vac (120 - 373 Vdc)	85 - 264 Vac (120 - 373 Vdc)
Rated frequency range	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz
Starting current limiter	<5 A, active	<30 A, NTC	<8 A, active	<8 A, active
Input fuse internal	2 A (slow-blow)	4 A (slow-blow)	4 A (slow-blow)	6,3 A (slow-blow)
Recommended back-up fuse (circuit breaker)	6 A, 10 A, 16 A, characteristics B, C	6 A, 10 A, 16 A, characteristics B, C	6 A, 10 A, 16 A, characteristics B, C	10 A, 16 A, characteristics B, C
Harmonic correction	-	-	-	active
Mains buffering (rated load)	10 / 70 ms (110 / 230 Vac)	12 / 35 ms (110 / 230 Vac)	12 / 35 ms (110 / 230 Vac)	24 / 24 ms (110 / 230 Vac)
Transient surge voltage protection	Varistor	Varistor	Varistor	Varistor
Output				
Output rated voltage	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Output voltage range	22 - 29.5 Vdc	22 - 29.5 Vdc	22 - 29.5 Vdc	22 - 29.5 Vdc
Resistance to reverse feed max.	35 Vdc	35 Vdc	35 Vdc	35 Vdc
Output rated current	3.00 A	5.00 A	5.00 A	10.00 A
Parallel connection	Yes	Yes	Yes	Yes
Power Boost	6.5 A / 4 s (5.8 A / 8 s)	10 A / 4 s (7.5 A / 8 s)	10 A / 4 s (7.5 A / 8 s)	20 A / 4 s (15 A / 8 s)
Overload behaviour	Constant current	Constant current	Constant current	Constant current
max. Power loss idling/nominal load	3.0 / 8.8 W	5.0 / 14.6 W	5.0 / 14.6 W	3.5 / 19.7 W
Serial operation	Yes	Yes	Yes	Yes
Efficiency	typ. 87.7 %	typ. 87.8 %	typ. 87.8 %	typ. 91.8 %
Ripple factor	typ. 70 mVss	typ. 70 mVss	typ. 70 mVss	typ. 70 mVss
Top Boost	14 A / 25 ms	21 A / 25 ms	21 A / 25 ms	60 A / 25 ms
Signaling				
Stand-by-input	Yes	Yes	Yes	Yes
Power Good (DC OK)	LED green, LED red	LED green, LED red	LED green, LED red	LED green, LED red
Potential free signal contact	Yes	Yes	Yes	Yes
Approvals				
Approvals	cURus, cULus	cURus, cULus	cURus, cULus	cURus, cULus
Environment				
Storage temperature	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C
Derating	-3 %/K > +50 °C, -5 %/Vac < 95 Vac	-3 %/K > +50 °C, -5 %/Vac < 95 Vac	-3 %/K > +50 °C, -5 %/Vac < 95 Vac	-3 %/K > +50 °C, -1.5 %/Vac < 110 Vac
Ambient temperature	-10 °C to +70 °C	-10 °C to +70 °C	-10 °C to +70 °C	-10 °C to +70 °C
Safety and protection				
Safety class	I, with PE connection	I, with PE connection	I, with PE connection	I, with PE connection
Protection index	IP 20	IP 20	IP 20	IP 20
Accessory				
Connector for signalling	PV-CON (optional)	PV-CON (optional)	PV-CON (optional)	PV-CON (optional)
Side DIN rail mounting	PV-TS35M (optional)	PV-TS35M (optional)	PV-TS35M (optional)	PV-TS35M (optional)
Direct screw fastening plate for lateral mounting	PV-WB2 (optional)	PV-WB2 (optional)	PV-WB2 (optional)	PV-WB2 (optional)
Order numbers				
Order Number	**PVSE 230/24-3B**	**PVSE 230/24-5**	**PVSE 230/24-5B**	**PVSE 230/24-10**

Single-phase, primary switched mode power supply, Economy
PVSE 230

Electrical data

Typ	PVSE 230/24-20	PVSE 230/30-15	PVSE 230/48-5	PVSE 230/48-10
Input				
Input rated voltage	110 - 240 Vac	110 - 240 Vac	110 - 240 Vac	110 - 240 Vac
Input rated current (rated load)	5.7 / 2.3 Aac (110 / 230 Vac)	5.7 / 2.3 Aac (110 / 230 Vac)	2.5 / 1.2 Aac (110 / 230 Vac)	5.7 / 2.3 Aac (110 / 230 Vac)
Input voltage range	85 - 264 Vac (120 - 373 Vdc)	85 - 264 Vac (120 - 373 Vdc)	85 - 264 Vac (120 - 373 Vdc)	85 - 264 Vac (120 - 373 Vdc)
Rated frequency range	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz
Starting current limiter	<8 A, active	<8 A, active	<8 A, active	<8 A, active
Input fuse internal	10 A (slow-blow)	10 A (slow-blow)	6.3 A (slow-blow)	10 A (slow-blow)
Recommended back-up fuse (circuit breaker)	10 A, 16 A, characteristics B, C	10 A, 16 A, characteristics B, C	10 A, 16 A, characteristics B, C	10 A, 16 A, characteristics B, C
Harmonic correction	active	active	active	active
Mains buffering (rated load)	20 / 25 ms (110 / 230 Vac)	20 / 25 ms (110 / 230 Vac)	24 / 24 ms (110 / 230 Vac)	20 / 25 ms (110 / 230 Vac)
Transient surge voltage protection	Varistor	Varistor	Varistor	Varistor
Output				
Output rated voltage	24 Vdc	30 Vdc	48 Vdc	48 Vdc
Output voltage range	22 - 29.5 Vdc	27 - 43 Vdc	33 - 52 Vdc	33 - 52 Vdc
Resistance to reverse feed max.	35 Vdc	63 Vdc	63 Vdc	63 Vdc
Output rated current	20.00 A	15.00 A	5.00 A	10.00 A
Parallel connection	Yes	Yes	Yes	Yes
Power Boost	30 A / 4 s (25 A / 8 s)	15 A / 4 s (12.5 A / 8 s)	10 A / 4 s (7.5 A / 8 s)	15 A / 4 s (12.5 A / 8 s)
Overload behaviour	Constant current	Constant current	Constant current	Constant current
max. Power loss idling/nominal load	4.8 / 50.2 W	4.8 / 50.2 W	7.4 / 21.6 W	4.8 / 50.2 W
Serial operation	Yes	Yes	Yes	Yes
Efficiency	typ. 91 %	typ. 91 %	typ. 91 %	typ. 91 %
Ripple factor	typ. 70 mVss	typ. 70 mVss	typ. 70 mVss	typ. 70 mVss
Top Boost	80 A / 25 ms	70 A / 25 ms	30 A / 25 ms	40 A / 25 ms
Signaling				
Stand-by-input	Yes	Yes	Yes	Yes
Power Good (DC OK)	LED green, LED red	LED green, LED red	LED green, LED red	LED green, LED red
Potential free signal contact	Yes	Yes	Yes	Yes
Approvals				
Approvals	cURus, cULus	cURus, cULus	cURus, cULus	cURus, cULus
Environment				
Storage temperature	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C
Derating	-3 %/K > +50 °C, -1,5 %/Vac < 110 Vac	-3 %/K > +50 °C, -1.5 %/Vac < 110 Vac	-3 %/K > +50 °C, -1.5 %/Vac < 110 Vac	-3 %/K > +50 °C, -1.5 %/Vac < 110 Vac
Ambient temperature	-10 °C to +70 °C	-10 °C to +70 °C	-10 °C to +70 °C	-10 °C to +70 °C
Safety and protection				
Safety class	I, with PE connection	I, with PE connection	I, with PE connection	I, with PE connection
Protection index	IP 20	IP 20	IP 20	IP 20
Accessory				
Connector for signalling	PV-CON (optional)	PV-CON (optional)	PV-CON (optional)	PV-CON (optional)
Side DIN rail mounting	PV-TS35M (optional)	PV-TS35M (optional)	PV-TS35M (optional)	PV-TS35M (optional)
Direct screw fastening plate for lateral mounting	PV-WB2 (optional)	PV-WB2 (optional)	PV-WB2 (optional)	PV-WB2 (optional)
Order numbers				
Order Number	**PVSE 230/24-20**	**PVSE 230/30-15**	**PVSE 230/48-5**	**PVSE 230/48-10**

Single-phase, primary switched mode power supply, Economy
PVSE 230

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Mechanical data

Typ	Terminals input, (spring clamp terminal, pluggable)	Terminals output, (spring clamp terminal, pluggable)	Terminals signalling, (spring clamp terminal, pluggable)	Mounting position	Fixing method	Weight	Dimension picture (in mm)	A	B	C	D	E
PVSE 230/12-6	max. 2.5 mm²	max. 2.5 mm²	max. 0.5 mm²	vertical	DIN Rail system TS35	0.8 kg	1	40	163.5	127	76	12.5
PVSE 230/12-10	max. 2.5 mm²	max. 2.5 mm²	max. 0.5 mm²	vertical	DIN Rail system TS35	1.1 kg	1	57	163.5	127	76	12.5
PVSE 230/12-15	max. 2.5 mm²	max. 2.5 mm²	max. 0.5 mm²	vertical	DIN Rail system TS35	1.3 kg	1	57	179.5	127	76	12.5
PVSE 230/24-3	max. 2.5 mm²	max. 2.5 mm²	max. 0.5 mm²	vertical	DIN Rail system TS35	0.8 kg	1	40	163.5	127	76	12.5
PVSE 230/24-3B	max. 2.5 mm²	max. 2.5 mm²	max. 0.5 mm²	vertical	DIN Rail system TS35	0.8 kg	1	40	163.5	127	76	12.5
PVSE 230/24-5	max. 2.5 mm²	max. 2.5 mm²	max. 0.5 mm²	vertical	DIN Rail system TS35	1.1 kg	1	57	163.5	127	76	12.5
PVSE 230/24-5B	max. 2.5 mm²	max. 2.5 mm²	max. 0.5 mm²	vertical	DIN Rail system TS35	1.1 kg	1	57	163.5	127	76	12.5
PVSE 230/24-10	max. 2.5 mm²	max. 2.5 mm²	max. 0.5 mm²	vertical	DIN Rail system TS35	1.3 kg	1	57	179.5	127	76	12.5
PVSE 230/24-20	max. 2.5 mm²	max. 10 mm²	max. 0.5 mm²	vertical	DIN Rail system TS35	2.3 kg	1	97	187.5	127	76	12.5
PVSE 230/30-15	max. 2.5 mm²	max. 10 mm²	max. 0.5 mm²	vertical	DIN Rail system TS35	2.3 kg	1	97	187.5	127	76	12.5
PVSE 230/48-5	max. 2.5 mm²	max. 2.5 mm²	max. 0.5 mm²	vertical	DIN Rail system TS35	1.3 kg	1	57	179.5	127	76	12.5
PVSE 230/48-10	max. 2.5 mm²	max. 10 mm²	max. 0.5 mm²	vertical	DIN Rail system TS35	2.3 kg	1	97	187.5	127	76	12.5

Dimension pictures

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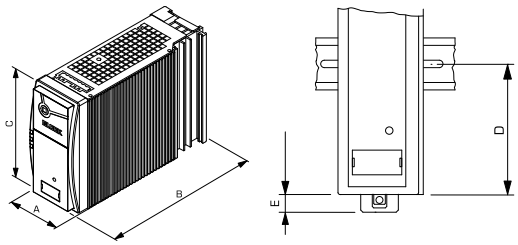


Single-phase, primary switched mode power supply
PVSA 230

General Data

Input rated voltage 100 - 240 Vac
Output rated voltage 30,5 Vdc
Output rated current 3 A
Ambient temperature -10 °C to +70 °C
Efficiency 82 %
Protection index IP 20

Advantages

Stabilised and adjustable output voltage
Up to 200 % Real Power Boost for 4 seconds
Top Boost to trip conventional circuit breakers
DC OK signalling via LEDs
Parallel connection option
Service-friendly spring-loaded connector system
Optional with active inrush current limiter
Panel installation on mounting rails
Compatible to AS-i

Applications

Primary switched mode power supply with integrated output filter for AS-i bus system.

Standards

Primary switched mode power supply
to UL 60950, UL 508

Safety:
EN 60950, EN 60950 (SELV), EN 60204 (PELV)

EMC:
EN 55022 (Interference emissions), EN 61000-4-3 (Interference immunity)

Approvals

Single-phase, primary switched mode power supply
PVSA 230

Typ	PVSA 230/30-3
Special features	
Characteristics	Compatible to AS-i
Input	
Input rated voltage	100 – 240 Vac
Input voltage range	85 - 264 Vac (120 - 350 Vdc)
Input voltage derating	5%/Vac < 95 Vac
Switch-on time	700 ms
Transient surge voltage protection	Varistor
Input rated current (rated load)	1,13/0,7 Aac (100 Vac/ 240 Vac)
Power factor	0,68
Starting current limiter	<30 A
Input fuse internal	4 AT
Frequency Range	50 Hz – 60 Hz
Recommended back-up fuse (circuit breaker)	6 A, 10 A, 16 A, characteristic B, C
Mains buffering (rated load)	typ. 80 ms @230 Vac
Output	
Output rated voltage	30,5 Vdc
Output voltage range	29,0 - 32,0 Vdc
Resistance to reverse feed max.	50 Vdc
Output rated current	3.00 A
Power Boost	6 A / 4 s (4,5 A / 8 s)
Top Boost	18 Adc for 25 ms
Overload behaviour	Constant current
Parallel connection	Yes
max. Power loss idling/nominal load	7,3 W / 20 W
Efficiency	82.0 %
Correction time	typ. 1 ms
Output limited current	typ. 1,1 x Inenn
Leakage current (50 Hz)	1 mA
Signaling	
Status indicator	LED green: Uout > 0,85 x Unenn; LED red: off
Environment	
Ambient temperature	–10 °C …+70 °C
Storage temperature	–25 °C …+85 °C
Derating	-3 %/K > +50 °C
Required minimum spacing (left/right)	0 mm
Type of cooling	Natural convection
Required minimum spacing (over/under)	70 mm
Safety and protection	
Protection index	IP 20
Safety class (prepared)	I
Accessory	
Connector for signalling	PV-CON (optional)
Order numbers	
Order Number	**PVSA 230/30-3**

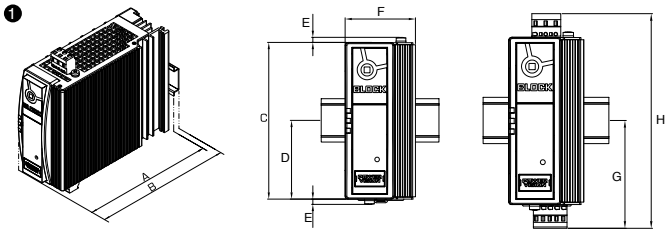
Single-phase, primary switched mode power supply
PVSA 230

Mechanical data

Typ	Terminals Input	Terminals Output	Fixing method	Weight	Dimension picture (in mm)	A	B	C	D	E	F	G	H
PVSA 230/30-3	WAGO series 231, max. 2,5 mm²	WAGO series 231, max. 2,5 mm²	DIN rail mounting	1.16 kg	1	163	170.5	127	63.5	4	57	81.5	163

Dimension pictures

1



Single-phase, primary switched mode power supply, PCB assembly
PP 1AC

BLOCK Website

General Data

- Input rated voltage 100 - 240 Vac
- Output voltage range 5 - 24 Vdc
- Output rated current 0.17 - 0.8 A
- Ambient temperature -25 °C to +50 °C
- Efficiency typ. 73 %
- Protection index IP 00

Advantages

- Stabilised output voltage
- Low idling losses <0,1W
- Wide-range input voltages
- Short-and open-circuit proof
- Thermal overload switch-off
- Low ripple factor

Applications

Switching power supply with excellent efficiency and low no-load losses for direct soldering to the PCB. Provides an extremely space-saving design of various applications.

Standards

Primary switched mode power supply
to UL 60950, UL 508

Safety:
EN 61558-2-16, EN 60950-1

EMC:
EN 61204-3

Approvals

EAC

Single-phase, primary switched mode power supply, PCB assembly
PP 1AC

BLOCK Website

Electrical data

Typ	PP-0105-008-0	PP-0109-005-0	PP-0112-004-0	PP-0118-003-0	PP-0124-002-0
Input					
Input rated voltage	100 - 240 Vac	100 - 240 Vac	100 - 240 Vac	100 - 240 Vac	100 - 240 Vac
Input voltage range	85 - 264 Vac (120 - 373 Vdc)	85 - 264 Vac (120 - 373 Vdc)	85 - 264 Vac (120 - 373 Vdc)	85 - 264 Vac (120 - 373 Vdc)	85 - 264 Vac (120 - 373 Vdc)
Input voltage derating	-3 %/Vac < 100 Vac	-3 %/Vac < 100 Vac	-3 %/Vac < 100 Vac	-3 %/Vac < 100 Vac	-3 %/Vac < 100 Vac
Switch-on time	16 ms	16 ms	16 ms	16 ms	16 ms
Recommended primary preliminary fuse	2 A (delay)	2 A (delay)	2 A (delay)	2 A (delay)	2 A (delay)
Rated frequency range	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz
Input rated current (rated load)	96 mA / 54 mA (100 / 230 Vac)	92 mA / 52 mA (100 / 230 Vac)	92 mA / 52 mA (100 / 230 Vac)	90 mA / 51 mA (100 / 230 Vac)	88 mA / 51 mA (100 / 230 Vac)
Power factor	0.45	0.45	0.45	0.45	0.45
Starting current limiter	< 7.5 A	< 7.5 A	< 7.5 A	< 7.5 A	< 7.5 A
Mains buffering (rated load)	14 / 82 ms (100 / 230 Vac)	14 / 83 ms (100 / 230 Vac)	16 / 93 ms (100 / 230 Vac)	17 / 87 ms (100 / 230 Vac)	15 / 93 ms (100 / 230 Vac)
Output					
Output rated voltage	5.0 Vdc	9.0 Vdc	12.0 Vdc	18.0 Vdc	24.0 Vdc
Power dissipation, no load/rated load	83 mW / 1.65 W	56 mW / 1.32 W	47 mW / 1.32 W	62 mW / 1.3 W	57 mW / 1.2 W
Over-voltage-protection	typ. 7.5 Vdc	typ. 15 Vdc	typ. 15 Vdc	typ. 28 Vdc	typ. 28 Vdc
Output rated current	0.80 A	0.45 A	0.34 A	0.23 A	0.17 A
Efficiency	typ. 71 %	typ. 75%	typ. 75%	typ. 76%	typ. 77%
Ripple factor	200 mVss (Ripple + Noise)	150 mVss (Ripple + Noise)	130 mVss (Ripple + Noise)	120 mVss (Ripple + Noise)	90 mVss (Ripple + Noise)
Output limited current	typ. 1.2 - 1.8 x Inenn	typ. 1.2 - 1.8 x Inenn	typ. 1.2 - 1.8 x Inenn	typ. 1.2 - 1.8 x Inenn	typ. 1.2 - 1.8 x Inenn
Environment					
Ambient temperature	-25 °C to +50 °C	-25 °C to +50 °C	-25 °C to +50 °C	-25 °C to +50 °C	-25 °C to +50 °C
Storage temperature	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C
Derating	-3 %/K > +40 °C	-3 %/K > +40 °C	-3 %/K > +40 °C	-3 %/K > +40 °C	-3 %/K > +40 °C
Type of cooling	natural convection	natural convection	natural convection	natural convection	natural convection
Safety and protection					
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class	II, without PE connection	II, without PE connection	II, without PE connection	II, without PE connection	II, without PE connection
Resistance to reverse feed max.	6.3 Vdc	16 Vdc	16 Vdc	35 Vdc	35 Vdc
Order numbers					
Order Number	**PP-0105-008-0**	**PP-0109-005-0**	**PP-0112-004-0**	**PP-0118-003-0**	**PP-0124-002-0**

Single-phase, primary switched mode power supply, PCB assembly
PP 1AC

BLOCK Website

Mechanical data

Typ	Terminals Input	Terminals Output	Mounting position	Dimension (W x H x D)	Weight	Dimension picture (in mm)	A	B	C	D	E	F	G	H	I	J	K
PP-0105-008-0	Pins for PCB	Pins for PCB	selectable	41 x 21 x 33 mm	0.04 kg	1	24.8	33.3	41.1	21	5.08	19.4	4.1	5	25	7.62	4
PP-0109-005-0	Pins for PCB	Pins for PCB	selectable	41 x 21 x 33 mm	0.04 kg	1	24.8	33.3	41.1	21	5.08	19.4	4.1	5	25	7.62	4
PP-0112-004-0	Pins for PCB	Pins for PCB	selectable	41 x 21 x 33 mm	0.04 kg	1	24.8	33.3	41.1	21	5.08	19.4	4.1	5	25	7.62	4
PP-0118-003-0	Pins for PCB	Pins for PCB	selectable	41 x 21 x 33 mm	0.04 kg	1	24.8	33.3	41.1	21	5.08	19.4	4.1	5	25	7.62	4
PP-0124-002-0	Pins for PCB	Pins for PCB	selectable	41 x 21 x 33 mm	0.04 kg	1	24.8	33.3	41.1	21	5.08	19.4	4.1	5	25	7.62	4

Dimension pictures

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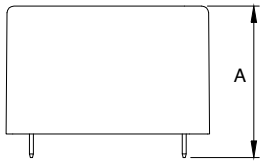

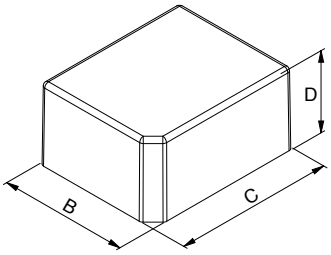

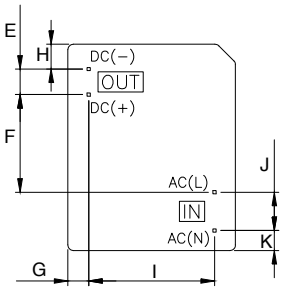

Ansicht unten
Bottom view

Two-phase, primary switched mode power supply
PM 2AC

BLOCK Website

General Data

- Input voltage range 200 - 500 Vac
- Nominal output voltage: DC 24 V
- Nominal output current: 3.8 A
- Ambient temperature: -25 °C ... +70 °C
- Protection index IP 20
- Plastic housing

Advantages

- Stabilised and adjustable output voltage
- Low stand-by consumption <1 W
- Constant current limiting without overload shutdown
- DC OK signalling
- Parallel operation option
- Push-in terminals
- Panel installation on mounting rails

Applications

Efficient, primary switched mode power supply in slim plastic housing. A powerful and flexible option that's still light and compact. This power supply is suitable for a highly diverse range of applications in solar, measurement and control technology as well as industrial and building automation. It delivers an output current of 3.8 A and is suitable for establishing NEC Class 2 circuits. The output voltage can be easily set using the rotary potentiometer on the front of the housing. The DIN rail fastening method and push-in connection terminals enable fast and secure mounting.

Standards

Primary switched mode power supply for NEC Class 2 applications to UL 60950, UL 508, UL 1310

Safety:
EN 61558-2-16, EN 60950-1, EN 60335-1

EMC:
EN 61204-3

Approvals

UL/CSA 60950 recognised (pending), UL 508 listed (pending), UL 1310

Two-phase, primary switched mode power supply
PM 2AC

BLOCK Website

Electrical data

Typ	PM-0224-038-0
Special features	
Characteristics	For establishing NEC Class 2 circuits
Input	
Input rated voltage	200 - 500 Vac
Input voltage range	180 - 575 Vac (254 - 800 Vdc)
Input voltage derating	-0.1 %/Vac < 320 Vac
Rated frequency range	44 Hz - 66 Hz / 0 Hz
Input rated current (rated load)	0.82 A / 0.52 A (200 Vac / 500 Vac)
Starting current limiter	< 30 A, NTC
Switch-on time	<1.2 s (230 Vac) / <0.8 s (400 Vac)
Power factor	0.66
Input fuse internal	3.15 A
Recommended back-up fuse (circuit breaker)	6 A, 10 A, 16 A, characteristic B, C
Mains buffering (rated load)	>15 ms (230 Vac) / >60 ms (400 Vac)
Transient surge voltage protection	Varistor
Output	
Output rated voltage	24 Vdc
Output voltage range	23 – 28.5 Vdc (> 24 Vdc constant capacity)
Output rated current	3.8 A / NEC Class 2
Output limited current	3.8 ... 3.2 A (constant current, Class 2)
Class 2 output (UL Limited Power Source, LPS)	✔
Parallel connection	Yes
Serial operation	Yes
Power dissipation, no load/rated load	2.8 W / 14 W (230 Vac)
Max. power losses	<15 W (180 Vac / 72 W)
Ripple factor	typ. 30 mVss
Resistance to reverse feed max.	35 Vdc
Over-voltage-protection	max. 40 Vdc
Efficiency	89 %
Signaling	
Status indicator	LED green Uout > typ. 21.5 Vdc LED lit permanently
Signal output	Active high signal Uout > typ. 21.5 Vdc max. 20 mA@24 Vdc short circuit proof
Approvals	
Approvals	cURus, cULus (in preparation)
Environment	
Storage temperature	-25 °C to +85 °C
Ambient temperature	-25 °C to +70 °C
Derating	-2.5 %/K > +55 °C
Mounting position	horizontal for standard rail DIN TS35
Type of cooling	Natural convection
Required minimum spacing (left/right)	0 mm
Required minimum spacing (over/under)	50 mm
Safety and protection	
Protection index	IP 20
Safety class	II, without PE connection
Order numbers	
Order Number	**PM-0224-038-0**

Two-phase, primary switched mode power supply
PM 2AC

BLOCK Website

Mechanical data

Typ	Terminals input (direct plug-in technology Push-in)	Terminals output (direct plug-in technology Push-in)	Terminals signalling (direct plug-in technology Push-in)	Weight	Dimension picture (in mm)	A	B	C	D	E	F	G
PM-0224-038-0	max 2,5 mm²	max 2,5 mm²	max 2,5 mm²	0.39 kg	1	90	45	3	52	3.5	103.5	111

Dimension pictures

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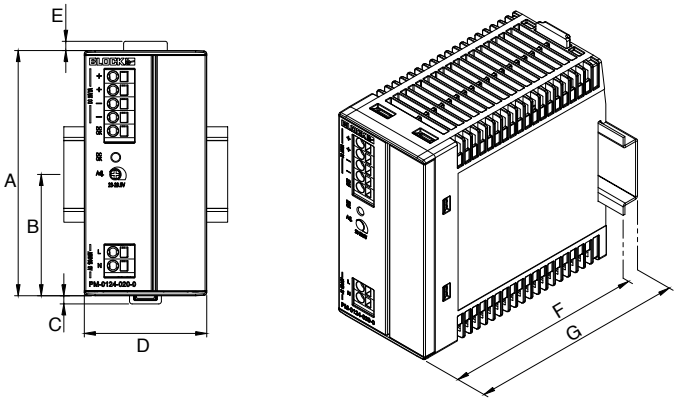

Single- and two-phase, primary switched mode power supply
PC 2AC

General Data

- Nominal input voltage: 200 - 500 Vac
- Nominal output voltage: 24 Vdc
- Nominal output current: 5 A - 10 A
- Ambient temperature -25 °C to +70 °C
- Protection index IP 20

Advantages

- Stabilised and adjustable output voltage
- Fast tripping of conventional circuit breakers
- DC OK signalling
- Parallel operation
- Push-in terminals
- Robust DIN rail mounting
- Resistant to transient overvoltages up to 4 kV
- Optional with 50 % Power Boost (PC-0224-xxx-2)

Applications

The economic power supplies in the Power Compact series set new standards in their class. Above-average robustness against transients and energetic surge pulses at their input and equipped with essential additional aspects for a worldwide high plant availability. A powerful and flexible option that's still light and compact. Due to a single or two-phase supply from 180 V to 550 V, these power supplies are suitable for a highly diverse range of applications in solar, measurement and control technology and they really come into their own in industrial and building automation. The output voltage can be set easily using the rotary potentiometer on the front of the housing. The robust DIN rail fastening method and push-in connection terminals enable fast and secure mounting.

Standards

Primary switched mode power supply
to UL 60950, UL 508

Safety:
EN 61558-2-16, EN 60950-1

EMC:
EN 61204-3

Approvals

UL 60950, UL 508, GL (prepared)

Single- and two-phase, primary switched mode power supply
PC 2AC

Typ	PC-0224-050-0	PC-0224-050-2	PC-0224-100-0	PC-0224-100-2
Input				
Input rated voltage	200 - 500 Vac	200 - 500 Vac	200 - 500 Vac	200 - 500 Vac
Input voltage range	180 - 550 Vac (254 - 780 Vdc)	180 - 550 Vac (254 - 780 Vdc)	180 - 550 Vac (254 - 780 Vdc)	180 - 550 Vac (254 - 780 Vdc)
Input voltage derating	-0.5 %/Vac < 200 Vac (-0.4 %/Vdc < 280 Vdc)	-0.5 %/Vac < 200 Vac (-0.4 %/Vdc < 280 Vdc)	0,5 %/Vac < 200 Vac	0,5 %/Vac < 200 Vac
Rated frequency range	44 - 66 Hz	44 - 66 Hz	44 - 66 Hz	44 - 66 Hz
Input rated current (rated load)	1.25 A (200 Vac) / 0.67 A (500 Vac)	1.25 A (200 Vac) / 0.67 A (500 Vac)	1,97 A (230 Vac)	1,97 A (230 Vac)
Starting current limiter	< 30 A, NTC	< 30 A, NTC	< 30 A, NTC	< 30 A, NTC
Switch-on time	0.98 s (200 Vac) / 0.47 s (500 Vac)	0.98 s (200 Vac) / 0.47 s (500 Vac)	0,5 s (1 x 230 Vac / 3 x 400 Vac)	0,5 s (1 x 230 Vac / 3 x 400 Vac)
Mains buffering (rated load)	15 ms (200 Vac) / 126 ms (500 Vac)	15 ms (200 Vac) / 126 ms (500 Vac)	20 ms (230 Vac) / 78 ms (400 Vac)	20 ms (230 Vac) / 78 ms (400 Vac)
Power factor	0.52	0.52	0.52	0.52
Input fuse internal	3.15 A	3.15 A	6,3 AT	6,3 AT
Recommended back-up fuse (circuit breaker)	6 A, 10 A, 16 A, characteristic B, C	6 A, 10 A, 16 A, characteristic B, C	6 A, 10 A, 16 A, characteristic B, C	6 A, 10 A, 16 A, characteristic B, C
Transient surge voltage protection	Varistor	Varistor	Varistor	Varistor
Output				
Output rated voltage	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Output voltage range	23 – 28.5 Vdc	23 – 28.5 Vdc	23 – 28.5 Vdc	23 – 28.5 Vdc
Output rated current	5 A	5 A	10 A	10 A
Power Boost	-	7.5 A / 5 s	-	15 A / 5 s @24 Vdc >260 Vac
Output limited current	typ. 5.5 A	8.5 A	11 A	typ. 11 A
Tripping of LS circuit breakers	max. B4	max. B4	max. B6/ C2	max. B6/ C2
Parallel connection	Yes	Yes	Yes	Yes
Serial operation	Yes	Yes	Yes	Yes
Power dissipation, no load/rated load	0.94 W / 16.36 W (230 Vac) 1.35 W / 14.55 W (400 Vac)	0.94 W / 16.36 W (230 Vac) 1.35 W / 14.55 W (400 Vac)	1,33 W / 27,77 W (230 Vac) 2 W / 20,27 W (400 Vac)	1,33 W / 27,77 W (230 Vac) 2 W / 20,27 W (400 Vac)
Max. power losses	18.2 W (200 Vac / 24 V / 5 A)	18.2 W (200 Vac / 24 V / 5 A)	27,77 W (230 Vac / 24 V / 10 A)	27,77 W (230 Vac / 24 V / 10 A)
Ripple factor	typ. 30 mVss	typ. 30 mVss	typ. 22 mVss	typ. 22 mVss
Efficiency	typ. 89 %	typ. 89 %	typ. 90% (230V) / 92,5% (400V)	typ. 90% (230V) / 92,5% (400V)
Resistance to reverse feed max.	35 Vdc	35 Vdc	35 Vdc	35 Vdc
Over-voltage-protection	max. 40 Vdc	max. 40 Vdc	typ. 40 Vdc	typ. 40 Vdc
Signaling				
Status indicator	LED green	LED green	LED green	LED green
Signal output	Relay contact	Relay contact	Relay contact	Relay contact
Approvals				
Approvals	cURus, cULus, GL (prepared)	cURus, cULus, GL (prepared)	cURus, cULus (prepared), GL (prepared)	cURus, cULus (prepared), GL (prepared)
Environment				
Type of cooling	natural convection	natural convection	natural convection	natural convection
Ambient temperature	-25 °C to +70 °C	-25 °C to +70 °C	-25 °C to +70 °C	-25 °C to +70 °C
Storage temperature	-25 °C ... +85 °C	-25 °C ... +85 °C	-25 °C ... +85 °C	-25 °C ... +85 °C
Derating	-2.5 %/K > +55 °C	-2.5 %/K > +55 °C	-2.5 %/K > +55 °C	-2.5 %/K > +55 °C
Required minimum spacing (left/right)	0 mm	0 mm	0 mm	0 mm
Required minimum spacing (over/under)	50 mm	50 mm	50 mm	50 mm
Safety and protection				
Protection index	IP 20	IP 20	IP 20	IP 20
Safety class	I, with PE connection	I, with PE connection	I, with PE connection	I, with PE connection
Order numbers				
Order Number	**PC-0224-050-0**	**PC-0224-050-2**	**PC-0224-100-0**	**PC-0224-100-2**

Single- and two-phase, primary switched mode power supply
PC 2AC

Mechanical data

Typ	Mounting position	Terminals signalling (direct plug-in technology Push-in)	Terminals output (direct plug-in technology Push-in)	Terminals input (direct plug-in technology Push-in)	Weight	Dimension (W x H x D)	Dimension picture (in mm)	A	B	C	D	E	F
PC-0224-050-0	horizontal for standard rail DIN TS35	max 2,5 mm²	max 2,5 mm²	max 2,5 mm²	0.6 kg	42 x 127 x 126 mm	1	127	63.5	3	42	118.5	126
PC-0224-050-2	horizontal for standard rail DIN TS35	max 2,5 mm²	max 2,5 mm²	max 2,5 mm²	0.6 kg	42 x 127 x 126 mm	1	127	63.5	3	42	118.5	126
PC-0224-100-0	horizontal for standard rail DIN TS35	max 2,5 mm²	max 2,5 mm²	max 2,5 mm²	0.8 kg	55 x 127 x 125 mm	1	127	63.5	3	55	118.5	125
PC-0224-100-2	horizontal for standard rail DIN TS35	max 2,5 mm²	max 2,5 mm²	max 2,5 mm²	0.8 kg	55 x 127 x 125 mm	1	127	63.5	3	55	118.5	125

Dimension pictures

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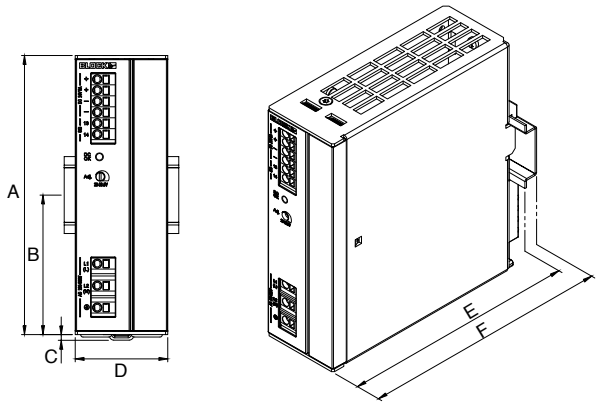

Three-phase, primary switched mode power supply
PC 3AC

General Data

- Nominal input voltage: 3 x 400 - 500 Vac
- Nominal output voltage: 24 Vdc, 48 Vdc, 60 Vdc
- Nominal output current: 10 - 40 A
- Ambient temperature -25 °C to +70 °C
- Protection index IP 20

Advantages

- Stabilised and adjustable output voltage
- Fast tripping of conventional circuit breakers
- DC OK signalling
- Parallel operation
- Push-in terminals
- Robust DIN rail mounting
- Resistant to transient overvoltages up to 4 kV
- Optional with 50 % Power Boost (PC-03xx-xxx-2)

Applications

The economic power supplies in the Power Compact series set new standards in their class. Above-average robustness against transients and energetic surge pulses at their input and equipped with essential additional aspects for a worldwide high plant availability. The output voltage can be set easily using the rotary potentiometer on the front of the housing. The robust DIN rail fastening method and push-in connection terminals enable fast and secure mounting. All versions are available as option with 50% power reserves for high inrush current applications.

Standards

Primary switched mode power supply
to UL 60950, UL 508

Safety:
EN 61558-2-16, EN 60950-1

EMC:
EN 61204-3

Approvals

UL 60950, UL 508, GL (prepared)

Three-phase, primary switched mode power supply
PC 3AC

Electrical data

Typ	PC-0324-100-0	PC-0324-100-2	PC-0324-200-0	PC-0324-200-2
Input				
Input rated voltage	400 - 500 Vac	400 - 500 Vac	400 - 500 Vac	400 - 500 Vac
Input voltage range	320 - 575 Vac	320 - 575 Vac	320 - 575 Vac	320 - 575 Vac
Input voltage derating	-	-	-	-
Rated frequency range	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz
Input rated current (rated load)	3 x 0.73 A (400 Vac) / 0.66 A (500 Vac)	3 x 0.73 A (400 Vac) / 0.66 A (500 Vac)	3 x 1.21 A (400 Vac) / 1.03 A (500 Vac)	3 x 1.21 A (400 Vac) / 1.03 A (500 Vac)
Starting current limiter	< 30 A, NTC	< 30 A, NTC	< 30 A, NTC	< 30 A, NTC
Input fuse internal	-	-	-	-
Recommended back-up fuse (circuit breaker)	6 A, 10 A, 16 A, characteristic B, C	6 A, 10 A, 16 A, characteristic B, C	6 A, 10 A, 16 A, characteristic B, C	6 A, 10 A, 16 A, characteristic B, C
Transient surge voltage protection	Varistor	Varistor	Varistor	Varistor
Output				
Output rated voltage	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Output voltage range	23 – 28.5 Vdc	23 – 28.5 Vdc	23 – 28.5 Vdc	23 – 28.5 Vdc
Output rated current	10 A	10 A	20 A	20 A
Output limited current	typ. 11 A (constant current)	typ. 11 A (constant current)	typ. 22 A (constant current)	typ. 22 A (constant current)
Power Boost	-	15 A / 5 s	-	30 A / 5 s
Tripping of LS circuit breakers	max. B6/C2 @ 2.5mm² /20m	max. B6/C2 @ 2.5mm² /20m	max. B6/C4/K4 @ 6mm² /20m	max. B6/C6/K4 @ 6mm² /20m
Parallel connection	Yes	Yes	Yes	Yes
Serial operation	Yes	Yes	Yes	Yes
Power dissipation, no load/rated load	2.7 W / 27.6 W (400 Vac)	2.7 W / 27.6 W (400 Vac)	4.03 W / 42.53 W (400 Vac)	4.03 W / 42.53 W (400 Vac)
Ripple factor	typ. 30 mVss	typ. 30 mVss	typ. 30 mVss	typ. 30 mVss
Efficiency	typ. 90 %	typ. 90 %	typ. 92 %	typ. 92 %
Resistance to reverse feed max.	35 Vdc	35 Vdc	35 Vdc	35 Vdc
Over-voltage-protection	max. 40 Vdc	max. 40 Vdc	max. 40 Vdc	max. 40 Vdc
Signaling				
Status indicator	LED green	LED green	LED green	LED green
Signal output	Relay contact	Relay contact	Relay contact	Relay contact
Approvals				
Approvals	cURus, cULus, GL (in preparation)	cURus, cULus, GL (in preparation)	cURus, cULus, GL (in preparation)	cURus, cULus, GL (in preparation)
Environment				
Type of cooling	natural convection	natural convection	natural convection	natural convection
Ambient temperature	-25 °C to +70 °C	-25 °C to +70 °C	-25 °C to +70 °C	-25 °C to +70 °C
Storage temperature	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C
Derating	-2.5 %/K > +55 °C	-2.5 %/K > +55 °C	-2.5 %/K > +55 °C	-2.5 %/K > +55 °C
Required minimum spacing (left/right)	0 mm	0 mm	0 mm	0 mm
Required minimum spacing (over/under)	50 mm	50 mm	50 mm	50 mm
Safety and protection				
Protection index	IP 20	IP 20	IP 20	IP 20
Safety class	I, with PE connection	I, with PE connection	I, with PE connection	I, with PE connection
Order numbers				
Order Number	**PC-0324-100-0**	**PC-0324-100-2**	**PC-0324-200-0**	**PC-0324-200-2**

Three-phase, primary switched mode power supply
PC 3AC

Typ	PC-0324-400-0	PC-0324-400-2	PC-0348-200-0	PC-0348-200-2
Input				
Input rated voltage	400 - 500 Vac	400 - 500 Vac	400 - 500 Vac	400 - 500 Vac
Input voltage range	320 - 575 Vac	320 - 575 Vac	320 - 575 Vac (450 - 800 Vdc)	320 - 575 Vac (450 - 800 Vdc)
Input voltage derating	-	-	-	-
Rated frequency range	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz
Input rated current (rated load)	3 x 2.15 A (400 Vac) / 1.82 A (500 Vac)	3 x 2.15 A (400 Vac) / 1.82 A (500 Vac)	3 x 2,01 A (400 Vac)/ 1,63 A (520 Vac)	3 x 2,01 A (400 Vac)/ 1,63 A (520 Vac)
Starting current limiter	< 30 A, NTC	< 30 A, NTC	< 30 A, NTC	< 30 A, NTC
Input fuse internal	-	-	6,3 AT	6,3 AT
Recommended back-up fuse (circuit breaker)	6 A, 10 A, 16 A, characteristic B, C	6 A, 10 A, 16 A, characteristic B, C	6 A, 10 A, 16 A, characteristic B, C	6 A, 10 A, 16 A, characteristic B, C
Transient surge voltage protection	Varistor	Varistor	Varistor	Varistor
Output				
Output rated voltage	24 Vdc	24 Vdc	48 Vdc	48 Vdc
Output voltage range	23 – 28.5 Vdc	23 – 28,5 Vdc	40 – 56 Vdc	40 – 56 Vdc
Output rated current	40 A	40 A	20 A	20 A
Output limited current	typ. 44 A (constant current)	typ. 44 A (constant current)	typ. 22 A (constant current)	typ. 22 A (constant current)
Power Boost	-	60 A / 5 s	-	30 A / 5 s
Tripping of LS circuit breakers	max. B10/C6/K4 @ 6/10mm² /40m	max. B10/C6/K4 @ 6/10mm² /40m	max. B10/C6/K6	max. B10/C6/K6
Parallel connection	Yes	Yes	Yes	Yes
Serial operation	Yes	Yes	Yes	Yes
Power dissipation, no load/rated load	2.78 W / 83.91 W (400 Vac)	2.78 W / 83.91 W (400 Vac)	5 W / 71,14 W (400 Vac)	5 W / 71,14 W (400 Vac)
Ripple factor	typ. 30 mVss	typ. 30 mVss	typ. 25 mVss	typ. 25 mVss
Efficiency	typ. 92.5 %	typ. 92.5 %	typ. 93%	typ. 93%
Resistance to reverse feed max.	35 Vdc	35 Vdc	63 Vdc	63 Vdc
Over-voltage-protection	max. 40 Vdc	max. 40 Vdc	typ. 60 Vdc	typ. 60 Vdc
Signaling				
Status indicator	LED green	LED green	LED green	LED green
Signal output	Relay contact	Relay contact	Relay contact	Relay contact
Approvals				
Approvals	cURus, cULus, GL (in preparation)	cURus, cULus, GL (in preparation)	cURus, cULus, GL (in preparation)	cURus, cULus, GL (in preparation)
Environment				
Type of cooling	natural convection	natural convection	natural convection	natural convection
Ambient temperature	-25 °C to +70 °C	-25 °C to +70 °C	-25 °C to +70 °C	-25 °C to +70 °C
Storage temperature	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C
Derating	-2.5 %/K > +55 °C	-2.5 %/K > +55 °C	-2.5 %/K > +55 °C	-2.5 %/K > +55 °C
Required minimum spacing (left/right)	0 mm	0 mm	0 mm	0 mm
Required minimum spacing (over/under)	50 mm	50 mm	50 mm	50 mm
Safety and protection				
Protection index	IP 20	IP 20	IP 20	IP 20
Safety class	I, with PE connection	I, with PE connection	I, with PE connection	I, with PE connection
Order numbers				
Order Number	**PC-0324-400-0**	**PC-0324-400-2**	**PC-0348-200-0**	**PC-0348-200-2**

Three-phase, primary switched mode power supply
PC 3AC

ePLAN data portal | BLOCK Website

Electrical data

Typ	PC-0360-160-0
Input	
Input rated voltage	400 - 500 Vac
Input voltage range	390 - 575 Vac (550 - 800 Vdc)
Input voltage derating	-
Rated frequency range	44 Hz - 66 Hz / 0 Hz
Input rated current (rated load)	3 x 2,02 A (400 Vac)/ 1,6 A (520 Vac)
Starting current limiter	< 30 A, NTC
Input fuse internal	6,3 AT
Recommended back-up fuse (circuit breaker)	6 A, 10 A, 16 A, characteristic B, C
Transient surge voltage protection	Varistor
Output	
Output rated voltage	60 Vdc
Output voltage range	40 – 61 Vdc
Output rated current	16 A
Output limited current	typ. 11 A (constant current)
Power Boost	-
Tripping of LS circuit breakers	max. B10/C6/K6
Parallel connection	Yes
Serial operation	Yes
Power dissipation, no load/rated load	7,5 W / 68,93 W (400 Vac)
Ripple factor	typ. 25 mVss
Efficiency	typ. 93%
Resistance to reverse feed max.	63 Vdc
Over-voltage-protection	typ. 63 Vdc
Signaling	
Status indicator	LED green
Signal output	Relay contact
Approvals	
Approvals	cURus, cULus, GL (in preparation)
Environment	
Type of cooling	natural convection
Ambient temperature	-25 °C to +70 °C
Storage temperature	-25 °C to +85 °C
Derating	-2.5 %/K > +55 °C
Required minimum spacing (left/right)	0 mm
Required minimum spacing (over/under)	50 mm
Safety and protection	
Protection index	IP 20
Safety class	I, with PE connection
Order numbers	
Order Number	**PC-0360-160-0**

Three-phase, primary switched mode power supply
PC 3AC

Mechanical data

Typ	Mounting position	Terminals signalling (direct plug-in technology Push-in)	Terminals output (direct plug-in technology Push-in)	Terminals input (direct plug-in technology Push-in)	Weight	Dimension (W x H x D)	Dimension picture (in mm)	A	B	C	D	E	F
PC-0324-100-0	horizontal for standard rail DIN TS35	max 2,5 mm²	max 2,5 mm²	max 2,5 mm²	1.02 kg	55 x 127 x 152 mm	1	127	63.5	3	55	152.5	160
PC-0324-100-2	horizontal for standard rail DIN TS35	max 2,5 mm²	max 2,5 mm²	max 2,5 mm²	1.02 kg	55 x 127 x 152 mm	1	127	63.5	3	55	152.5	160
PC-0324-200-0	horizontal for standard rail DIN TS35	max 2,5 mm²	max 6 mm²	max 2,5 mm²	1.51 kg	80 x 127 x 152 mm	1	127	63.5	3	80	152.5	160
PC-0324-200-2	horizontal for standard rail DIN TS35	max 2,5 mm²	max 6 mm²	max 2,5 mm²	1.51 kg	80 x 127 x 152 mm	1	127	63.5	3	80	152.5	160
PC-0324-400-0	horizontal for standard rail DIN TS35	max 2,5 mm²	max 16 mm²	max 2,5 mm²	2.71 kg	126 x 127 x 170 mm	1	127	63.5	3	126	170.5	178
PC-0324-400-2	horizontal for standard rail DIN TS35	max 2,5 mm²	max 16 mm²	max 2,5 mm²	2.71 kg	126 x 127 x 170 mm	1	127	63.5	3	126	170.5	178
PC-0348-200-0	horizontal for standard rail DIN TS35	max 2,5 mm²	max 16 mm²	max 2,5 mm²	2.76 kg	126 x 127 x 170 mm	1	127	63.5	3	126	170.5	178
PC-0348-200-2	horizontal for standard rail DIN TS35	max 2,5 mm²	max 16 mm²	max 2,5 mm²	2.77 kg	126 x 127 x 170 mm	1	127	63.5	3	126	170.5	178
PC-0360-160-0	horizontal for standard rail DIN TS35	max 2,5 mm²	max 16 mm²	max 2,5 mm²	2.76 kg	126 x 127 x 170 mm	1	127	63.5	3	126	170.5	178

Dimension pictures

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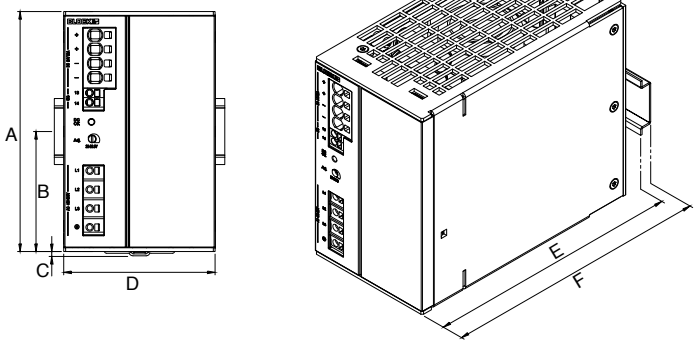


Three-phase, primary switched mode power supply, Economy
PVSE 400

General Data

- Input rated voltage 3 x 400 - 500 Vac
- Output rated voltage 24 - 48 Vdc
- Output rated current 10 - 40 A
- Ambient temperature -25 °C to +70 °C
- Efficiency up to 95 %
- Protection index IP 20

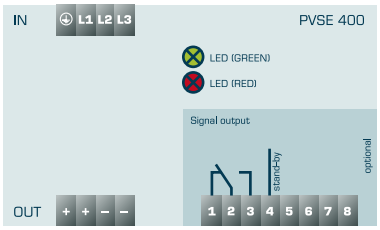
Advantages

- Stabilised and adjustable output voltage
- Up to 200 % Real Power Boost for 4 seconds
- Top Boost to trip conventional circuit breakers
- DC OK signalling
- Parallel connection option
- Service-friendly spring-loaded connector system
- Can be supplied with active inrush current limiting option
- Can be supplied with isolated DC OK signalling function
- Panel installation on mounting rails

Applications

Primary switched mode power supply with massive power reserves focussing on the key task of power supply.

Sample application



Standards

Primary switched mode power supply to UL 60950, UL 508

Safety:
EN 61558-2-16, EN 60950-1

EMC:
EN 61204-3

Approvals

UL/CSA 60950 recognised (E213214), UL508 listed (E219022)

Three-phase, primary switched mode power supply, Economy
PVSE 400

Electrical data

Typ	PVSE 400/24-10	PVSE 400/24-20	PVSE 400/24-40	PVSE 400/30-25
Input				
Input rated voltage	3 x 400 - 500 Vac	3 x 400 - 500 Vac	3 x 400 - 500 Vac	3 x 400 - 500 Vac
Input voltage range	340 - 550 Vac (480 - 780 Vdc)	340 - 550 Vac (480 - 780 Vdc)	340 - 550 Vac (480 - 780 Vdc)	340 - 550 Vac (480 - 780 Vdc)
Input rated current (rated load)	0.6 A (3 x 340 Vac)	1.1 A (3 x 340 Vac)	2 A (3 x 340 Vac)	1.6 A (3 x 340 Vac)
Rated frequency range	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz
Starting current limiter	<30 A, NTC	<30 A, NTC	<30 A, NTC	<30 A, NTC
Input fuse internal	3 x 1.6 A (slow-blow)	3 x 2.5 A (slow-blow)	3 x 6.3 A (slow-blow)	3 x 6.3 A (slow-blow)
Recommended back-up fuse (circuit breaker)	6 A, 10 A, 16 A, characteristics B, C	6 A, 10 A, 16 A, characteristics B, C	10 A, 16 A, characteristics B, C	10 A, 16 A, characteristics B, C
Harmonic correction	passive	passive	passive	passive
Mains buffering (rated load)	22.6 / 51.5 ms (400 / 500 Vac)	13.2 / 36.8 ms (400 / 500 Vac)	15.6 / 42.9 ms (400 / 500 Vac)	15.6 / 42.9 ms (400 / 500 Vac)
Transient surge voltage protection	Varistor	Varistor	Varistor	Varistor
Output				
Output rated voltage	24 Vdc	24 Vdc	24 Vdc	30 Vdc
Output voltage range	22.8 - 28.8 Vdc	22.8 - 28.8 Vdc	22.8 - 28.8 Vdc	27 - 43 Vdc
Resistance to reverse feed max.	35 Vdc	35 Vdc	35 Vdc	63 Vdc
Output rated current	10.00 A	20.00 A	40.00 A	25.00 A
Parallel connection	Yes	Yes	Yes	Yes
Power Boost	20 A / 4 s (15 A / 8 s)	40 A / 4 s (30 A / 8 s)	60 A / 4 s (50 A / 8 s)	45 A / 4 s (35 A / 8 s)
Overload behaviour	Constant current	Constant current	Constant current	Constant current
max. Power loss idling/nominal load	7.8 / 19.9 W	8.3 / 38.4 W	7.0 / 66.2 W	5.2 / 47.3 W
Serial operation	Yes	Yes	Yes	Yes
Efficiency	typ. 91.7 %	typ. 92.9 %	typ. 93.1 %	typ. 94.1 %
Ripple factor	typ. 70 mVss	typ. 70 mVss	typ. 70 mVss	typ. 70 mVss
Top Boost	70 A / 50 ms	80 A / 50 ms	100 A / 50 ms	85 A / 50 ms
Signaling				
Power Good (DC OK)	LED green, LED red	LED green, LED red	LED green, LED red	LED green, LED red
Potential free signal contact	Yes	Yes	Yes	Yes
Stand-by-input	Yes	Yes	Yes	Yes
Approvals				
Approvals	cURus, cULus	cURus, cULus	cURus, cULus	cURus, cULus
Environment				
Ambient temperature	-25 °C to +70 °C	-25° C to +70° C	-25 °C to +55 °C	-25° C to +70° C
Storage temperature	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C
Derating	-3 %/K > +50 °C	-3 %/K > +50 °C	-5 %/K > +45 °C	-3 %/K > +50 °C
Safety and protection				
Protection index	IP 20	IP 20	IP 20	IP 20
Safety class	I, with PE connection	I, with PE connection	I, with PE connection	I, with PE connection
Accessory				
Connector for signalling	PV-CON (optional)	PV-CON (optional)	PV-CON (optional)	PV-CON (optional)
Side DIN rail mounting	PV-TS35M (optional)	PV-TS35M (optional)	PV-TS35M (optional)	PV-TS35M (optional)
Direct screw fastening plate for lateral mounting	PV-WB2 (optional)	PV-WB2 (optional)	PV-WB2 (optional)	PV-WB2 (optional)
Order numbers				
Order Number	**PVSE 400/24-10**	**PVSE 400/24-20**	**PVSE 400/24-40**	**PVSE 400/30-25**

Three-phase, primary switched mode power supply, Economy
PVSE 400

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Electrical data

Typ	PVSE 400/48-10	PVSE 400/48-20
Input		
Input rated voltage	3 x 400 - 500 Vac	3 x 400 - 500 Vac
Input voltage range	340 - 550 Vac (480 - 780 Vdc)	340 - 550 Vac (480 - 780 Vdc)
Input rated current (rated load)	1.1 A (3 x 340 Vac)	2 A (3 x 340 Vac)
Rated frequency range	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz
Starting current limiter	<30 A, NTC	<30 A, NTC
Input fuse internal	3 x 6.3 A (slow-blow)	3 x 6.3 A (slow-blow)
Recommended back-up fuse (circuit breaker)	10 A, 16 A, characteristics B, C	10 A, 16 A, characteristics B, C
Harmonic correction	passive	passive
Mains buffering (rated load)	12 / 35 ms (400 / 500 Vac)	15.6 / 42.9 ms (400 / 500 Vac)
Transient surge voltage protection	Varistor	Varistor
Output		
Output rated voltage	48 Vdc	48 Vdc
Output voltage range	37 - 51 Vdc	37 - 51 Vdc
Resistance to reverse feed max.	63 Vdc	63 Vdc
Output rated current	10.00 A	20.00 A
Parallel connection	Yes	Yes
Power Boost	15 A / 4 s (12.5 A / 8 s)	30 A / 4 s (25 A / 8 s)
Overload behaviour	Constant current	Constant current
max. Power loss idling/nominal load	8.2 / 38 W	5.2 / 59.2 W
Serial operation	Yes	Yes
Efficiency	typ. 93 %	typ. 94.4 %
Ripple factor	typ. 70 mVss	typ. 70 mVss
Top Boost	55 A / 50 ms	80 A / 50 ms
Signaling		
Power Good (DC OK)	LED green, LED red	LED green, LED red
Potential free signal contact	Yes	Yes
Stand-by-input	Yes	Yes
Approvals		
Approvals	cURus, cULus	cURus, cULus
Environment		
Ambient temperature	-25° C to +70° C	-25° C to +70° C
Storage temperature	-25 °C to +85 °C	-25 °C to +85 °C
Derating	-3 %/K > +50 °C	-3 %/K > +50 °C
Safety and protection		
Protection index	IP 20	IP 20
Safety class	I, with PE connection	I, with PE connection
Accessory		
Connector for signalling	PV-CON (optional)	PV-CON (optional)
Side DIN rail mounting	PV-TS35M (optional)	PV-TS35M (optional)
Direct screw fastening plate for lateral mounting	PV-WB2 (optional)	PV-WB2 (optional)
Order numbers		
Order Number	**PVSE 400/48-10**	**PVSE 400/48-20**

Three-phase, primary switched mode power supply, Economy
PVSE 400

Mechanical data 30

Typ	Terminals input, (spring clamp terminal, pluggable)	Terminals output, (spring clamp terminal, pluggable)	Terminals signalling, (spring clamp terminal, pluggable)	Mounting position	Fixing method	Weight	Dimension picture (in mm)	A	B	C	D	E
PVSE 400/24-10	max. 2.5 mm²	max. 2.5 mm²	max. 0.5 mm²	vertical	DIN Rail system TS35	1.30 kg	1	57	179.5	127	76	12.5
PVSE 400/24-20	max. 2.5 mm²	max. 10 mm²	max. 0.5 mm²	vertical	DIN Rail system TS35	1.76 kg	2	77	179.5	127	76	12.5
PVSE 400/24-40	max. 2.5 mm²	max. 10 mm²	max. 0.5 mm²	vertical	DIN Rail system TS35	3.03 kg	3	128	205.5	127	76	12.5
PVSE 400/30-25	max. 2.5 mm²	max. 10 mm²	max. 0.5 mm²	vertical	DIN Rail system TS35	3.03 kg	3	128	205.5	127	76	12.5
PVSE 400/48-10	max. 2.5 mm²	max. 10 mm²	max. 0.5 mm²	vertical	DIN Rail system TS35	1.76 kg	2	77	179.5	127	76	12.5
PVSE 400/48-20	max. 2.5 mm²	max. 10 mm²	max. 0.5 mm²	vertical	DIN Rail system TS35	3.03 kg	3	128	205.5	127	76	12.5

Dimension pictures

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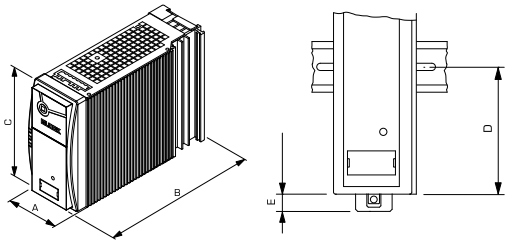

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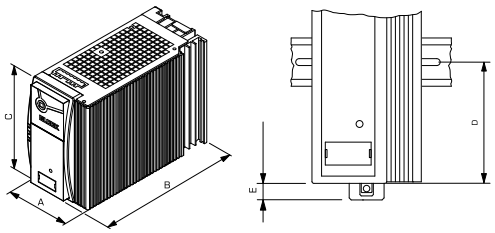

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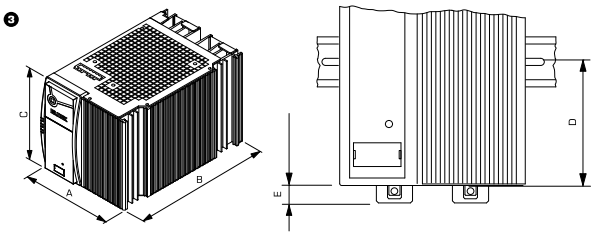


Three-phase, primary switched mode power supply, Basic
PVSB 400

General Data

- Input rated voltage 3 x 400 - 500 Vac
- Output rated voltage 24 Vdc
- Output rated current 10 - 40 A
- Ambient temperature -25 °C to +70 °C
- Efficiency up to 94 %
- Protection index IP 20

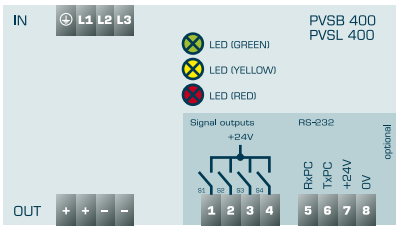
Advantages

- LCD
- Output current and output voltage monitoring
- RS-232 interface
- Stabilised and adjustable output voltage
- Up to 200 % Real Power Boost for 4 seconds
- Top Boost to trip conventional circuit breakers
- 3 LEDs and active signal outputs to indicate operating status
- Parallel connection option
- Service-friendly spring-loaded connector system
- Can be supplied with active inrush current limiting option
- Panel installation on mounting rails

Applications

Primary switched mode power supply with high power reserves for all automation requirements with a variety of parameter setting and display functions, including output current and output voltage monitoring.

Sample application



Standards

Primary switched mode power supply to UL 60950, UL 508

Safety:
EN 61558-2-16, EN 60950-1

EMC:
EN 61204-3

Approvals

UL/CSA 60950 recognised (E213214), UL508 listed (E219022)

Three-phase, primary switched mode power supply, Basic
PVSB 400

Electrical data

Typ	PVSB 400/24-10	PVSB 400/24-20	PVSB 400/24-40
Input			
Input rated voltage	3 x 400 - 500 Vac	3 x 400 - 500 Vac	3 x 400 - 500 Vac
Input voltage range	340 - 550 Vac (480 - 780 Vdc)	340 - 550 Vac (480 - 780 Vdc)	340 - 550 Vac (480 - 780 Vdc)
Input rated current (rated load)	0.6 A (3 x 340 Vac)	1.1 A (3 x 340 Vac)	2 A (3 x 340 Vac)
Rated frequency range	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz
Starting current limiter	<30 A, NTC	<30 A, NTC	<30 A, NTC
Input fuse internal	3 x 1.6 A (slow-blow)	3 x 2.5 A (slow-blow)	3 x 6.3 A (slow-blow)
Recommended back-up fuse (circuit breaker)	6 A, 10 A, 16 A, characteristics B, C	6 A, 10 A, 16 A, characteristics B, C	10 A, 16 A, characteristics B, C
Harmonic correction	passive	passive	passive
Transient surge voltage protection	Varistor	Varistor	Varistor
Mains buffering (rated load)	22.6 / 51.5 ms (400 / 500 Vac)	13.2 / 36.8 ms (400 / 500 Vac)	15.6 / 42.9 ms (400 / 500 Vac)
Output			
Output rated voltage	24 Vdc	24 Vdc	24 Vdc
Output voltage range	22.8 - 28.8 Vdc	22.8 - 28.8 Vdc	22.8 - 28.8 Vdc
Resistance to reverse feed max.	35 Vdc	35 Vdc	35 Vdc
Output rated current	10.00 A	20.00 A	40.00 A
Parallel connection	Yes	Yes	Yes
Power Boost	20 A / 4 s (15 A / 8 s)	40 A / 4 s (30 A / 8 s)	60 A / 4 s (50 A / 8 s)
Overload behaviour	Constant current or fuse	Constant current or fuse	Constant current or fuse
Efficiency	typ. 91.7 %	typ. 92.9 %	typ. 93.1 %
Ripple factor	typ. 70 mVss	typ. 70 mVss	typ. 70 mVss
Top Boost	70 A / 50 ms	80 A / 50 ms	100 A / 50 ms
Signaling			
Power Good (DC OK)	LED green, LED red, LED yellow	LED green, LED red, LED yellow	LED green, LED red, LED yellow
Potential free signal contact	No	No	No
Active signal outputs	4 x 24 Vdc, 2 configurable	4 x 24 Vdc, 2 configurable	4 x 24 Vdc, 2 configurable
Stand-by-input	No	No	No
Display, interface	Yes, RS 232	Yes, RS 232	Yes, RS 232
Approvals			
Approvals	cURus, cULus	cURus, cULus	cURus, cULus
Environment			
Ambient temperature	-25° C to +70° C	-25° C to +70° C	-25° C to +55° C
Storage temperature	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C
Derating	-3 %/K > +50 °C	-3 %/K > +50 °C	-5 %/K > +50 °C
Safety and protection			
Protection index	IP 20	IP 20	IP 20
Safety class	I, with PE connection	I, with PE connection	I, with PE connection
Accessory			
Connector for signalling	PV-CON (optional)	PV-CON (optional)	PV-CON (optional)
Adapter cable for interface	PV-KOK2 (optional)	PV-KOK2 (optional)	PV-KOK2 (optional)
Side DIN rail mounting	PV-TS35M (optional)	PV-TS35M (optional)	PV-TS35M (optional)
Direct screw fastening plate for lateral mounting	PV-WB2 (optional)	PV-WB2 (optional)	PV-WB2 (optional)
Order numbers			
Order Number	**PVSB 400/24-10**	**PVSB 400/24-20**	**PVSB 400/24-40**

Three-phase, primary switched mode power supply, Basic
PVSB 400

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Mechanical data

Typ	Terminals input, (spring clamp terminal, pluggable)	Terminals output, (spring clamp terminal, pluggable)	Terminals signalling, (spring clamp terminal, pluggable)	Mounting position	Fixing method	Weight	Dimension picture (in mm)	A	B	C	D	E
PVSB 400/24-10	max. 2.5 mm²	max. 2.5 mm²	max. 0.5 mm²	vertical	DIN Rail system TS35	1.30 kg	❶	57	179.5	127	76	12.5
PVSB 400/24-20	max. 2.5 mm²	max. 10 mm²	max. 0.5 mm²	vertical	DIN Rail system TS35	1.76 kg	❷	77	179.5	127	76	12.5
PVSB 400/24-40	max. 2.5 mm²	max. 10 mm²	max. 0.5 mm²	vertical	DIN Rail system TS35	3.03 kg	❸	128	205.5	127	76	12.5

Dimension pictures

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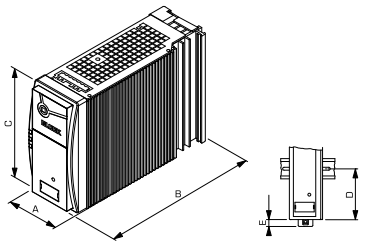

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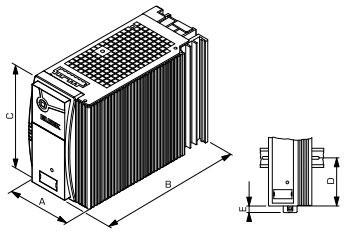

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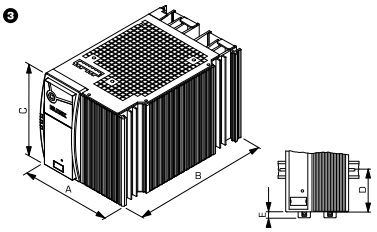


Three-phase, primary switched mode power supply, Line
PVSL 400

General Data

Input rated voltage 3 x 400 - 500 Vac
Output rated voltage 24 Vdc
Output rated current 10 - 40 A
Ambient temperature -25 °C to +70 °C
Efficiency up to 94 %
Protection index IP 20

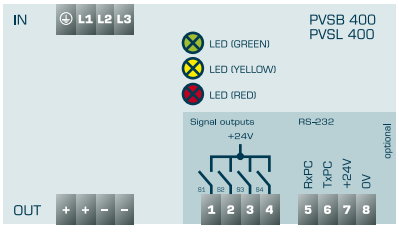
Advantages

Power input monitoring
LCD
Output current and output voltage monitoring
RS-232 interface
Stabilised and adjustable output voltage
Up to 200 % Real Power Boost for 4 seconds
Top Boost to trip conventional circuit breakers
3 LEDs and active signal outputs to indicate operating status
Parallel connection option
Service-friendly spring-loaded connector system
Can be supplied with active inrush current limiting
Panel installation on mounting rails

Applications

Primary switched mode power supply with high power reserves for all automation requirements with a variety of parameter setting and display functions, including output current and output voltage monitoring. Intelligent additional functions for the input power to replace a variety of external devices such as diagnostic voltmeter, phase meter, hour meter.

Sample application



Standards

Primary switched mode power supply to UL 60950, UL 508

Safety:
EN 61558-2-16, EN 60950-1

EMC:
EN 61204-3

Approvals

UL/CSA 60950 recognised (E213214), UL508 listed (E219022)

Three-phase, primary switched mode power supply, Line
PVSL 400

Electrical data

Typ	PVSL 400/24-10	PVSL 400/24-20	PVSL 400/24-40
Input			
Input rated voltage	3 x 400 - 500 Vac	3 x 400 - 500 Vac	3 x 400 - 500 Vac
Input voltage range	340 - 550 Vac (480 - 780 Vdc)	340 - 550 Vac (480 - 780 Vdc)	340 - 550 Vac (480 - 780 Vdc)
Input rated current (rated load)	0.6 A (3 x 340 Vac)	1.1 A (3 x 340 Vac)	2 A (3 x 340 Vac)
Rated frequency range	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz	44 Hz - 66 Hz / 0 Hz
Starting current limiter	<30 A, NTC	<30 A, NTC	<30 A, NTC
Input fuse internal	3 x 1.6 A (slow-blow)	3 x 2.5 A (slow-blow)	3 x 6.3 A (slow-blow)
Recommended back-up fuse (circuit breaker)	6 A, 10 A, 16 A, characteristics B, C	6 A, 10 A, 16 A, characteristics B, C	10 A, 16 A, characteristics B, C
Harmonic correction	passive	passive	passive
Mains buffering (rated load)	22.6 / 51.5 ms (400 / 500 Vac)	13.2 / 36.8 ms (400 / 500 Vac)	15.6 / 42.9 ms (400 / 500 Vac)
Transient surge voltage protection	Varistor	Varistor	Varistor
Output			
Output rated voltage	24 Vdc	24 Vdc	24 Vdc
Output voltage range	22.8 - 28.8 Vdc	22.8 - 28.8 Vdc	22.8 - 28.8 Vdc
Resistance to reverse feed max.	35 Vdc	35 Vdc	35 Vdc
Output rated current	10.00 A	20.00 A	40.00 A
Parallel connection	Yes	Yes	Yes
Power Boost	20 A / 4 s (15 A / 8 s)	40 A / 4 s (30 A / 8 s)	60 A / 4 s (50 A / 8 s)
Overload behaviour	Constant current or fuse	Constant current or fuse	Constant current or fuse
Efficiency	typ. 91.7 %	typ. 92.9%	typ. 93.1 %
Ripple factor	typ. 70 mVss	typ. 70 mVss	typ. 70 mVss
Top Boost	70 A / 50 ms	80 A / 50 ms	100 A / 50 ms
Signaling			
Power Good (DC OK)	LED green, LED red, LED yellow	LED green, LED red, LED yellow	LED green, LED red, LED yellow
Active signal outputs	4 x 24 Vdc, 2 configurable	4 x 24 Vdc, 2 configurable	4 x 24 Vdc, 2 configurable
Stand-by-input	No	No	No
Display, interface	Yes, RS 232	Yes, RS 232	Yes, RS 232
Approvals			
Approvals	cURus, cULus	cURus, cULus	cURus, cULus
Environment			
Ambient temperature	-25 °C to +70 °C	-25° C to +70° C	-25° C to +55° C
Storage temperature	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C
Derating	-3 %/K > +50 °C	-3%/K > +50 °C	-5 %/K > +50 °C
Safety and protection			
Protection index	IP 20	IP 20	IP 20
Safety class	I, with PE connection	I, with PE connection	I, with PE connection
Accessory			
Connector for signalling	PV-CON (optional)	PV-CON (optional)	PV-CON (optional)
Adapter cable for interface	PV-KOK2 (optional)	PV-KOK2 (optional)	PV-KOK2 (optional)
Side DIN rail mounting	PV-TS35M (optional)	PV-TS35M (optional)	PV-TS35M (optional)
Direct screw fastening plate for lateral mounting	PV-WB2 (optional)	PV-WB2 (optional)	PV-WB2 (optional)
Order numbers			
Order Number	**PVSL 400/24-10**	**PVSL 400/24-20**	**PVSL 400/24-40**

Three-phase, primary switched mode power supply, Line
PVSL 400

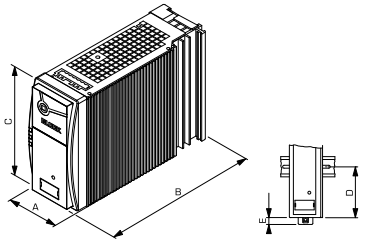
ePLAN data portal | BLOCK Website

Mechanical data

Typ	Terminals input, (spring clamp terminal, pluggable)	Terminals output, (spring clamp terminal, pluggable)	Terminals signalling, (spring clamp terminal, pluggable)	Mounting position	Fixing method	Weight	Dimension picture (in mm)	A	B	C	D	E
PVSL 400/24-10	max. 2.5 mm²	max. 2.5 mm²	max. 0.5 mm²	vertical	DIN Rail system TS35	1.30 kg	❶	57	179.5	127	76	12.5
PVSL 400/24-20	max. 2.5 mm²	max. 10 mm²	max. 0.5 mm²	vertical	DIN Rail system TS35	1.76 kg	❷	77	179.5	127	76	12.5
PVSL 400/24-40	max. 2.5 mm²	max. 10 mm²	max. 0.5 mm²	vertical	DIN Rail system TS35	3.03 kg	❸	128	205.5	127	76	12.5

Dimension pictures

❶



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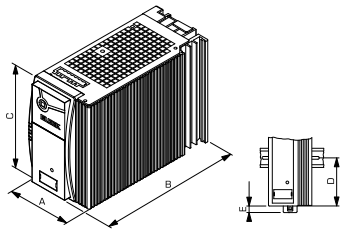

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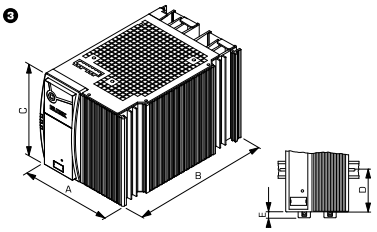


Constant current LED driver for High Power LED
PLED

BLOCK Website

General Data

- Input rated voltage 220 - 240 Vac
- Output rated voltage max. 94 V
- Output rated current 350 - 1400 mA
- Ambient temperature -25 °C to +60 °C
- Efficiency up to 90 %
- Protection index IP 20

Advantages

- Dimmable versions available (10 - 100 %)
- Extremely robust against transient overvoltages
- Protection of LEDs against voltage peaks and overtemperature (external NC required)
- Very wide output voltage range for a wide range of applications
- Long service life

Applications

Outdoor LED lightning with increased overvoltage resistance requirements

Standards

Safety:
EN 61347-2-13

EMC:
EN 61100-3-2, EN 55015 (emitted interference), EN 61547 (interference immunity)

Approvals

VDE (EN 61347)

Constant current LED driver for High Power LED
PLED

BLOCK Website

Electrical data

Typ	PLED-0194-007-0	PLED-0194-007-1	PLED-0194-011-0	PLED-0194-011-1
Input				
Input rated voltage	220 - 240 Vac	220 - 240 Vac	220 - 240 Vac	220 - 240 Vac
Input voltage range	196 Vac - 264 Vac 220 Vdc - 375 Vdc	196 Vac - 264 Vac 220 Vdc - 375 Vdc	196 Vac - 264 Vac 220 Vdc - 375 Vdc	196 Vac - 264 Vac 220 Vdc - 375 Vdc
Over voltage protection	6 kV (1,2 / 50 µs)	6 kV (1,2 / 50 µs)	6 kV (1,2 / 50 µs)	6 kV (1,2 / 50 µs)
Power factor	> 0,95	> 0,95	> 0,95	> 0,95
Input fuse internal	6,3 AT	6,3 AT	6,3 AT	6,3 AT
Frequency Range	47...63 Hz / 0 Hz	47...63 Hz / 0 Hz	47...63 Hz / 0 Hz	47...63 Hz / 0 Hz
Output				
Output voltage normal operation	max. 94 V	max. 94 V	max. 94 V	max. 94 V
Output voltage range	12 - 94 V (47 V at 700 mA)	12 - 94 V (47 V at 700 mA)	12 - 94 V (63 V bei 1050 mA)	12 - 94 V (63 V at 1050 mA)
Over-voltage-protection	<120 V	<120 V	<120 V	<120 V
Output rated current (switchable)	350 mA / 700 mA	350 mA / 700 mA	700 mA / 1050 mA	700 mA / 1050 mA
Overload behaviour	Hiccup	Hiccup	Hiccup	Hiccup
Parallel connection	Yes	Yes	Yes	Yes
max. Power loss idling/nominal load	4,7 W (350 mA)/ 4,8 W (700 mA)	4,7 W (350 mA)/ 4,8 W (700 mA)	6,6 W (700 mA)/ 7,2 W (1050 mA)	6,6 W (700 mA)/ 7,2 W (1050 mA)
Dimming range	-	10 ... 100 %	-	10 ... 100 %
Dimming voltage	-	1 ... 10 V	-	1 ... 10 V
Efficiency	typ. 88 %	typ. 88 %	typ. 90 %	typ. 90 %
Environment				
Ambient temperature	-25 °C - 60 °C	-25 °C - 60 °C	-25 °C - 60 °C	-25 °C - 60 °C
Storage temperature	-40 °C - 80 °C	-40 °C - 80 °C	-40 °C - 80 °C	-40 °C - 80 °C
Required minimum spacing (left/right)	0 mm	0 mm	0 mm	0 mm
Type of cooling	natural convection	natural convection	natural convection	natural convection
Safety and protection				
Protection index	IP 20	IP 20	IP 20	IP 20
Safety class (prepared)	II	II	II	II
Order numbers				
Order Number	**PLED-0194-007-0**	**PLED-0194-007-1**	**PLED-0194-011-0**	**PLED-0194-011-1**

Constant current LED driver for High Power LED
PLED

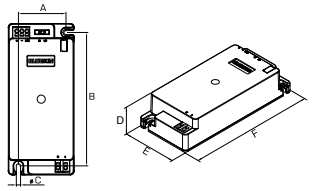
BLOCK Website

Mechanical data

Typ	Terminals input (direct plug-in technology Push-in)	Terminals output (direct plug-in technology Push-in)	Dimming input spring-loaded, plug-in	Fixing method	Dimension (W x H x D)	Weight	Dimension picture (in mm)	A	B	C	D	E	F
PLED-0194-007-0	max. 2,5 mm²	max. 2,5 mm²	-	Screw-on housing	40 x 32 x 148,5 mm	0.14 kg	1	22	131	4.2	32	40	148.5
PLED-0194-007-1	max. 2,5 mm²	max. 2,5 mm²	max. 0,5 mm²	Screw-on housing	40 x 32 x 148,5 mm	0.14 kg	1	22	131	4.2	32	40	148.5
PLED-0194-011-0	max. 2,5 mm²	max. 2,5 mm²	-	Screw-on housing	65 x 32 x 148,5 mm	0.25 kg	1	47	131	4.2	32	65	148.5
PLED-0194-011-1	max. 2,5 mm²	max. 2,5 mm²	max. 0,5 mm²	Screw-on housing	65 x 32 x 148,5 mm	0.25 kg	1	47	131	4.2	32	65	148.5

Dimension pictures

1



1-Channel circuit breaker
EasyB 1-Channel

General Data

- 24 Vdc 1-channel circuit breaker system
- Efficiency up to 99 %
- Multi-coloured LED and status display button
- Up to 40 fuse channels stackable side by side
- Optionally with current limitation or thermomagnetic characteristic
- Common signalling output for tripped and switched off channels
- Ambient temperature -25 °C to +70 °C
- Protection index IP 20

Advantages

- Automatic channel assignment
- Optional communication via communication modules
- Optional undervoltage shutdown in combined network
- Optional settings for tripping current
- Additional load outputs through output expanders mountable side by side
- Selective load-dependent activation
- Versions with collective reset input

Applications

EB-27 Electronic circuit breaker with thermomagnetic characteristic with alarm signal forwarded for tripped and switched off channels to the connected channels. Starter version with fuse for 24 V loads.

EB-28 Electronic circuit breaker with current-limiting characteristic with alarm signal forwarded for tripped and switched off channels to the connected channels. Starter version with fuse for 24 V loads if active current limitation is required.

EB-08, EB-18, EB-38 Electronic circuit breaker with current-limiting characteristic and comprehensive communication with the connected modules. Suitable as advanced fuse for 24 V loads with option of reading more detailed current supply parameters and actively controlling the channels.

Standards

Safety:
EN 60950-1, EN 50178, EN/IEC 60204-1

EMC:
EN 61000-6-2 (interference immunity), EN 61000-6-3 (emitted interference)

CE acc. to 2014/30/EU

Approvals

UL 508 (prepared), UL 2367 (prepared), GL (prepared)

1-Channel circuit breaker
EasyB 1-Channel

Electrical data

Typ	EB-0824-100-0	EB-1824-010-0	EB-1824-020-0	EB-1824-030-0
Special features				
Characteristics	Adjustable tripping currents	-	-	-
Input				
Input rated voltage	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Input voltage range	18 - 30 Vdc	18 - 30 Vdc	18 - 30 Vdc	18 - 30 Vdc
Maximal residual ripple of supplied input voltage	3 %	3 %	3 %	3 %
Max. total input current	10 A	1 A	2 A	3 A
Max. input current for each pole of terminal	10 A (-), 40 A (+)	10 A (-), 40 A (+)	10 A (-), 40 A (+)	10 A (-), 40 A (+)
Required input voltage for turning-on of outputs	17.5 V (Turn-off Threshold 16.7 V), ± 0.7 V	17.5 V (Turn-off Threshold 16.7 V), ± 0.7 V	17.5 V (Turn-off Threshold 16.7 V), ± 0.7 V	17.5 V (Turn-off Threshold 16.7 V), ± 0.7 V
Max. power losses	0.4 W	1,2 W	1,3 W	1,4 W
Over voltage protection	Suppressor diode 33 V	Suppressor diode 33 V	Suppressor diode 33 V	Suppressor diode 33 V
Stand-by current	39 mA @24 V	39 mA @ 24 V	39 mA @ 24 V	39 mA @ 24 V
Power losses in stand-by mode	0.3 W @ 24 V	1,17 W @ 24 V	1,17 W @ 24 V	1,17 W @ 24 V
Turn on capacity	50-110 mF @ 24 Vdc/ 2,5 mm² /2,5 m	110 mF @ 24 Vdc / 2,5 mm² / 2,5 m	130 mF @ 24 Vdc / 2,5 mm² / 2,5 m	120 mF @ 24 Vdc / 2,5 mm² / 2,5 m
Output				
Output rated voltage	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Maximum voltage drop between input and output	130 mV	58 mV	55 mV	82 mV
Initialization time of module	52 ms	52 ms	52 ms	52 ms
Turn-on delay of outputs	min. 50 ms / max. 5 s	min. 50 ms / max. 5 s	min. 50 ms / max. 5 s	min. 50 ms / max. 5 s
Waiting periode after switch-off of an output	500 ms (Short circuit) . . 5 s (Overload)	500 ms (Short circuit) . . 5 s (Overload)	500 ms (Short circuit) . . 5 s (Overload)	500 ms (Short circuit) . . 5 s (Overload)
Parallel use of outputs	Not allowed	Not allowed	Not allowed	Not allowed
Serial use of outputs	not allowed	not allowed	not allowed	not allowed
Resistance to reverse feed max.	35 Vdc	35 Vdc	35 Vdc	35 Vdc
Output rated current	0.5 - 10 A, adjustable (0,5A, 1A, 2A, 3A, 4A, 5A, 6A, 8A, 10A)	1 A	2 A	3 A
Efficiency	99.0 %	99.0 %	99.0 %	99.0 %
Output limited current	typ. rated current x 1,25 (@ 1-10 A) typ. rated current x 2,5 (@ 0,5 A)	typ. 1,25 A	typ. 2,5 A	typ. 3,75 A
Signaling				
Bus communication	Read:-state (tripped, On, Off) -set/current -input voltage -firmware version/serial number Write:-state (on, off, reset)	Read:-state (tripped, On, Off) -set/active current -input voltage -firmware version/serial number Write:-state (on, off, reset)	Read:-state (tripped, On, Off) -set/active current -input voltage -firmware version/serial number Write:-state (on, off, reset)	Read:-state (tripped, On, Off) -set/active current -input voltage -firmware version/serial number Write:-state (on, off, reset)
Status indicator	LED (red, green, orange)	LED (red, green, orange)	LED (red, green, orange)	LED (red, green, orange)
Signal output	Output status, short circuit proof high = Channel on, low = Channel off, fault	Output status, short circuit proof high = Channel on, low = Channel off, fault	Output status, short circuit proof high = Channel on, low = Channel off, fault	Output status, short circuit proof high = Channel on, low = Channel off, fault
Signal output (ON/OFF/Reset)	Reset input Level high = min. 15V, max. 30V Level low = min. 0V, max. 5V	Reset input Level high = min. 15V, max. 30V Level low = min. 0V, max. 5V	Reset input Level high = min. 15V, max. 30V Level low = min. 0V, max. 5V	Reset input Level high = min. 15V, max. 30V Level low = min. 0V, max. 5V
Environment				
Type of cooling	Natural convection	Natural convection	Natural convection	Natural convection
Ambient temperature	-25 °C to +70 °C	-25 °C . . +70 °C	-25 °C . . +70 °C	-25 °C . . +70 °C
Storage temperature	-25 °C ... +85 °C	-25 °C ... +85 °C	-25 °C ... +85 °C	-25 °C ... +85 °C
Derating	max. +60 °C > 6A	-	-	-
Relative humidity	5 . . 96 %, without condensation	5 . . 96 %, without condensation	5 . . 96 %, without condensation	5 . . 96 %, without condensation
Required minimum spacing (left/right)	0 mm	0 mm	0 mm	0 mm
Required minimum spacing (over/under)	30 mm	30 mm	30 mm	30 mm
Safety and protection				
Protection index	IP 20	IP 20	IP 20	IP 20
Safety class	III, without PE connection	III, without PE connection	III, without PE connection	III, without PE connection
Degree of pollution	2	2	2	2
Order numbers				
Order Number	**EB-0824-100-0**	**EB-1824-010-0**	**EB-1824-020-0**	**EB-1824-030-0**

1-Channel circuit breaker
EasyB 1-Channel

Electrical data

Typ	EB-1824-040-0	EB-1824-060-0	EB-1824-080-0	EB-1824-100-0
Special features				
Characteristics	-	-	-	-
Input				
Input rated voltage	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Input voltage range	18 - 30 Vdc	18 - 30 Vdc	18 - 30 Vdc	18 - 30 Vdc
Maximal residual ripple of supplied input voltage	3 %	3 %	3 %	3 %
Max. total input current	4 A	6 A	8 A	10 A
Max. input current for each pole of terminal	10 A (-), 40 A (+)	10 A (-), 40 A (+)	10 A (-), 40 A (+)	10 A (-), 40 A (+)
Required input voltage for turning-on of outputs	17.5 V (Turn-off Threshold 16.7 V), ± 0.7 V	17.5 V (Turn-off Threshold 16.7 V), ± 0.7 V	17.5 V (Turn-off Threshold 16.7 V), ± 0.7 V	17.5 V (Turn-off Threshold 16.7 V), ± 0.7 V
Max. power losses	1,5 W	1,8 W	2,0 W	2,5 W
Over voltage protection	Suppressor diode 33 V	Suppressor diode 33 V	Suppressor diode 33 V	Suppressor diode 33 V
Stand-by current	39 mA @ 24 V	39 mA @ 24 V	39 mA @ 24 V	39 mA @ 24 V
Power losses in stand-by mode	1,17 W @ 24 V	1,17 W @ 24 V	1,17 W @ 24 V	1,17 W @ 24 V
Turn on capacity	110 mF @ 24 Vdc / 2,5 mm² / 2,5 m	80 mF @ 24 Vdc / 2,5 mm² / 2,5 m	80 mF @ 24 Vdc / 2,5 mm² / 2,5 m	70 mF @ 24 Vdc / 2,5 mm² / 2,5 m
Output				
Output rated voltage	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Maximum voltage drop between input and output	70 mV	100 mV	105 mV	130 mV
Initialization time of module	52 ms	52 ms	52 ms	52 ms
Turn-on delay of outputs	min. 50 ms / max. 5 s	min. 50 ms / max. 5 s	min. 50 ms / max. 5 s	min. 50 ms / max. 5 s
Waiting periode after switch-off of an output	500 ms (Short circuit) . . 5 s (Overload)	500 ms (Short circuit) . . 5 s (Overload)	500 ms (Short circuit) . . 5 s (Overload)	500 ms (Short circuit) . . 5 s (Overload)
Parallel use of outputs	Not allowed	Not allowed	Not allowed	Not allowed
Serial use of outputs	not allowed	not allowed	not allowed	not allowed
Resistance to reverse feed max.	35 Vdc	35 Vdc	35 Vdc	35 Vdc
Output rated current	4 A	6 A	8 A	10 A
Efficiency	99.0 %	99.0 %	99.0 %	99.0 %
Output limited current	typ. 5 A	typ. 7,5 A	typ. 10 A	typ. 12,5 A
Signaling				
Bus communication	Read:-state (tripped, On, Off) -set/active current -input voltage -firmware version/serial number Write:-state (on, off, reset)	Read:-state (tripped, On, Off) -set/active current -input voltage -firmware version/serial number Write:-state (on, off, reset)	Read:-state (tripped, On, Off) -set/active current -input voltage -firmware version/serial number Write:-state (on, off, reset)	Read:-state (tripped, On, Off) -set/active current -input voltage -firmware version/serial number Write:-state (on, off, reset)
Status indicator	LED (red, green, orange)	LED (red, green, orange)	LED (red, green, orange)	LED (red, green, orange)
Signal output	Output status, short circuit proof high = Channel on, low = Channel off, fault	Output status, short circuit proof high = Channel on, low = Channel off, fault	Output status, short circuit proof high = Channel on, low = Channel off, fault	Output status, short circuit proof high = Channel on, low = Channel off, fault
Signal output (ON/OFF/Reset)	Reset input Level high = min. 15V, max. 30V Level low = min. 0V, max. 5V	Reset input Level high = min. 15V, max. 30V Level low = min. 0V, max. 5V	Reset input Level high = min. 15V, max. 30V Level low = min. 0V, max. 5V	Reset input Level high = min. 15V, max. 30V Level low = min. 0V, max. 5V
Environment				
Type of cooling	Natural convection	Natural convection	Natural convection	Natural convection
Ambient temperature	-25 °C . . +70 °C	-25 °C . . +70 °C	-25 °C . . +60 °C	-25 °C . . +60 °C
Storage temperature	-25 °C ... +85 °C	-25 °C ... +85 °C	-25 °C ... +85 °C	-25 °C ... +85 °C
Derating	-	-	-	-
Relative humidity	5 . . 96 %, without condensation	5 . . 96 %, without condensation	5 . . 96 %, without condensation	5 . . 96 %, without condensation
Required minimum spacing (left/right)	0 mm	0 mm	0 mm	0 mm
Required minimum spacing (over/under)	30 mm	30 mm	30 mm	30 mm
Safety and protection				
Protection index	IP 20	IP 20	IP 20	IP 20
Safety class	III, without PE connection	III, without PE connection	III, without PE connection	III, without PE connection
Degree of pollution	2	2	2	2
Order numbers				
Order Number	**EB-1824-040-0**	**EB-1824-060-0**	**EB-1824-080-0**	**EB-1824-100-0**

1-Channel circuit breaker
EasyB 1-Channel

Electrical data

Typ	EB-2724-010-0	EB-2724-020-0	EB-2724-030-0	EB-2724-040-0
Special features				
Characteristics	-	-	-	-
Input				
Input rated voltage	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Input voltage range	18 - 30 Vdc	18 - 30 Vdc	18 - 30 Vdc	18 - 30 Vdc
Maximal residual ripple of supplied input voltage	3 %	3 %	3 %	3 %
Max. total input current	1 A	2 A	3 A	4 A
Max. input current for each pole of terminal	10 A (-), 40 A (+)	10 A (-), 40 A (+)	10 A (-), 40 A (+)	10 A (-), 40 A (+)
Required input voltage for turning-on of outputs	17.5 V (Turn-off Threshold 16.7 V), ± 0.7 V	17.5 V (Turn-off Threshold 16.7 V), ± 0.7 V	17.5 V (Turn-off Threshold 16.7 V), ± 0.7 V	17.5 V (Turn-off Threshold 16.7 V), ± 0.7 V
Max. power losses	0,4 W	0,4 W	0,4 W	0,4 W
Over voltage protection	Suppressor diode 33 V	Suppressor diode 33 V	Suppressor diode 33 V	Suppressor diode 33 V
Stand-by current	12 mA @ 24 V	12 mA @ 24 V	12 mA @ 24 V	12 mA @ 24 V
Power losses in stand-by mode	0,3 W @ 24 V	0,3 W @ 24 V	0,3 W @ 24 V	0,3 W @ 24 V
Turn on capacity	70 mF @ 24 Vdc / 2,5 mm² / 2,5 m	80 mF @ 24 Vdc / 2,5 mm² / 2,5 m	80 mF @ 24 Vdc / 2,5 mm² / 2,5 m	80 mF @ 24 Vdc / 2,5 mm² / 2,5 m
Output				
Output rated voltage	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Maximum voltage drop between input and output	24 mV	29 mV	33 mV	34 mV
Initialization time of module	27 ms	27 ms	27 ms	27 ms
Turn-on delay of outputs	0 ms	0 ms	0 ms	0 ms
Waiting periode after switch-off of an output	500 ms (Short circuit) . . 5 s (Overload)	500 ms (Short circuit) . . 5 s (Overload)	500 ms (Short circuit) . . 5 s (Overload)	500 ms (Short circuit) . . 5 s (Overload)
Parallel use of outputs	Not allowed	Not allowed	Not allowed	Not allowed
Serial use of outputs	not allowed	not allowed	not allowed	not allowed
Resistance to reverse feed max.	35 Vdc	35 Vdc	35 Vdc	35 Vdc
Output rated current	1 A	2 A	3 A	4 A
Efficiency	99.0 %	99.0 %	99.0 %	99.0 %
Output limited current	-	-	-	-
Signaling				
Bus communication	Collective notification signal bypassed	Collective notification signal bypassed	Collective notification signal bypassed	Collective notification signal bypassed
Status indicator	LED (red, green, orange)	LED (red, green, orange)	LED (red, green, orange)	LED (red, green, orange)
Signal output	Output status, short circuit proof high = Channel on, low = Channel off, fault	Output status, short circuit proof high = Channel on, low = Channel off, fault	Output status, short circuit proof high = Channel on, low = Channel off, fault	Output status, short circuit proof high = Channel on, low = Channel off, fault
Signal output (ON/OFF/Reset)	-	-	-	-
Environment				
Type of cooling	Natural convection	Natural convection	Natural convection	Natural convection
Ambient temperature	-25 °C . . +70 °C	-25 °C . . +70 °C	-25 °C . . +70 °C	-25 °C . . +70 °C
Storage temperature	-25 °C ... +85 °C	-25 °C ... +85 °C	-25 °C ... +85 °C	-25 °C ... +85 °C
Derating	-	-	-	-
Relative humidity	5 . . 96 %, without condensation	5 . . 96 %, without condensation	5 . . 96 %, without condensation	5 . . 96 %, without condensation
Required minimum spacing (left/right)	0 mm	0 mm	0 mm	0 mm
Required minimum spacing (over/under)	30 mm	30 mm	30 mm	30 mm
Safety and protection				
Protection index	IP 20	IP 20	IP 20	IP 20
Safety class	III, without PE connection	III, without PE connection	III, without PE connection	III, without PE connection
Degree of pollution	2	2	2	2
Order numbers				
Order Number	**EB-2724-010-0**	**EB-2724-020-0**	**EB-2724-030-0**	**EB-2724-040-0**

1-Channel circuit breaker
EasyB 1-Channel

Electrical data

Typ	EB-2724-060-0	EB-2724-080-0	EB-2724-100-0	EB-2824-010-0
Special features				
Characteristics	-	-	-	-
Input				
Input rated voltage	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Input voltage range	18 - 30 Vdc	18 - 30 Vdc	18 - 30 Vdc	18 - 30 Vdc
Maximal residual ripple of supplied input voltage	3 %	3 %	3 %	3 %
Max. total input current	6 A	8 A	10 A	1 A
Max. input current for each pole of terminal	10 A (-), 40 A (+)	10 A (-), 40 A (+)	10 A (-), 40 A (+)	10 A (-), 40 A (+)
Required input voltage for turning-on of outputs	17.5 V (Turn-off Threshold 16.7 V), ± 0.7 V	17.5 V (Turn-off Threshold 16.7 V), ± 0.7 V	17.5 V (Turn-off Threshold 16.7 V), ± 0.7 V	17.5 V (Turn-off Threshold 16.7 V), ± 0.7 V
Max. power losses	0,6 W	0,9 W	1,2 W	0,6 W
Over voltage protection	Suppressor diode 33 V	Suppressor diode 33 V	Suppressor diode 33 V	Suppressor diode 33 V
Stand-by current	12 mA @ 24 V	12 mA @ 24 V	12 mA @ 24 V	18,6 mA @ 24 V
Power losses in stand-by mode	0,3 W @ 24 V	0,3 W @ 24 V	0,3 W @ 24 V	0,5 W @ 24 V
Turn on capacity	70 mF @ 24 Vdc / 2,5 mm² / 2,5 m	70 mF @ 24 Vdc / 2,5 mm² / 2,5 m	50 mF @ 24 Vdc / 2,5 mm² / 2,5 m	110 mF @ 24 Vdc / 2,5 mm² / 2,5 m
Output				
Output rated voltage	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Maximum voltage drop between input and output	54 mV	72 mV	92 mV	58 mV
Initialization time of module	27 ms	27 ms	27 ms	52 ms
Turn-on delay of outputs	0 ms	0 ms	0 ms	0 ms
Waiting periode after switch-off of an output	500 ms (Short circuit) . . 5 s (Overload)	500 ms (Short circuit) . . 5 s (Overload)	500 ms (Short circuit) . . 5 s (Overload)	500 ms (Short circuit) . . 5 s (Overload)
Parallel use of outputs	Not allowed	Not allowed	Not allowed	Not allowed
Serial use of outputs	not allowed	not allowed	not allowed	not allowed
Resistance to reverse feed max.	35 Vdc	35 Vdc	35 Vdc	35 Vdc
Output rated current	6 A	8 A	10 A	1 A
Efficiency	99.0 %	99.0 %	99.0 %	99.0 %
Output limited current	-	-	-	typ. 1,25 A
Signaling				
Bus communication	Collective notification signal bypassed	Collective notification signal bypassed	Collective notification signal bypassed	Collective notification signal bypassed
Status indicator	LED (red, green, orange)	LED (red, green, orange)	LED (red, green, orange)	LED (red, green, orange)
Signal output	Output status, short circuit proof high = Channel on, low = Channel off, fault	Output status, short circuit proof high = Channel on, low = Channel off, fault	Output status, short circuit proof high = Channel on, low = Channel off, fault	Output status, short circuit proof high = Channel on, low = Channel off, fault
Signal output (ON/OFF/Reset)	-	-	-	-
Environment				
Type of cooling	Natural convection	Natural convection	Natural convection	Natural convection
Ambient temperature	-25 °C . . +70 °C	-25 °C . . +60 °C	-25 °C . . +55 °C	-25 °C . . +70 °C
Storage temperature	-25 °C ... +85 °C	-25 °C ... +85 °C	-25 °C ... +85 °C	-25 °C ... +85 °C
Derating	-	-	-	-
Relative humidity	5 . . 96 %, without condensation	5 . . 96 %, without condensation	5 . . 96 %, without condensation	5 . . 96 %, without condensation
Required minimum spacing (left/right)	0 mm	0 mm	0 mm	0 mm
Required minimum spacing (over/under)	30 mm	30 mm	30 mm	30 mm
Safety and protection				
Protection index	IP 20	IP 20	IP 20	IP 20
Safety class	III, without PE connection	III, without PE connection	III, without PE connection	III, without PE connection
Degree of pollution	2	2	2	2
Order numbers				
Order Number	**EB-2724-060-0**	**EB-2724-080-0**	**EB-2724-100-0**	**EB-2824-010-0**

1-Channel circuit breaker
EasyB 1-Channel

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Electrical data

Typ	EB-2824-020-0	EB-2824-030-0	EB-2824-040-0	EB-2824-060-0
Special features				
Characteristics	-	-	-	-
Input				
Input rated voltage	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Input voltage range	18 - 30 Vdc	18 - 30 Vdc	18 - 30 Vdc	18 - 30 Vdc
Maximal residual ripple of supplied input voltage	3 %	3 %	3 %	3 %
Max. total input current	2 A	3 A	4 A	6 A
Max. input current for each pole of terminal	10 A (-), 40 A (+)	10 A (-), 40 A (+)	10 A (-), 40 A (+)	10 A (-), 40 A (+)
Required input voltage for turning-on of outputs	17.5 V (Turn-off Threshold 16.7 V), ± 0.7 V	17.5 V (Turn-off Threshold 16.7 V), ± 0.7 V	17.5 V (Turn-off Threshold 16.7 V), ± 0.7 V	17.5 V (Turn-off Threshold 16.7 V), ± 0.7 V
Max. power losses	0,6 W	0,7 W	0,9 W	1,1 W
Over voltage protection	Suppressor diode 33 V	Suppressor diode 33 V	Suppressor diode 33 V	Suppressor diode 33 V
Stand-by current	18,6 mA @ 24 V	18,6 mA @ 24 V	18,6 mA @ 24 V	18,6 mA @ 24 V
Power losses in stand-by mode	0,5 W @ 24 V	0,5 W @ 24 V	0,5 W @ 24 V	0,5 W @ 24 V
Turn on capacity	130 mF @ 24 Vdc / 2,5 mm² / 2,5 m	120 mF @ 24 Vdc / 2,5 mm² / 2,5 m	110 mF @ 24 Vdc / 2,5 mm² / 2,5 m	80 mF @ 24 Vdc / 2,5 mm² / 2,5 m
Output				
Output rated voltage	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Maximum voltage drop between input and output	55 mV	82 mV	70 mV	100 mV
Initialization time of module	52 ms	52 ms	52 ms	52 ms
Turn-on delay of outputs	0 ms	0 ms	0 ms	0 ms
Waiting periode after switch-off of an output	500 ms (Short circuit) . . 5 s (Overload)	500 ms (Short circuit) . . 5 s (Overload)	500 ms (Short circuit) . . 5 s (Overload)	500 ms (Short circuit) . . 5 s (Overload)
Parallel use of outputs	Not allowed	Not allowed	Not allowed	Not allowed
Serial use of outputs	not allowed	not allowed	not allowed	not allowed
Resistance to reverse feed max.	35 Vdc	35 Vdc	35 Vdc	35 Vdc
Output rated current	2 A	3 A	4 A	6 A
Efficiency	99.0 %	99.0 %	99.0 %	99.0 %
Output limited current	typ. 2,5 A	typ. 3,75 A	typ. 5 A	typ. 7,5 A
Signaling				
Bus communication	Collective notification signal bypassed	Collective notification signal bypassed	Collective notification signal bypassed	Collective notification signal bypassed
Status indicator	LED (red, green, orange)	LED (red, green, orange)	LED (red, green, orange)	LED (red, green, orange)
Signal output	Output status, short circuit proof high = Channel on, low = Channel off, fault	Output status, short circuit proof high = Channel on, low = Channel off, fault	Output status, short circuit proof high = Channel on, low = Channel off, fault	Output status, short circuit proof high = Channel on, low = Channel off, fault
Signal output (ON/OFF/Reset)	-	-	-	-
Environment				
Type of cooling	Natural convection	Natural convection	Natural convection	Natural convection
Ambient temperature	-25 °C . . +70 °C	-25 °C . . +70 °C	-25 °C . . +70 °C	-25 °C . . +70 °C
Storage temperature	-25 °C ... +85 °C	-25 °C ... +85 °C	-25 °C ... +85 °C	-25 °C ... +85 °C
Derating	-	-	-	-
Relative humidity	5 . . 96 %, without condensation	5 . . 96 %, without condensation	5 . . 96 %, without condensation	5 . . 96 %, without condensation
Required minimum spacing (left/right)	0 mm	0 mm	0 mm	0 mm
Required minimum spacing (over/under)	30 mm	30 mm	30 mm	30 mm
Safety and protection				
Protection index	IP 20	IP 20	IP 20	IP 20
Safety class	III, without PE connection	III, without PE connection	III, without PE connection	III, without PE connection
Degree of pollution	2	2	2	2
Order numbers				
Order Number	**EB-2824-020-0**	**EB-2824-030-0**	**EB-2824-040-0**	**EB-2824-060-0**

1-Channel circuit breaker
EasyB 1-Channel

Typ	EB-2824-080-0	EB-2824-100-0	EB-3824-100-0
Special features			
Characteristics	-	-	Adjustable tripping currents
Input			
Input rated voltage	24 Vdc	24 Vdc	24 Vdc
Input voltage range	18 - 30 Vdc	18 - 30 Vdc	18 - 30 Vdc
Maximal residual ripple of supplied input voltage	3 %	3 %	3 %
Max. total input current	8 A	10 A	10 A
Max. input current for each pole of terminal	10 A (-), 40 A (+)	10 A (-), 40 A (+)	10 A (-), 40 A (+)
Required input voltage for turning-on of outputs	17.5 V (Turn-off Threshold 16.7 V), ± 0.7 V	17.5 V (Turn-off Threshold 16.7 V), ± 0.7 V	17.5 V (Turn-off Threshold 16.7 V), ± 0.7 V
Max. power losses	1,3 W	1,8 W	1,2 W - 2,5 W
Over voltage protection	Suppressor diode 33 V	Suppressor diode 33 V	Suppressor diode 33 V
Stand-by current	18,6 mA @ 24 V	18,6 mA @ 24 V	39 mA @ 24 V
Power losses in stand-by mode	0,5 W @ 24 V	0,5 W @ 24 V	1,17 W @ 24 V
Turn on capacity	80 mF	70 mF @ 24 Vdc / 2,5 mm² / 2,5 m	50-110 mF @ 24 Vdc/ 2,5 mm² /2,5 m
Output			
Output rated voltage	24 Vdc	24 Vdc	24 Vdc
Maximum voltage drop between input and output	92 mV	130 mV	130 mV
Initialization time of module	52 ms	52 ms	52 ms
Turn-on delay of outputs	0 ms	0 ms	min. 50 ms / max. 5 s
Waiting periode after switch-off of an output	500 ms (Short circuit) . . 5 s (Overload)	500 ms (Short circuit) . . 5 s (Overload)	500 ms (Short circuit) . . 5 s (Overload)
Parallel use of outputs	Not allowed	Not allowed	Not allowed
Serial use of outputs	not allowed	not allowed	not allowed
Resistance to reverse feed max.	35 Vdc	35 Vdc	35 Vdc
Output rated current	8 A	10 A	0.5 - 10 A, adjustable (0,5A, 1A, 2A, 3A, 4A, 5A, 6A, 8A, 10A)
Efficiency	99.0 %	99.0 %	99.0 %
Output limited current	typ. 10 A	typ. 12,5 A	typ. rated current x 1,25 (@ 1-10 A) typ. rated current x 2,5 (@ 0,5 A)
Signaling			
Bus communication	Collective notification signal bypassed	Collective notification signal bypassed	Read:-state (tripped, On, Off) -set/current -input voltage -firmware version/serial number Write:-state (on, off, reset)
Status indicator	LED (red, green, orange)	LED (red, green, orange)	LED (red, green, orange)
Signal output	Output status, short circuit proof high = Channel on, low = Channel off, fault	Output status, short circuit proof high = Channel on, low = Channel off, fault	Output status, short circuit proof high = Channel on, low = Channel off, fault
Signal output (ON/OFF/Reset)	-	-	Reset input Level high = min. 15V, max. 30V Level low = min. 0V, max. 5V
Environment			
Type of cooling	Natural convection	Natural convection	Natural convection
Ambient temperature	-25 °C . . +60 °C	-25 °C . . +60 °C	-25 °C . . +70 °C
Storage temperature	-25 °C ... +85 °C	-25 °C ... +85 °C	-25 °C ... +85 °C
Derating	-	-	max. +60 °C > 6A
Relative humidity	5 . . 96 %, without condensation	5 . . 96 %, without condensation	5 . . 96 %, without condensation
Required minimum spacing (left/right)	0 mm	0 mm	0 mm
Required minimum spacing (over/under)	30 mm	30 mm	30 mm
Safety and protection			
Protection index	IP 20	IP 20	IP 20
Safety class	III, without PE connection	III, without PE connection	III, without PE connection
Degree of pollution	2	2	2
Order numbers			
Order Number	**EB-2824-080-0**	**EB-2824-100-0**	**EB-3824-100-0**

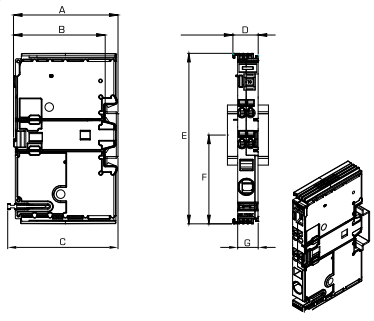
1-Channel circuit breaker
EasyB 1-Channel

Mechanical data 30

Typ	Terminals output, (spring clamp terminal)	Terminals input, (spring clamp terminal)	Terminals signalling, (spring clamp terminal)	Mounting position	Weight	Width	Dimension picture (in mm)	A	B	C	D	E	F	G
EB-0824-100-0	max 2.5 mm² (1 x "+")	max. 16 mm²	max. 2,5 mm²	horizontal for standard rail DIN TS35	0.042 kg	12 mm	1	61.2	53.7	64.5	14.8	99.3	51.7	12
EB-1824-010-0	max 2,5 mm² (1 x "+")	max. 16 mm²	max. 2,5 mm²	horizontal for standard rail DIN TS35	0.042 kg	12 mm	1	61.2	53.7	64.5	14.8	99.3	51.7	12
EB-1824-020-0	max 2,5 mm² (1 x "+")	max. 16 mm²	max. 2,5 mm²	horizontal for standard rail DIN TS35	0.042 kg	12 mm	1	61.2	53.7	64.5	14.8	99.3	51.7	12
EB-1824-030-0	max 2,5 mm² (1 x "+")	max. 16 mm²	max. 2,5 mm²	horizontal for standard rail DIN TS35	0.042 kg	12 mm	1	61.2	53.7	64.5	14.8	99.3	51.7	12
EB-1824-040-0	max 2,5 mm² (1 x "+")	max. 16 mm²	max. 2,5 mm²	horizontal for standard rail DIN TS35	0.042 kg	12 mm	1	61.2	53.7	64.5	14.8	99.3	51.7	12
EB-1824-060-0	max 2,5 mm² (1 x "+")	max. 16 mm²	max. 2,5 mm²	horizontal for standard rail DIN TS35	0.042 kg	12 mm	1	61.2	53.7	64.5	14.8	99.3	51.7	12
EB-1824-080-0	max 2,5 mm² (1 x "+")	max. 16 mm²	max. 2,5 mm²	horizontal for standard rail DIN TS35	0.042 kg	12 mm	1	61.2	53.7	64.5	14.8	99.3	51.7	12
EB-1824-100-0	max 2,5 mm² (1 x "+")	max. 16 mm²	max. 2,5 mm²	horizontal for standard rail DIN TS35	0.042 kg	12 mm	1	61.2	53.7	64.5	14.8	99.3	51.7	12
EB-2724-010-0	max 2,5 mm² (2 x "+")	max. 16 mm²	max. 2,5 mm²	horizontal for standard rail DIN TS35	0.039 kg	12 mm	1	61.2	53.7	64.5	14.8	99.3	51.7	12
EB-2724-020-0	max 2,5 mm² (2 x "+")	max. 16 mm²	max. 2,5 mm²	horizontal for standard rail DIN TS35	0.039 kg	12 mm	1	61.2	53.7	64.5	14.8	99.3	51.7	12
EB-2724-030-0	max 2,5 mm² (2 x "+")	max. 16 mm²	max. 2,5 mm²	horizontal for standard rail DIN TS35	0.039 kg	12 mm	1	61.2	53.7	64.5	14.8	99.3	51.7	12
EB-2724-040-0	max 2,5 mm² (2 x "+")	max. 16 mm²	max. 2,5 mm²	horizontal for standard rail DIN TS35	0.039 kg	12 mm	1	61.2	53.7	64.5	14.8	99.3	51.7	12
EB-2724-060-0	max 2,5 mm² (2 x "+")	max. 16 mm²	max. 2,5 mm²	horizontal for standard rail DIN TS35	0.039 kg	12 mm	1	61.2	53.7	64.5	14.8	99.3	51.7	12
EB-2724-080-0	max 2,5 mm² (2 x "+")	max. 16 mm²	max. 2,5 mm²	horizontal for standard rail DIN TS35	0.039 kg	12 mm	1	61.2	53.7	64.5	14.8	99.3	51.7	12
EB-2724-100-0	max 2,5 mm² (2 x "+")	max. 16 mm²	max. 2,5 mm²	horizontal for standard rail DIN TS35	0.039 kg	12 mm	1	61.2	53.7	64.5	14.8	99.3	51.7	12
EB-2824-010-0	max 2,5 mm² (2 x "+")	max. 16 mm²	max. 2,5 mm²	horizontal for standard rail DIN TS35	0.040 kg	12 mm	1	61.2	53.7	64.5	14.8	99.3	51.7	12
EB-2824-020-0	max 2,5 mm² (2 x "+")	max. 16 mm²	max. 2,5 mm²	horizontal for standard rail DIN TS35	0.040 kg	12 mm	1	61.2	53.7	64.5	14.8	99.3	51.7	12
EB-2824-030-0	max 2,5 mm² (2 x "+")	max. 16 mm²	max. 2,5 mm²	horizontal for standard rail DIN TS35	0.040 kg	12 mm	1	61.2	53.7	64.5	14.8	99.3	51.7	12
EB-2824-040-0	max 2,5 mm² (2 x "+")	max. 16 mm²	max. 2,5 mm²	horizontal for standard rail DIN TS35	0.040 kg	12 mm	1	61.2	53.7	64.5	14.8	99.3	51.7	12
EB-2824-060-0	max 2,5 mm² (2 x "+")	max. 16 mm²	max. 2,5 mm²	horizontal for standard rail DIN TS35	0.040 kg	12 mm	1	61.2	53.7	64.5	14.8	99.3	51.7	12

Dimension pictures

1



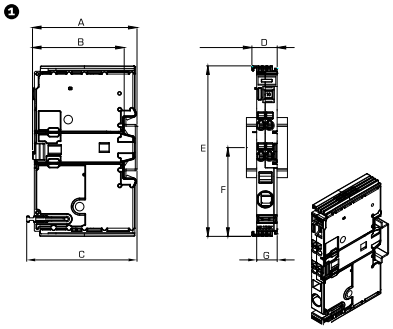
1-Channel circuit breaker
EasyB 1-Channel

Mechanical data

Typ	Terminals output, (spring clamp terminal)	Terminals input, (spring clamp terminal)	Terminals signalling, (spring clamp terminal)	Mounting position	Weight	Width	Dimension picture (in mm)	A	B	C	D	E	F	G
EB-2824-080-0	max 2,5 mm² (2 x "+")	max. 16 mm²	max. 2,5 mm²	horizontal for standard rail DIN TS35	0.040 kg	12 mm	1	61.2	53.7	64.5	14.8	99.3	51.7	12
EB-2824-100-0	max 2,5 mm² (2 x "+")	max. 16 mm²	max. 2,5 mm²	horizontal for standard rail DIN TS35	0.040 kg	12 mm	1	61.2	53.7	64.5	14.8	99.3	51.7	12
EB-3824-100-0	max 2,5 mm² (1 x "+")	max. 16 mm²	max. 2,5 mm²	horizontal for standard rail DIN TS35	0.042 kg	12 mm	1	61.2	53.7	64.5	14.8	99.3	51.7	12

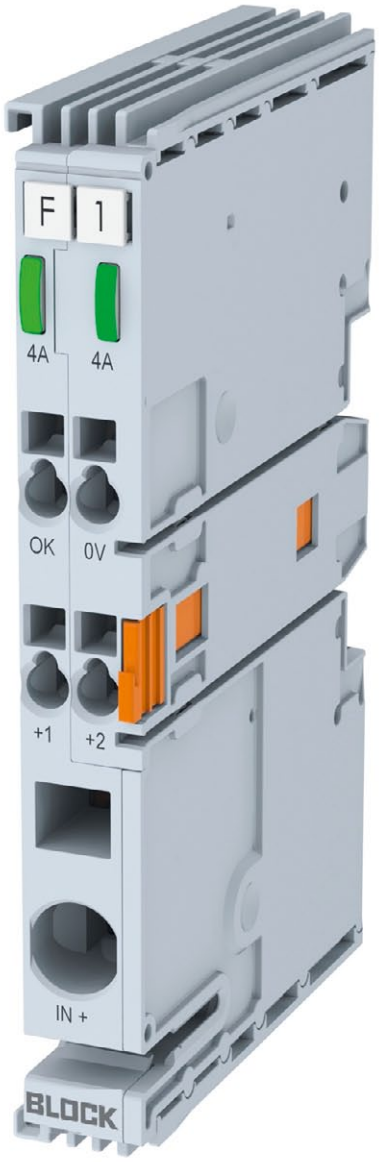
Dimension pictures

1



2-Channel circuit breaker
EasyB 2-Channel

BLOCK Website



General Data

- Efficiency up to 99 %
- Multi-coloured LED and status display button
- Up to 40 fuse channels stackable side by side
- With thermomagnetic characteristic
- Ambient temperature -25 °C to +55 °C / +70 °C
- Protection index IP 20

Advantages

- Compact design - 2 independent channels in 12 mm width
- Automatic channel assignment
- Additional load outputs through output expanders mountable side by side

Applications

Electronic circuit breaker with thermomagnetic characteristic with alarm signal forwarded for tripped and switched off channels to the connected channels. Starter version with fuse for 24 V loads.

Standards

Safety:
EN 60950-1, EN 50178, EN/IEC 60204-1

EMC:
EN 61000-6-2 (interference immunity), EN 61000-6-3 (emitted interference)

CE acc. to 2014/30/EU

Approvals

EAC

UL 508 (prepared), UL 2367 (prepared), GL (prepared)

2-Channel circuit breaker
EasyB 2-Channel

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Electrical data

Typ	EB-2724-2020-0	EB-2724-2040-0	EB-2724-2060-0	EB-2724-2080-0
Special features				
Available from	Q2 2017	Q2 2017	Q2 2017	Q2 2017
Input				
Input rated voltage	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Input voltage range	18 - 30 Vdc	18 - 30 Vdc	18 - 30 Vdc	18 - 30 Vdc
Maximal residual ripple of supplied input voltage	3 %	3 %	3 %	3 %
Max. total input current	2 A	4 A	6 A	8 A
Max. input current for each pole of terminal	10 A (-), 40 A (+)	10 A (-), 40 A (+)	10 A (-), 40 A (+)	10 A (-), 40 A (+)
Required input voltage for turning-on of outputs	17.5 V (Turn-off Threshold 16.7 V), ± 0.7 V	17.5 V (Turn-off Threshold 16.7 V), ± 0.7 V	17.5 V (Turn-off Threshold 16.7 V), ± 0.7 V	17.5 V (Turn-off Threshold 16.7 V), ± 0.7 V
Max. power losses	0,4 W	0,4 W	0,4 W	0,4 W
Over voltage protection	Suppressor diode 33 V	Suppressor diode 33 V	Suppressor diode 33 V	Suppressor diode 33 V
Stand-by current	12 mA @ 24 V	12 mA @ 24 V	12 mA @ 24 V	12 mA @ 24 V
Power losses in stand-by mode	0,3 W @ 24 V	0,3 W @ 24 V	0,3 W @ 24 V	0,3 W @ 24 V
Turn on capacity	70 mF @ 24 Vdc / 2,5 mm² / 2,5 m	80 mF @ 24 Vdc / 2,5 mm² / 2,5 m	80 mF @ 24 Vdc / 2,5 mm² / 2,5 m	80 mF @ 24 Vdc / 2,5 mm² / 2,5 m
Output				
Output rated voltage	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Output rated current	2 x 1 A	2 x 2 A	2 x 3 A	2 x 4 A
Maximum voltage drop between input and output	24 mV	29 mV	33 mV	34 mV
Initialization time of module	27 ms	27 ms	27 ms	27 ms
Turn-on delay of outputs	0 ms	0 ms	0 ms	0 ms
Waiting periode after switch-off of an output	500 ms (Short circuit) . . 5 s (Overload)	500 ms (Short circuit) . . 5 s (Overload)	500 ms (Short circuit) . . 5 s (Overload)	500 ms (Short circuit) . . 5 s (Overload)
Parallel use of outputs	Not allowed	Not allowed	Not allowed	Not allowed
Serial use of outputs	not allowed	not allowed	not allowed	not allowed
Resistance to reverse feed max.	35 Vdc	35 Vdc	35 Vdc	35 Vdc
Efficiency	99.0 %	99.0 %	99.0 %	99.0 %
Output limited current	-	-	-	-
Signaling				
Bus communication	Collective notification signal bypassed	Collective notification signal bypassed	Collective notification signal bypassed	Collective notification signal bypassed
Status indicator	LED (red, green, orange)	LED (red, green, orange)	LED (red, green, orange)	LED (red, green, orange)
Signal output	Output status, short circuit proof high = Channel on, low = Channel off, fault	Output status, short circuit proof high = Channel on, low = Channel off, fault	Output status, short circuit proof high = Channel on, low = Channel off, fault	Output status, short circuit proof high = Channel on, low = Channel off, fault
Signal output (ON/OFF/Reset)	-	-	-	-
Environment				
Type of cooling	Natural convection	Natural convection	Natural convection	Natural convection
Ambient temperature	-25 °C . . +70 °C	-25 °C . . +70 °C	-25 °C . . +70 °C	-25 °C . . +70 °C
Storage temperature	-25 °C ... +85 °C	-25 °C ... +85 °C	-25 °C ... +85 °C	-25 °C ... +85 °C
Derating	-	-	-	-
Relative humidity	5 . . 96 %, without condensation	5 . . 96 %, without condensation	5 . . 96 %, without condensation	5 . . 96 %, without condensation
Required minimum spacing (left/right)	0 mm	0 mm	0 mm	0 mm
Required minimum spacing (over/under)	30 mm	30 mm	30 mm	30 mm
Safety and protection				
Protection index	IP 20	IP 20	IP 20	IP 20
Safety class	III, without PE connection	III, without PE connection	III, without PE connection	III, without PE connection
Degree of pollution	2	2	2	2
Order numbers				
Order Number	**EB-2724-2020-0**	**EB-2724-2040-0**	**EB-2724-2060-0**	**EB-2724-2080-0**

2-Channel circuit breaker
EasyB 2-Channel

BLOCK Website

Electrical data

Typ	EB-2724-2120-0	EB-2724-2160-0
Special features		
Available from	Q2 2017	Q2 2017
Input		
Input rated voltage	24 Vdc	24 Vdc
Input voltage range	18 - 30 Vdc	18 - 30 Vdc
Maximal residual ripple of supplied input voltage	3 %	3 %
Max. total input current	12 A	16 A
Max. input current for each pole of terminal	10 A (-), 40 A (+)	10 A (-), 40 A (+)
Required input voltage for turning-on of outputs	17.5 V (Turn-off Threshold 16.7 V), ± 0.7 V	17.5 V (Turn-off Threshold 16.7 V), ± 0.7 V
Max. power losses	0,6 W	0,9 W
Over voltage protection	Suppressor diode 33 V	Suppressor diode 33 V
Stand-by current	12 mA @ 24 V	12 mA @ 24 V
Power losses in stand-by mode	0,3 W @ 24 V	0,3 W @ 24 V
Turn on capacity	70 mF @ 24 Vdc / 2,5 mm² / 2,5 m	70 mF @ 24 Vdc / 2,5 mm² / 2,5 m
Output		
Output rated voltage	24 Vdc	24 Vdc
Output rated current	2 x 6 A	2 x 8 A
Maximum voltage drop between input and output	54 mV	72 mV
Initialization time of module	27 ms	27 ms
Turn-on delay of outputs	0 ms	0 ms
Waiting periode after switch-off of an output	500 ms (Short circuit) . . 5 s (Overload)	500 ms (Short circuit) . . 5 s (Overload)
Parallel use of outputs	Not allowed	Not allowed
Serial use of outputs	not allowed	not allowed
Resistance to reverse feed max.	35 Vdc	35 Vdc
Efficiency	99.0 %	99.0 %
Output limited current	-	-
Signaling		
Bus communication	Collective notification signal bypassed	Collective notification signal bypassed
Status indicator	LED (red, green, orange)	LED (red, green, orange)
Signal output	Output status, short circuit proof high = Channel on, low = Channel off, fault	Output status, short circuit proof high = Channel on, low = Channel off, fault
Signal output (ON/OFF/Reset)	-	-
Environment		
Type of cooling	Natural convection	Natural convection
Ambient temperature	-25 °C . . +70 °C	-25 °C . . +55 °C
Storage temperature	-25 °C ... +85 °C	-25 °C ... +85 °C
Derating	-	-
Relative humidity	5 . . 96 %, without condensation	5 . . 96 %, without condensation
Required minimum spacing (left/right)	0 mm	0 mm
Required minimum spacing (over/under)	30 mm	30 mm
Safety and protection		
Protection index	IP 20	IP 20
Safety class	III, without PE connection	III, without PE connection
Degree of pollution	2	2
Order numbers		
Order Number	**EB-2724-2120-0**	**EB-2724-2160-0**

2-Channel circuit breaker
EasyB 2-Channel

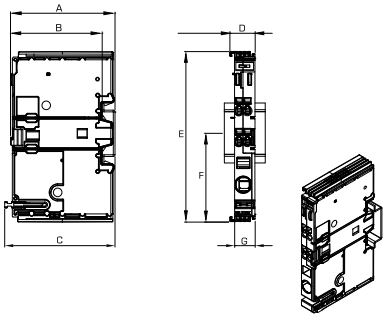
BLOCK Website

Mechanical data 30

Typ	Terminals output, (spring clamp terminal)	Terminals input, (spring clamp terminal)	Terminals signalling, (spring clamp terminal)	Mounting position	Weight	Dimension picture (in mm)	A	B	C	D	E	F	G
EB-2724-2020-0	max 2,5 mm² (2 x "+")	max. 16 mm²	max. 2,5 mm²	horizontal for standard rail DIN TS35	0.039 kg	1	61.2	53.7	64.5	14.8	99.3	51.7	12
EB-2724-2040-0	max 2,5 mm² (2 x "+")	max. 16 mm²	max. 2,5 mm²	horizontal for standard rail DIN TS35	0.039 kg	1	61.2	53.7	64.5	14.8	99.3	51.7	12
EB-2724-2060-0	max 2,5 mm² (2 x "+")	max. 16 mm²	max. 2,5 mm²	horizontal for standard rail DIN TS35	0.039 kg	1	61.2	53.7	64.5	14.8	99.3	51.7	12
EB-2724-2080-0	max 2,5 mm² (2 x "+")	max. 16 mm²	max. 2,5 mm²	horizontal for standard rail DIN TS35	0.039 kg	1	61.2	53.7	64.5	14.8	99.3	51.7	12
EB-2724-2120-0	max 2,5 mm² (2 x "+")	max. 16 mm²	max. 2,5 mm²	horizontal for standard rail DIN TS35	0.039 kg	1	61.2	53.7	64.5	14.8	99.3	51.7	12
EB-2724-2160-0	max 2,5 mm² (2 x "+")	max. 16 mm²	max. 2,5 mm²	horizontal for standard rail DIN TS35	0.039 kg	1	61.2	53.7	64.5	14.8	99.3	51.7	12

Dimension pictures

1



Electronic circuit breaker with thermomagnetic characteristic **ECONOMY SMART**

General Data

- Nominal input voltage 12 / 24 / 48 Vdc
- Output channels 2 / 4 / 8
- Tripping current 1 - 6 A / 2 - 10 A
- Thermomagnetic characteristic
- Ambient temperature -25 °C to +70 °C
- Protection index IP 20
- Efficiency typ. 99 %

Advantages

- Adjustable tripping current for each output channel via current selector switch
- Ability to turn-on high load capacitance at each channel
- Sequential and load-dependent switching-on of channels
- Comprehensive single-channel-diagnostics and remote switching on/off of each output channel via 2-wire-interface
- LED signalisation and remote request for each output channel
- Group alarm contact

Applications

ECONOMY SMART circuit breakers with a thermomagnetic characteristic represent an economical alternative to the classic circuit breaker. They also ensure reliable tripping even in the case of high line resistance. This makes the circuit breakers ideal for use in standard machine production. The electronic circuit breaker distributes and monitors the load current over several current circuits. Overloads and short circuits on an output are reliably recognized. The electronics permit brief current peaks and switch longer overloads off. The rated current for each output can be individually set with a current selector switch accessible from the front. The outputs are activated depending on the time delay and load to avoid an overload current. If the rated current is exceeded for a certain amount of time, the output will be switched off automatically and can be reactivated after a waiting time (thermal relaxation) using the pushbutton or the remote signal input S1. The pushbutton can also be used to switch the output manually. It is possible to read out the state of each output using the three signal contacts. The state of each output is also indicated with a multi-colored LED.

Standards

Electronic circuit breaker
UL 508, UL 2367

Safety:
EN 60950-1, EN 50178,
EN/IEC 60204-1

EMC:
EN 61000-6-2, EN 61000-6-3

Safety extra-low voltage (SELV/PELV):
IEC 60364-4-41 (DIN VDE 0100-410)

CE acc. to 2004/108/EG (EMC-Directive)

Approvals

UL 2367 (E-File: E356250)UL 508 (E-File: E219022)GL

Electronic circuit breaker with thermomagnetic characteristic
ECONOMY SMART

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Electrical data

Typ	PM-0712-200-0	PM-0712-400-0	PM-0724-120-0	PM-0724-200-0
Input				
Input rated voltage	12 Vdc	12 Vdc	24 Vdc	24 Vdc
Input voltage range	10 - 16 Vdc	10 - 16 Vdc	18 - 30 Vdc	18 - 30 Vdc
Maximal residual ripple of supplied input voltage	3 %	3 %	3 %	3 %
Required input voltage for turning-on of outputs	10.5 V (Turn-off Threshold 10 V)	10.5 V (Turn-off Threshold 10 V)	19.5 V (Turn-off Threshold 18 V)	19.5 V (Turn-off Threshold 18 V)
Max. total input current	20 A	40 A	12 A	20 A
Max. input current for each pole of terminal	40 A	40 A	40 A	40 A
Over voltage protection	Suppressor diode 33 V	Suppressor diode 33 V	Suppressor diode 33 V	Suppressor diode 33 V
Stand-by current	44 mA @ 12 V	44 mA @ 12 V	35 mA @ 24 V	35 mA @ 24 V
Power losses in stand-by mode	0.53 W @ 12 V	0.53 W @ 12 V	0.84 W @ 24 V	0.84 W @ 24 V
Output				
Output rated voltage	12 Vdc	12 Vdc	24 Vdc	24 Vdc
Output rated current	2 x 2 - 10 A	4 x 2 - 10 A	2 x 1 - 6 A	2 x 2 - 10 A
Maximum voltage drop between input and output	200 mV @ 2 x 10 A	200 mV @ 4 x 10 A	120 mV @ 2 x 6 A	200 mV @ 2 x 10 A
Initialization time of module	250 ms	250 ms	250 ms	250 ms
Turn-on delay of outputs	Load dependent, min. 50 ms / max. 5 s	Load dependent, min. 50 ms / max. 5 s	Load dependent, min. 50 ms / max. 5 s	Load dependent, min. 50 ms / max. 5 s
Waiting periode after switch-off of an output	500 ms (short circuit) ... 10 s (overload)	500 ms (short circuit) ... 10 s (overload)	500 ms (short circuit) ... 10 s (overload)	500 ms (short circuit) ... 10 s (overload)
Max. power losses	5.3 W @ 2 x 10 A	10 W @ 4 x 10 A	2.5 W @ 2 x 6 A	5.5 W @ 2 x 10 A
Efficiency	99.0 %	99.0 %	99.0 %	99.0 %
Internal output fuse	15 A	15 A	15 A	15 A
Resistance to reverse feed max.	35 Vdc	35 Vdc	35 Vdc	35 Vdc
Parallel use of outputs	Not allowed	Not allowed	Not allowed	Not allowed
Serial use of outputs	Not allowed	Not allowed	Not allowed	Not allowed
Signaling				
Status indicator	LED (red, green, orange)	LED (red, green, orange)	LED (red, green, orange)	LED (red, green, orange)
Signal input S1	DC 12-24 V (On/Off/Reset)	DC 12-24 V (On/Off/Reset)	DC 24 V (On/Off/Reset)	DC 24 V (On/Off/Reset)
Signal output S2	DC 12 V, max. 25 mA (status output channels)	DC 12 V, max. 25 mA (status output channels)	DC 24 V, max. 25 mA (status output channels)	DC 24 V, max. 25 mA (status output channels)
Signal output S3	DC 12 V, max. 25 mA (Common signalling output)	DC 12 V, max. 25 mA (Common signalling output)	DC 24 V, max. 25 mA (Common signalling output)	DC 24 V, max. 25 mA (Common signalling output)
Approvals				
Approvals	-	cURus, cULus, GL	cURus, cULus, GL	cURus, cULus, GL
Environment				
Storage temperature	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C
Ambient temperature	-25 °C to +70 °C	-25 °C to +70 °C	-25 °C to +70 °C	-25 °C to +70 °C
Derating	-	-	-	-
Type of cooling	Natural convection	Natural convection	Natural convection	Natural convection
Required minimum spacing (left/right)	0 mm	0 mm	0 mm	0 mm
Required minimum spacing (over/under)	40 mm	40 mm	40 mm	40 mm
Safety and protection				
Protection index	IP 20	IP 20	IP 20	IP 20
Safety class	III, without PE connection	III, without PE connection	III, without PE connection	III, without PE connection
Degree of pollution	2	2	2	2
Order numbers				
Order Number	**PM-0712-200-0**	**PM-0712-400-0**	**PM-0724-120-0**	**PM-0724-200-0**

Electronic circuit breaker with thermomagnetic characteristic
ECONOMY SMART

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Electrical data

Typ	PM-0724-240-0	PM-0724-400-0	PM-0724-400-2	PM-0748-200-0
Input				
Input rated voltage	24 Vdc	24 Vdc	24 Vdc	48 Vdc
Input voltage range	18 - 30 Vdc	18 - 30 Vdc	18 - 30 Vdc	32 - 58 Vdc
Maximal residual ripple of supplied input voltage	3 %	3 %	3 %	3 %
Required input voltage for turning-on of outputs	19.5 V (Turn-off Threshold 18 V)	19.5 V (Turn-off Threshold 18 V)	19.5 V (Turn-off Threshold 18 V)	35 Vdc
Max. total input current	24 A	40 A	40 A	20 A
Max. input current for each pole of terminal	40 A	40 A	40 A	40 A
Over voltage protection	Suppressor diode 33 V	Suppressor diode 33 V	Suppressor diode 33 V	Suppressor diode 68 V
Stand-by current	35 mA @ 24 V	35 mA @ 24 V	35 mA @ 24 V	
Power losses in stand-by mode	0.84 W @ 24 V	0.84 W @ 24 V	0.84 W @ 24 V	
Output				
Output rated voltage	24 Vdc	24 Vdc	24 Vdc	48 Vdc
Output rated current	4 x 1 - 6 A	4 x 2 - 10 A	4 x 2 - 10 A	2 x 2 - 10 A
Maximum voltage drop between input and output	120 mV @ 4 x 6 A	200 mV @ 4 x 10 A	200 mV @ 2 x 10 A	
Initialization time of module	250 ms	250 ms	250 ms	250 ms
Turn-on delay of outputs	Load dependent, min. 50 ms / max. 5 s	Load dependent, min. 50 ms / max. 5 s	Load dependent, min. 50 ms / max. 5 s	Load dependent, min. 50 ms / max. 5 s
Waiting periode after switch-off of an output	500 ms (short circuit) ... 10 s (overload)	500 ms (short circuit) ... 10 s (overload)	500 ms (short circuit) ... 20 s (overload)	500 ms (short circuit) ... 20 s (overload)
Max. power losses	4.2 W @ 4 x 6 A	10 W @ 4 x 10 A	10 W @ 4 x 10 A	
Efficiency	99.0 %	99.0 %	99.0 %	99.0 %
Internal output fuse	15 A	15 A	15 A	15 A
Resistance to reverse feed max.	35 Vdc	35 Vdc	35 Vdc	58 Vdc
Parallel use of outputs	Not allowed	Not allowed	Not allowed	Not allowed
Serial use of outputs	Not allowed	Not allowed	Not allowed	Not allowed
Signaling				
Status indicator	LED (red, green, orange)	LED (red, green, orange)	LED (red, green, orange)	LED (red, green, orange)
Signal input S1	DC 24 V (On/Off/Reset)	DC 24 V (On/Off/Reset)	DC 24 V (On/Off/Reset)	15 - 58 Vdc (On / Off / Reset)
Signal output S2	DC 24 V, max. 25 mA (status output channels)	DC 24 V, max. 25 mA (status output channels)	"13": Solid State Relais; max. 58 Vdc / 40 Vac / 100 mA	"S2": 24 Vdc, 20 mA, short circuit proof, status report of outputs
Signal output S3	DC 24 V, max. 25 mA (Common signalling output)	DC 24 V, max. 25 mA (Common signalling output)	"14": Solid State Relais; max. 58 Vdc / 40 Vac / 100 mA	"S3": 24 Vdc, 20 mA, short circuit proof; high = OK, low = min. one channel tripped
Approvals				
Approvals	cURus, cULus, GL	cURus, cULus, GL	cURus, cULus, GL	cURus, cULus, GL
Environment				
Storage temperature	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C
Ambient temperature	-25 °C to +70 °C	-25 °C to +70 °C	-25 °C to +70 °C	-25 °C to +70 °C
Derating	-	-	-	-
Type of cooling	Natural convection	Natural convection	Natural convection	Natural convection
Required minimum spacing (left/right)	0 mm	0 mm	0 mm	0 mm
Required minimum spacing (over/under)	40 mm	40 mm	40 mm	40 mm
Safety and protection				
Protection index	IP 20	IP 20	IP 20	IP 20
Safety class	III, without PE connection	III, without PE connection	III, without PE connection	III, without PE connection
Degree of pollution	2	2	2	2
Order numbers				
Order Number	**PM-0724-240-0**	**PM-0724-400-0**	**PM-0724-400-2**	**PM-0748-200-0**

Electronic circuit breaker with thermomagnetic characteristic
ECONOMY SMART

Electrical data

Typ	PM-0748-200-2	PM-0748-400-0	PM-0748-400-2	PC-0724-480-0
Input				
Input rated voltage	48 Vdc	48 Vdc	48 Vdc	24 Vdc
Input voltage range	32 - 58 Vdc	32 - 58 Vdc	32 - 58 Vdc	18 - 30 Vdc
Maximal residual ripple of supplied input voltage	3 %	3 %	3 %	3 %
Required input voltage for turning-on of outputs	35 Vdc	35 Vdc	35 Vdc	19.5 V (Turn-off Threshold 18 V)
Max. total input current	20 A	40 A	40 A	48 A
Max. input current for each pole of terminal	40 A	40 A	40 A	40 A
Over voltage protection	Suppressor diode 68 V	Suppressor diode 68 V	Suppressor diode 68 V	Suppressor diode 33 V
Stand-by current		17 mA	17 mA	48 mA @ 24 V
Power losses in stand-by mode		0.82 W	0,82 W	1.15 W @ 24 V
Output				
Output rated voltage	48 Vdc	48 Vdc	48 Vdc	24 Vdc
Output rated current	2 x 2 - 10 A, adjustable	4 x 2 - 10 A, adjustable	4 x 2 - 10 A, adjustable	8 x 1 - 6 A
Maximum voltage drop between input and output		175 mV (4 x 10 A)	175 mV (4 x 10 A)	155 mV @ 8 x 6 A
Initialization time of module	250 ms	250 ms	250 ms	250 ms
Turn-on delay of outputs	Load dependent, min. 50 ms / max. 5 s	Load dependent, min. 50 ms / max. 5 s	Load dependent, min. 50 ms / max. 5 s	Load dependent, min. 50 ms / max. 5 s
Waiting periode after switch-off of an output	500 ms (short circuit) ... 20 s (overload)	500 ms (short circuit) ... 20 s (overload)	500 ms (short circuit) ... 20 s (overload)	500 ms (short circuit) ... 10 s (overload)
Max. power losses		8 W (4 x 10 A)	8 W (4 x 10 A)	8.6 W @ 8 x 6 A
Efficiency	99.0 %	99.0 %	99.0 %	99.0 %
Internal output fuse	15 A	15 A	15 A	15 A
Resistance to reverse feed max.	58 Vdc	58 Vdc	58 Vdc	35 Vdc
Parallel use of outputs	Not allowed	Not allowed	Not allowed	Not allowed
Serial use of outputs	Not allowed	Not allowed	Not allowed	Not allowed
Signaling				
Status indicator	LED (red, green, orange)	LED (red, green, orange)	LED (red, green, orange)	LED (red, green, orange)
Signal input S1	15 - 58 Vdc (On / Off / Reset)	15 - 58 Vdc (On / Off / Reset)	15 - 58 Vdc (On / Off / Reset)	DC 24 V (On/Off/Reset)
Signal output S2	"13": Solid State Relais; max. 58 Vdc / 40 Vac / 100 mA	"S2": 24 Vdc, 20 mA, short circuit proof, status report of outputs	"13": Solid State Relais; max. 58 Vdc / 40 Vac / 100 mA	DC 24 V, max. 25 mA (status output channels)
Signal output S3	"14": Solid State Relais; max. 58 Vdc / 40 Vac / 100 mA	"S3": 24 Vdc, 20 mA, short circuit proof; high = OK, low = min. one channel tripped	"14": Solid State Relais; max. 58 Vdc / 40 Vac / 100 mA	DC 24 V, max. 25 mA (Common signalling output)
Approvals				
Approvals	cURus, cULus, GL	-	-	cURus, cULus, GL
Environment				
Storage temperature	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C
Ambient temperature	-25 °C to +70 °C	-25 °C to +70 °C	-25 °C to +70 °C	-25 °C to +70 °C
Derating	-	-	-	-
Type of cooling	Natural convection	Natural convection	Natural convection	Natural convection
Required minimum spacing (left/right)	0 mm	0 mm	0 mm	0 mm
Required minimum spacing (over/under)	40 mm	40 mm	40 mm	40 mm
Safety and protection				
Protection index	IP 20	IP 20	IP 20	IP 20
Safety class	III, without PE connection	III, without PE connection	III, without PE connection	III, without PE connection
Degree of pollution	2	2	2	2
Order numbers				
Order Number	**PM-0748-200-2**	**PM-0748-400-0**	**PM-0748-400-2**	**PC-0724-480-0**

Electronic circuit breaker with thermomagnetic characteristic
ECONOMY SMART

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Electrical data

Typ	PC-0724-800-0	PC-0724-800-2	PC-0748-800-0	PC-0748-800-2
Input				
Input rated voltage	24 Vdc	24 Vdc	48 Vdc	48 Vdc
Input voltage range	18 - 30 Vdc	18 - 30 Vdc	32 - 58 Vdc	32 - 58 Vdc
Maximal residual ripple of supplied input voltage	3 %	3 %	3 %	3 %
Required input voltage for turning-on of outputs	19.5 V (Turn-off Threshold 18 V)	19.5 V (Turn-off Threshold 18 V)	35 V (Turn-off Threshold 32 V)	35 V (Turn-off Threshold 32 V)
Max. total input current	70 A	70 A	70 A	70 A
Max. input current for each pole of terminal	40 A	40 A	40 A	40 A
Over voltage protection	Suppressor diode 33 V	Suppressor diode 33 V	Suppressor diode 68 V	Suppressor diode 68 V
Stand-by current	55 mA @ 24 V	55 mA @ 24 V	27 mA	27 mA
Power losses in stand-by mode	1.32 W @ 24 V	1.32 W @ 24 V	1,3 W @ 24 V	1,3 W @ 24 V
Output				
Output rated voltage	24 Vdc	24 Vdc	48 Vdc	48 Vdc
Output rated current	8 x 2 - 10 A	8 x 2 - 10 A	8 x 2 - 10 A	8 x 2 - 10 A
Maximum voltage drop between input and output	200 mV @ 8 x 10 A	200 mV @ 8 x 10 A	200 mV (8 x 10 A)	200 mV (8 x 10 A)
Initialization time of module	250 ms	250 ms	250 ms	250 ms
Turn-on delay of outputs	Load dependent, min. 50 ms / max. 5 s	Load dependent, min. 50 ms / max. 5 s	Load dependent, min. 50 ms / max. 5 s	Load dependent, min. 50 ms / max. 5 s
Waiting periode after switch-off of an output	500 ms (short circuit) ... 10 s (overload)	500 ms (short circuit) ... 10 s (overload)	500 ms (short circuit) ... 20 s (overload)	500 ms (short circuit) ... 20 s (overload)
Max. power losses	20 W @ 8 x 10 A	20 W @ 8 x 10 A	4,5 W (2 x 10 A)	4,5 W (2 x 10 A)
Efficiency	99.0 %	99.0 %	99.0 %	99.0 %
Internal output fuse	15 A	15 A	15 A	15 A
Resistance to reverse feed max.	35 Vdc	35 Vdc	58 Vdc	58 Vdc
Parallel use of outputs	Not allowed	Not allowed	Not allowed	Not allowed
Serial use of outputs	Not allowed	Not allowed	Not allowed	Not allowed
Signaling				
Status indicator	LED (red, green, orange)	LED (red, green, orange)	LED (red, green, orange)	LED (red, green, orange)
Signal input S1	DC 24 V (On/Off/Reset)	DC 24 V (On/Off/Reset)	15 - 58 Vdc (On / Off / Reset)	15 - 58 Vdc (On / Off / Reset)
Signal output S2	DC 24 V, max. 25 mA (status output channels)	"13": Solid State Relais; max. 58 Vdc / 40 Vac / 100 mA	24 Vdc, 20 mA, short circuit proof, status report of outputs	"13": Solid State Relais; max. 58 Vdc / 40 Vac / 100 mA
Signal output S3	DC 24 V, max. 25 mA (Common signalling output)	"14": Solid State Relais; max. 58 Vdc / 40 Vac / 100 mA	24 Vdc, 20 mA, short circuit proof; high = OK, low = min. one channel tripped	"14": Solid State Relais; max. 58 Vdc / 40 Vac / 100 mA
Approvals				
Approvals	cURus, cULus, GL	cURus, cULus, GL	cURus, cULus, GL	cURus, cULus, GL
Environment				
Storage temperature	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C
Ambient temperature	-25 °C to +70 °C	-25 °C to +70 °C	-25 °C to +70 °C	-25 °C to +70 °C
Derating	-	-	-	-
Type of cooling	Natural convection	Natural convection	Natural convection	Natural convection
Required minimum spacing (left/right)	0 mm	0 mm	0 mm	0 mm
Required minimum spacing (over/under)	40 mm	40 mm	40 mm	40 mm
Safety and protection				
Protection index	IP 20	IP 20	IP 20	IP 20
Safety class	III, without PE connection	III, without PE connection	III, without PE connection	III, without PE connection
Degree of pollution	2	2	2	2
Order numbers				
Order Number	**PC-0724-800-0**	**PC-0724-800-2**	**PC-0748-800-0**	**PC-0748-800-2**

Electronic circuit breaker with thermomagnetic characteristic
ECONOMY SMART

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Mechanical data

Typ	Mounting position	Terminals signalling, 1) direct plug-in technology Push-in 2) pluggable, WAGO series 721	Input terminals (2 x "-"), 1) direct plug-in technology Push-in 2) pluggable, WAGO series 721	Input terminals (2 x "+"), 1) direct plug-in technology Push-in 2) pluggable, WAGO series 831	Output terminals ("+"), 1) direct plug-in technology Push-in 2) pluggable, WAGO series 721	Weight	Dimension picture (in mm)	A	B	C	D	E	F	G
PM-0712-200-0	horizontal for standard rail DIN TS35	1) max. 2,5 mm²	1) max. 2,5 mm²	1) max. 6 mm²	1) max. 2,5 mm²	0.20 kg	1	90	45	45	3	3.5	91.5	99
PM-0712-400-0	horizontal for standard rail DIN TS35	1) max. 2,5 mm²	1) max. 2,5 mm²	1) max. 6 mm²	1) max. 2,5 mm²	0.20 kg	1	90	45	45	3	3.5	91.5	99
PM-0724-120-0	horizontal for standard rail DIN TS35	1) max. 2,5 mm²	1) max. 2,5 mm²	1) max. 6 mm²	1) max. 2,5 mm²	0.20 kg	1	90	45	45	3	3.5	91.5	99
PM-0724-200-0	horizontal for standard rail DIN TS35	1) max. 2,5 mm²	1) max. 2,5 mm²	1) max. 6 mm²	1) max. 2,5 mm²	0.20 kg	1	90	45	45	3	3.5	91.5	99
PM-0724-240-0	horizontal for standard rail DIN TS35	1) max. 2,5 mm²	1) max. 2,5 mm²	1) max. 6 mm²	1) max. 2,5 mm²	0.20 kg	1	90	45	45	3	3.5	91.5	99
PM-0724-400-0	horizontal for standard rail DIN TS35	1) max. 2,5 mm²	1) max. 2,5 mm²	1) max. 6 mm²	1) max. 2,5 mm²	0.20 kg	1	90	45	45	3	3.5	91.5	99
PM-0724-400-2	horizontal for standard rail DIN TS35	1) max. 2,5 mm²	1) max. 2,5 mm²	1) max. 6 mm²	1) max. 2,5 mm²	0.20 kg	1	90	45	45	3	3.5	91.5	99
PM-0748-200-0	horizontal for standard rail DIN TS35	1) max. 2,5 mm²	1) max. 2,5 mm²	1) max. 6 mm²	1) max. 2,5 mm²	0.14 kg	1	90	45	45	3	3.5	91.5	99
PM-0748-200-2	horizontal for standard rail DIN TS35	1) max. 2,5 mm²	1) max. 2,5 mm²	1) max. 6 mm²	1) max. 2,5 mm²	0.14 kg	1	90	45	45	3	3.5	91.5	99
PM-0748-400-0	horizontal for standard rail DIN TS35	1) max. 2,5 mm²	1) max. 2,5 mm²	1) max. 6 mm²	1) max. 2,5 mm²	0.14 kg	1	90	45	45	3	3.5	91.5	99
PM-0748-400-2	horizontal for standard rail DIN TS35	1) max. 2,5 mm²	1) max. 2,5 mm²	1) max. 6 mm²	1) max. 2,5 mm²	0.14 kg	1	90	45	45	3	3.5	91.5	99
PC-0724-480-0	horizontal for standard rail DIN TS35	1) max. 2,5 mm²	1) max. 2,5 mm²	1) max. 6 mm²	1) max. 2,5 mm²	0.40 kg	3	127	63.5	42	3	116.5	124	-
PC-0724-800-0	horizontal for standard rail DIN TS35	1) max. 2,5 mm²	1) max. 2,5 mm²	1) max. 6 mm²	1) max. 2,5 mm²	0.40 kg	3	127	63.5	42	3	116.5	124	-
PC-0724-800-2	horizontal for standard rail DIN TS35	1) max. 2,5 mm²	1) max. 2,5 mm²	1) max. 6 mm²	1) max. 2,5 mm²	0.40 kg	3	127	63.5	42	3	116.5	124	-
PC-0748-800-0	horizontal for standard rail DIN TS35	2) max. 2,5 mm²	2) max. 2,5 mm²	2) max. 6 mm²	2) max. 2,5 mm²	0.40 kg	3	127	63.5	42	3	116.5	124	-
PC-0748-800-2	horizontal for standard rail DIN TS35	2) max. 2,5 mm²	2) max. 2,5 mm²	2) max. 6 mm²	2) max. 2,5 mm²	0.40 kg	3	127	63.5	42	3	116.5	124	-

Dimension pictures

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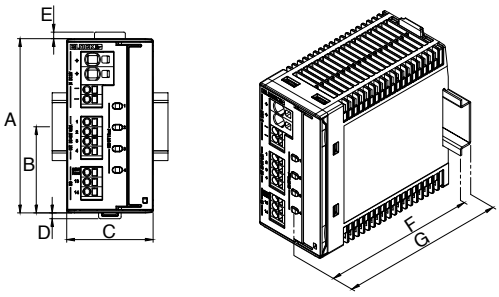

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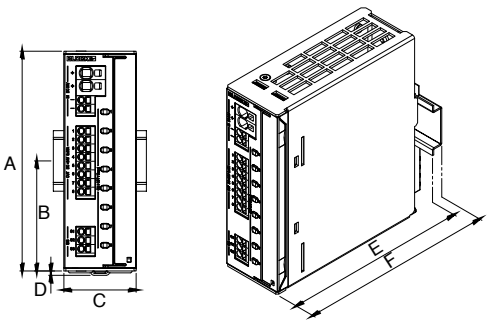

Electronic circuit breaker with thermomagnetic characteristic
ECONOMY REMOTE

General Data

Nominal input voltage 24 Vdc
Output channels 2 / 4 / 8
Tripping current 2 - 10 A
Thermomagnetic characteristic
Operational temperature -25° C ... +70° C
Protection index IP 20
Efficiency typ. 99 %

Advantages

Adjustable tripping current for each output channel via 2-wire-interface
Ability to turn-on high load capacitance at each channel
Sequential and load-dependent switching-on of channels
Comprehensive single-channel-diagnostics and remote switching on/off of each output channel via 2-wire-interface
Group alarm contact for simple diagnosis

Applications

ECONOMY REMOTE circuit breakers with a thermomagnetic characteristic represent an economical alternative to the classic circuit breaker. They also ensure reliable tripping even in the case of high line resistance. This makes the circuit breakers ideal for use in standard machine production. The electronic circuit breaker distributes and monitors the load current over several current circuits. Overloads and short circuits on an output are reliably recognized. The electronics permit brief current peaks and switch longer overloads off. The tripping current for each output can be individually set in 6 steps only with a higher-level control system (e.g. PLC). The outputs are activated depending on the time delay and load to avoid an overload current. If the rated current is exceeded for a certain amount of time, the output will be switched off automatically and can be reactivated after a waiting time (thermal relaxation) using the pushbutton or the remote signal input S1. The pushbutton can also be used to switch the output manually. It is possible to read out the state of each output using the three signal contacts. The state of each output is also indicated with a multi-colored LED.

Standards

Electronic circuit breaker
UL 508, UL 2367

Safety:
EN 60950-1, EN 50178,
EN/IEC 60204-1

EMC:
EN 61000-6-2, EN 61000-6-3

Safety extra-low voltage (SELV/PELV):
IEC 60364-4-41 (DIN VDE 0100-410)

CE acc. to 2004/108/EG (EMC-Directive)

Approvals

UL 2367 (E-File: E356250)UL 508 (E-File: E219022)GL

Electronic circuit breaker with thermomagnetic characteristic
ECONOMY REMOTE

ePLAN data portal

BLOCK Website

Electrical data

Typ	PM-3724-200-0	PM-3724-400-0	PC-3724-800-0
Input			
Input rated voltage	24 Vdc	24 Vdc	24 Vdc
Input voltage range	18 - 30 Vdc	18 - 30 Vdc	18 - 30 Vdc
Maximal residual ripple of supplied input voltage	3 %	3 %	3 %
Required input voltage for turning-on of outputs	19.5 V (Turn-off Threshold 18 V)	19.5 V (Turn-off Threshold 18 V)	19.5 V (Turn-off Threshold 18 V)
Max. total input current	20 A	40 A	70 A
Max. input current for each pole of terminal	40 A	40 A	40 A
Over voltage protection	Suppressor diode 33 V	Suppressor diode 33 V	Suppressor diode 33 V
Stand-by current	35 mA @ 24 V	35 mA @ 24 V	55 mA @ 24 V
Power losses in stand-by mode	0.84 W @ 24 V	0.84 W @ 24 V	1.32 W @ 24 V
Output			
Output rated voltage	24 Vdc	24 Vdc	24 Vdc
Output rated current	2 x (2, 3, 6, 8,10 A)	4 x (2, 3, 6, 8,10 A)	8 x (2, 3, 6, 8,10 A)
Maximum voltage drop between input and output	200 mV @ 2 x 10 A	200 mV @ 4 x 10 A	200 mV @ 8 x 10 A
Initialization time of module	250 ms	250 ms	250 ms
Turn-on delay of outputs	Load dependent, min. 50 ms / max. 5 s	Load dependent, min. 50 ms / max. 5 s	Load dependent, min. 50 ms / max. 5 s
Waiting periode after switch-off of an output	500 ms (short circuit) . . 10 s (overload)	500 ms (short circuit) . . 10 s (overload)	500 ms (short circuit) . . 10 s (overload)
Max. power losses	5.5 W @ 2 x 10 A	10 W @ 4 x 10 A	20 W @ 8 x 10 A
Efficiency	99.0 %	99.0 %	99.0 %
Internal output fuse	15 A	15 A	15 A
Resistance to reverse feed max.	35 Vdc	35 Vdc	35 Vdc
Parallel use of outputs	Not allowed	Not allowed	Not allowed
Serial use of outputs	Not allowed	Not allowed	Not allowed
Signaling			
Status indicator	LED (red, green, orange)	LED (red, green, orange)	LED (red, green, orange)
Signal input S1	DC 24 V (On/Off/Reset)	DC 24 V (On/Off/Reset)	DC 24 V (On/Off/Reset)
Signal output S2	DC 24 V, max. 25 mA (status output channels)	DC 24 V, max. 25 mA (status output channels)	DC 24 V, max. 25 mA (status output channels)
Signal output S3	DC 24 V, max. 25 mA (Common signalling output)	DC 24 V, max. 25 mA (Common signalling output)	DC 24 V, max. 25 mA (Common signalling output)
Environment			
Storage temperature	-25 °C ... +85 °C	-25 °C ... +85 °C	-25 °C ... +85 °C
Ambient temperature	-25° C ... +70° C	-25° C ... +70° C	-25° C ... +70° C
Derating	-	Max. output current per channel: 10 A Total current (all channels togehther): max. 40A @ 40°C max. 35A @ 50°C max. 25A @ 60°C max. 20A @ 70°C	Max. output current per channel: 10 A Total current (all channels togehther): max. 50A @ 60°C max. 40A @ 70°C
Type of cooling	Natural convection	Natural convection	Natural convection
Required minimum spacing (left/right)	0 mm	0 mm	0 mm
Required minimum spacing (over/under)	40 mm	40 mm	40 mm
Safety and protection			
Protection index	IP 20	IP 20	IP 20
Safety class	III, without PE connection	III, without PE connection	III, without PE connection
Degree of pollution	2	2	2
Order numbers			
Order Number	**PM-3724-200-0**	**PM-3724-400-0**	**PC-3724-800-0**

Electronic circuit breaker with thermomagnetic characteristic
ECONOMY REMOTE

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Mechanical data

Typ	Mounting position	Terminals signalling (direct plug-in technology Push-in)	Input terminals (2 x "-"), 1) direct plug-in technology Push-in	Input terminals (2 x "+"), 1) direct plug-in technology Push-in	Output terminals ("+ "), direct plug-in technoligy Push-in	Weight	Dimension (W x H x D)	Dimension picture (in mm)	A	B	C	D	E	F
PM-3724-200-0	horizontal for standard rail DIN TS35	max. 2,5 mm²	max. 2,5 mm²	max. 6 mm²	max. 2,5 mm²	0.20 kg	45 x 90 x 90.5 mm	1	90	45	3	45	91.5	99
PM-3724-400-0	horizontal for standard rail DIN TS35	max. 2,5 mm²	max. 2,5 mm²	max. 6 mm²	max. 2,5 mm²	0.20 kg	45 x 90 x 90.5 mm	1	90	45	3	45	91.5	99
PC-3724-800-0	horizontal for standard rail DIN TS35	max. 2,5 mm²	max. 2,5 mm²	max. 6 mm²	max. 2,5 mm²	0.40 kg	42 x 127 x 116.5 mm	1	127	63.5	3	42	116.5	124

Dimension pictures

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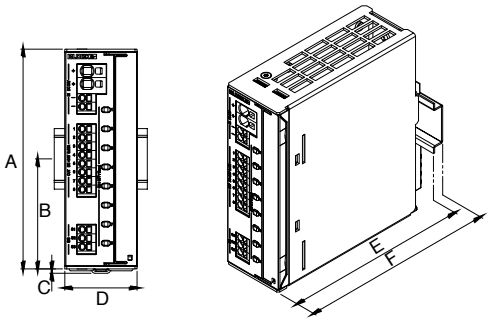

Electronic circuit breaker with current limiting
BASIC SMART

General Data

Nominal input voltage 24 Vdc
Output channels 2 / 4 / 8
Tripping current 0.5 - 6 A / 2 - 12 A
Active current limiting typ. 1,7 x Irated
Ambient temperature -25 °C to +70 °C
Protection index IP 20
Efficiency typ. 99 %

Advantages

Adjustable tripping current for each output channel via current selector switch
Selective immediate switch off of defective circuits in the event of critical supply voltage
Sequential and load-dependent switching-on of channels
Comprehensive single-channel-diagnostics and remote switching on/off of each output channel via 2-wire-interface
Further diagnoses of input voltage and the current of each circuit
Group alarm contact

Applications

The BASIC SMART circuit breakers guarantee maximum system availability. In the event of overload, only the faulty current paths are reliably switched off without affecting the remaining circuits thanks to active current limiting to 1.7 times the rated current. The electronic circuit breaker distributes and monitors the load current over several current circuits. Overloads and short circuits on an output are reliably recognized. The electronics permit brief current peaks and switch longer overloads off. The rated current for each output can be individually set with a current selector switch accessible from the front. The outputs are activated depending on the time delay and load to avoid an overload current. If the rated current is exceeded for a certain amount of time, the output will be switched off automatically and can be reactivated after a waiting time (thermal relaxation) using the pushbutton or the remote signal input S1. The pushbutton can also be used to switch the output manually. It is possible to read out the state of each output using the three signal contacts. The state of each output is also indicated with a multi-colored LED.

Standards

Electronic circuit breaker
UL 508, UL 2367

Safety:
EN 60950-1, EN 50178,
EN/IEC 60204-1

EMC:
EN 61000-6-2, EN 61000-6-3

Safety extra-low voltage (SELV/PELV):
IEC 60364-4-41 (DIN VDE 0100-410)
CE acc. to 2004/108/EG (EMC-Directive)

Approvals

UL 2367 (E-File: E356250)UL 508 (E-File: E219022)GL

Electronic circuit breaker with current limiting
BASIC SMART

Electrical data

Typ	PM-0824-120-0	PM-0824-240-0	PM-0824-240-2	PC-0824-480-0
Input				
Input rated voltage	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Input voltage range	18 - 30 Vdc	18 - 30 Vdc	18 - 30 Vdc	18 - 30 Vdc
Maximal residual ripple of supplied input voltage	3 %	3 %	3 %	3 %
Required input voltage for turning-on of outputs	19.5 V (Turn-off Threshold 18 V)	19.5 V (Turn-off Threshold 18 V)	19.5 V (Turn-off Threshold 18 V)	19.5 V (Turn-off Threshold 18 V)
Max. total input current	12 A	24 A	24 A	48 A
Max. input current for each pole of terminal	40 A	40 A	40 A	40 A
Over voltage protection	Suppressor diode 33 V	Suppressor diode 33 V	Suppressor diode 33 V	Suppressor diode 33 V
Stand-by current	32 mA @ 24 V	32 mA @ 24 V	22.7 mA @ 24 V	48 mA @ 24 V
Power losses in stand-by mode	0.77 W @ 24 V	0.77 W @ 24 V	0.55 W @ 24 V	1.15 W @ 24 V
Output				
Output rated voltage	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Output rated current	2 x 0.5 - 6 A	4 x 0.5 - 6 A	2 x 2 - 12 A	8 x 0.5 - 6 A
Maximum voltage drop between input and output	145 mV @ 2 x 6 A	145 mV @ 4 x 6 A	210 mV @ 2 x 12 A	155 mV @ 8 x 6 A
Initialization time of module	250 ms	250 ms	250 ms	250 ms
Turn-on delay of outputs	Load dependent, min. 50 ms / max. 5 s	Load dependent, min. 50 ms / max. 5 s	Load dependent, min. 50 ms / max. 5 s	Load dependent, min. 50 ms / max. 5 s
Waiting periode after switch-off of an output	500 ms (short circuit) . . 10 s (overload)	500 ms (short circuit) . . 10 s (overload)	500 ms (short circuit) . . 10 s (overload)	500 ms (short circuit) . . 10 s (overload)
Max. power losses	2.5 W @ 2 x 6 A	4.3 W @ 4 x 6 A	5.58 W @ 2 x 12 A	8.6 W @ 8 x 6 A
Efficiency	99.0 %	99.0 %	99.0 %	99.0 %
Internal output fuse	15 A	15 A	15 A	15 A
Resistance to reverse feed max.	35 Vdc	35 Vdc	35 Vdc	35 Vdc
Parallel use of outputs	Not allowed	Not allowed	Not allowed	Not allowed
Serial use of outputs	Not allowed	Not allowed	Not allowed	Not allowed
Signaling				
Status indicator	LED (red, green, orange)	LED (red, green, orange)	LED (red, green, orange)	LED (red, green, orange)
Signal input S1	24 Vdc (On/Off/Reset)	24 Vdc (On/Off/Reset)	24 Vdc (On/Off/Reset)	24 Vdc (On/Off/Reset)
Signal output S2	24 Vdc, max. 25mA (status output channels)	24 Vdc, max. 25mA (status output channels)	24 Vdc, max. 25mA (status output channels)	24 Vdc, max. 25mA (status output channels)
Signal output S3	24 Vdc, max 25mA (Common signalling output)	24 Vdc, max 25mA (Common signalling output)	24 Vdc, max 25mA (Common signalling output)	24 Vdc, max 25mA (Common signalling output)
Approvals				
Approvals	cURus, cULus, GL	cURus, cULus, GL	cURus, cULus, GL	cURus, cULus, GL
Environment				
Storage temperature	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C
Ambient temperature	-25° C to +70° C	-25° C to +70° C	-25° C to +70° C	-25° C to +70° C
Derating	-	-	-	-
Type of cooling	Natural convection	Natural convection	Natural convection	Natural convection
Required minimum spacing (left/right)	0 mm	0 mm	0 mm	0 mm
Required minimum spacing (over/under)	40 mm	40 mm	40 mm	40 mm
Safety and protection				
Protection index	IP 20	IP 20	IP 20	IP 20
Safety class	III, without PE connection	III, without PE connection	III, without PE connection	III, without PE connection
Degree of pollution	2	2	2	2
Order numbers				
Order Number	**PM-0824-120-0**	**PM-0824-240-0**	**PM-0824-240-2**	**PC-0824-480-0**

Electronic circuit breaker with current limiting
BASIC SMART

Electrical data

Typ	PM-0824-480-0
Input	
Input rated voltage	24 Vdc
Input voltage range	18 - 30 Vdc
Maximal residual ripple of supplied input voltage	3 %
Required input voltage for turning-on of outputs	19.5 V (Turn-off Threshold 18 V)
Max. total input current	48 A
Max. input current for each pole of terminal	40 A
Over voltage protection	Suppressor diode 33 V
Stand-by current	32 mA @ 24 V
Power losses in stand-by mode	0.77 W @ 24 V
Output	
Output rated voltage	24 Vdc
Output rated current	4 x 2 - 12 A
Maximum voltage drop between input and output	240 mV @ 4 x 12 A
Initialization time of module	250 ms
Turn-on delay of outputs	Load dependent, min. 50 ms / max. 5 s
Waiting periode after switch-off of an output	500 ms (short circuit) . . 10 s (overload)
Max. power losses	12.3 W @ 4 x 12 A
Efficiency	99.0 %
Internal output fuse	15 A
Resistance to reverse feed max.	35 Vdc
Parallel use of outputs	Not allowed
Serial use of outputs	Not allowed
Signaling	
Status indicator	LED (red, green, orange)
Signal input S1	24 Vdc (On/Off/Reset)
Signal output S2	24 Vdc, max. 25mA (status output channels)
Signal output S3	24 Vdc, max 25mA (Common signalling output)
Approvals	
Approvals	cURus, cULus, GL
Environment	
Storage temperature	-25 °C to +85 °C
Ambient temperature	-25° C to +70° C
Derating	-
Type of cooling	Natural convection
Required minimum spacing (left/right)	0 mm
Required minimum spacing (over/under)	40 mm
Safety and protection	
Protection index	IP 20
Safety class	III, without PE connection
Degree of pollution	2
Order numbers	
Order Number	**PM-0824-480-0**

Electronic circuit breaker with current limiting
BASIC SMART

Mechanical data

Typ	Mounting position	Terminals signalling, 1) direct plug-in technology Push-in 2) pluggable, WAGO series 721	Input terminals (2 x "-"), 1) direct plug-in technology Push-in 2) pluggable, WAGO series 721	Input terminals (2 x "+"), 1) direct plug-in technology Push-in 2) pluggable, WAGO series 831	Output terminals ("+"), 1) direct plug-in technology Push-in 2) pluggable, WAGO series 721	Weight	Dimension picture (in mm)	A	B	C	D	E	F	G
PM-0824-120-0	horizontal for standard rail DIN TS35	1) max 2,5 mm²	1) max 2,5 mm²	1) max 6 mm²	1) max 2,5 mm²	0.2 kg	1	90	45	45	3	3.5	91.5	99
PM-0824-240-0	horizontal for standard rail DIN TS35	1) max 2,5 mm²	1) max 2,5 mm²	1) max 6 mm²	1) max 2,5 mm²	0.2 kg	1	90	45	45	3	3.5	91.5	99
PM-0824-240-2	horizontal for standard rail DIN TS35	1) max. 2,5 mm²	1) max. 2,5 mm²	1) max. 6 mm²	1) max. 2,5 mm²	0.2 kg	1	90	45	45	3	3.5	91.5	99
PC-0824-480-0	horizontal for standard rail DIN TS35	1) max. 2,5 mm²	1) max. 2,5 mm²	1) max. 6 mm²	1) max. 2,5 mm²	0.4 kg	3	127	63.5	42	3	116.5	124	-
PM-0824-480-0	horizontal for standard rail DIN TS35	1) max. 2,5 mm²	1) max. 2,5 mm²	1) max. 6 mm²	1) max. 2,5 mm²	0.2 kg	1	90	45	45	3	3.5	91.5	99

Dimension pictures

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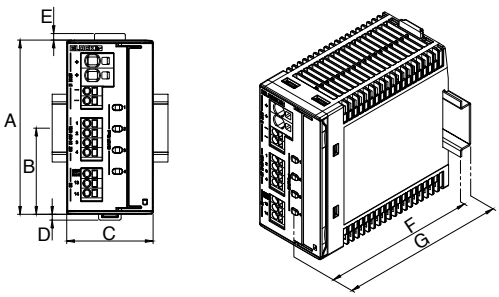

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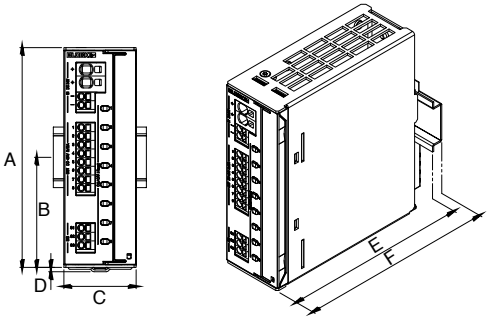

Electronic circuit breaker with current limiting and non-adjustable tripping currents
BASIC FIX

General Data

Nominal input voltage 24 Vdc
Output channels 2 / 4
Fixed tripping current
Active current limiting typ. 1,3 x Irated
Ambient temperature -25 °C to +70 °C
Protection index IP 20
Efficiency typ. 99 %

Advantages

Selective immediate switch off of defective circuits in the event of critical supply voltage
Sequential and load-dependent switching-on of channels
Comprehensive single-channel-diagnostics and remote switching on/off of each output channel via 2-wire-interface
Group alarm contact

Applications

If circuits are designed with the same safety values in a number of applications, the BASIC FIX circuit breakers represent the most economical basis. Different rated current combinations enable use in a wide range of applications. Each channel features active current limiting to 1.3 times the fixed preset rated current. The electronic circuit breaker distributes and monitors the load current over several current circuits. Overloads and short circuits on an output are reliably recognized. The electronics permit brief current peaks and switch longer overloads off. The outputs are activated depending on the time delay and load to avoid an overload current. If the rated current is exceeded for a certain amount of time, the output will be switched off automatically and can be reactivated after a waiting time (thermal relaxation) using the pushbutton or the remote signal input S1. The pushbutton can also be used to switch the output manually. It is possible to read out the state of each output using the three signal contacts. The state of each output is also indicated with a multi-colored LED.

Standards

Electronic circuit breaker
UL 508, UL 2367

Safety:
EN 60950-1, EN 50178,
EN/IEC 60204-1

EMC:
EN 61000-6-2, EN 61000-6-3

Safety extra-low voltage (SELV/PELV):
IEC 60364-4-41 (DIN VDE 0100-410)
CE acc. to 2004/108/EG (EMC-Directive)

Approvals

UL 2367 (E-File: E356250)UL 508 (E-File: E219022)GL

Electronic circuit breaker with current limiting and non-adjustable tripping currents
BASIC FIX

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Electrical data

Typ	PM-2824-120-0	PM-2824-180-0	PM-2824-240-0	PM-9824-076-0
Special features				
Characteristics	-	-	-	For establishing NEC Class 2 circuits
Input				
Input rated voltage	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Input voltage range	18 - 30 Vdc	18 - 30 Vdc	18 - 30 Vdc	20 - 28,8 Vdc
Maximal residual ripple of supplied input voltage	3 %	3 %	3 %	3 %
Required input voltage for turning-on of outputs	19.5 V (Turn-off Threshold 18 V)	19.5 V (Turn-off Threshold 18 V)	19.5 V (Turn-off Threshold 18 V)	20 V (Turn-off Threshold 18 V)
Max. total input current	12 A	18 A	24 A	7,6 A
Max. input current for each pole of terminal	40 A	40 A	40 A	40 A
Over voltage protection	Suppressor diode 33 V	Suppressor diode 33 V	Suppressor diode 33 V	Suppressor diode 33 V
Stand-by current	32 mA @ 24 V	32 mA @ 24 V	32 mA @ 24 V	32 mA @ 24 V
Power losses in stand-by mode	0.77 W @ 24 V	0.77 W @ 24 V	0.77 W @ 24 V	0.65 W @ 24 V
Output				
Output rated voltage	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Output rated current	2 x 6 A	2 x 6 A + 2 x 3 A	4 x 6 A	2 x 3,8 A (NEC Class 2)
Maximum voltage drop between input and output	145 mV @ 2 x 6 A	145 mV @ 18 A	145 mV @ 4 x 6 A	125 mV @ 2 x 3.8 A
Initialization time of module	250 ms	250 ms	250 ms	250 ms
Turn-on delay of outputs	Load dependent, min. 50 ms / max. 5 s	Load dependent, min. 50 ms / max. 5 s	Load dependent, min. 50 ms / max. 5 s	Load dependent, min. 50 ms / max. 5 s
Waiting periode after switch-off of an output	500 ms (short circuit) . . 10 s (overload)	500 ms (short circuit) . . 10 s (overload)	500 ms (short circuit) . . 10 s (overload)	500 ms (short circuit) . . 10 s (overload)
Max. power losses	2.5 W @ 2 x 6 A	3.6 W @ 18 A	4.3 W @ 4 x 6 A	1.6 W @ 2 x 3.8 A
Efficiency	99.0 %	99.0 %	99.0 %	99.0 %
Internal output fuse	15 A	15 A	15 A	15 A
Resistance to reverse feed max.	35 Vdc	35 Vdc	35 Vdc	35 Vdc
Parallel use of outputs	Not allowed	Not allowed	Not allowed	Not allowed
Serial use of outputs	Not allowed	Not allowed	Not allowed	Not allowed
Signaling				
Status indicator	LED (red, green, orange)	LED (red, green, orange)	LED (red, green, orange)	LED (red, green, orange)
Signal input S1	24 Vdc (On/Off/Reset)	24 Vdc (On/Off/Reset)	24 Vdc (On/Off/Reset)	24 Vdc (On/Off/Reset)
Signal output S2	24 Vdc, max. 25mA (status output channels)	24 Vdc, max. 25mA (status output channels)	24 Vdc, max. 25mA (status output channels)	24 Vdc, max. 25mA (status output channels)
Signal output S3	24 Vdc, max 25mA (Common signalling output)	24 Vdc, max 25mA (Common signalling output)	24 Vdc, max 25mA (Common signalling output)	24 Vdc, max 25mA (Common signalling output)
Approvals				
Approvals	cURus, cULus, GL	cURus, cULus, GL	cURus, cULus, GL	cURus, cULus, GL
Environment				
Storage temperature	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C	-25 °C to +85 °C
Ambient temperature	-25 °C to +70 °C	-25 °C to +70 °C	-25 °C to +70 °C	-25 °C to +70 °C
Derating	-	-	-	-
Type of cooling	Natural convection	Natural convection	Natural convection	Natural convection
Required minimum spacing (left/right)	0 mm	0 mm	0 mm	0 mm
Required minimum spacing (over/under)	40 mm	40 mm	40 mm	40 mm
Safety and protection				
Protection index	IP 20	IP 20	IP 20	IP 20
Safety class	III, without PE connection	III, without PE connection	III, without PE connection	III, without PE connection
Degree of pollution	2	2	2	2
Order numbers				
Order Number	**PM-2824-120-0**	**PM-2824-180-0**	**PM-2824-240-0**	**PM-9824-076-0**

Electronic circuit breaker with current limiting and non-adjustable tripping currents
BASIC FIX

Typ	PM-9824-152-0
Special features	
Characteristics	For establishing NEC Class 2 circuits
Input	
Input rated voltage	24 Vdc
Input voltage range	20 - 28,8 Vdc
Maximal residual ripple of supplied input voltage	3 %
Required input voltage for turning-on of outputs	20 V (Turn-off Threshold 18 V)
Max. total input current	15,2 A
Max. input current for each pole of terminal	40 A
Over voltage protection	Suppressor diode 33 V
Stand-by current	34 mA @ 24 V
Power losses in stand-by mode	0.82 W @ 24 V
Output	
Output rated voltage	24 Vdc
Output rated current	4 x 3,8 A @ 24 V (NEC Class 2)
Maximum voltage drop between input and output	150 mV @ 4 x 3.8 A
Initialization time of module	250 ms
Turn-on delay of outputs	Load dependent, min. 50 ms / max. 5 s
Waiting periode after switch-off of an output	500 ms (short circuit) . . 10 s (overload)
Max. power losses	3,1 W @ 4 x 3.6 A
Efficiency	99.0 %
Internal output fuse	15 A
Resistance to reverse feed max.	35 Vdc
Parallel use of outputs	Not allowed
Serial use of outputs	Not allowed
Signaling	
Status indicator	LED (red, green, orange)
Signal input S1	24 Vdc (On/Off/Reset)
Signal output S2	24 Vdc, max. 25mA (status output channels)
Signal output S3	24 Vdc, max 25mA (Common signalling output)
Approvals	
Approvals	cURus, cULus, GL
Environment	
Storage temperature	-25 °C to +85 °C
Ambient temperature	-25 °C to +70 °C
Derating	-
Type of cooling	Natural convection
Required minimum spacing (left/right)	0 mm
Required minimum spacing (over/under)	40 mm
Safety and protection	
Protection index	IP 20
Safety class	III, without PE connection
Degree of pollution	2
Order numbers	
Order Number	**PM-9824-152-0**

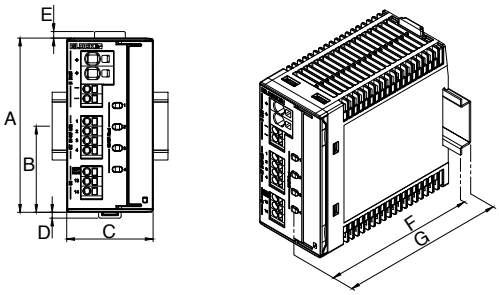
Electronic circuit breaker with current limiting and non-adjustable tripping currents
BASIC FIX

Mechanical data 30

Typ	Input terminals (2 x "-"), 1) direct plug-in technology Push-in	Input terminals (2 x "+"), 1) direct plug-in technology Push-in	Output terminals ("+ "), direct plug-in technology Push-in	Terminals signalling (direct plug-in technology Push-in)	Mounting position	Weight	Dimension (W x H x D)	Dimension picture (in mm)	A	B	C	D	E	F	G
PM-2824-120-0	max 2,5 mm²	max 6 mm²	max 2,5 mm²	max 2,5 mm²	horizontal for standard rail DIN TS35	0.2 kg	45 x 90 x 91.5 mm	1	90	45	45	3	3.5	91.5	99
PM-2824-180-0	max 2,5 mm²	max 6 mm²	max 2,5 mm²	max 2,5 mm²	horizontal for standard rail DIN TS35	0.2 kg	45 x 90 x 91,5 mm	1	90	45	45	3	3.5	91.5	99
PM-2824-240-0	max. 2,5 mm²	max. 6 mm²	max. 2,5 mm²	max. 2,5 mm²	horizontal for standard rail DIN TS35	0.2 kg	45 x 90 x 91.5 mm	1	90	45	45	3	3.5	91.5	99
PM-9824-076-0	max 2,5 mm²	max. 6 mm²	max 2,5 mm²	max 2,5 mm²	horizontal for standard rail DIN TS35	0.2 kg	42 x 127 x 116,5 mm	1	90	45	45	3	3.5	91.5	99
PM-9824-152-0	max 2,5 mm²	max 6 mm²	max 2,5 mm²	max 2,5 mm²	horizontal for standard rail DIN TS35	0.2 kg	42 x 127 x 116,5 mm	1	90	45	45	3	3.5	91.5	99

Dimension pictures

1



Redundancy module
PELR

General Data

Input rated voltage 12 - 24 Vdc
Output rated voltage 12 - 24 Vdc
Output rated current 2 x 5/1 x 10 A
Ambient temperature -25 °C to +55 °C
Efficiency typ. 97 %
Protection index IP 20

Advantages

- Signalling via LEDs
- Service-friendly spring-loaded connector system

Applications

Redundancy module for decoupling two power supplies for building a fail-safe supply system. Set of machines and equipment requiring high operational reliability.

Standards

Redundancy module
to UL 60950, UL 508

Safety:
EN 60950 (SELV), EN 60204 (PELV)

EMC:
EN 61000-6-3 (Interference emissions), EN 61000-6-2 (Interference immunity)

Redundancy module
PELR

ePLAN data portal | BLOCK Website

Electrical data

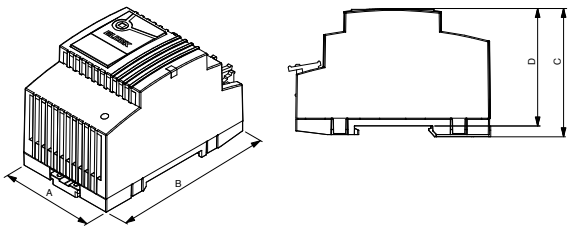
Typ	PELR 24/24-5
Input	
Input rated voltage	24 Vdc
Input voltage range	11 - 30 Vdc
Input rated current	2 x 5 A / 1 x 10 A
Output	
Output rated voltage	Uin-0,7 V@10 A
Output voltage	Uin-0,7 Vdc@10 A
Resistance to reverse feed max.	35 Vdc
Output rated current	10 A
Internal fuse	No
Parallel connection	Yes
max. Power loss idling/nominal load	1 / 7 W (10 A)
Efficiency	97 %
Signaling	
Operating status	LED green
Environment	
Ambient temperature	-25 °C to +55 °C
Storage temperature	-25° C to +85° C
Safety and protection	
Protection index	IP 20
Safety class	III
Order numbers	
Order Number	**PELR 24/24-5**

Mechanical data

Typ	Terminals input, (spring clamp terminal, pluggable)	Terminals output, (spring clamp terminal, pluggable)	Mounting position	Fixing method	Weight	Dimension picture (in mm)	A	B	C	D
PELR 24/24-5	max. 2.5 mm²	max. 2.5 mm²	vertical	DIN Rail system TS35	0.16 kg	❶	72	89	59	54

Dimension pictures

❶



Redundancy module Power Compact
PC RE

General Data

Input rated voltage 24 - 48 Vdc
Output rated voltage 24 - 48 Vdc
Output rated current 40 A
Ambient temperature -40 °C to +70 °C
Efficiency >99 %
Protection index IP 20

Advantages

High efficiency
Error message via relay contact and LEDs
Safe parallel operation to increase power
Fully compatible with Top and Power Boost for your power supplies
Active operation for minimal power loss even in the event of a short-circuit on the secondary side
Based on Mosfet technology

Applications

Redundancy module for decoupling from two power supplies on installation of a fail-safe power supply system. For machines and systems which place high requirements on operational safety.

Standards

Redundancy module
to UL 60950, UL 508

Safety:
EN 60950 (SELV), EN 60204 (PELV)

EMC:
EN 61000-6-3 (Interference emissions), EN 61000-6-2 (Interference immunity)

Approvals

UL 60950 (prepared), UL 508 (prepared), GL (prepared)

Redundancy module Power Compact
PC RE

Electrical data

Typ	PC-0624-400-0	PC-0648-400-0
Input		
Input rated voltage	24 Vdc	48 Vdc
Input voltage range	10 - 36 Vdc	33 - 56 Vdc
Input rated current	2 x 20 A / 1 x 40 A	2 x 20 A
Output		
Output rated voltage	24 Vdc	48 Vdc
Output voltage range	10 - 36 Vdc	33 - 56 Vdc
Voltage drop	max. 100 mV	max. 100 mV
Resistance to reverse feed max.	37 Vdc	58 Vdc
Output rated current	40.00 A	40.00 A
Internal fuse	No	No
Power Boost	200 A, 50 ms / 120 A, 4 s / 100 A, 8 s	160 A, 50 ms / 60 A, 4 s / 50 A, 8 s
Parallel connection	Yes	Yes
max. Power loss idling/nominal load	1,5 W / 9,5 W	1,5 W / 9,5 W
Efficiency	99,5%	99,5%
Signaling		
Power Good (DC OK)	Green LED per input	Green LED per input
Potential free signal contact	N/O contact	N/O contact
Approvals		
Approvals	UL 60950/ UL508 (prepared), GL (prepared)	UL 60950/ UL508 (prepared), GL (prepared)
Environment		
Ambient temperature	-40 °C to +70 °C	-40 °C to +70 °C
Storage temperature	-25 °C to +85 °C	-25 °C to +85 °C
Derating	-	-1,5 %/K > +65 °C
Climatic category	3k3	3k3
Required minimum spacing (left/right)	0 mm	0 mm
Type of cooling	convection	convection
Required minimum spacing (over/under)	50 mm	50 mm
Degree of pollution	2	2
Relative humidity	5 - 96 %	5 - 96 %
MTBF @ 50 °C/500 V (Mil-HB-217F)	>500.000h	>500.000h
Safety and protection		
Protection index	IP 20	IP 20
Safety class (prepared)	III, without PE connection	III, without PE connection
Reverse connection protection	Yes	Yes
Order numbers		
Order Number	**PC-0624-400-0**	**PC-0648-400-0**

Redundancy module Power Compact
PC RE

Mechanical data

Typ	Terminals input (direct plug-in technology Push-in)	Terminals output (direct plug-in technology Push-in)	Terminals signaling	Fixing method	Mounting position	Weight	Dimension picture (in mm)	A	B	C	D	E	F
PC-0624-400-0	max. 16 mm²	max. 16 mm²	max. 2,5 mm²	DIN Rail system TS35	vertical	0.37 kg	1	127	63.5	5	42	120	112.5
PC-0648-400-0	max. 16 mm²	max. 16 mm²	max. 2,5 mm²	DIN Rail system TS35	vertical	0.37 kg	1	127	63.5	5	42	120	112.5

Dimension pictures

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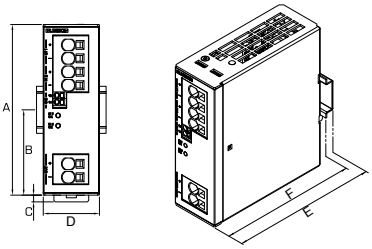


Uninterruptible power supply
PC Combi UPS

General Data

- Rated input voltage: 100 - 240 Vac
- Rated output voltage: 24 Vdc
- Rated output current: 5 A
- Recommended battery modules: 1.2 - 12 Ah
- Ambient temperature: -25 °C to +70 °C
- Protection index IP 20

Advantages

- Combined power supply with charging and controlling unit
- Fast tripping of conventional circuit breakers
- Battery modules get detected automatically
- Reliable signalling when there is low remaining life expectancy of connected battery modules
- Extended life expectancy through temperature controlled battery management
- Interface to visualise and adjust relevant data
- Reliable supply of industrial PC's

Applications

The uninterruptible power supply Power Compact contains an economic DC 24V/5A power supply with basic specifications for industrial computer and also a loading and controlling unit for an ideal battery management.

Standards

Uninterruptible power supply
to UL 60950, UL 508

Safety:
EN 60950, EN 60950 (SELV), EN 60204 (PELV)

EMC:
EN 61000-6-3 (Interference emissions), EN 61000-6-2 (Interference immunity)

Approvals

UL/CSA 60950 recognised (E213214), UL508 listed (E219022)Germanischer Lloyd prepared

Uninterruptible power supply
PC Combi UPS

Electrical data

Typ	PC-1024-050-0
Input	
Input rated voltage	100 - 240 Vac
Input voltage range	85 - 264 Vac (120 - 372 Vdc)
AC input derating	-1.5 % / Vac < 110 Vac
DC input derating	-1 % / Vdc < 150 Vdc
Rated frequency range	47 Hz - 63 Hz / 0 Hz
Input rated current (rated load)	1.96 A / 0.95 A (100 / 230 Vac)
Starting current limiter	< 30 A, NTC
Switch-on time	< 200 ms
Input fuse internal	4 A (time-lag)
Recommended back-up fuse (circuit breaker)	6 A, 10 A, 16 A, charakteristic B, C
Transient surge voltage protection	Varistor
Output	
Output rated current	5.00 A
Tripping of LS circuit breakers	max. B4
Parallel connection	Only with redundancy module, max. 5 A output current
Serial operation	Yes
Ripple factor	typ. 50 mVss
Output rated voltage	24 Vdc
Over-voltage-protection	typ. 38 Vdc
Rated output voltage (normal mode)	24 Vdc
Rated output voltage (buffer mode)	24 Vdc
Output voltage range (mains operation)	23 – 28.5 Vdc
Output voltage range (battery operation)	Battery voltage - 0.5 V (27.5 - 19 Vdc)
Output voltage limiting (mains operation)	typ. 6.5 A, constant current
Output voltage limiting (battery operation)	typ. 5.5 A
Power losses in mains operation (nominal load, battery charged)	22 W (100 Vac) 17W (230 Vac)
Max. power losses in battery operation (stand-by/nominal load)	3.2 W / 5.2 W
Storage medium	
Remote shutdown	Yes
Buffer period	1, 2, 3, 5, 10, 15, 20 Min, PC-Mode, Maximum, Individual
Type of the storage medium	Accumulator, external
Reverse connection protection	Yes, (fuse in battery module trips)
Charging characteristic	3-stage charging process (IUoU charging characteristic)
Charging current	max. 0.6 A
End-of-charge voltage	26...29,5 V temperature-controlled, adjustable via interface
Check for presence of battery	1 per minute
Check remaining battery life	6 per hour
Deep discharge protection	19 Vdc
Warning threshold, battery almost flat	20.4 Vdc
Recommended battery modules	1.2 - 12 Ah
Parallel connection of battery modules	Yes, max. 3
Signaling	
Status indicator	3 LED green/yellow/red
Isolated group input	max. 30 V / 200 mA current limiting (in 3 seperate signal outputs)
Alarm/Bat.Mode/Bat.Charge signal output	Relay, kill switch type, max. 30 V, function adjustable via interface
Approvals	

Uninterruptible power supply
PC Combi UPS

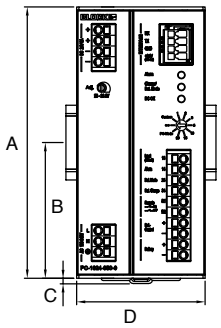
Typ	PC-1024-050-0
Approvals	
Approvals	cURus, cULus, GL
Environment	
Ambient temperature	-25 °C ... +70 °C
Storage temperature	-25 °C ... +85 °C
Derating	-3 %/K > +50 °C
Mounting position	horizontal for standard rail DIN TS35
Type of cooling	natural convection
Required minimum spacing (left/right)	0 mm
Required minimum spacing (over/under)	50 mm
Safety and protection	
Protection index	IP 20
Safety class	I, with PE connection
Resistance to reverse feed max.	35 Vdc
Order numbers	
Order Number	**PC-1024-050-0**

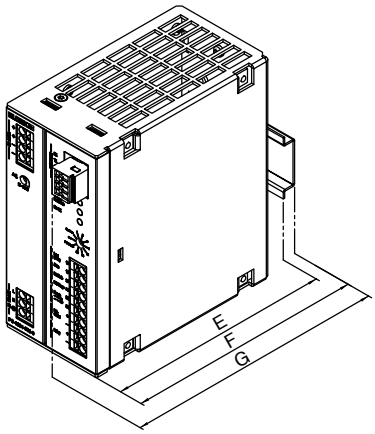
Electrical data

Typ	Terminals signalling (direct plug-in technology Push-in)	Terminals output (direct plug-in technology Push-in)	Terminals input (direct plug-in technology Push-in)	Terminals storage medium direct plug-in technology Push-in	Weight	Dimension picture (in mm)	A	B	C	D	E	F	G
PC-1024-050-0	max 2,5 mm²	max 2,5 mm²	max 2,5 mm²	max. 2,5 mm²	0.8 kg	1	127	63.5	3	60	118.5	126	136

Mechanical data

Dimension pictures





Uninterruptible power supply
PVUA

General Data

Input rated voltage 24 Vdc
Output rated voltage 24 Vdc
Output rated current 10 - 20 A
Ambient temperature -25 °C to +60 °C
Efficiency up to 97 %
Protection index IP 20

Advantages

Electronic overcurrent and short-circuit protection
Active current limiting in the event of an error
Automatic detection of connected battery module
Reliable early warning signal when battery life expectancy is declining
Extended life expectancy through temperature controlled battery management
Service-friendly spring-loaded connector system
Isolated signal contact
Reverse polarity protection
Exhaustive discharge protection for batteries
Interface to visualise and adjust relevant data
Current and voltage monitoring
Active signal outputs for function monitoring
RS-232 interface
Reliable supply of industrial PC's

Applications

The charge- and control unit controls and monitors the battery module, warns reliably if the live expectancy of the battery is low and provides information on the charge status und the remaining time during buffering. All relevant data can be shown on the integrated display or accessed thought the build in data interface.

Standards

Uninterruptible power supply
to UL 60950, UL 508

Safety:
EN 60950, EN 60950 (SELV), EN 60204 (PELV)

EMC:
EN 61000-6-3 (Interference emissions), EN 61000-6-2 (Interference immunity)

Approvals

UL/CSA 60950 recognised (E213214), UL508 listed (E219022)

Uninterruptible power supply
PVUA

Electrical data

Typ	PVUA 24/24-10	PVUA 24/24-20
Input		
Input rated voltage	24 Vdc	24 Vdc
Input voltage range	18 - 29 Vdc	18 - 29 Vdc
Current input (idle/charging/max.)	0.1 / 0.8 / 10.8 A	0.1 / 1.5 / 21.5 A
Switching threshold for buffer mode	20 - 25.5 Vdc	20 - 25.5 Vdc
Output		
Output voltage normal operation	typ. Uin - 1 Vdc (10 A)	typ. Uin - 1 Vdc (20 A)
Output voltage, battery mode	typ. battery voltage - 1 Vdc (10 A)	typ. battery voltage - 1 Vdc (20 A)
Output rated voltage	24 Vdc	24 Vdc
Resistance to reverse feed max.	35 Vdc	35 Vdc
Output rated current	10.00 A	20.00 A
Internal fuse	15 A (slow-blow)	30 A (slow-blow)
Overload behaviour	Constant current with cyclic shutdown	Constant current with cyclic shutdown
Parallel connection	No	No
Serial operation	No	No
max. Power loss idling/nominal load	15 / 20 W	15 / 30 W
Efficiency	typ. 95.4 %	typ. 96.3 %
Storage medium		
Type of the storage medium	Accumulator, external	Accumulator, external
Rated charging voltage	24 Vdc	24 Vdc
Charge voltage range	26 to 29.5 Vdc	26 to 29.5 Vdc
Temperaturnachführung der Ladespannung	automatical or manual	automatical or manual
Charging current	max. 0.6 A	max. 1.0 A
Recommended storage medium	24 Vdc / 1.2 Ah, 3.2 Ah, 7 Ah, 12 Ah	24 Vdc / 7 Ah, 12 Ah
Signaling		
Operating status	LED green, LED red, LED yellow	LED green, LED red, LED yellow
Potential free signal contact	Changeover contact, configurable	Changeover contact, configurable
Active signal outputs	3 x 24 Vdc, 2 configurable	3 x 24 Vdc, 2 configurable
Remote shutdown in buffer mode operation	Yes (break contact)	Yes (break contact)
Display, interface	Yes, RS 232	Yes, RS 232
Approvals		
Approvals	cURus, cULus	cURus, cULus
Environment		
Ambient temperature	-10° C to +60° C	-10° C to +60° C
Storage temperature	-25 °C to +85 °C	-25 °C to +85 °C
Safety and protection		
Protection index	IP 20	IP 20
Accessory		
Connector for signalling	PV-CON (optional)	PV-CON (optional)
Adapter cable for interface	PV-KOK2 (optional)	PV-KOK2 (optional)
Side DIN rail mounting	PV-TS35M (optional)	PV-TS35M (optional)
Direct screw fastening plate for lateral mounting	PV-WB2 (optional)	PV-WB2 (optional)
Order numbers		
Order Number	**PVUA 24/24-10**	**PVUA 24/24-20**

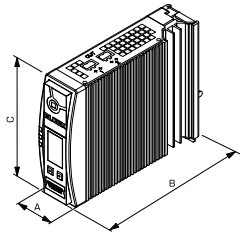
Uninterruptible power supply
PVUA

Mechanical data

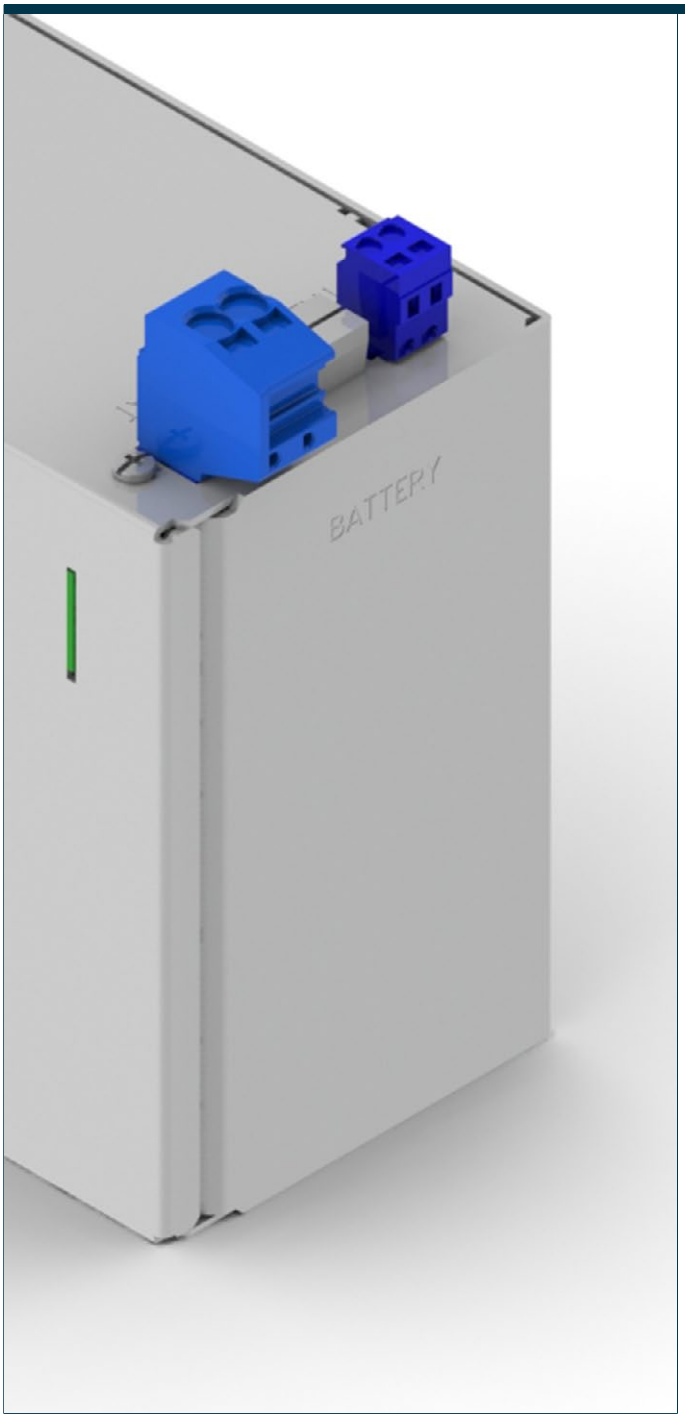
Typ	Terminals input, (spring clamp terminal, pluggable)	Terminals output, (spring clamp terminal, pluggable)	Terminals signalling, (spring clamp terminal, pluggable)	Terminals storage medium, (spring clamp terminal, pluggable)	Mounting position	Fixing method	Weight	Dimension picture (in mm)	A	B	C
PVUA 24/24-10	max. 2.5 mm²	max. 2.5 mm²	max. 0.5 mm²	max. 2.5 mm²	vertical	DIN Rail system TS35	0.80 kg	1	40	163.5	127
PVUA 24/24-20	max. 10 mm²	max. 10 mm²	max. 0.5 mm²	max. 10 mm²	vertical	DIN Rail system TS35	0.80 kg	1	57	163.5	127

Dimension pictures

1



Battery module
PBAT



General Data

- Input rated voltage 24 Vdc
- Output rated voltage 24 Vdc
- Protection index IP 20
- Ambient temperature -40 °C to +60 °C
- Lifetime 15 years / 20°C
- Battery module with pure lead rechargeable battery

Advantages

- Automatic detection of battery modules at UPS control unit
- Reliable early warning signal when battery life expectancy is declining
- Extended life expectancy through temperature controlled battery management
- Service-friendly spring-loaded connector system

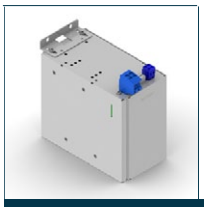
Applications

Battery module for setting up a secure 24 VDC supply following mains failure

Standards

Approvals

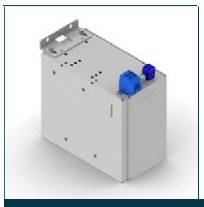
UL 508 (E219022) prepared



Battery module
PBAT

Electrical data

Typ	PBAT-1224-025-0	PBAT-1224-130-0
Input		
Input rated voltage	24 Vdc	24 Vdc
Rated capacitie	2.5 Ah	13.0 Ah
Output		
Output rated voltage	24 Vdc	24 Vdc
Output rated current	20 A	40 A
Internal fuse	1x 25 AT	2x 25 AT
Parallel connection	Yes	Yes
Storage medium		
End-of-charge voltage	27 Vdc	27 Vdc
Environment		
Ambient temperature	-40 °C...+60 °C	-40 °C...+60 °C
Storage temperature	-40 °C...+60 °C	-40 °C...+60 °C
Service life	15 years at +20 °C	15 years at +20 °C
Latest commissioning (only accumulators)	6 months at +30 °C to +40 °C	6 months at +30 °C to +40 °C
Safety and protection		
Protection index	IP 20	IP 20
Safety class	III	III
Order numbers		
Order Number	**PBAT-1224-025-0**	**PBAT-1224-130-0**



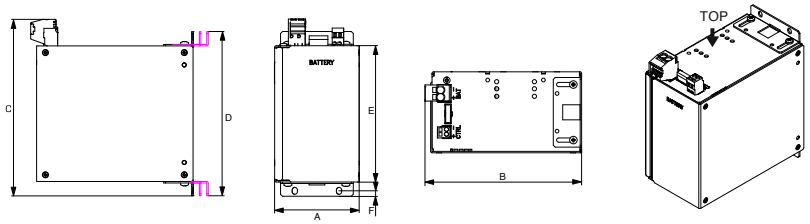
Battery module
PBAT

Mechanical data

Typ	Fixing method	Terminals Output	Terminals Input	Temperature sensor / communication connection	Weight	Width	Dimension picture (in mm)	A	B	C	D	E	F	G
PBAT-1224-025-0	Direct screw fastening (optional)	Wago series 831, max. 10 mm²	Wago series 831, max. 10 mm²	Wago Series 231, 5 mm²	3.80 kg	86 mm	❶	86	166	180.7	168	139	5.5	-
PBAT-1224-130-0	Direct screw joint	Wago series 831, max. 10 mm²	Wago series 831, max. 10 mm²	Wago series 231, max. 2,5 mm²	12.30 kg	226 mm	❷	226.5	199.5	186.5	163	132	144	110.7

Dimension pictures

❶



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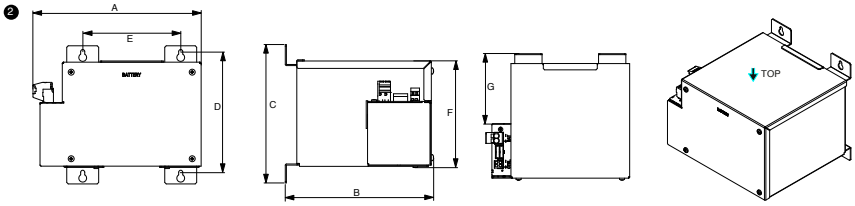
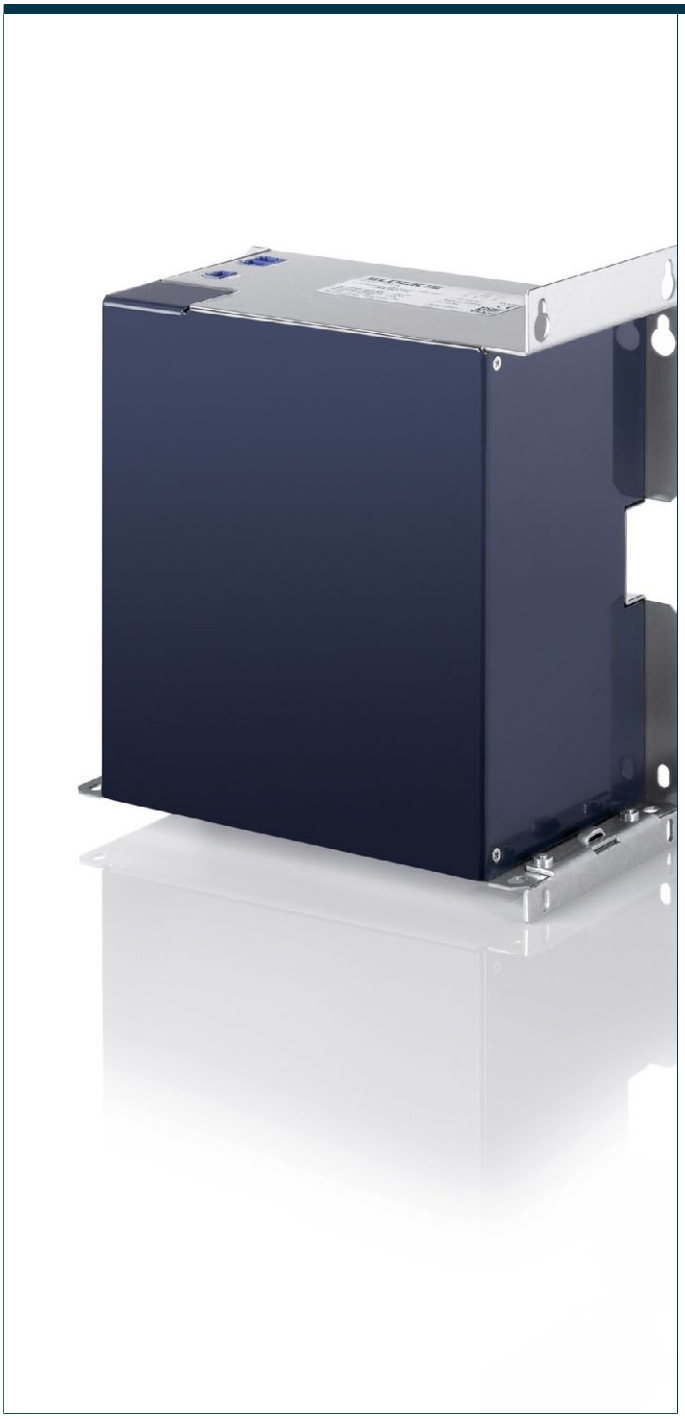


Battery module
PVA



General Data

Input rated voltage 24 Vdc
Output rated voltage 24 Vdc
Capacity 3.2 - 12 Ah
Ambient temperature -10 °C to +40 °C
Protection index IP 20

Advantages

Automatic detection of connected battery module
Reliable early warning signal when battery life expectancy is declining
Extended life expectancy through temperature controlled battery management
Service-friendly spring-loaded connector system

Applications

Battery module for building a secure 24 Vdc power supply in case of power failure.

Approvals

UL 508 (E219022)

Battery module
PVA

Electrical data

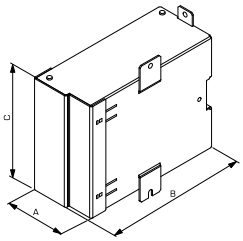
Typ	PVA 24/3,2Ah	PVA 24/7Ah	PVA 24/12Ah
Input			
Input rated voltage	24 Vdc	24 Vdc	24 Vdc
Rated capacitie	3.2 Ah	7.0 Ah	12.0 Ah
Output			
Output rated voltage	24 Vdc	24 Vdc	24 Vdc
Output rated current	max. 20.00 A	max. 40.00 A	max. 40.00 A
Internal fuse	25 A (slow-blow)	2 x 25 A (slow-blow)	2 x 25 A (slow-blow)
Parallel connection	Yes	Yes	Yes
Environment			
Ambient temperature	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C
Storage temperature	-20 °C to +40 °C	-20 °C to +40 °C	-20 °C to +40 °C
Service life	5 years at +20 °C	5 years at +20 °C	5 years at +20 °C
Latest commissioning (only accumulators)	6 months at +30 °C to +40 °C	6 months at +30 °C to +40 °C	6 months at +30 °C to +40 °C
Safety and protection			
Protection index	IP 20	IP 20	IP 20
Safety class	III, without PE connection	III, without PE connection	III, without PE connection
Order numbers			
Order Number	**PVA 24/3,2Ah**	**PVA 24/7Ah**	**PVA 24/12Ah**

Mechanical data

Typ	Terminals input / output (spring clamp terminal, pluggable)	Terminals temperature measurement, (spring clamp terminal, pluggable)	Fixing method	Weight	Dimension picture (in mm)	A	B	C
PVA 24/3,2Ah	max. 2.5 mm²	max. 2.5 mm²	Straps at the case	4.0 kg	❶	73	175.5	165
PVA 24/7Ah	max. 10 mm²	max. 2.5 mm²	Straps at the case	7.1 kg	❷	217.5	86	236
PVA 24/12Ah	max. 10 mm²	max. 2.5 mm²	Straps at the case	10.6 kg	❸	120.5	217.5	236

Dimension pictures

❶



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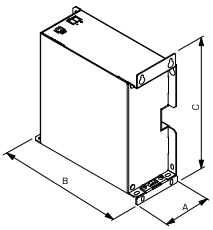

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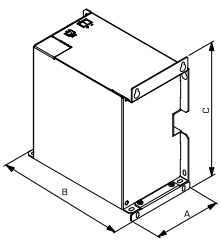


Battery module
PVAF

General Data

Input rated voltage 24 Vdc
Output rated voltage 24 Vdc
Capacity 0.8 - 12 Ah
Ambient temperature -10 °C to +40 °C
Protection index IP 20

Advantages

Automatic detection of battery modules at UPS control unit
Reliable early warning signal when battery life expectancy is declining
Extended life expectancy through temperature controlled battery management
Service-friendly spring-loaded connector system

Applications

Battery module for building a secure 24 Vdc power supply in case of power failure.

Approvals

UL 508 (E219022)

Battery module
PVAF

Electrical data

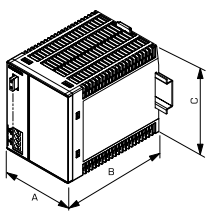
Typ	PVAF 24/0,8Ah	PVAF 24/1,2Ah	PVAF 24/3,2Ah	PVAF 24/7Ah	PVAF 24/12Ah
Input					
Input rated voltage	24 Vdc	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Rated capacitie	0.8 Ah	1.2 Ah	3.2 Ah	7.0 Ah	12.0 Ah
Output					
Output rated voltage	24 Vdc	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Output rated current	max. 5 A	max. 7.50 A	max. 20 A	max. 40 A	max. 40 A
Internal fuse	10 A (slow blow)	15 A (slow blow)	25 A (slow blow)	2x25 A (slow-blow)	2x25 A (slow-blow)
Parallel connection	Yes	Yes	Yes	Yes	Yes
Environment					
Ambient temperature	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C
Storage temperature	-20 °C to +40 °C	-20 °C to +40 °C	-20 °C to +40 °C	-20 °C to +40 °C	-20 °C to +40 °C
Service life	5 years at 20 °C	5 years at 20 °C	5 years at 20 °C	5 years at 20 °C	5 years at 20 °C
Latest commissioning (only accumulators)	6 months at 30 - 40 °C	6 months at 30 - 40 °C	6 months at 30 - 40 °C	6 months at 30 - 40 °C	6 months at 30 - 40 °C
Safety and protection					
Protection index	IP 20	IP 20	IP 20	IP 20	IP 20
Order numbers					
Order Number	**PVAF 24/0,8Ah**	**PVAF 24/1,2Ah**	**PVAF 24/3,2Ah**	**PVAF 24/7Ah**	**PVAF 24/12Ah**

Mechanical data

Terminal and mounting					
Terminals input / output (spring clamp terminal, pluggable)	max. 2.5 mm²	max. 2.5 mm²	max. 2.5 mm²	max. 10 mm²	max. 10 mm²
Terminals temperature measurement, (spring clamp terminal, pluggable)	max. 2.5 mm²	max. 2.5 mm²	max. 2.5 mm²	max. 2.5 mm²	max. 2.5 mm²
Fixing method	DIN Rail system TS35	DIN Rail system TS35	DIN Rail system TS35, screwed mounting	Straps at the case	Straps at the case
Measures and weights					
Weight	1.0 kg	1.8 kg	3.9 kg	5.9 kg	10.2 kg
Dimension picture (in mm)	❶	❷	❷	❸	❹
A	72	55	80	163	230
B	103.5	136	170.5	173.5	173.5
C	90	126.6	145	145	145

Dimension pictures

❶



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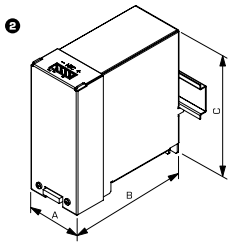

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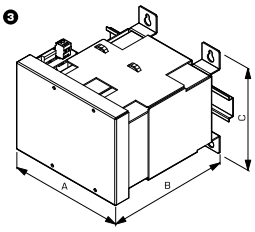

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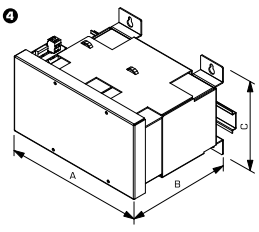


Buffer module
PVUC

General Data

Input rated voltage 24 Vdc
Output rated voltage 24 Vdc
Output rated current 10 - 20 A
Ambient temperature -10 °C to +60 °C
Efficiency typ. 97 %
Protection index IP 20

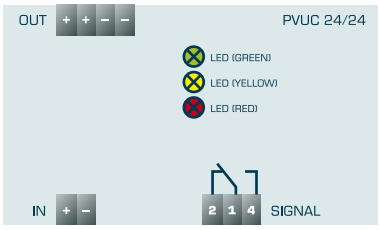
Advantages

Electronic overcurrent and short-circuit protection
Reverse polarity protection
Configurable switch-in threshold
3 LEDs for signalling purposes
Isolated signal contact
Service-friendly spring-loaded connector system
Parallel connection option
Decoupled output
Panel installation on mounting rails

Applications

Maintenance-free buffer module to secure the power supply during short power interruptions.

Sample application



Standards

Service-free buffer module
to UL 508

Safety:
EN 60950, EN 60950 (SELV), EN 60204 (PELV)

EMC:
EN 61000-6-3 (Interference emissions), EN 61000-6-2 (Interference immunity)

Approvals

UL 508 (E219022)

Buffer module
PVUC

Electrical data

Typ	PVUC 24/24-10	PVUC 24/24-20
Input		
Input rated voltage	24 Vdc	24 Vdc
Input voltage range	20 - 30 Vdc	20 - 30 Vdc
Current input (idle/charging/max.)	60 mA / 1 A / 11 A	60 mA / 1 A / 22 A
Switching threshold for buffer mode	20 - 24 Vdc	21 - 24 Vdc
Output		
Output rated voltage	24 Vdc	24 Vdc
Output voltage normal operation	typ. Uin - 0.5 Vdc (10 A)	typ. Uin - 1 Vdc (20 A)
Output rated voltage, battery mode	20 - 24 Vdc (adjustable)	20 - 24 Vdc (adjustable)
Resistance to reverse feed max.	35 Vdc	35 Vdc
Output rated current	10.00 A	20.00 A
Buffer period	0.4 s (10 A) / 6.3 s (1 A)	0.4 s (20 A) / 15.5 s (1 A)
Charging time	typ. 5 minutes	typ. 5 minutes
Internal fuse	No	No
Overload behaviour	Constant current (typ. 11 A)	Constant current (typ. 22 A)
Parallel connection	Yes	Yes
Serial operation	No	No
max. Power loss idling/nominal load	1.5 / 6.5 W	1.5 / 15 W
Efficiency	typ. 97 %	typ. 97 %
Storage medium		
Type of the storage medium	Capacitors, internal	Capacitors, internal
Signaling		
Operating status	LED green, LED red, LED yellow	LED green, LED red, LED yellow
Potential free signal contact	Changeover contact	Changeover contact
Active signal outputs	No	No
Display, interface	No	No
Approvals		
Approvals	cULus	cULus
Environment		
Ambient temperature	-10 °C to +60 °C	-10 °C to +60 °C
Storage temperature	-25 °C to +85 °C	-25 °C to +85 °C
Safety and protection		
Protection index	IP 20	IP 20
Safety class	III, without PE connection	III, without PE connection
Reverse connection protection	Yes	Yes
Accessory		
Side DIN rail mounting	PV-TS35M (optional)	PV-TS35M (optional)
Direct screw fastening plate for lateral mounting	PV-WB2 (optional)	PV-WB2 (optional)
Order numbers		
Order Number	**PVUC 24/24-10**	**PVUC 24/24-20**

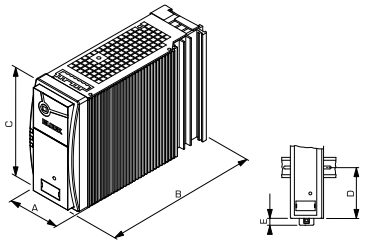
Buffer module
PVUC

30 Mechanical data

Typ	Terminals input, (spring clamp terminal, pluggable)	Terminals output, (spring clamp terminal, pluggable)	Terminals signalling, (spring clamp terminal, pluggable)	Mounting position	Fixing method	Weight	Dimension picture (in mm)	A	B	C	D	E
PVUC 24/24-10	max. 2.5 mm²	max. 2.5 mm²	max. 2.5 mm²	vertical	DIN Rail system TS35	1 kg	❶	57	179.5	127	76	12.5
PVUC 24/24-20	max. 10 mm²	max. 10 mm²	max. 2.5 mm²	vertical	DIN Rail system TS35	1 kg	❶	57	179.5	127	76	12.5

Dimension pictures

❶



Ground module
EB-GND

BLOCK Website

General Data

- Input rated voltage 12/24/48 Vdc
- Output rated current max. 40 A
- Ambient temperature -40 °C to +70 °C

Advantages

- 0 V collective terminal with 4 or 8 inputs
- EB-GND4: Output to feed back up to 40 A to the power supply provided
- Total current up to 40 A per module

Applications

Ground module to feed back the 0 V signal to the power supply as a replacement for the series terminal.

Ground module
EB-GND

BLOCK Website

Electrical data

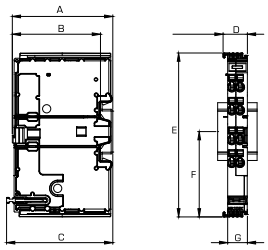
Typ	EB-GND4	EB-GND8
Input		
Input rated voltage	12/24/48 Vdc	12/24/48 Vdc
Input rated current	4 x 10 A	8 x 10 A
Output		
Output current	max. 40 A	max. 40 A
Environment		
Ambient temperature	-40 °C to +70 °C	-40 °C to +70 °C
Storage temperature	-40 °C to +85 °C	-40 °C to +85 °C
Accessory		
Cross connection	EB-BAR for bridging modules in series	EB-BAR for bridging modules in series
Order numbers		
Order Number	**EB-GND4**	**EB-GND8**

Mechanical data

Terminal and mounting		
Terminals output, (spring clamp terminal)	1,5 - 16 mm²	-
Terminals input, (spring clamp terminal)	0,08 - 2,5 mm²	0,08 - 2,5 mm²
Mounting position	horizontal for standard rail DIN TS35	horizontal for standard rail DIN TS35
Measures and weights		
Dimension (W x H x D)	12 x 99 x 60 mm	12 x 99 x 60 mm
Weight	0.040 kg	0.040 kg
Dimension picture (in mm)	❶	❶
A	61.2	61.2
B	53.7	53.7
C	64.5	64.5
D	14.8	14.8
E	99.3	99.3
F	51.7	51.7
G	12	12

Dimension pictures

❶



Communication modules for the EasyB series
EB-Communication

General Data

- Input rated voltage 24 Vdc
- Protection index IP 20
- Ambient temperature -25 °C to +70 °C

Advantages

- Intelligent interface for reading and writing of information of connected EasyB modules
- EasyB channels switchable individually
- Adjustable tripping current
- Automatic feedthrough of all signal levels

Applications

Communication modules as interface for connecting a higher-level controller. Compatible with circuit breakers in EB-08, EB-18, and EB-38 versions.

Standards

Safety:
EN 60950-1, EN 50178, EN/IEC 60204-1

EMC:
EN 61000-6-2 (interference immunity), EN 61000-6-3 (emitted interference)

CE acc. to 2014/30/EU

Approvals

UL 508 (prepared), GL (prepared)

Communication modules for the EasyB series
EB-Communication

Electrical data

Typ	EB-MODBUS-RTU	EB-IO-LINK
Special features		
Available from	in stock	Q2 2017
General data		
Input rated voltage	24 Vdc	24 Vdc
Input voltage range	18 - 30 Vdc	18 - 30 Vdc
Maximal residual ripple of supplied input voltage	3 %	3 %
Required input voltage for turning-on of outputs	17.5 V (Turn-off Threshold 16.7 V), ± 0.7 V	17.5 V (Turn-off Threshold 16.7 V), ± 0.7 V
Power dissipation, no load/rated load	0.4 W / 0.85 W	0.36 W / 0.80 W
Initialization time of module	4,68 ms	4,68 ms
Over voltage protection	Suppressor diode 33 V	Suppressor diode 33 V
Stand-by current	26 mA	33 mA
Resistance to reverse feed max.	35 Vdc	35 Vdc
Interface	RTU mode, 8Bit, No Parity, 1 Stop Bit	IO-LINK
Bus communication	Read:-state (tripped, On, Off) -set/active current -input voltage -firmware version/serial number Write:-state (on, off, reset)	Read:-state (tripped, On, Off) -set/active current -input voltage -firmware version/serial number Write:-state (on, off, reset)
Max. bus participants	32	-
Signaling		
Isolated group input	"13" Solid State Relay 58 Vdc/ 40 Vac/ 100 mA	-
Potential free signal output	"14" Solid State Relay 58 Vdc/ 40 Vac/ 100 mA	-
Isolated signal output	"24" Solid State Relay 58 Vdc/ 40 Vac/ 100 mA	-
Signal output (ON/OFF/Reset)	Reset input Level high = min. 11 V, max. 30 V Level low = min. 0 V, max. 5 V Jitter: +/- 5 %; +/- 5 ms	Reset input Level high = min. 11 V, max. 30 V Level low = min. 0 V, max. 5 V Jitter: +/- 5 %; +/- 5 ms
Approvals		
Approvals	UL (prepared), GL (prepared)	UL (prepared), GL (prepared)
Environment		
Ambient temperature	-25 °C to +70 °C	-25 °C to +70 °C
Storage temperature	-25 °C to +85 °C	-25 °C to +85 °C
Derating	-	-
Climatic category	3K3	3K3
Required minimum spacing (left/right)	0 mm	0 mm
Type of cooling	Natural convection	Natural convection
Required minimum spacing (over/under)	30 mm	30 mm
Relative humidity	5...96 % without condensation	5...96 % without condensation
Safety and protection		
Protection index	IP 20	IP 20
Safety class	III, without PE connection	III, without PE connection
Degree of pollution	2	2
Order numbers		
Order Number	**EB-MODBUS-RTU**	**EB-IO-LINK**

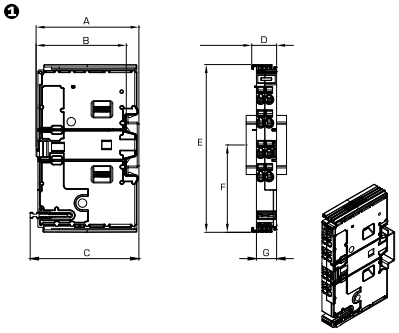
Communication modules for the EasyB series
EB-Communication

Mechanical data

Typ	Terminals input, (spring clamp terminal)	Terminals interface (spring clamp terminal)	Terminals signalling, (spring clamp terminal)	Mounting position	Weight	Dimension (W x H x D)	Dimension picture (in mm)	A	B	C	D	E	F	G
EB-MODBUS-RTU	-	max. 2,5 mm²	max. 2,5 mm²	horizontal for standard rail DIN TS35	0.040 kg	15 x 99 x 60 mm	1	61.2	53.7	64.5	14.8	99.3	51.7	12
EB-IO-LINK	max. 16 mm²	max. 2,5 mm²	max. 2,5 mm²	horizontal for standard rail DIN TS35	0.040 kg	15 x 99 x 60 mm	1	61.2	53.7	64.5	14.8	99.3	51.7	12

Dimension pictures

1



ACCESSORIES EASYB

Output expander

Output expander for mounting on right side of EasyB circuit breaker channel. 8 additional terminal points are provided for the +24 V output of the circuit breaker as a substitute for the terminal block.

Automatic contact to the left circuit breaker.

Order number

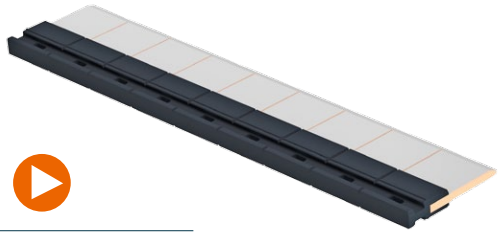
EB-PMM

Left side cover

Cover on the left side of the EasyB module as protection from unintentional contact with the circuit breaker.

Order number

EB-COV



Power bus bar

Cross connection for distribution of 24 Vdc voltage to all contacted EasyB modules. Max. length 492 mm for up to 41 contacted modules.

Order number

EB-BAR

Labeling field

Labeling field for all EasyB circuit breakers.

Order number

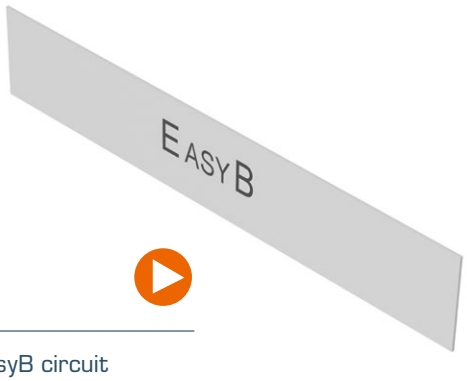
EB-MARK1

Labeling bracket

Labeling bracket for all EasyB circuit breakers.

Order number

EB-MARK20



Labeling strip

Labeling strip for all EasyB circuit breakers.

Order number

EB-MARK21

ACCESSORIES

Communication cable

2,8 m long adapter cable for RS-232 interface. Used to connect Power Vision/ Power Compact components to controllers or PCs.

Order number

PC-KOK1
PV-KOK2

Wall fastening

For direct wall screw mounting sideways for all Power Vision components.

Order number

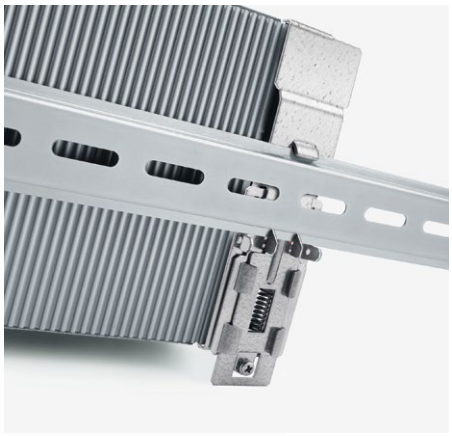
PV-WB2

TH35 sideway mounting

For mounting sideways in a DIN rail for all Power Vision components.

Order number

PV-TS35M

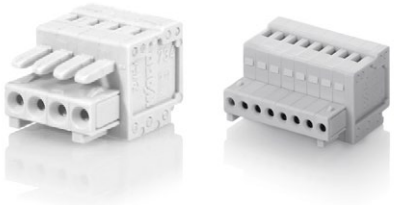


USB Converter

USB converter for connection of series equipment (RS232 9 pole Sub-D) to the USB-Bus device.

Order number

PV-USB/SERIELL



Female plug

Female plug for PC-Kombi-USV (PC-CON1) and all Power Vision components with signal contacts on the front panel or integrated RS-232-interface (PV-CON).

Order number

PC-CON1
PV-CON

Output expander

Output expander for 5 x duplication of 4 or 8 24 V DC potential.

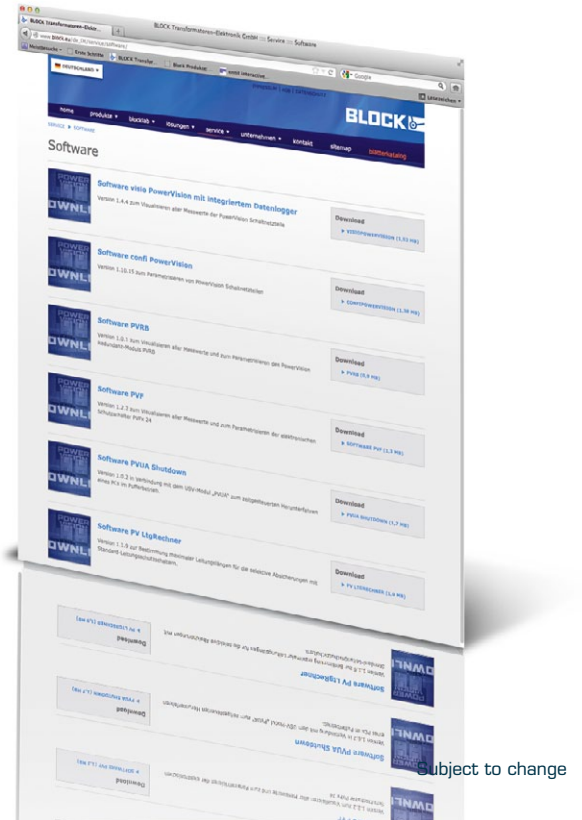
Use, for example, on electronic circuit breakers for distribution of 24 V DC and 0 V DC, as a replacement for the modular terminal.

Jumper option of the 0 V feed to adjacent modules via optional jumper comb.

Robust DIN rail mounting.

Order number

PMM-01
PMM-02



Software

Windows-compatible software for the configuration and visualisation of all Power Vision components with integrated control unit. Available for free at **block.eu**.

Autotransformer
PVAT3

BLOCK Website

General Data

Input rated voltage 3 x 690 Vac
Output rated voltage 3 x 400 Vac
Rated power 650 - 1386 VA
Ambient temperature +60° C
Protection index IP 00

Advantages

Low weight and small size (compared to isolating transformers)
Very high efficiency
Very good corrosion protection and low noise thanks to vacuum impregnation
Quick to cable up thanks to the use of spring-clamp terminals

Applications

Autotransformers to adjust the supply voltage of three-phase switching power supplies from 690 Vac to 400 Vac.

Standards

Autotransformer
to: VDE 0570 Teil 2-13, DIN EN 61558-2-13, EN 61558-2-13,
IEC 61558-2-13, UL 5085-1/-2, CSA 22.2 No.66

Approvals

UL 506, CSA 22.2

Autotransformer
PVAT3

BLOCK Website

Electrical data

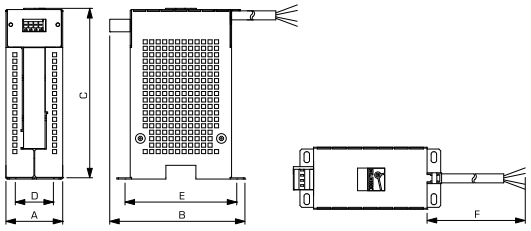
Typ	PVAT3 20	PVAT3 40
Input		
Rated input voltage	3 x 690 Vac	3 x 690 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz
Output		
Rated output voltage	3 x 400 Vac	3 x 400 Vac
Rated Power	650 VA	1386 VA
Rated current	3 x 0.94 A	3 x 2.0 A
Vector group	YaO	YaO
Approvals		
Approvals	cURus	cURus
Environment		
Ambient temperature max.	60° C	60° C
Safety and protection		
Type	Closed type	Closed type
Insulation class	F	F
Protection index	IP 00	IP 00
Safety class (prepared)	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof
Order numbers		
Order Number	**PVAT3 20**	**PVAT3 40**

Mechanical data

Terminal and mounting		
Terminals Input	Spring clamp terminal, 4 mm²	Spring clamp terminal, 4 mm²
Terminals Output	Supply cable 4 x 1.5 mm²	Supply cable 4 x 1.5 mm²
Fixing method	Straps at the case	Straps at the case
Measures and weights		
Weight	4.60 kg	6.60 kg
Core type	3UI 75/26,5	3UI 75/41,5
Dimension picture (in mm)	❶	❶
A	72	90
B	170	170
C	215	215
D	47.5	63
E	145	145
F	350	350

Dimension pictures

❶

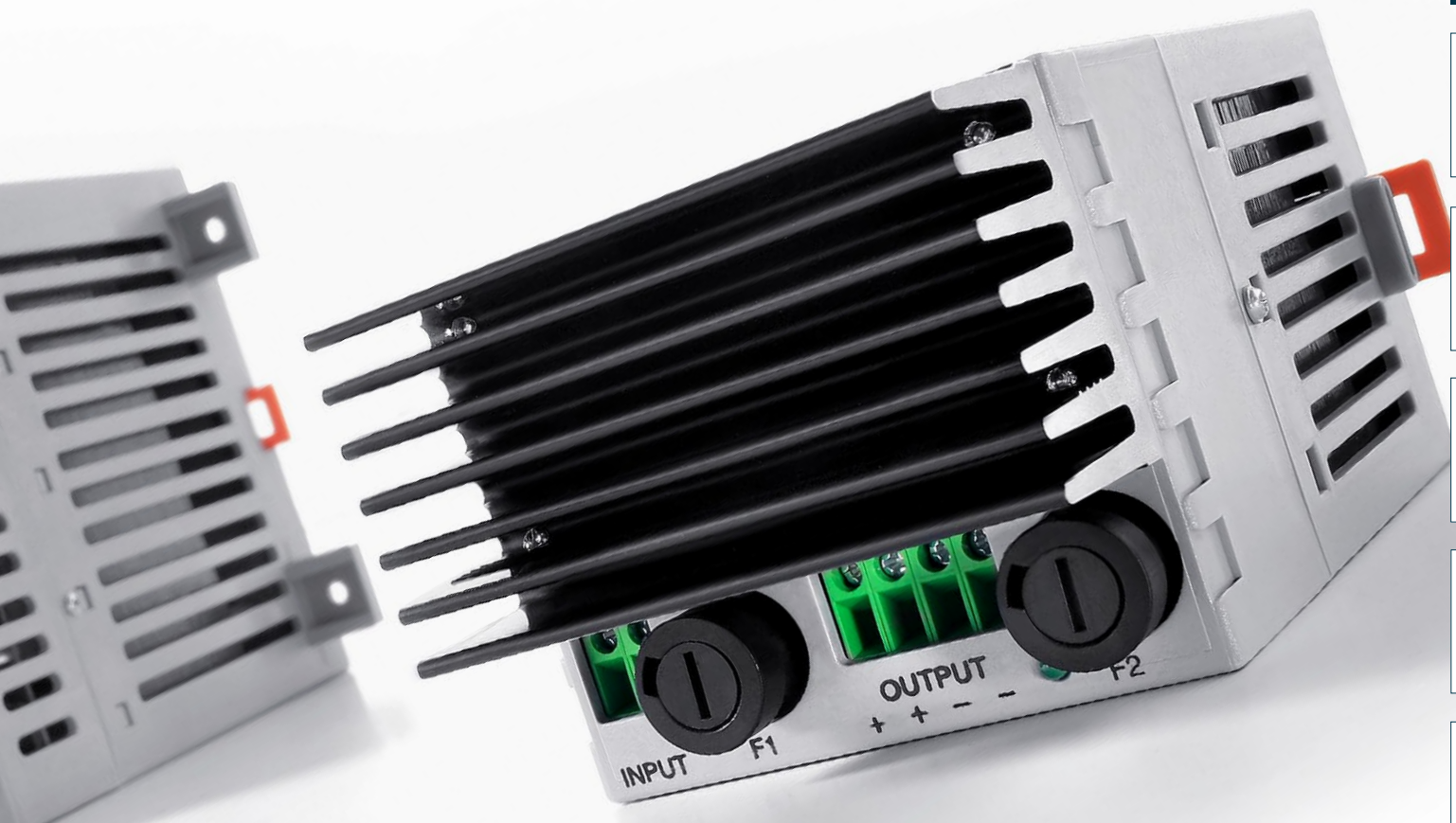


OVERVIEW OF TRANSFORMER POWER SUPPLIES LINEAR STABILIZED

	Type	Output rated voltage	Input rated voltage	12 W	25 W	48 W	72 W	120 W	Residual ripple factor	Page
1-phase	GLS	24 Vdc	230 Vac	0.5 A	1 A	2 A	3 A	5 A	≤30 mVss (U_{nenn})	420

FEATURES

Type	GLS
■	Status LED
■	Stabilized and configurable output voltage
Page	420



Single-phase, linear stabiliszd dc power supply
GLS

BLOCK Website

General Data

Input rated voltage 230 Vac
Output rated voltage 24 Vdc
Output rated current 0.5 - 5 A
Residual ripple factor ≤30 mVss
Ambient temperature 40° C, 60° C by reduced power
Protection index IP 00
Panel installation on mounting rails

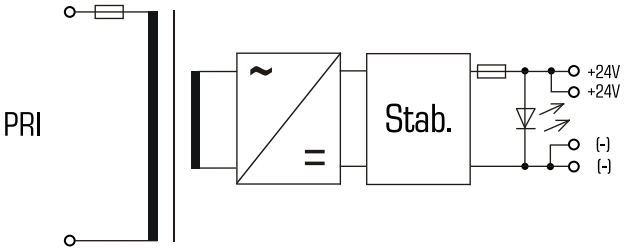
Advantages

Accurate output current regulation
Short settling time
Low ripple factor
Input and output protection

Applications

Linear regulated DC power supply for environments susceptible to interference for example in measurement or data transmission.

Sample application



Standards

Linear stabilised dc power supply / Safety isolating transformer to VDE 0570 part 2-6, EN 61558-2-6, IEC 61558-2-6, UL 1012, UL 5085

EMC:
EN 61000-4-4 / EN 61000-4-5 (Interference immunity), EN 50011 (Interference emissions)

Approvals

c UL us transformer only

UL 5085-1/-2, CSA 22.2 No.66

Single-phase, linear stabiliszd dc power supply
GLS

BLOCK Website

Electrical data

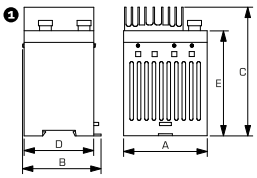
Typ	GLS 230/24-0,5	GLS 230/24-1	GLS 230/24-2	GLS 230/24-3
Input				
Input rated voltage	230 Vac	230 Vac	230 Vac	230 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output				
Output rated voltage	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Power	12.00 W	24.00 W	48.00 W	72.00 W
Output rated current (40°C)	0.50 A	1.00 A	2.00 A	3.00 A
Output rated current (60°C)	0.30 A	0.40 A	0.70 A	1.00 A
Ripple factor	≤30 mVpp at nom. input volt.	≤30 mVpp at nom. input volt.	≤30 mVpp at nom. input volt.	≤30 mVpp at nom. input volt.
Efficiency	50.0 %	50.0 %	52.0 %	52.0 %
Approvals				
Approvals	cURus (transformer only)	cURus (transformer only)	cURus (transformer only)	cURus (transformer only)
Environment				
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling
Ambient temperature max.	+40° C, +60° C by reduced power	+40° C, +60° C by reduced power	+40° C, +60° C by reduced power	+40° C, +60° C by reduced power
Safety and protection				
Type	Enclosed	Enclosed	Enclosed	Enclosed
Insulation class	E	E	E	E
Protection index	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I
Short circuit strength	short-circuit proof	short-circuit proof	short-circuit proof	short-circuit proof
Order numbers				
Order Number	**GLS 230/24-0,5**	**GLS 230/24-1**	**GLS 230/24-2**	**GLS 230/24-3**

Mechanical data

Terminal and mounting				
Terminals	Screw-type terminals	Screw-type terminals	Screw-type terminals	Screw-type terminals
Fixing method	DIN Rail system TS35	DIN Rail system TS35	DIN Rail system TS35	DIN Rail system TS35
Measures and weights				
Weight	0.95 kg	1.20 kg	2.60 kg	2.60 kg
Dimension picture (in mm)	❸	❸	❸	❸
A	62.5	62.5	90	90
B	85	85	85	85
C	135	132	138	168
D	75	75	75	75
E	105	105	113	113
F	-	-	-	-
G	-	-	-	-

Dimension pictures

❶



Single-phase, linear stabiliszd dc power supply
GLS

BLOCK Website

Electrical data

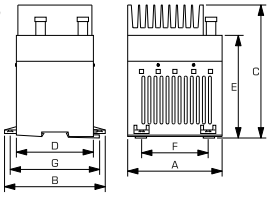
Typ	GLS 230/24-5
Input	
Input rated voltage	230 Vac
Frequency range	50 - 60 Hz
Output	
Output rated current (40°C)	5.00 A
Output rated current (60°C)	2.00 A
Power	120.00 W
Output rated current (60°C)	2.00 A
Ripple factor	≤30 mVpp at nom. input volt.
Efficiency	55.0 %
Approvals	
Approvals	cURus (transformer only)
Environment	
Type of cooling	self-cooling
Ambient temperature max.	+40° C, +60° C by reduced power
Safety and protection	
Type	Enclosed
Insulation class	E
Protection index	IP 00
Safety class (prepared)	I
Short circuit strength	short-circuit proof
Order numbers	
Order Number	**GLS 230/24-5**

Mechanical data

Terminal and mounting	
Terminals	Screw-type terminals
Fixing method	DIN Rail system TS35
Measures and weights	
Weight	4.00 kg
Dimension picture (in mm)	❹
A	125
B	134
C	175
D	102
E	135
F	87
G	119

Dimension pictures

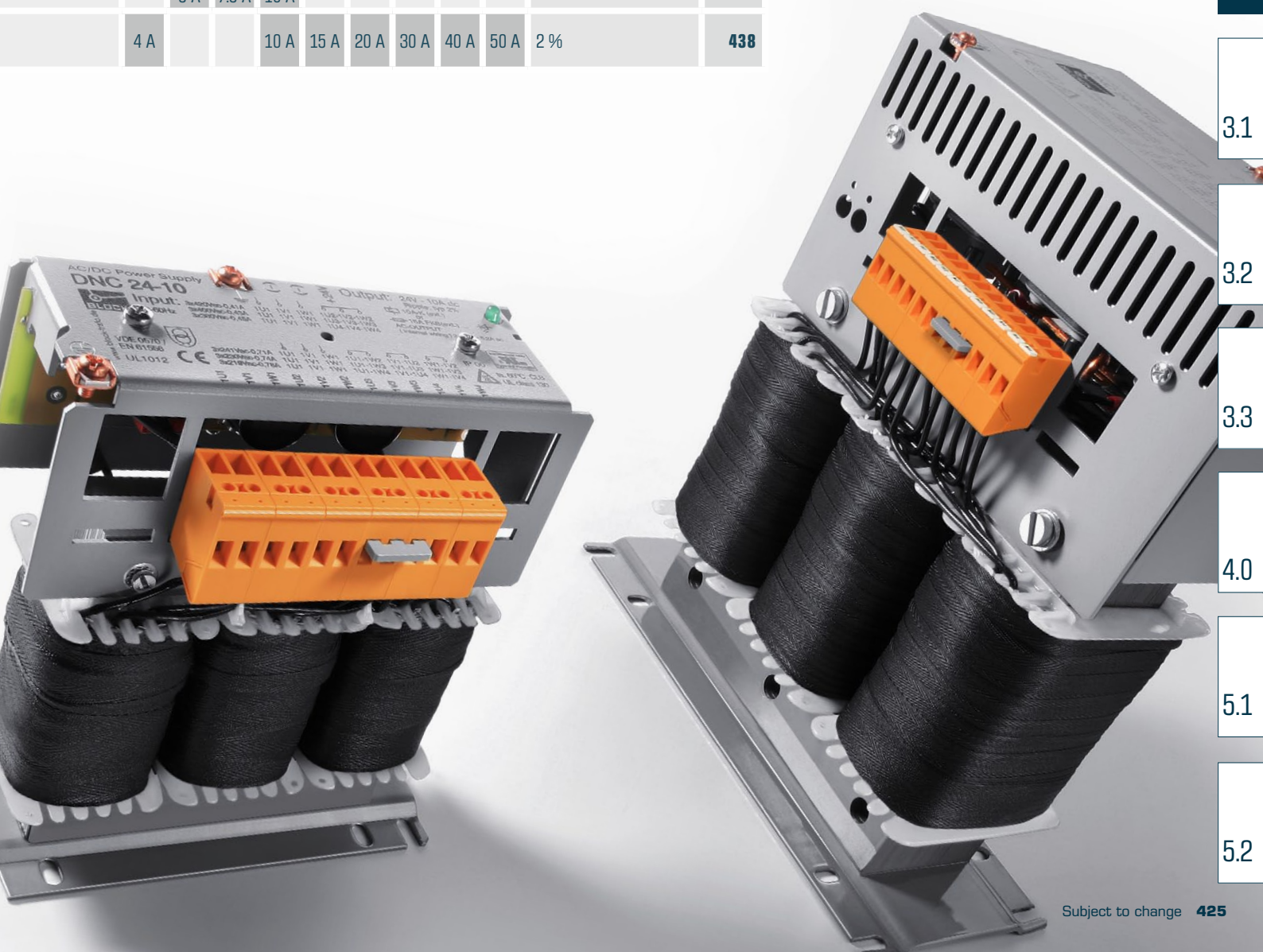
❷



OVERVIEW OF TRANSFORMER POWER SUPPLIES NON-STABILIZED

	Type	Output rated voltage	Input rated voltage	6 W	12 W	24 W	36 W	48 W	60 W	72 W
1-phase	GNC	24 Vdc	230 and 400 Vac (±15 V)						2.5 A	
1-phase	DCT	12 Vdc	230 Vac	0.5 A	1 A	2 A		4 A		
1-phase	DCT	24 Vdc	230 Vac		0.5 A		1.5 A		2.5 A	
1-phase	GLC	24 Vdc	230 Vac			1 A		2 A		3 A
1-phase	GLC	24 Vdc	400 Vac			1 A		2 A		3 A
3-phase	DNC	24 Vdc	Delta connection: 3 x 230 Vac (±11 V) Star connection: 3 x 400 Vac (±20 V)							

96 W	120 W	180 W	240 W	360 W	480 W	720 W	960 W	1200 W	Residual ripple factor	Page
	5 A	7.5 A	10 A	15 A					3 %	435
									≤5 %	426
	5 A	7.5 A	10 A							430
	5 A	7.5 A	10 A							
4 A			10 A	15 A	20 A	30 A	40 A	50 A	2 %	438



Single-phase, non-stabilized DC power supply
DCT

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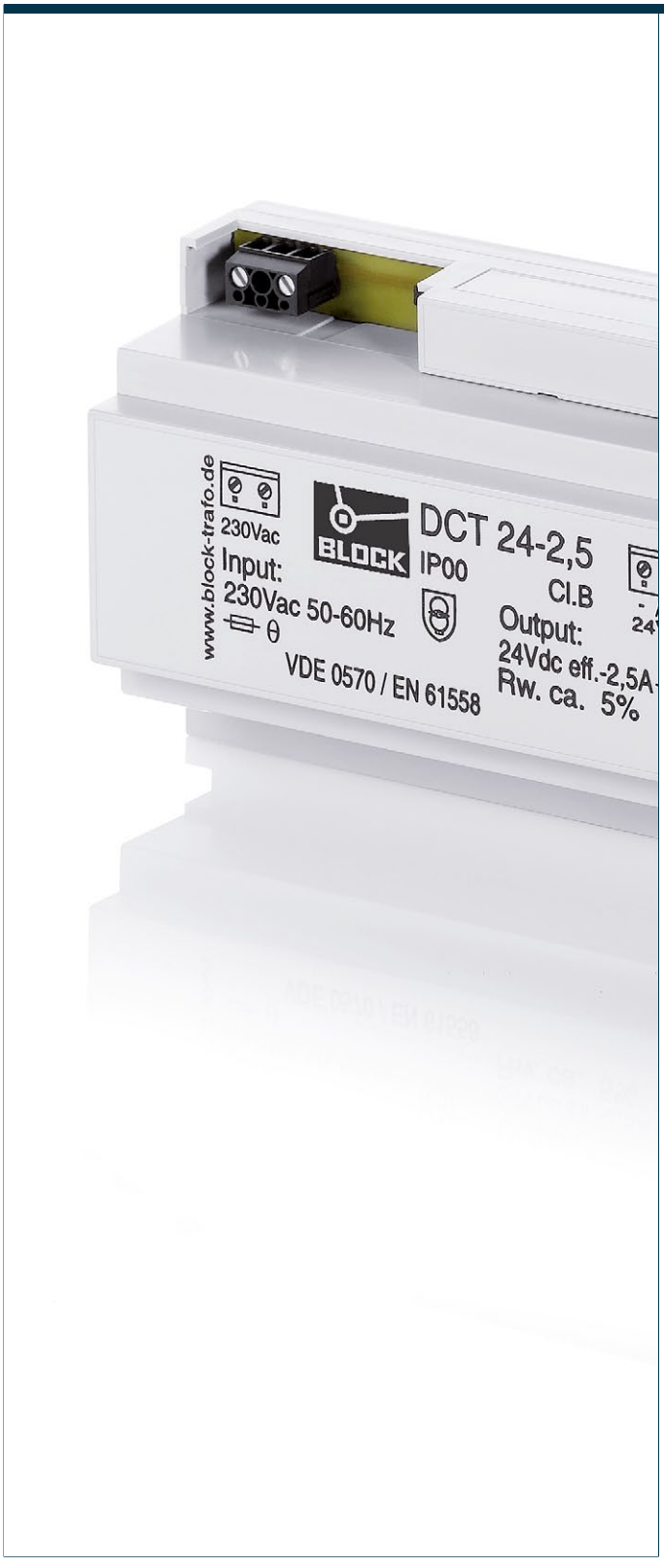


General Data

Input rated voltage 230 Vac
Output rated voltage 12 - 24 Vdc
Output rated current 0.5 - 4 A
Residual ripple factor ≤5 %
Ambient temperature +25 °C
Protection index IP 00

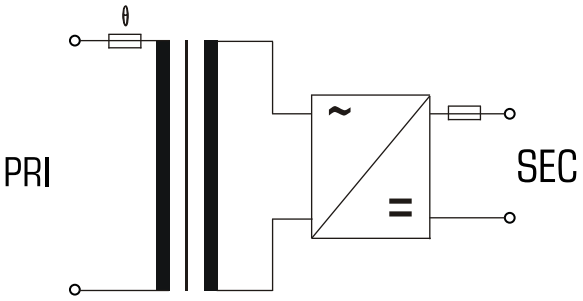
Advantages

Thermal fuse in the input and a fuse protection for the output
Separate windings
Capacitor accessories
Permanent corrosion protection, high insulation value and maximum electrical reliability thanks to XtraDenseFill resin encapsulation
Robust plastic housing for rail mounting, e.g. in consumer units or meter mounting boards

Applications

Robust DC power supply is concentrated on the core task of voltage and power supply. Flat step profile optimized for installation in control panels in building automation.

Sample application



Standards

Non-stabilised dc power supply / Safety isolating transformer
to VDE 0570 part 2-6, EN 61558-2-6, IEC 61558-2-6

Approvals

EAC

Single-phase, non-stabilized DC power supply
DCT

BLOCK Website

Electrical data

Typ	DCT 12-0,5	DCT 12-1	DCT 12-2	DCT 12-4
Input				
Input rated voltage	230 Vac	230 Vac	230 Vac	230 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output				
Output rated voltage	12 Vdc	12 Vdc	12 Vdc	12 Vdc
Power	6.00 W	12.00 W	24.00 W	48.00 W
Output rated current	0.50 A	1.00 A	2.00 A	4.00 A
Ripple factor	≤5 %	≤5 %	≤5 %	≤5 %
Environment				
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling
Ambient temperature max.	+25 °C	+25 °C	+25 °C	+25 °C
Safety and protection				
Type	Resin encapsulated transformer	Resin encapsulated transformer	Resin encapsulated transformer	Resin encapsulated transformer
Insulation class	B	B	B	B
Protection index	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	II	II	II	II
Short circuit strength	short-circuit proof	short-circuit proof	short-circuit proof	short-circuit proof
Order numbers				
Order Number	**DCT 12-0,5**	**DCT 12-1**	**DCT 12-2**	**DCT 12-4**

Single-phase, non-stabilized DC power supply
DCT

BLOCK Website

Electrical data

Typ	DCT 24-0,5	DCT 24-1,5	DCT 24-2,5
Input			
Input rated voltage	230 Vac	230 Vac	230 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output			
Output rated voltage	24 Vdc	24 Vdc	24 Vdc
Power	12.00 W	36.00 W	60.00 W
Output rated current	0.50 A	1.50 A	2.50 A
Ripple factor	≤5 %	≤5 %	≤5 %
Environment			
Type of cooling	self-cooling	self-cooling	self-cooling
Ambient temperature max.	+25 °C	+25 °C	+25 °C
Safety and protection			
Type	Resin encapsulated transformer	Resin encapsulated transformer	Resin encapsulated transformer
Insulation class	B	B	B
Protection index	IP 00	IP 00	IP 00
Safety class (prepared)	II	II	II
Short circuit strength	short-circuit proof	short-circuit proof	short-circuit proof
Order numbers			
Order Number	**DCT 24-0,5**	**DCT 24-1,5**	**DCT 24-2,5**

Single-phase, non-stabilized DC power supply **DCT**

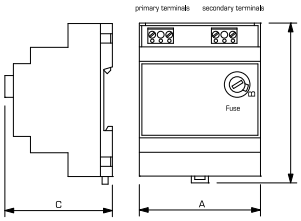
BLOCK Website

Mechanical data

Typ	Terminals	Fixing method	Weight	Dimension picture (in mm)	A	B	C
DCT 12-0,5	Screw-type terminals	DIN Rail system TS35	0.45 kg	❶	71	94	63
DCT 12-1	Screw-type terminals	DIN Rail system TS35	0.51 kg	❷	71	94	63
DCT 12-2	Screw-type terminals	DIN Rail system TS35	1.08 kg	❷	106	94	63
DCT 12-4	Screw-type terminals	DIN Rail system TS35	1.90 kg	❷	159	94	63
DCT 24-0,5	Screw-type terminals	DIN Rail system TS35	0.52 kg	❸	71	94	63
DCT 24-1,5	Screw-type terminals	DIN Rail system TS35	1.09 kg	❸	106	94	63
DCT 24-2,5	Screw-type terminals	DIN Rail system TS35	1.93 kg	❸	159	94	63

Dimension pictures

❶



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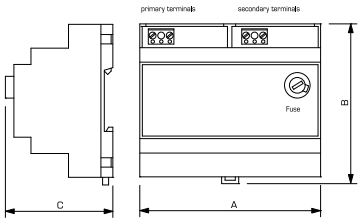

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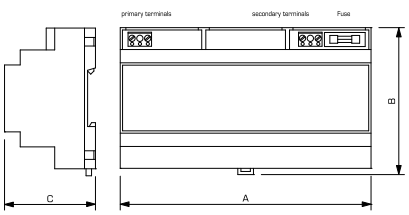

Single-phase, non-stabilized DC power supply
GLC

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General Data

Input rated voltage 230 and 400 Vac
Output rated voltage 24 Vdc
Output rated current 1 - 10 A
Residual ripple factor ≤5 %
Ambient temperature +60 °C
Protection index IP 00

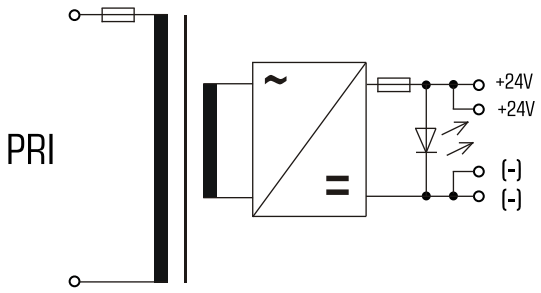
Advantages

Fuse protection in the input and a fuse protection for the output
Separate windings
Capacitor accessories
Double screw terminals on the output
DC OK signalling via LEDs
Panel installation on mounting rails

Applications

Robust DC power supply is concentrated on the core task of voltage and power supply.

Sample application



Standards

Non-stabilised dc power supply / Safety isolating transformer
to VDE 0570 part 2-6, EN 61558-2-6, IEC 61558-2-6, UL 1012, UL 5085

Approvals

c UL us transformer only

UL 5085-1/-2, CSA 22.2 No.66

Single-phase, non-stabilized DC power supply **GLC**

BLOCK Website

Electrical data

Typ	GLC 230/24-1	GLC 230/24-2	GLC 230/24-3	GLC 230/24-5
Input				
Input rated voltage	230 Vac	230 Vac	230 Vac	230 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output				
Output rated voltage	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Power	24.00 W	48.00 W	72.00 W	120.00 W
Output rated current	1.00 A	2.00 A	3.00 A	5.00 A
Ripple factor	≤5 %	≤5 %	≤5 %	≤5 %
Approvals				
Approvals	cURus (transformer only)	cURus (transformer only)	cURus (transformer only)	cURus (transformer only)
Environment				
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling
Ambient temperature max.	60 °C	60 °C	60 °C	60 °C
Safety and protection				
Type	Enclosed	Enclosed	Enclosed	Enclosed
Insulation class	E	E	E	E
Protection index	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	II	II	II	II
Short circuit strength	short-circuit proof	short-circuit proof	short-circuit proof	short-circuit proof
Order numbers				
Order Number	**GLC 230/24-1**	**GLC 230/24-2**	**GLC 230/24-3**	**GLC 230/24-5**

Single-phase, non-stabilized DC power supply **GLC**

BLOCK Website

Electrical data

Typ	GLC 230/24-7,5	GLC 230/24-10	GLC 400/24-1	GLC 400/24-2
Input				
Input rated voltage	230 Vac	230 Vac	400 Vac	400 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output				
Output rated voltage	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Power	180.00 W	240.00 W	24.00 W	48.00 W
Output rated current	7.50 A	10.00 A	1.00 A	2.00 A
Ripple factor	≤5 %	≤5 %	≤5 %	≤5 %
Approvals				
Approvals	cURus (transformer only)	cURus (transformer only)	cURus (transformer only)	cURus (transformer only)
Environment				
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling
Ambient temperature max.	60 °C	60 °C	60 °C	60 °C
Safety and protection				
Type	Enclosed	Enclosed	Enclosed	Enclosed
Insulation class	E	E	E	E
Protection index	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	II	II	II	II
Short circuit strength	short-circuit proof	short-circuit proof	short-circuit proof	short-circuit proof
Order numbers				
Order Number	**GLC 230/24-7,5**	**GLC 230/24-10**	**GLC 400/24-1**	**GLC 400/24-2**

Single-phase, non-stabilized DC power supply **GLC**

BLOCK Website

Electrical data

Typ	GLC 400/24-3	GLC 400/24-5	GLC 400/24-7,5	GLC 400/24-10
Input				
Input rated voltage	400 Vac	400 Vac	400 Vac	400 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output				
Output rated voltage	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Power	72.00 W	120.00 W	180.00 W	240.00 W
Output rated current	3.00 A	5.00 A	7.50 A	10.00 A
Ripple factor	≤5 %	≤5 %	≤5 %	≤5 %
Approvals				
Approvals	cURus (transformer only)	cURus (transformer only)	cURus (transformer only)	cURus (transformer only)
Environment				
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling
Ambient temperature max.	60 °C	60 °C	60 °C	60 °C
Safety and protection				
Type	Enclosed	Enclosed	Enclosed	Enclosed
Insulation class	E	E	E	E
Protection index	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	II	II	II	II
Short circuit strength	short-circuit proof	short-circuit proof	short-circuit proof	short-circuit proof
Order numbers				
Order Number	**GLC 400/24-3**	**GLC 400/24-5**	**GLC 400/24-7,5**	**GLC 400/24-10**

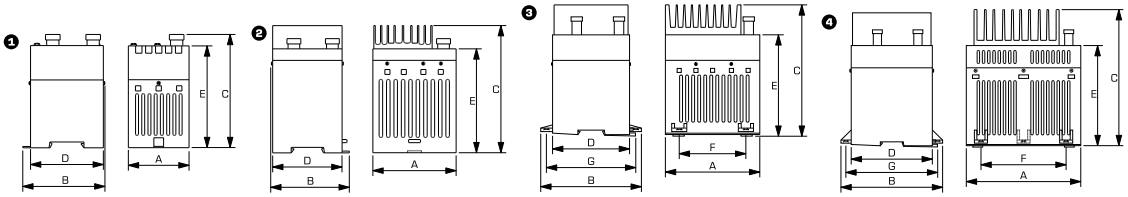
Single-phase, non-stabilized DC power supply **GLC**

BLOCK Website

Mechanical data 30

Typ	Terminals	Fixing method	Weight	Dimension picture (in mm)	A	B	C	D	E	F	G
GLC 230/24-1	Screw-type terminals	DIN Rail system TS35	1.10 kg	1	62.5	85	116	75	105	-	-
GLC 230/24-2	Screw-type terminals	DIN Rail system TS35	1.80 kg	2	90	85	138	75	113	-	-
GLC 230/24-3	Screw-type terminals	DIN Rail system TS35	2.30 kg	2	90	85	138	75	113	-	-
GLC 230/24-5	Screw-type terminals	DIN Rail system TS35, additional with screws	3.50 kg	3	125	134	175	102	135	87	119
GLC 230/24-7,5	Screw-type terminals	DIN Rail system TS35, additional with screws	6.50 kg	4	175	155	212	124	157	130	140
GLC 230/24-10	Screw-type terminals	DIN Rail system TS35, additional with screws	7.30 kg	4	175	155	212	124	157	130	140
GLC 400/24-1	Screw-type terminals	DIN Rail system TS35	1.10 kg	1	62.5	85	130	75	105	-	-
GLC 400/24-2	Screw-type terminals	DIN Rail system TS35	1.80 kg	2	90	85	138	75	113	-	-
GLC 400/24-3	Screw-type terminals	DIN Rail system TS35	2.30 kg	2	90	85	138	75	113	-	-
GLC 400/24-5	Screw-type terminals	DIN Rail system TS35, additional with screws	3.50 kg	3	125	134	175	102	135	87	119
GLC 400/24-7,5	Screw-type terminals	DIN Rail system TS35, additional with screws	6.50 kg	4	175	155	212	124	157	130	140
GLC 400/24-10	Screw-type terminals	DIN Rail system TS35, additional with screws	7.30 kg	4	175	155	212	124	157	130	140

Dimension pictures



Single-phase, non stabilized DC power supply
GNC

BLOCK Website

General Data

- Input rated voltage 230 and 400 Vac
- Output rated voltage 24 Vdc
- Output rated current 2.5 - 15 A
- Residual ripple factor ≤3 %
- Ambient temperature +60 °C
- Protection index IP 00

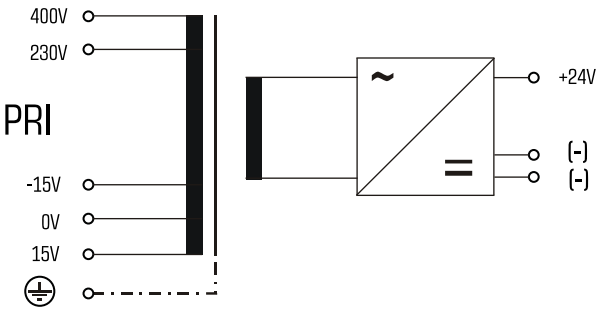
Advantages

- Unsusceptible to voltage surges or transients
- High overload capacity
- DC OK signalling via LEDs
- Capacitor accessories
- Very good corrosion protection and low noise thanks to vacuum impregnation
- Impulse loading MKT-capacitors
- Varistor wiring
- Contact protected screw connection terminals complying with UVV BGV A3
- GNC 24-2,5 with combination footplate for bolted and rail mounting

Applications

Robust DC power supply for harsh industrial applications.

Sample application



Standards

Non-stabilised dc power supply / Safety isolating transformer
to VDE 0570 part 2-6, EN 61558-2-6, IEC 61558-2-6, UL 1012, UL 5085

Approvals

UL 5085-1/-2, CSA 22.2 No.66

Single-phase, non stabilized DC power supply
GNC

BLOCK Website

Electrical data

Typ	GNC 24-2,5	GNC 24-5	GNC 24-7,5	GNC 24-10
Input				
Input rated voltage	230/400 Vac, ±15 Vac	230/400 Vac, ±15 Vac	230/400 Vac, ±15 Vac	230/400 Vac, ±15 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output				
Output rated voltage	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Power	60.00 W	120.00 W	180.00 W	240.00 W
Output rated current	2.50 A	5.00 A	7.50 A	10.00 A
Ripple factor	3 %	3 %	3 %	3 %
Approvals				
Approvals	cURus (transformer only)	cURus (transformer only)	cURus (transformer only)	cURus (transformer only)
Environment				
Ambient temperature max.	60 °C	60 °C	60 °C	60 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling
Safety and protection				
Type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130
Protection index	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Order numbers				
Order Number	**GNC 24-2,5**	**GNC 24-5**	**GNC 24-7,5**	**GNC 24-10**

Single-phase, non stabilized DC power supply **GNC**

BLOCK Website

Electrical data

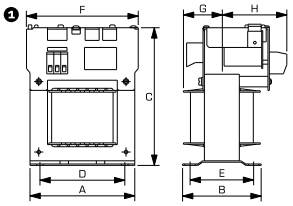
Typ	GNC 24-15
Input	
Input rated voltage	230/400 Vac, ±15 Vac
Frequency range	50 - 60 Hz
Output	
Output rated voltage	24 Vdc
Power	360.00 W
Output rated current	15.00 A
Ripple factor	3 %
Approvals	
Approvals	cURus (transformer only)
Environment	
Ambient temperature max.	60 °C
Type of cooling	self-cooling
Safety and protection	
Type	Open type
Insulation class	VDE=B, UL=class 130
Protection index	IP 00
Safety class (prepared)	I
Short circuit strength	non-short-circuit proof
Order numbers	
Order Number	**GNC 24-15**

Mechanical data

Typ	Terminals	Fixing method	Fixing screws	Weight	Dimension picture (in mm)	A	B	C	D	E	F	G	H
GNC 24-2,5	Screw-type terminals	Base plate	M4	2.40 kg	1	84	76	140	64	64	84	48	40
GNC 24-5	Screw-type terminals	Base plate	M5	4.60 kg	1	105	103	160	80.5	86	105	57	52
GNC 24-7,5	Screw-type terminals	Base plate	M5	6.30 kg	1	120	112	173	90	94	120	57	56
GNC 24-10	Screw-type terminals	Base plate	M5	7.45 kg	1	120	121	173	90	103	120	64	60
GNC 24-15	Screw-type terminals	Base plate	M6	8.30 kg	1	150	112	200	122	90	160	55	94

Dimension pictures

1



Three-phase, non stabilized DC power supply
DNC

BLOCK Website

General Data

Universal input rated voltage
Output rated voltage 24 Vdc
Output rated power 96 - 1200 W
Residual ripple factor ≤2 %
Ambient temperature +60 °C
Protection index IP 00

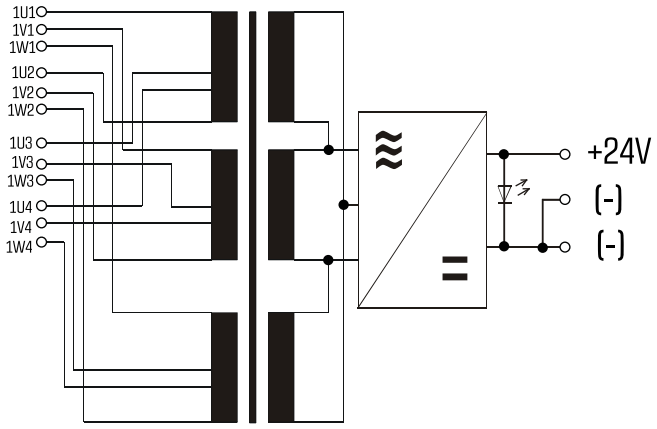
Advantages

Unsusceptible to voltage surges or transients
High overload capacity
DC OK signalling via LEDs
Capacitor accessories
Very good corrosion protection and low noise thanks to vacuum impregnation
Impulse loading MKT-capacitors
Varistor wiring
Contact protected screw connection terminals complying with UVV BGV A3

Applications

Robust DC power supply for harsh industrial applications.

Sample application



Standards

Non-stabilised dc power supply / Safety isolating transformer
to VDE 0570 part 2-6, EN 61558-2-6, IEC 61558-2-6, UL 1012, UL 5085

Approvals

c UL us transformer only EAC

UL 5085-1/-2, CSA 22.2 No.66

Three-phase, non stabilized DC power supply
DNC

BLOCK Website

Electrical data

Typ	DNC 24-4	DNC 24-10	DNC 24-15 C	DNC 24-20 C
Input				
Input rated voltage	Delta-connection: 3x219 Vac/230 Vac/241 Vac Star-connection: 3x380 Vac/400 Vac/420 Vac	Delta-connection: 3x219 Vac/230 Vac/241 Vac Star-connection: 3x380 Vac/400 Vac/420 Vac	Delta-connection: 3x219 Vac/230 Vac/241 Vac Star-connection: 3x380 Vac/400 Vac/420 Vac	Delta-connection: 3x219 Vac/230 Vac/241 Vac Star-connection: 3x380 Vac/400 Vac/420 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output				
Output rated voltage	24 Vdc	24 Vdc	24 Vdc	24 Vdc
Power	96.00 W	240.00 W	360.00 W	480.00 W
Output rated current	4.00 A	10.00 A	15.00 A	20.00 A
Ripple factor	typ. 2 %	typ. 2 %	typ. 2 %	typ. 2 %
Approvals				
Approvals	cURus (transformer only)	cURus (transformer only)	cURus (transformer only)	cURus (transformer only)
Environment				
Ambient temperature max.	+60 °C	+60 °C	+60 °C	+60 °C
Type of cooling	self-cooling	self-cooling	self-cooling	self-cooling
Safety and protection				
Type	Open type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130
Protection index	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Order numbers				
Order Number	**DNC 24-4**	**DNC 24-10**	**DNC 24-15 C**	**DNC 24-20 C**

Three-phase, non stabilized DC power supply
DNC

BLOCK Website

Electrical data

Typ	DNC 24-30 C	DNC 24-40 C	DNC 24-50 C
Input			
Input rated voltage	Delta-connection: 3x219 Vac/230 Vac/241 Vac Star-connection: 3x380 Vac/400 Vac/420 Vac	Delta-connection: 3x219 Vac/230 Vac/241 Vac Star-connection: 3x380 Vac/400 Vac/420 Vac	Delta-connection: 3x219 Vac/230 Vac/241 Vac Star-connection: 3x380 Vac/400 Vac/420 Vac
Frequency range	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Output			
Output rated voltage	24 Vdc	24 Vdc	24 Vdc
Power	720.00 W	960.00 W	1200.00 W
Output rated current	30.00 A	40.00 A	50.00 A
Ripple factor	typ. 2 %	typ. 2 %	typ. 2 %
Approvals			
Approvals	cURus (transformer only)	cURus (transformer only)	cURus (transformer only)
Environment			
Ambient temperature max.	+60 °C	+60 °C	+60 °C
Type of cooling	self-cooling	self-cooling	self-cooling
Safety and protection			
Type	Open type	Open type	Open type
Insulation class	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130
Protection index	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I
Short circuit strength	non-short-circuit proof	non-short-circuit proof	non-short-circuit proof
Order numbers			
Order Number	**DNC 24-30 C**	**DNC 24-40 C**	**DNC 24-50 C**

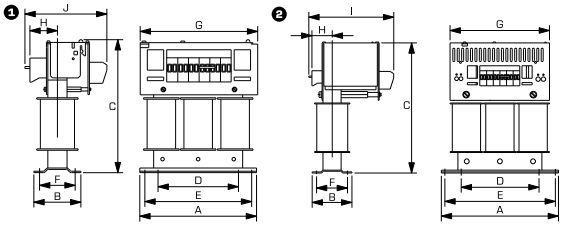
Three-phase, non stabilized DC power supply
DNC

BLOCK Website

30 Mechanical data

Typ	Terminals	Fixing method	Fixing screws	Weight	Dimension picture (in mm)	A	B	C	D	E	F	G	H	I
DNC 24-4	Screw-type terminals	Base plate	M5	2.50 kg	1	130	72	160	-	105	54	130	37	90
DNC 24-10	Screw-type terminals	Base plate	M5	4.30 kg	1	164	66	190	113	150	50	165	40	108
DNC 24-15 C	Screw-type terminals	Base plate	M5	6.10 kg	1	164	81	190	113	150	63	165	47	108
DNC 24-20 C	Screw-type terminals	Base plate	M6	7.20 kg	1	216	71	220	136	200	55	175	42	140
DNC 24-30 C	Screw-type terminals	Base plate	M6	10.60 kg	1	216	92	225	136	200	75	175	51	160
DNC 24-40 C	Screw-type terminals	Base plate	M6	16.20 kg	2	266	90	297	176	250	70	225	62	185
DNC 24-50 C	Screw-type terminals	Base plate	M6	22.10 kg	2	266	114	297	176	250	94	225	62	185

Dimension pictures



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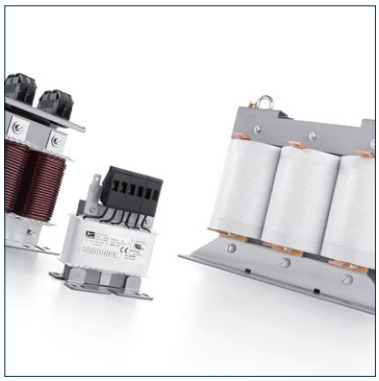
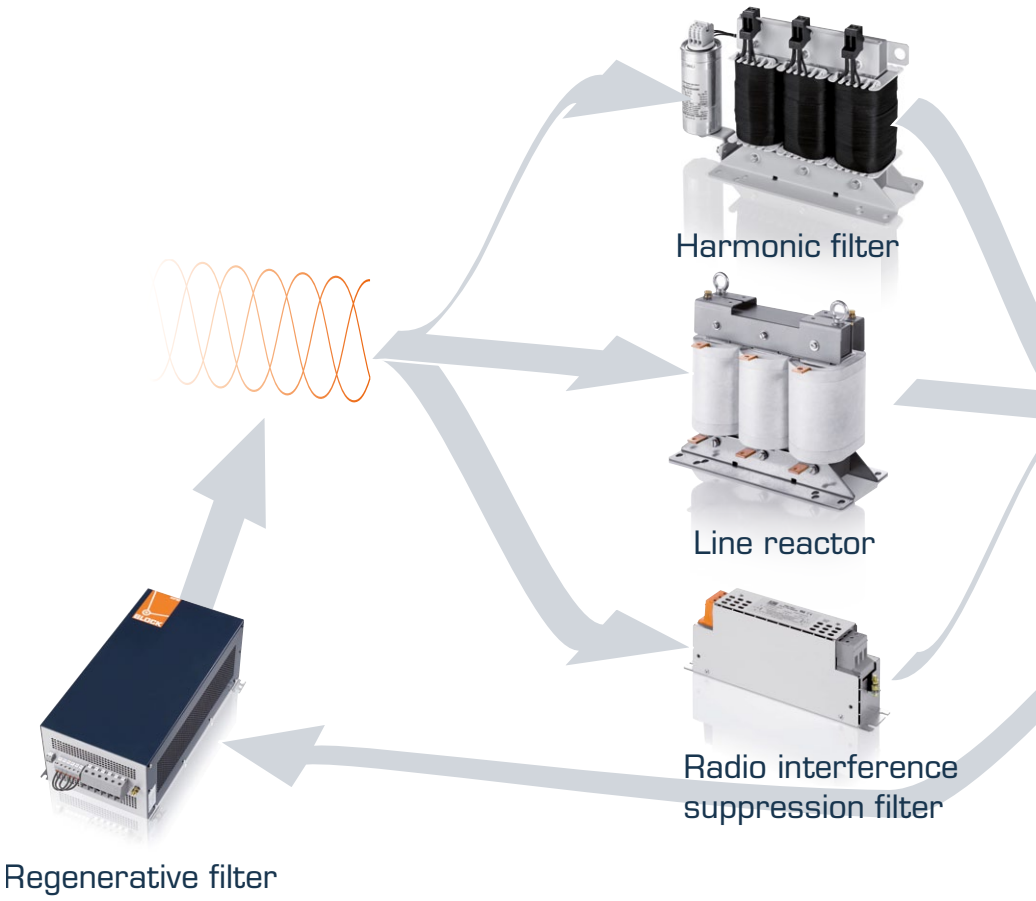


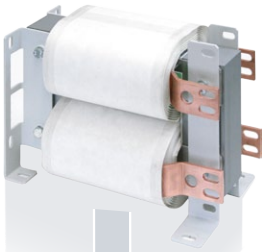
RELIABLE OPERATION

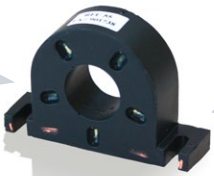


Test laboratory

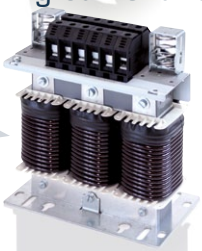
Voltage stabilizers

Intermediate circuit reactor





Bearing current reactor



dv/dt filter

FI

Sine filter

Motor

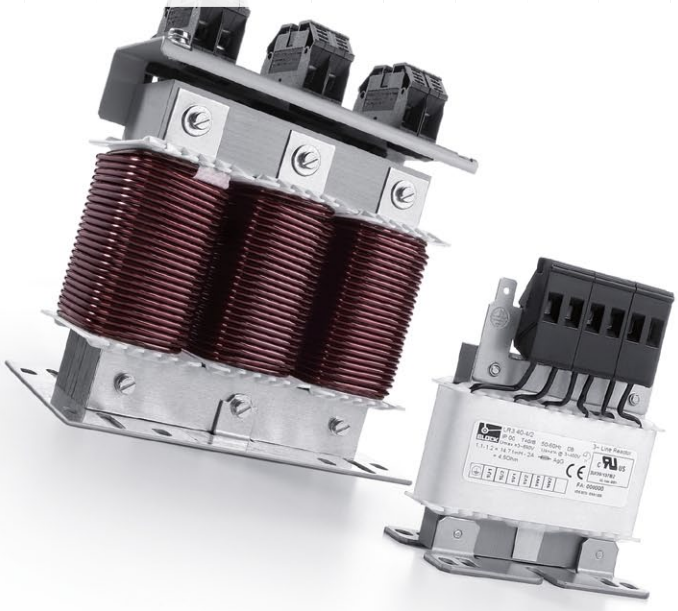
Ferrite transformer

All-pole sine filter

OVERVIEW
LINE REACTORS

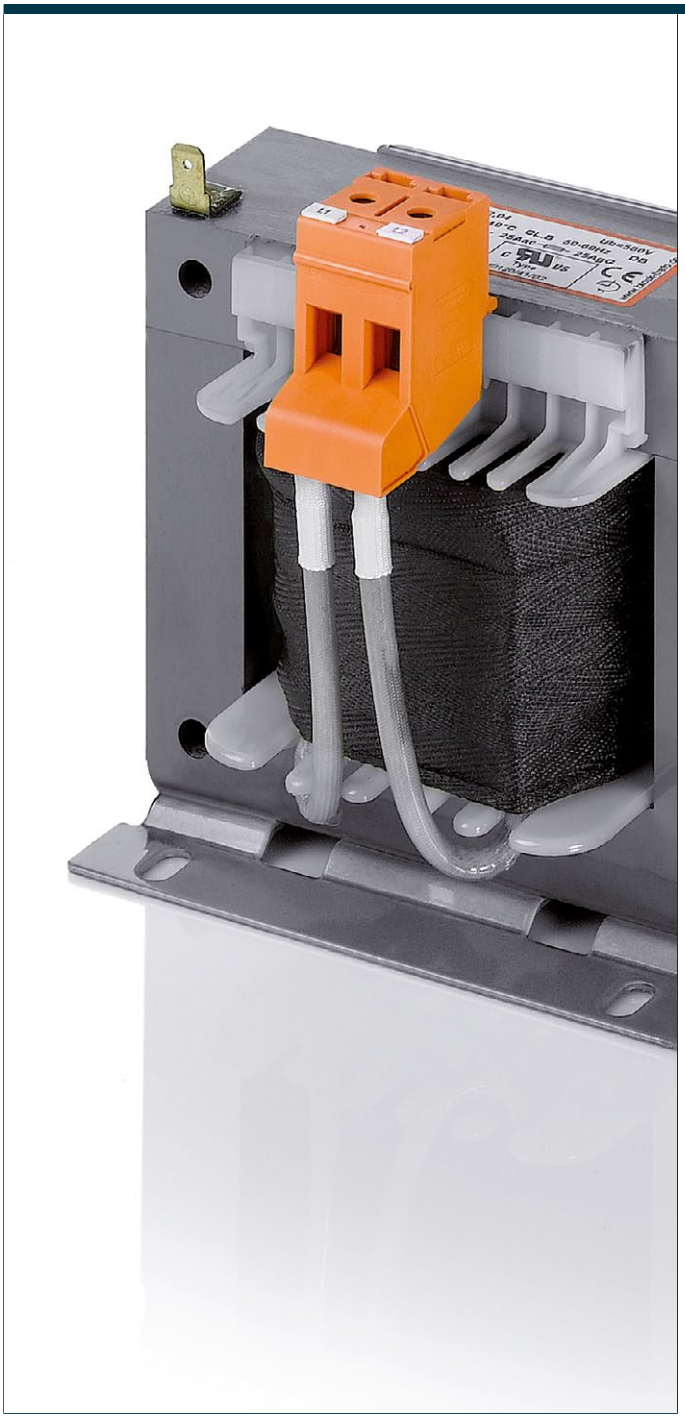
	Type	Rated input voltage	Voltage drop	Rated current																		
AC 1-phase	NKE	230 or 400 V	4 % uk		4 A	6 A		10 A	16 A	20 A	25 A											
AC 3-phase	LR3	3 x 400 – 500 V	3-5 % uk	2 A	4 A	6 A	8 A	10 A	16 A	20 A	25 A	30 A	35 A	40 A	45 A	50 A	63 A	70 A	80 A	90 A		
	LR3A	3 x 400 V	3-5 % uk																	90 A		

																		Page
																		448
	100 A	115 A	125 A	160 A	180 A	200 A	250 A	300 A	400 A	500 A	630 A	710 A	800 A	1000 A	1200 A	1400 A	1600 A	451
	100 A	115 A	125 A	160 A	180 A	200 A	250 A	300 A	400 A	500 A	630 A	710 A	800 A	1000 A	1200 A	1400 A	1600 A	464



Line reactor, single-phase
NKE 230 / 400

BLOCK Website



General Data

Rated voltage 230 or 400 Vac
Rated current 4 - 25 A
Inductance 1.170 - 12.750 mH
Insulation class B
Ambient temperature -10 °C to +40 °C
Degree of protection IP 00

Advantages

Use as line reactor, commutating reactor or PFC reactor
Power harmonic damping
Starting current limitation
Increases the service life of consumers
Low ripple
Very good corrosion protection and low noise thanks to vacuum impregnation
Bridging voltage dips
Peak current limitation

Applications

Line reactor to minimise mains pollution, to reduce the reactive-power components and charging currents in the DC link capacitor and to improve the cos(phi).

Standards

Line- and commutation reactor to
DIN EN 61558-2-20, IEC 61558-2-20, UL 506, CSA 22.2

Approvals

UL 506, CSA 22.2

Line reactor, single-phase
NKE 230 / 400

BLOCK Website

Electrical data

Typ	NKE 4/7,33	NKE 4/12,75	NKE 6/4,88	NKE 6/8,50	NKE 10/2,93	NKE 10/5,10
Operating data						
Rated voltage	230 Vac	400 Vac	230 Vac	400 Vac	230 Vac	400 Vac
Voltage drop	9.2 Vac	16 Vac	9.2 Vac	16 Vac	9.2 Vac	16 Vac
Rated current	4 A	4 A	6 A	6 A	10 A	10 A
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Inductance	7.330 mH	12.750 mH	4.880 mH	8.500 mH	2.930 mH	5.100 mH
Inductance deviation	±10%	±10%	±10%	±10%	±10%	±10%
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C
Type of cooling	AN	AN	AN	AN	AN	AN
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	B	B	B	B	B	B
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Test voltage	2500 Vac	2500 Vac	2500 Vac	2500 Vac	2500 Vac	2500 Vac
Order numbers						
Order Number	**NKE 4/7,33**	**NKE 4/12,75**	**NKE 6/4,88**	**NKE 6/8,50**	**NKE 10/2,93**	**NKE 10/5,10**

Line reactor, single-phase
NKE 230 / 400

BLOCK Website

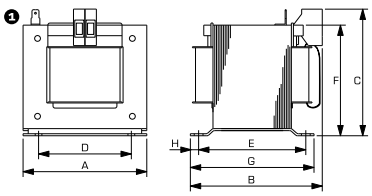
Electrical data

Typ	NKE 16/1,83	NKE 16/3,19	NKE 20/1,47	NKE 20/2,55	NKE 25/1,17	NKE 25/2,04
Operating data						
Rated voltage	230 Vac	400 Vac	230 Vac	400 Vac	230 Vac	400 Vac
Voltage drop	9.2 Vac	16 Vac	9.2 Vac	16 Vac	9.2 Vac	16 Vac
Rated current	16 A	16 A	20 A	20 A	25 A	25 A
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Inductance	1.830 mH	3.190 mH	1.470 mH	2.550 mH	1.170 mH	2.040 mH
Inductance deviation	±10%	±10%	±10%	±10%	±10%	±10%
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C
Type of cooling	AN	AN	AN	AN	AN	AN
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	B	B	B	B	B	B
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Test voltage	2500 Vac	2500 Vac	2500 Vac	2500 Vac	2500 Vac	2500 Vac
Order numbers						
Order Number	**NKE 16/1,83**	**NKE 16/3,19**	**NKE 20/1,47**	**NKE 20/2,55**	**NKE 25/1,17**	**NKE 25/2,04**

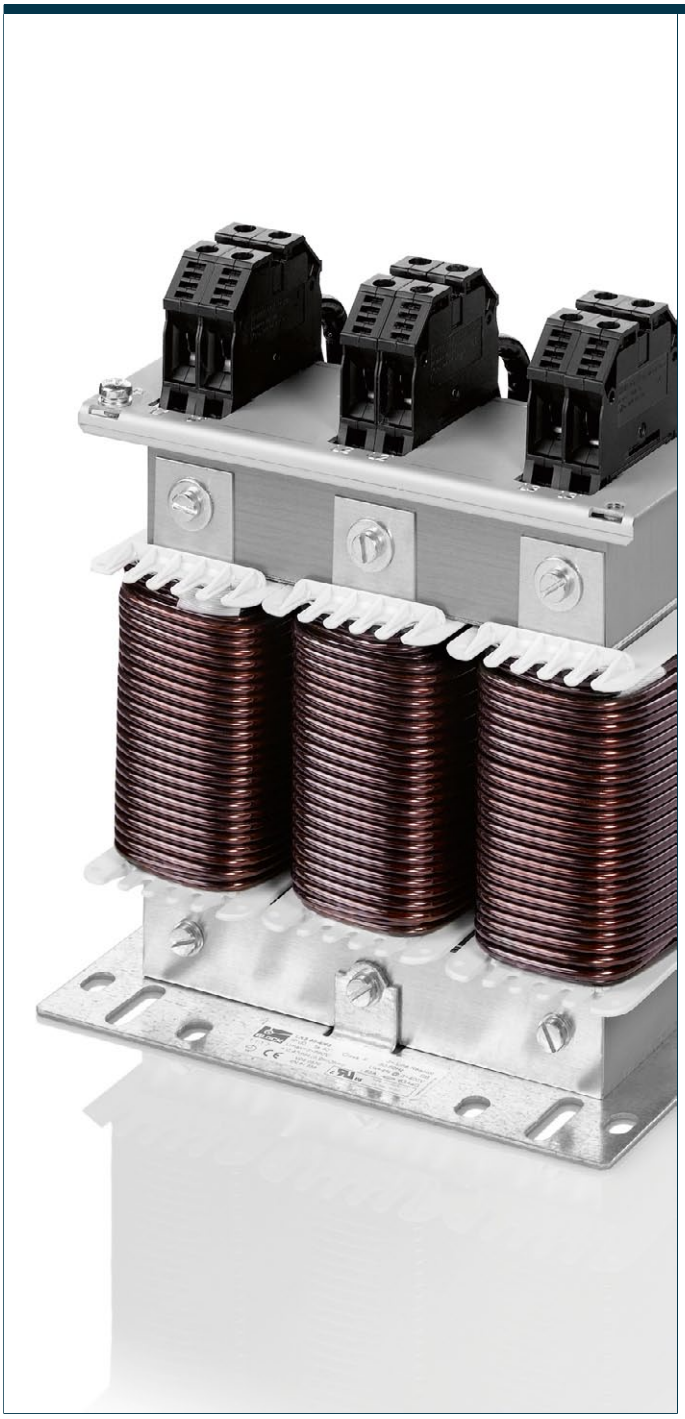
Mechanical data

Typ	Terminals phase	Terminals PE	Fixing method	Fixing screws	Weight	Dimension picture (in mm)	A	B	C	D	E	F	G	H
NKE 4/7,33	Screw clamp, 4 mm²	Tab connector, 6.3 x 0.8 mm	Base plate	M3	0.6 kg	1	60	66	68	44	39	56	50	5.5
NKE 4/12,75	Screw clamp, 4 mm²	Tab connector, 6.3 x 0.8 mm	Base plate	M3	0.6 kg	1	60	66	68	44	39	56	50	5.5
NKE 6/4,88	Screw clamp, 4 mm²	Tab connector, 6.3 x 0.8 mm	Base plate	M3	0.6 kg	1	60	66	68	44	39	56	50	5.5
NKE 6/8,50	Screw clamp, 4 mm²	Tab connector, 6.3 x 0.8 mm	Base plate	M4	1.4 kg	1	84	78	96	64	52	76	64	6
NKE 10/2,93	Screw clamp, 4 mm²	Tab connector, 6.3 x 0.8 mm	Base plate	M4	1.4 kg	1	84	78	96	64	52	76	64	6
NKE 10/5,10	Screw clamp, 4 mm²	Tab connector, 6.3 x 0.8 mm	Base plate	M4	1.4 kg	1	84	78	96	64	52	76	64	6
NKE 16/1,83	Screw clamp, 4 mm²	Tab connector, 6.3 x 0.8 mm	Base plate	M4	1.4 kg	1	84	78	96	64	52	76	64	6
NKE 16/3,19	Screw clamp, 4 mm²	Tab connector, 6.3 x 0.8 mm	Base plate	M5	2.2 kg	1	96	88	110	84	65	86	81	7.5
NKE 20/1,47	Screw clamp, 10 mm²	Tab connector, 6.3 x 0.8 mm	Base plate	M4	1.4 kg	1	84	87	96	64	52	76	64	6
NKE 20/2,55	Screw clamp, 10 mm²	Tab connector, 6.3 x 0.8 mm	Base plate	M5	4.2 kg	1	120	110	130	90	75	116	93	8
NKE 25/1,17	Screw clamp, 10 mm²	Tab connector, 6.3 x 0.8 mm	Base plate	M4	1.4 kg	1	84	87	96	64	52	76	64	6
NKE 25/2,04	Screw clamp, 10 mm²	Tab connector, 6.3 x 0.8 mm	Base plate	M5	4.2 kg	1	120	110	130	90	75	116	93	8

Dimension pictures



Line reactor, three-phase
LR3 400



General Data

Rated voltage 3 x 400 Vac
Short-circuit voltage (uK) 3 - 5 %
Rated current 3 x 2 - 3 x 1600 A
Inductance 0.019 - 14.700 mH
Insulation class B, F or H
Ambient temperature -10 °C to +40 °C
Degree of protection IP 00

Advantages

Use as line reactor, commutating reactor or PFC reactor
Ensuring the short-circuit voltage of 3, 4 or 5 % to the mains
Power harmonic damping
Starting current limitation
Increases the service life of consumers
Low ripple
Bridging voltage dips
Peak current limitation
Very good corrosion protection and low noise thanks to vacuum impregnation
Integrated lifting rings
Multifunctional fixing rails

Applications

Line reactor to minimise mains pollution, to reduce the reactive-power components and charging currents in the DC link capacitor and to improve the cos(phi).

Standards

Line- and commutation reactor to
DIN EN 61558-2-20, IEC 61558-2-20, UL 506, CSA 22.2

Approvals

UL 506, CSA 22.2

Line reactor, three-phase
LR3 400

Electrical data

Typ	LR3 40-3/2	LR3 40-4/2	LR3 40-5/2	LR3 40-3/4	LR3 40-4/4	LR3 40-5/4
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated voltage (IEC)	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac
Rated voltage (UL)	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac
Short circuit voltage uK	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac
Voltage drop	6.9 Vac	9.2 Vac @ 400 Vac	11.6 Vac @ 400 Vac	6.9 Vac	9.2 Vac	11.6 Vac
Rated current	3 x 2 A	3 x 2 A	3 x 2 A	3 x 4 A	3 x 4 A	3 x 4 A
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Inductance	11.000 mH	14.700 mH	18.500 mH	5.500 mH	7.350 mH	9.200 mH
Inductance deviation	±10%	±10%	±10%	±10%	±10%	±10%
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C
Type of cooling	AN	AN	AN	AN	AN	AN
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	IEC=B, UL=class 130	IEC=B, UL=class 130	IEC=B, UL=class 130	IEC=B, UL=class 130	IEC=B, UL=class 130	IEC=B, UL=class 130
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Test voltage	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac
Order numbers						
Order Number	**LR3 40-3/2**	**LR3 40-4/2**	**LR3 40-5/2**	**LR3 40-3/4**	**LR3 40-4/4**	**LR3 40-5/4**

Electrical data

Typ	LR3 40-3/6	LR3 40-4/6	LR3 40-5/6	LR3 40-3/8	LR3 40-4/8	LR3 40-5/8
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated voltage (IEC)	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac
Rated voltage (UL)	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac
Short circuit voltage uK	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac
Voltage drop	6.9 Vac	9.2 Vac	11.6 Vac	6.9 Vac	9.2 Vac	11.6 Vac
Rated current	3 x 6 A	3 x 6 A	3 x 6 A	3 x 8 A	3 x 8 A	3 x 8 A
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Inductance	3.700 mH	4.900 mH	6.200 mH	2.750 mH	3.680 mH	4.600 mH
Inductance deviation	±10%	±10%	±10%	±10%	±10%	±10%
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C
Type of cooling	AN	AN	AN	AN	AN	AN
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	IEC=B, UL=class 130	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Test voltage	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac
Order numbers						
Order Number	**LR3 40-3/6**	**LR3 40-4/6**	**LR3 40-5/6**	**LR3 40-3/8**	**LR3 40-4/8**	**LR3 40-5/8**

Line reactor, three-phase
LR3 400

Electrical data

Typ	LR3 40-3/10	LR3 40-4/10	LR3 40-5/10	LR3 40-3/16	LR3 40-4/16	LR3 40-5/16
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated voltage (IEC)	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac
Rated voltage (UL)	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac
Short circuit voltage uK	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac
Voltage drop	6.9 Vac	9.2 Vac	11.6 Vac	6.9 Vac	9.2 Vac	11.6 Vac
Rated current	3 x 10 A	3 x 10 A	3 x 10 A	3 x 16 A	3 x 16 A	3 x 16 A
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Inductance	2.200 mH	2.940 mH	3.680 mH	1.380 mH	1.840 mH	2.300 mH
Inductance deviation	±10%	±10%	±10%	±10%	±10%	±10%
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C
Type of cooling	AN	AN	AN	AN	AN	AN
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Test voltage	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac
Order numbers						
Order Number	**LR3 40-3/10**	**LR3 40-4/10**	**LR3 40-5/10**	**LR3 40-3/16**	**LR3 40-4/16**	**LR3 40-5/16**

Electrical data

Typ	LR3 40-3/20	LR3 40-4/20	LR3 40-5/20	LR3 40-3/25	LR3 40-4/25	LR3 40-5/25
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated voltage (IEC)	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac
Rated voltage (UL)	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac
Short circuit voltage uK	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac
Voltage drop	6.9 Vac	9.2 Vac	11.6 Vac	6.9 Vac	9.2 Vac	11.6 Vac
Rated current	3 x 20 A	3 x 20 A	3 x 20 A	3 x 25 A	3 x 25 A	3 x 25 A
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Inductance	1.100 mH	1.470 mH	1.840 mH	0.880 mH	1.180 mH	1.470 mH
Inductance deviation	±10%	±10%	±10%	±10%	±10%	±10%
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C
Type of cooling	AN	AN	AN	AN	AN	AN
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Test voltage	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac
Order numbers						
Order Number	**LR3 40-3/20**	**LR3 40-4/20**	**LR3 40-5/20**	**LR3 40-3/25**	**LR3 40-4/25**	**LR3 40-5/25**

Line reactor, three-phase
LR3 400

Electrical data

Typ	LR3 40-3/30	LR3 40-4/30	LR3 40-5/30	LR3 40-3/35	LR3 40-4/35	LR3 40-5/35
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated voltage (IEC)	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac
Rated voltage (UL)	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac
Short circuit voltage uK	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac
Voltage drop	6.9 Vac	9.2 Vac	11.6 Vac	6.9 Vac	9.2 Vac	11.6 Vac
Rated current	3 x 30 A	3 x 30 A	3 x 30 A	3 x 35 A	3 x 35 A	3 x 35 A
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Inductance	0.740 mH	0.980 mH	1.230 mH	0.630 mH	0.840 mH	1.050 mH
Inductance deviation	±10%	±10%	±10%	±10%	±10%	±10%
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C
Type of cooling	AN	AN	AN	AN	AN	AN
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Test voltage	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac
Order numbers						
Order Number	**LR3 40-3/30**	**LR3 40-4/30**	**LR3 40-5/30**	**LR3 40-3/35**	**LR3 40-4/35**	**LR3 40-5/35**

Electrical data

Typ	LR3 40-3/40	LR3 40-4/40	LR3 40-5/40	LR3 40-3/45	LR3 40-4/45	LR3 40-5/45
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated voltage (IEC)	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac
Rated voltage (UL)	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac
Short circuit voltage uK	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac
Voltage drop	6.9 Vac	9.2 Vac	11.6 Vac	6.9 Vac	9.2 Vac	11.6 Vac
Rated current	3 x 40 A	3 x 40 A	3 x 40 A	3 x 45 A	3 x 45 A	3 x 45 A
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Inductance	0.550 mH	0.740 mH	0.920 mH	0.490 mH	0.650 mH	0.817 mH
Inductance deviation	±10%	±10%	±10%	±10%	±10%	±10%
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C
Type of cooling	AN	AN	AN	AN	AN	AN
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Test voltage	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac
Order numbers						
Order Number	**LR3 40-3/40**	**LR3 40-4/40**	**LR3 40-5/40**	**LR3 40-3/45**	**LR3 40-4/45**	**LR3 40-5/45**

Line reactor, three-phase
LR3 400

Electrical data

Typ	LR3 40-3/50	LR3 40-4/50	LR3 40-5/50	LR3 40-3/63	LR3 40-4/63	LR3 40-5/63
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated voltage (IEC)	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac
Rated voltage (UL)	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac
Short circuit voltage uK	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac
Voltage drop	6.9 Vac	9.2 Vac	11.6 Vac	6.9 Vac	9.2 Vac	11.6 Vac
Rated current	3 x 50 A	3 x 50 A	3 x 50 A	3 x 63 A	3 x 63 A	3 x 63 A
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Inductance	0.440 mH	0.590 mH	0.735 mH	0.350 mH	0.470 mH	0.584 mH
Inductance deviation	±10%	±10%	±10%	±10%	±10%	±10%
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C
Type of cooling	AN	AN	AN	AN	AN	AN
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Test voltage	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac
Order numbers						
Order Number	**LR3 40-3/50**	**LR3 40-4/50**	**LR3 40-5/50**	**LR3 40-3/63**	**LR3 40-4/63**	**LR3 40-5/63**

Electrical data

Typ	LR3 40-3/70	LR3 40-4/70	LR3 40-5/70	LR3 40-3/80	LR3 40-4/80	LR3 40-5/80
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated voltage (IEC)	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac
Rated voltage (UL)	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac
Short circuit voltage uK	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac
Voltage drop	6.9 Vac	9.2 Vac	11.6 Vac	6.9 Vac	9.2 Vac	11.6 Vac
Rated current	3 x 70 A	3 x 70 A	3 x 70 A	3 x 80 A	3 x 80 A	3 x 80 A
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Inductance	0.315 mH	0.420 mH	0.525 mH	0.270 mH	0.370 mH	0.460 mH
Inductance deviation	±10%	±10%	±10%	±10%	±10%	±10%
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C
Type of cooling	AN	AN	AN	AN	AN	AN
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Test voltage	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac
Order numbers						
Order Number	**LR3 40-3/70**	**LR3 40-4/70**	**LR3 40-5/70**	**LR3 40-3/80**	**LR3 40-4/80**	**LR3 40-5/80**

Line reactor, three-phase
LR3 400

Electrical data

Typ	LR3 40-3/90	LR3 40-4/90	LR3 40-5/90	LR3 40-3/100	LR3 40-4/100	LR3 40-5/100
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated voltage (IEC)	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac
Rated voltage (UL)	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac
Short circuit voltage uK	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac
Voltage drop	6.9 Vac	9.2 Vac	11.6 Vac	6.9 Vac	9.2 Vac	11.6 Vac
Rated current	3 x 90 A	3 x 90 A	3 x 90 A	3 x 100 A	3 x 100 A	3 x 100 A
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Inductance	0.245 mH	0.330 mH	0.408 mH	0.220 mH	0.300 mH	0.368 mH
Inductance deviation	±10%	±10%	±10%	±10%	±10%	±10%
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C
Type of cooling	AN	AN	AN	AN	AN	AN
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Test voltage	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac
Order numbers						
Order Number	**LR3 40-3/90**	**LR3 40-4/90**	**LR3 40-5/90**	**LR3 40-3/100**	**LR3 40-4/100**	**LR3 40-5/100**

Electrical data

Typ	LR3 40-3/115	LR3 40-4/115	LR3 40-5/115	LR3 40-3/125	LR3 40-4/125	LR3 40-5/125
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated voltage (IEC)	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac
Rated voltage (UL)	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac
Short circuit voltage uK	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac
Voltage drop	6.9 Vac	9.2 Vac	11.6 Vac	6.9 Vac	9.2 Vac	11.6 Vac
Rated current	3 x 115 A	3 x 115 A	3 x 115 A	3 x 125 A	3 x 125 A	3 x 125 A
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Inductance	0.193 mH	0.260 mH	0.320 mH	0.177 mH	0.240 mH	0.294 mH
Inductance deviation	±10%	±10%	±10%	±10%	±10%	±10%
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C
Type of cooling	AN	AN	AN	AN	AN	AN
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=H, UL=class 180	IEC=H, UL=class 180
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Test voltage	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac
Order numbers						
Order Number	**LR3 40-3/115**	**LR3 40-4/115**	**LR3 40-5/115**	**LR3 40-3/125**	**LR3 40-4/125**	**LR3 40-5/125**

Line reactor, three-phase
LR3 400

Electrical data

Typ	LR3 40-3/160	LR3 40-4/160	LR3 40-5/160	LR3 40-3/180	LR3 40-4/180	LR3 40-5/180
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated voltage (IEC)	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac
Rated voltage (UL)	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac
Short circuit voltage uK	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac
Voltage drop	6.9 Vac	9.2 Vac	11.6 Vac	6.9 Vac	9.2 Vac	11.6 Vac
Rated current	3 x 160 A	3 x 160 A	3 x 160 A	3 x 180 A	3 x 180 A	3 x 180 A
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Inductance	0.138 mH	0.190 mH	0.230 mH	0.123 mH	0.170 mH	0.204 mH
Inductance deviation	±10%	±10%	±10%	±10%	±10%	±10%
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C
Type of cooling	AN	AN	AN	AN	AN	AN
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Test voltage	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac
Order numbers						
Order Number	**LR3 40-3/160**	**LR3 40-4/160**	**LR3 40-5/160**	**LR3 40-3/180**	**LR3 40-4/180**	**LR3 40-5/180**

Electrical data

Typ	LR3 40-3/200	LR3 40-4/200	LR3 40-5/200	LR3 40-3/250	LR3 40-4/250	LR3 40-5/250
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated voltage (IEC)	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac
Rated voltage (UL)	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac
Short circuit voltage uK	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac
Voltage drop	6.9 Vac	9.2 Vac	11.6 Vac	6.9 Vac	9.2 Vac	11.6 Vac
Rated current	3 x 200 A	3 x 200 A	3 x 200 A	3 x 250 A	3 x 250 A	3 x 250 A
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Inductance	0.110 mH	0.150 mH	0.184 mH	0.088 mH	0.120 mH	0.147 mH
Inductance deviation	±10%	±10%	±10%	±10%	±10%	±10%
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C
Type of cooling	AN	AN	AN	AN	AN	AN
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	IEC=H, UL=class 180	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Test voltage	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac
Order numbers						
Order Number	**LR3 40-3/200**	**LR3 40-4/200**	**LR3 40-5/200**	**LR3 40-3/250**	**LR3 40-4/250**	**LR3 40-5/250**

Line reactor, three-phase
LR3 400

Electrical data

Typ	LR3 40-3/300	LR3 40-4/300	LR3 40-5/300	LR3 40-3/400	LR3 40-4/400	LR3 40-5/400
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated voltage (IEC)	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac
Rated voltage (UL)	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac
Short circuit voltage uK	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac
Voltage drop	6.9 Vac	9.2 Vac	11.6 Vac	6.9 Vac	9.2 Vac	11.6 Vac
Rated current	3 x 300 A	3 x 300 A	3 x 300 A	3 x 400 A	3 x 400 A	3 x 400 A
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Inductance	0.074 mH	0.098 mH	0.123 mH	0.055 mH	0.074 mH	0.092 mH
Inductance deviation	±10%	±10%	±10%	±10%	±10%	±10%
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C
Type of cooling	AN	AN	AN	AN	AN	AN
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	IEC=F, UL=class 155	IEC=H, UL=class 180	IEC=F, UL=class 155	IEC=H, UL=class 180	IEC=F, UL=class 155	IEC=F, UL=class 155
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Test voltage	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac
Order numbers						
Order Number	**LR3 40-3/300**	**LR3 40-4/300**	**LR3 40-5/300**	**LR3 40-3/400**	**LR3 40-4/400**	**LR3 40-5/400**

Electrical data

Typ	LR3 40-3/500	LR3 40-4/500	LR3 40-5/500	LR3 40-3/630	LR3 40-4/630	LR3 40-5/630
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated voltage (IEC)	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac
Rated voltage (UL)	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac
Short circuit voltage uK	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac
Voltage drop	6.9 Vac	9.2 Vac	11.6 Vac	6.9 Vac	9.2 Vac	11.6 Vac
Rated current	3 x 500 A	3 x 500 A	3 x 500 A	3 x 630 A	3 x 630 A	3 x 630 A
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Inductance	0.044 mH	0.059 mH	0.074 mH	0.035 mH	0.047 mH	0.059 mH
Inductance deviation	±10%	±10%	±10%	±10%	±10%	±10%
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C
Type of cooling	AN	AN	AN	AN	AN	AN
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	IEC=F, UL=class 155	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Test voltage	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac
Order numbers						
Order Number	**LR3 40-3/500**	**LR3 40-4/500**	**LR3 40-5/500**	**LR3 40-3/630**	**LR3 40-4/630**	**LR3 40-5/630**

Line reactor, three-phase
LR3 400

Electrical data

Typ	LR3 40-3/710	LR3 40-4/710	LR3 40-5/710	LR3 40-3/800	LR3 40-4/800	LR3 40-5/800
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated voltage (IEC)	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac
Rated voltage (UL)	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac
Short circuit voltage uK	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac
Voltage drop	6.9 Vac	9.2 Vac	11.6 Vac	6.9 Vac	9.2 Vac	11.6 Vac
Rated current	3 x 710 A	3 x 710 A	3 x 710 A	3 x 800 A	3 x 800 A	3 x 800 A
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Inductance	0.031 mH	0.042 mH	0.052 mH	0.028 mH	0.037 mH	0.046 mH
Inductance deviation	±10%	±10%	±10%	±10%	±10%	±10%
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C
Type of cooling	AN	AN	AN	AN	AN	AN
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Test voltage	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac
Order numbers						
Order Number	**LR3 40-3/710**	**LR3 40-4/710**	**LR3 40-5/710**	**LR3 40-3/800**	**LR3 40-4/800**	**LR3 40-5/800**

Electrical data

Typ	LR3 40-3/1000	LR3 40-4/1000	LR3 40-5/1000	LR3 40-3/1200	LR3 40-4/1200	LR3 40-5/1200
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated voltage (IEC)	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac
Rated voltage (UL)	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac
Short circuit voltage uK	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac
Voltage drop	6.9 Vac	9.2 Vac	11.6 Vac	6.9 Vac	9.2 Vac	11.6 Vac
Rated current	3 x 1000 A	3 x 1000 A	3 x 1000 A	3 x 1200 A	3 x 1200 A	3 x 1200 A
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Inductance	0.022 mH	0.030 mH	0.037 mH	0.018 mH	0.025 mH	0.031 mH
Inductance deviation	±10%	±10%	±10%	±10%	±10%	±10%
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C
Type of cooling	AN	AN	AN	AN	AN	AN
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Test voltage	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac
Order numbers						
Order Number	**LR3 40-3/1000**	**LR3 40-4/1000**	**LR3 40-5/1000**	**LR3 40-3/1200**	**LR3 40-4/1200**	**LR3 40-5/1200**

Line reactor, three-phase
LR3 400

Electrical data

Typ	LR3 40-3/1400	LR3 40-4/1400	LR3 40-5/1400	LR3 40-3/1600	LR3 40-4/1600	LR3 40-5/1600
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated voltage (IEC)	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac
Rated voltage (UL)	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac
Short circuit voltage uK	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac
Voltage drop	6.9 Vac	9.2 Vac	11.6 Vac	6.9 Vac	9.2 Vac	11.6 Vac
Rated current	3 x 1400 A	3 x 1400 A	3 x 1400 A	3 x 1600 A	3 x 1600 A	3 x 1600 A
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Inductance	0.016 mH	0.021 mH	0.026 mH	0.014 mH	0.019 mH	0.023 mH
Inductance deviation	±10%	±10%	±10%	±10%	±10%	±10%
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C
Type of cooling	AN	AN	AN	AN	AN	AN
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Test voltage	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac
Order numbers						
Order Number	**LR3 40-3/1400**	**LR3 40-4/1400**	**LR3 40-5/1400**	**LR3 40-3/1600**	**LR3 40-4/1600**	**LR3 40-5/1600**

Line reactor, three-phase
LR3 400

Mechanical data

Typ	Terminals phase	Terminals PE	Fixing method	Fixing screws	Weight	Dimension picture (in mm)	A	B	C	D	d1	d2	E	e1	e2	F
LR3 40-3/2	Screw clamp, 4 mm²	Tab connector, 6.3 x 0.8 mm	Fixing rail	M4	0.53 kg	1	74	56	116	50	65	-	35	40	-	-
LR3 40-4/2	Screw clamp, 4 mm²	Tab connector, 6.3 x 0.8 mm	Fixing rail	M4	0.53 kg	1	74	56	116	50	65	-	27	35	-	-
LR3 40-5/2	Screw clamp, 4 mm²	Tab connector, 6.3 x 0.8 mm	Fixing rail	M4	0.53 kg	1	74	56	100	50	65	-	35	40	-	-
LR3 40-3/4	Screw clamp, 4 mm²	Tab connector, 6.3 x 0.8 mm	Fixing rail	M4	0.72 kg	1	74	63	98	50	65	-	42	47	-	-
LR3 40-4/4	Screw clamp, 4 mm²	Tab connector, 6.3 x 0.8 mm	Fixing rail	M4	1.31 kg	1	80	60	116	56	71	-	38	45	-	-
LR3 40-5/4	Screw clamp, 4 mm²	Tab connector, 6.3 x 0.8 mm	Fixing rail	M4	1.31 kg	1	80	60	114	56	71	-	38	45	-	-
LR3 40-3/6	Screw clamp, 4 mm²	Tab connector, 6.3 x 0.8 mm	Fixing rail	M4	0.94 kg	1	80	60	116	56	71	-	38	45	-	-
LR3 40-4/6	Screw clamp, 4 mm²	Tab connector, 6.3 x 0.8 mm	Fixing rail	M4	1.45 kg	1	80	69	117	56	71	-	47	54	-	-
LR3 40-5/6	Screw clamp, 4 mm²	for M4	Fixing rail	M4	1.39 kg	1	80	69	117	56	71	-	47	54	-	-
LR3 40-3/8	Screw clamp, 4 mm²	for M4	Fixing rail	M4	1.45 kg	1	80	69	117	56	71	-	47	54	-	-
LR3 40-4/8	Screw clamp, 4 mm²	for M5	Fixing rail	M4	1.90 kg	2	120	85	135	90	105	-	39	70	-	-
LR3 40-5/8	Screw clamp, 4 mm²	for M4	Fixing rail	M4	2.00 kg	2	120	85	136	90	105	-	39	70	-	-
LR3 40-3/10	Screw clamp, 4 mm²	for M5	Fixing rail	M4	2.00 kg	2	120	85	135	90	105	-	39	70	-	-
LR3 40-4/10	Screw clamp, 4 mm²	for M5	Fixing rail	M4	2.00 kg	2	120	85	135	90	105	-	39	70	-	-
LR3 40-5/10	Screw clamp, 4 mm²	for M4	Fixing rail	M4	2.70 kg	2	120	95	138	90	105	-	49	80	-	-
LR3 40-3/16	Screw clamp, 4 mm²	for M5	Fixing rail	M4	2.70 kg	2	120	95	135	90	105	-	49	80	-	-
LR3 40-4/16	Screw clamp, 4 mm²	for M5	Fixing rail	M4	2.70 kg	2	120	95	135	90	105	-	49	80	-	-
LR3 40-5/16	Screw clamp, 4 mm²	for M4	Fixing rail	M5	3.80 kg	2	155	95	163	113	135	-	50	80	-	-
LR3 40-3/20	Screw clamp, 4 mm²	for M5	Fixing rail	M5	3.54 kg	2	155	95	162	113	135	-	50	80	-	-
LR3 40-4/20	Screw clamp, 4 mm²	for M5	Fixing rail	M5	3.80 kg	3	155	95	162	113	135	-	50	80	-	-
LR3 40-5/20	Screw clamp, 4 mm²	for M4	Fixing rail	M5	5.34 kg	2	155	110	162	113	135	-	65	95	-	-
LR3 40-3/25	Screw clamp, 10 mm²	for M5	Fixing rail	M5	3.80 kg	3	155	95	166	113	135	-	50	80	-	-
LR3 40-4/25	Screw clamp, 10 mm²	for M5	Fixing rail	M5	5.80 kg	3	155	110	167	113	135	-	65	95	-	-
LR3 40-5/25	Screw clamp, 10 mm²	for M4	Fixing rail	M5	5.85 kg	2	155	110	166	113	135	-	65	95	-	-
LR3 40-3/30	Screw clamp, 10 mm²	for M5	Fixing rail	M5	5.44 kg	3	155	110	167	113	135	-	65	95	-	-
LR3 40-4/30	Screw clamp, 10 mm²	for M5	Fixing rail	M5	5.85 kg	3	155	110	167	113	135	-	65	95	-	-
LR3 40-5/30	Screw clamp, 10 mm²	for M5	Fixing rail	M5	6.25 kg	3	185	102	198	90	136	-	70	83	-	-
LR3 40-3/35	Screw clamp, 10 mm²	for M5	Fixing rail	M5	5.95 kg	3	155	110	167	113	135	-	65	95	-	-
LR3 40-4/35	Screw clamp, 10 mm²	for M5	Fixing rail	M5	5.95 kg	3	155	110	166	113	135	-	65	95	-	-
LR3 40-5/35	Screw clamp, 10 mm²	for M5	Fixing rail	M5	8.25 kg	3	185	112	197	90	136	-	80	93	-	-
LR3 40-3/40	Screw clamp, 10 mm²	for M6	Fixing rail	M5	6.12 kg	3	185	102	195	90	136	-	83	70	-	-
LR3 40-4/40	Screw clamp, 10 mm²	for M6	Fixing rail	M5	6.80 kg	3	185	102	195	90	136	-	83	70	-	-
LR3 40-5/40	Screw clamp, 10 mm²	for M6	Fixing rail	M5	8.28 kg	3	185	112	197	90	136	-	80	93	-	-

Dimension pictures

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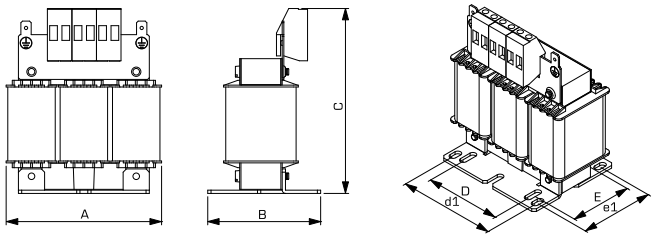

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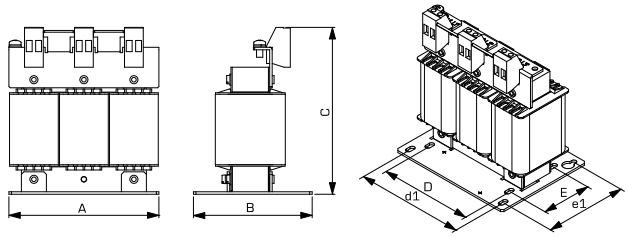

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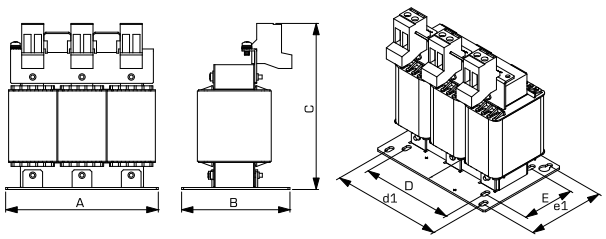


Line reactor, three-phase
LR3 400

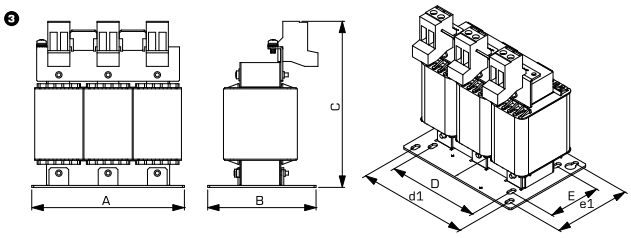
ePLAN data portal BLOCK Website

Mechanical data 30

Typ	Terminals phase	Terminals PE	Fixing method	Fixing screws	Weight	Dimension picture (in mm)	A	B	C	D	d1	d2	E	e1	e2	F
LR3 40-3/45	Screw clamp, 10 mm²	for M5	Fixing rail	M6	6.80 kg	3	185	102	195	90	136	-	83	70	-	-
LR3 40-4/45	Screw clamp, 10 mm²	for M5	Fixing rail	M6	8.25 kg	3	185	112	196	90	136	170	80	93	-	-
LR3 40-5/45	Screw clamp, 10 mm²	for M5	Fixing rail	M6	9.65 kg	3	185	122	207	90	136	-	90	103	-	-
LR3 40-3/50	Screw clamp, 16 mm²	for M5	Fixing rail	M6	6.80 kg	4	185	102	210	90	136	170	83	70	57	-
LR3 40-4/50	Screw clamp, 10 mm²	for M6	Fixing rail	M6	8.35 kg	4	185	112	207	90	136	170	67	80	93	-
LR3 40-5/50	Screw clamp, 35 mm²	for M6	Fixing rail	M6	10.80 kg	3	210	117	239	105	156	-	85	98	-	-
LR3 40-3/63	Screw clamp, 16 mm²	for M5	Fixing rail	M6	7.71 kg	4	185	112	207	90	136	170	93	80	67	-
LR3 40-4/63	Screw clamp, 16 mm²	for M5	Fixing rail	M6	9.65 kg	4	210	117	241	105	156	175	77	85	98	-
LR3 40-5/63	Screw clamp, 35 mm²	for M5	Fixing rail	M6	12.19 kg	3	210	125	237	105	156	-	93	106	-	-
LR3 40-3/70	Screw clamp, 16 mm²	for M5	Fixing rail	M6	9.50 kg	4	185	122	207	90	136	170	103	90	77	-
LR3 40-4/70	Screw clamp, 35 mm²	for M5	Fixing rail	M6	10.80 kg	4	210	117	240	98	156	175	77	88	105	-
LR3 40-5/70	Screw clamp, 35 mm²	for M5	Fixing rail	M6	14.38 kg	3	210	135	240	180	-	-	92	-	-	-
LR3 40-3/80	Screw clamp, 35 mm²	for M5	Fixing rail	M6	10.80 kg	4	210	117	240	105	156	175	98	85	77	-
LR3 40-4/80	Screw clamp, 35 mm²	for M5	Fixing rail	M6	12.50 kg	4	210	125	238	105	156	175	85	93	105	-
LR3 40-5/80	Screw clamp, 35 mm²	for M5	Fixing rail	M8	19.00 kg	3	230	149	260	176	180	-	95	122	-	-
LR3 40-3/90	Flat copper	for M8	Fixing rail	M8	12.51 kg	5	210	105	180	175	-	-	82	-	-	128
LR3 40-4/90	Flat copper	for M8	Fixing rail	M8	16.00 kg	5	267	115	201	176	180	249	74	82	101	128
LR3 40-5/90	Flat copper	for M8	Fixing rail	M8	21.66 kg	5	267	139	201	179	180	249	98	106	125	156
LR3 40-3/100	Flat copper	for M8	Fixing rail	M8	13.22 kg	5	267	115	201	176	180	249	74	82	98	128
LR3 40-4/100	Flat copper	for M8	Fixing rail	M8	19.00 kg	5	267	139	201	176	180	249	97	106	125	153
LR3 40-5/100	Flat copper	for M8	Fixing rail	M8	23.19 kg	5	291	139	212	185	273	-	110	110	-	160
LR3 40-3/115	Flat copper	for M8	Fixing rail	M8	19.00 kg	5	267	139	201	176	180	249	98	106	122	152
LR3 40-4/115	Flat copper	for M8	Fixing rail	M8	21.00 kg	5	291	139	212	185	273	-	120	120	-	158
LR3 40-5/115	Flat copper	for M8	Fixing rail	M8	25.31 kg	5	219	132	233	200	-	-	105	-	-	164
LR3 40-3/125	Flat copper	for M8	Fixing rail	M8	19.00 kg	5	267	139	202	176	180	249	98	106	122	152
LR3 40-4/125	Flat copper	for M8	Fixing rail	M8	22.00 kg	5	291	139	211	185	273	-	120	120	-	159
LR3 40-5/125	Flat copper	for M8	Fixing rail	M8	25.61 kg	5	219	132	234	200	-	-	105	-	-	165
LR3 40-3/160	Flat copper	for M8	Fixing rail	M8	20.20 kg	5	291	129	212	185	273	-	97	97	-	148
LR3 40-4/160	Flat copper	for M8	Fixing rail	M8	25.50 kg	5	291	149	210	185	273	-	185	185	-	169
LR3 40-5/160	Flat copper	for M8	Fixing rail	M8	32.00 kg	5	352	144	264	224	240	328	88	107	123	166
LR3 40-3/180	Flat copper	for M8	Fixing rail	M8	26.47 kg	5	291	149	208	185	273	-	117	117	-	169
LR3 40-4/180	Flat copper	for M8	Fixing rail	M8	28.00 kg	5	291	153	212	185	273	-	123	123	-	177
LR3 40-5/180	Flat copper	for M8	Fixing rail	M8	48.28 kg	5	352	168	265	224	240	328	122	132	148	208

Dimension pictures

3



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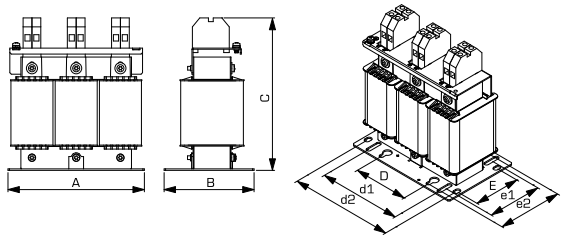

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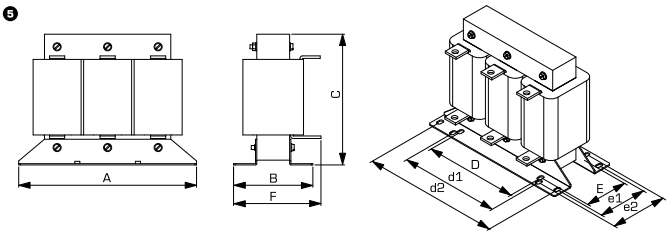


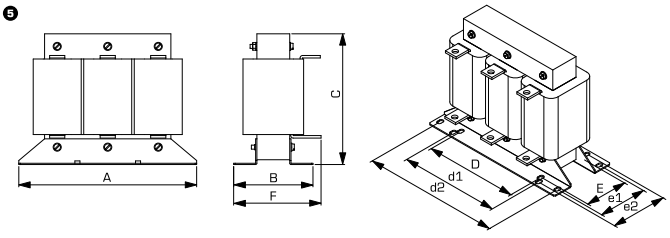
Line reactor, three-phase
LR3 400

Mechanical data 30

Typ	Terminals phase	Terminals PE	Fixing method	Fixing screws	Weight	Dimension picture (in mm)	A	B	C	D	d1	d2	E	e1	e2	F
LR3 40-3/200	Flat copper	for M8	Fixing rail	M8	23.21 kg	5	316	164	232	200	215	292	105	102	101	181
LR3 40-4/200	Flat copper	for M8	Fixing rail	M8	32.00 kg	5	352	144	264	224	240	328	97	107	123	163
LR3 40-5/200	Flat copper	for M8	Fixing rail	M8	48.00 kg	5	352	168	265	224	240	328	122	132	148	204
LR3 40-3/250	Flat copper	for M8	Fixing rail	M8	32.00 kg	5	352	144	264	224	240	328	81	91	107	162
LR3 40-4/250	Flat copper	for M8	Fixing rail	M8	41.00 kg	5	352	158	265	224	240	328	110	120	136	177
LR3 40-5/250	Flat copper	for M8	Fixing rail	M8	48.58 kg	5	352	183	266	224	240	328	137	147	163	217
LR3 40-3/300	Flat copper	for M8	Fixing rail	M8	31.80 kg	5	352	144	264	224	240	328	81	97	107	183
LR3 40-4/300	Flat copper	for M8	Fixing rail	M8	48.00 kg	5	352	168	265	224	240	328	127	131	147	207
LR3 40-5/300	Flat copper	for M8	Fixing rail	M8	62.00 kg	5	352	195	266	224	240	328	148	158	174	232
LR3 40-3/400	Flat copper	for M8	Fixing rail	M8	41.50 kg	5	352	157	265	224	240	328	104	110	120	197
LR3 40-4/400	Flat copper	for M8	Fixing rail	M8	56.00 kg	5	352	183	266	224	240	328	136	146	162	220
LR3 40-5/400	Flat copper	for M8	Fixing rail	M8	71.73 kg	5	412	172	318	264	310	388	136	146	146	202
LR3 40-3/500	Flat copper	for M8	Fixing rail	M8	56.00 kg	5	352	184	265	224	240	328	120	136	146	217
LR3 40-4/500	Flat copper	for M8	Fixing rail	M8	62.00 kg	5	352	195	266	224	240	328	147	157	173	232
LR3 40-5/500	Flat copper	for M8	Fixing rail	M8	74.35 kg	5	412	172	318	264	310	388	136	146	146	203
LR3 40-3/630	Flat copper	for M8	Fixing rail	M8	60.53 kg	5	412	170	315	264	310	388	134	134	124	200
LR3 40-4/630	Flat copper	for M8	Fixing rail	M8	75.50 kg	5	412	188	317	264	310	388	151	161	161	214
LR3 40-5/630	Flat copper	for M8	Fixing rail	M8	85.75 kg	5	480	155	372	316	370	450	129	139	147	205
LR3 40-3/710	Flat copper	for M8	Fixing rail	M8	73.15 kg	5	412	188	317	264	310	388	149	149	139	209
LR3 40-4/710	Flat copper	for M8	Fixing rail	M10	102.00 kg	5	480	186	372	316	371	450	139	149	157	226
LR3 40-5/710	Flat copper	for M8	Fixing rail	M10	98.69 kg	5	480	165	372	316	370	450	139	149	157	215
LR3 40-3/800	Flat copper	for M8	Fixing rail	M10	102.00 kg	5	480	183	377	316	370	450	140	150	158	226
LR3 40-4/800	Flat copper	for M8	Fixing rail	M10	115.00 kg	5	480	200	371	316	370	450	154	164	172	241
LR3 40-5/800	Flat copper	for M16	Fixing rail	M10	144.07 kg	5	552	217	419	356	430	516	161	163	189	308
LR3 40-3/1000	Flat copper	for M16	Fixing rail	M10	115.00 kg	5	480	200	376	316	370	450	144	164	172	238
LR3 40-4/1000	Flat copper	for M16	Fixing rail	M10	145.00 kg	5	480	245	376	316	370	450	199	209	217	274
LR3 40-5/1000	Flat copper	for M16	Fixing rail	M10	128.32 kg	5	552	217	419	356	430	516	161	163	189	305
LR3 40-3/1200	Flat copper	for M16	Fixing rail	M12	115.72 kg	5	552	217	419	356	430	516	167	169	195	301
LR3 40-4/1200	Flat copper	for M16	Fixing rail	M12	186.20 kg	5	552	244	419	356	430	516	176	190	216	329
LR3 40-5/1200	Flat copper	for M16	Fixing rail	M12	186.20 kg	5	552	274	420	356	430	516	218	220	246	362
LR3 40-3/1400	Flat copper	for M16	Fixing rail	M12	145.24 kg	5	552	244	420	356	430	516	194	196	222	358
LR3 40-4/1400	Flat copper	for M16	Fixing rail	M12	207.90 kg	5	552	274	420	356	430	516	206	220	246	362
LR3 40-5/1400	Flat copper	for M16	Fixing rail	M12	207.90 kg	5	540	270	465	490	-	-	236	-	-	328
LR3 40-3/1600	Flat copper	for M16	Fixing rail	M12	171.40 kg	5	552	274	420	356	430	516	224	226	252	358
LR3 40-4/1600	Flat copper	for M16	Fixing rail	M12	306.60 kg	5	552	294	416	356	430	516	226	240	266	377
LR3 40-5/1600	Flat copper	for M10	Fixing rail	M12	306.60 kg	5	540	270	465	490	-	-	336	-	-	324

Dimension pictures

5



Line reactor, three-phase, aluminium
LR3A 400

BLOCK Website

General Data

Rated voltage 3 x 400 Vac
Short-circuit voltage (uK) 3 - 5 %
Rated current 3 x 90 - 3 x 1600 A
Inductance 0.019 - 14.700 mH
Insulation class H
Ambient temperature -10 °C to +40 °C
Degree of protection IP 00

Advantages

Use as line reactor, commutating reactor or PFC reactor
Weight reduction through aluminum winding
Ensuring the short-circuit voltage of 3, 4 or 5 % to the mains
Power harmonic damping
Starting current limitation
Increases the service life of consumers
Low ripple
Bridging voltage dips
Peak current limitation
Very good corrosion protection and low noise thanks to vacuum impregnation
Integrated lifting rings

Applications

Line reactor to minimise mains pollution, to reduce the reactive-power components and charging currents in the DC link capacitor and to improve the cos(phi).

Standards

Line- and commutation reactor to
DIN EN 61558-2-20, IEC 61558-2-20, UL 506, CSA 22.2

Approvals

UL 506, CSA 22.2

Line reactor, three-phase, aluminium
LR3A 400

BLOCK Website

Electrical data

Typ	LR3A 40-3/90	LR3A 40-4/90	LR3A 40-5/90	LR3A 40-3/100	LR3A 40-4/100	LR3A 40-5/100
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated voltage (IEC)	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac
Rated voltage (UL)	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac
Short circuit voltage uK	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac
Frequency range	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz
Voltage drop	6.9 Vac	9.2 Vac	11.6 Vac	6.9 Vac	9.2 Vac	11.6 Vac
Rated current	90 A	90 A	90 A	100 A	100 A	100 A
Inductance	0.245 mH	0.330 mH	0.408 mH	0.220 mH	0.290 mH	0.368 mH
Inductance deviation	±10 %	±10 %	±10 %	±10 %	±10 %	±10 %
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C
Type of cooling	AN	AN	AN	AN	AN	AN
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Insulation class	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180
Test voltage	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac
Order numbers						
Order Number	**LR3A 40-3/90**	**LR3A 40-4/90**	**LR3A 40-5/90**	**LR3A 40-3/100**	**LR3A 40-4/100**	**LR3A 40-5/100**

Line reactor, three-phase, aluminium
LR3A 400

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Electrical data

Typ	LR3A 40-3/115	LR3A 40-4/115	LR3A 40-5/115	LR3A 40-3/125	LR3A 40-4/125	LR3A 40-5/125
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated voltage (IEC)	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac
Rated voltage (UL)	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac
Short circuit voltage uK	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac	4 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac
Frequency range	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz
Voltage drop	6.9 Vac	9.2 Vac	11.6 Vac	6.9 Vac	9.2 Vac	11.6 Vac
Rated current	115 A	115 A	115 A	125 A	125 A	125 A
Inductance	0.193 mH	0.250 mH	0.320 mH	0.177 mH	0.230 mH	0.294 mH
Inductance deviation	±10 %	±10 %	±10 %	±10 %	±10 %	±10 %
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C
Type of cooling	AN	AN	AN	AN	AN	AN
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Insulation class	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180
Test voltage	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac
Order numbers						
Order Number	**LR3A 40-3/115**	**LR3A 40-4/115**	**LR3A 40-5/115**	**LR3A 40-3/125**	**LR3A 40-4/125**	**LR3A 40-5/125**

Electrical data

Typ	LR3A 40-3/160	LR3A 40-4/160	LR3A 40-5/160	LR3A 40-3/180	LR3A 40-4/180	LR3A 40-5/180
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated voltage (IEC)	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac
Rated voltage (UL)	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac
Short circuit voltage uK	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac
Frequency range	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz
Voltage drop	6.9 Vac	9.2 Vac	11.6 Vac	6.9 Vac	9.2 Vac	11.6 Vac
Rated current	160 A	160 A	160 A	180 A	180 A	180 A
Inductance	0.138 mH	0.180 mH	0.230 mH	0.123 mH	0.160 mH	0.204 mH
Inductance deviation	±10 %	±10 %	±10 %	±10 %	±10 %	±10 %
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C
Type of cooling	AN	AN	AN	AN	AN	AN
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Insulation class	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180
Test voltage	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac
Order numbers						
Order Number	**LR3A 40-3/160**	**LR3A 40-4/160**	**LR3A 40-5/160**	**LR3A 40-3/180**	**LR3A 40-4/180**	**LR3A 40-5/180**

Line reactor, three-phase, aluminium
LR3A 400

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Electrical data

Typ	LR3A 40-3/200	LR3A 40-4/200	LR3A 40-5/200	LR3A 40-3/250	LR3A 40-4/250	LR3A 40-5/250
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated voltage (IEC)	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac
Rated voltage (UL)	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac
Short circuit voltage uK	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac
Frequency range	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz
Voltage drop	6.9 Vac	9.2 Vac	11.6 Vac	6.9 Vac	9.2 Vac	11.6 Vac
Rated current	200 A	200 A	200 A	250 A	250 A	250 A
Inductance	0.110 mH	0.150 mH	0.184 mH	0.088 mH	0.120 mH	0.147 mH
Inductance deviation	±10 %	±10 %	±10 %	±10 %	±10 %	±10 %
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C
Type of cooling	AN	AN	AN	AN	AN	AN
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Insulation class	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180
Test voltage	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac
Order numbers						
Order Number	**LR3A 40-3/200**	**LR3A 40-4/200**	**LR3A 40-5/200**	**LR3A 40-3/250**	**LR3A 40-4/250**	**LR3A 40-5/250**

Electrical data

Typ	LR3A 40-3/300	LR3A 40-4/300	LR3A 40-5/300	LR3A 40-3/400	LR3A 40-4/400	LR3A 40-5/400
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated voltage (IEC)	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac
Rated voltage (UL)	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac
Short circuit voltage uK	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac
Frequency range	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz
Voltage drop	6.9 Vac	9.2 Vac	11.6 Vac	6.9 Vac	9.2 Vac	11.6 Vac
Rated current	300 A	300 A	300 A	400 A	400 A	400 A
Inductance	0.074 mH	0.089 mH	0.123 mH	0.055 mH	0.074 mH	0.092 mH
Inductance deviation	±10 %	±10 %	±10 %	±10 %	±10 %	±10 %
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C
Type of cooling	AN	AN	AN	AN	AN	AN
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Insulation class	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180
Test voltage	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac
Order numbers						
Order Number	**LR3A 40-3/300**	**LR3A 40-4/300**	**LR3A 40-5/300**	**LR3A 40-3/400**	**LR3A 40-4/400**	**LR3A 40-5/400**

Line reactor, three-phase, aluminium
LR3A 400

BLOCK Website

Electrical data

Typ	LR3A 40-3/500	LR3A 40-4/500	LR3A 40-5/500	LR3A 40-3/630	LR3A 40-4/630	LR3A 40-5/630
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated voltage (IEC)	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac
Rated voltage (UL)	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac
Short circuit voltage uK	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac
Frequency range	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz
Voltage drop	6.9 Vac	9.2 Vac	11.6 Vac	6.9 Vac	9.2 Vac	11.6 Vac
Rated current	500 A	500 A	500 A	630 A	630 A	630 A
Inductance	0.044 mH	0.059 mH	0.074 mH	0.035 mH	0.047 mH	0.059 mH
Inductance deviation	±10 %	±10 %	±10 %	±10 %	±10 %	±10 %
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C
Type of cooling	AN	AN	AN	AN	AN	AN
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Insulation class	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180
Test voltage	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac
Order numbers						
Order Number	**LR3A 40-3/500**	**LR3A 40-4/500**	**LR3A 40-5/500**	**LR3A 40-3/630**	**LR3A 40-4/630**	**LR3A 40-5/630**

Electrical data

Typ	LR3A 40-3/710	LR3A 40-4/710	LR3A 40-5/710	LR3A 40-3/800	LR3A 40-4/800	LR3A 40-5/800
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated voltage (IEC)	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac
Rated voltage (UL)	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac
Short circuit voltage uK	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac
Frequency range	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz
Voltage drop	6.9 Vac	9.2 Vac	11.6 Vac	6.9 Vac	9.2 Vac	11.6 Vac
Rated current	710 A	710 A	710 A	800 A	800 A	800 A
Inductance	0.031 mH	0.042 mH	0.052 mH	0.022 mH	0.037 mH	0.046 mH
Inductance deviation	±10 %	±10 %	±10 %	±10 %	±10 %	±10 %
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C
Type of cooling	AN	AN	AN	AN	AN	AN
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Insulation class	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180
Test voltage	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac
Order numbers						
Order Number	**LR3A 40-3/710**	**LR3A 40-4/710**	**LR3A 40-5/710**	**LR3A 40-3/800**	**LR3A 40-4/800**	**LR3A 40-5/800**

Line reactor, three-phase, aluminium
LR3A 400

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Electrical data

Typ	LR3A 40-3/1000	LR3A 40-4/1000	LR3A 40-5/1000	LR3A 40-3/1200	LR3A 40-4/1200	LR3A 40-5/1200
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated voltage (IEC)	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac
Rated voltage (UL)	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac
Short circuit voltage uK	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac
Frequency range	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz
Voltage drop	6.9 Vac	9.2 Vac	11.6 Vac	6.9 Vac	9.2 Vac	11.6 Vac
Rated current	800 A	1000 A	800 A	1200 A	1200 A	1200 A
Inductance	0.022 mH	0.030 mH	0.037 mH	0.018 mH	0.025 mH	0.031 mH
Inductance deviation	±10 %	±10 %	±10 %	±10 %	±10 %	±10 %
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C
Type of cooling	AN	AN	AN	AN	AN	AN
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Insulation class	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180
Test voltage	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac
Order numbers						
Order Number	**LR3A 40-3/1000**	**LR3A 40-4/1000**	**LR3A 40-5/1000**	**LR3A 40-3/1200**	**LR3A 40-4/1200**	**LR3A 40-5/1200**

Electrical data

Typ	LR3A 40-3/1400	LR3A 40-4/1400	LR3A 40-5/1400	LR3A 40-3/1600	LR3A 40-4/1600	LR3A 40-5/1600
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated voltage (IEC)	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac	3 x 690 Vac
Rated voltage (UL)	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac	3 x 600 Vac
Short circuit voltage uK	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac	3 % @ 400 Vac	4 % @ 400 Vac	5 % @ 400 Vac
Frequency range	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz
Voltage drop	6.9 Vac	9.2 Vac	11.6 Vac	6.9 Vac	9.2 Vac	11.6 Vac
Rated current	1400 A	1400 A	1400 A	1600 A	1600 A	1600 A
Inductance	0.016 mH	0.021 mH	0.026 mH	0.014 mH	0.019 mH	0.023 mH
Inductance deviation	±10 %	±10 %	±10 %	±10 %	±10 %	±10 %
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C	-10 °C to +40 °C
Type of cooling	AN	AN	AN	AN	AN	AN
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Insulation class	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180	IEC=H, UL=class 180
Test voltage	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac	4000 Vac
Order numbers						
Order Number	**LR3A 40-3/1400**	**LR3A 40-4/1400**	**LR3A 40-5/1400**	**LR3A 40-3/1600**	**LR3A 40-4/1600**	**LR3A 40-5/1600**

Line reactor, three-phase, aluminium
LR3A 400

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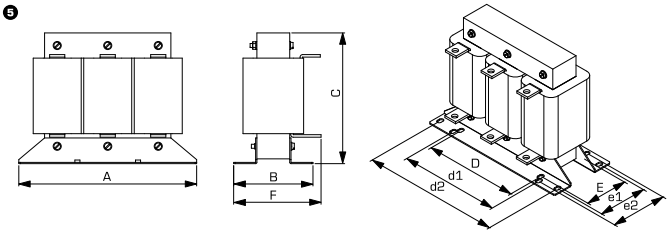
30 Mechanical data

Typ	Terminals phase	Terminals PE	Fixing method	Fixing screws	Weight	Dimension picture (in mm)	A	B	C	D	d1	d2	E	e1	e2	F
LR3A 40-3/90	Flat copper	for M8	Fixing rail	M8	10.64 kg	5	210	105	177	175	-	-	81	-	-	-
LR3A 40-4/90	Flat copper	for M8	Fixing rail	M8	10.95 kg	5	267	149	200	176	249	-	79	79	-	-
LR3A 40-5/90	Flat copper	for M8	Fixing rail	M8	18.25 kg	5	250	139	215	100	191	-	103	103	-	-
LR3A 40-3/100	Flat copper	for M8	Fixing rail	M8	11.33 kg	5	267	115	198	176	180	249	65	92	73	-
LR3A 40-4/100	Flat copper	for M8	Fixing rail	M8	16.30 kg	5	267	173	200	176	249	-	103	103	-	-
LR3A 40-5/100	Flat copper	for M8	Fixing rail	M8	18.47 kg	5	250	139	215	100	191	-	103	103	-	-
LR3A 40-3/115	Flat copper	for M8	Fixing rail	M8	17.09 kg	5	267	139	205	176	180	249	89	116	97	-
LR3A 40-4/115	Flat copper	for M8	Fixing rail	M8	17.30 kg	5	291	179	210	185	273	-	107	107	-	-
LR3A 40-5/115	Flat copper	for M8	Fixing rail	M8	26.25 kg	5	250	131	230	200	-	-	97	97	-	-
LR3A 40-3/125	Flat copper	for M8	Fixing rail	M8	17.42 kg	5	267	139	205	176	180	249	89	116	97	-
LR3A 40-4/125	Flat copper	for M8	Fixing rail	M8	17.10 kg	5	291	179	210	185	273	-	107	107	-	-
LR3A 40-5/125	Flat copper	for M8	Fixing rail	M8	26.25 kg	5	250	131	230	200	-	-	97	97	-	-
LR3A 40-3/160	Flat copper	for M8	Fixing rail	M8	15.91 kg	5	250	129	210	100	191	-	93	93	-	-
LR3A 40-4/160	Flat copper	for M8	Fixing rail	M8	22.10 kg	5	291	189	210	185	273	-	117	117	-	-
LR3A 40-5/160	Flat copper	for M8	Fixing rail	M8	27.39 kg	5	352	144	260	224	240	328	88	114	98	-
LR3A 40-3/180	Flat copper	for M8	Fixing rail	M8	25.48 kg	5	250	131	230	200	-	-	97	97	-	-
LR3A 40-4/180	Flat copper	for M8	Fixing rail	M8	25.20 kg	5	270	131	237	144	200	-	101	101	-	-
LR3A 40-5/180	Flat copper	for M8	Fixing rail	M8	37.71 kg	5	352	169	265	224	240	328	113	139	123	-
LR3A 40-3/200	Flat copper	for M8	Fixing rail	M8	25.59 kg	5	250	131	230	200	-	-	97	97	-	-
LR3A 40-4/200	Flat copper	for M8	Fixing rail	M8	25.00 kg	5	352	194	260	224	240	328	102	92	119	-
LR3A 40-5/200	Flat copper	for M8	Fixing rail	M8	38.04 kg	5	352	169	265	224	240	328	113	139	123	-
LR3A 40-3/250	Flat copper	for M8	Fixing rail	M8	25.08 kg	5	352	144	260	224	240	328	88	114	98	-
LR3A 40-4/250	Flat copper	for M8	Fixing rail	M8	31.00 kg	5	352	207	260	224	240	328	115	105	132	-
LR3A 40-5/250	Flat copper	for M8	Fixing rail	M8	44.03 kg	5	352	184	265	224	240	328	128	154	138	-
LR3A 40-3/300	Flat copper	for M8	Fixing rail	M8	26.07 kg	5	352	144	260	224	240	328	88	114	98	-
LR3A 40-4/300	Flat copper	for M8	Fixing rail	M8	37.00 kg	5	352	219	260	224	240	328	127	117	144	-
LR3A 40-5/300	Flat copper	for M8	Fixing rail	M8	48.65 kg	5	352	195	265	224	240	328	139	165	149	-
LR3A 40-3/400	Flat copper	for M8	Fixing rail	M8	31.48 kg	5	352	157	260	224	240	328	101	127	111	-
LR3A 40-4/400	Flat copper	for M8	Fixing rail	M8	43.50 kg	5	352	234	260	224	240	328	142	132	159	-
LR3A 40-5/400	Flat copper	for M8	Fixing rail	M8	53.59 kg	5	412	170	315	264	310	388	134	134	124	-
LR3A 40-3/500	Flat copper	for M8	Fixing rail	M8	43.37 kg	5	352	184	265	224	240	328	128	154	138	-
LR3A 40-4/500	Flat copper	for M8	Fixing rail	M8	49.00 kg	5	352	245	260	224	240	328	153	143	170	-
LR3A 40-5/500	Flat copper	for M8	Fixing rail	M8	55.46 kg	5	412	170	315	264	130	388	134	134	124	-
LR3A 40-3/630	Flat copper	for M8	Fixing rail	M8	53.15 kg	5	412	170	315	264	310	388	134	134	124	-
LR3A 40-4/630	Flat copper	for M8	Fixing rail	M8	67.00 kg	5	480	225	380	316	370	450	125	143	135	-
LR3A 40-5/630	Flat copper	for M8	Fixing rail	M8	83.13 kg	5	552	193	410	356	430	516	145	171	143	-
LR3A 40-3/710	Flat copper	for M8	Fixing rail	M8	62.44 kg	5	412	185	315	164	310	388	149	149	139	-
LR3A 40-4/710	Flat copper	for M8	Fixing rail	M8	76.00 kg	5	480	235	380	316	370	450	135	153	145	-
LR3A 40-5/710	Flat copper	for M8	Fixing rail	M8	104.73 kg	5	552	193	410	356	430	516	145	171	143	-
LR3A 40-3/800	Flat copper	for M10	Fixing rail	M10	70.39 kg	5	480	183	370	316	370	450	135	143	125	-
LR3A 40-4/800	Flat copper	for M10	Fixing rail	M10	115.00 kg	5	480	250	380	316	370	450	150	153	145	-
LR3A 40-5/800	Flat copper	for M10	Fixing rail	M10	105.06 kg	5	552	193	410	356	413	516	145	171	143	-
LR3A 40-3/1000	Flat copper	for M10	Fixing rail	M10	82.02 kg	5	480	198	360	316	370	450	150	158	140	-
LR3A 40-4/1000	Flat copper	for M10	Fixing rail	M10	145.00 kg	5	480	295	380	316	370	450	195	198	190	-
LR3A 40-5/1000	Flat copper	for M10	Fixing rail	M10	105.06 kg	5	552	193	410	356	430	516	145	171	143	-

Dimension pictures

5



Line reactor, three-phase, aluminium
LR3A 400

BLOCK Website

Mechanical data

Typ	Terminals phase	Terminals PE	Fixing method	Fixing screws	Weight	Dimension picture (in mm)	A	B	C	D	d1	d2	E	e1	e2	F
LR3A 40-3/1200	Flat copper	for M10	Fixing rail	M10	98.13 kg	5	552	193	410	356	430	516	145	171	143	-
LR3A 40-4/1200	Flat copper	for M10	Fixing rail	M10	186.20 kg	5	555	330	445	356	430	515	180	210	180	-
LR3A 40-5/1200	Flat copper	for M10	Fixing rail	M10	189.20 kg	5	552	302	410	356	430	516	232	258	230	-
LR3A 40-3/1400	Flat copper	for M10	Fixing rail	M10	124.77 kg	5	552	272	410	356	430	516	172	198	230	-
LR3A 40-4/1400	Flat copper	for M10	Fixing rail	M10	170.50 kg	5	555	360	445	356	430	515	210	240	210	-
LR3A 40-5/1400	Flat copper	for M10	Fixing rail	M10	177.87 kg	5	540	270	465	490	-	-	218	-	-	-
LR3A 40-3/1600	Flat copper	for M10	Fixing rail	M10	159.76 kg	5	552	272	410	356	430	516	202	228	200	-
LR3A 40-4/1600	Flat copper	for M10	Fixing rail	M10	186.00 kg	5	555	380	455	356	430	515	230	260	230	-
LR3A 40-5/1600	Flat copper	for M10	Fixing rail	M10	301.62 kg	5	540	370	465	490	-	-	302	338	318	-

Dimension pictures

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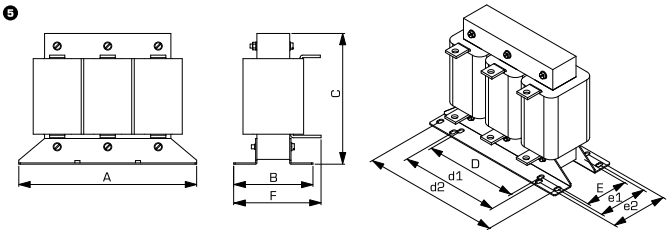
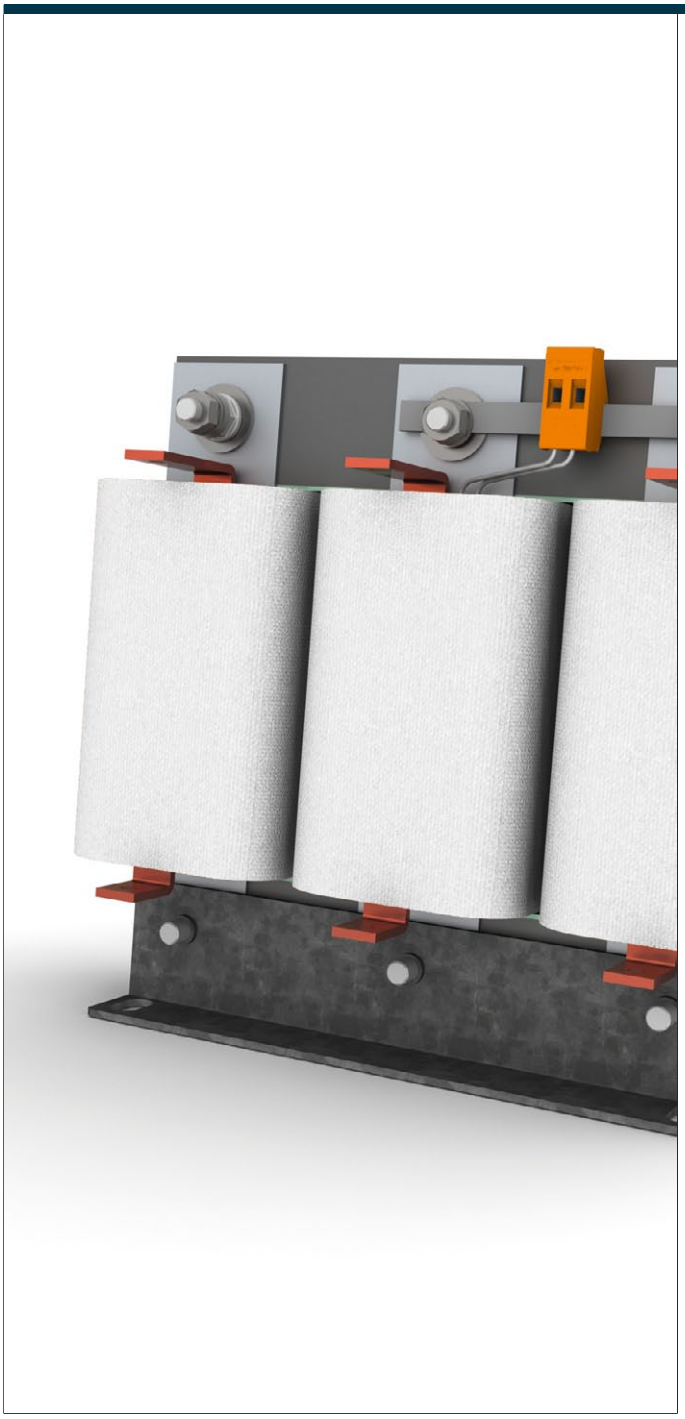


Detuned reactor
DR3

BLOCK Website



General Data

Rated input voltage 3 x 400 Vac
For reactive power 12.5 - 50 kVAr
Detuning factor 7 - 14 %
Insulation class F/H
Maximum ambient temperature 40 °C
Degree of protection IP 00

Advantages

No overloading of the capacitors
Stabilizing mains impedance
Low inductance tolerance
Very good corrosion protection and low noise thanks to vacuum impregnation
Extended linearity
Thermal design for continuous duty in the event of mains operation and harmonics
Optional with thermal switch

Applications

Detuned reactor for choking idle reactive power compensation capacitors.

Standards

Detuning reactor in accordance with EN 61558 Part 1, 61558 Part 20, UL 506, CSA 22.2

Approvals

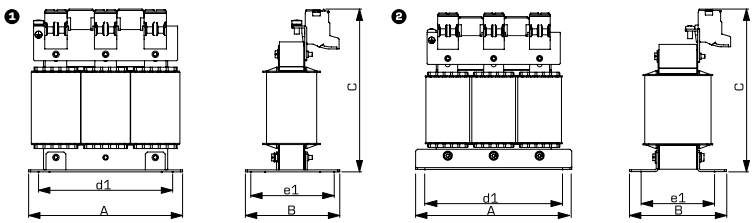
UL 506, CSA 22.2

Detuned reactor
DR3

BLOCK Website

Typ	DR3 12,5/7	DR3 12,5/7/T	DR3 12,5/14	DR3 12,5/14/T	DR3 25/7	DR3 25/7/T
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated frequency	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz
for reactive power	12.5 kVAr	12.5 kVAr	12.5 kVAr	12.5 kVAr	25.0 kVAr	25.0 kVAr
Current pere phase at 50 Hz (I)	19.5 A	19.5 A	19.5 A	19.5 A	36.0 A	36.0 A
Inductance linear to (at ≥95 % L; Im)	27.3 A	27.3 A	27.3 A	27.3 A	50.4 A	50.4 A
Inductance per phase (L)	3.220 mH	3.220 mH	6.750 mH	6.750 mH	1.590 mH	1.590 mH
Tolerance	±3 %	±3 %	±3 %	±3 %	±3 %	±3 %
Detuning factor	p = 7 %	p = 7 %	p = 14 %	p = 14 %	p = 7 %	p = 7 %
Temperature control	No	Yes	No	Yes	No	Yes
Resonance frequency	189 Hz	189 Hz	134 Hz	134 Hz	189 Hz	189 Hz
Output						
Power loss	115.0 W	115.0 W	150.0 W	150.0 W	140.0 W	140.0 W
Approvals						
Approvals	cURus (pending)	cURus (pending)	cURus (pending)	cURus (pending)	cURus (pending)	cURus (pending)
Environment						
Ambient temperature max.	40 °C (60 °C Cl. H)	40 °C (60 °C Cl. H)	40 °C (60 °C Cl. H)	40 °C (60 °C Cl. H)	40 °C (60 °C Cl. H)	40 °C (60 °C Cl. H)
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	F (40 °C) / H (60 °C)	F (40 °C) / H (60 °C)	F (40 °C) / H (60 °C)	F (40 °C) / H (60 °C)	F (40 °C) / H (60 °C)	F (40 °C) / H (60 °C)
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Test voltage	2500 Vac, 50 Hz	2500 Vac, 50 Hz	2500 Vac, 50 Hz	2500 Vac, 50 Hz	2500 Vac, 50 Hz	2500 Vac, 50 Hz
Order numbers						
Order Number	**DR3 12,5/7**	**DR3 12,5/7/T**	**DR3 12,5/14**	**DR3 12,5/14/T**	**DR3 25/7**	**DR3 25/7/T**
Terminal and mounting						
Fixing method	Fixing rail	Fixing rail	Fixing rail	Fixing rail	Fixing rail	Fixing rail
Fixing screws	M8	M8	M8	M8	M8	M8
Terminals phase	Screw clamp, 10 mm²	Screw clamp, 10 mm²	Screw clamp, 10 mm²	Screw clamp, 10 mm²	Screw clamp, 10 mm²	Screw clamp, 10 mm²
Terminals PE	Bolt, M5	Bolt, M5	Bolt, M5	Bolt, M5	Bolt, M5	Bolt, M5
Measures and weights						
Weight	8.70 kg	8.70 kg	15.00 kg	15.00 kg	12.70 kg	12.70 kg
Dimension picture (in mm)	❶	❶	❷	❷	❶	❶
A	185	185	240	240	212	212
B	125	125	140	140	125	125
C	215	215	245	245	235	235
d1	170	170	185	185	175	175
e1	77	77	85	85	95	95

Dimension pictures



Detuned reactor
DR3

BLOCK Website

Electrical data

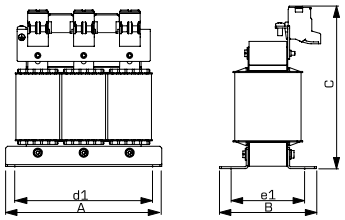
Typ	DR3 25/14	DR3 25/14/T	DR3 50/7	DR3 50/7/T	DR3 50/14	DR3 50/14/T
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated frequency	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz
for reactive power	25.0 kVAr	25.0 kVAr	50.0 kVAr	50.0 kVAr	50.0 kVAr	50.0 kVAr
Current pere phase at 50 Hz (I)	36.0 A	36.0 A	72.0 A	72.0 A	72.0 A	72.0 A
Inductance linear to (at ≥95 % L; Im)	50.4 A	50.4 A	129.6 A	129.6 A	129.6 A	129.6 A
Inductance per phase (L)	3.350 mH	3.350 mH	0.750 mH	0.750 mH	1.660 mH	1.660 mH
Tolerance	±3 %	±3 %	±3 %	±3 %	±3 %	±3 %
Detuning factor	p = 14 %	p = 14 %	p = 7 %	p = 7 %	p = 14 %	p = 14 %
Temperature control	No	Yes	No	Yes	No	Yes
Resonance frequency	134 Hz	134 Hz	189 Hz	189 Hz	134 Hz	134 Hz
Output						
Power loss	165.0 W	165.0 W	180.0 W	180.0 W	320.0 W	320.0 W
Approvals						
Approvals	cURus (pending)	cURus (pending)	cURus (pending)	cURus (pending)	cURus (pending)	cURus (pending)
Environment						
Ambient temperature max.	40 °C (60 °C Cl. H)	40 °C (60 °C Cl. H)	40 °C (60 °C Cl. H)	40 °C (60 °C Cl. H)	40 °C (60 °C Cl. H)	40 °C (60 °C Cl. H)
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	F (40 °C) / H (60 °C)	F (40 °C) / H (60 °C)	F (40 °C) / H (60 °C)	F (40 °C) / H (60 °C)	F (40 °C) / H (60 °C)	F (40 °C) / H (60 °C)
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Test voltage	2500 Vac, 50 Hz	2500 Vac, 50 Hz	2500 Vac, 50 Hz	2500 Vac, 50 Hz	2500 Vac, 50 Hz	2500 Vac, 50 Hz
Order numbers						
Order Number	**DR3 25/14**	**DR3 25/14/T**	**DR3 50/7**	**DR3 50/7/T**	**DR3 50/14**	**DR3 50/14/T**

Mechanical data

Terminal and mounting						
Fixing method	Fixing rail	Fixing rail	Fixing rail	Fixing rail	Fixing rail	Fixing rail
Fixing screws	M8	M8	M8	M8	M8	M8
Terminals phase	Screw clamp, 10 mm²	Screw clamp, 10 mm²	Flat copper	Flat copper	Flat copper	Flat copper
Terminals PE	Bolt, M5	Bolt, M5	Bolt, M8	Bolt, M8	Bolt, M8	Bolt, M8
Measures and weights						
Weight	19.80 kg	19.80 kg	24.70 kg	24.70 kg	39.00 kg	39.00 kg
Dimension picture (in mm)	❷	❷	❸	❸	❸	❸
A	240	240	256	256	300	300
B	150	150	140	140	160	160
C	245	245	234	234	270	270
d1	185	185	200	200	224	224
e1	95	95	90	90	119	119

Dimension pictures

❷



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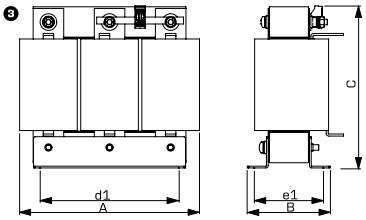
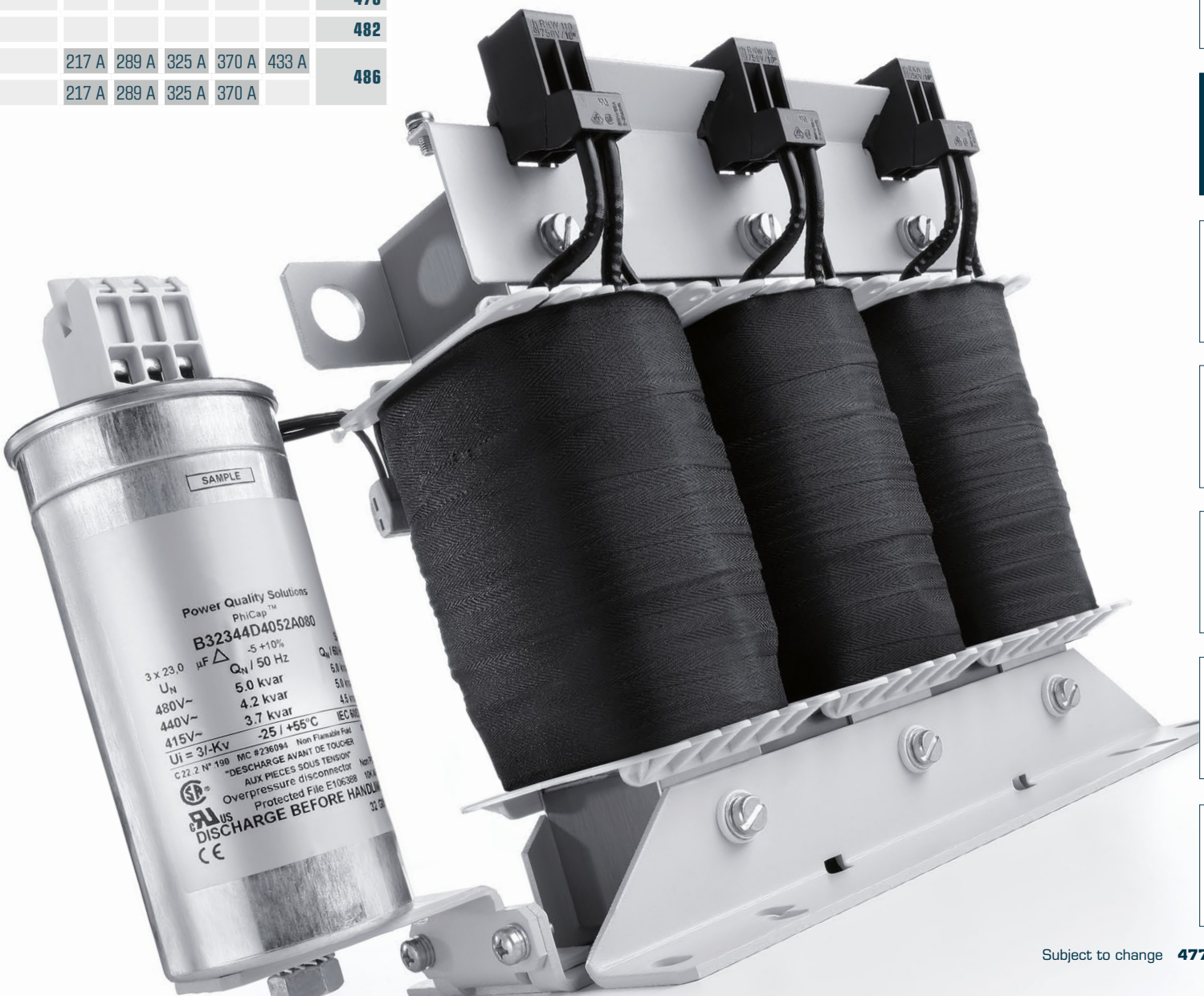


OVERVIEW HARMONIC FILTERS

	Type	Rated voltage	THD-I	0.19 kW	0.59 kW	1.01 kW	2.73 kW	3.68 kW	4.6 kW	5.5 kW	5.7 kW	11 kW	15 kW	20 kW	26 kW	45 kW	55 kW	90 kW	110 kW
AC 3-phase	HF1P	230 Vac	10 %	0.84 A	2.5 A	4.44 A	11.9 A	16 A	20 A		25 A								
	HF1K	3 x 400 Vac	8 %							10 A		19 A	26 A	35 A	43 A	72 A	101 A	144 A	
	HFM-FB	3 x 400 Vac	7 %							10 A		19 A	26 A	35 A	43 A	72 A	101 A	144 A	180 A
		3 x 480 Vac								10 A		19 A	26 A	35 A	43 A	72 A	101 A	144 A	180 A

BLOCK

132 kW	160 kW	230 kW	260 kW	250 kW	Page
					478
					482
217 A	289 A	325 A	370 A	433 A	486
217 A	289 A	325 A	370 A		



Harmonic filter
HF1P 230

BLOCK Website

General Data

Rated voltage 230 Vac
Rated current 0,84 - 25 A
THD-I 10 % at 50 Hz, 18 % at 60 Hz in rated operation
Load rated capacity 0.19 - 5.7 kW
Insulation class H
Ambient temperature -10 °C to +40 °C
Degree of protection IP 20

Advantages

Sinusoidal current consumption from the main in devices with uncontrolled B2U diode rectifiers
Compliance with EN 61000-3-2, EN 61000-3-12
Support in the compliance with IEEE 519, D-A-CH-CZ
Power factor >0,95 at rated current
Operation at 50 - 60 Hz possible
Use of the HF1P as a central sum filter for multiple converters possible

Applications

Harmonic filter module to ensure sinusoidal main currents, reduction of main harmonic currents, increase in system service life and system reliability and compliance with power quality standards such as IEEE 519, TEC 61000-3-2, IEC 61000-3-12.

Standards

Harmonic filter in accordance with
EN 61558 Part 1, EN 61558 Part 20, UL 508 17th Ed., CSA 22.2 No. 14-10

Approvals

EAC

Harmonic filter
HF1P 230

BLOCK Website

Electrical data

Typ	HF1P 0,19-230	HF1P 0,59-230	HF1P 1,01-230	HF1P 2,73-230	HF1P 3,68-230	HF1P 4,60-230
Operating data						
Rated voltage	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac
Voltage range	207-253 Vac	207-253 Vac	207-253 Vac	207-253 Vac	207-253 Vac	207-253 Vac
Rated current	0.84 A	2.50 A	4.44 A	11.90 A	16.00 A	20.00 A
THD-I	10 % at 50 Hz, 18 % at 60 Hz (nominal load)	10 % at 50 Hz, 18 % at 60 Hz (nominal load)	10 % at 50 Hz, 18 % at 60 Hz (nominal load)	10 % at 50 Hz, 18 % at 60 Hz (nominal load)	10 % at 50 Hz, 18 % at 60 Hz (nominal load)	10 % at 50 Hz, 18 % at 60 Hz (nominal load)
Rated load power*	0.19 kW	0.59 kW	1.01 kW	2.73 kW	3.68 kW	4.6 kW
Description of the load	Symmetrical loading by converters with B2U input rectifiers	Symmetrical loading by converters with B2U input rectifiers	Symmetrical loading by converters with B2U input rectifiers	Symmetrical loading by converters with B2U input rectifiers	Symmetrical loading by converters with B2U input rectifiers	Symmetrical loading by converters with B2U input rectifiers
Overrating Capacity	150 % for 60 sec. every 10 min.	150 % for 60 sec. every 10 min.	150 % for 60 sec. every 10 min.	150 % for 60 sec. every 10 min.	150 % for 60 sec. every 10 min.	150 % for 60 sec. every 10 min.
Power loss	27.0 W	27.0 W	55.0 W	50.0 W	80.0 W	80.0 W
Efficiency	85.0 %	95.5 %	95.0 %	98.0 %	97.8 %	98.2 %
Capacitive idle power	0.1 kVAr	0.3 kVAr	0.7 kVAr	1.8 kVAr	2.6 kVAr	3.3 kVAr
Input						
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Environment						
Ambient temperature	-10 °C to +40 °C, without condensation	-10 °C to +40 °C, without condensation	-10 °C to +40 °C, without condensation	-10 °C to +40 °C, without condensation	-10 °C to +40 °C, without condensation	-10 °C to +40 °C, without condensation
Type of cooling	AN	AN	AN	AN	AN	AN
MTBF @ 50 °C/500 V (Mil-HB-217F)	>500.000 h @ 40°C/400Vac	>500.000 h @ 40°C/400Vac	>500.000 h @ 40°C/400Vac	>500.000 h @ 40°C/400Vac	>500.000 h @ 40°C/400Vac	>500.000 h @ 40°C/400Vac
Safety and protection						
Type	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure
Insulation class	H	H	H	H	H	H
Protection index	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20
Safety class	I	I	I	I	I	I
Notes						
*	IE2 efficiencies of the motors and an efficiency >96 % assumed	IE2 efficiencies of the motors and an efficiency >96 % assumed	IE2 efficiencies of the motors and an efficiency >96 % assumed	IE2 efficiencies of the motors and an efficiency >96 % assumed	IE2 efficiencies of the motors and an efficiency >96 % assumed	IE2 efficiencies of the motors and an efficiency >96 % assumed
Order numbers						
Order Number	**HF1P 0,19-230**	**HF1P 0,59-230**	**HF1P 1,01-230**	**HF1P 2,73-230**	**HF1P 3,68-230**	**HF1P 4,60-230**

Harmonic filter
HF1P 230

BLOCK Website

Electrical data

Typ	HF1P 5,70-230
Operating data	
Rated voltage	230 Vac
Voltage range	207-253 Vac
Rated current	25.00 A
THD-I	10 % at 50 Hz, 18 % at 60 Hz (nominal load)
Rated load power*	5.50 kW
Description of the load	Symmetrical loading by converters with B2U input rectifiers
Overrating Capacity	150 % for 60 sec. every 10 min.
Power loss	70.0 W
Efficiency	98.7 %
Capacitive idle power	4.5 kVAr
Input	
Rated frequency	50 - 60 Hz
Environment	
Ambient temperature	-10 °C to +40 °C, without condensation
Type of cooling	AN
MTBF @ 50 °C/500 V (Mil-HB-217F)	>500.000 h @ 40°C/400Vac
Safety and protection	
Type	Metal enclosure
Insulation class	H
Protection index	IP 20
Safety class	I
Notes	
*	IE2 efficiencies of the motors and an efficiency >96 % assumed
Order numbers	
Order Number	**HF1P 5,70-230**

Harmonic filter
HF1P 230

BLOCK Website

Mechanical data

Typ	Terminals phase	Terminals PE	Fixing method	Weight	Dimension picture (in mm)	A	B	C	D	E
HF1P 0,19-230	Screw clamp, 16 mm²	Bolt, M6	Mounting lugs	1.8 kg	❷	230	85	107	47	201
HF1P 0,59-230	Screw clamp, 16 mm²	Bolt, M6	Mounting lugs	3.9 kg	❷	280	95.2	135	56	252
HF1P 1,01-230	Screw clamp, 16 mm²	Bolt, M6	Mounting lugs	5.6 kg	❷	301	109	138	57	273
HF1P 2,73-230	Screw clamp, 16 mm²	Bolt, M6	Mounting lugs	11.2 kg	❷	385	132	182	72	357
HF1P 3,68-230	Screw clamp, 16 mm²	Bolt, M6	Mounting lugs	21.4 kg	❷	414	158.2	239	108	385
HF1P 4,60-230	Screw clamp, 16 mm²	Bolt, M6	Mounting lugs	22.2 kg	❷	456	143.2	210	93	428
HF1P 5,70-230	Screw clamp, 16 mm²	Bolt, M6	Mounting lugs	33.7 kg	❷	543	158.2	242	113	515

Dimension pictures

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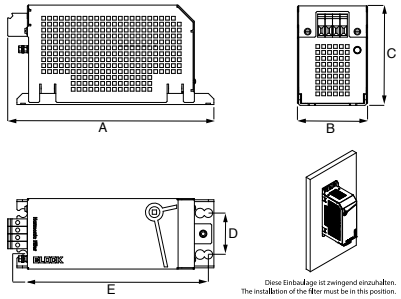

Harmonic filter
HF1K 400

BLOCK Website

General Data

Rated voltage 3 x 400 Vac
Rated current 3 x 10 - 3 x 144 A
THD-I <8 % in rated operation
Load rated capacity 5.5 - 90 kW
Insulation class H
Ambient temperature -10 °C to +45 °C
Degree of protection IP 00

Advantages

Sinusoidal current consumption from the main in devices with uncontrolled B6U diode rectifiers
Compliance with EN 61000-3-2, EN 61000-3-12
Support in the compliance with IEEE 519, D-A-CH-CZ
Cos(phi)>0,95 at rated current
Hardly any intermediate circuit voltage dip by comparison with a 4 % uK line reactor
Harmonic filter with minimum capacitive idle reactive power
Very good corrosion protection and low noise thanks to vacuum impregnation
Operation at 50 - 60 Hz possible
Use of the HF1K as a central sum filter for multiple converters possible

Applications

Harmonic filter module to ensure sinusoidal main currents, reduction of main harmonic currents, increase in system service life and system reliability and compliance with power quality standards such as IEEE 519, TEC 61000-3-2, IEC 61000-3-12.

Standards

Harmonic filter in accordance with
EN 61558 Part 1, EN 61558 Part 20, UL 508 17th Ed., CSA 22.2 No. 14-10

Approvals

UL 506, CSA 22.2

Harmonic filter
HF1K 400

BLOCK Website

Electrical data

Typ	HF1K 7-400	HF1K 13-400	HF1K 18-400	HF1K 24-400	HF1K 30-400	HF1K 50-400
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Voltage range	360-440 Vac	360-440 Vac	360-440 Vac	360-440 Vac	360-440 Vac	360-440 Vac
Rated current	3 x 10 A	3 x 19 A	3 x 26 A	3 x 35 A	3 x 43 A	3 x 72 A
THD-I	8 % (nominal load)	8 % (nominal load)	8 % (nominal load)	8 % (nominal load)	8 % (nominal load)	8 % (nominal load)
Rated load power*	5.5 kW	11 kW	15 kW	20 kW	26 kW	45 kW
Description of the load	Symmetrical loading by converters with B6U input rectifiers	Symmetrical loading by converters with B6U input rectifiers	Symmetrical loading by converters with B6U input rectifiers	Symmetrical loading by converters with B6U input rectifiers	Symmetrical loading by converters with B6U input rectifiers	Symmetrical loading by converters with B6U input rectifiers
Overrating Capacity	150 % for 60 sec. every 10 min.	150 % for 60 sec. every 10 min.	150 % for 60 sec. every 10 min.	150 % for 60 sec. every 10 min.	150 % for 60 sec. every 10 min.	150 % for 60 sec. every 10 min.
Power loss	90.0 W	160.0 W	180.0 W	230.0 W	290.0 W	412.0 W
Efficiency	99.0 %	99.0 %	99.0 %	99.0 %	99.0 %	99.0 %
Capacitive idle power	1.7 kVAr	1.8 kVAr	2.9 kVAr	3.8 kVAr	4.9 kVAr	10.0 kVAr
Input						
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature	-10 °C to +45 °C, without condensation	-10 °C to +45 °C, without condensation	-10 °C to +45 °C, without condensation	-10 °C to +45 °C, without condensation	-10 °C to +45 °C, without condensation	-10 °C to +45 °C, without condensation
Type of cooling	AN	AN	AN	AN	AN	AN
MTBF @ 50 °C/500 V (Mil-HB-217F)	>500.000 h @ 40°C/400Vac	>500.000 h @ 40°C/400Vac	>500.000 h @ 40°C/400Vac	>500.000 h @ 40°C/400Vac	>500.000 h @ 40°C/400Vac	>500.000 h @ 40°C/400Vac
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	H	H	H	H	H	H
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class	I	I	I	I	I	I
Notes						
*	IE2 efficiencies of the motors and an efficiency >96 % assumed	IE2 efficiencies of the motors and an efficiency >96 % assumed	IE2 efficiencies of the motors and an efficiency >96 % assumed	IE2 efficiencies of the motors and an efficiency >96 % assumed	IE2 efficiencies of the motors and an efficiency >96 % assumed	IE2 efficiencies of the motors and an efficiency >96 % assumed
Order numbers						
Order Number	**HF1K 7-400**	**HF1K 13-400**	**HF1K 18-400**	**HF1K 24-400**	**HF1K 30-400**	**HF1K 50-400**

Harmonic filter
HF1K 400

BLOCK Website

Electrical data

Typ	HF1K 70-400	HF1K 100-400
Operating data		
Rated voltage	3 x 400 Vac	3 x 400 Vac
Voltage range	360-440 Vac	360-440 Vac
Rated current	3 x 101 A	3 x 144 A
THD-I	8 % (nominal load)	8 % (nominal load)
Rated load power*	63 kW	90 kW
Description of the load	Symmetrical loading by converters with B6U input rectifiers	Symmetrical loading by converters with B6U input rectifiers
Overrating Capacity	150 % for 60 sec. every 10 min.	150 % for 60 sec. every 10 min.
Power loss	550.0 W	750.0 W
Efficiency	99.0 %	99.0 %
Capacitive idle power	13.5 kVAr	19.0 kVAr
Input		
Rated frequency	50 - 60 Hz	50 - 60 Hz
Approvals		
Approvals	cURus	cURus
Environment		
Ambient temperature	-10 °C to +45 °C, without condensation	-10 °C to +45 °C, without condensation
Type of cooling	AN	AN
MTBF @ 50 °C/500 V (Mil-HB-217F)	>500.000 h @ 40°C/400Vac	>500.000 h @ 40°C/400Vac
Safety and protection		
Type	Open type	Open type
Insulation class	H	H
Protection index	IP 00	IP 00
Safety class	I	I
Notes		
*	IE2 efficiencies of the motors and an efficiency >96 % assumed	IE2 efficiencies of the motors and an efficiency >96 % assumed
Order numbers		
Order Number	**HF1K 70-400**	**HF1K 100-400**

Harmonic filter
HF1K 400

BLOCK Website

Mechanical data

Typ	Terminals phase	Terminals PE	Fixing method	Weight	Dimension picture (in mm)	A	A1	B	B1	C	D1	D2	D3	E1	E2	E3	F1
HF1K 7-400	Screw clamp, 10 mm²	Bolt, M6	Mounting lugs	14.0 kg	1	375	260	121	236	235	175	225	-	85	84	-	7
HF1K 13-400	Screw clamp, 10 mm²	Bolt, M6	Mounting lugs	28.0 kg	1	440	325	160	275	275	200	215	292	90	114	112	10
HF1K 18-400	Screw clamp, 10 mm²	Bolt, M6	Mounting lugs	31.0 kg	1	440	325	170	285	275	200	215	292	102	126	124	10
HF1K 24-400	Screw clamp, 10 mm²	Bolt, M6	Mounting lugs	36.2 kg	1	485	360	165	290	315	224	240	328	107	133	117	10
HF1K 30-400	Screw clamp, 10 mm²	Bolt, M6	Mounting lugs	59.1 kg	1	545	420	165	290	355	264	310	388	125	125	115	10
HF1K 50-400	Copper tab, M10 bolt	Bolt, M6	Mounting lugs	75.5 kg	2	545	420	195	320	315	264	310	388	155	155	145	10
HF1K 70-400	Copper tab, M12 bolt	Bolt, M8	Mounting lugs	125.0 kg	2	685	560	223	348	420	356	430	516	156	182	154	14.5
HF1K 100-400	Copper tab, M12 bolt	Bolt, M8	Mounting lugs	163.0 kg	2	685	560	250	375	430	356	430	516	184	210	182	14.5

Dimension pictures

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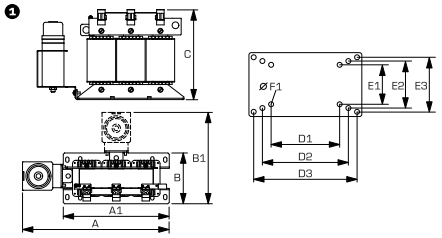

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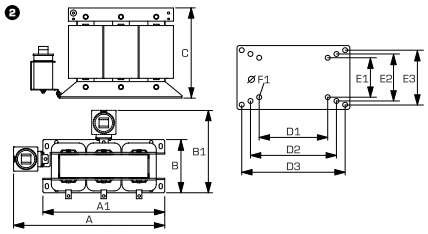

Harmonic filter
HFM-FB 400

BLOCK Website

General Data

Rated voltage 3 x 400 - 3 x 480 Vac
Rated current 3 x 10.00 - 3 x 433.00 A
7 % typ. at nominal load
Load rated capacity 5 - 250 kW
Insulation class F
Ambient temperature -10 °C to +40 °C
Degree of protection IP 00
SCCR 100 kA (without preliminary fuse)

Advantages

Sinusoidal current consumption from the main in devices with uncontrolled B6U diode rectifiers or controlled B6C thyristor bridges
Compliance with EN 61000-3-2, EN 61000-3-12
Support in the compliance with IEEE 519, D-A-CH-CZ
Cos(phi)>0.95 at rated current
Hardly any intermediate circuit voltage dip by comparison with a 4 % uK line reactor
Use of the HFM as a central sum filter for multiple converters possible

Applications

Harmonic filter module to ensure sinusoidal main currents, reduction of main harmonic currents, increase in system service life and system reliability and compliance with power quality standards such as IEEE 519, TEC 61000-3-2, IEC 61000-3-12.

Standards

Harmonic filter in accordance with
EN 61558 Part 1, EN 61558 Part 20, UL 508 17th Ed., CSA 22.2 No. 14-10

Approvals

UL 506, CSA 22.2

Harmonic filter
HFM-FB 400

BLOCK Website

Electrical data

Typ	HFM-FB 7-400	HFM-FB 13-400	HFM-FB 18-400	HFM-FB 24-400	HFM-FB 30-400	HFM-FB 50-400
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated current	3 x 10.00 A	3 x 19.00 A	3 x 26.00 A	3 x 35.00 A	3 x 43.00 A	3 x 72.00 A
Voltage range	380 - 440 Vac	380 - 440 Vac	380 - 440 Vac	380 - 440 Vac	380 - 440 Vac	380 - 440 Vac
Rated frequency	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz
THD-I	7 % typ at nominal load	7 % typ at nominal load	7 % typ at nominal load	7 % typ at nominal load	7 % typ at nominal load	7 % typ at nominal load
Rated load power*	5.0 kW	7.5 kW	11.0 kW	15.0 and 18.5 kW	22.0 kW	30.0 and 37.0 kW
Description of the load	Balanced load by inverter	Balanced load by inverter	Balanced load by inverter	Balanced load by inverter	Balanced load by inverter	Balanced load by inverter
Overrating Capacity	150 % for 60 sec. every 10 min.	150 % for 60 sec. every 10 min.	150 % for 60 sec. every 10 min.	150 % for 60 sec. every 10 min.	150 % for 60 sec. every 10 min.	150 % for 60 sec. every 10 min.
Efficiency	99.0 %	99.0 %	99.0 %	99.0 %	99.0 %	99.0 %
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature	-10 °C to +40 °C, without condensation	-10 °C to +40 °C, without condensation	-10 °C to +40 °C, without condensation	-10 °C to +40 °C, without condensation	-10 °C to +40 °C, without condensation	-10 °C to +40 °C, without condensation
MTBF @ 50 °C/500 V (Mil-HB-217F)	>200.000 h	>200.000 h	>200.000 h	>200.000 h	>200.000 h	>200.000 h
Safety and protection						
Type	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure
Insulation class	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class	I	I	I	I	I	I
SCCR	100 kA	100 kA	100 kA	100 kA	100 kA	100 kA
Notes						
*	IE2 efficiencies of the motors and an efficiency >96 % assumed	IE2 efficiencies of the motors and an efficiency >96 % assumed	IE2 efficiencies of the motors and an efficiency >96 % assumed	IE2 efficiencies of the motors and an efficiency >96 % assumed	IE2 efficiencies of the motors and an efficiency >96 % assumed	IE2 efficiencies of the motors and an efficiency >96 % assumed
Order numbers						
Order Number	**HFM-FB 7-400**	**HFM-FB 13-400**	**HFM-FB 18-400**	**HFM-FB 24-400**	**HFM-FB 30-400**	**HFM-FB 50-400**

Harmonic filter
HFM-FB 400

BLOCK Website

Electrical data

Typ	HFM-FB 70-400	HFM-FB 100-400	HFM-FB 125-400	HFM-FB 150-400	HFM-FB 200-400	HFM-FB 225-400
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Rated current	3 x 101.00 A	3 x 144.00 A	3 x 180.00 A	3 x 217.00 A	3 x 289.00 A	3 x 325.00 A
Voltage range	380 - 440 Vac	380 - 440 Vac	380 - 440 Vac	380 - 440 Vac	380 - 440 Vac	380 - 440 Vac
Rated frequency	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz
THD-I	7 % typ at nominal load	7 % typ at nominal load	7 % typ at nominal load	7 % typ at nominal load	7 % typ at nominal load	7 % typ at nominal load
Rated load power*	55.0 kW	75.0 kW	90.0 kW	110.0 kW	160.0 kW	180.0 kW
Description of the load	Balanced load by inverter	Balanced load by inverter	Balanced load by inverter	Balanced load by inverter	Balanced load by inverter	Balanced load by inverter
Overrating Capacity	150 % for 60 sec. every 10 min.	150 % for 60 sec. every 10 min.	150 % for 60 sec. every 10 min.	150 % for 60 sec. every 10 min.	150 % for 60 sec. every 10 min.	150 % for 60 sec. every 10 min.
Efficiency	99.0 %	99.0 %	99.0 %	99.0 %	99.0 %	99.0 %
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature	-10 °C to +40 °C, without condensation	-10 °C to +40 °C, without condensation	-10 °C to +40 °C, without condensation	-10 °C to +40 °C, without condensation	-10 °C to +40 °C, without condensation	-10 °C to +40 °C, without condensation
MTBF @ 50 °C/500 V (Mil-HB-217F)	>200.000 h	>200.000 h	>200.000 h	>200.000 h	>200.000 h	>200.000 h
Safety and protection						
Type	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure
Insulation class	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155	IEC=F, UL=class 155
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class	I	I	I	I	I	I
SCCR	100 kA	100 kA	100 kA	100 kA	100 kA	100 kA
Notes						
*	IE2 efficiencies of the motors and an efficiency >96 % assumed	IE2 efficiencies of the motors and an efficiency >96 % assumed	IE2 efficiencies of the motors and an efficiency >96 % assumed	IE2 efficiencies of the motors and an efficiency >96 % assumed	IE2 efficiencies of the motors and an efficiency >96 % assumed	IE2 efficiencies of the motors and an efficiency >96 % assumed
Order numbers						
Order Number	**HFM-FB 70-400**	**HFM-FB 100-400**	**HFM-FB 125-400**	**HFM-FB 150-400**	**HFM-FB 200-400**	**HFM-FB 225-400**

Harmonic filter
HFM-FB 400

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Electrical data

Typ	HFM-FB 255-400	HFM-FB 300-400
Operating data		
Rated voltage	3 x 400 Vac	3 x 400 Vac
Rated current	3 x 370,00 A	3 x 433,00 A
Voltage range	380 - 420 Vac	380 - 420 Vac
Rated frequency	50 Hz	50 Hz
THD-I	7 % typ at nominal load	7 % typ at nominal load
Rated load power*	200.0 kW	250.0 kW
Description of the load	Balanced load by inverter	Balanced load by inverter
Overrating Capacity	150 % for 60 sec. every 10 min.	150 % for 60 sec. every 10 min.
Efficiency	99.0 %	99.0 %
Approvals		
Approvals	cURus	cURus
Environment		
Ambient temperature	-10 °C to +40 °C, without condensation	-10 °C to +40 °C, without condensation
MTBF @ 50 °C/500 V (Mil-HB-217F)	>200.000 h	>200.000 h
Safety and protection		
Type	Metal enclosure	Metal enclosure
Insulation class	IEC=F, UL=class 155	IEC=F, UL=class 155
Protection index	IP 00	IP 00
Safety class	I	I
SCCR	100 kA	100 kA
Notes		
*	IE2 efficiencies of the motors and an efficiency >96 % assumed	IE2 efficiencies of the motors and an efficiency >96 % assumed
Order numbers		
Order Number	**HFM-FB 255-400**	**HFM-FB 300-400**

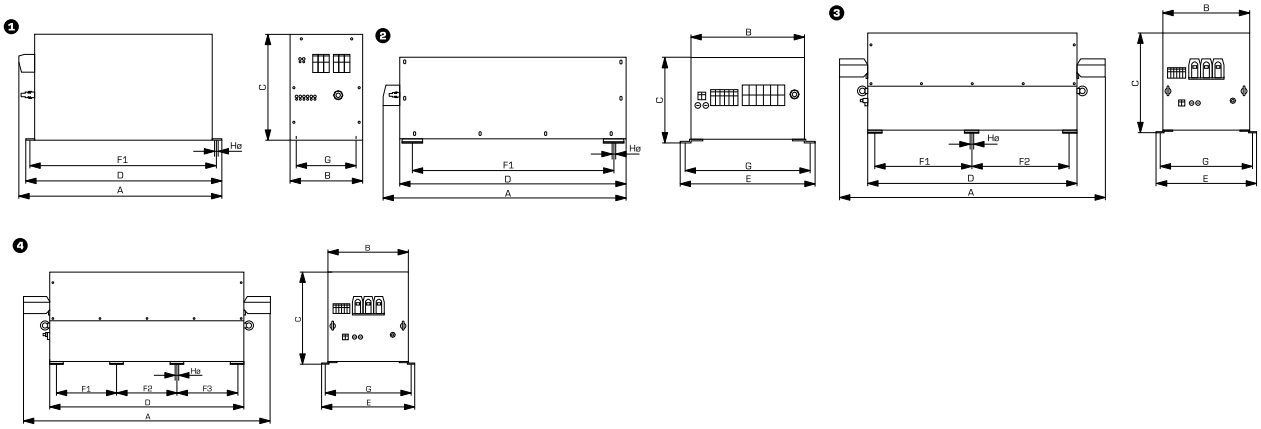
Harmonic filter
HFM-FB 400

BLOCK Website

30 Mechanical data

Typ	Terminals phase	Terminals PE	Connection cross section [mm²]	Fixing method	Weight	Dimension picture (in mm)	A	B	C	D	E	F1	F2	F3	G	H
HFM-FB 7-400	Screw clamp, 16 mm²	Bolt, M8		Mounting lugs	27.0 kg	1	455	165	242	440	-	416	-	-	135	6.5
HFM-FB 13-400	Screw clamp, 16 mm²	Bolt, M8		Mounting lugs	28.0 kg	1	455	165	242	440	-	416	-	-	135	6.5
HFM-FB 18-400	Screw clamp, 50 mm²	for M8	PRI 50, SEC 16	Mounting lugs	40.0 kg	2	645	302	225	600	365.5	532.5	-	-	333.5	11
HFM-FB 24-400	Screw clamp, 50 mm²	for M8	PRI 50, SEC 16	Mounting lugs	49.0 kg	2	645	302	225	600	356.5	532.5	-	-	333.5	11
HFM-FB 30-400	Screw clamp, 50 mm²	for M8	PRI 50, SEC 16	Mounting lugs	52.0 kg	2	885	302	225	840	356.5	772.5	-	-	333.5	11
HFM-FB 50-400	Screw clamp, 50 mm²	for M8	PRI 50, SEC 16	Mounting lugs	88.0 kg	2	885	302	225	840	356.5	772.5	-	-	333.5	11
HFM-FB 70-400	Bolt terminal, M10, 150 mm²	for M8	min. 50	Mounting lugs	150.0 kg	3	1060	345	400	830	393	377	395	-	370	11
HFM-FB 100-400	Bolt terminal, M10, 150 mm²	for M8	min. 35	Mounting lugs	152.0 kg	3	1060	345	400	830	393	377	395	-	370	11
HFM-FB 125-400	Bolt terminal, M16, 240 mm²	for M8	min. 95	Mounting lugs	178.0 kg	3	1160	406	420	900	454	430	412	-	430	11
HFM-FB 150-400	Bolt terminal, M16, 240 mm²	for M8	min. 95	Mounting lugs	224.0 kg	3	1160	406	420	900	454	430	412	-	430	11
HFM-FB 200-400	Bolt terminal, M16, 240 mm²	for M8	min. 95	Mounting lugs	271.0 kg	3	1330	406	420	1070	454	515	497	-	430	11
HFM-FB 225-400	Bolt terminal, M16, 240 mm²	for M8	min. 95	Mounting lugs	284.0 kg	3	1330	406	420	1070	454	515	497	-	430	11
HFM-FB 255-400	Bolt terminal, M16, 240 mm²	for M8	6-300	Mounting lugs	310.0 kg	4	1350	470	420	1100	530	355	355	355	505	11
HFM-FB 300-400	Bolt terminal, M16, 300 mm²	for M8	6-300	Mounting lugs	387.0 kg	4	1450	470	420	1200	530	380	380	380	505	11

Dimension pictures

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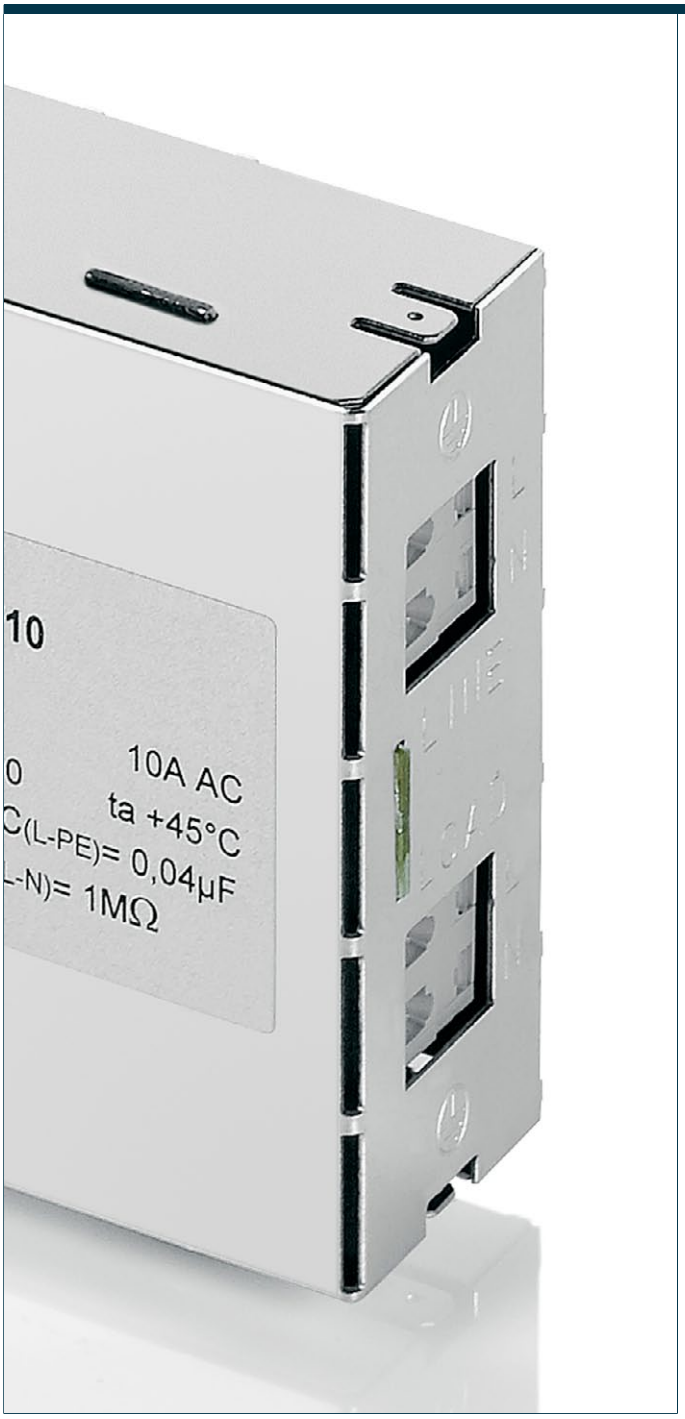
X1.1 X1.2 X1.3 X2.1 X2.2 X2.3

OVERVIEW
RADIO INTERFERENCE SUPPRESSION FILTERS

	Type	Voltage range	Low leakage current	Reduced leakage current	IT mains	Electronic apperatures	General EMI suppression	Systems engineering, weak interferences	Systems engineering, complex structure	Frequency inverter, long motor cable	Frequency inverter, short motor cable	Frequency inverter, short motor cable	Several frequency inverters	Unknown requiremens, high suppression	Low frequency disturbance (=LF) or high frequency (=HF)	Page
AC 1-phase	HFE 156	0 – 250 Vac		■		■	■	■		■	■	■			HF	494
	HFE 356	0 – 250 Vac	■			■	■	■			■	■			HF	496
	HFE 104	0 – 250 Vac	■			■	■	■							HF	498
	HFE 200	0 – 250 Vac	■			■	■	■							HF	500
	HLE 110	0 – 250 Vac		■		■	■	■	■	■	■	■	■	■	HF	502
	HLE 310	0 – 250 Vac	■			■	■	■			■		■		HF	506
AC 3-phase	HFD 156	0 – 480 Vac		■		■	■	■			■	■			HF	510
	HFD 356	0 – 480 Vac	■			■	■	■			■	■			HF	513
	HLD 103	0 – 3 x 520 Vac				■	■	■	■	■	■	■	■	■	HF	516
	HLD 110	0 – 3 x 520 Vac				■	■	■	■	■	■	■	■	■	HF	519
	HLD 310	0 – 3 x 520 Vac	■	■	■	■	■	■	■		■	■			HF	523
	HLD 710	0 – 3 x 520 Vac		■		■	■	■	■	■	■	■	■	■	HF	527
	HLD 810	0 – 3 x 520 Vac	■		■	■	■	■			■		■		HF	531
	HFD 500	0 – 3 x 520 Vac				■	■	■			■	■			HF	535
	HFD 210	0 – 3 x 480 - 520 Vac				■	■	■	■	■	■	■		■	HF	539
	HFD 510	0 – 3 x 480 - 520 Vac				■	■	■	■	■	■	■		■	HF	543
AC 3-phase + N	HLV 110	0 – 3 x 520 Vac				■	■	■	■	■	■	■	■	■	HF	546
	HLV 310	0 – 3 x 520 Vac	■			■	■	■			■		■		HF	550
	HLV 710	0 – 3 x 520 Vac		■		■	■	■	■	■	■	■	■	■	HF	554
	HLV 810	0 – 3 x 520 Vac	■		■	■	■	■			■		■		HF	558
	HFV 510	0 – 3 x 480 Vac				■	■	■	■	■	■	■	■	■	HF	562

Radio interference suppression filter, single-phase
HFE 156

BLOCK Website



General Data

Rated voltage 250 Vac
Voltage range 0 - 250 Vac
Rated current 1.00 - 16.00 A
Leakage current 8.00 mA
Ambient temperature max. 45 °C
Degree of protection IP 20

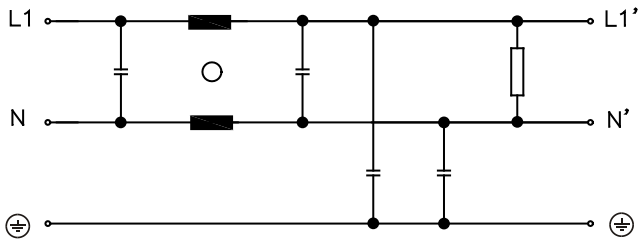
Advantages

For general requirements
Single-stage filter concept
Efficient filter effect against line-bound interference emissions
Increase in the interference immunity of the connected consumer
DIN rail mounting

Applications

Radio interference suppression filter for mains-side interference suppression of power supplies and electronic devices.

Sample application



Standards

Radio interference suppression filter to DIN EN 60939-2

Approvals

EAC

Radio interference suppression filter, single-phase
HFE 156

BLOCK Website

Electrical data

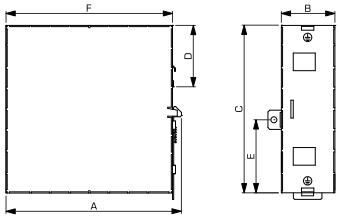
Typ	HFE 156-230/1	HFE 156-230/3	HFE 156-230/6	HFE 156-230/10	HFE 156-230/12	HFE 156-230/16
Operating data						
Rated voltage	250 Vac	250 Vac	250 Vac	250 Vac	250 Vac	250 Vac
Voltage range	0 - 250 Vac	0 - 250 Vac	0 - 250 Vac	0 - 250 Vac	0 - 250 Vac	0 - 250 Vac
Rated current	1 A	3 A	6 A	10 A	12 A	16 A
Leakage current (50 Hz)	8 mA	8 mA	8 mA	8 mA	8 mA	8 mA
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Power loss	0.9 W	1.8 W	2.6 W	4.0 W	6.2 W	8.9 W
Overrating Capacity	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly
Environment						
Climatic category	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)
Ambient temperature max.	45 °C	45 °C	45 °C	45 °C	45 °C	45 °C
Safety and protection						
Type	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure
Protection index	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20
Safety class (prepared)	I	I	I	I	I	I
Test voltage	1700 Vdc Phase/N, 2700 Vdc Phase/PE	1700 Vdc Phase/N, 2700 Vdc Phase/PE	1700 Vdc Phase/N, 2700 Vdc Phase/PE	1700 Vdc Phase/N, 2700 Vdc Phase/PE	1700 Vdc Phase/N, 2700 Vdc Phase/PE	1700 Vdc Phase/N, 2700 Vdc Phase/PE
Order numbers						
Order Number	**HFE 156-230/1**	**HFE 156-230/3**	**HFE 156-230/6**	**HFE 156-230/10**	**HFE 156-230/12**	**HFE 156-230/16**

Mechanical data

Terminal and mounting						
Terminals phase	2.5 mm² spring terminal	2.5 mm² spring terminal	2.5 mm² spring terminal	2.5 mm² spring terminal	2.5 mm² spring terminal	2.5 mm² spring terminal
Terminals PE	Tab connector, 6.3 x 0.8 mm	Tab connector, 6.3 x 0.8 mm	Tab connector, 6.3 x 0.8 mm	Tab connector, 6.3 x 0.8 mm	Tab connector, 6.3 x 0.8 mm	Tab connector, 6.3 x 0.8 mm
Fixing method	Panel installation on mounting rails	Panel installation on mounting rails	Panel installation on mounting rails	Panel installation on mounting rails	Panel installation on mounting rails	Panel installation on mounting rails
Measures and weights						
Weight	0.32 kg	0.33 kg	0.33 kg	0.34 kg	0.56 kg	0.55 kg
Dimension picture (in mm)	❶	❶	❶	❶	❶	❶
A	107	107	107	107	127	127
B	40	40	40	40	45	45
C	85	85	85	85	110	110
D	22	22	22	22	52	52
E	33	33	33	33	33	33
F	100	100	100	100	120	120

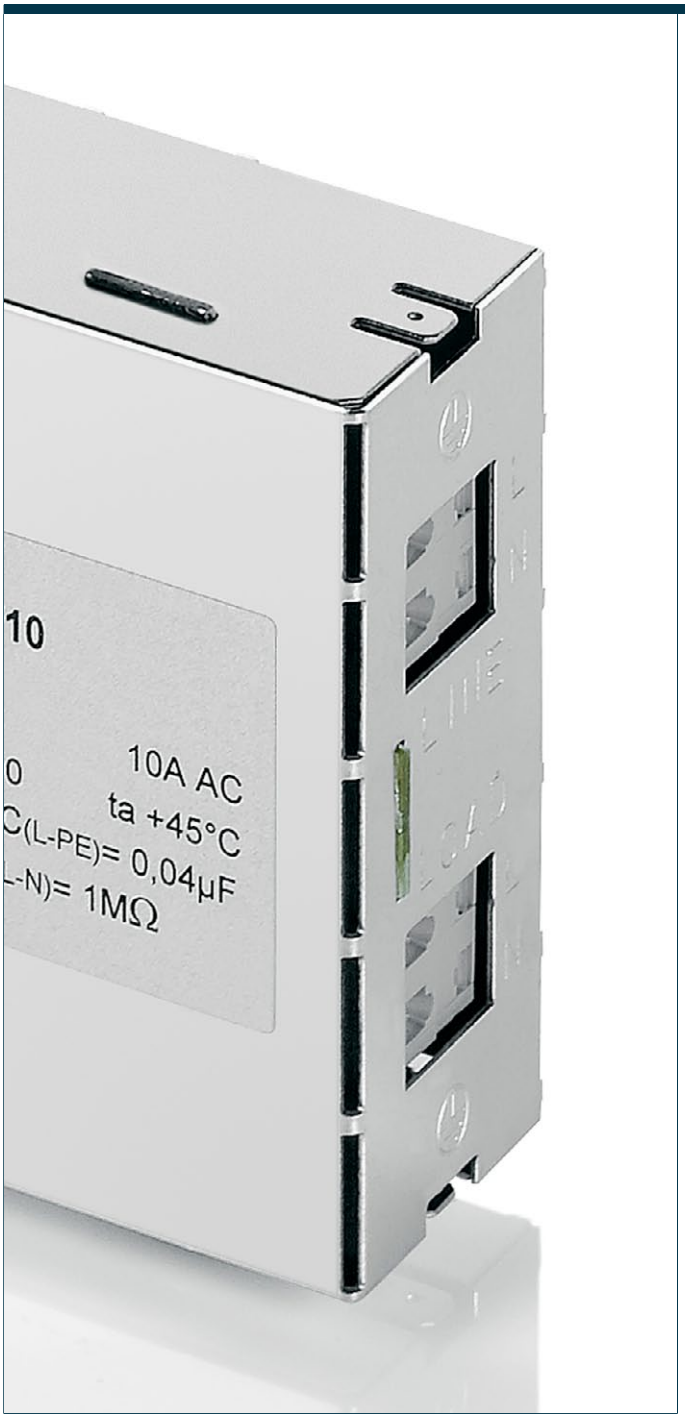
Dimension pictures

❶



Radio interference suppression filter, single-phase, low leakage current
HFE 356

BLOCK Website



General Data

Rated voltage 250 Vac
Voltage range 0 - 250 Vac
Rated current 1.00 - 16.00 A
Leakage current 2 mA
Degree of protection IP 20
DIN Rail mounting

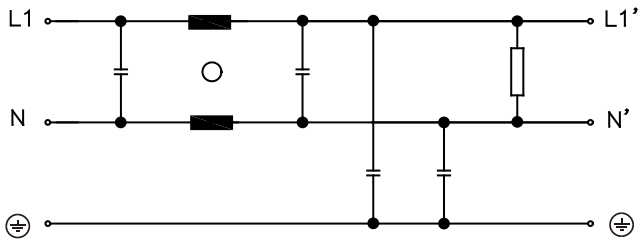
Advantages

For general requirements
Low leakage current
Single-stage filter concept
Efficient filter effect against line-bound interference emissions
Increase in the interference immunity of the connected consumer

Applications

Radio interference suppression filter for mains-side interference suppression of power supplies and electronic devices.

Sample application



Standards

Radio interference suppression filter to DIN EN 60939-2

Approvals

EAC

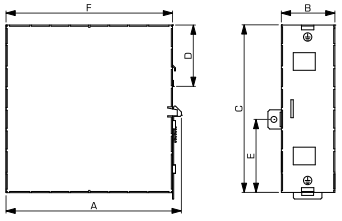
Radio interference suppression filter, single-phase, low leakage current
HFE 356

BLOCK Website

Typ	HFE 356-230/1	HFE 356-230/3	HFE 356-230/6	HFE 356-230/10	HFE 356-230/12	HFE 356-230/16
Special features						
Characteristics	Suitable for the medical field	Suitable for the medical field	Suitable for the medical field	Suitable for the medical field	Suitable for the medical field	Suitable for the medical field
Operating data						
Rated voltage	250 Vac	250 Vac	250 Vac	250 Vac	250 Vac	250 Vac
Voltage range	0 - 250 Vac	0 - 250 Vac	0 - 250 Vac	0 - 250 Vac	0 - 250 Vac	0 - 250 Vac
Rated current	1 A	3 A	6 A	10 A	12 A	16 A
Leakage current (50 Hz)	2 mA	2 mA	2 mA	2 mA	2 mA	2 mA
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Power loss	0.9 W	1.8 W	2.6 W	4.0 W	6.2 W	8.9 W
Overrating Capacity	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly
Standards						
Classification	EMI filter	EMI filter	EMI filter	EMI filter	EMI filter	EMI filter
Environment						
Climatic category	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)
Ambient temperature max.	45 °C	45 °C	45 °C	45 °C	45 °C	45 °C
Safety and protection						
Type	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure
Protection index	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20
Safety class (prepared)	I	I	I	I	I	I
Test voltage	1700 Vdc Phase/N, 2700 Vdc Phase/PE	1700 Vdc Phase/N, 2700 Vdc Phase/PE	1700 Vdc Phase/N, 2700 Vdc Phase/PE	1700 Vdc Phase/N, 2700 Vdc Phase/PE	1700 Vdc Phase/N, 2700 Vdc Phase/PE	1700 Vdc Phase/N, 2700 Vdc Phase/PE
Order numbers						
Order Number	**HFE 356-230/1**	**HFE 356-230/3**	**HFE 356-230/6**	**HFE 356-230/10**	**HFE 356-230/12**	**HFE 356-230/16**
Terminal and mounting						
Terminals phase	2.5 mm² spring terminal	2.5 mm² spring terminal	2.5 mm² spring terminal	2.5 mm² spring terminal	2.5 mm² spring terminal	2.5 mm² spring terminal
Terminals PE	Tab connector, 6.3 x 0.8 mm	Tab connector, 6.3 x 0.8 mm	Tab connector, 6.3 x 0.8 mm	Tab connector, 6.3 x 0.8 mm	Tab connector, 6.3 x 0.8 mm	Tab connector, 6.3 x 0.8 mm
Fixing method	Panel installation on mounting rails	Panel installation on mounting rails	Panel installation on mounting rails	Panel installation on mounting rails	Panel installation on mounting rails	Panel installation on mounting rails
Measures and weights						
Weight	0.32 kg	0.33 kg	0.33 kg	0.34 kg	0.56 kg	0.55 kg
Dimension picture (in mm)	❶	❶	❶	❶	❶	❶
A	107	107	107	107	127	127
B	40	40	40	40	45	45
C	85	85	85	85	110	110
D	22	22	22	22	52	52
E	33	33	33	33	33	33
F	100	100	100	100	120	120

Dimension pictures

❶



Radio interference filter, single-phase, low leakage current
HFE 104

BLOCK Website

General Data

Rated voltage 250 Vac
Voltage range 0 - 250 Vac
Rated current 1.00 - 65.00 A
Leakage current 0.37 mA
Degree of protection IP 00
Flat-pin terminals 6.3 x 0.8 mm

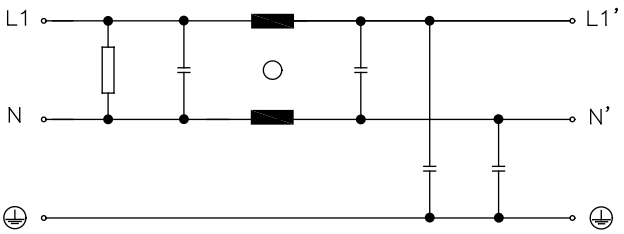
Advantages

For general requirements
Low leakage current
Single-stage filter concept
Efficient filter effect against line-bound interference emissions
Increase in the interference immunity of the connected consumer

Applications

Radio interference suppression filter for mains-side interference suppression of power supplies and electronic devices.

Sample application



Standards

Radio interference suppression filter to DIN EN 60939-2

Approvals

EAC

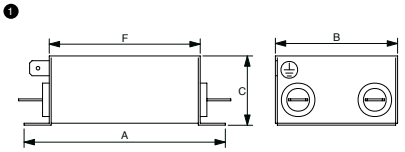
Radio interference filter, single-phase, low leakage current
HFE 104

BLOCK Website

Typ	HFE 104-230/1	HFE 104-230/2	HFE 104-230/3	HFE 104-230/6	HFE 104-230/10	HFE 104-230/20
Special features						
Characteristics	Suitable for the medical field	Suitable for the medical field	Suitable for the medical field	Suitable for the medical field	Suitable for the medical field	Suitable for the medical field
Operating data						
Rated voltage	250 Vac	250 Vac	250 Vac	250 Vac	250 Vac	250 Vac
Voltage range	0 - 250 Vac	0 - 250 Vac	0 - 250 Vac	0 - 250 Vac	0 - 250 Vac	0 - 250 Vac
Rated current	1 A	2 A	3 A	6 A	10 A	20 A
Leakage current (50 Hz)	0.37 mA	0.37 mA	0.37 mA	0.37 mA	0.37 mA	0.37 mA
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Overrating Capacity	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly
Environment						
Climatic category	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Test voltage	1700 Vdc Phase/N, 2700 Vdc Phase/PE	1700 Vdc Phase/N, 2700 Vdc Phase/PE	1700 Vdc Phase/N, 2700 Vdc Phase/PE	1700 Vdc Phase/N, 2700 Vdc Phase/PE	1700 Vdc Phase/N, 2700 Vdc Phase/PE	1700 Vdc Phase/N, 2700 Vdc Phase/PE
Order numbers						
Order Number	**HFE 104-230/1**	**HFE 104-230/2**	**HFE 104-230/3**	**HFE 104-230/6**	**HFE 104-230/10**	**HFE 104-230/20**
Terminal and mounting						
Terminals phase	Tab connector, 6.3 x 0.8 mm	Tab connector, 6.3 x 0.8 mm	Tab connector, 6.3 x 0.8 mm	Tab connector, 6.3 x 0.8 mm	Tab connector, 6.3 x 0.8 mm	Tab connector, 6.3 x 0.8 mm
Terminals PE	Tab connector, 6.3 x 0.8 mm	Tab connector, 6.3 x 0.8 mm	Tab connector, 6.3 x 0.8 mm	Tab connector, 6.3 x 0.8 mm	Tab connector, 6.3 x 0.8 mm	Tab connector, 6.3 x 0.8 mm
Fixing method	Mounting lugs	Mounting lugs	Mounting lugs	Mounting lugs	Mounting lugs	Mounting lugs
Measures and weights						
Weight	0.16 kg	0.16 kg	0.23 kg	0.23 kg	0.29 kg	0.71 kg
Dimension picture (in mm)	❶	❶	❶	❶	❶	❷
A	70	70	84	84	84	118
B	45	45	51	51	51	84
C	29	29	29	29	39	38
D	-	-	-	-	-	51
E	60	60	74	74	74	108
F	50	50	63	63	63	99

Dimension pictures

❶



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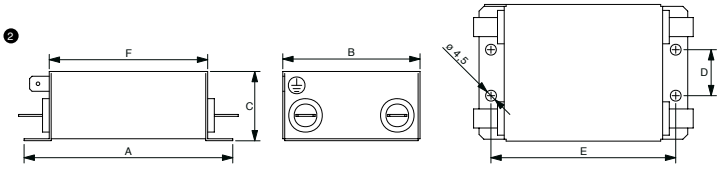
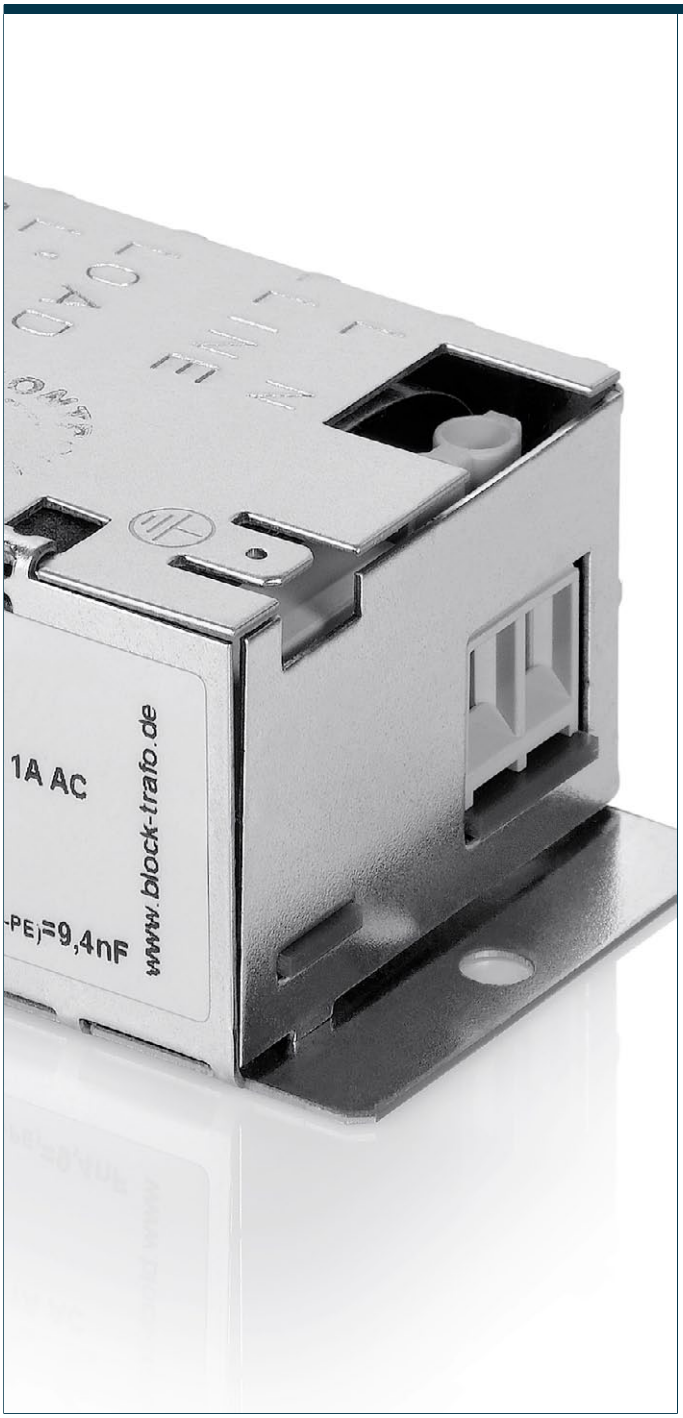


Radio interference suppression filter, single-phase, low leakage current
HFE 200

BLOCK Website



General Data

Rated voltage 250 Vac
Voltage range 0 - 250 Vac
Rated current 1.00 - 16.00 A
Leakage current 0.40 mA
Degree of protection IP 20

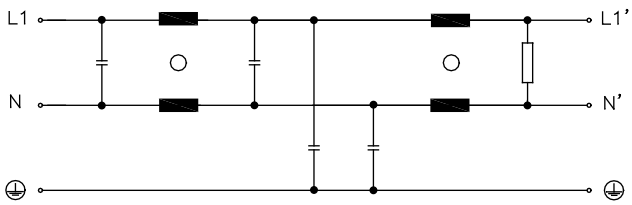
Advantages

For enhanced requirements
Low leakage current
Two stage filter concept
Efficient filter effect against line-bound interference emissions
Increase in the interference immunity of the connected consumer

Applications

Radio interference suppression filter for mains-side interference suppression of power supplies and electronic devices.

Sample application



Standards

Radio interference suppression filter to DIN EN 60939-2

Approvals

EAC

Radio interference suppression filter, single-phase, low leakage current
HFE 200

BLOCK Website

Electrical data

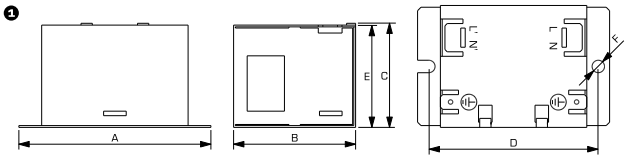
Typ	HFE 200-230/1	HFE 200-230/3	HFE 200-230/6	HFE 200-230/10	HFE 200-230/12	HFE 200-230/16
Operating data						
Rated voltage	250 Vac	250 Vac	250 Vac	250 Vac	250 Vac	250 Vac
Voltage range	0 - 250 Vac	0 - 250 Vac	0 - 250 Vac	0 - 250 Vac	0 - 250 Vac	0 - 250 Vac
Rated current	1 A	3 A	6 A	10 A	12 A	16 A
Leakage current (50 Hz)	0.4 mA	0.4 mA	0.4 mA	0.4 mA	0.4 mA	0.4 mA
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Overrating Capacity	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly
Environment						
Climatic category	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure
Protection index	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20
Safety class (prepared)	I	I	I	I	I	I
Test voltage	1700 Vdc Phase/N, 2700 Vdc Phase/PE	1700 Vdc Phase/N, 2700 Vdc Phase/PE	1700 Vdc Phase/N, 2700 Vdc Phase/PE	1700 Vdc Phase/N, 2700 Vdc Phase/PE	1700 Vdc Phase/N, 2700 Vdc Phase/PE	1700 Vdc Phase/N, 2700 Vdc Phase/PE
Order numbers						
Order Number	**HFE 200-230/1**	**HFE 200-230/3**	**HFE 200-230/6**	**HFE 200-230/10**	**HFE 200-230/12**	**HFE 200-230/16**

Mechanical data

Terminal and mounting						
Terminals phase	Screw clamp, 4 mm²	Screw clamp, 4 mm²	Screw clamp, 4 mm²	Screw clamp, 4 mm²	Screw clamp, 4 mm²	Screw clamp, 4 mm²
Terminals PE	Tab connector, 6.3 x 0.8 mm	Tab connector, 6.3 x 0.8 mm	Tab connector, 6.3 x 0.8 mm	Tab connector, 6.3 x 0.8 mm	Tab connector, 6.3 x 0.8 mm	Tab connector, 6.3 x 0.8 mm
Fixing method	Mounting lugs	Mounting lugs	Mounting lugs	Mounting lugs	Mounting lugs	Mounting lugs
Measures and weights						
Weight	0.14 kg	0.19 kg	0.37 kg	0.53 kg	0.53 kg	0.58 kg
Dimension picture (in mm)	❶	❶	❶	❶	❶	❶
A	85	85	114	156	156	119
B	54	54	57	58	58	86
C	35	47	55	67	67	69
D	75	75	103	143	143	109
E	34	46	54	66	66	68
F	5.5	5.5	5.5	5.5	5.5	5.5

Dimension pictures

❶



Radio interference suppression filter, single-phase
HLE 110

BLOCK Website

General Data

Rated voltage 250 Vac
Voltage range 0 - 250 Vac
Rated current 4 - 55 A
Leakage current 8.50 mA
Degree of protection IP 20

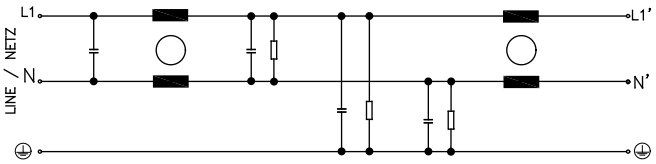
Advantages

For enhanced requirements
Single-stage filter concept
Efficient filter effect against line-bound interference emissions
Increase in the interference immunity of the connected consumer

Applications

Radio interference suppression filter for line-side interference suppression of single devices, frequency converters or as group interference suppression.

Sample application



Standards

Radio interference suppression filter to DIN EN 60939-2

Approvals

EAC

Radio interference suppression filter, single-phase
HLE 110

BLOCK Website

Electrical data

Typ	HLE 110-230/4	HLE 110-230/8	HLE 110-230/12	HLE 110-230/16	HLE 110-230/20	HLE 110-230/25
Operating data						
Rated voltage	250 Vac	250 Vac	250 Vac	250 Vac	250 Vac	250 Vac
Voltage range	0 - 250 Vac	0 - 250 Vac	0 - 250 Vac	0 - 250 Vac	0 - 250 Vac	0 - 250 Vac
Rated current	4 A	8 A	12 A	16 A	20 A	25 A
Leakage current (50 Hz)*	8.50 mA	8.50 mA	8.50 mA	8.50 mA	8.50 mA	8.50 mA
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Overrating Capacity	150 %, short-time	150 %, short-time	150 %, short-time	150 %, short-time	150 %, short-time	150 %, short-time
Environment						
Climatic category	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)
Ambient temperature max.	50 °C	50 °C	50 °C	50 °C	50 °C	50 °C
Safety and protection						
Type	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure
Protection index	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20
Safety class (prepared)	I	I	I	I	I	I
Test voltage	1700 Vdc Phase/Phase, 2700 Vdc Phase/PE	1700 Vdc Phase/Phase, 2700 Vdc Phase/PE	1700 Vdc Phase/Phase, 2700 Vdc Phase/PE	1700 Vdc Phase/Phase, 2700 Vdc Phase/PE	1700 Vdc Phase/Phase, 2700 Vdc Phase/PE	1700 Vdc Phase/Phase, 2700 Vdc Phase/PE
Notes						
*	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %
Order numbers						
Order Number	**HLE 110-230/4**	**HLE 110-230/8**	**HLE 110-230/12**	**HLE 110-230/16**	**HLE 110-230/20**	**HLE 110-230/25**

Radio interference suppression filter, single-phase
HLE 110

BLOCK Website

Electrical data

Typ	HLE 110-230/30	HLE 110-230/42	HLE 110-230/55
Operating data			
Rated voltage	250 Vac	250 Vac	250 Vac
Voltage range	0 - 250 Vac	0 - 250 Vac	0 - 250 Vac
Rated current	30 A	42 A	55 A
Leakage current (50 Hz)*	8.50 mA	8.50 mA	8.50 mA
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Overrating Capacity	150 %, short-time	150 %, short-time	150 %, short-time
Environment			
Climatic category	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)
Ambient temperature max.	50 °C	50 °C	50 °C
Safety and protection			
Type	Metal enclosure	Metal enclosure	Metal enclosure
Protection index	IP 20	IP 20	IP 20
Safety class (prepared)	I	I	I
Test voltage	1700 Vdc Phase/Phase, 2700 Vdc Phase/PE	1700 Vdc Phase/Phase, 2700 Vdc Phase/PE	1700 Vdc Phase/Phase, 2700 Vdc Phase/PE
Notes			
*	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %
Order numbers			
Order Number	**HLE 110-230/30**	**HLE 110-230/42**	**HLE 110-230/55**

Radio interference suppression filter, single-phase
HLE 110

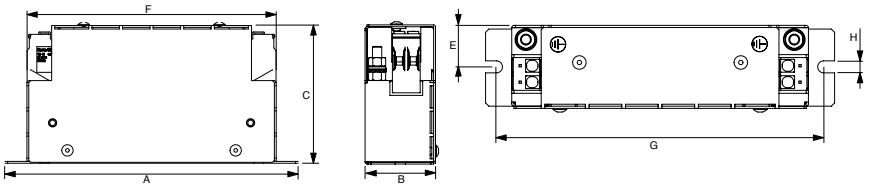
BLOCK Website

Mechanical data 30

Typ	Terminals phase	Terminals PE	Fixing method	Fixing screws	Weight	Dimension picture (in mm)	A	B	C	D	E	F	G	H
HLE 110-230/4	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs	M5	0.52 kg	1	160	38	75	-	19	136	150	5.5
HLE 110-230/8	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs	M5	0.58 kg	1	160	38	75	-	19	136	150	5.5
HLE 110-230/12	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs	M5	0.78 kg	1	190	38	75	-	19	166	180	5.5
HLE 110-230/16	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs	M5	0.78 kg	1	190	38	75	-	19	166	180	5.5
HLE 110-230/20	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs	M5	0.80 kg	1	190	38	75	-	19	166	180	5.5
HLE 110-230/25	Screw clamp, 10 mm²	Bolt, M6	Mounting lugs	M6	1.30 kg	2	230	50	95	25	12.5	200	215	5.5
HLE 110-230/30	Screw clamp, 10 mm²	Bolt, M6	Mounting lugs	M6	1.35 kg	2	230	50	95	25	12.5	200	215	5.5
HLE 110-230/42	Screw clamp, 10 mm²	Bolt, M6	Mounting lugs	M6	1.45 kg	2	230	50	95	25	12.5	200	215	5.5
HLE 110-230/55	Screw clamp, 16 mm²	Bolt, M6	Mounting lugs	M6	2.00 kg	5	225	85	95	60	12.5	230	210	5.5

Dimension pictures

1



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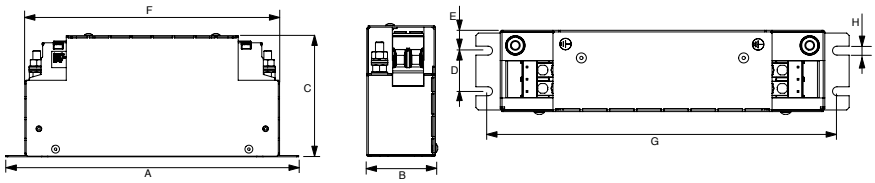

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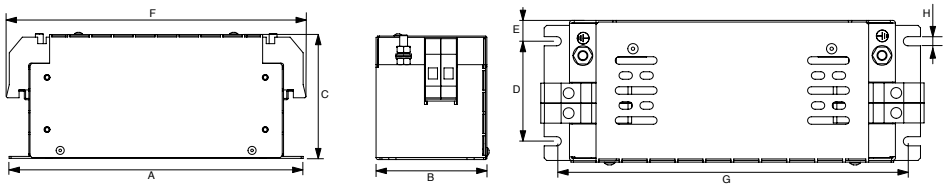


Radio interference filter, single-phase, low leakage current
HLE 310

BLOCK Website

General Data

Rated voltage 250 Vac
Voltage range 0 - 250 Vac
Rated current 4 - 55 A
Leakage current <3.00 mA
Degree of protection IP 20

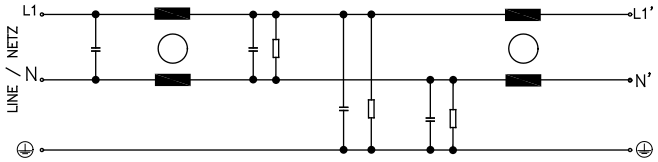
Advantages

For enhanced requirements
Low leakage current
Single-stage filter concept
Efficient filter effect against line-bound interference emissions
Increase in the interference immunity of the connected consumer

Applications

Radio interference suppression filter for line-side interference suppression of single devices, frequency converters or as group interference suppression.

Sample application



Standards

Radio interference suppression filter to DIN EN 60939-2

Approvals

EAC

Radio interference filter, single-phase, low leakage current
HLE 310

BLOCK Website

Electrical data

Typ	HLE 310-230/4	HLE 310-230/8	HLE 310-230/12	HLE 310-230/16	HLE 310-230/20	HLE 310-230/25
Special features						
Characteristics	Suitable for the medical field	Suitable for the medical field	Suitable for the medical field	Suitable for the medical field	Suitable for the medical field	Suitable for the medical field
Operating data						
Rated voltage	250 Vac	250 Vac	250 Vac	250 Vac	250 Vac	250 Vac
Voltage range	0 - 250 Vac	0 - 250 Vac	0 - 250 Vac	0 - 250 Vac	0 - 250 Vac	0 - 250 Vac
Rated current	4 A	8 A	12 A	16 A	20 A	25 A
Leakage current (50 Hz)*	<3.00 mA	<3.00 mA	<3.00 mA	<3.00 mA	<3.00 mA	<3.00 mA
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Overrating Capacity	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly
Environment						
Climatic category	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)
Ambient temperature max.	50 °C	50 °C	50 °C	50 °C	50 °C	50 °C
Safety and protection						
Type	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure
Protection index	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20
Safety class (prepared)	I	I	I	I	I	I
Test voltage	1700 Vdc Phase/Phase, 2700 Vdc Phase/PE	1700 Vdc Phase/Phase, 2700 Vdc Phase/PE	1700 Vdc Phase/Phase, 2700 Vdc Phase/PE	1700 Vdc Phase/Phase, 2700 Vdc Phase/PE	1700 Vdc Phase/Phase, 2700 Vdc Phase/PE	1700 Vdc Phase/Phase, 2700 Vdc Phase/PE
Notes						
*	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %
Order numbers						
Order Number	**HLE 310-230/4**	**HLE 310-230/8**	**HLE 310-230/12**	**HLE 310-230/16**	**HLE 310-230/20**	**HLE 310-230/25**

Radio interference filter, single-phase, low leakage current
HLE 310

BLOCK Website

Electrical data

Typ	HLE 310-230/30	HLE 310-230/42	HLE 310-230/55
Special features			
Characteristics	Suitable for the medical field	Suitable for the medical field	Suitable for the medical field
Operating data			
Rated voltage	250 Vac	250 Vac	250 Vac
Voltage range	0 - 250 Vac	0 - 250 Vac	0 - 250 Vac
Rated current	30 A	42 A	55 A
Leakage current (50 Hz)*	<3.00 mA	<3.00 mA	<3.00 mA
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Overrating Capacity	150 %, shortly	150 %, shortly	150 %, shortly
Environment			
Climatic category	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)
Ambient temperature max.	50 °C	50 °C	50 °C
Safety and protection			
Type	Metal enclosure	Metal enclosure	Metal enclosure
Protection index	IP 20	IP 20	IP 20
Safety class (prepared)	I	I	I
Test voltage	1700 Vdc Phase/Phase, 2700 Vdc Phase/PE	1700 Vdc Phase/Phase, 2700 Vdc Phase/PE	1700 Vdc Phase/Phase, 2700 Vdc Phase/PE
Notes			
*	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %
Order numbers			
Order Number	**HLE 310-230/30**	**HLE 310-230/42**	**HLE 310-230/55**

Radio interference filter, single-phase, low leakage current
HLE 310

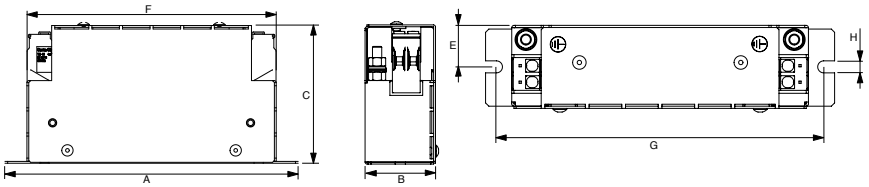
BLOCK Website

Mechanical data

Typ	Terminals phase	Terminals PE	Fixing method	Fixing screws	Weight	Dimension picture (in mm)	A	B	C	D	E	F	G	H
HLE 310-230/4	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs	M5	0.52 kg	1	160	38	75	-	19	136	150	5.5
HLE 310-230/8	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs	M5	0.58 kg	1	160	38	75	-	19	136	150	5.5
HLE 310-230/12	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs	M5	0.78 kg	1	190	38	75	-	19	166	180	5.5
HLE 310-230/16	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs	M5	0.78 kg	1	190	38	75	-	19	166	180	5.5
HLE 310-230/20	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs	M5	0.80 kg	1	190	38	75	-	19	166	180	5.5
HLE 310-230/25	Screw clamp, 10 mm²	Bolt, M6	Mounting lugs	M6	1.30 kg	2	230	50	95	25	12.5	200	215	5.5
HLE 310-230/30	Screw clamp, 10 mm²	Bolt, M6	Mounting lugs	M6	1.35 kg	2	230	50	95	25	12.5	200	215	5.5
HLE 310-230/42	Screw clamp, 10 mm²	Bolt, M6	Mounting lugs	M6	1.45 kg	2	230	50	95	25	12.5	200	215	5.5
HLE 310-230/55	Screw clamp, 16 mm²	Bolt, M6	Mounting lugs	M6	2.00 kg	5	225	85	95	60	12.5	230	210	5.5

Dimension pictures

1



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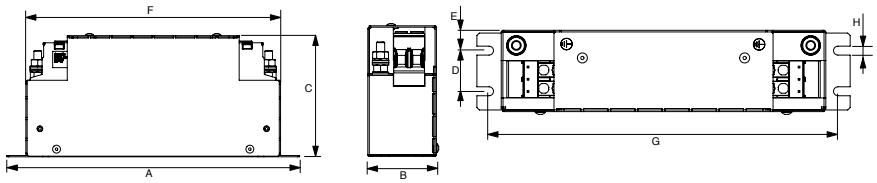

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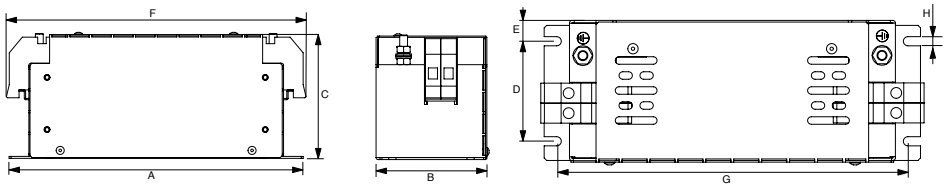


Radio interference suppression filter, three-phase
HFD 156

BLOCK Website

General Data

Rated voltage 3 x 480 Vac
Voltage range 3 x 0 - 480 Vac
Rated current 3 x 3 - 3 x 16 A
Leakage current 1.00 mA
Ambient temperature max. 45 °C
Degree of protection IP 20

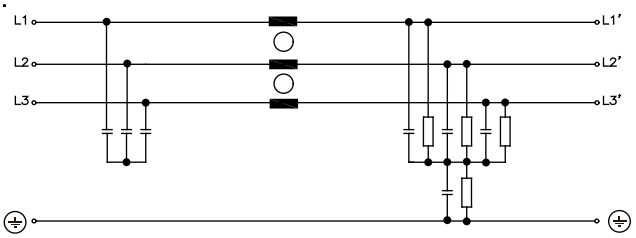
Advantages

For general requirements
Single-stage filter concept
Efficient filter effect against line-bound interference emissions
Increase in the interference immunity of the connected consumer
DIN rail mounting

Applications

Radio interference suppression filter for mains-side interference suppression of power supplies and electronic devices.

Sample application



Standards

Radio interference suppression filter to DIN EN 60939-2

Approvals

EAC

Radio interference suppression filter, three-phase
HFD 156

BLOCK Website

Electrical data

Typ	HFD 156-400/3	HFD 156-400/6	HFD 156-400/10	HFD 156-400/12	HFD 156-400/16
Operating data					
Rated voltage	3 x 480 Vac	3 x 480 Vac	3 x 480 Vac	3 x 480 Vac	3 x 480 Vac
Voltage range	3 x 0 - 480 Vac	3 x 0 - 480 Vac	3 x 0 - 480 Vac	3 x 0 - 480 Vac	3 x 0 - 480 Vac
Rated current	3 x 3 A	3 x 6 A	3 x 10 A	3 x 12 A	3 x 16 A
Leakage current (50 Hz)**	9.00 mA	9.00 mA	9.00 mA	9.00 mA	9.00 mA
Leakage current (50 Hz)*	1.00 mA	1.00 mA	1.00 mA	1.00 mA	1.00 mA
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Power loss	2.2 W	2.7 W	4.7 W	6.1 W	7.9 W
Overrating Capacity	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly
Environment					
Climatic category	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)
Ambient temperature max.	45 °C	45 °C	45 °C	45 °C	45 °C
Safety and protection					
Type	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure
Protection index	IP 20	IP 20	IP 20	IP 20	IP 20
Safety class (prepared)	I	I	I	I	I
Test voltage	2100 Vdc Phase/Phase, 2700 Vdc Phase/PE	2100 Vdc Phase/Phase, 2700 Vdc Phase/PE	2100 Vdc Phase/Phase, 2700 Vdc Phase/PE	2100 Vdc Phase/Phase, 2700 Vdc Phase/PE	2100 Vdc Phase/Phase, 2700 Vdc Phase/PE
Notes					
*	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %
**	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases
Order numbers					
Order Number	**HFD 156-400/3**	**HFD 156-400/6**	**HFD 156-400/10**	**HFD 156-400/12**	**HFD 156-400/16**

Radio interference suppression filter, three-phase
HFD 156

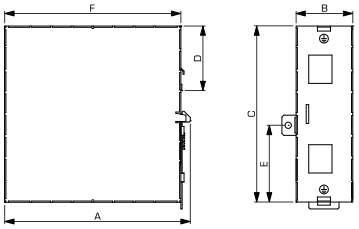
BLOCK Website

Mechanical data

Typ	Terminals phase	Terminals PE	Fixing method	Weight	Dimension picture (in mm)	A	B	C	D	E	F
HFD 156-400/3	2.5 mm² spring terminal	Tab connector, 6.3 x 0.8 mm	DIN Rail mounting	0.48 kg	1	127	45	110	52	33	120
HFD 156-400/6	2.5 mm² spring terminal	Tab connector, 6.3 x 0.8 mm	DIN Rail mounting	0.49 kg	1	127	45	110	52	33	120
HFD 156-400/10	2.5 mm² spring terminal	Tab connector, 6.3 x 0.8 mm	DIN Rail mounting	0.49 kg	1	127	45	110	52	33	120
HFD 156-400/12	2.5 mm² spring terminal	Tab connector, 6.3 x 0.8 mm	DIN Rail mounting	0.72 kg	1	147	45	140	52	66	140
HFD 156-400/16	2.5 mm² spring terminal	Tab connector, 6.3 x 0.8 mm	DIN Rail mounting	0.73 kg	1	147	45	140	52	66	140

Dimension pictures

1



Radio interference suppression filter, three-phase, low leakage current
HFD 356

BLOCK Website

General Data

Rated voltage 3 x 480 Vac
Voltage range 0 - 480 Vac
Rated current 3 x 3 - 3 x 16 A
Leakage current 0.50 mA
Degree of protection IP 20
DIN Rail mounting

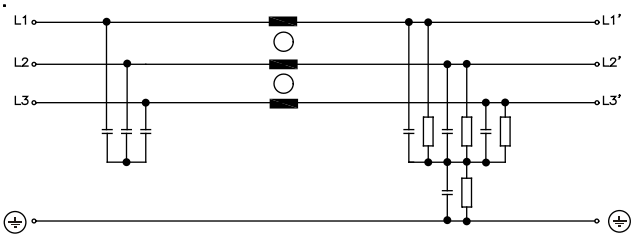
Advantages

For general requirements
Low leakage current
Single-stage filter concept
Efficient filter effect against line-bound interference emissions
Increase in the interference immunity of the connected consumer

Applications

Radio interference suppression filter for mains-side interference suppression of power supplies and electronic devices.

Sample application



Standards

Radio interference suppression filter to DIN EN 60939-2

Approvals

EAC

Radio interference suppression filter, three-phase, low leakage current
HFD 356

BLOCK Website

Electrical data

Typ	HFD 356-400/3	HFD 356-400/6	HFD 356-400/10	HFD 356-400/12	HFD 356-400/16
Special features					
Characteristics	Suitable for the medical field	Suitable for the medical field	Suitable for the medical field	Suitable for the medical field	Suitable for the medical field
Operating data					
Rated voltage	3 x 480 Vac	3 x 480 Vac	3 x 480 Vac	3 x 480 Vac	3 x 480 Vac
Voltage range	0 - 480 Vac	0 - 480 Vac	0 - 480 Vac	0 - 480 Vac	0 - 480 Vac
Rated current	3 x 3 A	3 x 6 A	3 x 10 A	3 x 12 A	3 x 16 A
Leakage current (50 Hz)**	4.00 mA	4.00 mA	5.00 mA	5.00 mA	5.00 mA
Leakage current (50 Hz)*	0.50 mA	0.50 mA	0.50 mA	0.50 mA	0.50 mA
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Power loss	2.2 W	2.7 W	4.7 W	6.1 W	7.9 W
Overrating Capacity	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly
Environment					
Climatic category	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)
Ambient temperature max.	45 °C	45 °C	45 °C	45 °C	45 °C
Safety and protection					
Type	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure
Protection index	IP 20	IP 20	IP 20	IP 20	IP 20
Safety class (prepared)	I	I	I	I	I
Test voltage	2100 Vdc Phase/Phase, 2700 Vdc Phase/PE	2100 Vdc Phase/Phase, 2700 Vdc Phase/PE	2100 Vdc Phase/Phase, 2700 Vdc Phase/PE	2100 Vdc Phase/Phase, 2700 Vdc Phase/PE	2100 Vdc Phase/Phase, 2700 Vdc Phase/PE
Notes					
*	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %
**	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases
Order numbers					
Order Number	**HFD 356-400/3**	**HFD 356-400/6**	**HFD 356-400/10**	**HFD 356-400/12**	**HFD 356-400/16**

Radio interference suppression filter, three-phase, low leakage current
HFD 356

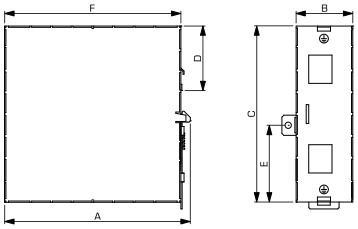
BLOCK Website

Mechanical data 30

Typ	Terminals phase	Terminals PE	Fixing method	Weight	Dimension picture (in mm)	A	B	C	D	E	F
HFD 356-400/3	2.5 mm² spring terminal	Tab connector, 6.3 x 0.8 mm	DIN Rail mounting	0.48 kg	1	127	45	110	52	33	120
HFD 356-400/6	2.5 mm² spring terminal	Tab connector, 6.3 x 0.8 mm	DIN Rail mounting	0.49 kg	1	127	45	110	52	33	120
HFD 356-400/10	2.5 mm² spring terminal	Tab connector, 6.3 x 0.8 mm	DIN Rail mounting	0.49 kg	1	127	45	110	52	33	120
HFD 356-400/12	2.5 mm² spring terminal	Tab connector, 6.3 x 0.8 mm	DIN Rail mounting	0.72 kg	1	147	45	140	52	66	140
HFD 356-400/16	2.5 mm² spring terminal	Tab connector, 6.3 x 0.8 mm	DIN Rail mounting	0.73 kg	1	147	45	140	52	66	140

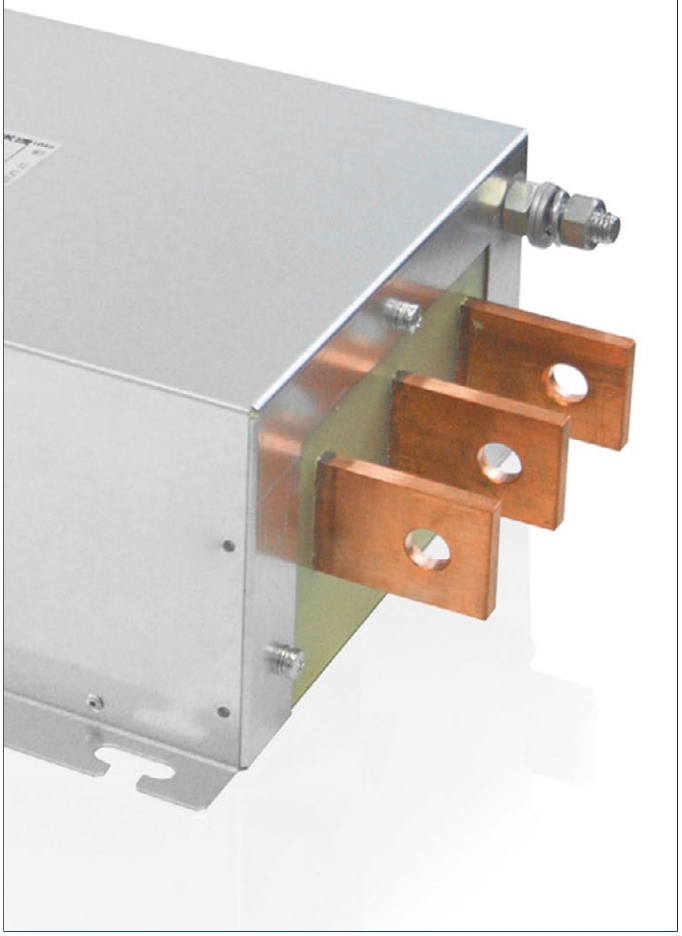
Dimension pictures

1



Radio interference suppression filter, three-phase
HLD 103

BLOCK Website



General Data

Rated voltage 3 x 520 Vac
Voltage range 3 x 0 - 520 Vac
Rated current 3 x 270 - 3 x 1800 A
Leakage current 60.00 mA
Ambient temperature max. 50 °C
Degree of protection IP 00

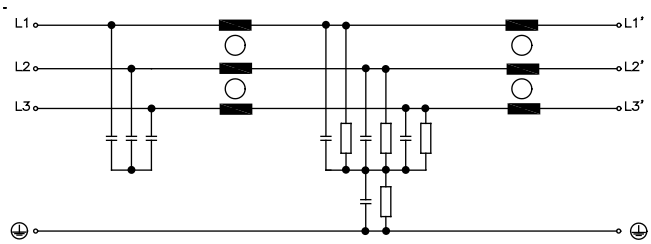
Advantages

For enhanced requirements
Single-stage filter concept
Efficient filter effect against line-bound interference emissions
Increase in the interference immunity of the connected consumer

Applications

Radio interference suppression filter for line-side interference suppression of single devices, frequency inverters or as group interference suppression.

Sample application



Standards

Radio interference suppression filter to DIN EN 60939-2

Approvals

EAC

Radio interference suppression filter, three-phase
HLD 103

BLOCK Website

Electrical data

Typ	HLD 103-500/270	HLD 103-500/400	HLD 103-500/750	HLD 103-500/1000	HLD 103-500/1800
Operating data					
Rated voltage	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac
Voltage range	3 x 0 - 520 Vac	3 x 0 - 520 Vac	3 x 0 - 520 Vac	3 x 0 - 520 Vac	3 x 0 - 520 Vac
Rated current	3 x 270 A	3 x 400 A	3 x 750 A	3 x 1000 A	3 x 1800 A
Leakage current (50 Hz)*	570.00 mA	570.00 mA	570.00 mA	570.00 mA	570.00 mA
Leakage current (50 Hz)**	60.00 mA	60.00 mA	60.00 mA	60.00 mA	60.00 mA
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Overrating Capacity	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly
Environment					
Climatic category	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)
Ambient temperature max.	50 °C	50 °C	50 °C	50 °C	50 °C
Safety and protection					
Type	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I
Test voltage	2121 Vdc Phase/Phase, 2700 Vdc Phase/PE	2121 Vdc Phase/Phase, 2700 Vdc Phase/PE	2121 Vdc Phase/Phase, 2700 Vdc Phase/PE	2121 Vdc Phase/Phase, 2700 Vdc Phase/PE	2121 Vdc Phase/Phase, 2700 Vdc Phase/PE
Notes					
*	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %
**	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases
Order numbers					
Order Number	**HLD 103-500/270**	**HLD 103-500/400**	**HLD 103-500/750**	**HLD 103-500/1000**	**HLD 103-500/1800**

Radio interference suppression filter, three-phase
HLD 103

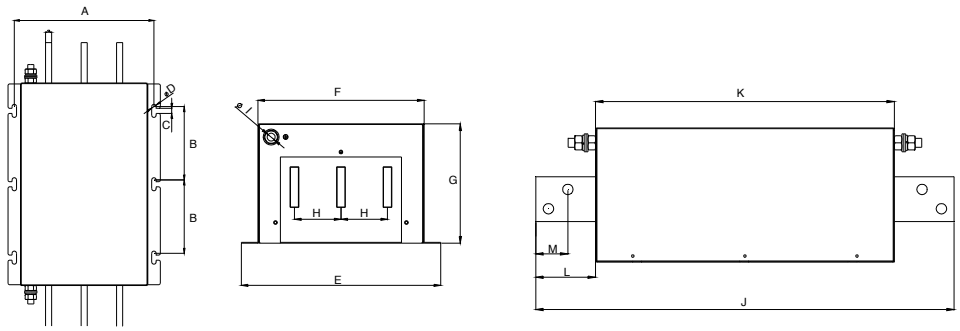
BLOCK Website

Mechanical data

Typ	Terminals phase	Terminals PE	Fixing method	Fixing screws	Weight	Dimension picture (in mm)	A	B	C	D	E	F	G	H	I	J	K	L	M
HLD 103-500/270	Flat copper, 20 x 5 mm	Bolt, M12	Mounting lugs	M8	12.60 kg	1	235	120	10	9	260	210	100	60	12	380	300	40	10
HLD 103-500/400	Flat copper, 25 x 6 mm	Bolt, M12	Mounting lugs	M8	12.90 kg	1	235	120	10	9	260	210	100	60	12	380	300	40	12.5
HLD 103-500/750	Flat copper, 30 x 10 mm	Bolt, M12	Mounting lugs	M8	15.80 kg	1	235	120	10	9	260	210	110	60	12	390	300	45	15
HLD 103-500/1000	Flat copper, 40 x 8 mm	Bolt, M12	Mounting lugs	M8	0.00 kg	1	255	145	10	9	280	230	130	60	12	460	350	55	20
HLD 103-500/1800	Flat copper, 60 x 12 mm	Bolt, M12	Mounting lugs	M8	0.00 kg	1	275	145	10	9	300	250	180	70	12	560	400	80	43

Dimension pictures

1



Radio interference suppression filter, three-phase
HLD 110

BLOCK Website

General Data

Rated voltage 3 x 520 Vac
Voltage range 3 x 0 - 520 Vac
Rated current 3 x 8 - 3 x 250 A
Leakage current 20.00 - 37.00 mA
Ambient temperature max. 50 °C
Degree of protection IP 20

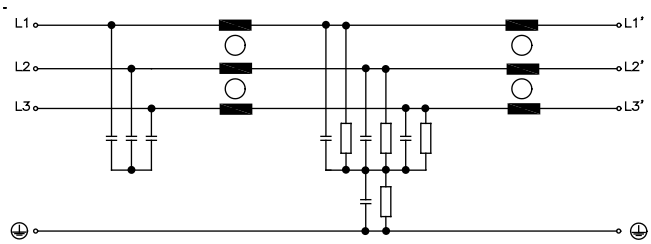
Advantages

For enhanced requirements
Single-stage filter concept
Efficient filter effect against line-bound interference emissions
Increase in the interference immunity of the connected consumer

Applications

Radio interference suppression filter for line-side interference suppression of single devices, frequency inverters or as group interference suppression.

Sample application



Standards

Radio interference suppression filter complying with DIN EN 60939-2, UL 1283, CSA C22.2 No.8

Approvals

UL 1283 5th edition, CSA 22.2 No 8

Radio interference suppression filter, three-phase
HLD 110

BLOCK Website

Electrical data

Typ	HLD 110-500/8	HLD 110-500/12	HLD 110-500/16	HLD 110-500/30	HLD 110-500/42	HLD 110-500/55
Operating data						
Rated voltage	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac
Voltage range	3 x 0 - 520 Vac	3 x 0 - 520 Vac	3 x 0 - 520 Vac	3 x 0 - 520 Vac	3 x 0 - 520 Vac	3 x 0 - 520 Vac
Rated current	3 x 8 A	3 x 12 A	3 x 16 A	3 x 30 A	3 x 42 A	3 x 55 A
Leakage current (50 Hz)*	20.00 mA	20.00 mA	21.00 mA	29.00 mA	20.00 mA	30.00 mA
Leakage current (50 Hz)**	190.00 mA	190.00 mA	205.00 mA	280.00 mA	290.00 mA	290.00 mA
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Power loss	6.0 W	9.0 W	12.0 W	15.0 W	22.0 W	30.0 W
Overrating Capacity	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly
Approvals						
Approvals	cURus, UL 1283 5th edition, CSA 22.2 No.8	cURus, UL 1283 5th edition, CSA 22.2 No.8	cURus, UL 1283 5th edition, CSA 22.2 No.8	cURus, UL 1283 5th edition, CSA 22.2 No.8	cURus, UL 1283 5th edition, CSA 22.2 No.8	cURus, UL 1283 5th edition, CSA 22.2 No.8
Environment						
Climatic category	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)
Ambient temperature max.	50 °C	50 °C	50 °C	50 °C	50 °C	50 °C
Safety and protection						
SCCR***	100 kA	100 kA	100 kA	100 kA	100 kA	100 kA
Type	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure
Protection index	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20
Safety class (prepared)	I	I	I	I	I	I
Test voltage	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE
Notes						
*	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %
**	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases
***	with corresponding preliminary fuse	with corresponding preliminary fuse	with corresponding preliminary fuse	with corresponding preliminary fuse	with corresponding preliminary fuse	with corresponding preliminary fuse
Order numbers						
Order Number	**HLD 110-500/8**	**HLD 110-500/12**	**HLD 110-500/16**	**HLD 110-500/30**	**HLD 110-500/42**	**HLD 110-500/55**

Radio interference suppression filter, three-phase
HLD 110

BLOCK Website

Electrical data

Typ	HLD 110-500/75	HLD 110-500/100	HLD 110-500/130	HLD 110-500/180	HLD 110-500/250
Operating data					
Rated voltage	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac
Voltage range	3 x 0 - 520 Vac	3 x 0 - 520 Vac	3 x 0 - 520 Vac	3 x 0 - 520 Vac	3 x 0 - 520 Vac
Rated current	3 x 75 A	3 x 100 A	3 x 130 A	3 x 180 A	3 x 250 A
Leakage current (50 Hz)*	22.00 mA	30.00 mA	22.00 mA	31.00 mA	37.00 mA
Leakage current (50 Hz)**	210.00 mA	290.00 mA	210.00 mA	300.00 mA	355.00 mA
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Power loss	35.0 W	60.0 W	90.0 W	150.0 W	180.0 W
Overrating Capacity	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly
Approvals					
Approvals	cURus, UL 1283 5th edition, CSA 22.2 No.8	cURus, UL 1283 5th edition, CSA 22.2 No.8	cURus, UL 1283 5th edition, CSA 22.2 No.8	cURus, UL 1283 5th edition, CSA 22.2 No.8	cURus, UL 1283 5th edition, CSA 22.2 No.8
Environment					
Climatic category	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)
Ambient temperature max.	50 °C	50 °C	50 °C	50 °C	50 °C
Safety and protection					
SCCR***	100 kA	100 kA	100 kA	100 kA	100 kA
Type	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure
Protection index	IP 20	IP 20	IP 20	IP 20	IP 20
Safety class (prepared)	I	I	I	I	I
Test voltage	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE
Notes					
*	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %
**	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases
***	with corresponding preliminary fuse	with corresponding preliminary fuse	with corresponding preliminary fuse	with corresponding preliminary fuse	with corresponding preliminary fuse
Order numbers					
Order Number	**HLD 110-500/75**	**HLD 110-500/100**	**HLD 110-500/130**	**HLD 110-500/180**	**HLD 110-500/250**

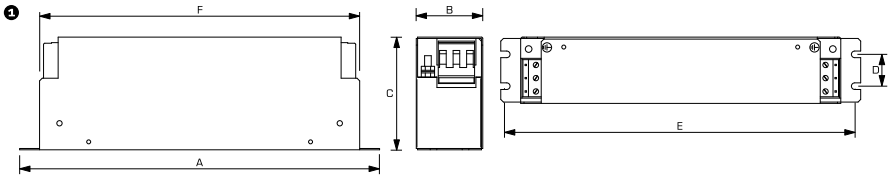
Radio interference suppression filter, three-phase
HLD 110

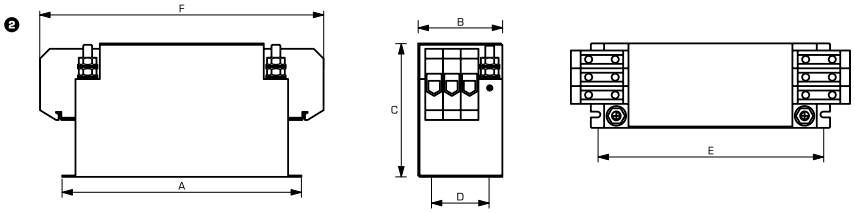
BLOCK Website

30 Mechanical data

Typ	Terminals phase	Terminals PE	Fixing method	Fixing screws	Weight	Dimension picture (in mm)	A	B	C	D	E	F
HLD 110-500/8	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs	M5	0.8 kg	1	190	45	75	20	180	166
HLD 110-500/12	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs	M5	1.0 kg	1	220	45	75	20	210	190
HLD 110-500/16	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs	M5	1.2 kg	1	250	45	75	20	240	220
HLD 110-500/30	Screw clamp, 10 mm²	Bolt, M5	Mounting lugs	M5	1.8 kg	1	270	55	95	30	255	240
HLD 110-500/42	Screw clamp, 10 mm²	Bolt, M5	Mounting lugs	M5	2.1 kg	1	310	55	95	30	295	280
HLD 110-500/55	Screw clamp, 16 mm²	Bolt, M6	Mounting lugs	M5	2.5 kg	2	250	85	95	60	235	255
HLD 110-500/75	Screw clamp, 35 mm²	Bolt, M8	Mounting lugs	M6	4.5 kg	2	270	85	135	60	255	310
HLD 110-500/100	Screw clamp, 50 mm²	Bolt, M10	Mounting lugs	M6	5.2 kg	2	270	95	150	65	255	325
HLD 110-500/130	Screw clamp, 50 mm²	Bolt, M10	Mounting lugs	M6	5.6 kg	2	270	95	150	65	255	325
HLD 110-500/180	Screw clamp, 95 mm²	Bolt, M10	Mounting lugs	M6	9.2 kg	2	380	130	181	102	365	440
HLD 110-500/250	Screw clamp, 150 mm²	Bolt, M12	Mounting lugs	M6	12.2 kg	2	450	155	220	125	435	525

Dimension pictures





Radio interference suppression filter, three-phase, low leakage current
HLD 310

BLOCK Website

General Data

Rated voltage 3 x 520 Vac
Voltage range 0 - 3 x 520 Vac
Rated current 3 x 8 - 3 x 250 A
Leakage current <0.4 mA
Degree of protection IP 20

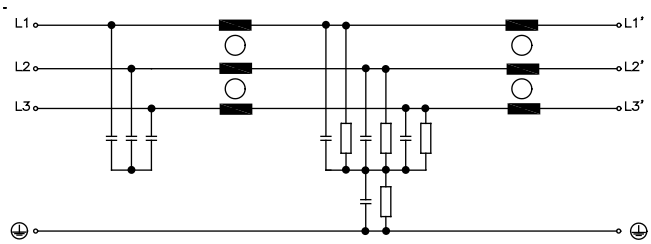
Advantages

For enhanced requirements
Low leakage current
Single-stage filter concept
Efficient filter effect against line-bound interference emissions
Increase in the interference immunity of the connected consumer

Applications

Radio interference suppression filter for line-side interference suppression of single devices, frequency converters or as group interference suppression.

Sample application



Standards

Radio interference suppression filter complying with DIN EN 60939-2, UL 1283, CSA C22.2 No.8

Approvals

UL 1283 5th edition, CSA 22.2 No 8

Radio interference suppression filter, three-phase, low leakage current
HLD 310

BLOCK Website

Electrical data

Typ	HLD 310-500/8	HLD 310-500/12	HLD 310-500/16	HLD 310-500/30	HLD 310-500/42	HLD 310-500/55
Special features						
Characteristics	Suitable for the medical field	Suitable for the medical field	Suitable for the medical field	Suitable for the medical field	Suitable for the medical field	Suitable for the medical field
Operating data						
Rated voltage	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac
Voltage range	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac
Rated current	3 x 8 A	3 x 12 A	3 x 16 A	3 x 30 A	3 x 42 A	3 x 55 A
Leakage current (50 Hz)*	<0.40 mA	<0.40 mA	<0.40 mA	<0.40 mA	<0.40 mA	<0.40 mA
Leakage current (50 Hz)**	<3.50 mA	<3.50 mA	<3.50 mA	<3.50 mA	<3.50 mA	<3.50 mA
Power loss	6.0 W	9.0 W	12.0 W	15.0 W	22.0 W	30.0 W
Overrating Capacity	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly
Input						
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Approvals						
Approvals	cURus, UL 1283 5th edition, CSA 22.2 No.8	cURus, UL 1283 5th edition, CSA 22.2 No.8	cURus, UL 1283 5th edition, CSA 22.2 No.8	cURus, UL 1283 5th edition, CSA 22.2 No.8	cURus, UL 1283 5th edition, CSA 22.2 No.8	cURus, UL 1283 5th edition, CSA 22.2 No.8
Environment						
Climatic category	25/085/21 [in accordance with EN 60068-1]	25/085/21 [in accordance with EN 60068-1]	25/085/21 [in accordance with EN 60068-1]	25/085/21 [in accordance with EN 60068-1]	25/085/21 [in accordance with EN 60068-1]	25/085/21 [in accordance with EN 60068-1]
Ambient temperature max.	50 °C	50 °C	50 °C	50 °C	50 °C	50 °C
Safety and protection						
SCCR***	100 kA	100 kA	100 kA	100 kA	100 kA	100 kA
Type	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure
Protection index	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20
Safety class (prepared)	I	I	I	I	I	I
Test voltage	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE
Notes						
*	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %
**	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases
***	with corresponding preliminary fuse	with corresponding preliminary fuse	with corresponding preliminary fuse	with corresponding preliminary fuse	with corresponding preliminary fuse	with corresponding preliminary fuse
Order numbers						
Order Number	**HLD 310-500/8**	**HLD 310-500/12**	**HLD 310-500/16**	**HLD 310-500/30**	**HLD 310-500/42**	**HLD 310-500/55**

Radio interference suppression filter, three-phase, low leakage current
HLD 310

BLOCK Website

Electrical data

Typ	HLD 310-500/75	HLD 310-500/100	HLD 310-500/130	HLD 310-500/180	HLD 310-500/250
Special features					
Characteristics	Suitable for the medical field	Suitable for the medical field	Suitable for the medical field	Suitable for the medical field	Suitable for the medical field
Operating data					
Rated voltage	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac
Voltage range	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac
Rated current	3 x 75 A	3 x 100 A	3 x 130 A	3 x 180 A	3 x 250 A
Leakage current (50 Hz)*	<0.40 mA	<0.40 mA	<0.40 mA	<0.40 mA	<0.40 mA
Leakage current (50 Hz)**	<3.50 mA	<3.50 mA	<3.50 mA	<3.50 mA	<3.50 mA
Power loss	35.0 W	60.0 W	90.0 W	150.0 W	180.0 W
Overrating Capacity	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly
Input					
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Approvals					
Approvals	cURus, UL 1283 5th edition, CSA 22.2 No.8	cURus, UL 1283 5th edition, CSA 22.2 No.8	cURus, UL 1283 5th edition, CSA 22.2 No.8	cURus, UL 1283 5th edition, CSA 22.2 No.8	cURus, UL 1283 5th edition, CSA 22.2 No.8
Environment					
Climatic category	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)
Ambient temperature max.	50 °C	50 °C	50 °C	50 °C	50 °C
Safety and protection					
SCCR***	100 kA	100 kA	100 kA	100 kA	100 kA
Type	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure
Protection index	IP 20	IP 20	IP 20	IP 20	IP 20
Safety class (prepared)	I	I	I	I	I
Test voltage	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE
Notes					
*	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %
**	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases
***	with corresponding preliminary fuse	with corresponding preliminary fuse	with corresponding preliminary fuse	with corresponding preliminary fuse	with corresponding preliminary fuse
Order numbers					
Order Number	**HLD 310-500/75**	**HLD 310-500/100**	**HLD 310-500/130**	**HLD 310-500/180**	**HLD 310-500/250**

Radio interference suppression filter, three-phase, low leakage current
HLD 310

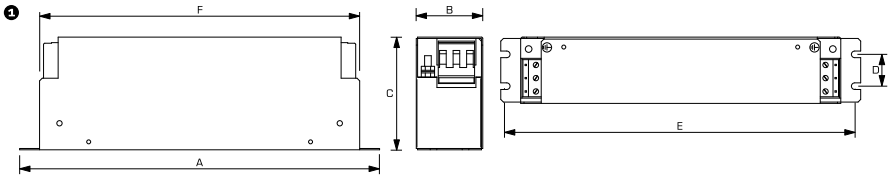
BLOCK Website

30 Mechanical data

Typ	Terminals phase	Terminals PE	Fixing method	Fixing screws	Weight	Dimension picture (in mm)	A	B	C	D	E	F
HLD 310-500/8	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs	M5	0.78 kg	1	190	45	75	20	180	166
HLD 310-500/12	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs	M5	1.20 kg	1	220	45	75	20	210	190
HLD 310-500/16	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs	M5	1.20 kg	1	250	45	75	20	240	220
HLD 310-500/30	Screw clamp, 10 mm²	Bolt, M5	Mounting lugs	M5	1.80 kg	1	270	55	95	30	255	240
HLD 310-500/42	Screw clamp, 10 mm²	Bolt, M6	Mounting lugs	M5	2.10 kg	1	310	55	95	30	295	280
HLD 310-500/55	Screw clamp, 16 mm²	Bolt, M6	Mounting lugs	M5	2.50 kg	2	250	85	95	60	235	255
HLD 310-500/75	Screw clamp, 35 mm²	Bolt, M8	Mounting lugs	M6	4.50 kg	2	270	85	135	60	255	310
HLD 310-500/100	Screw clamp, 50 mm²	Bolt, M10	Mounting lugs	M6	5.20 kg	2	270	95	150	65	255	325
HLD 310-500/130	Screw clamp, 50 mm²	Bolt, M10	Mounting lugs	M6	5.60 kg	1	270	95	150	65	255	325
HLD 310-500/180	Screw clamp, 95 mm²	Bolt, M10	Mounting lugs	M6	9.20 kg	2	380	130	181	102	365	440
HLD 310-500/250	Screw clamp, 150 mm²	Bolt, M10	Mounting lugs	M6	12.20 kg	2	450	155	220	125	435	525

Dimension pictures

1



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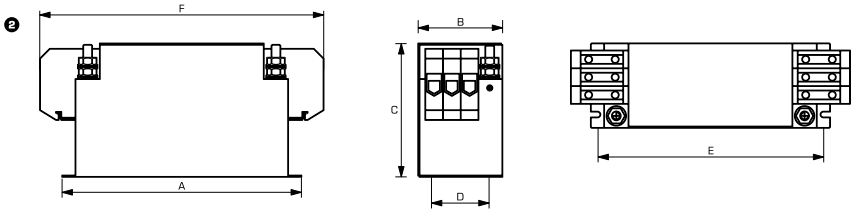


Radio interference suppression filter, three-phase, low leakage current
HLD 710

BLOCK Website

General Data

Rated voltage 3 x 520 Vac
Voltage range 0 - 3 x 520 Vac
Rated current 3 x 8 - 3 x 250 A
Leakage current 6.00 - 7.00 mA
Ambient temperature max. 50 °C
Degree of protection IP 20

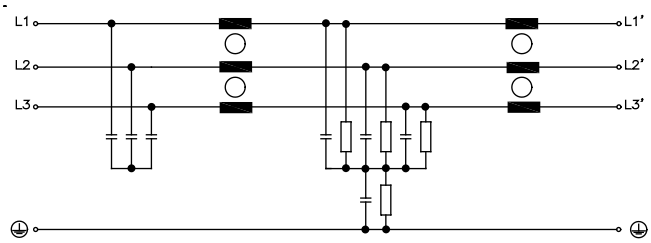
Advantages

For enhanced requirements
Reduced leakage current
Single-stage filter concept
Efficient filter effect against line-bound interference emissions
Increase in the interference immunity of the connected consumer

Applications

Radio interference suppression filter for line-side interference suppression of single devices, frequency converters or as group interference suppression.

Sample application



Standards

Radio interference suppression filter complying with DIN EN 60939-2, UL 1283, CSA C22.2 No.8

Approvals

UL 1283 5th edition, CSA 22.2 No 8

Radio interference suppression filter, three-phase, low leakage current
HLD 710

BLOCK Website

Electrical data

Typ	HLD 710-500/8	HLD 710-500/12	HLD 710-500/16	HLD 710-500/30	HLD 710-500/42	HLD 710-500/55
Operating data						
Rated voltage	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac
Voltage range	0 - 520 Vac	0 - 520 Vac	0 - 520 Vac	0 - 520 Vac	0 - 520 Vac	0 - 520 Vac
Rated current	3 x 8 A	3 x 12 A	3 x 16 A	3 x 30 A	3 x 42 A	3 x 55 A
Leakage current (50 Hz)*	6.00 mA	6.00 mA	6.00 mA	6.50 mA	6.50 mA	6.50 mA
Leakage current (50 Hz)**	60.00 mA	60.00 mA	60.00 mA	63.00 mA	63.00 mA	63.00 mA
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Power loss	6.0 W	9.0 W	12.0 W	15.0 W	22.0 W	30.0 W
Overrating Capacity	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly
Approvals						
Approvals	cURus, UL 1283 5th edition, CSA 22.2 No.8	cURus, UL 1283 5th edition, CSA 22.2 No.8	cURus, UL 1283 5th edition, CSA 22.2 No.8	cURus, UL 1283 5th edition, CSA 22.2 No.8	cURus, UL 1283 5th edition, CSA 22.2 No.8	cURus, UL 1283 5th edition, CSA 22.2 No.8
Environment						
Climatic category	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)
Ambient temperature max.	50 °C	50 °C	50 °C	50 °C	50 °C	50 °C
Safety and protection						
SCCR***	100 kA	100 kA	100 kA	100 kA	100 kA	100 kA
Type	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure
Protection index	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20
Safety class (prepared)	I	I	I	I	I	I
Test voltage	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE
Notes						
*	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %
**	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases
***	with corresponding preliminary fuse	with corresponding preliminary fuse	with corresponding preliminary fuse	with corresponding preliminary fuse	with corresponding preliminary fuse	with corresponding preliminary fuse
Order numbers						
Order Number	**HLD 710-500/8**	**HLD 710-500/12**	**HLD 710-500/16**	**HLD 710-500/30**	**HLD 710-500/42**	**HLD 710-500/55**

Radio interference suppression filter, three-phase, low leakage current
HLD 710

BLOCK Website

Electrical data

Typ	HLD 710-500/75	HLD 710-500/100	HLD 710-500/130	HLD 710-500/180	HLD 710-500/250
Operating data					
Rated voltage	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac
Voltage range	0 - 520 Vac	0 - 520 Vac	0 - 520 Vac	0 - 520 Vac	0 - 520 Vac
Rated current	3 x 75 A	3 x 100 A	3 x 130 A	3 x 180 A	3 x 250 A
Leakage current (50 Hz)*	6.50 mA	6.50 mA	6.50 mA	7.00 mA	7.00 mA
Leakage current (50 Hz)**	63.00 mA	63.00 mA	63.00 mA	65.00 mA	65.00 mA
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Power loss	35.0 W	60.0 W	90.0 W	150.0 W	180.0 W
Overrating Capacity	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly
Approvals					
Approvals	cURus, UL 1283 5th edition, CSA 22.2 No.8	cURus, UL 1283 5th edition, CSA 22.2 No.8	cURus, UL 1283 5th edition, CSA 22.2 No.8	cURus, UL 1283 5th edition, CSA 22.2 No.8	cURus, UL 1283 5th edition, CSA 22.2 No.8
Environment					
Climatic category	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)
Ambient temperature max.	50 °C	50 °C	50 °C	50 °C	50 °C
Safety and protection					
SCCR***	100 kA	100 kA	100 kA	100 kA	100 kA
Type	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure
Protection index	IP 20	IP 20	IP 20	IP 20	IP 20
Safety class (prepared)	I	I	I	I	I
Test voltage	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE
Notes					
*	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %
**	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases
***	with corresponding preliminary fuse	with corresponding preliminary fuse	with corresponding preliminary fuse	with corresponding preliminary fuse	with corresponding preliminary fuse
Order numbers					
Order Number	**HLD 710-500/75**	**HLD 710-500/100**	**HLD 710-500/130**	**HLD 710-500/180**	**HLD 710-500/250**

Radio interference suppression filter, three-phase, low leakage current
HLD 710

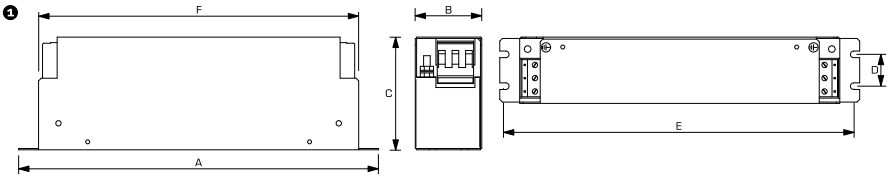
BLOCK Website

Mechanical data

Typ	Terminals phase	Terminals PE	Fixing method	Fixing screws	Weight	Dimension picture (in mm)	A	B	C	D	E	F
HLD 710-500/8	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs	M5	0.78 kg	1	190	45	75	20	180	166
HLD 710-500/12	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs	M5	1.00 kg	1	220	45	75	20	210	190
HLD 710-500/16	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs	M5	1.20 kg	1	250	45	75	20	240	220
HLD 710-500/30	Screw clamp, 10 mm²	Bolt, M5	Mounting lugs	M5	1.80 kg	1	270	55	95	30	255	240
HLD 710-500/42	Screw clamp, 10 mm²	Bolt, M6	Mounting lugs	M5	2.10 kg	1	310	55	95	30	295	280
HLD 710-500/55	Screw clamp, 16 mm²	Bolt, M6	Mounting lugs	M5	2.50 kg	2	250	85	95	60	235	255
HLD 710-500/75	Screw clamp, 35 mm²	Bolt, M8	Mounting lugs	M6	4.50 kg	2	270	85	135	60	255	310
HLD 710-500/100	Screw clamp, 50 mm²	Bolt, M10	Mounting lugs	M6	5.20 kg	2	270	95	150	65	255	325
HLD 710-500/130	Screw clamp, 50 mm²	Bolt, M10	Mounting lugs	M6	5.60 kg	2	270	95	150	65	255	325
HLD 710-500/180	Screw clamp, 95 mm²	Bolt, M10	Mounting lugs	M6	9.20 kg	2	380	130	181	102	365	440
HLD 710-500/250	Screw clamp, 150 mm²	Bolt, M12	Mounting lugs	M6	12.20 kg	2	450	155	220	125	435	525

Dimension pictures

1



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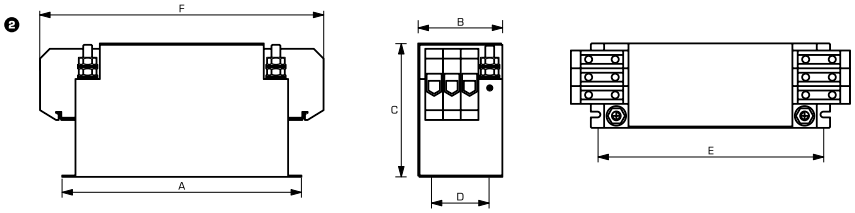


Radio interference suppression filter, three-phase, for IT Network
HLD 810

BLOCK Website

General Data

Rated voltage 3 x 520 Vac
Voltage range 0 - 3 x 520 Vac
Rated current 3 x 8 - 3 x 250 A
Ambient temperature max. 50 °C
Degree of protection IP 20
Leakage current 0 mA

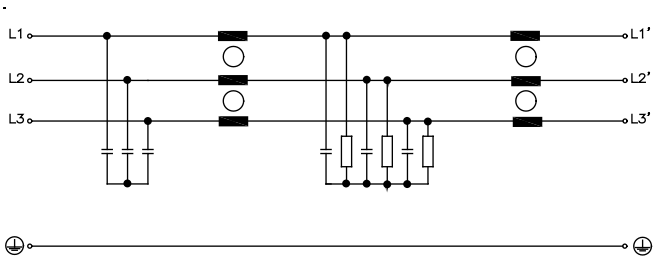
Advantages

For enhanced requirements
Single-stage filter concept
Efficient filter effect against line-bound interference emissions
Increase in the interference immunity of the connected consumer

Applications

Radio interference suppression filter for line-side interference suppression of single devices, frequency converters or as group interference suppression.

Sample application



Standards

Radio interference suppression filter complying with DIN EN 60939-2, UL 1283, CSA C22.2 No.8

Approvals

UL 1283 5th edition, CSA 22.2 No 8

Radio interference suppression filter, three-phase, for IT Network
HLD 810

BLOCK Website

Electrical data

Typ	HLD 810-500/8	HLD 810-500/12	HLD 810-500/16	HLD 810-500/30	HLD 810-500/42	HLD 810-500/55
Operating data						
Voltage range	0 - 520 Vac	0 - 520 Vac	0 - 520 Vac	0 - 520 Vac	0 - 520 Vac	0 - 520 Vac
Rated voltage	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac
Rated current	3 x 8 A	3 x 12 A	3 x 16 A	3 x 30 A	3 x 42 A	3 x 55 A
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Power loss	6.0 W	9.0 W	12.0 W	15.0 W	22.0 W	30.0 W
Overrating Capacity	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly
Leakage current (50 Hz)	0 mA	0 mA	0 mA	0 mA	0 mA	0 mA
Approvals						
Approvals	cURus, UL 1283 5th edition, CSA C22.2 No.8	cURus, UL 1283 5th edition, CSA C22.2 No.8	cURus, UL 1283 5th edition, CSA C22.2 No.8	cURus, UL 1283 5th edition, CSA C22.2 No.8	cURus, UL 1283 5th edition, CSA C22.2 No.8	cURus, UL 1283 5th edition, CSA C22.2 No.8
Environment						
Climatic category	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)
Ambient temperature max.	50 °C	50 °C	50 °C	50 °C	50 °C	50 °C
Safety and protection						
SCCR*	100 kA	100 kA	100 kA	100 kA	100 kA	100 kA
Type	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure
Protection index	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20
Safety class (prepared)	I	I	I	I	I	I
Test voltage	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE
Notes						
*	with corresponding preliminary fuse	with corresponding preliminary fuse	with corresponding preliminary fuse	with corresponding preliminary fuse	with corresponding preliminary fuse	with corresponding preliminary fuse
Order numbers						
Order Number	**HLD 810-500/8**	**HLD 810-500/12**	**HLD 810-500/16**	**HLD 810-500/30**	**HLD 810-500/42**	**HLD 810-500/55**

Radio interference suppression filter, three-phase, for IT Network
HLD 810

BLOCK Website

Electrical data

Typ	HLD 810-500/75	HLD 810-500/100	HLD 810-500/130	HLD 810-500/180	HLD 810-500/250
Operating data					
Voltage range	0 - 520 Vac	0 - 520 Vac	0 - 520 Vac	0 - 520 Vac	0 - 520 Vac
Rated voltage	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac
Rated current	3 x 75 A	3 x 100 A	3 x 130 A	3 x 180 A	3 x 250 A
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Power loss	35.0 W	60.0 W	90.0 W	150.0 W	180.0 W
Overrating Capacity	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly
Leakage current (50 Hz)	0 mA	0 mA	0 mA	0 mA	0 mA
Approvals					
Approvals	cURus, UL 1283 5th edition, CSA C22.2 No.8	cURus, UL 1283 5th edition, CSA C22.2 No.8	cURus, UL 1283 5th edition, CSA C22.2 No.8	cURus, UL 1283 5th edition, CSA C22.2 No.8	cURus, UL 1283 5th edition, CSA C22.2 No.8
Environment					
Climatic category	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)
Ambient temperature max.	50 °C	50 °C	50 °C	50 °C	50 °C
Safety and protection					
SCCR*	100 kA	100 kA	100 kA	100 kA	100 kA
Type	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure
Protection index	IP 20	IP 20	IP 20	IP 20	IP 20
Safety class (prepared)	I	I	I	I	I
Test voltage	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE
Notes					
*	with corresponding preliminary fuse	with corresponding preliminary fuse	with corresponding preliminary fuse	with corresponding preliminary fuse	with corresponding preliminary fuse
Order numbers					
Order Number	**HLD 810-500/75**	**HLD 810-500/100**	**HLD 810-500/130**	**HLD 810-500/180**	**HLD 810-500/250**

Radio interference suppression filter, three-phase, for IT Network
HLD 810

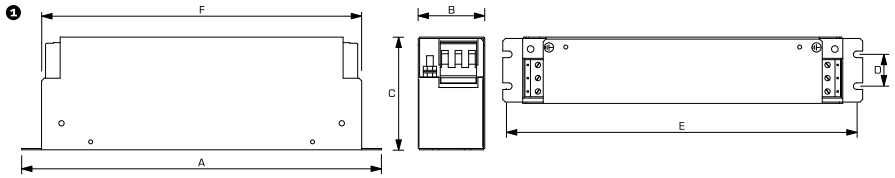
BLOCK Website

Mechanical data

Typ	Terminals phase	Terminals PE	Fixing method	Fixing screws	Weight	Dimension picture (in mm)	A	B	C	D	E	F
HLD 810-500/8	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs	M5	0.78 kg	1	190	45	75	20	180	166
HLD 810-500/12	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs	M5	1.00 kg	1	220	45	75	20	210	190
HLD 810-500/16	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs	M5	1.20 kg	1	250	45	75	20	240	220
HLD 810-500/30	Screw clamp, 10 mm²	Bolt, M5	Mounting lugs	M5	1.80 kg	1	270	55	95	30	255	240
HLD 810-500/42	Screw clamp, 10 mm²	Bolt, M6	Mounting lugs	M5	2.10 kg	1	310	55	95	30	295	280
HLD 810-500/55	Screw clamp, 16 mm²	Bolt, M6	Mounting lugs	M5	2.50 kg	2	250	85	95	60	235	255
HLD 810-500/75	Screw clamp, 35 mm²	Bolt, M8	Mounting lugs	M6	4.50 kg	2	270	85	135	60	255	310
HLD 810-500/100	Screw clamp, 50 mm²	Bolt, M10	Mounting lugs	M6	5.20 kg	2	270	95	150	65	255	325
HLD 810-500/130	Screw clamp, 50 mm²	Bolt, M10	Mounting lugs	M6	5.60 kg	2	270	95	150	65	255	325
HLD 810-500/180	Screw clamp, 95 mm²	Bolt, M10	Mounting lugs	M6	9.20 kg	2	380	130	181	102	365	440
HLD 810-500/250	Screw clamp, 150 mm²	Bolt, M12	Mounting lugs	M6	12.20 kg	2	450	155	220	125	435	525

Dimension pictures

1



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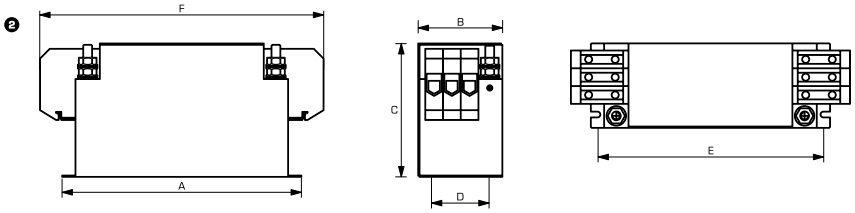


Radio interference suppression filter, three-phase
HFD 500

BLOCK Website

General Data

Rated voltage 3 x 520 Vac
Voltage range 0 - 3 x 520 Vac
Rated current 3 x 8 - 3 x 110 A
Leakage current 18.00 - 66.00 mA
Degree of protection IP 20
DIN Rail mounting

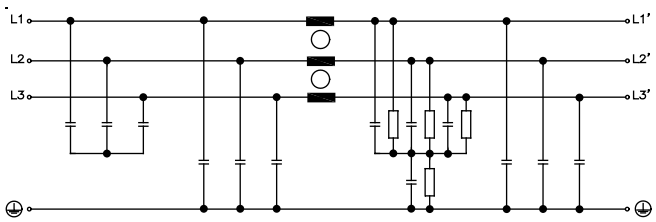
Advantages

- For general requirements
- Single-stage filter concept
- Efficient filter effect against line-bound interference emissions
- Increase in the interference immunity of the connected consumer

Applications

Radio interference suppression filter for mains-side interference suppression of power supplies and electronic devices.

Sample application



Standards

Radio interference suppression filter to DIN EN 60939-2

Approvals

EAC

Radio interference suppression filter, three-phase
HFD 500

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Electrical data

Typ	HFD 500/8	HFD 500/16	HFD 500/25	HFD 500/36	HFD 500/50	HFD 500/80
Operating data						
Rated voltage	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac
Voltage range	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac
Rated current	3 x 8 A	3 x 16 A	3 x 25 A	3 x 36 A	3 x 50 A	3 x 80 A
Leakage current (50 Hz)*	18.00 mA	18.00 mA	34.00 mA	34.00 mA	34.00 mA	66.00 mA
Leakage current (50 Hz)**	6.00 mA	6.00 mA	175.00 mA	175.00 mA	175.00 mA	220.00 mA
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Overrating Capacity	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Climatic category	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)
Safety and protection						
Type	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure
Protection index	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20
Safety class (prepared)	I	I	I	I	I	I
Test voltage	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE
Notes						
*	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %
**	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases
Order numbers						
Order Number	**HFD 500/8**	**HFD 500/16**	**HFD 500/25**	**HFD 500/36**	**HFD 500/50**	**HFD 500/80**

Radio interference suppression filter, three-phase
HFD 500

BLOCK Website

Electrical data

Typ	HFD 500/110
Operating data	
Rated voltage	3 x 520 Vac
Voltage range	0 - 3 x 520 Vac
Rated current	3 x 110 A
Leakage current (50 Hz)*	66.00 mA
Leakage current (50 Hz)**	220.00 mA
Rated frequency	50 - 60 Hz
Overrating Capacity	150 %, shortly
Environment	
Ambient temperature max.	40 °C
Climatic category	25/085/21 (in accordance with EN 60068-1)
Safety and protection	
Type	Metal enclosure
Protection index	IP 20
Safety class (prepared)	I
Test voltage	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE
Notes	
*	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %
**	Leakage current by loss of two phases
Order numbers	
Order Number	**HFD 500/110**

Radio interference suppression filter, three-phase
HFD 500

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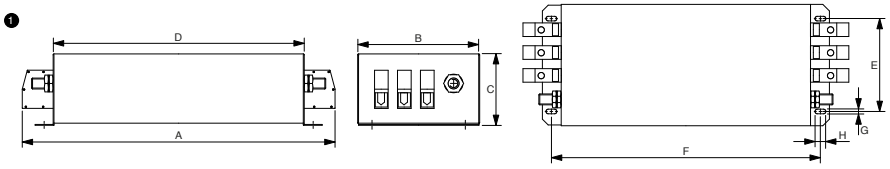
Mechanical data 30

Typ	Terminals phase	Terminals PE	Fixing method	Weight	Dimension picture (in mm)	A	B	C	D	E	F	G	H
HFD 500/8	Screw clamp, 4 mm²	Bolt, M6	Mounting lugs	1.85 kg	2	219	115	60	85	180	100	115	6.5
HFD 500/16	Screw clamp, 4 mm²	Bolt, M6	Mounting lugs	3.10 kg	2	239	150	65	120	200	135	115	6.5
HFD 500/25	Screw clamp, 10 mm²	Bolt, M6	Mounting lugs	3.15 kg	2	250	150	65	120	200	135	115	6.5
HFD 500/36	Screw clamp, 10 mm²	Bolt, M6	Mounting lugs	3.22 kg	2	250	150	65	120	200	135	115	6.5
HFD 500/50	Screw clamp, 10 mm²	Bolt, M6	Mounting lugs	3.30 kg	2	250	150	65	120	200	135	115	6.5
HFD 500/80	Screw clamp, 25 mm²	Bolt, M6	Mounting lugs	9.50 kg	1	427	170	90	350	130	375	6.5	15
HFD 500/110	Screw clamp, 50 mm²	Bolt, M6	Mounting lugs	10.20 kg	1	436	170	100	350	130	375	6.5	15

Dimension pictures

1



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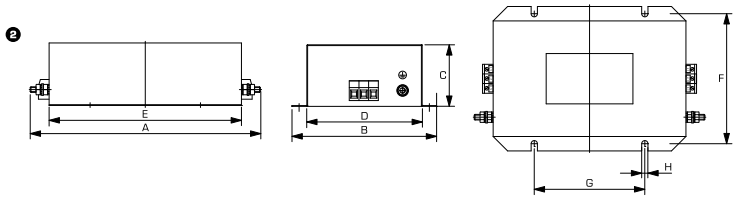


Radio interference suppression filter, three-phase
HFD 210

BLOCK Website

General Data

Rated voltage 3 x 480 - 3 x 520 Vac
Voltage range 0 - 3 x 480 - 520 Vac
Rated current 3 x 7 - 3 x 180 A
Leakage current 12.00 - 18.00 mA
Protection index IP 20

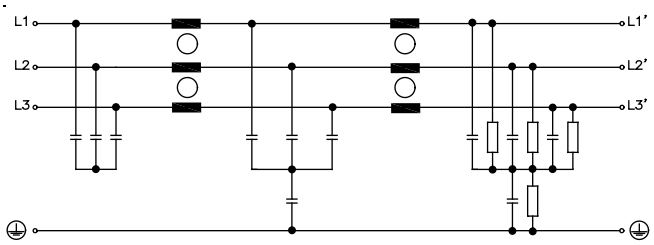
Advantages

For enhanced requirements
Two-stage filter concept
Efficient filter effect against line-bound interference emissions
Increase in the interference immunity of the connected consumer

Applications

Radio interference suppression filter for line-side interference suppression of single devices, frequency converters or as group interference suppression.

Sample application



Standards

Radio interference suppression filter to DIN EN 60939-2

Approvals

UL 1283 5th edition, CSA 22.2 No 8

Radio interference suppression filter, three-phase
HFD 210

BLOCK Website

Electrical data

Typ	HFD 210-500/7	HFD 210-500/16	HFD 210-500/30	HFD 210-500/42	HFD 210-500/55	HFD 210-500/75
Operating data						
Rated voltage	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac
Voltage range	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac
Rated current	3 x 7 A	3 x 16 A	3 x 30 A	3 x 42 A	3 x 55 A	3 x 75 A
Leakage current (50 Hz)*	13.00 mA	14.00 mA	16.00 mA	16.00 mA	16.00 mA	16.00 mA
Leakage current (50 Hz)**	130.00 mA	133.00 mA	154.00 mA	154.00 mA	154.00 mA	154.00 mA
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Overrating Capacity	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly
Approvals						
Approvals	cURus, UL 1283 5th edition, CSA 22.2 No.8	cURus, UL 1283 5th edition, CSA 22.2 No.8	cURus, UL 1283 5th edition, CSA 22.2 No.8	cURus, UL 1283 5th edition, CSA 22.2 No.8	cURus, UL 1283 5th edition, CSA 22.2 No.8	cURus, UL 1283 5th edition, CSA 22.2 No.8
Environment						
Climatic category	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)
Ambient temperature max.	50 °C	50 °C	50 °C	50 °C	50 °C	50 °C
Safety and protection						
Type	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure
Protection index	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20
Safety class (prepared)	I	I	I	I	I	I
Test voltage	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE
Notes						
*	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %
**	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases
Order numbers						
Order Number	**HFD 210-500/7**	**HFD 210-500/16**	**HFD 210-500/30**	**HFD 210-500/42**	**HFD 210-500/55**	**HFD 210-500/75**

Radio interference suppression filter, three-phase
HFD 210

BLOCK Website

Electrical data

Typ	HFD 210-500/100	HFD 210-500/130	HFD 210-500/180
Operating data			
Rated voltage	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac
Voltage range	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac
Rated current	3 x 100 A	3 x 130 A	3 x 180 A
Leakage current (50 Hz)*	16.00 mA	18.00 mA	18.00 mA
Leakage current (50 Hz)**	154.00 mA	173.00 mA	173.00 mA
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Overrating Capacity	150 %, shortly	150 %, shortly	150 %, shortly
Approvals			
Approvals	cURus, UL 1283 5th edition, CSA 22.2 No.8	cURus, UL 1283 5th edition, CSA 22.2 No.8	cURus, UL 1283 5th edition, CSA 22.2 No.8
Environment			
Climatic category	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)
Ambient temperature max.	50 °C	50 °C	50 °C
Safety and protection			
Type	Metal enclosure	Metal enclosure	Metal enclosure
Protection index	IP 20	IP 20	IP 20
Safety class (prepared)	I	I	I
Test voltage	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE
Notes			
*	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %
**	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases
Order numbers			
Order Number	**HFD 210-500/100**	**HFD 210-500/130**	**HFD 210-500/180**

Radio interference suppression filter, three-phase
HFD 210

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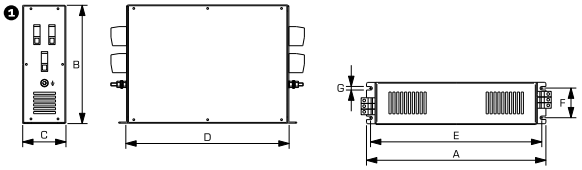
Mechanical data

Typ	Terminals phase	Terminals PE	Fixing method	Weight	Dimension picture (in mm)	A	B	C	D	E	F	G
HFD 210-500/7	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs	1.10 kg	1	255	126	50	225	240	25	6.5
HFD 210-500/16	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs	1.70 kg	1	305	142	55	275	289	30	6.5
HFD 210-500/30	Screw clamp, 10 mm²	Bolt, M5	Mounting lugs	1.80 kg	1	335	150	60	305	320	35	6.5
HFD 210-500/42	Screw clamp, 10 mm²	Bolt, M5	Mounting lugs	2.70 kg	1	329	185	70	300	314	45	6.5
HFD 210-500/55	Screw clamp, 16 mm²	Bolt, M6	Mounting lugs	3.50 kg	1	329	185	80	300	314	55	6.5
HFD 210-500/75	Screw clamp, 25 mm²	Bolt, M6	Mounting lugs	4.40 kg	1	329	220	80	300	314	55	6.5
HFD 210-500/100	Screw clamp, 50 mm²	Bolt, M10	Mounting lugs	5.60 kg	1	379	220	90	350	364	65	6.5
HFD 210-500/130	Screw clamp, 50 mm²	Bolt, M10	Mounting lugs	6.80 kg	1	429	240	110	400	414	80	6.5
HFD 210-500/180	Screw clamp, 95 mm²	Bolt, M10	Mounting lugs	10.00 kg	1	438	240	110	400	414	80	6.5

Dimension pictures



Radio interference filter, three-phase
HFD 510

BLOCK Website

General Data

Rated voltage 3 x 480 - 3 x 520 Vac
Voltage range 0 - 3 x 480 - 520 Vac
Rated current 3 x 8 - 3 x 180 A
Leakage current 4.00 - 43.00 mA
Degree of protection IP 20

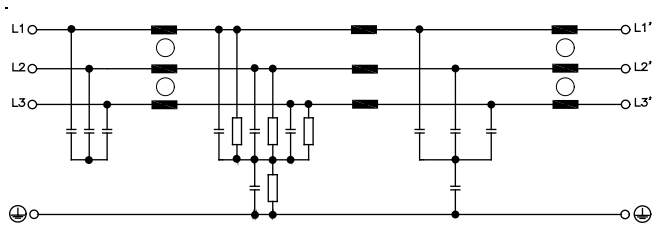
Advantages

For the highest requirements
Two-stage filter concept
Efficient filter effect against line-bound interference emissions
Increase in the interference immunity of the connected consumer

Applications

Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %.

Sample application



Standards

Radio interference suppression filter to DIN EN 60939-2

Approvals

EAC

Radio interference filter, three-phase
HFD 510

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Electrical data

Typ	HFD 510-500/8	HFD 510-500/16	HFD 510-500/25	HFD 510-500/50	HFD 510-500/80	HFD 510-500/130
Operating data						
Rated voltage	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac
Voltage range	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac
Rated current	3 x 8 A	3 x 16 A	3 x 25 A	3 x 50 A	3 x 80 A	3 x 130 A
Leakage current (50 Hz)*	4.00 mA	20.00 mA	18.00 mA	20.00 mA	33.00 mA	42.00 mA
Leakage current (50 Hz)**	40.00 mA	193.00 mA	175.00 mA	188.00 mA	320.00 mA	402.00 mA
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Overrating Capacity	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly
Environment						
Climatic category	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure
Protection index	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20
Safety class (prepared)	I	I	I	I	I	I
Test voltage	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE
Notes						
*	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %
**	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases
Order numbers						
Order Number	**HFD 510-500/8**	**HFD 510-500/16**	**HFD 510-500/25**	**HFD 510-500/50**	**HFD 510-500/80**	**HFD 510-500/130**

Radio interference filter, three-phase
HFD 510

BLOCK Website

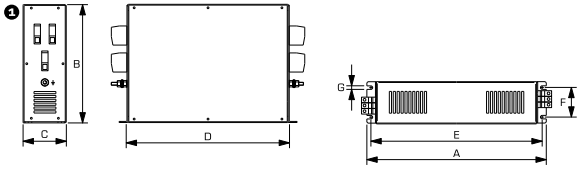
Electrical data

Typ	HFD 510-500/180
Operating data	
Rated voltage	3 x 520 Vac
Voltage range	0 - 3 x 520 Vac
Rated current	3 x 180 A
Leakage current (50 Hz)*	43.00 mA
Leakage current (50 Hz)**	417.00 mA
Rated frequency	50 - 60 Hz
Overrating Capacity	150 %, shortly
Environment	
Climatic category	25/085/21 (in accordance with EN 60068-1)
Ambient temperature max.	40 °C
Safety and protection	
Type	Metal enclosure
Protection index	IP 20
Safety class (prepared)	I
Test voltage	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE
Notes	
*	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %
**	Leakage current by loss of two phases
Order numbers	
Order Number	**HFD 510-500/180**

Mechanical data

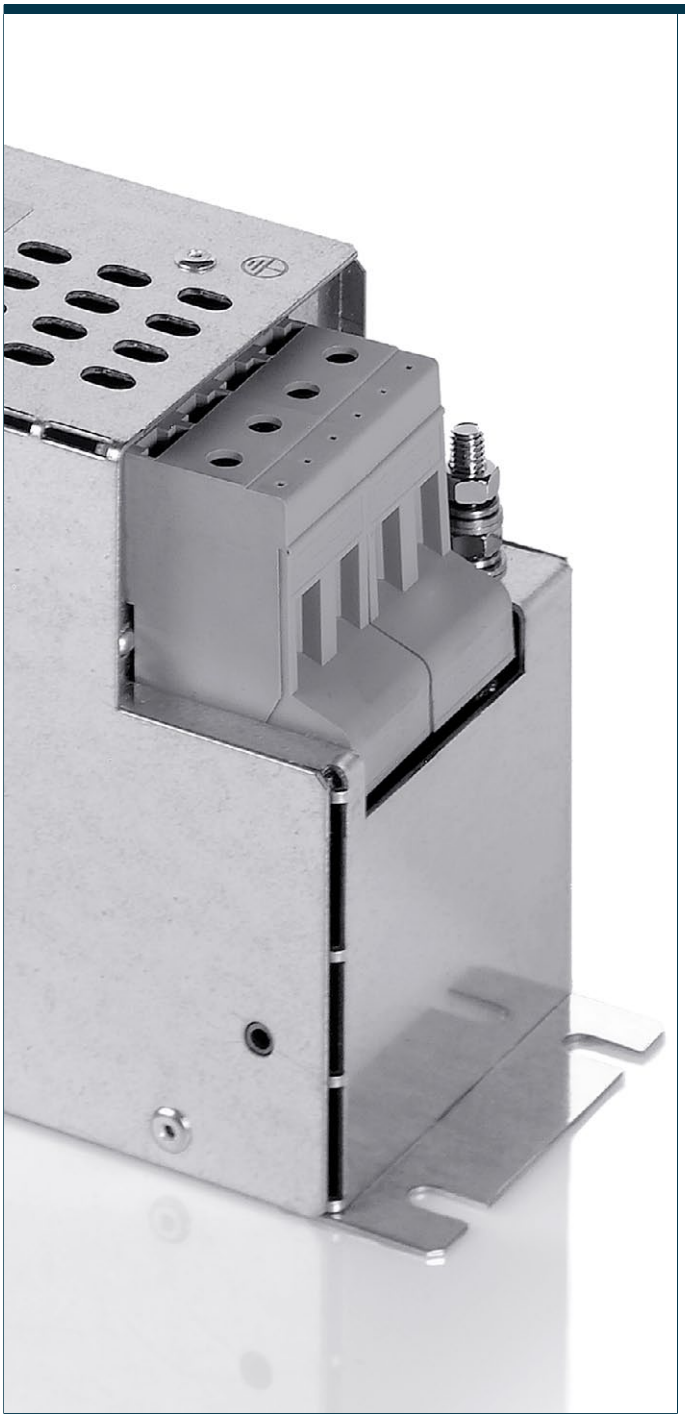
Typ	Terminals phase	Terminals PE	Fixing method	Weight	Dimension picture (in mm)	A	B	C	D	E	F	G
HFD 510-500/8	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs	1.10 kg	1	255	125	50	225	240	25	6.5
HFD 510-500/16	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs	1.90 kg	1	305	142	55	275	290	27	6.5
HFD 510-500/25	Screw clamp, 10 mm²	Bolt, M5	Mounting lugs	1.90 kg	1	329	185	70	300	314	45	6.5
HFD 510-500/50	Screw clamp, 16 mm²	Bolt, M8	Mounting lugs	3.10 kg	1	429	240	110	400	414	80	6.5
HFD 510-500/80	Screw clamp, 50 mm²	Bolt, M10	Mounting lugs	4.00 kg	1	429	240	110	400	414	80	6.5
HFD 510-500/130	Screw clamp, 95 mm²	Bolt, M10	Mounting lugs	6.80 kg	1	438	240	110	400	414	80	6.5
HFD 510-500/180	Screw clamp, 95 mm²	Bolt, M10	Mounting lugs	7.00 kg	1	536	300	116	500	512	90	8.5

Dimension pictures



Radio interference suppression filter, three-phase with neutral conductor
HLV 110

BLOCK Website



General Data

Rated voltage 3 x 520 Vac
Voltage range 0 - 3 x 520 Vac
Rated current 3 x 8 - 3 x 250 A+N
Leakage current 19.00 - 37.00 mA
Ambient temperature max. 50 °C
Degree of protection IP 20

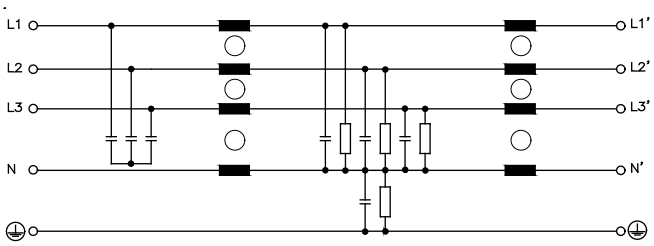
Advantages

- For enhanced requirements
- Single-stage filter concept
- Efficient filter effect against line-bound interference emissions
- Increase in the interference immunity of the connected consumer

Applications

Radio interference suppression filter for line-side interference suppression of single devices, frequency inverters or as group interference suppression.

Sample application



Standards

Radio interference suppression filter complying with DIN EN 60939-2, UL 1283, CSA C22.2 No.8

Approvals

UL 1283 5th edition, CSA 22.2 No 8

Radio interference suppression filter, three-phase with neutral conductor
HLV 110

BLOCK Website

Electrical data

Typ	HLV 110-500/8	HLV 110-500/12	HLV 110-500/16	HLV 110-500/30	HLV 110-500/42	HLV 110-500/55
Operating data						
Rated voltage	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac
Voltage range	0 - 520 Vac	0 - 520 Vac	0 - 520 Vac	0 - 520 Vac	0 - 520 Vac	0 - 520 Vac
Rated current	3 x 8 A+N	3 x 12 A+N	3 x 16 A+N	3 x 30 A+N	3 x 42 A+N	3 x 55 A+N
Leakage current (50 Hz)*	19.00 mA	19.00 mA	21.00 mA	21.00 mA	30.00 mA	22.00 mA
Leakage current (50 Hz)**	187.00 mA	187.00 mA	200.00 mA	200.00 mA	285.00 mA	208.00 mA
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Overrating Capacity	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly
Approvals						
Approvals	-	-	cURus,UL 1283 5th edition, CSA 22.2 No.8	-	-	-
Environment						
Climatic category	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)
Ambient temperature max.	50 °C	50 °C	50 °C	50 °C	50 °C	50 °C
Safety and protection						
Type	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure
Protection index	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20
Safety class (prepared)	I	I	I	I	I	I
Test voltage	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE
Notes						
*	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %
**	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases
Order numbers						
Order Number	**HLV 110-500/8**	**HLV 110-500/12**	**HLV 110-500/16**	**HLV 110-500/30**	**HLV 110-500/42**	**HLV 110-500/55**

Radio interference suppression filter, three-phase with neutral conductor
HLV 110

BLOCK Website

Electrical data

Typ	HLV 110-500/75	HLV 110-500/100	HLV 110-500/130	HLV 110-500/180	HLV 110-500/250
Operating data					
Rated voltage	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac
Voltage range	0 - 520 Vac	0 - 520 Vac	0 - 520 Vac	0 - 520 Vac	0 - 520 Vac
Rated current	3 x 75 A+N	3 x 100 A+N	3 x 130 A+N	3 x 180 A+N	3 x 250 A+N
Leakage current (50 Hz)*	30.00 mA	22.00 mA	22.00 mA	31.00 mA	37.00 mA
Leakage current (50 Hz)**	285.00 mA	207.00 mA	207.00 mA	296.00 mA	351.00 mA
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Overrating Capacity	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly
Approvals					
Approvals	-	-	-	-	-
Environment					
Climatic category	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)
Ambient temperature max.	50 °C	50 °C	50 °C	50 °C	50 °C
Safety and protection					
Type	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure
Protection index	IP 20	IP 20	IP 20	IP 20	IP 20
Safety class (prepared)	I	I	I	I	I
Test voltage	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE
Notes					
*	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %
**	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases
Order numbers					
Order Number	**HLV 110-500/75**	**HLV 110-500/100**	**HLV 110-500/130**	**HLV 110-500/180**	**HLV 110-500/250**

Radio interference suppression filter, three-phase with neutral conductor
HLV 110

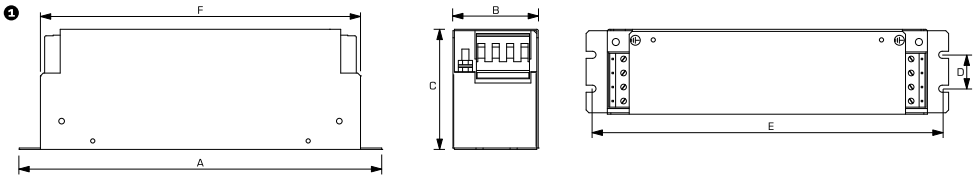
BLOCK Website

Mechanical data

Typ	Terminals phase	Terminals phase/N	Fixing method	Fixing screws	Weight	Dimension picture (in mm)	A	B	C	D	E	F
HLV 110-500/8	Screw clamp, 4 mm²	Screw clamp, 4 mm²	Mounting lugs	M5	0.83 kg	1	190	55	75	30	178	165
HLV 110-500/12	Screw clamp, 4 mm²	Screw clamp, 4 mm²	Mounting lugs	M5	0.97 kg	1	220	55	75	30	208	190
HLV 110-500/16	Screw clamp, 4 mm²	Screw clamp, 4 mm²	Mounting lugs	M5	1.20 kg	1	250	55	75	30	240	220
HLV 110-500/30	Screw clamp, 10 mm²	Screw clamp, 10 mm²	Mounting lugs	M5	1.80 kg	1	270	70	95	45	255	240
HLV 110-500/42	Screw clamp, 10 mm²	Screw clamp, 10 mm²	Mounting lugs	M6	2.20 kg	1	310	70	95	40	295	280
HLV 110-500/55	Screw clamp, 16 mm²	Screw clamp, 16 mm²	Mounting lugs	M6	2.90 kg	2	250	100	95	70	233	255
HLV 110-500/75	Screw clamp, 35 mm²	Screw clamp, 35 mm²	Mounting lugs	M6	4.80 kg	2	270	100	150	70	255	298
HLV 110-500/100	Screw clamp, 50 mm²	Screw clamp, 50 mm²	Mounting lugs	M6	6.20 kg	2	320	115	150	85	307	370
HLV 110-500/130	Screw clamp, 50 mm²	Screw clamp, 50 mm²	Mounting lugs	M6	6.90 kg	2	320	115	150	85	307	370
HLV 110-500/180	Screw clamp, 95 mm²	Screw clamp, 95 mm²	Mounting lugs	M6	11.10 kg	2	380	150	180	125	365	445
HLV 110-500/250	Screw clamp, 150 mm²	Screw clamp, 150 mm²	Mounting lugs	M6	15.10 kg	2	450	186	220	155	435	420

Dimension pictures

1



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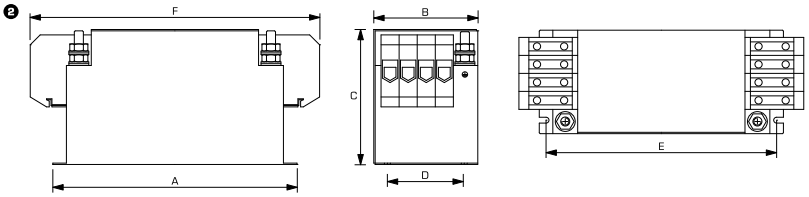

Radio interference suppression filter, three-phase with neutral conductor, low leakage current
HLV 310

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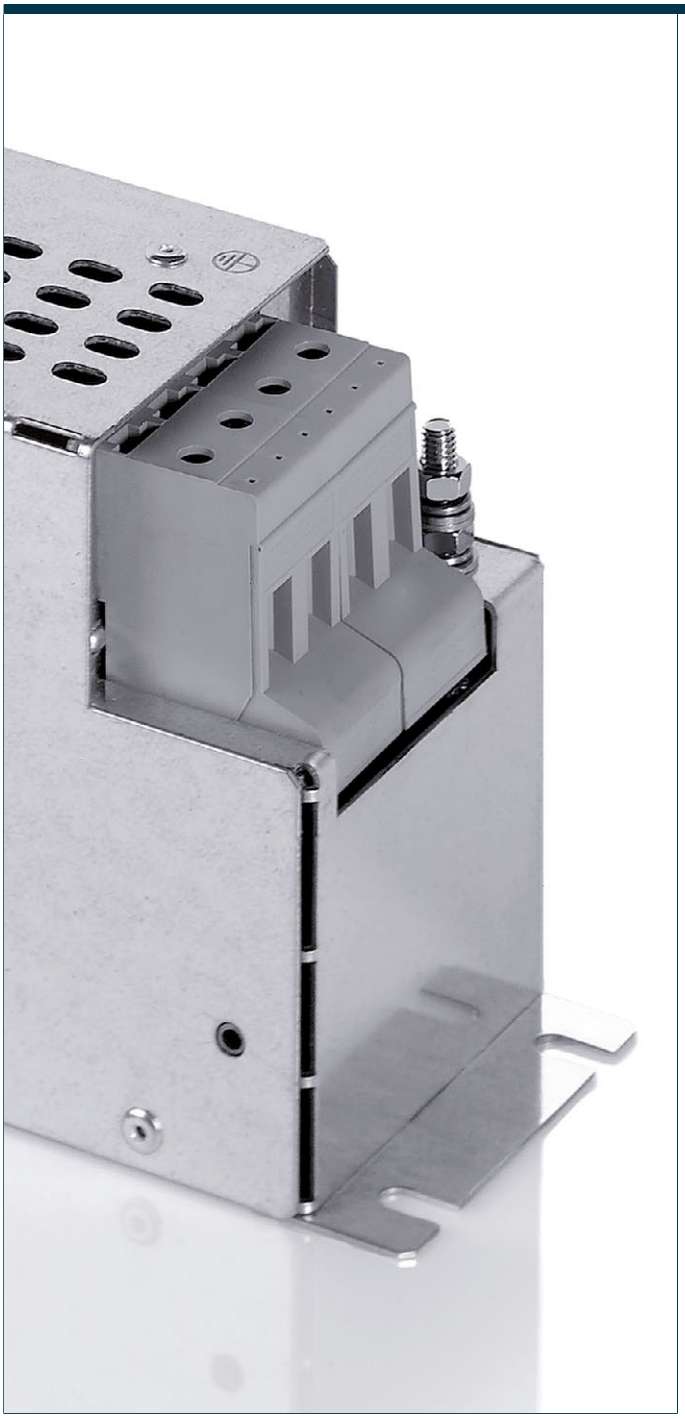


General Data

Rated voltage 3 x 520 Vac
Voltage range 0 - 3 x 520 Vac
Rated current 3 x 8 - 3 x 250 A+N
Leakage current <1.0 mA
Degree of protection IP 20

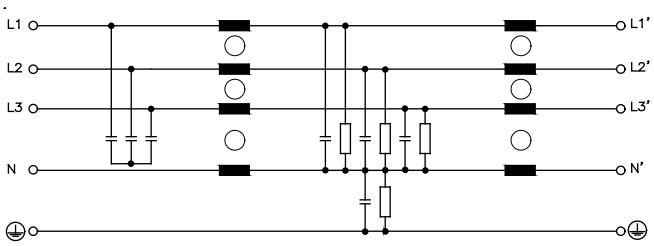
Advantages

For enhanced requirements
Low leakage current
Single-stage filter concept
Efficient filter effect against line-bound interference emissions
Increase in the interference immunity of the connected consumer

Applications

Radio interference suppression filter for line-side interference suppression of single devices, frequency converters or as group interference suppression.

Sample application



Standards

Radio interference suppression filter to DIN EN 60939-2

Approvals

EAC

Radio interference suppression filter, three-phase with neutral conductor, low leakage current
HLV 310

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Electrical data

Typ	HLV 310-500/8	HLV 310-500/12	HLV 310-500/16	HLV 310-500/30	HLV 310-500/42	HLV 310-500/55
Special features						
Characteristics	Suitable for the medical field	Suitable for the medical field	Suitable for the medical field	Suitable for the medical field	Suitable for the medical field	Suitable for the medical field
Operating data						
Rated voltage	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac
Voltage range	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac
Rated current	3 x 8 A+N	3 x 12 A+N	3 x 12 A+N	3 x 30 A+N	3 x 42 A+N	3 x 55 A+N
Leakage current (50 Hz)*	<1.0 mA	<1.0 mA	<1.0 mA	<1.0 mA	<1.0 mA	<1.0 mA
Leakage current (50 Hz)**	<3.5 mA	<3.5 mA	<3.5 mA	<3.5 mA	<3.5 mA	<3.5 mA
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Overrating Capacity	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly
Environment						
Climatic category	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)
Ambient temperature max.	50 °C	50 °C	50 °C	50 °C	50 °C	50 °C
Safety and protection						
Type	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure
Protection index	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20
Safety class (prepared)	I	I	I	I	I	I
Test voltage	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE
Notes						
*	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %
**	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases
Order numbers						
Order Number	**HLV 310-500/8**	**HLV 310-500/12**	**HLV 310-500/16**	**HLV 310-500/30**	**HLV 310-500/42**	**HLV 310-500/55**

Radio interference suppression filter, three-phase with neutral conductor, low leakage current
HLV 310

BLOCK Website

Electrical data

Typ	HLV 310-500/75	HLV 310-500/100	HLV 310-500/130	HLV 310-500/180	HLV 310-500/250
Special features					
Characteristics	Suitable for the medical field	Suitable for the medical field	Suitable for the medical field	Suitable for the medical field	Suitable for the medical field
Operating data					
Rated voltage	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac
Voltage range	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac
Rated current	3 x 75 A+N	3 x 100 A+N	3 x 130 A+N	3 x 180 A+N	3 x 250 A+N
Leakage current (50 Hz)*	<1.0 mA	<1.0 mA	<1.0 mA	<1.0 mA	<1.0 mA
Leakage current (50 Hz)**	<3.5 mA	<3.5 mA	<3.5 mA	<3.5 mA	<3.5 mA
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Overrating Capacity	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly
Environment					
Climatic category	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)
Ambient temperature max.	50 °C	50 °C	50 °C	50 °C	50 °C
Safety and protection					
Type	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure
Protection index	IP 20	IP 20	IP 20	IP 20	IP 20
Safety class (prepared)	I	I	I	I	I
Test voltage	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE
Notes					
*	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %
**	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases
Order numbers					
Order Number	**HLV 310-500/75**	**HLV 310-500/100**	**HLV 310-500/130**	**HLV 310-500/180**	**HLV 310-500/250**

Radio interference suppression filter, three-phase with neutral conductor, low leakage current
HLV 310

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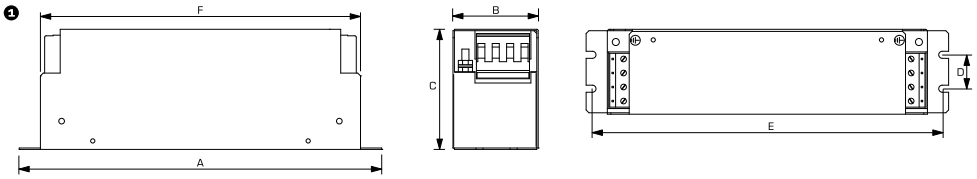
Mechanical data

Typ	Terminals phase/N	Terminals PE	Fixing method	Fixing screws	Weight	Dimension picture (in mm)	A	B	C	D	E	F
HLV 310-500/8	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs	M5	0.83 kg	1	190	55	75	30	178	165
HLV 310-500/12	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs	M5	0.97 kg	1	220	55	75	30	208	190
HLV 310-500/16	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs	M5	1.20 kg	1	250	55	75	30	240	220
HLV 310-500/30	Screw clamp, 10 mm²	Bolt, M5	Mounting lugs	M5	1.80 kg	1	270	70	95	45	255	240
HLV 310-500/42	Screw clamp, 10 mm²	Bolt, M6	Mounting lugs	M6	2.20 kg	1	310	70	95	40	295	280
HLV 310-500/55	Screw clamp, 16 mm²	Bolt, M6	Mounting lugs	M6	2.90 kg	2	250	100	95	70	233	255
HLV 310-500/75	Screw clamp, 35 mm²	Bolt, M10	Mounting lugs	M6	4.80 kg	2	270	100	150	70	255	298
HLV 310-500/100	Screw clamp, 50 mm²	Bolt, M10	Mounting lugs	M6	6.20 kg	2	320	115	150	85	307	370
HLV 310-500/130	Screw clamp, 50 mm²	Bolt, M10	Mounting lugs	M6	6.90 kg	2	320	115	150	85	307	370
HLV 310-500/180	Screw clamp, 95 mm²	Bolt, M10	Mounting lugs	M6	11.10 kg	2	380	150	180	125	365	445
HLV 310-500/250	Screw clamp, 150 mm²	Bolt, M12	Mounting lugs	M6	15.10 kg	2	450	186	220	155	435	420

Dimension pictures

1



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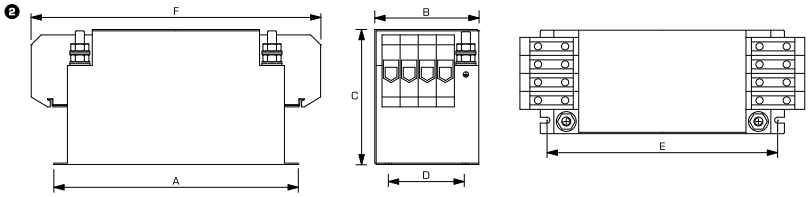

Radio interference suppression filter, three-phase with neutral conductor, low leakage current
HLV 710

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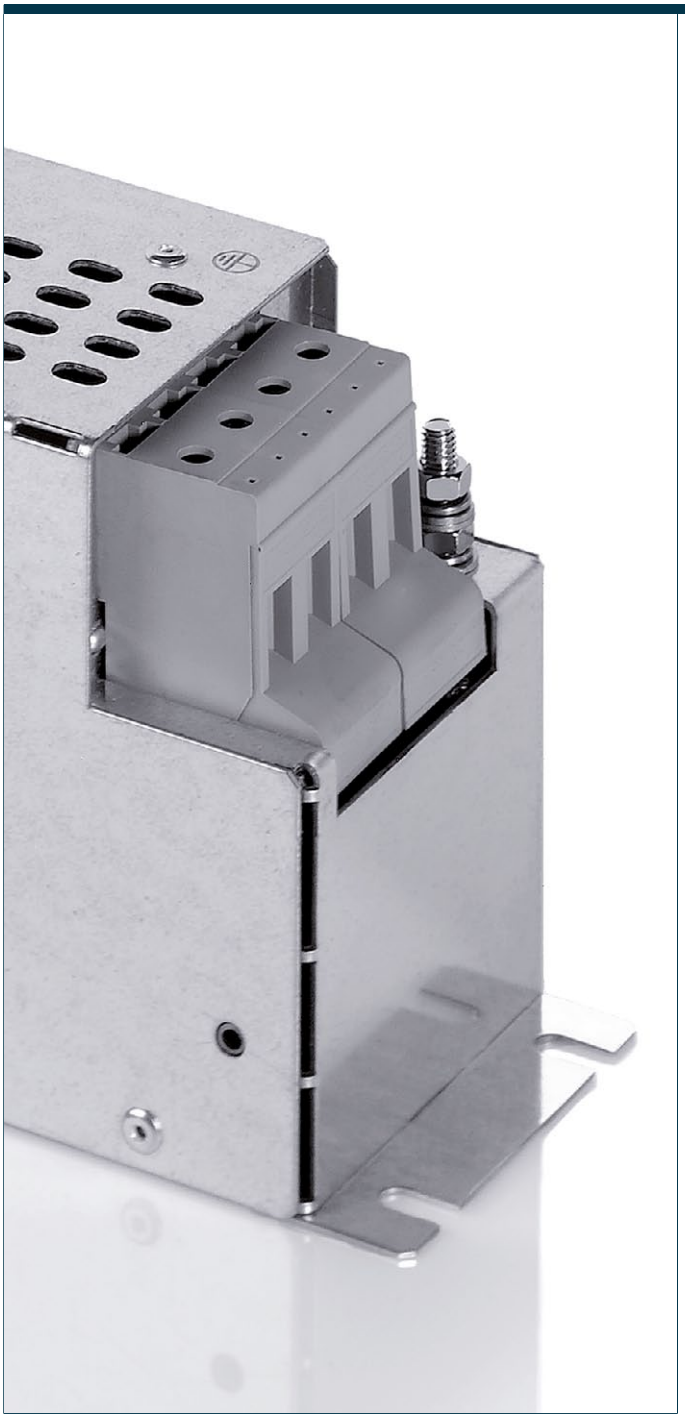


General Data

Rated voltage 3 x 520 Vac
Voltage range 0 - 3 x 520 Vac
Rated current 3 x 8 - 3 x 250 A+N
Leakage current 6.00 - 7.00 mA
Degree of protection IP 20

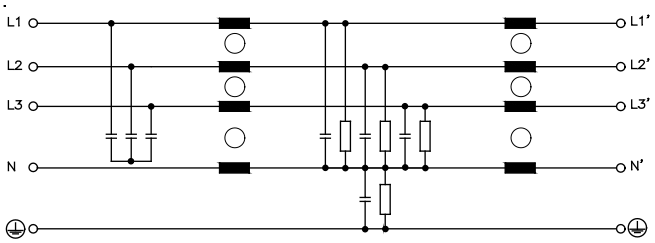
Advantages

For enhanced requirements
Reduced leakage current
Single-stage filter concept
Efficient filter effect against line-bound interference emissions

Applications

Radio interference suppression filter for line-side interference suppression of single devices, frequency converters or as group interference suppression.

Sample application



Standards

Radio interference suppression filter to DIN EN 60939-2

Approvals

EAC

Radio interference suppression filter, three-phase with neutral conductor, low leakage current
HLV 710

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Electrical data

Typ	HLV 710-500/8	HLV 710-500/12	HLV 710-500/16	HLV 710-500/30	HLV 710-500/42	HLV 710-500/55
Operating data						
Rated voltage	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac
Voltage range	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac
Rated current	3 x 8 A+N	3 x 12 A+N	3 x 16 A+N	3 x 30 A+N	3 x 42 A+N	3 x 55 A+N
Leakage current (50 Hz)*	6.00 mA	6.00 mA	6.00 mA	6.50 mA	6.50 mA	6.50 mA
Leakage current (50 Hz)**	60.00 mA	60.00 mA	60.00 mA	63.00 mA	63.00 mA	63.00 mA
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Overrating Capacity	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly
Environment						
Climatic category	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)
Ambient temperature max.	50 °C	50 °C	50 °C	50 °C	50 °C	50 °C
Safety and protection						
Type	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure
Protection index	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20
Safety class (prepared)	I	I	I	I	I	I
Test voltage	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE
Notes						
*	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %
**	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases
Order numbers						
Order Number	**HLV 710-500/8**	**HLV 710-500/12**	**HLV 710-500/16**	**HLV 710-500/30**	**HLV 710-500/42**	**HLV 710-500/55**

Radio interference suppression filter, three-phase with neutral conductor, low leakage current
HLV 710

BLOCK Website

Electrical data

Typ	HLV 710-500/75	HLV 710-500/100	HLV 710-500/130	HLV 710-500/180	HLV 710-500/250
Operating data					
Rated voltage	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac
Voltage range	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac
Rated current	3 x 75 A+N	3 x 100 A+N	3 x 130 A+N	3 x 180 A+N	3 x 250 A+N
Leakage current (50 Hz)*	6.50 mA	6.50 mA	6.50 mA	7.00 mA	7.00 mA
Leakage current (50 Hz)**	63.00 mA	63.00 mA	65.00 mA	65.00 mA	65.00 mA
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Overrating Capacity	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly
Environment					
Climatic category	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)
Ambient temperature max.	50 °C	50 °C	50 °C	50 °C	50 °C
Safety and protection					
Type	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure
Protection index	IP 20	IP 20	IP 20	IP 20	IP 20
Safety class (prepared)	I	I	I	I	I
Test voltage	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE
Notes					
*	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %
**	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases
Order numbers					
Order Number	**HLV 710-500/75**	**HLV 710-500/100**	**HLV 710-500/130**	**HLV 710-500/180**	**HLV 710-500/250**

Radio interference suppression filter, three-phase with neutral conductor, low leakage current
HLV 710

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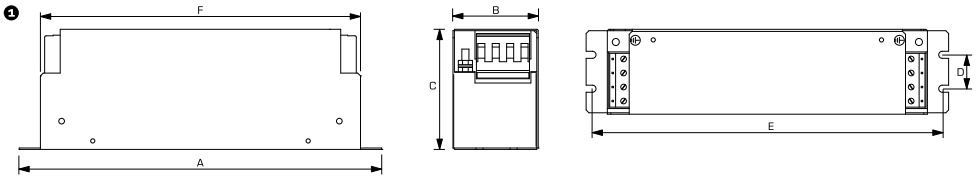
Mechanical data

Typ	Terminals phase/N	Terminals PE	Fixing method	Fixing screws	Weight	Dimension picture (in mm)	A	B	C	D	E	F
HLV 710-500/8	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs	M5	0.83 kg	1	190	55	75	30	178	165
HLV 710-500/12	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs	M5	0.97 kg	1	220	55	75	30	208	190
HLV 710-500/16	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs	M5	1.20 kg	1	250	55	75	30	240	220
HLV 710-500/30	Screw clamp, 10 mm²	Bolt, M5	Mounting lugs	M5	1.80 kg	1	270	70	95	45	255	240
HLV 710-500/42	Screw clamp, 10 mm²	Bolt, M6	Mounting lugs	M6	2.20 kg	1	310	70	95	40	295	255
HLV 710-500/55	Screw clamp, 16 mm²	Bolt, M6	Mounting lugs	M6	2.90 kg	2	250	100	95	70	233	255
HLV 710-500/75	Screw clamp, 35 mm²	Bolt, M10	Mounting lugs	M6	2.90 kg	2	270	100	150	70	255	298
HLV 710-500/100	Screw clamp, 50 mm²	Bolt, M10	Mounting lugs	M6	6.20 kg	2	320	115	150	85	307	370
HLV 710-500/130	Screw clamp, 50 mm²	Bolt, M10	Mounting lugs	M6	6.90 kg	2	320	115	150	85	307	370
HLV 710-500/180	Screw clamp, 95 mm²	Bolt, M10	Mounting lugs	M6	11.10 kg	2	380	150	180	125	365	445
HLV 710-500/250	Screw clamp, 150 mm²	Bolt, M12	Mounting lugs	M6	15.10 kg	2	450	186	220	155	435	420

Dimension pictures

1



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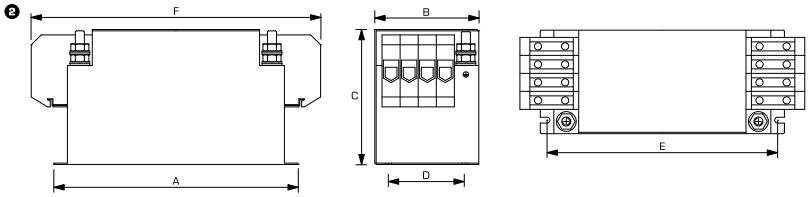

Radio interference suppression filter, three-phase with neutral conductor, no leakage current
HLV 810

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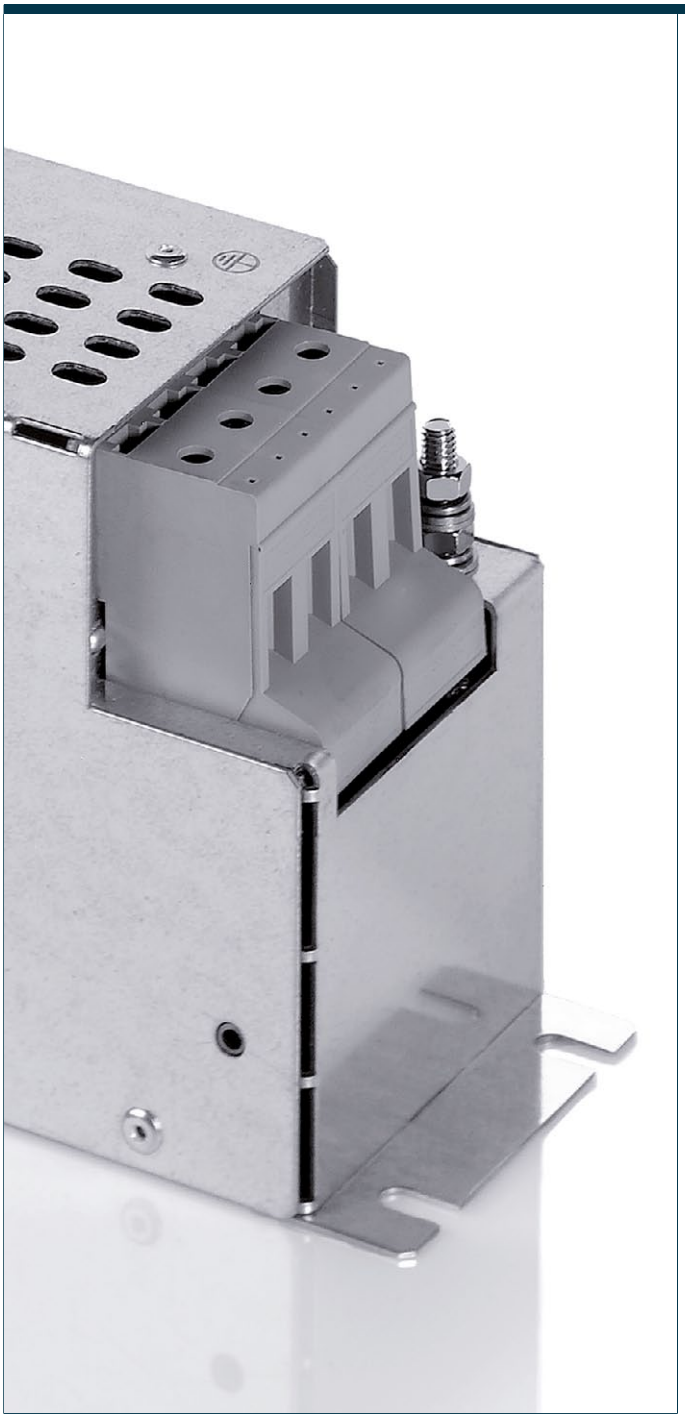


General Data

Rated voltage 3 x 520 Vac
Voltage range 0 - 3 x 520 Vac
Rated current 3 x 8 - 3 x 250 A+N
Degree of protection IP 20
Leakage current 0 mA

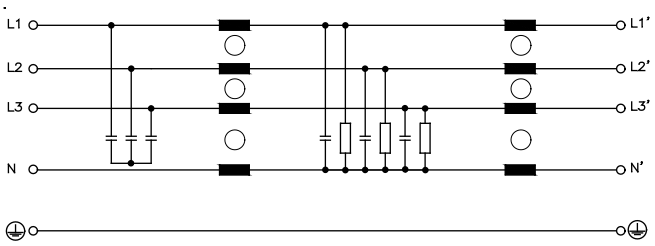
Advantages

For enhanced requirements
Single-stage filter concept
Efficient filter effect against line-bound interference emissions
Increase in the interference immunity of the connected consumer

Applications

Radio interference suppression filter for line-side interference suppression of single devices or frequency converters.

Sample application



Standards

Radio interference suppression filter to DIN EN 60939-2

Approvals

EAC

Radio interference suppression filter, three-phase with neutral conductor, no leakage current
HLV 810

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Electrical data

Typ	HLV 810-500/8	HLV 810-500/12	HLV 810-500/16	HLV 810-500/30	HLV 810-500/42	HLV 810-500/55
Operating data						
Rated voltage	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac
Voltage range	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac
Rated current	3 x 8 A+N	3 x 12 A+N	3 x 16 A+N	3 x 30 A+N	3 x 42 A NBN	3 x 55 A+N
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Overrating Capacity	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly
Leakage current (50 Hz)	0 mA	0 mA	0 mA	0 mA	0 mA	0 mA
Environment						
Climatic category	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)
Ambient temperature max.	50 °C	50 °C	50 °C	50 °C	50 °C	50 °C
Safety and protection						
Type	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure
Protection index	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20
Safety class (prepared)	I	I	I	I	I	I
Test voltage	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE
Order numbers						
Order Number	**HLV 810-500/8**	**HLV 810-500/12**	**HLV 810-500/16**	**HLV 810-500/30**	**HLV 810-500/42**	**HLV 810-500/55**

Radio interference suppression filter, three-phase with neutral conductor, no leakage current
HLV 810

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Electrical data

Typ	HLV 810-500/75	HLV 810-500/100	HLV 810-500/130	HLV 810-500/180	HLV 810-500/250
Operating data					
Rated voltage	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac	3 x 520 Vac
Voltage range	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac	0 - 3 x 520 Vac
Rated current	3 x 75 A+N	3 x 100 A+N	3 x 130 A+N	3 x 180 A+N	3 x 250 A+N
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Overrating Capacity	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly
Leakage current (50 Hz)	0 mA	0 mA	0 mA	0 mA	0 mA
Environment					
Climatic category	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)
Ambient temperature max.	50 °C	50 °C	50 °C	50 °C	50 °C
Safety and protection					
Type	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure
Protection index	IP 20	IP 20	IP 20	IP 20	IP 20
Safety class (prepared)	I	I	I	I	I
Test voltage	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE
Order numbers					
Order Number	**HLV 810-500/75**	**HLV 810-500/100**	**HLV 810-500/130**	**HLV 810-500/180**	**HLV 810-500/250**

Radio interference suppression filter, three-phase with neutral conductor, no leakage current
HLV 810

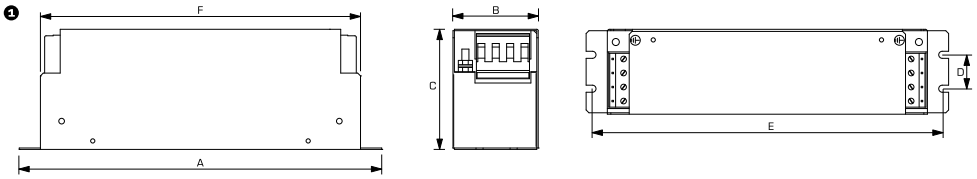
BLOCK Website

Mechanical data 30

Typ	Terminals phase/N	Terminals PE	Fixing method	Fixing screws	Weight	Dimension picture (in mm)	A	B	C	D	E	F
HLV 810-500/8	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs	M5	0.83 kg	1	190	55	75	30	178	165
HLV 810-500/12	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs	M5	0.97 kg	1	220	55	75	30	208	190
HLV 810-500/16	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs	M5	1.20 kg	1	250	55	75	30	240	220
HLV 810-500/30	Screw clamp, 10 mm²	Bolt, M5	Mounting lugs	M5	1.80 kg	1	270	70	95	45	255	240
HLV 810-500/42	Screw clamp, 10 mm²	Bolt, M6	Mounting lugs	M6	2.20 kg	1	310	70	95	40	295	255
HLV 810-500/55	Screw clamp, 16 mm²	Bolt, M6	Mounting lugs	M6	2.90 kg	2	250	100	95	70	233	255
HLV 810-500/75	Screw clamp, 35 mm²	Bolt, M10	Mounting lugs	M6	4.80 kg	2	270	100	150	70	255	298
HLV 810-500/100	Screw clamp, 50 mm²	Bolt, M10	Mounting lugs	M5	6.20 kg	2	320	115	150	85	307	370
HLV 810-500/130	Screw clamp, 50 mm²	Bolt, M10	Mounting lugs	M6	6.90 kg	2	320	115	150	85	307	370
HLV 810-500/180	Screw clamp, 95 mm²	Bolt, M10	Mounting lugs	M6	11.10 kg	2	380	150	180	125	365	445
HLV 810-500/250	Screw clamp, 150 mm²	Bolt, M12	Mounting lugs	M6	15.10 kg	2	450	186	220	155	435	420

Dimension pictures

1



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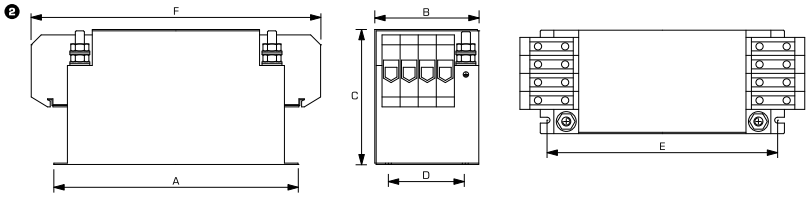


Radio interference suppression filter, three-phase with neutral conductor
HFV 510

BLOCK Website

General Data

Rated voltage 3 x 480 Vac
Voltage range 0 - 3 x 480 Vac
Rated current 3 x 16 - 3 x 80 A+N
Leakage current 15.00 - 22.00 mA
Degree of protection IP 20

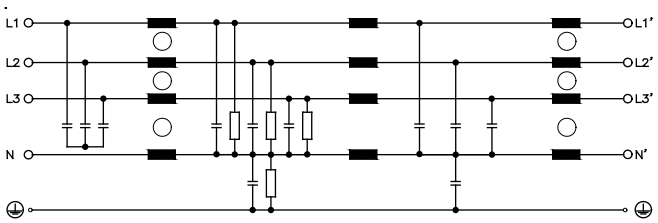
Advantages

- For the highest requirements
- Two stage filter concept
- Efficient filter effect against line-bound interference emissions
- Increase in the interference immunity of the connected consumer

Applications

Radio interference suppression filter for line-side interference suppression of single devices, frequency converters or as group interference suppression.

Sample application



Standards

Radio interference suppression filter to DIN EN 60939-2

Approvals

EAC

Radio interference suppression filter, three-phase with neutral conductor
HFV 510

BLOCK Website

Electrical data

Typ	HFV 510-400/16	HFV 510-400/25	HFV 510-400/35	HFV 510-400/50	HFV 510-400/80
Operating data					
Rated voltage	3 x 480 Vac	3 x 480 Vac	3 x 480 Vac	3 x 480 Vac	3 x 480 Vac
Voltage range	0 - 3 x 480 Vac	0 - 3 x 480 Vac	0 - 3 x 480 Vac	0 - 3 x 480 Vac	0 - 3 x 480 Vac
Rated current	3 x 16 A+N	3 x 25 A+N	3 x 35 A+N	3 x 50 A+N	3 x 80 A+N
Leakage current (50 Hz)*	15.00 mA	17.00 mA	22.00 mA	17.00 mA	19.00 mA
Leakage current (50 Hz)**	145.00 mA	161.00 mA	215.00 mA	161.00 mA	178.00 mA
Rated frequency	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz	50 - 60 Hz
Overrating Capacity	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly	150 %, shortly
Environment					
Climatic category	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)	25/085/21 (in accordance with EN 60068-1)
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection					
Type	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure
Protection index	IP 20	IP 20	IP 20	IP 20	IP 20
Safety class (prepared)	I	I	I	I	I
Test voltage	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE	2150 Vdc Phase/Phase, 2700 Vdc Phase/PE
Notes					
*	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %	Leakage current measured against the maximum permissible input voltage fluctuation in accordance with IEC 38 ±10 %
**	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases	Leakage current by loss of two phases
Order numbers					
Order Number	**HFV 510-400/16**	**HFV 510-400/25**	**HFV 510-400/35**	**HFV 510-400/50**	**HFV 510-400/80**

Radio interference suppression filter, three-phase with neutral conductor
HFV 510

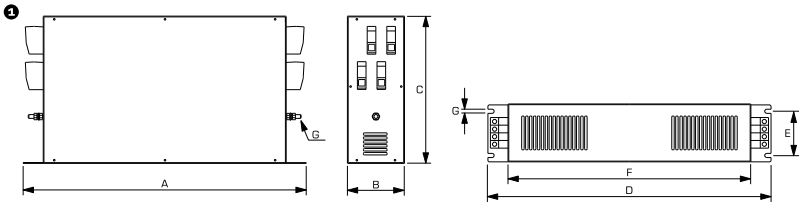
BLOCK Website

30 Mechanical data

Typ	Terminals phase/N	Terminals PE	Fixing method	Weight	Dimension picture (in mm)	A	B	C	D	E	F	G
HFV 510-400/16	Screw clamp, 4 mm²	Bolt, M5	Mounting lugs with fixing holes	1.70 kg	1	305	55	142	290	30	295	6.5
HFV 510-400/25	Screw clamp, 10 mm²	Bolt, M5	Mounting lugs with fixing holes	1.80 kg	1	329	70	185	314	45	300	6.5
HFV 510-400/35	Screw clamp, 10 mm²	Bolt, M5	Mounting lugs with fixing holes	2.80 kg	1	329	70	185	314	45	300	6.5
HFV 510-400/50	Screw clamp, 16 mm²	Bolt, M8	Mounting lugs with fixing holes	3.10 kg	1	429	110	240	414	80	400	6.5
HFV 510-400/80	Screw clamp, 25 mm²	Bolt, M10	Mounting lugs with fixing holes	4.00 kg	1	633	110	240	618	80	600	6.5

Dimension pictures

1



Magnetic voltage stabilizer
KH 250

BLOCK Website

General Data

Rated input voltage 230 Vac
Rated output voltage 230 Vac
Rated power 250 VA
Ambient temperature +40 °C
Degree of protection IP 40

Advantages

Compensation for mains voltage fluctuations
Attenuation of asymmetric interference voltage peaks
Bridging voltage dips
Galvanic isolation from the mains
Short-circuit proof
No-load proof
RF interference-free
Service-free

Applications

Magnetic voltage stabiliser securing the supply voltage in the event of mains overvoltage, mains undervoltage, voltage dips and voltage surges and in the case of brief voltage interruptions.

Standards

Magnetic voltage stabiliser acting as mains transformer in accordance with VDE 0570 part 2-12, EN 61558-2-12; IEC 61558-2-12

Approvals

EAC

Magnetic voltage stabilizer
KH 250

BLOCK Website

Electrical data

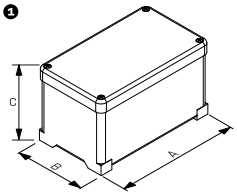
Typ	KH 250
Operating data	
Rated input voltage	230 Vac
Permissible tolerance (Input voltage)	+10 % to -20 %
Rated output voltage	230 Vac
Rated current	1.1 A
Rated frequency	50 Hz
Permissible tolerance (Frequency)	±1 Hz
Response time	typ. 3 line periods (60 ms)
Output	
Rated Power	250 VA
Environment	
Ambient temperature max.	40 °C
Safety and protection	
Type	Resin encapsulated transformer
Insulation class	A
Protection index	IP 40
Safety class (prepared)	II
Short circuit strength	short-circuit proof
Test voltage	3750 Vac, 50 Hz
Order numbers	
Order Number	**KH 250**

Mechanical data

Terminal and mounting	
Terminals Input	Mains lead, 2 m long with moulded plug
Terminals Output	Socket
Measures and weights	
Weight	11.70 kg
Dimension (W x H x D)	145 x 200 x 245 mm
Dimension picture (in mm)	❶
A	245
B	145
C	200

Dimension pictures

❶



Magnetic voltage stabilizer
BSD

BLOCK Website

General Data

Rated input voltage 230 Vac
Rated output voltage 230 Vac
Rated power 60 - 3000 VA
Degree of protection IP 00
Ambient temperature +40 °C

Advantages

Compensation for mains voltage fluctuations
Attenuation of asymmetric parasitic voltage peaks
Bridging momentary voltage dips
May be switched between high control precision and elevated parasitic voltage attenuation
Galvanic isolation from the mains
Short-circuit proof
No-load proof
RF interference free

Applications

Magnetic voltage stabilizer securing the supply voltage in the event of mains overvoltage, mains undervoltage, voltage dips and voltage surges and in the case of brief voltage interruptions.

Standards

Magnetic voltage stabiliser acting as mains transformer in accordance with VDE 0570 part 2;2-12, EN 61558-1; 2-12, IEC 61558-1;2-12

Magnetic voltage stabilizer
BSD

BLOCK Website

Electrical data

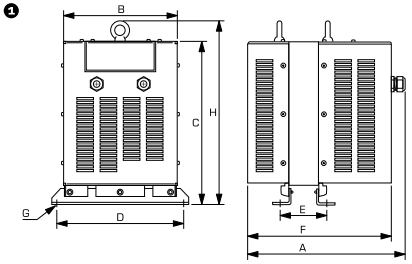
Typ	BSD 60	BSD 120	BSD 250	BSD 500	BSD 800	BSD 1000
Operating data						
Rated input voltage	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac
Permissible tolerance (Input voltage)	+10 % to -30 %	+10 % to -30 %	+10 % to -30 %	+10 % to -30 %	+10 % to -30 %	+10 % to -30 %
Rated output voltage	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac	230 Vac
Rated current	0.26 A	0.52 A	1.01 A	2.17 A	3.48 A	4.34 A
Rated frequency	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz	50 Hz
Harmonic content	<4 % at ohmic load	<4 % at ohmic load	<5 % at ohmic load	<5 % at ohmic load	<5 % at ohmic load	<5 % at ohmic load
Stored energy time at rated load	10 ms	10 ms	10 ms	10 ms	10 ms	10 ms
Correction time	20 - 60 ms	20 - 60 ms	20 - 60 ms	20 - 60 ms	20 - 60 ms	20 - 60 ms
Output						
Rated Power	60 VA	120 VA	250 VA	500 VA	800 VA	1000 VA
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Enclosed	Enclosed	Enclosed	Enclosed	Enclosed	Enclosed
Insulation class	E	E	E	E	E	E
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Short circuit strength	short-circuit proof	short-circuit proof	short-circuit proof	short-circuit proof	short-circuit proof	short-circuit proof
Test voltage	3550 Vac, 50 Hz	3550 Vac, 50 Hz	3550 Vac, 50 Hz	3550 Vac, 50 Hz	3550 Vac, 50 Hz	3550 Vac, 50 Hz
Order numbers						
Order Number	**BSD 60**	**BSD 120**	**BSD 250**	**BSD 500**	**BSD 800**	**BSD 1000**

Mechanical data

Terminal and mounting						
Fixing method	Fixing rail	Fixing rail	Fixing rail	Fixing rail	Fixing rail	Fixing rail
Terminals	Screw-type terminals	Screw-type terminals	Screw-type terminals	Screw-type terminals	Screw-type terminals	Screw-type terminals
Measures and weights						
Weight	3.60 kg	6.40 kg	11.00 kg	15.50 kg	22.00 kg	31.00 kg
Dimension picture (in mm)	❶	❶	❶	❶	❶	❶
A	212	232	266	288	318	287
B	75	100	147	147	147	210
C	138	181	216	216	216	302
D	92	120	165	165	165	235
E	58	59	66	88	118	82
F	190	210	242	264	294	261
G	66	66	140	140	140	162
H	-	-	-	-	-	340

Dimension pictures

❶



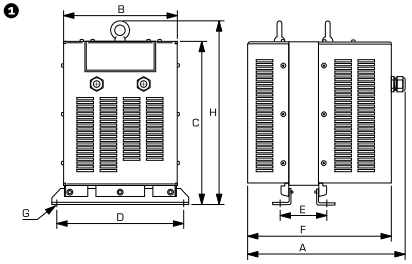
Magnetic voltage stabilizer
BSD

BLOCK Website

Typ	BSD 1500	BSD 2000	BSD 3000
Electrical data			
Operating data			
Rated input voltage	230 Vac	230 Vac	230 Vac
Permissible tolerance (Input voltage)	+10 % to -30 %	+10 % to -30 %	+10 % to -30 %
Rated output voltage	230 Vac	230 Vac	230 Vac
Rated current	6.52 A	8.7 A	13 A
Rated frequency	50 Hz	50 Hz	50 Hz
Harmonic content	<5 % at ohmic load	<5 % at ohmic load	<5 % at ohmic load
Stored energy time at rated load	10 ms	10 ms	10 ms
Correction time	20 - 60 ms	20 - 60 ms	20 - 60 ms
Output			
Rated Power	1500 VA	2000 VA	3000 VA
Environment			
Ambient temperature max.	40 °C	40 °C	40 °C
Safety and protection			
Type	Enclosed	Enclosed	Enclosed
Insulation class	E	E	E
Protection index	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I
Short circuit strength	short-circuit proof	short-circuit proof	short-circuit proof
Test voltage	3550 Vac, 50 Hz	3550 Vac, 50 Hz	3550 Vac, 50 Hz
Order numbers			
Order Number	**BSD 1500**	**BSD 2000**	**BSD 3000**
Mechanical data			
Terminal and mounting			
Fixing method	Fixing rail	Fixing rail	Fixing rail
Terminals	Screw-type terminals	Screw-type terminals	Screw-type terminals
Measures and weights			
Weight	43.00 kg	56.00 kg	82.00 kg
Dimension picture (in mm)	❶	❶	❶
A	325	418	485
B	210	210	210
C	302	302	302
D	235	235	235
E	120	153	220
F	299	392	459
G	162	162	162
H	340	340	340

Dimension pictures

❶



OVERVIEW
SINE FILTERS/MOTOR REACTORS

	Type	Sort	Voltage range	0.55 kW	1.1 W	1.5 kW	2.2 kW	3 MW	4 kW	5.5 kW	7.5 kW	11 kW	15 kW	18.5 kW	18.5 kW / 22 kW	
Motor reactor	MDB	Motor reactor	3 x 0 – 500 Vac				6.3 A		9.4 A	13 A	16 A	24 A	30 A	39 A		
	MR3	Motor reactor	3 x 0 – 500 Vac		2.5 A	4 A	6 A	8 A	10 A		18 A	24 A	30 A	37 A	42 A	
Sine filter	SFB	Sine filter	3 x 0 – 520 Vac			4 A			10 A		16.5 A	23.5 A	32 A	37 A		
	SFA 400	All-pole sine filter	3 x 0 – 480 Vac	1.3 A	2.5 A	4 A	6 A		10 A		16.5 A	24 A	32 A	40 A		
	SFA 500	All-pole sine filter	3 x 0 – 500 Vac				6 A			13 A		24 A				

22 kW	30 kW	37 kW	45 kW	55 kW	75 kW	90 kW	132 kW	250 kW	260 kW	Page
46 A	61 A	72 A	91 A	110 A	150 A	176 A				572
48 A	61 A									576
48 A	61 A	72 A	90 A	115 A	150 A	180 A	250 A	440 A	480 A	580
50 A	60 A									585
46 A	65 A									589

Motor reactor
MDB

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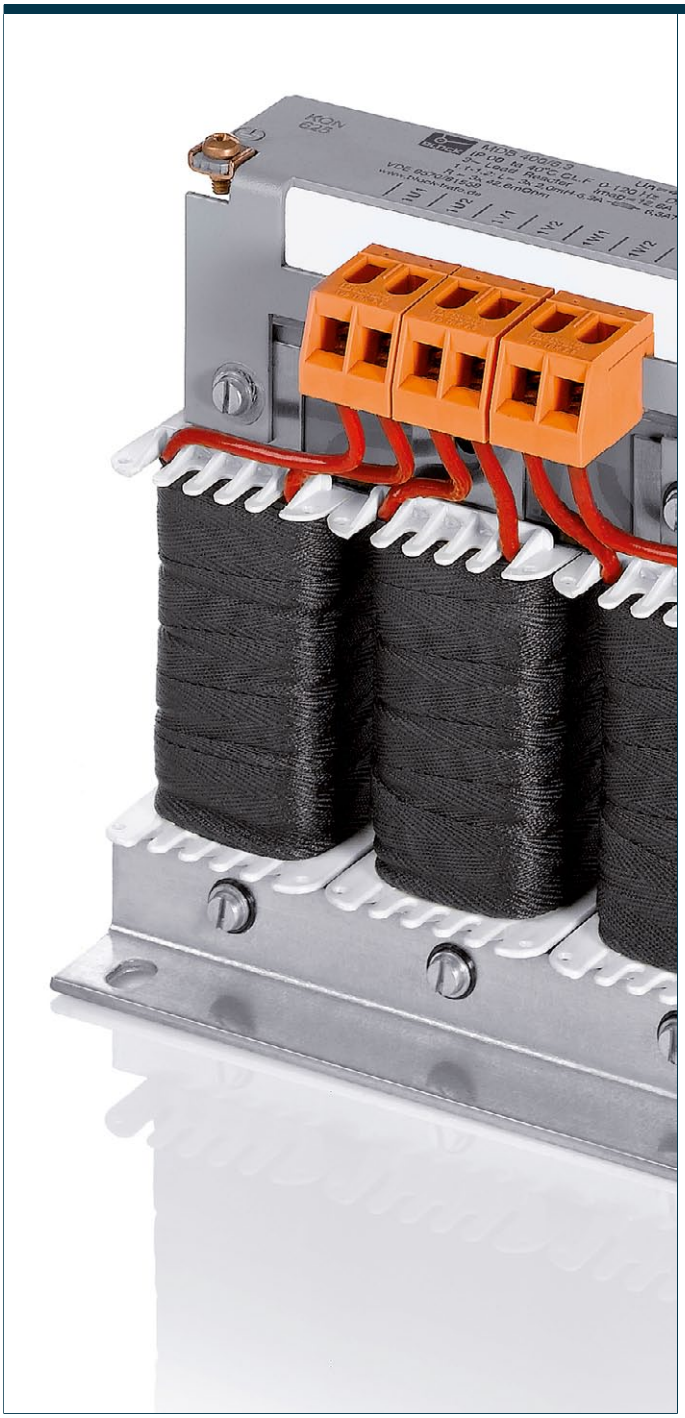


General Data

Rated voltage 3 x 400 Vac
Rated current 6.3 - 176 A
For motor rated output 2.2 - 90 kW
For switching frequencies of 2 to 6 kHz
Rated frequency from 0 to 120 Hz
Insulation class F
Maximum ambient temperature 40 °C
Degree of protection IP 00

Advantages

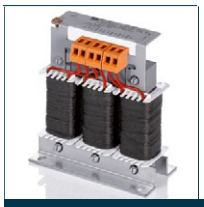
High damping of edge steepness
High damping of inverter switching frequency
Reduction of leakage current
Long shielded cable lengths possible
High efficiency
Very good corrosion protection and low noise thanks to vacuum impregnation

Standards

Output reactor for frequency inverter
DIN EN 61558-2-20, IEC 61558-2-20

Approvals

EAC



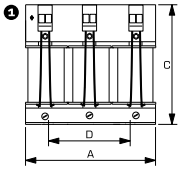
Motor reactor
MDB

BLOCK Website

Typ	MDB 400/6,3	MDB 400/9,4	MDB 400/13	MDB 400/16	MDB 400/24	MDB 400/30
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Voltage range	0 - 3 x 500 Vac	0 - 3 x 500 Vac	0 - 3 x 500 Vac	0 - 3 x 500 Vac	0 - 3 x 500 Vac	0 - 3 x 500 Vac
Rated current	6.30 A	9.40 A	13.00 A	16.00 A	24.00 A	30.00 A
for motor rated output approx.	2.20 kW	4.00 kW	5.50 kW	7.50 kW	11.00 kW	15.00 kW
Inductance	2.000 mH	0.900 mH	0.900 mH	0.900 mH	0.450 mH	0.450 mH
Rated frequency	0 - 120 Hz	0 - 120 Hz	0 - 120 Hz	0 - 120 Hz	0 - 120 Hz	0 - 120 Hz
Switching frequency	2 - 6 kHz	2 - 6 kHz	2 - 6 kHz	2 - 6 kHz	2 - 6 kHz	2 - 6 kHz
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	F	F	F	F	F	F
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Test voltage	2500 Vac, 50 Hz	2500 Vac, 50 Hz	2500 Vac, 50 Hz	2500 Vac, 50 Hz	2500 Vac, 50 Hz	2500 Vac, 50 Hz
Order numbers						
Order Number	**MDB 400/6,3**	**MDB 400/9,4**	**MDB 400/13**	**MDB 400/16**	**MDB 400/24**	**MDB 400/30**
Terminal and mounting						
Terminals phase	Screw clamp, 2.5 mm²	Screw clamp, 2.5 mm²	Screw clamp, 4 mm²	Screw clamp, 10 mm²	Screw clamp, 10 mm²	Flat copper
Terminals PE	Bolt, M4	Bolt, M4	Bolt, M4	Bolt, M4	Bolt, M4	Bolt, M6
Fixing method	Fixing rail	Fixing rail	Fixing rail	Fixing rail	Fixing rail	Fixing rail
Fixing screws	M5	M5	M5	M6	M6	M6
Measures and weights						
Weight	4.50 kg	4.50 kg	5.50 kg	10.00 kg	10.00 kg	11.20 kg
Dimension picture (in mm)	❶	❶	❶	❶	❶	❷
A	155	155	155	190	190	210
B	70	70	85	115	115	130
C	160	160	160	193	193	-
D	130	130	130	170	170	175
E	55	55	70	75	75	95
F	128	128	128	155	155	182
G	75	75	90	100	100	115
H	10	10	10	12.5	12.5	10

Dimension pictures

❶



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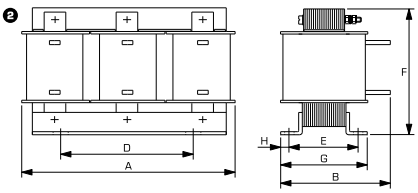
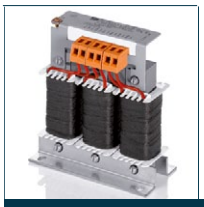




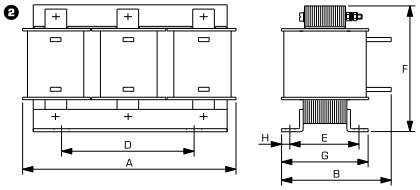
Motor reactor
MDB

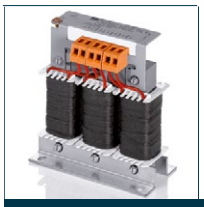
BLOCK Website

Typ	MDB 400/39	MDB 400/46	MDB 400/61	MDB 400/72	MDB 400/91	MDB 400/110
Electrical data						
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Voltage range	0 - 3 x 500 Vac	0 - 3 x 500 Vac	0 - 3 x 500 Vac	0 - 3 x 500 Vac	0 - 3 x 500 Vac	0 - 3 x 500 Vac
Rated current	39.00 A	46.00 A	61.00 A	72.00 A	91.00 A	110.00 A
for motor rated output approx.	18.50 kW	22.00 kW	30.00 kW	37.00 kW	45.00 kW	55.00 kW
Inductance	0.300 mH	0.150 mH	0.100 mH	0.050 mH	0.050 mH	0.050 mH
Rated frequency	0 - 120 Hz	0 - 120 Hz	0 - 120 Hz	0 - 120 Hz	0 - 120 Hz	0 - 120 Hz
Switching frequency	2 - 6 kHz	2 - 6 kHz	2 - 6 kHz	2 - 6 kHz	2 - 6 kHz	2 - 6 kHz
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	F	F	F	F	F	F
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Test voltage	2500 Vac, 50 Hz	2500 Vac, 50 Hz	2500 Vac, 50 Hz	2500 Vac, 50 Hz	2500 Vac, 50 Hz	2500 Vac, 50 Hz
Order numbers						
Order Number	**MDB 400/39**	**MDB 400/46**	**MDB 400/61**	**MDB 400/72**	**MDB 400/91**	**MDB 400/110**
Mechanical data						
Terminal and mounting						
Terminals phase	Flat copper	Flat copper	Flat copper	Flat copper	Flat copper	Flat copper
Terminals PE	Bolt, M6	Bolt, M6	Bolt, M6	Bolt, M6	Bolt, M6	Bolt, M8
Fixing method	Fixing rail	Fixing rail	Fixing rail	Fixing rail	Fixing rail	Fixing rail
Fixing screws	M6	M6	M6	M6	M6	M8
Measures and weights						
Weight	11.30 kg	10.30 kg	10.30 kg	10.30 kg	10.30 kg	20.00 kg
Dimension picture (in mm)	❷	❷	❷	❷	❷	❷
A	210	210	210	210	210	240
B	130	120	120	120	120	131
C	-	-	-	-	-	-
D	175	175	175	175	175	190
E	95	85	85	85	85	95
F	182	182	182	182	182	205
G	115	105	105	105	105	121
H	10	10	10	10	10	13

Dimension pictures

❷





Motor reactor
MDB

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Electrical data

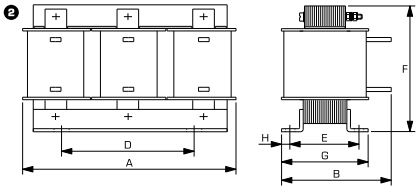
Typ	MDB 400/150	MDB 400/176
Operating data		
Rated voltage	3 x 400 Vac	3 x 400 Vac
Voltage range	0 - 3 x 500 Vac	0 - 3 x 500 Vac
Rated current	150.00 A	176.00 A
for motor rated output approx.	75.00 kW	90.00 kW
Inductance	0.050 mH	0.050 mH
Rated frequency	0 - 120 Hz	0 - 120 Hz
Switching frequency	2 - 6 kHz	2 - 6 kHz
Environment		
Ambient temperature max.	40 °C	40 °C
Safety and protection		
Type	Open type	Open type
Insulation class	F	F
Protection index	IP 00	IP 00
Safety class (prepared)	I	I
Test voltage	2500 Vac, 50 Hz	2500 Vac, 50 Hz
Order numbers		
Order Number	**MDB 400/150**	**MDB 400/176**

Mechanical data

Terminal and mounting		
Terminals phase	Flat copper	Flat copper
Terminals PE	Bolt, M8	Bolt, M8
Fixing method	Fixing rail	Fixing rail
Fixing screws	M8	M8
Measures and weights		
Weight	24.30 kg	27.50 kg
Dimension picture (in mm)	❷	❷
A	240	240
B	141	165
C	-	-
D	190	190
E	105	129
F	205	205
G	131	155
H	13	13

Dimension pictures

❷



Motor reactor
MR3 400

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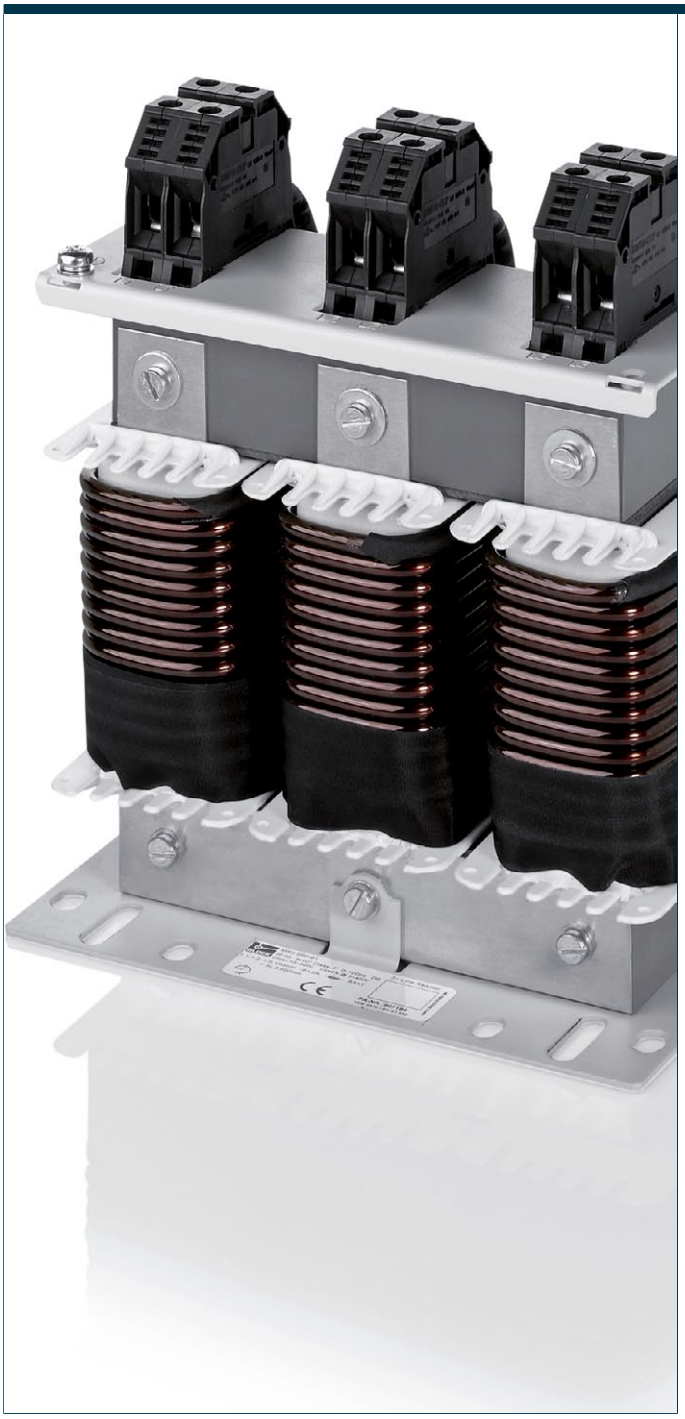

General Data

Rated voltage 3 x 400 Vac
Rated current 2.5 - 61.0 A
For motor rated output 0.75 - 30 kW
For switching frequencies of 3 to 8 kHz
Rated frequency from 0 to 50 Hz
Inductance 2.55 - 0.10 mH
Insulation class B
Maximum ambient temperature 40 °C

Advantages

High damping of edge steepness
High damping of inverter switching frequency
Reduction of leakage current at low construction volumes
Long shielded cable lengths possible
High efficiency
Very good corrosion protection and low noise thanks to vacuum impregnation

Applications

Motor reactor for the limitation of the voltage peaks damaging to the motor insulation (dv/dt).

Standards

Output reactor for frequency inverter
DIN EN 61558-2-20, IEC 61558-2-20

Approvals

Motor reactor
MR3 400

BLOCK Website

Electrical data

Typ	MR3 400/2,5	MR3 400/4	MR3 400/6	MR3 400/8	MR3 400/10	MR3 400/13
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Voltage range	3 x 0 - 500 Vac	3 x 0 - 500 Vac	3 x 0 - 500 Vac	3 x 0 - 500 Vac	3 x 0 - 500 Vac	3 x 0 - 500 Vac
Rated current	2.5 A	4 A	6 A	8 A	10 A	13 A
for motor rated output approx.	0.75 kW	1.10 kW	2.20 kW	3.00 kW	4.00 kW	5.50 kW
Inductance	2.550 mH	1.590 mH	1.060 mH	0.800 mH	0.640 mH	0.490 mH
Rated frequency	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz
Switching frequency	3 - 8 kHz	3 - 8 kHz	3 - 8 kHz	3 - 8 kHz	3 - 8 kHz	3 - 8 kHz
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Test voltage	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz
Insulation class	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=B, UL=class 130	VDE=F, UL=class 130	VDE=F, UL=class 130
Order numbers						
Order Number	**MR3 400/2,5**	**MR3 400/4**	**MR3 400/6**	**MR3 400/8**	**MR3 400/10**	**MR3 400/13**

Electrical data

Typ	MR3 400/18	MR3 400/24	MR3 400/30	MR3 400/37	MR3 400/42	MR3 400/48
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Voltage range	3 x 0 - 500 Vac	3 x 0 - 500 Vac	3 x 0 - 500 Vac	3 x 0 - 500 Vac	3 x 0 - 500 Vac	3 x 0 - 500 Vac
Rated current	18 A	24 A	30 A	37 A	42 A	48 A
for motor rated output approx.	7.50 kW	11.00 kW	15.00 kW	18.50 kW	22.00 kW	22.00 kW
Inductance	0.350 mH	0.270 mH	0.210 mH	0.170 mH	0.150 mH	0.130 mH
Rated frequency	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz	0 - 50 Hz
Switching frequency	3 - 8 kHz	3 - 8 kHz	3 - 8 kHz	3 - 8 kHz	3 - 8 kHz	3 - 8 kHz
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Test voltage	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz	4000 Vac, 50 Hz
Insulation class	VDE=F, UL=class 130	VDE=F, UL=class 130	VDE=F, UL=class 130	VDE=F, UL=class 130	VDE=F, UL=class 130	VDE=F, UL=class 130
Order numbers						
Order Number	**MR3 400/18**	**MR3 400/24**	**MR3 400/30**	**MR3 400/37**	**MR3 400/42**	**MR3 400/48**

Motor reactor
MR3 400

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Electrical data

Typ	MR3 400/61
Operating data	
Rated voltage	3 x 400 Vac
Voltage range	3 x 0 - 500 Vac
Rated current	61 A
for motor rated output approx.	30.00 kW
Inductance	0.100 mH
Rated frequency	0 - 50 Hz
Switching frequency	3 - 8 kHz
Approvals	
Approvals	cURus
Environment	
Ambient temperature max.	40 °C
Safety and protection	
Type	Open type
Protection index	IP 00
Safety class (prepared)	I
Test voltage	4000 Vac, 50 Hz
Insulation class	VDE=F, UL=class 130
Order numbers	
Order Number	**MR3 400/61**

Motor reactor
MR3 400

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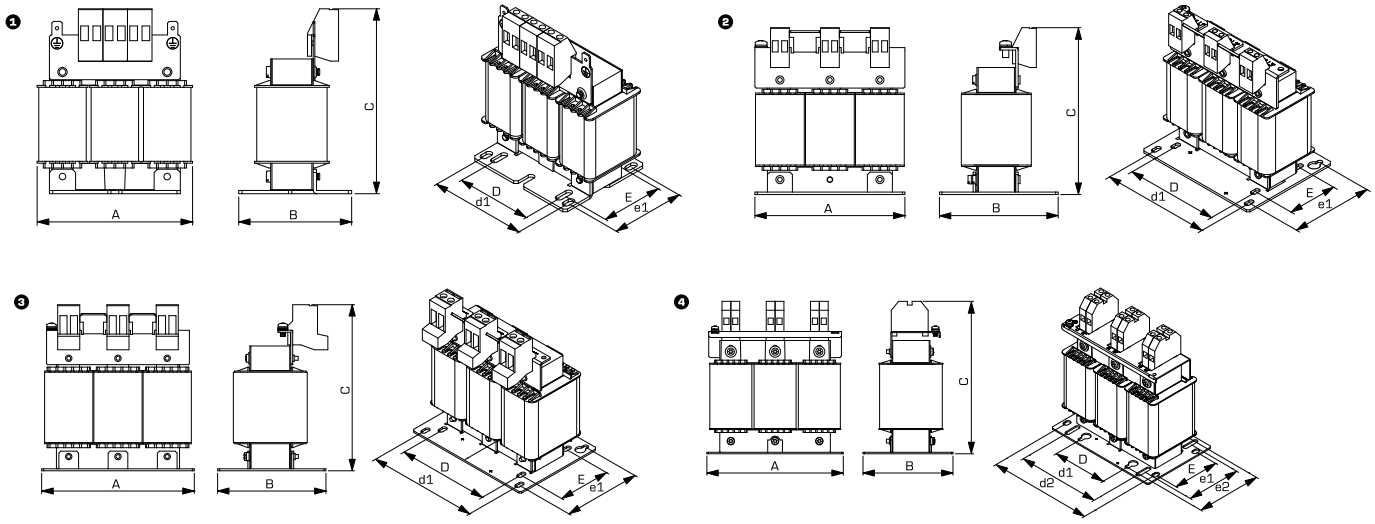
Mechanical data 30

Typ	Terminals phase	Terminals PE	Fixing method	Fixing screws	Weight	Dimension picture (in mm)	A	B	C	D	d1	d2	E	e1	e2	F
MR3 400/2,5	Screw clamp, 4 mm²	Bolt, M4	Fixing rail	M4	0.8 kg	1	78	63	100	50	65	-	42	47	-	-
MR3 400/4	Screw clamp, 4 mm²	Bolt, M4	Fixing rail	M4	0.9 kg	1	77	63	100	50	65	-	42	47	-	-
MR3 400/6	Screw clamp, 4 mm²	Bolt, M4	Fixing rail	M4	1.1 kg	1	95	60	117	56	71	-	38	45	-	-
MR3 400/8	Screw clamp, 4 mm²	Bolt, M4	Fixing rail	M4	1.2 kg	1	95	60	117	56	71	-	38	45	-	-
MR3 400/10	Screw clamp, 4 mm²	Bolt, M4	Fixing rail	M4	1.8 kg	2	120	85	140	90	105	-	35	68	-	-
MR3 400/13	Screw clamp, 4 mm²	Bolt, M5	Fixing rail	M4	1.9 kg	2	240	170	276.8	90	105	-	39	63.5	-	-
MR3 400/18	Screw clamp, 4 mm²	Bolt, M5	Fixing rail	M4	2.1 kg	2	240	190	274.6	49	73.5	-	45	78	-	-
MR3 400/24	Screw clamp, 4 mm²	Bolt, M5	Fixing rail	M4	2.2 kg	2	120	95	142	90	105	-	49	73.5	-	-
MR3 400/30	Screw clamp, 4 mm²	Bolt, M5	Fixing rail	M5	3.5 kg	3	155	95	170	113	135	-	50	72.4	-	-
MR3 400/37	Screw clamp, 4 mm²	Bolt, M5	Fixing rail	M5	3.6 kg	3	310	190	335.4	113	135	-	50	72.4	-	-
MR3 400/42	Screw clamp, 10 mm²	Bolt, M5	Fixing rail	M5	6.5 kg	3	155	110	170	113	135	-	65	87.4	-	-
MR3 400/48	Screw clamp, 16 mm²	Bolt, M5	Fixing rail	M5	6.5 kg	4	185	100	211	136	170	-	70	57.5	-	-
MR3 400/61	Screw clamp, 16 mm²	Bolt, M6	Fixing rail	M6	7.8 kg	4	185	112	210	136	170	-	80	67	-	-

Dimension pictures



Sine filter
SFB

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General Data

Rated voltage 3 x 400 Vac
Rated current 4 - 480 A
For motor rated output 1.5 - 260 kW
For switching frequencies of 4 to 8 kHz
Rated frequency from 0 to 150 Hz
Insulation class H
Maximum ambient temperature 40 °C
Degree of protection IP 00

Advantages

Prevention of overvoltages on the motor
Long cable lengths possible
Reduction in motor noise
Reduction in line-borne and field-borne emitted interference
Reduction in motor losses
Very good corrosion protection and low noise thanks to vacuum impregnation

Applications

Sine filter for the suppression of differential mode interference.

Standards

Output filter with capacitor for frequency inverters complying with DIN EN 61558-2-20, IEC 61558-2-20, UL 508, CSA 22.2 No. 14-9195

Approvals

UL 508, CSA 22.2 No 14-9195

Sine filter
SFB

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Electrical data

Typ	SFB 400/4	SFB 400/10	SFB 400/16,5	SFB 400/23,5	SFB 400/32	SFB 400/37
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Voltage range	0 - 520 Vac	0 - 520 Vac	0 - 520 Vac	0 - 520 Vac	0 - 520 Vac	0 - 520 Vac
Voltage drop	7.5 % @ 400 Vac	7 % @ 400 Vac	7.5 % @ 400 Vac	8 % @ 400 Vac	8.7 % @ 400 Vac	8.6 % @ 400 Vac
Rated current	4 A	10 A	16.5 A	23.5 A	32 A	37 A
for motor rated output approx.	1.50 kW	4.00 kW	7.50 kW	11.00 kW	15.00 kW	18.50 kW
Rated frequency	0 - 150 Hz	0 - 150 Hz	0 - 150 Hz	0 - 150 Hz	0 - 150 Hz	0 - 150 Hz
Switching frequency	4 - 8 kHz	4 - 8 kHz	4 - 8 kHz	4 - 8 kHz	4 - 8 kHz	4 - 8 kHz
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	H	H	H	H	H	H
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Test voltage	3000 Vac, 50 Hz	3000 Vac, 50 Hz	3000 Vac, 50 Hz	3000 Vac, 50 Hz	3000 Vac, 50 Hz	3000 Vac, 50 Hz
Order numbers						
Order Number	**SFB 400/4**	**SFB 400/10**	**SFB 400/16,5**	**SFB 400/23,5**	**SFB 400/32**	**SFB 400/37**

Sine filter
SFB

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Electrical data

Typ	SFB 400/48	SFB-N 400/61	SFB-N 400/72	SFB-N 400/90	SFB 400/115	SFB 400/150
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Voltage range	0 - 520 Vac	0 - 520 Vac	0 - 520 Vac	0 - 520 Vac	0 - 520 Vac	0 - 520 Vac
Voltage drop	7.8 % @ 400 Vac	8.3 % @ 400 Vac	7.5 % @ 400 Vac	10 % @ 400 Vac	11 % @ 400 Vac	10.2 % @ 400 Vac
Rated current	48 A	61 A	72 A	90 A	115 A	150 A
for motor rated output approx.	22.00 kW	30.00 kW	37.00 kW	45.00 kW	55.00 kW	75.00 kW
Rated frequency	0 - 150 Hz	0 - 150 Hz	0 - 150 Hz	0 - 150 Hz	0 - 150 Hz	0 - 150 Hz
Switching frequency	4 - 8 kHz	4 - 8 kHz	4 - 8 kHz	4 - 8 kHz	4 - 8 kHz	4 - 8 kHz
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C	40 °C	40 °C
Safety and protection						
Type	Open type	Open type	Open type	Open type	Open type	Open type
Insulation class	H	H	H	H	H	H
Protection index	IP 00	IP 00	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I	I	I
Test voltage	3000 Vac, 50 Hz	3000 Vac, 50 Hz	3000 Vac, 50 Hz	3000 Vac, 50 Hz	3000 Vac, 50 Hz	3000 Vac, 50 Hz
Order numbers						
Order Number	**SFB 400/48**	**SFB-N 400/61**	**SFB-N 400/72**	**SFB-N 400/90**	**SFB 400/115**	**SFB 400/150**

Sine filter
SFB

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Electrical data

Typ	SFB 400/180	SFB 400/250	SFB 400/440	SFB 400/480
Operating data				
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Voltage range	0 - 520 Vac	0 - 520 Vac	0 - 520 Vac	0 - 520 Vac
Voltage drop	7.5 % @ 400 Vac	7.5 % @ 400 Vac	7.5 % @ 400 Vac	7 % @ 400 Vac
Rated current	180 A	250 A	440 A	480 A
for motor rated output approx.	90.00 kW	132.00 kW	250.00 kW	260.00 kW
Rated frequency	0 - 60 Hz	0 - 60 Hz	0 - 60 Hz	0 - 60 Hz
Switching frequency	4 - 8 kHz	4 - 8 kHz	4 - 8 kHz	4 - 8 kHz
Approvals				
Approvals	cURus	-	-	-
Environment				
Ambient temperature max.	40 °C	40 °C	40 °C	40 °C
Safety and protection				
Type	Open type	Open type	Open type	Open type
Insulation class	H	H	H	H
Protection index	IP 00	IP 00	IP 00	IP 00
Safety class (prepared)	I	I	I	I
Test voltage	3000 Vac, 50 Hz	3000 Vac, 50 Hz	3000 Vac, 50 Hz	3000 Vac, 50 Hz
Order numbers				
Order Number	**SFB 400/180**	**SFB 400/250**	**SFB 400/440**	**SFB 400/480**

Sine filter
SFB

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Mechanical data

Typ	Terminals phase	Terminals PE	Fixing method	Fixing screws	Mounting position	Weight	Dimension picture (in mm)	A	B	C	D	E
SFB 400/4	Screw clamp, 4 mm²	Bolt, M4	Fixing rail	M5	only for vertical mounting	4.0 kg	1	155	110	160	130	56
SFB 400/10	Screw clamp, 4 mm²	Bolt, M4	Fixing rail	M5	only for vertical mounting	5.5 kg	1	155	125	160	130	71
SFB 400/16,5	Screw clamp, 10 mm²	Bolt, M4	Fixing rail	M5	only for vertical mounting	9.5 kg	1	190	160	195	170	67
SFB 400/23,5	Screw clamp, 16 mm²	Bolt, M6	Fixing rail	M6	only for vertical mounting	14.5 kg	2	240	190	280	190	95
SFB 400/32	Screw clamp, 16 mm²	Bolt, M6	Fixing rail	M6	only for vertical mounting	19.0 kg	2	240	200	280	190	105
SFB 400/37	Screw clamp, 16 mm²	Bolt, M6	Fixing rail	M6	only for vertical mounting	21.0 kg	2	240	210	280	190	115
SFB 400/48	Screw clamp, 16 mm²	Bolt, M6	Fixing rail	M6	only for vertical mounting	25.5 kg	2	240	220	285	190	125
SFB-N 400/61	Screw clamp, 35 mm²	Bolt, M8	Fixing rail	M8	only for vertical mounting	33.5 kg	2	300	228	335	240	110
SFB-N 400/72	Screw clamp, 35 mm²	Bolt, M8	Fixing rail	M8	only for vertical mounting	37.0 kg	2	300	240	340	240	133
SFB-N 400/90	Screw clamp, 50 mm²	Bolt, M8	Fixing rail	M8	only for vertical mounting	53.0 kg	2	300	240	355	240	145
SFB 400/115	Screw clamp, 95 mm²	Bolt, M8	Fixing rail	M8	only for vertical mounting	66.0 kg	3	360	210	425	264	125
SFB 400/150	Screw clamp, 95 mm²	Bolt, M8	Fixing rail	M10	only for vertical mounting	69.0 kg	3	360	230	425	264	140
SFB 400/180	Screw clamp, 150 mm²	Bolt, M8	Fixing rail	M10	only for vertical mounting	75.0 kg	3	365	240	445	264	154
SFB 400/250	Screw clamp, 150 mm²	Bolt, M12	Fixing rail	M10	only for vertical mounting	120.0 kg	4	400	500	450	326	450
SFB 400/440	Screw clamp, 150 mm²	Bolt, M12	Fixing rail	M10	only for vertical mounting	200.0 kg	5	630	540	400	550	480
SFB 400/480	Screw clamp, 150 mm²	Bolt, M14	Fixing rail	M10	only for vertical mounting	220.0 kg	6	750	400	430	450	270

Dimension pictures

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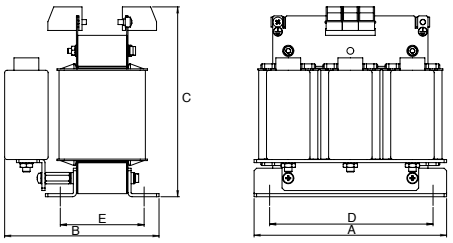

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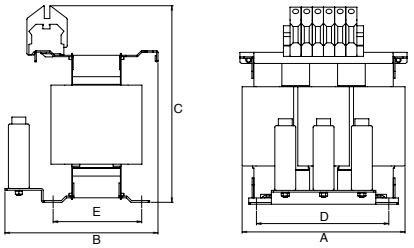

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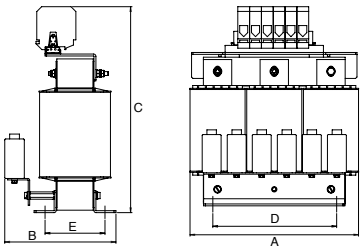

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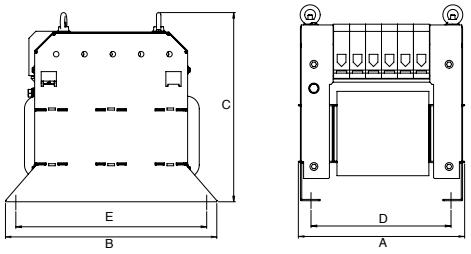

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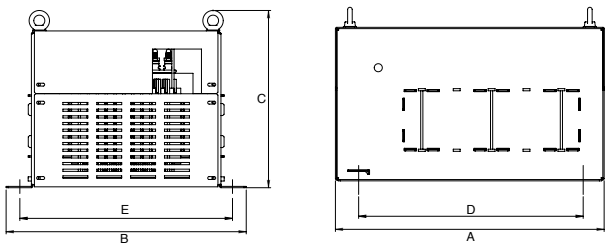

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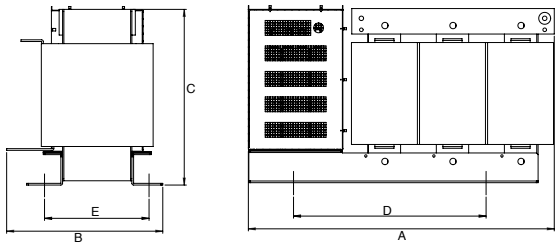

All-pole sine filter
SFA 400

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General Data

Rated voltage 3 x 400 Vac
Rated current 1.3 - 60 A
Designed for inverter with DC link connector (+Vdc), positive or negative or mid point and and works with continuous PWM (please contact our technical support staff)
For motor rated output 1.5 - 30 kW
For switching frequencies ≥ 8 kHz
Rated frequency from 0 to 60 Hz
Insulation class H
Maximum ambient temperature 45 °C

Advantages

Prevention of overvoltages on the motor
Long cable lengths possible
Reduction in motor noise
Minimisation of bearing currents
Minimisation of leakage currents (is beneficial in the event of incorrect RCD tripping)
Reduction in line-borne and field-borne emitted interference: can be omitted from shielded cables, where necessary
Reduction of motor losses

Applications

Sine filter for the suppression of differential mode interference and common mode interference. Designed for inverter with DC link connector (+Vg/+Ug), positive or negative or mid point and and works with continuous PWM (please contact our technical support staff).

Standards

Output filter with capacitor for frequency inverters complying with IEC 61558-2-20, UL 508, CSA 22.2 No. 14-10

Approvals

UL 5085-1/-2, CSA 22.2 No.66

All-pole sine filter
SFA 400

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Electrical data

Typ	SFA 400/1,3	SFA 400/2,5	SFA 400/4	SFA 400/6	SFA 400/10	SFA 400/16,5
Operating data						
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Voltage range	380 - 480 Vac	380 - 480 Vac	380 - 480 Vac	380 - 480 Vac	380 - 480 Vac	380 - 480 Vac
Voltage drop	<5 % @ 400 Vac	<5 % @ 400 Vac	<5 % @ 400 Vac	<5 % @ 400 Vac	<5 % @ 400 Vac	<5 % @ 400 Vac
Rated current	1.3 A	2.5 A	4 A	6 A	10 A	16.5 A
for motor rated output approx.	0.55 kW	1.10 kW	1.50 kW	2.20 kW	4.00 kW	7.50 kW
Rated frequency	≤60 Hz	≤60 Hz	≤60 Hz	≤60 Hz	≤60 Hz	≤60 Hz
Switching frequency	≥8 kHz	≥8 kHz	≥8 kHz	≥8 kHz	≥8 kHz	≥8 kHz
Approvals						
Approvals	cURus	cURus	cURus	cURus	cURus	cURus
Environment						
Ambient temperature max.	45 °C	45 °C	45 °C	45 °C	45 °C	45 °C
Safety and protection						
Type	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure
Insulation class	F	F	F	F	F	F
Protection index	IP 20	IP 20	IP 20	IP 20	IP 20	IP 20
Safety class (prepared)	I	I	I	I	I	I
Test voltage	2500 Vac, 50 Hz	2500 Vac, 50 Hz	2500 Vac, 50 Hz	2500 Vac, 50 Hz	2500 Vac, 50 Hz	2500 Vac, 50 Hz
Order numbers						
Order Number	**SFA 400/1,3**	**SFA 400/2,5**	**SFA 400/4**	**SFA 400/6**	**SFA 400/10**	**SFA 400/16,5**

All-pole sine filter
SFA 400

BLOCK Website

Electrical data

Typ	SFA 400/24	SFA 400/32	SFA 400/40	SFA 400/50	SFA 400/60
Operating data					
Rated voltage	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac	3 x 400 Vac
Voltage range	380 - 480 Vac	380 - 480 Vac	380 - 480 Vac	380 - 480 Vac	380 - 480 Vac
Voltage drop	<5 % @ 400 Vac	<5 % @ 400 Vac	<5 % @ 400 Vac	<5 % @ 400 Vac	<5 % @ 400 Vac
Rated current	24 A	32 A	40 A	50 A	60 A
for motor rated output approx.	11.00 kW	15.00 kW	18.50 kW	22.00 kW	30.00 kW
Rated frequency	≤60 Hz	≤60 Hz	≤60 Hz	≤60 Hz	≤60 Hz
Switching frequency	≥8 kHz	≥8 kHz	≥8 kHz	≥8 kHz	≥8 kHz
Approvals					
Approvals	cURus	cURus	cURus	cURus	cURus
Environment					
Ambient temperature max.	45 °C	45 °C	45 °C	45 °C	45 °C
Safety and protection					
Type	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure
Insulation class	F	F	F	F	F
Protection index	IP 20	IP 20	IP 20	IP 20	IP 20
Safety class (prepared)	I	I	I	I	I
Test voltage	2500 Vac, 50 Hz	2500 Vac, 50 Hz	2500 Vac, 50 Hz	2500 Vac, 50 Hz	2500 Vac, 50 Hz
Order numbers					
Order Number	**SFA 400/24**	**SFA 400/32**	**SFA 400/40**	**SFA 400/50**	**SFA 400/60**

All-pole sine filter
SFA 400

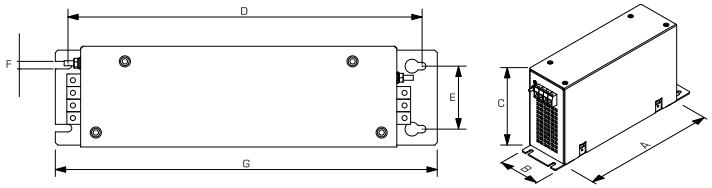
BLOCK Website

Mechanical data

Typ	Terminals phase	Terminals PE	Fixing method	Fixing screws	Weight	Dimension picture (in mm)	A	B	C	D	E	F	G
SFA 400/1,3	Screw clamp, 4 mm²	Bolt, M4	Mounting lugs	M5	3.2 kg	1	250	80	150	280	50	6	302
SFA 400/2,5	Screw clamp, 4 mm²	Bolt, M4	Mounting lugs	M5	4.7 kg	1	250	80	150	280	50	6	302
SFA 400/4	Screw clamp, 4 mm²	Bolt, M4	Mounting lugs	M5	7.4 kg	2	290	80	170	320	50	6	342
SFA 400/6	Screw clamp, 10 mm²	Bolt, M4	Mounting lugs	M5	8.1 kg	2	290	80	170	320	50	6	342
SFA 400/10	Screw clamp, 10 mm²	Bolt, M5	Mounting lugs	M6	11.0 kg	1	320	135	200	355	100	6.5	372
SFA 400/16,5	Screw clamp, 10 mm²	Bolt, M5	Mounting lugs	M6	17.0 kg	1	320	135	200	355	100	6.5	372
SFA 400/24	Screw clamp, 16 mm²	Bolt, M6	Mounting lugs	M6	25.0 kg	2	370	260	200	400	230	6.5	430
SFA 400/32	Screw clamp, 16 mm²	Bolt, M6	Mounting lugs	M6	27.0 kg	2	400	280	200	430	230	6.5	460
SFA 400/40	Screw clamp, 16 mm²	Bolt, M6	Mounting lugs	M6	34.0 kg	2	450	310	250	480	250	6.5	510
SFA 400/50	Screw clamp, 16 mm²	Bolt, M6	Mounting lugs	M6	45.0 kg	2	500	310	250	530	250	6.5	560

Dimension pictures

1



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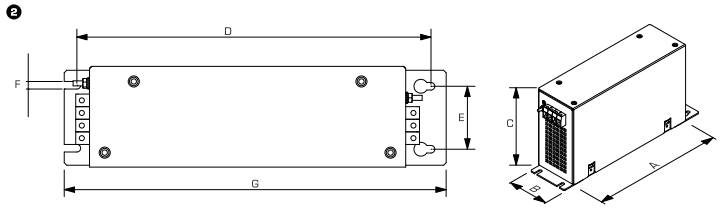
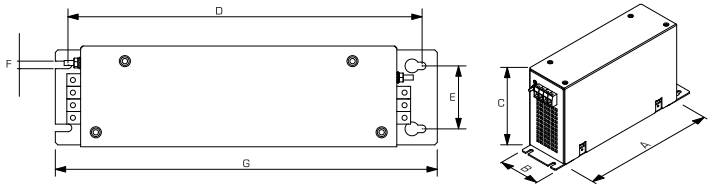


Mechanical data

Typ	Terminals phase	Terminals PE	Fixing method	Fixing screws	Weight	Dimension picture (in mm)	A	B	C	D	E	F	G
SFA 400/60	Screw clamp, 35 mm²	Bolt, M8	Mounting lugs	M6	56.0 kg	2	550	310	250	580	250	6.5	610

Dimension pictures

2



All-pole sine filter
SFA 500

BLOCK Website

General Data

Rated voltage 3 x 500 Vac
For switching frequencies ≥ 4 kHz
For motor rated output 2.2 - 45 kW
Maximum ambient temperature 45 °C
Degree of protection IP 20
Rated current 6 - 65 A
Rated frequency from 5 to 150 Hz
Insulation class H

Advantages

Efficiency optimisation of the drive system
Use of unshielded motor cables
Improves conducted and radiated electromagnetic interference (150 kHz - 300 MHz)
Significant reduction of leakage currents
Elimination of bearing currents
Increase of motor service life

Applications

Sine filter for the suppression of differential mode interference and common mode interference. Designed for inverter with DC link connector (+Vg/+Ug), positive or negative or mid point and and works with continuous PWM (please contact our technical support staff).

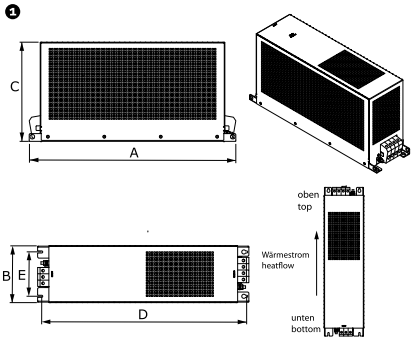
All-pole sine filter
SFA 500

BLOCK Website

Typ	SFA 500/6	SFA 500/13	SFA 500/24	SFA 500/46
Operating data				
Rated voltage	3 x 500 Vac	3 x 500 Vac	3 x 500 Vac	3 x 500 Vac
Rated frequency	5 - 150 Hz	5 - 150 Hz	5 - 150 Hz	5 - 150 Hz
Voltage range	0 - 500 Vac	0 - 500 Vac	0 - 500 Vac	0 - 500 Vac
Voltage drop	< 6.5 % @ 400 Vac	< 6.5 % @ 400 Vac	< 6.5 % @ 400 Vac	< 6.5 % @ 400 Vac
Rated current	6 A (400 V ≥ 4 kHz) 5,2 A (500 V ≥ 4 kHz)	13 A (400 V ≥ 4 kHz) 11,8 A (500 V ≥ 4 kHz)	24 A (400 V ≥ 4 kHz) 22,6 A (500 V ≥ 4 kHz)	46 A (400 V ≥ 4 kHz) 43,3 A (500 V ≥ 4 kHz)
for motor rated output approx.	2.20 kW	5.50 kW	11.00 kW	22.00 kW
Output				
Vector group	III	III	III	III
Switching frequency	≥ 4 kHz	≥ 4 kHz	≥ 4 kHz	≥ 4 kHz
Environment				
Ambient temperature	-10 to +45 °C	-10 to +45 °C	-10 to +45 °C	-10 to +45 °C
Type of cooling	AN	AN	AN	AN
Safety and protection				
Type	Metal enclosure	Metal enclosure	Metal enclosure	Metal enclosure
Protection index	IP 20	IP 20	IP 20	IP 20
Safety class (prepared)	I	I	I	I
Insulation class	H	H	H	H
Order numbers				
Order Number	**SFA 500/6**	**SFA 500/13**	**SFA 500/24**	**SFA 500/46**
Terminal and mounting				
Terminals phase	Screw clamp, 10 mm²	Screw clamp, 10 mm²	Screw clamp, 16 mm²	Screw clamp, 16 mm²
Terminals PE	Bolt, M6	Bolt, M6	Bolt, M6	Bolt, M6
Fixing method	Mounting lugs	Mounting lugs	Mounting lugs	Mounting lugs
Fixing screws	M6	M6	M6	M6
Measures and weights				
Weight	14.0 kg	18.0 kg	25.0 kg	40.0 kg
Dimension picture (in mm)	❶	❶	❶	❶
A	310	390	450	450
B	105	120	135	160
C	160	215	270	310
D	290	370	430	430
E	75	90	100	120

Dimension pictures

❶



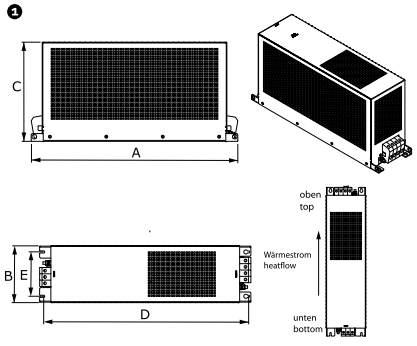
All-pole sine filter
SFA 500

BLOCK Website

Typ	SFA 500/65
Operating data	
Rated voltage	3 x 500 Vac
Rated frequency	5 - 150 Hz
Voltage range	0 - 500 Vac
Voltage drop	< 6.5 % @ 400 Vac
Rated current	65 A (400 V ≥ 4 kHz) 59 A (500 V ≥ 4 kHz)
for motor rated output approx.	45.00 kW
Output	
Vector group	III
Switching frequency	≥ 4 kHz
Environment	
Ambient temperature	-10 to +45 °C
Type of cooling	AN
Safety and protection	
Type	Metal enclosure
Protection index	IP 20
Safety class (prepared)	I
Insulation class	H
Order numbers	
Order Number	**SFA 500/65**
Terminal and mounting	
Terminals phase	Screw clamp, 50 mm²
Terminals PE	Bolt, M8
Fixing method	Mounting lugs
Fixing screws	M6
Measures and weights	
Weight	57.0 kg
Dimension picture (in mm)	❶
A	670
B	180
C	320
D	650
E	140

Dimension pictures

❶



TEST LABORATORY

BLOCKLAB

EMC service

All our products, such as transformers, reactors, power supplies and radio interference suppression filters are developed and produced with the customer and market in mind. Our accredited EMC test laboratory functions as an independent business division. The laboratory concentrates on EMC services for products in the capital goods industry.

- Consultancy, contribution, suppression
- There right from the start of development
- EMC interference suppression components
- DIN EN ISO 9001 certified,
  accredited according to DIN EN ISO/IEC 17025
- Mobile EMC-equipment

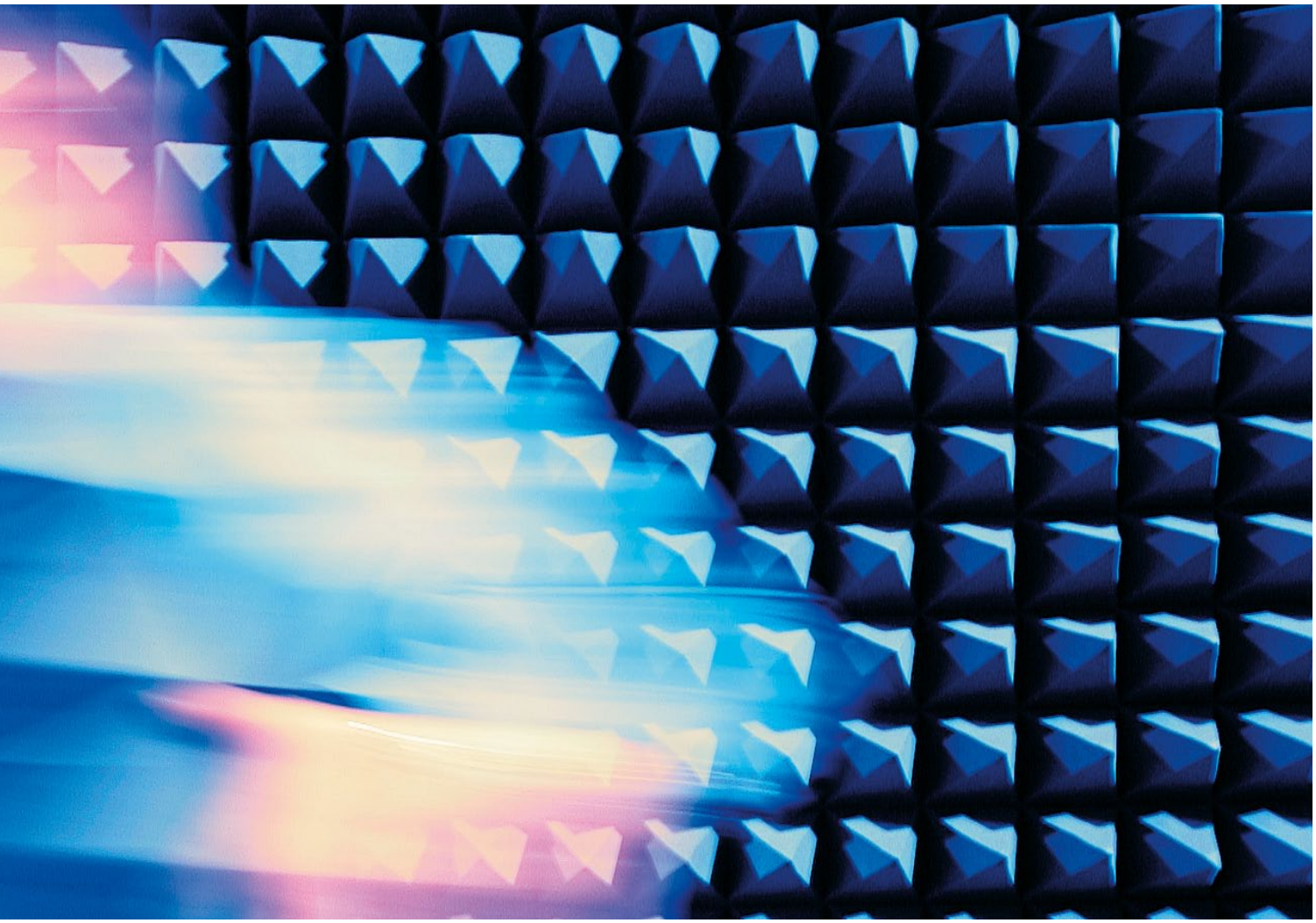
BLOCKLAB

EMC SERVICES CATALOG

Standard	Test
Immunity to interference	
DIN EN 61000-4-2	ESD, discharge of static electricity up to 15 kV
DIN EN 61000-4-3	High-frequency electromagnetic fields 80 MHz–1 GHz, up to 10 V/m (3 m test track), in the absorber booth
DIN EN 61000-4-4	BURST, rapid transient electrical interference parameters, 5/50 ns, 5 kHz and 100 kHz repeat frequency, to 4 kV
DIN EN 61000-4-5	SURGE, surge voltage, 1.2/50 (8/20) µs, up to 4 kV
DIN EN 61000-4-6	Line-guided high frequency, 0.15 – 80 MHz, up to 10 V/140 dBµV
DIN EN 61000-4-11	Voltage dips, short-term interruptions, voltage fluctuations (up to 25 A)
DIN EN 61000-4-13	Harmonics and interharmonics
Interference emissions	
DIN EN 61000-3-2	Line-guided mains feedback, harmonics up to 2 kHz/16 A
DIN EN 61000-3-3	Line-guided mains feedback, flicker/voltage fluctuations up to 16 A
DIN EN 61000-3-12	Line-guided mains feedback, up to 2 kHz/16 A < I ≤ 75 A
DIN EN 55011, DIN EN 55022	Line-guided mains feedback 10 kHz – 30 MHz
DIN EN 55011, DIN EN 55022	Radiated interference 30 MHz – 1 GHz

More services

- Material tests
- Shock and vibration tests
- Climatic testing



Material tests

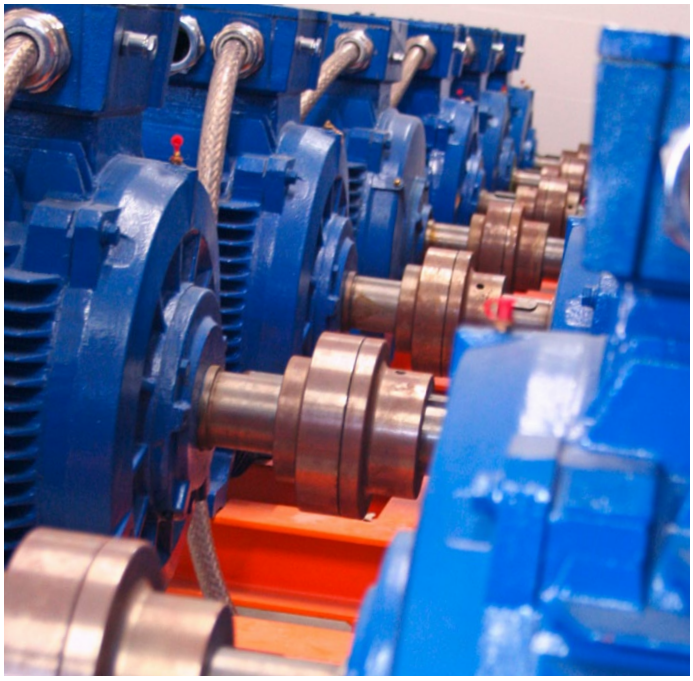
- Partial discharge test up to 100 kV
- Temperature rise test max. 80 channels
- Power Audit up to 24 h monitoring
- Power quality test weekly monitoring

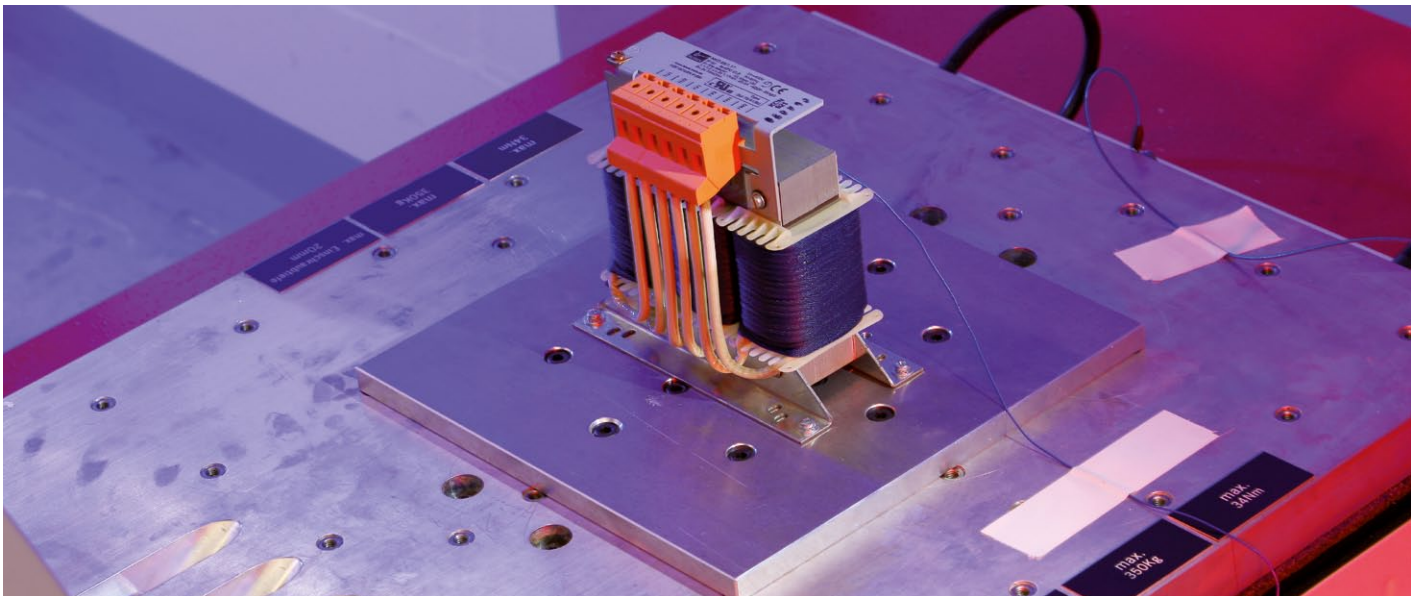
45 kVA

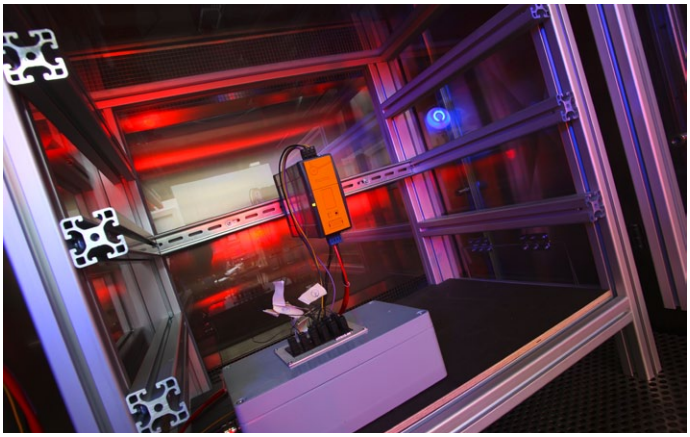
Electronic power source (AC+DC) with a power up to 45 kVA. For simulating worldwide power quality situations and failures.

1 MVA

Test stand for testing and optimising our products under actual conditions.







About our products and services

BLOCK has many years of design engineering experience and works in partnership with its customers, providing a variety of sources of support for proving the reliability of products when subject to environmental and operational loads. We will be at your side at every stage of the product creation process, helping you to select suitable trials and even carrying out in-process reliability tests.

Shock and vibration tests

max. weight of DUT up to 350 kg
Swept Sine, Shock and Random

- Max. Peak-Force
  22.2 kN
- Max. Acceleration
  Sine 40 g (60 g vertical)
- Shock (half-sine)
  150 g
- Random (RMS)
  30 g
- Max. Velocity
  2 m/s

Thermal simulation

- Temperature range
  -80 °C – +180 °C
- Humidity
  0 % – 100 %

- **EMC service**
- **Climatic testing**
- **Shock and vibration testing**
- **Partial discharge measuring**
- **RoHS screening**

4

Sheet-metal enclosure
BGE

BLOCK Website

General Data

- Degree of protection IP 23
- For floor mounting

Advantages

- Variable foot angle for easy installation
- Excellent corrosion protection and high abrasion resistance through powder-coated surface RAL 5008
- With cooling fins for optimal heat extraction

Applications

Universal metal enclosure for degree of protection IP23

Standards

Approvals

UL 508A (prepared)

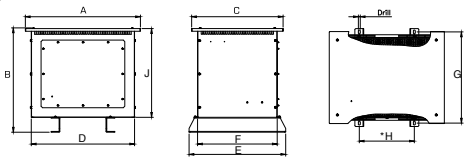
Sheet-metal enclosure
BGE

BLOCK Website

Typ	BGE-050	BGE-065	BGE-070	BGE-080	BGE-085	BGE-095
Operating data						
Enclosure suitable for protection index	IP 23	IP 23	IP 23	IP 23	IP 23	IP 23
For power (single-phase)	3 kVA	6.3 kVA	15 kVA	25 kVA	40 kVA	55 kVA
For power (three-phase)	5 kVA	10 kVA	20 kVA	30 kVA	63 kVA	85 kVA
Notes						
*	variable size: 135 - 350 mm The dimension depends on the transformer to be installed.	variable size: 190 - 475 mm The dimension depends on the transformer to be installed.	variable size: 210 - 480 mm The dimension depends on the transformer to be installed.	variable size: 220 - 625 mm The dimension depends on the transformer to be installed.	variable size: 230 - 685 mm The dimension depends on the transformer to be installed.	variable size: 290 - 740 mm The dimension depends on the transformer to be installed.
Order numbers						
Order Number	**BGE-050**	**BGE-065**	**BGE-070**	**BGE-080**	**BGE-085**	**BGE-095**
Terminal and mounting						
Cable glanding type	2 x M16 - M63	2 x M16 - M63	2 x M16 - M63	2 x M16 - M63	2 x M16 - M63	2 Universal entries
Cable glanding Ø	5 - 44 mm	5 - 44 mm	5 - 44 mm	5 - 44 mm	5 - 44 mm	30 - 66 mm
Measures and weights						
Effective inside dimension (W)	397 mm	547 mm	597 mm	697 mm	757 mm	847 mm
Effective inside dimension (H)	361 mm	491 mm	547 mm	595 mm	706 mm	855 mm
Effective inside dimension (D)	297 mm	322 mm	417 mm	538 mm	607 mm	707 mm
Dimension (W x H x D)	480 x 444 x 380 mm	630 x 579 x 405 mm	680 x 635 x 500 mm	780 x 703 x 620 mm	860 x 814 x 710 mm	950 x 964 x 810 mm
Weight	15 kg	19 kg	25 kg	40 kg	50 kg	60 kg
Dimension picture (in mm)	❶	❶	❶	❶	❶	❷
A	480	630	680	780	860	950
B	444	579	635	703	814	964
C	380	405	500	620	710	810
D	400	550	600	700	760	850
E	410	435	530	655	715	810
F	300	325	420	540	610	710
G	370	385	480	615	675	770
*H	135	190	210	220	230	290
J	364	494	550	603	714	964

Dimension pictures

❶



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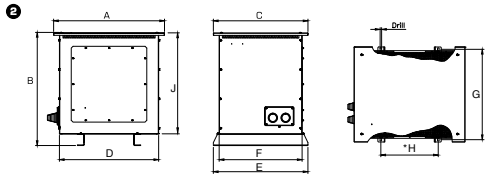


Sheet-metal enclosure
BGE

BLOCK Website

Electrical data

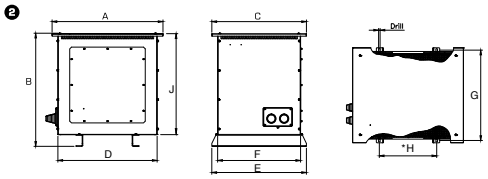
Typ	BGE-115	BGE-130	BGE-150
Operating data			
Enclosure suitable for protection index	IP 23	IP 23	IP 23
For power (single-phase)	85 kVA	210 kVA	420 kVA
For power (three-phase)	125 kVA	315 kVA	630 kVA
Notes			
*	variable size: 310 - 820 mm The dimension depends on the transformer to be installed.	variable size: 375 - 1065 mm The dimension depends on the transformer to be installed.	variable size: 365 - 1190 mm The dimension depends on the transformer to be installed.
Order numbers			
Order Number	**BGE-115**	**BGE-130**	**BGE-150**

Mechanical data

Terminal and mounting			
Cable glanding type	2 Universal entries	2 Universal entries	2 Universal entries
Cable glanding Ø	30 - 66 mm	30 - 66 mm	30 - 66 mm
Measures and weights			
Effective inside dimension (W)	1032 mm	1176 mm	1356 mm
Effective inside dimension (H)	967 mm	1116 mm	1216 mm
Effective inside dimension (D)	802 mm	906 mm	906 mm
Dimension (W x H x D)	1150 x 1070 x 920 mm	1310 x 1225 x 1040 mm	1490 x 1325 x 1040 mm
Weight	75 kg	125 kg	75 kg
Dimension picture (in mm)	❷	❷	❷
A	1150	1310	1490
B	1070	1225	1325
C	920	1040	1040
D	1035	1180	1360
E	910	1030	1030
F	805	910	910
G	870	990	990
*H	310	375	365
J	970	1125	1125

Dimension pictures

❷



Sheet-metal enclosure
BGUK

BLOCK Website

General Data

- For Power 63 - 25000 VA
- Degree of protection IP 20 - IP 23
- For wall mounting (BGUK 1 - BGUK 3)
- For wall and floor mounting (BGUK 10 - BGUK 60)

Advantages

- Integrated rail system for the installation of different product sizes (BGUK 30 - BGUK 60)
- Excellent corrosion protection and high abrasion resistance through powder-coated surface RAL 5008
- Ventilation openings for optimized cooling
- Faceplate without cooling fins for individual connection options (BGUK 10 - 60)
- Integrated crane eyes
- Optionally available in degree of protection IP 54

Applications

Universal metal enclosure with cooling fins for degree of protection IP20/IP23

Sheet-metal enclosure
BGUK

BLOCK Website

Electrical data

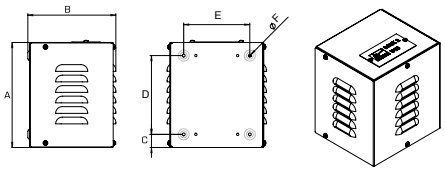
Typ	BGUK 1	BGUK 2	BGUK 3	BGUK 10	BGUK 20	BGUK 30
Operating data						
For power (single-phase)	63 VA	250 VA	500 VA	1600 VA	2500 VA	5000 VA
For power (three-phase)	100 VA	160 VA	400 VA	750 VA	1500 VA	3000 VA
Max. Power loos (at 40 °C ambient temperature)	17 W	17 W	48 W	110 W	240 W	260 W
Enclosure suitable for protection index	IP 20	IP 20	IP 20	IP 23	IP 23	IP 23
Order numbers						
Order Number	**BGUK 1**	**BGUK 2**	**BGUK 3**	**BGUK 10**	**BGUK 20**	**BGUK 30**

Mechanical data

Terminal and mounting						
Floor mounting	-	-	-	✔	✔	✔
Wall mounting	✔	✔	✔	✔	✔	✔
Cable glanding type	2x PG 11	2x PG 11	2x PG 11	2x M 25	2x M 25	2x M 25
Cable glanding Ø	5 - 10 mm	5 - 10 mm	5 - 10 mm	9 - 14 mm	9 - 14 mm	9 - 14 mm
Measures and weights						
Dimension (W x H x D)	140 x 150 x 130 mm	190 x 200 x 170 mm	230 x 250 x 210 mm	320 x 250 x 195 mm	420 x 322 x 230 mm	470 x 423 x 265 mm
Weight	1.5 kg	2.7 kg	4.0 kg	7.0 kg	12.0 kg	16.0 kg
Effective inside dimension (W)	120 mm	170 mm	210 mm	235 mm	305 mm	305 mm
Effective inside dimension (D)	115 mm	155 mm	195 mm	155 mm	185 mm	185 mm
Effective inside dimension (H)	120 mm	170 mm	220 mm	220 mm	290 mm	370 mm
Fixing hole Ø	5.5 mm	5.5 mm	5.5 mm	9 mm	9 mm	11 x 14 mm
Accessory						
Front plate (optional)	-	-	-	BGUKF 10	BGUKF 20	BGUKF 30
Dimension picture (in mm)	❶	❶	❶	❷	❷	❷
A	150	200	250	250	322	422.5
B	130	168.5	208.5	195	230	265
C	25	25	25	261	360	465
D	100	150	200	320	420	470
E	76.6	126.6	166.6	304	400	441.5
F	4.5	4.5	4.5	9	9	11
G	-	-	-	130	160	200

Dimension pictures

❶



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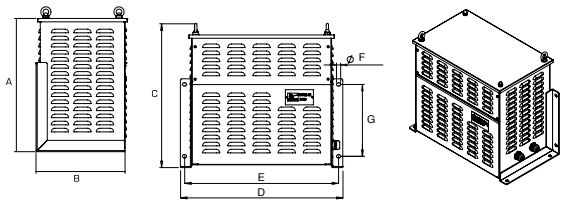


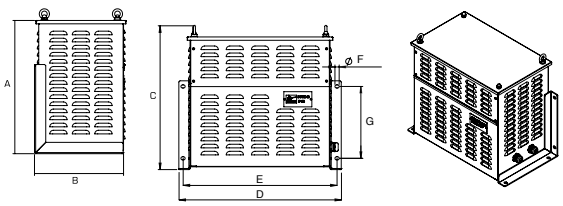
Sheet-metal enclosure
BGUK

BLOCK Website

Typ	BGUK 40	BGUK 50	BGUK 60
Operating data			
For power (single-phase)	10000 VA	15000 VA	25000 VA
For power (three-phase)	6300 VA	15000 VA	25000 VA
Max. Power loos (at 40 °C ambient temperature)	340 W	760 W	950 W
Enclosure suitable for protection index	IP 23	IP 23	IP 23
Order numbers			
Order Number	**BGUK 40**	**BGUK 50**	**BGUK 60**
Terminal and mounting			
Floor mounting	✔	✔	✔
Wall mounting	✔	✔	✔
Cable glanding type	2x M 32	2x M 40	2 x M 50
Cable glanding Ø	13 - 17 mm	17 - 24 mm	23 - 32 mm
Measures and weights			
Dimension (W x H x D)	580 x 472 x 325 mm	700 x 572 x 420 mm	950 x 744 x 570 mm
Weight	22.0 kg	32.0 kg	65.0 kg
Effective inside dimension (W)	455 mm	555 mm	805 mm
Effective inside dimension (D)	275 mm	375 mm	525 mm
Effective inside dimension (H)	425 mm	520 mm	690 mm
Fixing hole Ø	11 x 14 mm	13 x 17 mm	13 x 17 mm
Accessory			
Front plate (optional)	BGUKF 40	BGUKF 50	BGUKF 60
Dimension picture (in mm)	❷	❷	❷
A	471.5	572	743.5
B	325	420	570
C	510	620	790
D	580	700	950
E	550	660	910
F	11	13	13
G	255	325	475

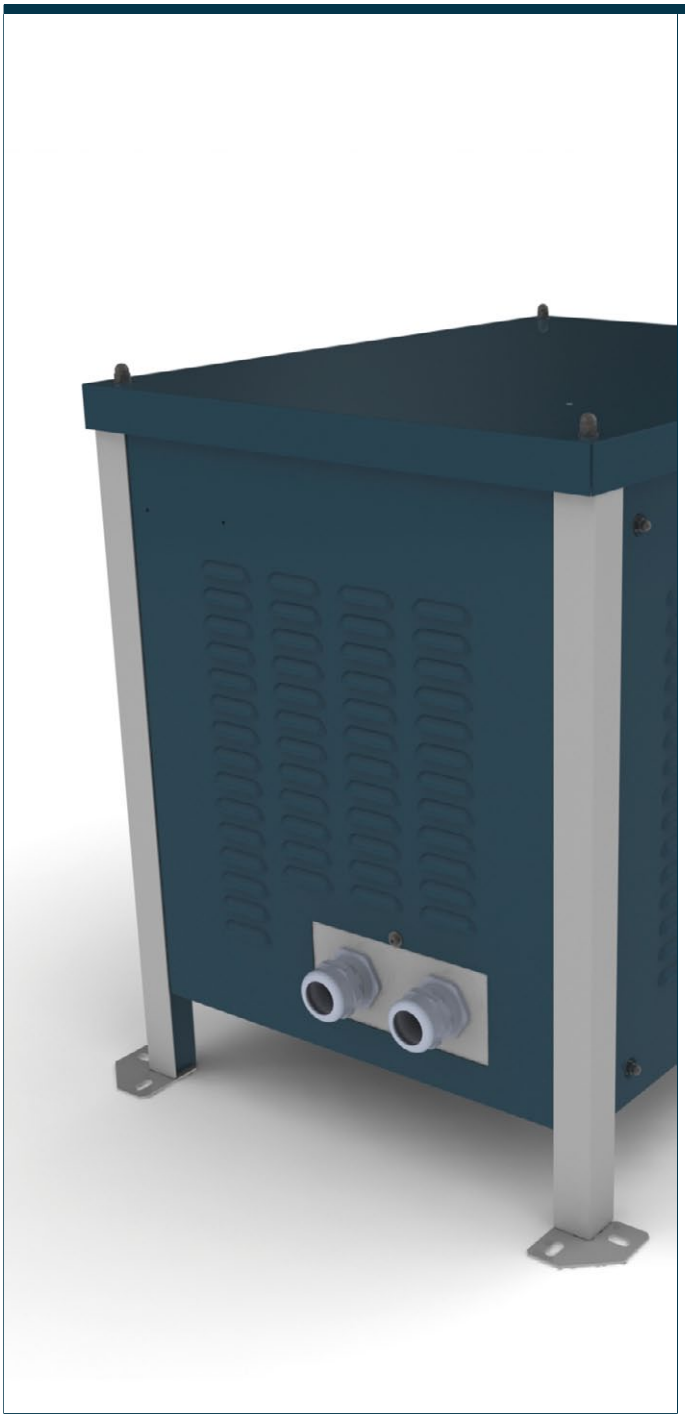
Dimension pictures

❷



Sheet-metal enclosure
BG

BLOCK Website



General Data

- Degree of protection IP 23
- For floor mounting

Advantages

- Integrated rail system for the installation of different product sizes
- Excellent corrosion protection and high abrasion resistance through powder-coated surface RAL 5008/9006
- Integrated crane eyes
- With cooling fins for optimal heat extraction
- Optionally available in degree of protection IP 54

Applications

Universal metal enclosure for degree of protection IP23

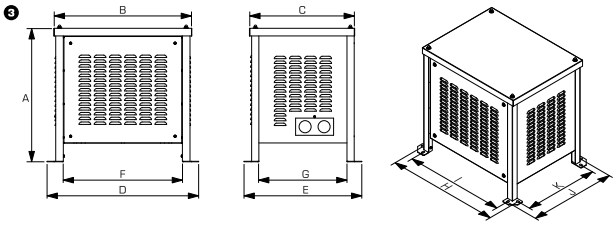
Sheet-metal enclosure
BG

BLOCK Website

Typ	BG 240	BG 270	BG 300	BG 450
Operating data				
Enclosure suitable for protection index	IP 23	IP 23	IP 23	IP 23
Max. Power loos (at 40 °C ambient temperature)	800 W	1200 W	1700 W	2500 W
For power (single-phase)	17 kVA	36 kVA	53 kVA	100 kVA
For power (three-phase)	25 kVA	60 kVA	80 kVA	150 kVA
Order numbers				
Order Number	**BG 240**	**BG 270**	**BG 300**	**BG 450**
Terminal and mounting				
Cable glanding type	2 x M50	2 x M63	2 Universal entries	2 Universal entries
Cable glanding Ø	23 - 32 mm	37 - 44 mm	30 - 66 mm	30 - 66 mm
Measures and weights				
Effective inside dimension (W)	560 mm	670 mm	735 mm	1170 mm
Effective inside dimension (H)	700 mm	760 mm	850 mm	980 mm
Effective inside dimension (D)	480 mm	550 mm	650 mm	850 mm
Fixing hole Ø	11 x 22 mm	11 x 22 mm	11 x 22 mm	11 x 22 mm
Dimension (W x H x D)	798 x 699 x 620 mm	858 x 809 x 690 mm	940 x 898 x 792 mm	1260 x 1141 x 991 mm
Weight	45 kg	60 kg	110 kg	160 kg
Dimension picture (in mm)	❸	❸	❹	❹
A	698.5	809	898	1140.5
B	726	786	878	1198
C	554	615	716	916
D	798	858	940	1260
E	620	690	792	991
F	627	687	699	1019
G	464	534	610	809
H	760	820	904	1224
I	676	736	779	1099
J	582	652	756	955
K	502	572	660.5	859.5

Dimension pictures

❸



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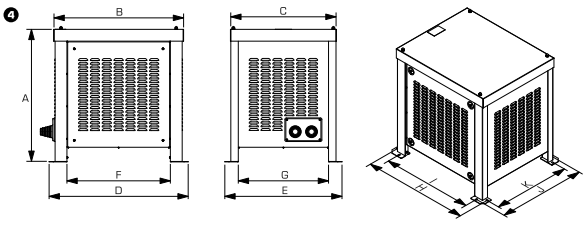


TEX-E - Triple insulated copper wire
CU-TIW

BLOCK Website

General Data

TIW - Triple insulated wire
Temperature class: E 120 °C (UL: 130 °C)
Operating voltage max. 1000 Vrms
Voltage resistance: 3kV AC 1min
UL listed (E206440)
Weight per bobbin: 100 g

Advantages

No additional insulation between primary and secondary is necessary
Solderable without prior stripping

Applications

TEX-E wires are used as insulated wires in switching inductive components.Please consider the relevant standards.

TEX-E - Triple insulated copper wire
CU-TIW

BLOCK Website

Mechanical data 30

Typ	Resistance	Heat resistance	Wire diameter	Tolerance	Major diameter Ø (max.)	Length m (min.)	Weight	Weight
CU-TIW 100/0,20	607.600 Ω/km	120 °C (Cl.E), UL: 130 °C	0.20 mm	±0.008 mm	0.417 mm	226,1	0.10 kg	0.398 kg/km
CU-TIW 100/0,25	382.500 Ω/km	120 °C (Cl.E), UL: 130 °C	0.25 mm	±0.008 mm	0.467 mm	156,5	0.10 kg	0.575 kg/km
CU-TIW 100/0,30	262.900 Ω/km	120 °C (Cl.E), UL: 130 °C	0.30 mm	±0.010 mm	0.520 mm	114,5	0.10 kg	0.786 kg/km
CU-TIW 100/0,40	145.300 Ω/km	120 °C (Cl.E), UL: 130 °C	0.40 mm	±0.010 mm	0.625 mm	68,4	0.10 kg	1.316 kg/km
CU-TIW 100/0,50	91.430 Ω/km	120 °C (Cl.E), UL: 130 °C	0.50 mm	±0.010 mm	0.725 mm	45,3	0.10 kg	1.985 kg/km
CU-TIW 100/0,60	65.260 Ω/km	120 °C (Cl.E), UL: 130 °C	0.60 mm	±0.020 mm	0.825 mm	32,2	0.10 kg	2.793 kg/km
CU-TIW 100/0,75	41.190 Ω/km	120 °C (Cl.E), UL: 130 °C	0.75 mm	±0.020 mm	0.975 mm	21,1	0.10 kg	4.267 kg/km
CU-TIW 100/0,90	28.350 Ω/km	120 °C (Cl.E), UL: 130 °C	0.90 mm	±0.020 mm	1.130 mm	14,9	0.10 kg	6.056 kg/km

Copper wire tin-plated
CU-V

BLOCK Website

General Data

- Copper wire of E-Cu58
- Tin coating nom. 1 µm
- Wire diameter 0.2 - 1.5 mm

Advantages

- With galvanic tin plating
- Tin plating in compliance with DIN 40500
- Solderable

Applications

Copper wire for wiring of circuits as well as connecting wire for components

Copper wire tin-plated
CU-V

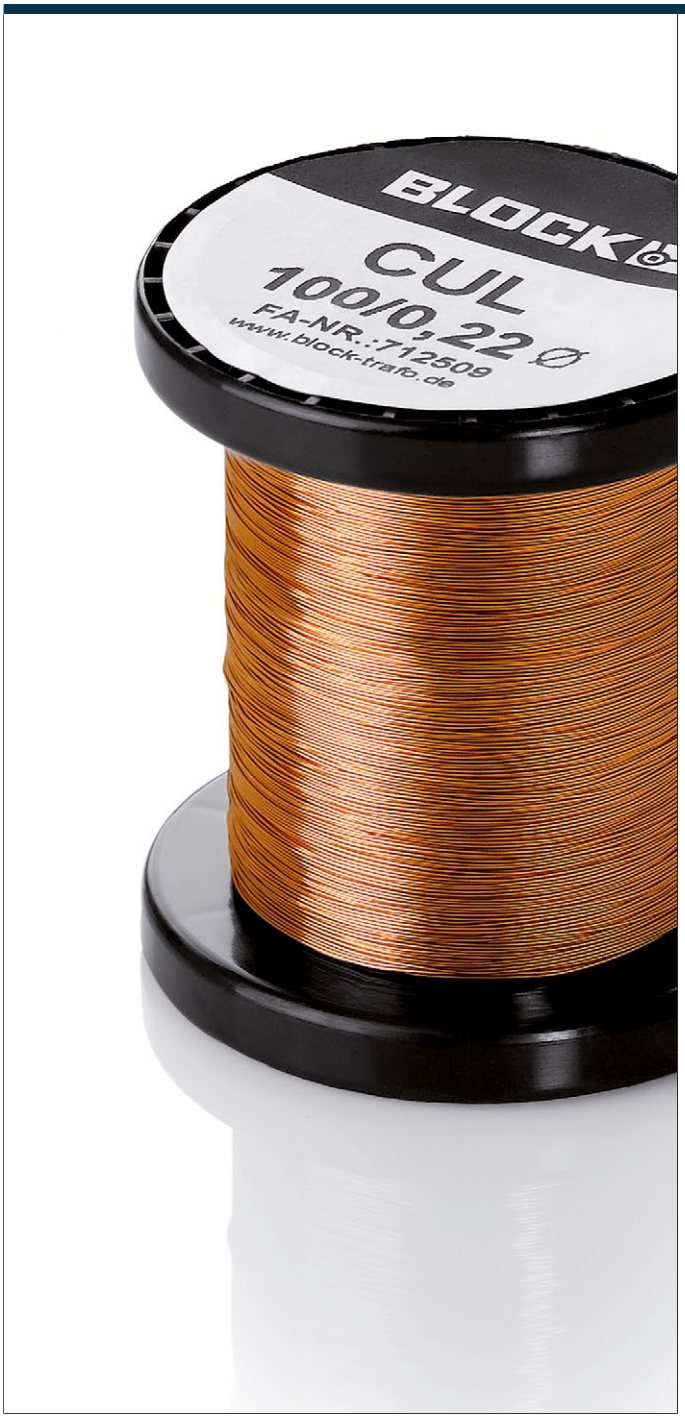
BLOCK Website

30 Mechanical data

Typ	Resistance	Wire diameter	Length m (min.)	Weight
CU-V 100/0,20	0.549 Ω/m	0.20 mm	260	0.10 kg
CU-V 100/0,40	0.137 Ω/m	0.40 mm	71	0.10 kg
CU-V 100/0,50	0.088 Ω/m	0.50 mm	46	0.10 kg
CU-V 100/0,80	0.034 Ω/m	0.80 mm	17	0.10 kg
CU-V 100/1,00	0.022 Ω/m	1.00 mm	11	0.10 kg
CU-V 100/1,50	0.001 Ω/m	1.50 mm	5	0.10 kg

Enamelled copper wire
CUL

BLOCK Website



General Data

- Current rating 0.02 - 11.5 A
- Long-term thermal resistance 150 °C (class F)
- May be tinned >350 °C
- Wire diameter 0.08 - 2 mm

Advantages

- Insulating varnish basis min, polyurethane, mod.
- Grade 1
- TJ min. 155 °C
- Solderable

Applications

Enamelled copper wire for the production of coils and windings and for general laboratory needs.Please consider the relevant standards.

Enamelled copper wire
CUL

BLOCK Website

Mechanical data 30

Typ	Current rating	Heat resistance	Insulating varnish	Tin-plate	Wire diameter	Weight	Length m (min.)
CUL 50/0,08	0.02 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	0.08 mm	0.05 kg	856
CUL 100/0,10	0.03 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	0.10 mm	0.10 kg	1144
CUL 100/0,15	0.06 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	0.15 mm	0.10 kg	509
CUL 100/0,22	0.14 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	0.22 mm	0.10 kg	215
CUL 100/0,28	0.22 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	0.28 mm	0.10 kg	140
CUL 100/0,35	0.35 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	0.35 mm	0.10 kg	87
CUL 100/0,40	0.45 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	0.40 mm	0.10 kg	69
CUL 100/0,50	0.70 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	0.50 mm	0.10 kg	44
CUL 100/0,63	1.00 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	0.63 mm	0.10 kg	28
CUL 100/0,75	1.55 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	0.75 mm	0.10 kg	20
CUL 100/0,85	2.00 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	0.85 mm	0.10 kg	15
CUL 100/1,00	2.80 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	1.00 mm	0.10 kg	11
CUL 100/1,12	3.50 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	1.12 mm	0.10 kg	9
CUL 200/0,10	0.03 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	0.10 mm	0.20 kg	2289
CUL 200/0,15	0.06 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	0.15 mm	0.20 kg	1017
CUL 200/0,22	0.14 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	0.22 mm	0.20 kg	429
CUL 200/0,28	0.22 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	0.28 mm	0.20 kg	280
CUL 200/0,35	0.35 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	0.35 mm	0.20 kg	175
CUL 200/0,40	0.45 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	0.40 mm	0.20 kg	138
CUL 200/0,50	0.70 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	0.50 mm	0.20 kg	88
CUL 200/0,63	1.00 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	0.63 mm	0.20 kg	56
CUL 200/0,75	1.55 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	0.75 mm	0.20 kg	40
CUL 200/0,85	2.00 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	0.85 mm	0.20 kg	31
CUL 200/1,00	2.80 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	1.00 mm	0.20 kg	22
CUL 200/1,12	3.50 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	1.12 mm	0.20 kg	18
CUL 500/0,40	0.45 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	0.40 mm	0.50 kg	345
CUL 500/0,50	0.70 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	0.50 mm	0.50 kg	221
CUL 500/0,63	1.00 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	0.63 mm	0.50 kg	140
CUL 500/0,75	1.55 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	0.75 mm	0.50 kg	99
CUL 500/0,85	2.00 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	0.85 mm	0.50 kg	77
CUL 500/1,00	2.80 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	1.00 mm	0.50 kg	56
CUL 500/1,12	3.50 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	1.12 mm	0.50 kg	44
CUL 500/1,32	5.00 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	1.32 mm	0.50 kg	32
CUL 500/1,50	6.50 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	1.50 mm	0.50 kg	25
CUL 500/1,80	9.50 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	1.80 mm	0.50 kg	17
CUL 500/2,00	11.50 A	155 °C (CL.F)	min. Polyurethan, mod.	>350 °C	2.00 mm	0.50 kg	14

Stranded copper litz wire
CLI

BLOCK Website

General Data

- Current rating 0.42 - 3.36 A
- Long-term thermal resistance 130 °C (class B)
- May be tinned >350 °C
- Wire diameter 15 x 0.1 - 120 x 0.1 mm

Advantages

- Insulating varnish basis polyurethane, mod.
- Grade 1
- TJ min. 130 °C
- Solderable

Applications

Stranded radio frequency copper litz wire for the production of coils and windings in the radio frequency range and for general laboratory needs.Please consider the relevant standards.

Stranded copper litz wire
CLI

BLOCK Website

Mechanical data 30

Typ	Current rating	Heat resistance	Insulating varnish	Tin-plate	Eff. cross section	Weight	Cu-Weight
CLI 200/15	0.42 A	130 °C (Kl.B)	Polyurethane, mod.	>350 °C	0.118 mm²	0.20 kg	0.20 kg
CLI 200/30	0.84 A	130 °C (Kl.B)	Polyurethane, mod.	>350 °C	0.236 mm²	0.20 kg	0.20 kg
CLI 200/60	1.68 A	130 °C (Kl.B)	Polyurethane, mod.	>350 °C	0.471 mm²	0.20 kg	0.20 kg
CLI 200/90	2.52 A	130 °C (Kl.B)	Polyurethane, mod.	>350 °C	0.707 mm²	0.20 kg	0.20 kg
CLI 200/120	3.36 A	130 °C (Kl.B)	Polyurethane, mod.	>350 °C	0.943 mm²	0.20 kg	0.20 kg

Braided copper litz wire
CLI-S

BLOCK Website

General Data

- Current rating 0.28 - 3.36 A
- Long-term thermal resistance 155 °C (class F)
- May be tinned >350 °C
- Wire diameter 10 x 0.1 - 120 x 0.1 mm

Advantages

- Insulating varnish basis polyurethane, mod.
- Grade 1
- TJ min. 155 °C
- Solderable

Applications

Braided insulated radio frequency copper litz wire for the production of coils and windings in the radio frequency range and for general laboratory needs. The HF-litz wire consists of twisted, stranded wires with a common textile wound.Please consider the relevant standards.

Braided copper litz wire
CLI-S

BLOCK Website

Mechanical data

Typ	Current rating	Heat resistance	Insulating varnish	Tin-plate	Eff. cross section	Weight	Major diameter Ø (max.)
CLI-S 100/10	0.28 A	155 °C (Kl.F)	Polyurethane, mod.	>350 °C	0.079 mm²	0.11 kg	0.502 mm
CLI-S 100/20	0.56 A	155 °C (Kl.F)	Polyurethane, mod.	>350 °C	0.157 mm²	0.11 kg	0.705 mm
CLI-S 100/25	0.70 A	155 °C (Kl.F)	Polyurethane, mod.	>350 °C	0.196 mm²	0.11 kg	0.789 mm
CLI-S 100/30	0.84 A	155 °C (Kl.F)	Polyurethane, mod.	>350 °C	0.236 mm²	0.11 kg	0.860 mm
CLI-S 100/45	1.26 A	155 °C (Kl.F)	Polyurethane, mod.	>350 °C	0.353 mm²	0.11 kg	1.045 mm
CLI-S 100/60	1.68 A	155 °C (Kl.F)	Polyurethane, mod.	>350 °C	0.471 mm²	0.11 kg	1.200 mm
CLI-S 100/75	2.10 A	155 °C (Kl.F)	Polyurethane, mod.	>350 °C	0.589 mm²	0.11 kg	1.337 mm
CLI-S 100/90	2.52 A	155 °C (Kl.F)	Polyurethane, mod.	>350 °C	0.707 mm²	0.11 kg	1.461 mm
CLI-S 100/120	3.36 A	155 °C (Kl.F)	Polyurethane, mod.	>350 °C	0.943 mm²	0.11 kg	1.681 mm

Resistance wire
RD

BLOCK Website

General Data

Resistance alloy as specified in DIN 46 461 (CuNi44)
Specific electrical resistance 0.49 (Ωx mm²)/m)
Average temperature constant of the electrical resistor at 20 °C = 0.00004-0.00008
Average linear thermal expansion coefficient between 20 - 100 °C = 13.5 x 10-6
Melting temperature 1220-1270 °C
Maximum permissible wire temperature up to 600 °C

Advantages

Constant in specific resistance
Influence of the temperature or inherent heating on the resistance value practically insignificant (max. 0.8 % at 100 °C temperature rise)
Firmly adhering surface oxide coating withstands any temperature change and protects against further oxidation under continuous load
Very easy to machine thanks to softness and malleability
Suitable for soft soldering, hard soldering or welding

Applications

Resistance wire for the production of technical resistances, shunts and for general laboratory needs.

Resistance wire
RD

BLOCK Website

Electrical data

Typ	RD 100/0,1	RD 100/0,2	RD 100/0,3	RD 100/0,4	RD 100/0,6	RD 100/0,8
Operating data						
Resistance	62.400 Ω/m	15.600 Ω/m	6.930 Ω/m	3.900 Ω/m	1.730 Ω/m	0.975 Ω/m
Specific electrical resistance	0.49 (Ω x mm²)/m	0.49 (Ω x mm²)/m	0.49 (Ω x mm²)/m	0.49 (Ω x mm²)/m	0.49 (Ω x mm²)/m	0.49 (Ω x mm²)/m
Current intensity for wire temperature (100°C)	0.237 A	0.560 A	0.940 A	1.340 A	2.210 A	3.190 A
Current intensity for wire temperature (200°C)	0.396 A	0.940 A	1.570 A	2.240 A	3.700 A	5.330 A
Current intensity for wire temperature (300°C)	0.537 A	1.280 A	2.120 A	3.080 A	5.000 A	7.210 A

Electrical data

Typ	RD 100/1,0	RD 100/1,2	RD 100/1,5	RD 100/2,0	RD 100/3,0	RD 100/4,0
Operating data						
Resistance	0.624 Ω/m	0.433 Ω/m	0.277 Ω/m	0.156 Ω/m	0.069 Ω/m	0.039 Ω/m
Specific electrical resistance	0.49 (Ω x mm²)/m	0.49 (Ω x mm²)/m	0.49 (Ω x mm²)/m	0.49 (Ω x mm²)/m	0.49 (Ω x mm²)/m	0.49 (Ω x mm²)/m
Current intensity for wire temperature (100°C)	4.220 A	5.300 A	7.000 A	10.000 A	16.600 A	23.900 A
Current intensity for wire temperature (200°C)	7.050 A	8.850 A	11.700 A	16.800 A	27.800 A	40.000 A
Current intensity for wire temperature (300°C)	9.550 A	12.000 A	15.800 A	22.700 A	37.700 A	54.000 A

Resistance wire
RD

BLOCK Website

Mechanical data 30

Typ	highest wire temperature	Mean linear coefficient of thermal expansion between 20 - 100 °C	Mean temperature coefficient of resistance at 20 °C	Melting point	Wire diameter	Weight	Remark
RD 100/0,1	to 600 °C	13.5x10-6	0.00004-0.00008	1220-1270 °C	0.10 mm	0.10 kg	The specified wire temperatures apply for blank Isotan wires, especially unclamped in still air. Oxidized wires have a higher radiated temperature. The current load precisely required for a defined temperature can ultimately only be explicitly determined for the relations and requirements on the customer side for the specified intended use.
RD 100/0,2	to 600 °C	13.5x10-6	0.00004-0.00008	1220-1270 °C	0.20 mm	0.10 kg	The specified wire temperatures apply for blank Isotan wires, especially unclamped in still air. Oxidized wires have a higher radiated temperature. The current load precisely required for a defined temperature can ultimately only be explicitly determined for the relations and requirements on the customer side for the specified intended use.
RD 100/0,3	to 600 °C	13.5x10-6	0.00004-0.00008	1220-1270 °C	0.30 mm	0.10 kg	The specified wire temperatures apply for blank Isotan wires, especially unclamped in still air. Oxidized wires have a higher radiated temperature. The current load precisely required for a defined temperature can ultimately only be explicitly determined for the relations and requirements on the customer side for the specified intended use.
RD 100/0,4	to 600 °C	13.5x10-6	0.00004-0.00008	1220-1270 °C	0.40 mm	0.10 kg	The specified wire temperatures apply for blank Isotan wires, especially unclamped in still air. Oxidized wires have a higher radiated temperature. The current load precisely required for a defined temperature can ultimately only be explicitly determined for the relations and requirements on the customer side for the specified intended use.
RD 100/0,6	to 600 °C	13.5x10-6	0.00004-0.00008	1220-1270 °C	0.60 mm	0.10 kg	The specified wire temperatures apply for blank Isotan wires, especially unclamped in still air. Oxidized wires have a higher radiated temperature. The current load precisely required for a defined temperature can ultimately only be explicitly determined for the relations and requirements on the customer side for the specified intended use.
RD 100/0,8	to 600 °C	13.5x10-6	0.00004-0.00008	1220-1270 °C	0.80 mm	0.10 kg	The specified wire temperatures apply for blank Isotan wires, especially unclamped in still air. Oxidized wires have a higher radiated temperature. The current load precisely required for a defined temperature can ultimately only be explicitly determined for the relations and requirements on the customer side for the specified intended use.

Resistance wire
RD

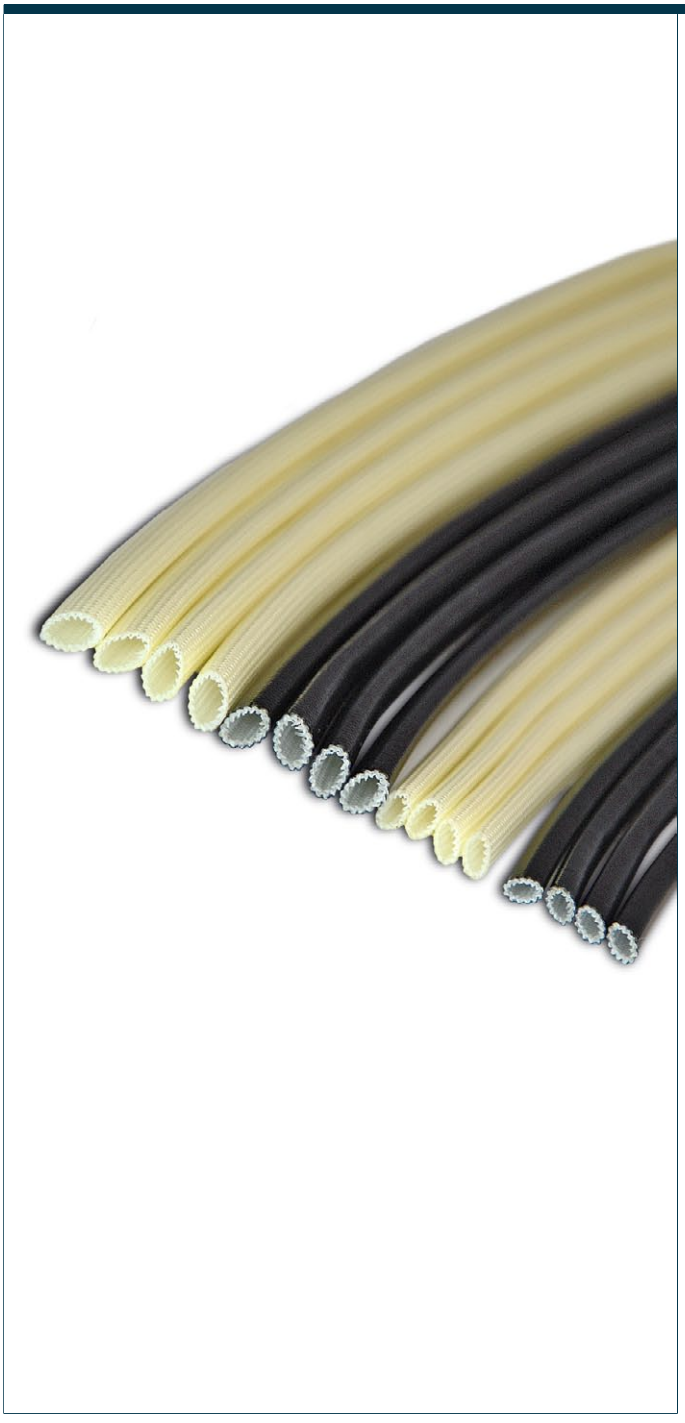
BLOCK Website

Mechanical data 30

Typ	highest wire temperature	Mean linear coefficient of thermal expansion between 20 - 100 °C	Mean temperature coefficient of resistance at 20 °C	Melting point	Wire diameter	Weight	Remark
RD 100/1,0	to 600 °C	13.5x10-6	0.00004-0.00008	1220-1270 °C	1.00 mm	0.10 kg	The specified wire temperatures apply for blank Isotan wires, especially unclamped in still air. Oxidized wires have a higher radiated temperature. The current load precisely required for a defined temperature can ultimately only be explicitly determined for the relations and requirements on the customer side for the specified intended use.
RD 100/1,2	to 600 °C	13.5x10-6	0.00004-0.00008	1220-1270 °C	1.20 mm	0.10 kg	The specified wire temperatures apply for blank Isotan wires, especially unclamped in still air. Oxidized wires have a higher radiated temperature. The current load precisely required for a defined temperature can ultimately only be explicitly determined for the relations and requirements on the customer side for the specified intended use.
RD 100/1,5	to 600 °C	13.5x10-6	0.00004-0.00008	1220-1270 °C	1.50 mm	0.10 kg	The specified wire temperatures apply for blank Isotan wires, especially unclamped in still air. Oxidized wires have a higher radiated temperature. The current load precisely required for a defined temperature can ultimately only be explicitly determined for the relations and requirements on the customer side for the specified intended use.
RD 100/2,0	to 600 °C	13.5x10-6	0.00004-0.00008	1220-1270 °C	2.00 mm	0.10 kg	The specified wire temperatures apply for blank Isotan wires, especially unclamped in still air. Oxidized wires have a higher radiated temperature. The current load precisely required for a defined temperature can ultimately only be explicitly determined for the relations and requirements on the customer side for the specified intended use.
RD 100/3,0	to 600 °C	13.5x10-6	0.00004-0.00008	1220-1270 °C	3.00 mm	0.10 kg	The specified wire temperatures apply for blank Isotan wires, especially unclamped in still air. Oxidized wires have a higher radiated temperature. The current load precisely required for a defined temperature can ultimately only be explicitly determined for the relations and requirements on the customer side for the specified intended use.
RD 100/4,0	to 600 °C	13.5x10-6	0.00004-0.00008	1220-1270 °C	4.00 mm	0.10 kg	The specified wire temperatures apply for blank Isotan wires, especially unclamped in still air. Oxidized wires have a higher radiated temperature. The current load precisely required for a defined temperature can ultimately only be explicitly determined for the relations and requirements on the customer side for the specified intended use.

Fabric sleeving
SET-G

BLOCK Website



General Data

- Thermal class F (155 °C)
- Compatible with modified polyester, acrylic, epoxy, phenolic and formvar wire enamels
- According to UL #E63450, #E53690, CSA file #LR58486

Advantages

- Without loss of any electrical or physical properties (up to 155 °C)
- Resistant to most acids, organic solvents, oils and water
- Fair resistance to alkalies

Applications

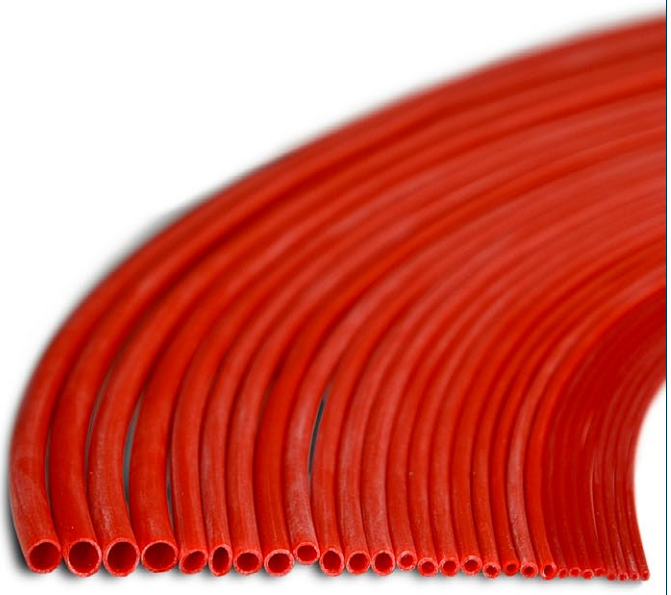
The fabric sleeving is used to insulate leads and crossovers in fractional and integral horsepower motors. They also are used in dry and oil-filled transformers, generators and other moisture-sensitive equipment, as well as in home appliances, lighting fixtures, instrument circuits and controls. Additional uses include switchgear, breaker panels, welding equipment and other commercial apparatus subjected to continuous operating temperatures of 155°C, particularly those requiring insulation system compatibility.

Mechanical data

Typ	Material	Heat resistance	Inner diameter Ø	Remark
SET-G-0,5-2,8	Fiberglass, Acryl	155 °C	0.5 - 2.8 mm	PU 24
SET-G-2,9-5,7	Fiberglass, Acryl	155 °C	2.9 - 5.7 mm	PU 16

Silicone sleeving
SET-SIL

BLOCK Website



General Data

- Permanent temperature resistance class H (180 °C)
- Application range -60 °C to 200 °C
- According to IEC 60684-123/124, DIN 40628, RoHS compliant according to 2011/65 EC

Advantages

- Additional mechanical protection at high temperatures
- Additional electrical insulation of magnet wires and litz wires

Applications

The silicone sleeving is used as lightweight, additional mechanical protection for applications with very high thermal stress. Furthermore, it offers additional electrical insulation for cables and enamelled copper wires in electric machines and transformers as well as in certain electronic applications.

Mechanical data

Typ	Material	Disruptive strength	Dielectric strength	Temperature resistance	Heat resistance	Inner diameter Ø	Remark
SET-SIL-0,5-3,5	Silicone	approx. 1 kV / 0,1 mm wall thickness	approx. 10 ^ 13 Ωx cm	-60 °C to 200 °C	200 °C	0.5 - 3.5 mm	PU 28

Heat shrinkable sleeving
SET-S

BLOCK Website

General Data

- Shrink ratio 2:1
- Operating temperature -55 °C to +135 °C
- Shrink temperature min. +90 °C
- According to E196690

Advantages

- Flame retardant, hardly inflammable
- Flexible and high-performance sleeving
- For professional use

Applications

Flexible high-performance polyolefin heat-shrinkable sleeving. SET-S is specially modified to meet international specifications for professional use.

Mechanical data

Typ	Material	Disruptive strength	Shrink ratio	Operating temperature	Shrink temperature min.	Longitudinal change	Tensile strength	Elongation at break	Inner diameter Ø	Remark
SET-S-1,6-9,5	Polyolefin, thin-walled	> 20 kV / mm	2:1	-55 °C to +135 °C	+90 °C	± 5% max.	> 10,4 MPa	>200 %	1.6 - 9.5 mm	PU 12
SET-S-12,7-76	Polyolefin, thin-walled	> 20 kV / mm	2:1	-55 °C bis +135 °C	+90 °C	± 5% max.	> 10,4 MPa	>200 %	12.7 - 76 mm	PU 5

5

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The CE marking

General note

The technical explanations contained here represent points of departure for many areas of application, a number of rules apply in addition to special and exceptional cases. The intention here is to provide a brief introduction into the complex subject field.

CE marking

EU guidelines have been issued by the Council of the European Union, based upon the Treaty for the Establishment of the European Economic Community (EEC), particularly under Article 100. These EU guidelines are for the purpose of establishing conformity among the legal and administrative regulations of the different member states of the European Union (EU) in cases where differences among national regulations lead to trade restrictions or otherwise hinder the functioning of the internal market of the EU. The guidelines are to be adopted by the national lawmakers within prescribed time periods for the respective national legal system.

The manufacturer is required to attach the EU designation to products which fall under the authority of certain EU regulations as a sign of conformity with them. The products affected are those which are covered by the guidelines made in accordance with the "New Concept" (issued 07.05.1985) which contain requirements governing the technical quality of different products.

EU guidelines are binding legal directives of the European Union. That means that the fulfillment of these requirements is a **precondition for the marketing of the products in Europe. This does not affect the rest of the world trade market.** The attachment of the EU designation confirms product conformity with the corresponding fundamental requirements of all (applicable) guidelines affecting the product. As the documentation of conformity with directives, the EU designation is solely intended for monitoring government agencies. It is, however, often misinterpreted as a "Quality Seal". Because of this, it is unfortunately often demanded in cases where there is no legal requirement for it.

For this reason, our company dispenses with any advertising display of the EU symbol in our catalogue and prospectus pages, since the placement of the EU designation on products is done solely to satisfy a legal requirement which all manufacturers and importers are obligated to adhere to.

Although the EU declaration of conformity on the part of the manufacturer is kept on file only for the purposes of the monitoring agencies (for at least 10 years following the last bringing of the product into circulation), respective copies of it can be made available to customers upon request.

The determination of which guideline(s) is (are) to be applied can be deduced from the EU Declaration of Conformity for the respective product. The directives and their changed directives most commonly applied to our company's range of products are:

1. The Low Voltage Directive (2014/35/EU) for electrical equipment to be used with a rated voltage of between 50 Vac and 1000 Vac and between 75 Vdc and 1500 Vdc.

Title: Directive of the Council for the Establishment of Conformity among Legal Directives of the Member States with respect to Electrical Equipment for Use between Certain Voltage Limits 2014/35/EU of 26. 02. 2014

Almost all of the products in our manufacturing program fall under the area of application of the Low Voltage Directive. The conformity of each piece of electrical equipment, every device, every system and every installation with the safety requirements of the directive is to be certified by

2. The EMC directive (2014/30/EU) for devices which could cause electromagnetic interference or whose operation could be impaired by this kind of interference.

Title: Directive 2014/30/EU of the European Parliament and of the Council of 26. 02. 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility.

Legal basis:
For the purpose of establishing conformity among the legal directives of the member states, the Council of the European Community issued a binding directive for its members on 03. 05. 1989, which was in turn put into effect on 09. 11. 1992 by the Federal Republic of Germany in the form of a federal law governing electromagnetic compatibility (EMVG). The Bureau of Directive for Telekommunikation und Post (RegTP) and its external offices were charged with responsibility for the implementation (monitoring) of the EMC law.

Definition, in accordance with the following extract from Article 1:
Electromagnetic compatibility is the ability of an apparatus, equipment or a system to operate satisfactorily in the electromagnetic environment without itself causing electromagnetic interference while doing so which would be unacceptable to any of the devices, installations or systems present in this environment.

Area of application, in accordance with the following extract from Article 2:
This directive applies to all devices which could cause electromagnetic interference or whose operation could be impaired by such interference.

Note: "Apparatus" (in accordance with Article 3) means any finished appliance or combination thereof made available on the market as a single functional unit, intended for the end-user and liable to generate electromagnetic disturbance, or the performance of which is liable to be affected by such disturbance.

Fundamental procedural methods:
Starting 01. 01. 1992 (with transition grace period until 31. 12. 1995), only those electrical and electronic devices, systems and installations may be brought into circulation or put into operation in the European Union which are in conformance with the established EMC safety requirements contained in the directive. The conformity of every device, every system and every installation with the safety requirements of the directive is to be certified by the manufacturer by means of an EU Declaration of Conformity and to mark the product with the EU Sign of Conformity.

Modules which are not required to carry the designation of conformity:
For the purposes of the EMC directive, a module is defined as any element which is used for installation in a device but which possesses no function of its own and which is not intended for use by an ultimate consumer. In accordance with Article 1 of the EMC directive, modules are therefore not devices and from the onset do not fall under the jurisdiction of this directive.

Electromagnetic compatibility

Definition

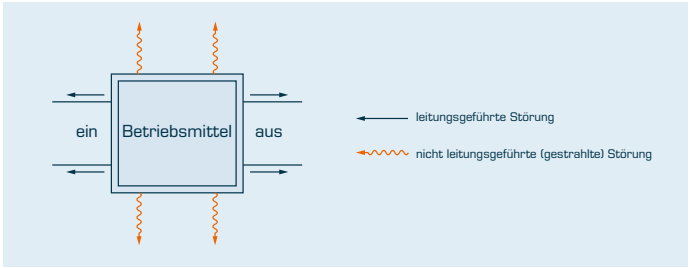
According to the definition contained in the EMC regulation 2014/30/EU, electromagnetic compatibility is the capability of a device to be able to work satisfactorily in the electromagnetic environment without itself causing electromagnetic interference while doing so which would be unacceptable to any of the devices, installations or systems present in this environment.

A distinction is made between
1. Electromagnetic interference (EMS)
2. Electromagnetic immunity (EMI)

Electromagnetic interference (EMS)

Electromagnetic interference (emitted interference) is every kind of electromagnetic event (e.g. noise, unwanted signal), which could impair the functioning of a device, an installation or a system.
The basic specification for emitted interference is

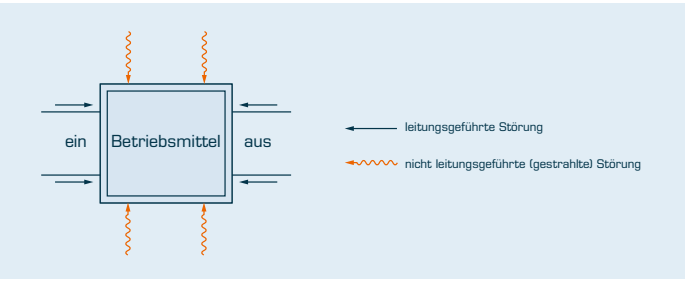
- EN 61000-6-3 (Residential, business, trade areas and small-scale enterprises)
- EN 61000-6-4 (Industrial area)



Electromagnetic immunity (EMI)

Test standards are:

- EN 61000-4-2
  Electrostatic discharge immunity test
- EN 61000-4-3
  Radiated, radio-frequency, electromagnetic field immunity test
- EN 61000-4-4
  Electrical fast transient/burst immunity test
- EN 61000-4-5
  Surge immunity test
- EN 61000-4-6
  Immunity to conducted disturbances, induced by radio-frequency fields
- EN 61000-4-8
  Power frequency magnetic field immunity test
- EN 61000-4-11
  Voltage dips, short interruptions and voltage variations immunity tests

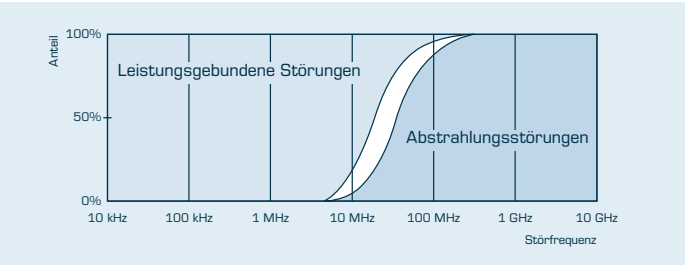


Shielding from interference

There are many opportunities for interference to be transmitted:

- by means of metallic contact as electrical current and voltage, carried by power mains
- as a magnetic field
- as an electrical field
- as an electromagnetic wave or radiation

Propagation of mains borne and radiated interference generally behaves as follows:

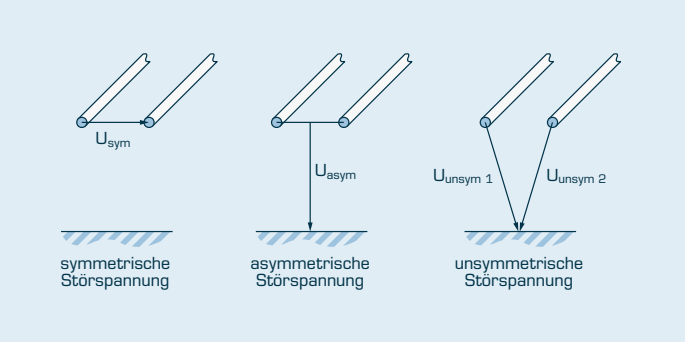


The attenuation of interference is achieved by construction which takes EMC into consideration, involving such things as low-impedance earthing, filters, shielded lines, metallic housing and spatial clearance. The EMC measures to be carried out, however, are highly dependent on the components utilised and on the operating parameters of the system, which means that it is almost impossible to make universally valid statements.

Mains borne interference

Interference voltage often occurs on electrical lines, between conductors and between conductors and the earth, in intensities which can range up to a frequency of circa 30 MHz. A distinction is made between symmetrical, asymmetrical and non-symmetrical interference voltage.

Reactors, capacitors and filters are particularly suitable for the attenuation of mains borne interference, as are – indirectly – shielded cables. As a rule, additional protection measures (radio links, varistors) are necessary against energy-rich interference, e.g. caused by lightning bolts.



EMC standards

The fundamental principles for EMC standardisation are generally compiled by

- CISPR, founded in 1934 (International Special Committee on Radio Interference, Comité international Spécial des Perturbations Radioélectriques) and
- IEC TC77, founded in 1974 (International Electrotechnical Commission Technical Committee 77, Comité d'études 77 de la Commission Electrotechnique Internationale)

in coordination with the IEC Regulation Guide 107 (EMC-Guide to the drafting of electromagnetic compatibility publications).

The purpose of Guide 107 is to ensure that identical procedures and points of view are applied during the course of EMC standardisation and to keep everything as conclusive as possible. Observations are carried out on line-borne and radiated phenomena occurring in the frequency range between 0 Hz and 400 GHz, in which electromagnetic compatibility is to be achievable.

Generally speaking, four categories of EMC standards are defined, whereby each EMC standard is, as a whole, assigned to only one of the four categories.

1. Basic publications (Basic Standards) e.g.

- IEC 61000-2, -3, -4, -5 etc.
- CISPR 11, 13, 14, 15, 16, 22

The Basic Standards can have the status of a standard or even that of a technical report. They contain the respective measuring procedures, classification of environmental conditions and testing techniques for EMC, but no measurement limiting values for individual products or product families. Constant reference is made to the Basic Standards in the basic specifications, product family standards and product standards. It should be clear from the title alone that it is a Basic Standard (Basic Norm) which is being dealt with.

2. Basic specifications (Generic Standards)

- Residential and small-scale business enterprises field:
  EN 61000-6-3 (Emitted Interference), EN 61000-6-1 (Interference Immunity)
- Industrial field:
  EN 61000-6-4 (Emitted Interference), EN 61000-6-2 (Interference Immunity)

The basic specifications are to be applied to products for which neither product family standards nor product standards exist. There is always a distinction made between the environmental conditions of industry (supplied by industrial mains) and those of residential, business and trade areas and small-scale enterprises (supplied by public electricity mains). While limited number of EMC tests specify minimum interference limit values and maximum interference emission limit values, they do not address certain product characteristics.

3. Product Family Standards, e.g.

- EN 55011 (Emitted Interference), Industrial, Scientific, Medicinal (ISM) Devices
- EN 55013 (Emitted Interference), EN 55020 (Interference Immunity), Audio, TV, Radio devices
- EN 55014 (Emitted Interference), EN 55104 (Interference Immunity), Household Appliances

The product family standards are tailored to specific product families and contain particular specifications (e.g. limit values, test design, operational criteria and criteria for complaints). Concerning measuring procedures, Basic Standards are referred to and limit values are coordinated with the basic specifications. Product family standards for EMC can exist as independent standards, but also as (autonomous) parts of standards which govern the other aspects (e.g. electrical safety) for the product family.

4. Product standards (Dedicated Product Standards), e.g.

- EN 61800-3, Frequency Converters
- EN 50199, Electric Arc Welding Devices

The product family standards are intended for special products, they enjoy the highest application priority and are therefore the only ones to be applied for ensuring the EMC of the product. In terms of the inclusion of Basic Standards and basic specifications, the rules which apply to the product family standards are the same as those for the product standards.

Classifications

Protection class

The protection class 0, I, II or III (Ref.: VDE 0140/EN 61140/IEC 61140) is a **construction feature** for the classification of electrical equipment for the purpose of security against dangerous fault or leakage currents (electrical shock), e.g.:

- Protection class 0:
  Device with basic insulation as a precaution for basic protection, but without provision for fault protection
- Protection class I:
  Device with protective conductor connection and (at least) basic insulation
- Protection class II:
  Device without protective conductor connection and double or enhanced insulation
- Protection class III:
  Device supplied with SELV (Safety Extra-Low Voltage) and in which no voltages higher than the SELV are generated.

Electrical equipment intended for installation in devices have no safety class and can only be "prepared for" one of these. Electrical equipment which has been prepared for utilisation in protection class II devices can also be utilised in protection class I devices.

Type of protection

Specification of the type of protection (Ref.: DIN VDE 0470, EN 60 529, IEC 60529) describes the **protection of electrical equipment** by means of housing, covers, enclosures and similar.

The type of protection is specified by letter symbols (IP Code), whereby the **first code number** (0 to 6) offers information concerning protection against contact and against the penetration of foreign objects. The **second code number** (0 to 8) provides information about protection against the water penetration.

Common types of protection in use:

- IP 00
  No special protection against accidental contact or against the penetration of foreign objects. No special protection against water. **Constructions of the "open design type" are manufactured for the IP 00 type of protection.**
- IP 20
  Protection against contact and against the penetration of solid foreign objects larger than ø 12 mm. No special protection against water.
- IP 23
  Protection against contact and against the penetration of solid foreign objects larger than ø 12 mm. Protection against water spray falling at any angle of up to 60° to the vertical, so that such jets will have no damaging effects.
- IP 40
  Protection against contact and against the penetration of solid foreign objects larger than ø 1 mm. No special protection against water.
- IP 44
  Protection against contact and against the penetration of solid foreign objects larger than ø 1 mm. Protection against water spray so that no spray hitting the equipment from any direction will have any damaging effect.
- IP 54
  Complete protection against contact. Protection against damaging dust deposits. While dust penetration is not completely prevented, the dust which does enter may not amount to quantities which will impair working procedures. Protection against water spray, so that no spray hitting the equipment from any direction will have any damaging effect.
- IP 65
  Complete protection against contact. Protection against dust penetration. Protection against water spray. Protection against water jets from spray nozzles directed at the equipment from all directions to the extent that no spray will have any damaging effect.
- IP 67
  Complete protection against contact. Protection against the dust penetration. Protection against the effects of temporary immersion in water. Water shall not be permitted to penetrate in a quantity which will would cause damaging effects when the housing is temporarily immersed in water under standardised pressure and time conditions.
- IP 68
  Complete protection against contact. Protection against the dust penetration. Protection against the effects of immersion in water for an indefinite time. Water shall not be permitted to penetrate in a quantity which will would cause damaging effects when the housing is immersed in water under standardised pressure conditions.

Note: The specification of the type of protection refers to the condition at the time of delivery and to the established or usual method of setting up the equipment. The type of protection can change as the result of a different setup or installation method..

Class of insulation system

The regulations (Ref.: VDE 0301/ HD 566S1/IEC 60085) in addition to (Ref.: VDE 0304/HD 611.1S1/IEC 60216) describe among other things the **thermal resistance of electrical insulation classes**. The different insulation classes are assigned temperatures in reference to their periods of thermal resistance.

Common classes of insularion systems:
A (105 °C), E (120 °C), B (130 °C), F (155 °C), H (180 °C), N (200 °C)

Unless other arrangements have been made, transformers and power reactors are designed in accordance with the specifications of the insulation material classes B, F or H.

Insulation system (EIS)

An electrical insulation system (EIS) is an insulating arrangement made up of one or more insulation materials (electrical insulation materials) which is installed together with the associated conduction parts in one piece of electrical equipment (Ref: VDE 0302 Teil 1/ EN 60505/ IEC 60505 sowie VDE 0302 Teil 11/ EN 61857-1/ IEC 61857-1). A judgement is made under thermal stresses of whether or not the **combination of insulation materials** is suitable for operation in the respective insulation material class.

Ambient air temperature for measurement

The ambient air temperature for measurement is the highest ambient air temperature at which a piece of electrical equipment or an electrical device or an installation component (e.g. transformer, reactor, filters) can be operated continuously under normal operating conditions. It is **the air temperature of the immediate surroundings**. Electrical values often refer to the ambient air temperature for measurement and they can change with different temperatures! Special attention is to be paid to the installation of components in housings with a higher type of protection. Possible deficient cooling can lead to non-authorised high temperatures in the housing. A reduction of the expected service life of the component is possible in this case (see “Insulation material class”).

The ambient air temperature for measurement is specified using a shortened notation form (Ref.: VDE* 0570, EN 61558, IEC 61558).

Example:
ta = 25 °C or ta = 40 °C

Unless other arrangements have been made, the rated ambient temperature used for the design of components intended for installation is set at 40 °C and at 25 °C for (table) devices which are to be operated independently.

*Association of german electrical engineers

Test class

The test class indicates climate category (Ref.: DIN EN 60068/EN 60068/ IEC 60068) as the key to the designation of the climatic usability of component parts.

Example:

25/085/21
25 = –25 °C, Test A: coldness, 085 = + 85 °C, Test B: dry heat,
21 = 21 days, Test Ca: moist heat constant

The individual tests are defined in different parts of the standard.

Characters and symbols

VDE 0570 Part 2–6/EN 61558-2-6/IEC 61558-2-6
Safety transformer, short-circuit proof,
double or increased insulation between PRI and SEC, PRI max. 1000 V, SEC max. 50 V AC voltage (effective value) and/or 120 V smoothed DC voltage, frequency max. 500 Hz

VDE 0570 Part 2–6/EN 61558-2-6/IEC 61558-2-6
Safety transformer, not short-circuit proof,
double or increased insulation between PRI and SEC, PRI max. 1000 V, SEC max. 50 V AC voltage (effective value) and/or 120 V smoothed DC voltage, frequency max. 500 Hz

VDE 0570 Part 2–4/EN 61558-2-4/IEC 61558-2-4
Isolating transformer, short-circuit proof,
double or increased insulation between PRI and SEC, PRI max. 1000 V, SEC max. 500 V AC voltage or 708 V smoothed DC voltage, frequency max. 500 Hz.

VDE 0570 Part 2–4/EN 61558-2-4/IEC 61558-2-4
Isolating transformer, not short-circuit proof,
double or increased insulation between PRI and SEC, PRI max. 1000 V, SEC max. 500 V AC voltage or 708 V smoothed DC voltage, frequency max. 500 Hz.

VDE 0570 Part 2–15/EN 61558-2-15/IEC 61558-2-15
Isolating transformer for supplying medical areas, not short-circuit proof, double or increased insulation between PRI and SEC; windings installed one above the other; windings-core; windings-shield; shield-core; PRI max. 1000 V, SEC max. 250 V, frequency max. 500 Hz

VDE 0570 Part 2–12/EN 61558-2-12/IEC 61558-2-12
Magnetic voltage stabiliser acting as isolating transformer, short-circuit proof, double or increased insulation between PRI and SEC, PRI max. 1000 V, SEC max. 500 V, frequency max. 500 Hz (30 kHz internally)

VDE 0570 Part 2–2/EN 61558-2-2/IEC 61558-2-2
Control transformer, not short-circuit proof, basic insulation between PRI and SEC, PRI max. 1000 V, SEC max. 1000 V AC voltage or 1415 V smoothed DC voltage, frequency max. 500 Hz

VDE 0570 Part 2–1/EN 61558-2-1/IEC 61558-2-1
Mains transformer, not short-circuit proof, basic insulation between PRI and SEC, PRI max. 1000 V, SEC max. 1000 V AC voltage or 1415 V smoothed DC voltage, frequency max. 500 Hz

VDE 0570 Part 2–13/EN 61558-2-13/IEC 61558-2-13
Autotransformer, not short-circuit proof, no insulation between PRI and SEC, PRI max. 1100 V, SEC max. 1000 V AC voltage or 1415 V smoothed DC voltage, frequency max. 500 Hz

VDE 0570 Part 2–20/EN 61558-2-20/IEC 61558-2-20
Small reactor, not overload-free, max. 1000 V, frequency max. 1 MHz

Specification for the fuse assigned in the case of transformers that are not short-circuit proof; here, 6.3 A time-lag

Thermal overcurrent release; here, 20 A miniature circuit breaker

Temperature fuse

Temperature fuse

Self-resetting thermal relay
, e.g. thermal time delay switch

Switched mode power supply

Protective conductor, earth

Non-self-resetting thermal relay Reset by switching off the mains connection, e.g. thermal time delay switch with locking function, PTC

Connection for mount or core

Non-self-resetting thermal relay Manual reset (e.g. thermal overcurrent release, miniature circuit breaker)

Suitable for use with fitments whose flammability properties are not known, e.g. wood, furniture, intermediate ceilings. Sign in acc. with VDE 0710 Part 14.

PTC thermistor

Sign for domestic use, only for dry rooms, general

NTC thermistor

Voltage warning, general

ta 40 °C
ta 40

Rated ambient temperature; here, 40 °C

Heat source warning: hot surface, general

CL.B
CL.130
class 130

Insulation class; here, B

AC current, also spelled A. C. or ac (alternating current)

Safety class II, total insulation

DC current, also spelled D. C. or dc (direct current)

Approvals

CE marking, legal mark of conformity in Europe (stands for Conformité Européenne)

ENEC approval, Europe; in Germany: certification by VDE (10), European Norms Electrical Certification

VDE approval, Germany,
VDE Testing and Certification Institute

UL approval (recognized component), USA and Canada; in Germany: certification by UL, Underwriters Laboratories Inc.

UL approval (recognized component), USA and Canada; in Germany: certification by UL, Underwriters Laboratories Inc., only relates to the integrated transformerr.

UL approval (recognized component), USA,
Underwriters Laboratories Inc.

UL approval, (Listed) USA,
Underwriters Laboratories Inc

CSA approval, Canada, Canadian Standards Association

GL approval, certification by Germanischer Lloyd

AS-Interface approval, certification by AS-International Association

EAC approval, Export approval for the Eurasian Economic Union

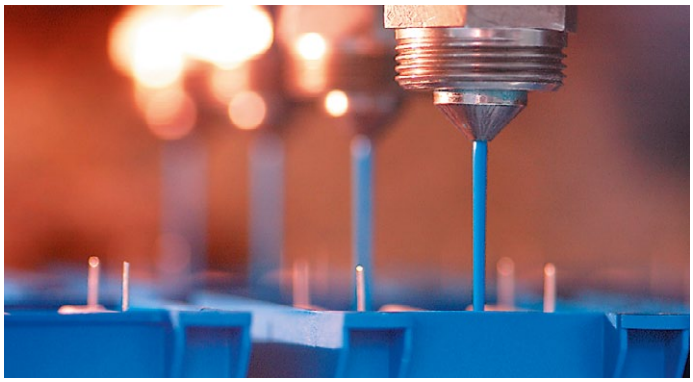
Special signs by BLOCK

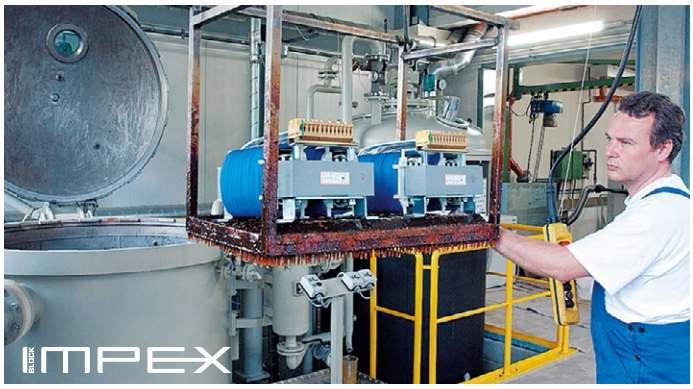
XtraDenseFill: XtraDenseFill from BLOCK, a casting technique that ensures cavity-free filling of the transformer's entire internal structure due to high vacuum and pressure phases. It significantly reduces creepage distances and clearances and enables the electrical equipment to enjoy long-term protection against the effects of its environment. A more compact design can also be used.

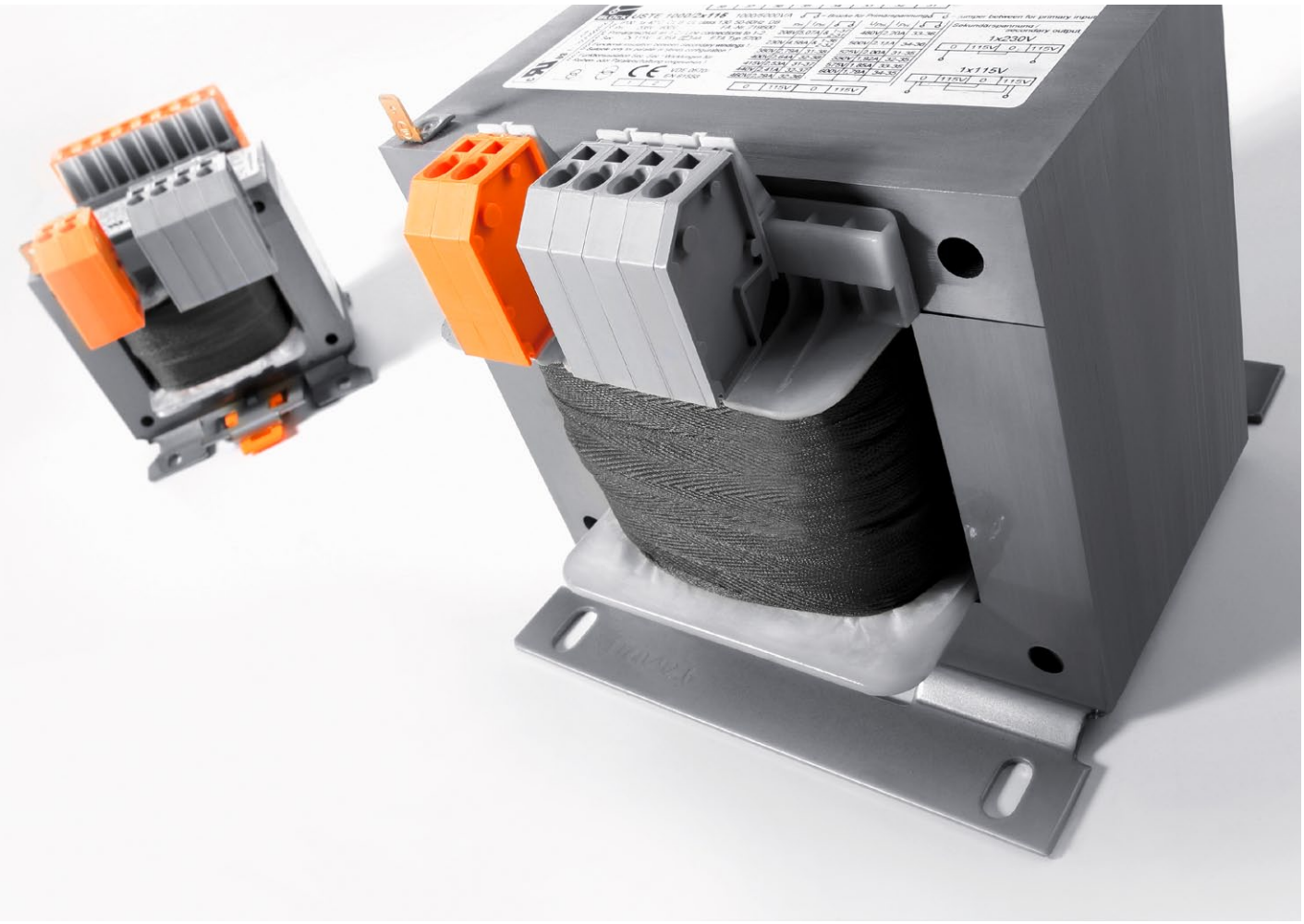
BLOCK ImpEx: Ensures the winding material is covered evenly, thus providing extensive protection against external influences. The resin developed specifically for BLOCKImpEx, together with our in-house-developed impregnation process, seals as many cavities as possible and creates a temperature reserve to ensure efficiency during long periods of operation.

The BLOCK logo: a sign of quality

The old BLOCK logo: our original logo







Transformers

General technical information

A transformer is a static device with two or more coils which transforms a system of alternating voltage and alternating current through electromagnetic induction, usually with different values but the same frequency, for the purpose of transmitting electrical energy (Ref: VDE 0570, IEV 421-01-01)

Requirements

The design-related differences between transformers are generally determined by their intended utilisation. Respective requirements are established in the installation and device standards
(e.g. VDE 0100, VDE 0113/EN 60204/
IEC 60204, VDE 0700/EN 60335/
VDE 0805/EN 60950/
IEC 60950) and in the transformer standards (e.g. VDE 0570/DIN EN 61558/
EN 61558/IEC 61558).

An important selection criterion is the insulation construction between input and output electrical circuits:

Transformers with double or enhanced insulation

- Safety transformers (for the safety measure of safety extra-low voltage)
- Safety isolating transformers (for the safety measure of protective separation)

Transformes with basic insulation

- Control transformers (for the safety measure of protective earthing)
- Mains transformers with separated coils, general

Transformers without insulation (no metallic isolation) between input and output circuits

- Autotransformers

Standards

Unless otherwise agreed upon with the ordering party, we manufacture in accordance with the latest "State of Technology" and with the following standards:

VDE 0570: Safety of transformers, power units and similar
EN 61558, IEC 61558: Safety of power transformers, power supply units and similar.

Rated input voltage

The rated input voltage (Ref.: VDE 0570, EN 61558, IEC 61558) is the distribution voltage (or the voltage between the external conductors in the cases of multiphase systems), which the manufacturer has assigned to the transformer for the established operating conditions.

Rated input voltage range

The rated input voltage range (Ref.: VDE 0570, EN 61558, IEC 61558) is the input voltage range assigned to the transformer, as expressed in its upper and lower limits. Unless other arrangements have been made, the upper limit is equivalent to 1.10 times the value of the rated input voltage with which the transformer can be continuously operated without suffering any damage. The lower limit is non-critical. It is nevertheless to be noted that the internal resistance (U_K) of the transformer can increase as a result of the reduced magnetic flux through the core. The prerequisite for a description of the limit values is the transformer load at rated (output) power, expressed as the ohmic or active resistance load.

Rated frequency

The rated frequency (Ref.: VDE 0570, EN 61558, IEC 61558) is the frequency allocated to the transformer for the established operating conditions.

Unless other arrangements have been made, transformers will be designed for 50 to 60 Hz.

Open-circuit current

Open-circuit current is the (apparen) input current of the non-loaded transformer at the rated input voltage and the rated frequency.

Because of non Sine shape of the curve, measurements are to be carried out using "true effect" testing equipment. The size of the open-circuit current can also vary within a production lot, mainly because of non-constant core sheet characteristics. The open-circuit current should, however, be lower than the input current at rated (output) power in order to avoid any possible overloading of the input (primary) coil of the transformer during open-circuit operation.

Open-circuit output

Open-circuit output is the (effective) input power of the non-loaded transformer at the rated input voltage and the rated frequency. This power leads to a heating-up of the transformer which is not under a load because of the magnetisation of the core.

Input (primary) coil

The input coil is the coil established for the connection with the electrical supply circuit.

There can be several coils for series and parallel connections, taps can also be present. Depending on number, amount of insulation required and percentile deviation of the taps in relation to rated input voltage, an increase in core power (structural size) may become required for the transformer.

An increase of core power is absolutely mandatory when several different input voltages are to be set up as alternatives. If for example 230 V and 400 V are called for in conjunction with unchanging rated (output) power, then the coil space required is increased by about 21 % (coil former with a single chamber). This comes about since one coil needs to be on hand for the full power of the 230 V input voltage, another one needs to be there for 230 V to 400 V. The core power of the transformer is thus to be set at a level circa 21 % higher than the rated (output) power.

Rated input voltage	**Rated (output) power** x factor = core power	
	I-Kammer	**II-Kammer**
115 + 230 Vac	1.25	1.50
230 + 400 Vac	1.21	1.43
230 + 500 Vac	1.27	1.54
230 + 400 + 500 Vac	1.31	1.63
230 + 400 + 440 + 500 Vac	1.32	1.64
400 + 440 Vac	1.05	1.09
400 + 440 + 500 Vac	1.11	1.21

Rated output voltage

In cases where the transformer is connected to rated input voltage, in the presence of rated frequency and loading with an impedance (which, in connection with rated output voltage and by using the rated power factor for alternating current, results in rated power) the output voltage may not deviate from its rated value by more than the following:

- 10 % for the output voltage of unconditionally short-circuit proof transformers with a rated output voltage,
- 10 % for the highest output voltage of unconditionally short-circuit proof transformers with more than one rated output voltage,
- 15 % for the other output voltages of unconditionally short-circuit proof transformers with more than one rated output voltage,
- 5 % for the output voltages of other transformers.

The percentage values listed above are increased by 5 for transformers with rectifiers.

Measurement is carried out after warmed-up operating temperature has been reached (equilibrium state) and (unless other arrangements have been made) at rated ambient temperature and rated (output) impedance for which the rated power factor = 1.

For transformers with several output coils, each coil group will be simultaneously loaded, unless some other arrangement has been established.

For transformers with attached rectifiers, the output voltage will be measured at the terminations of the direct current circuit with a voltage measuring device as an arithmetic mean value, insofar as the voltage is not expressly specified as an effective value..

Open-circuit operation output voltage

The open-circuit operation output voltage (Ref.: VDE 0570, EN 61558, IEC 61558) is the output voltage of the non-loaded transformer with rated input voltage and rated frequency. For safety, isolating and control transformers, the highest permissible values for deviation in terms of rated output voltage are to be observed to some extent. The respective determinations are specified in Part 2 of the Standard named above for the various transformer types.

$$\text{deviation} = \frac{\text{open-circuit operation output voltage} - \text{nominal output voltage} \times 100\ \%}{\text{nominal output voltage}}$$

Example: Isolating transformer with 230 V rated output voltage and 238 V open-circuit operation output voltage

$$\text{deviation} = \frac{238\ \text{V} - 230\ \text{V} \times 100\ \%}{230\ \text{V}} = 3.48\ \%$$

Common presentations are also, e.g.:

$$\text{open-circuit operation output voltage} = \text{nominal output voltage} \times \text{Factor}$$

Example: Control transformer with 24 V rated output voltage

$$\text{open-circuit operation output voltage} = 24\ \text{V} \times 1.10 = 26.4\ \text{V}$$

Note: In accordance with VDE 0113, IEC 60204 and VDE 0570, EN 61558, IEC 61558, the open-circuit operation output voltage for control transformers may not increase by more than a maximum of 10 %!

or

$$\text{Regulation} = \frac{\text{open-circuit operation output voltage} - \text{nominal output voltage} \times 100\ \%}{\text{open-circuit operation output voltage}}$$

Example: Safety transformer with 11.5 V rated output voltage and 14 V open-circuit operation output voltage

$$\text{Regulation} = \frac{14\ \text{V} - 11.5\ \text{V} \times 100\ \%}{14\ \text{V}} = 17.9\ \%$$

In cases of rated (output) power levels of over 1 kVA, the short-circuit voltage (as a percentage of rated input voltage) will be specified. Short-circuit voltage (%), deviation (%), regulation (%) and open-circuit voltage factor (factor – 1.00 = %) can be roughly compared with one another.

Output (secondary) coil

The output coil is a coil designated for connection with a distributing mains, a device, a piece of equipment or another installation.

There may be several coils and taps present. Depending on number and on the amount of insulation required, an increase of the core power (structural size) of the transformer could become necessary. Unless other arrangements have been made, this is the way that taps are designed for the intensity of the current at the highest voltage level and they can carry loads only in alternation.

If the full rated (output) power is to be available from every tap and/or if several output coils are desired which are not simultaneously able to carry loads or to carry changeable loads, then the need for winding space increases. The core power of the transformer is thus to be set at a level higher than the rated (output) power.

Rated power

The rated power (Ref.: VDE 0570, EN 61558, IEC 61558) is the product arising from rated output voltage and rated output current or, in cases of multiphase transformers, the product times wn, where n is the total number of the phases.

Note: When single-phase transformers (e.g. control transformers) are being connected to two external conductors of a three-phase mains, the number of phases is to be set to 1 for the rated power of the transformer.

In cases where the transformer has more than one output coil or an output coil with taps, the rated power is the sum of the products of rated output voltage and rated output current of all circuits which can be loaded simultaneously.

Installation altitude

The calculation of the transformers is at an altitude of max. 1000 m above sea level. A higher installation altitude require a power reduction caused by the lower heat dissipation.

Installation altitude in meters above NN	power x factor
1500	0.98
2000	0.97
2500	0.95
3000	0.93
3500	0.92
4000	0.90
4500	0.88
5000	0.86
5500	0.85
6000	0.83

Ambient temperature and rated power

With rated ambient temperature deviating from 40 °C and with reference to insulation material class B, one can proceed approximately as follows:

Rated ambient temperature	Rated (output) power x factor = core power
25 °C	1.14
40 °C	1.00
45 °C	0.93
50 °C	0.87
55 °C	0.80
60 °C	0.73
65 °C	0.67
70 °C	0.60

Core power (structural size) needs to be adjusted to reflect rated (output) power.

Example: How high must the core power of a transformer of 100 VA (at 40 °C) be increased in order to be able to operate it at 70 °C

$$P_{core} = \frac{100\ VA}{0.60} = 167\ VA$$

Example: What is the maximum power to be had from a 100 VA transformer (in terms of 40 °C) at 55 °C?

$$P_{max} = 100\ VA \times 0.80 = 80\ VA$$

Excess temperature

The excess temperature is the temperature in the transformer which is created in the established operating conditions of the transformer as a result of self-heating. The maximum permitted excess temperature is calculated from the difference arising between a temperature assigned to the insulation material class and the rated ambient temperature of the transformer. Depending on the insulation material class, the possible excess temperature is also to be reduced for hot spots.

Example: Insulation material class E (120 °C), hot spot 5 °C, Rated ambient temperature 40 °C

$$\Delta T = 120\ °C - 5\ °C - 40\ °C = 75\ °C$$

Short-circuit-proofness

Transformers are divided up according to their type of short-circuit-proofness (Ref.: VDE 0570, EN 61558, IEC 61558):

A **short-circuit proof transformer** is a transformer for which the temperature does not exceed established limit values when the transformer is overloaded or short-circuited and which continues to fulfil all the requirements of the Standard listed above once the overload or the short-circuit has been eliminated.

- An **unconditionally short-circuit proof transformer** is a short-circuit-proof transformer without a protective device for which the temperature does not exceed the established temperature limit values in cases of overload or short-circuits which can continue to be operated after the overload or the short-circuit has been eliminated.
  Note: Due to physical limitations, this kind of transformer permits only structural designs with low levels of rated power of up to circa 4 VA. The open-circuit voltage factor can thereby take on a value of up to 2.00. The shape of the curve of the output voltage can deviate from the Sine form. It is not mandatory that unconditionally short-circuit-proof transformers need be permanently short-circuit proof.
- A **conditionally short-circuit proof transformer** is a short-circuit proof transformer with a built-in protective device, which opens the electrical circuit or limits the electricity in the input or output circuit when the transformer is overloaded or short-circuited.
  Note: Examples of protective devices are fuses, overload releases, temperature fuses, automatic and non-automatic resetting temperature limiters, posistors and automatic mechanically-triggered protective switches.

A **non-short-circuit proof transformer** is a transformer which is intended to be protected against excessive temperatures by means of a protective device which is not built into the transformer.

Note: Unless other arrangements have been made, the ordering party is responsible for taking measures to protect the transformer.

Low-band magnetic leakage fields

Inductive component parts generate low-band magnetic fields, called forth by the leakage fields of the magnetising procedure at the level of the operating frequency. Effects on neighbouring electrical equipment, devices, apparatus or installations cannot to be ruled out entirely. The degree of the influence is essentially dependent upon an EMC-compliant construction (earthing, shielding) of the components and on their spatial clearance from one another. For the purposes of general estimation and as an aid to project design, the following typical values can apply, based on a rated power of circa 200 VA:

Component part* (without shielding)	Leakage field induction within the clearance	
	10 mm	100 mm
Toroidal transformer	1.2 mT	0.02 mT
EI-sheathed core transformer	2.2 mT	0.04 mT
EI-sheathed reactor with gap	12 mT	1.30 mT
Magnetic voltage stabilizer	5 mT	0.30 mT

*Reference: magnetic core induction ca. 1.2 T (1 Tesla = 1 Vs/m^2), at 50 Hz

For non-critical applications, we recommend a clearance of 50 mm to 100 mm between the components and between them and the shielding (e.g. sheet metal housing). For critical applications (e.g. sensitive measuring amplifiers, digital circuits, monitors), additional EMC shielding measures or greater clearances are generally necessary. However, EMC measures to be carried out depend heavily upon the components utilised and upon the operating parameters of the system, which means that it is impossible to make statements of universal validity.

Core power

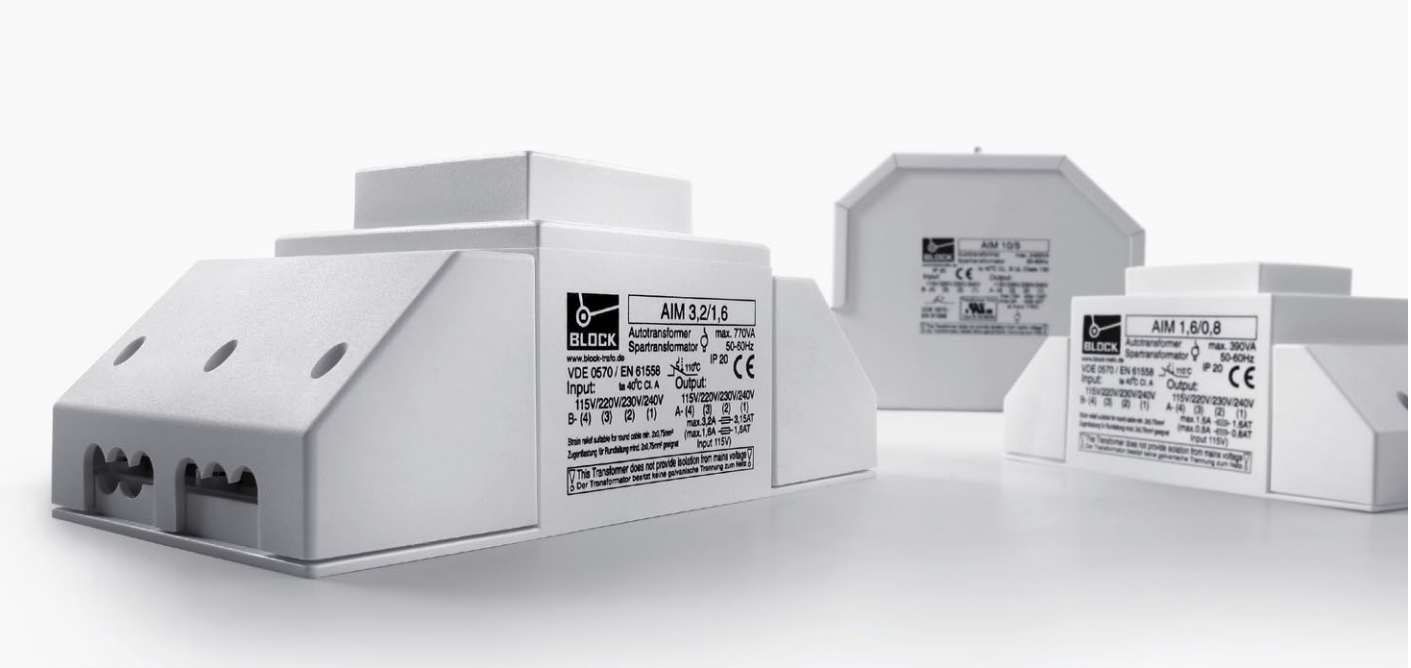
The core power is the power assigned to one particular construction form or structural size, with the specification of particular operating or design characteristics.

Operating characteristics may include, for example, the following:

- Insulation material class E
- Rated ambient temperature 40 °C
- Rated frequency 50 Hz
- Open-circuit operation-output voltage-factor maximum 1.10

Design characteristics may include, for example, the following:

- Type of protection IP 54
- Insulation construction
- Increased need for winding space
- Specification of a particular core type



Autotransformers

Auto transformers are transformers in which input and output coils share common parts (Ref.: VDE 0570 Parts 2–13). For this reason, there is no metallic isolation between the coils.

Requirements

The general statements already made concerning transformers also apply to auto transformers, i.e., such things as protection class, type of protection, insulation material class and rated ambient temperature.

Usually, and unless other arrangements have been made with the ordering party, auto transformers will be manufactured with basic insulation between voltage-bearing parts and the core. Existing taps cannot be subjected to loads simultaneously, unless the dimensioning was especially designed for it.

Standards

Unless otherwise agreed with the buyer, we finished state-of-the-art technology and the following standards:

VDE 0570: Safety of power transformers, power supply units and similar,
Teil 1: General requirements and tests,
Teil 2–13: Particular requirements for auto transformers.

EN 61558, IEC 61558: Safety of power transformers, power supply units and similar,
Part 1: General requirements and tests,
Part 2–13: Particular requirements for auto transformers.

Magnet core power

Magnet core power is the power which would be transmitted to the magnet core as a transformer with separated (spaced apart) coils. In everyday speech, the term "core power" is frequently used for "magnet core power" and "throughput power" for "rated power" in reference to auto transformers.

Auto transformers possess shared input and output coils. For this reason, there is no metallic isolation between the coils. Depending on voltage turns ratio, there is to some extent a considerable reduction of the core power in comparison with a design with separated coils.

$$P_{core} = \frac{U_H - U_N \times P_{nominal}}{U_H}$$

P_{core} = required core power (VA)
P_{rated} = rated power (VA) (throughput power)
U_H = higher voltage (V)
U_N = lower voltage (V)

Example: A load of 400 V/5 kVA is to be modified to suit a mains with 460 V.

$$P_{core} = \frac{460\ V - 400\ V}{460\ V} \times 5000\ VA = 652\ VA$$

The required core power of the auto transformer therefore amounts to only 652 VA.

Notes for the low-voltage lightning installation

General requirement

The mounting of low-voltage lighting installations must be carried out in such a way that any danger to persons or property caused by dangerous fault or leakage currents or thermal influences is averted.

Transformers

Use only short-circuit proof transformers in accordance with VDE 0570/EN 61558/ IEC 61558.

Note: even conditionally short-circuit proof safety transformers are short-circuit proof.

Take care to note temperature of the air surrounding the transformer.
Note:

- Do not operate transformers without a ta-specification with ambient temperatures above 25 °C.
- Transformers with a ta-specification are to be operated at rated ambient temperatures up to the specified value.

Mount transformers with a minimum clearance of about 30 cm from one another in order to avoid heat buildup and the influence of magnetic leakage fields.

Only use transformers with MM designation when the behavior in fire of the surrounding construction materials (wood, furniture, intermediate ceilings) is unknown.

Charge the transformers to in order to 100 % capacity as much as possible, in order to achieve an optimal voltage adjustment to the halogen lamps.

Install transformers with a rated output voltage of preferably 11.5 V for supplying 12 V halogen lamps in order to extend the service life of the halogen lamps and/or in order not to shorten it when exposed to mains overvoltage.

If the transformer is also to take on the line safety of connected secondary power lines, then the transformer must be an appropriate one for this purpose.

If the transformer is to supply a line system with two directly touchable lines (rope cable systems, conductor rails), then wiring must be carried out with safety device (e.g. electronic automatic current controller).
Safety goal:

- The lamp output is monitored at ±25 W.
- In cases where this is exceeded or where it is not achieved, a switch-off takes place within 0.3 s.

Please observe the regulation for preventing damage "Low-voltage illumination installations and systems" VDS 2324 from the Verband der Sachversicherer e. V. (Association of Property Insurers), Cologne.

The transformer should be placed near to the illumination equipment, since there are relatively high currents flow in low-voltage installations, thus meaning that the conductor length, the conductor cross-section and the voltage drop connected with them must all be considered.
Note:

- Maintain a minimum clearance to the transformer of approx. 40 cm to 50 cm, in order to keep away from heat build-up and heat radiation.
- In order to avoid overheating caused by heat radiation, never direct the light of the halogen lamp at the transformer.
- Cold light reflector lamps radiate a high amount of infrared heat radiation, also towards the back through the reflector.
- Only heat-resistant connection lines are to be used for direct hook-up to.

Mount the transformers in such a way that no oscillations can be transmitted in order to avoid unwanted humming noises. Thin-walled mounting plates (such as a loudspeaker diaphragm) can even increase the mechanical 100 Hz vibration of the transformer!

Mount the transformer in such a way that blown fuses can be replaced without difficulty.

Note: Transformers with integrated semiconductors and resetting temperature limiters are once again ready for operation after elimination of the error, mains interruption and cooling.

Switch on transformers or transformer groups with switch-on current limiters, so that it will not be able to lead to the triggering of safety cutouts connected in series.

When using dimmer operation for brightness setting of the halogen lamps, use only those transformers which are suitable for this.
Note:

- use only special transformer dimmers.
- take into account the efficiency of the transformer.
- note base load as specified by the dimmer manufacturer.
- if the supplying of several transformers is handled by a single dimmer, then the transformers utilised should all be of the same type, in order to minimise compensating currents or any oscillation behavior.
- Fine-tune the arrangement of the wiring and the cross-section of the wires to meet the requirements of the phase control in order to minimise electromagnetic interference fields and oscillation behavior.

Halogen lamps

Note: The heat resistance R of the halogen lamp is of slightly lesser low impedance with undervoltage and of slightly greater high impedance with overvoltage.

The power consumption of a halogen lamp can deviate from the rated power by as much as approx. 10 %.

Some kinds of dimmer operation used for adjusting the illumination intensity of halogen lamp types can lead to corrosion of the helical parts and blackening of the quartz bulb in connection with low levels of dimmer voltage. The halogen lamp should be periodically operated at maximum dimmer voltage to ensure that the halogen circuit process is able to take place.

Typical operating conditions			
Operating voltage	**12.5 V**	**12.0 V**	**11.5 V**
Service life	50 %	100 %	180 %
Lightning current	120 %	100 %	80 %
Lamp current	102 %	100 %	98 %
Lamp current in the example	4.26 A	4.17 A	4.07 A

Halogen lamp 12 V/50 W (R = 2.88 Ω)

Loading capacity of cables and power lines

Note:

- based upon VDE 0100 Part 559
- based upon DIN VDE 0298
- in terms of copper wires
- in terms of two loaded PVC-insulated lines and cable
- in terms of 25 C ambient temperature
- in terms of wire placement method B2, placement in electric installation tube or channel (wire lines or multi-wire lines on or in walls or concealed or on the floor)

Electric current loading capacity I_z (A)	10.5	16.5	22.0	30.0	39.0	53.0
Rated cross-section (mm^2)	*1.0	1.5	2.5	4.0	6.0	10.0

*The CU wire cross-section diameter must be at least 1.5 mm^2. It may be reduced to 1 mm^2, if:

- flexible lines are used,
- no overloading is possible,
- and a line length of 3 m is not exceeded.

Conversion factors for deviating ambient temperatures:

Ambient temperature (°C)	25	30	35	40	45	50
Electrical current conversion factor	1.0	0.94	0.88	0.82	0.75	0.67

Conversion factors for the accumulation of cables and power lines in the electrical installation pipe or channel:

Number of simultaneously loaded electrical circuits	1	2	3	4	5	6
Electrical current conversion factor	1.00	0.80	0.70	0.65	0.60	0.57

Note: The loading capacity of cables and lines offers information regarding the thermal current carrying capacity, but not about voltage drop, and therefore not about length.

Allocation of the overvoltage protection organs for protection in case of overload

The loading capacity of cables and lines presumes that there is a correct allocation of the overvoltage protection organs (protective devices), such as line protection switches and fuses.

Note: If the transformer is also to assume the line safety of connected secondary power lines, then the transformer must be an appropriate one for this purpose.

Generally speaking, the allocation rules apply (Ref.: VDE 0100 Part 430):

- $I_B \leq I_N \leq I_Z$
- $I_2 \leq 1.48\ I_Z$

with

I_B = operating current of the electrical circuit
I_Z = current load capacity of the line or the cable
I_N = rated electrical current of the protective device
I_2 = conventional tripping current of the protective device (conventional fusing current)

Example: A CU line of 1 mm^2 is to be shielded against overload with a protective device with a rated electrical current of 10 A and a triggering characteristic B or C.

I_B = 10 A
I_Z = 10.5 A (for 1 mm2 CU with PVC insulation at 25 °C ambient temperature, based upon VDE 0298)
I_N = 10 A
I_2 = 14.5 A (multiplied by 1.45 with B or C, in accordance with VDE 0641)

- $I_B \leq I_N \leq I_Z$
  10 A ≤ 10 A ≤ 10.5 A
  is fulfilled
- $I_2 \leq 1.48\ I_Z$
  14.4 A ≤ 1.45 A ≤ 10.5 A
  is fulfilled

Result: The line is protected against overload.

Voltage drop on cables and power lines

In addition to thermal loading capacity, voltage drop also plays an essential role in cables and power lines. A voltage drop of 2.5 % to 3 % has established itself as a practice-oriented compromise between the material costs for wiring and a still-bearable brightness loss for lighting equipment.

The length of the cables and power lines can be calculated with sufficient precision in accordance with:

$$L = \frac{A \times U_B \times U_B \times æ \times dU}{2 \times P \times 100}$$

L = 2-wire cable or length between transformer and halogen lamp (m)

U_B = rated voltage of the transformer (V)

dU = voltage drop (%)

A = cross section of a cable or a conductor (mm^2)

P = rated power of the lamp(s) (W)

æ = electrical conductivity (CU= 56 m/Ω mm^2)

Given a voltage drop of 3 % and a rated transformer voltage of 11.5 V, the following power line lengths emerge. It must be remembered in this connection that the same voltage drop is to be found on all cable and power line lengths, in order to avoid brightness differences in conjunction with the use of the same lighting equipment.

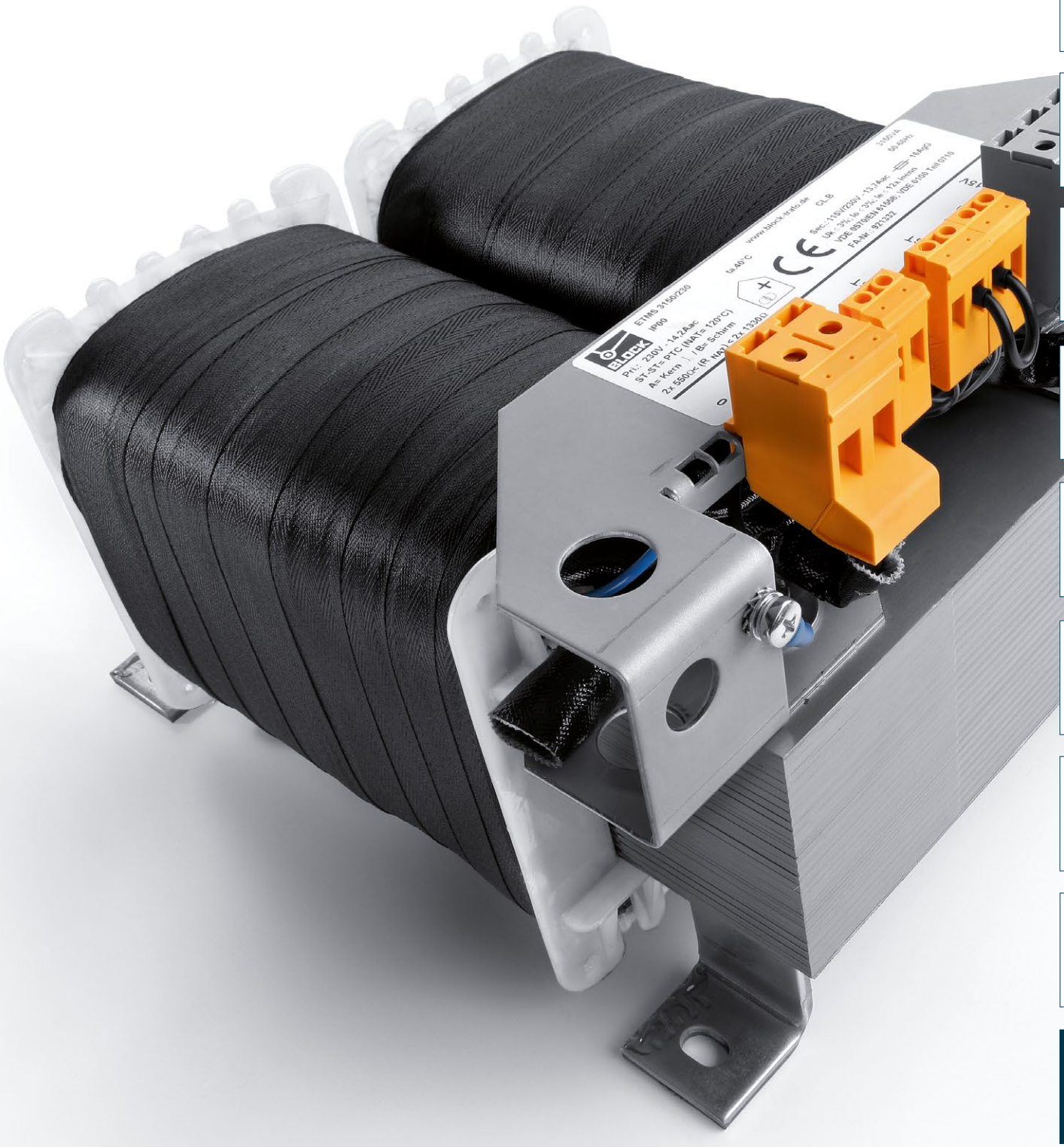
Note: Take into account loading capacity of cables and power lines, as well as the allocation of the overvoltage protection features.

Cable and lead lengths in relation to 3% voltage drop::

Lamps rated power	Electrical current 11.5 V	Length of the 2-wire CU power line with cross-section		
		2x 1.0 mm^2	2x 1.5 mm^2	2x 2.5 mm^2
10 W	0.8 A	11.11 m	16.66 m	27.77 m
20 W	1.6 A	5.56 m	8.33 m	13.89 m
35 W	2.8 A	3.17 m	4.76 m	7.94 m
50 W	4 A	2.22 m	3.33 m	5.56 m
75 W	6 A	1.48 m	2.22 m	3.70 m
100 W	8 A	1.11 m	1.67 m	2.78 m
150 W	12 A	*0.74 m	1.11 m	1.85 m
200 W	16 A	*0.56 m	0.83 m	1.39 m
250 W	20 A	*0.44 m	*0.67 m	1.11 m
300 W	24 A	*0.37 m	*0.56 m	*0.93 m
350 W	28 A	*0.32 m	*0.48 m	*0.79 m
400 W	32 A	*0.28 m	*0.42 m	*0.69 m
450 W	36 A	*0.25 m	*0.37 m	*0.62 m
500 W	40 A	*0.22 m	*0.33 m	*0.56 m
550 W	44 A	*0.20 m	*0.30 m	*0.51 m
600 W	48 A	*0.19 m	*0.28 m	*0.46 m

Lamps rated power	Length of the 2-wire CU power line with cross-section			
	2x 4.0 mm^2	2x 6.0 mm^2	2x 10 mm^2	2x 16 mm^2
10 W	44.45 m	66.65 m	111.1 m	177.7 m
20 W	22.22 m	33.33 m	55.55 m	88.87 m
35 W	12.70 m	19.04 m	31.74 m	50.78 m
50 W	8.89 m	13.33 m	22.22 m	35.55 m
75 W	5.93 m	8.89 m	14.81 m	23.70 m
100 W	4.44 m	6.67 m	11.11 m	17.78 m
150 W	2.96 m	4.44 m	7.41 m	11.85 m
200 W	2.22 m	3.33 m	5.55 m	8.89 m
250 W	1.78 m	2.67 m	4.44 m	7.11 m
300 W	1.48 m	2.22 m	3.70 m	5.93 m
350 W	1.27 m	1.90 m	3.17 m	5.08 m
400 W	*1.11 m	1.67 m	2.78 m	4.44 m
450 W	*0.99 m	1.48 m	2.47 m	3.95 m
500 W	*0.89 m	*1.33 m	2.22 m	3.56 m
550 W	*0.81 m	*1.21 m	2.02 m	3.23 m
600 W	*0.74 m	*1.11 m	1.85 m	2.96 m

*Do not use, because the demand of current carrying capacity I_Z of cables and wires is not fulfilled!



Transformers used for medical purposes

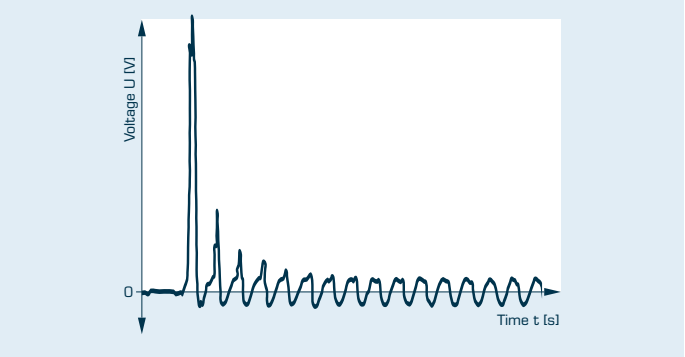
The requirement

For isolating transformers, the following requirements apply, in accordance with VDE 0570 part 2–15, EN 61558-2-15:

- Part 13.3: The switch-on current is not permitted to be in excess of twelve times of the curve summit value of the rated input current.

The switch-on

The oscillogram shows the typical curve progression of the primary switch-on current of a transformer:



The switch-on current is reduced in accordance with an e-function, in order to die off after about 100 ms. The current peaks reach their maximum in unfavourable switch-on moments: in the mains voltage zero crossing, in open-circuit operation (without load) and with high remanence of the iron core.

The rated electrical current

The rated primary current of a transformer comes into force with rated primary voltage, rated frequency and orderly operation with rated power load. If the rated primary current is not known or cannot be determined using measurement technology, then an approximate determination can take place as follows:

$$I_B \approx \frac{P_B}{\eta \times U_B} (A)$$

P_B = rated (secondary) power (VA) divided by 3 in the case of alternating current

U_B = rated primary voltage (V) with alternating current combined voltage L – N

η = efficiency of the transformer
typically 0.94 with 3,150 VA
typically 0.95 with 5,000 VA
typically 0.96 with 8,000 VA

Calculation of the peak value of the rated primary current yields:

$I_S = I_B \times \sqrt{2}$ (AS)

The switch-on current factor

Based on the previous models, the switch-on current factor can be defined as the ratio of the maximum switch-on current of the unloaded transformer to the peak value of the rated primary current of the loaded transformer.

The measuring

Determination of switch-on currents using measurement techniques previously proved itself to be expensive and hardly possible to carry out on location in the context of a construction site. The switch-on current is determined by means of a storage oscillograph using a low-impedance shunt (connected in series to the primary coil of the transformer to be tested). Frequent repetition of the switch-on process raises the probability of measuring the maximum value of the switch-on current at the least favourable switch-on moment.

Computation of the switch-on current factor

Starting from the measurement of the switch-on current and of the rated electrical current, the switch-on current factor can be computed as follows:

$$F = \frac{I_{on\,max}}{I_B \times \sqrt{2}}$$

For isolating transformers used for medical purposes with VDE 0100 part 710, VDE 0570 part 2–15, EN 61558-2-15, the switch-on current factor F must be less than 12.

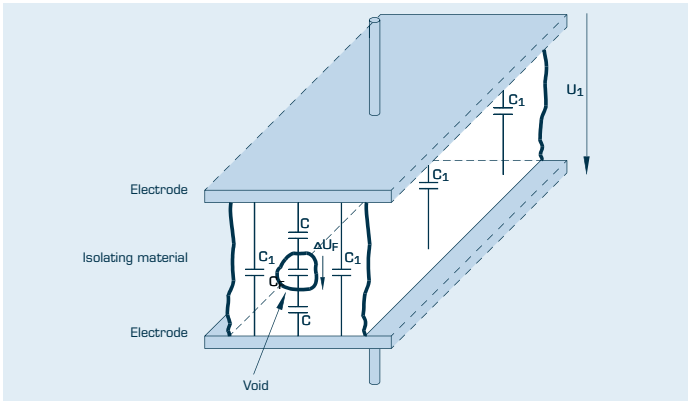
Partial discharge measurement on transformers

In the published standards for devices, partial discharge ability is also required, in addition double or reinforced insulation, to ensure electrical separation in component parts and other electrical modules. An example of this the standard norm, "Outfitting of high-voltage installations with electronic equipment", VDE 0160/ EN 61800/IEC 61800. This standard norm contains a partial discharge test on the insulation system of the winding materials used. The correctly-applied partial discharge measurement offers a non-destruction testing procedure which can be applied for the qualitative evaluation of an insulation system.

What are partial discharges?

This has to do with a stochastic or random discharge between two voltage-bearing electrodes which bridge over only a partial distance of the clearance between the electrodes. They appear first at the contact surface or also sometimes physically displaced within an insulation configuration. If this occurs in a solid insulation material, then it is referred to as an internal partial discharge (PD), the causes of which are to be found either in defective manufacturing technology or in the use of unsuitable materials. Numbered among the latter for actual insulation materials are hollow spaces, voids and non-homogeneities which cannot be ruled out to 100 %.

A simplified insulation configuration between two electrodes is provided in the illustration in order to better clarify the processes which contribute to the formation of a partial discharge. The individual capacitors illustrate the course of the lines of electric flux. C_F indicates the concentration of the lines of electric flux in the flaw position, C symbolises the course of the lines of electric flux from the surface of the insulating material to the walls surrounding the hollow space. If the initial voltage in this configuration crosses over the flaw position which is to be considered a voltage- dependent radio link (C_F), then a voltage drop U_F occurs there, which causes a change in the charge q_F. The voltage leap at the electrodes caused by this can be used for an analysis of the PD activity of the insulating material.

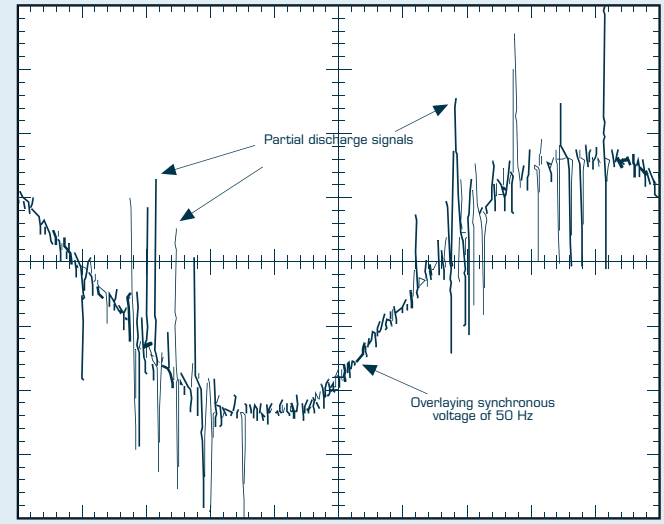


What is the effect of partial discharges?

Every discharge caused by a PD causes a weakening of the material surrounding it. Continuous PD leads to a permanent destruction processes in the insulator. When the damage reaches an advanced state it results in the loss of insulation capability. Therefore, in order to ensure a permanently reliable insulation system configuration, it must be a requirement that:

- no PD shall occur in the insulation system in connection with the maximum allowable operating voltage plus a safety margin
- PD caused by transients shall terminate automatically after cessation of the overvoltage
- PD freedom shall be designed for the maximum peak value plus a safety margin for amplitude stresses with continuously repeating voltage impulses

The previously won research results show a new way for evaluating insulation systems the low-voltage technology transformers. It is becoming possible to make more than just a vague Good/Bad statement about safe electrical separation inside a transformer – now one can also evaluate its quality, which also means a statement predicting its service life.



Instructions for interference protection transformers

Mains interruption and their causes

Mains interruption cause systems failures and impair the functioning of installations, computers and highly sensitive electronic consumers and equipment. Investigations in Central Europe have shown that 3/4 of all sporadically-occuring errors and faulty functioning among highly-sensitive consumers are based on defective quality of the power supply.

The most common occurrences are:

- long-term mains overvoltage
- long-term mains undervoltage
- interference impulses and transients
- voltage drops and voltage surges
- electrical disturbance
- short-term mains interruption
- long-term mains interruption

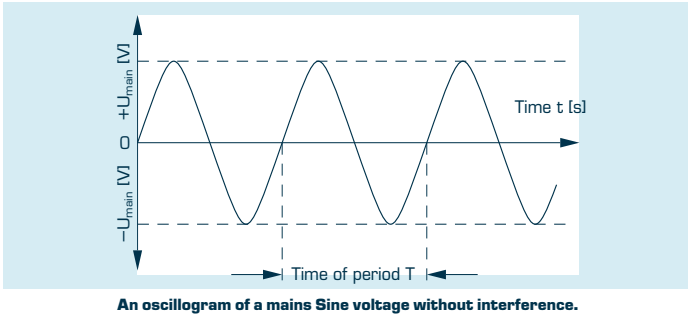
Mains interruptions can result from a wide variety of causes, e.g.:

- switching procedures in the mains
- long cable paths in the mains
- environmental influences, such as storms
- mains overloading

Typical causes for mains interruptions generated in-house include, for example:

- thyristor-controlled operating mechanisms
- elevators, air conditioning systems, copy machines
- motors, compensation installations
- electrical welders, large machines
- switching illumination devices

Types and description of mains interruptions

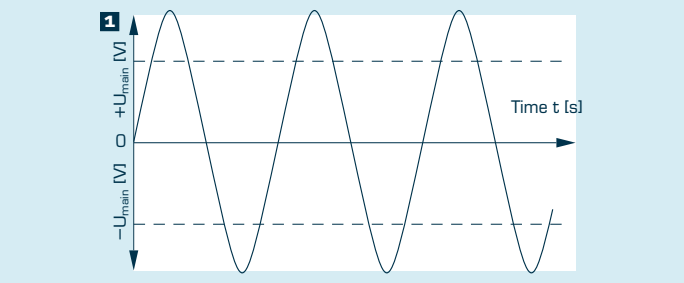


An oscillogram of a mains Sine voltage without interference.

1. Mains overvoltage

Mains voltage in excess over a long period by more than +6 % (VDE 0175/HD 472 S1/ IEC 60038).

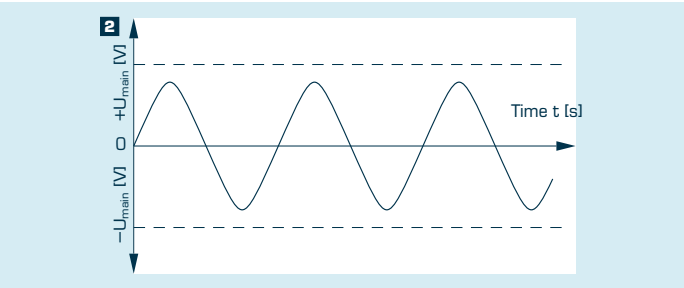
Circa 15–20 % involvement in mains interruptions. Leads to overheating and thermal destruction of components. Causes total failure.



2. Mains undervoltage

Mains voltage fails to achieve minimum levels over a long period by more than –10 % (VDE 0175/HD 472 S1/IEC 60038).

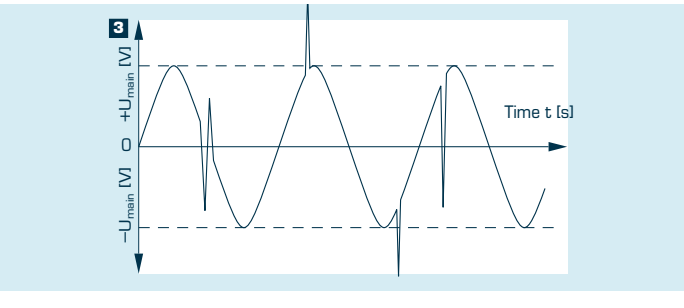
Circa 20–30 % involvement in mains interruptions. Leads to non-defined operating states for the mains units of the components, caused by deficient mains stabilisation. Causes data errors.



3. Interference impulses

Energy-rich impulses (e.g. 700 V/1 ms) and energy-poor transients (e.g. 2500 V/20 µs), by switching processes in the mains.

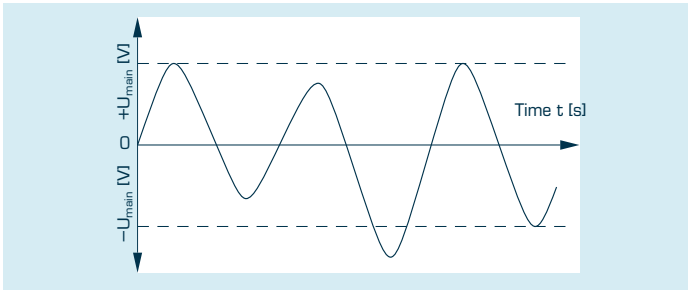
Circa 30–35 % involvement in mains interruptions.



4. Voltage drop and voltage surge

Voltage level changes abruptly and in an uncontrolled manner, e.g. through load changes and long wiring arrangements.

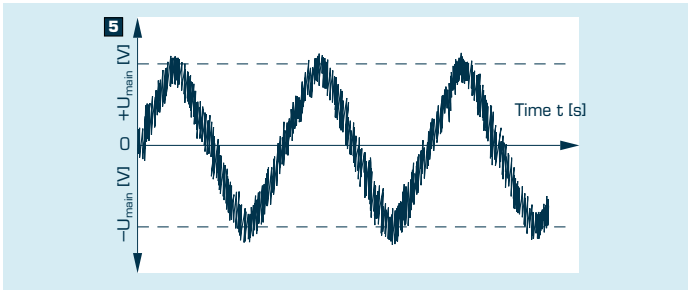
Circa 15–30 % involvement in mains interruptions. Leads to non-defined operating states and can cause the destruction of components. Cause data errors.



5. Electrical noise

The mixture of frequencies superimposed on the mains by poor earthing and/or severe HF disrupters, such as radio stations, storms.

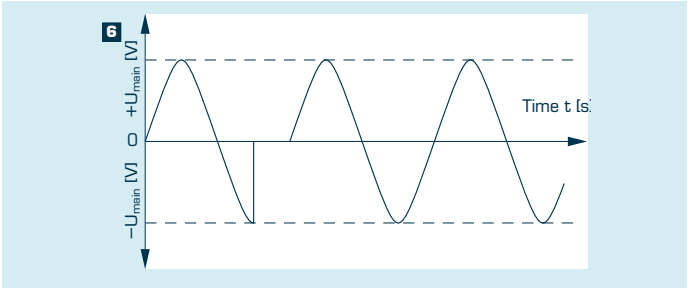
Circa 20–35 % involvement in mains interruptions. Leads to non-defined operating states for the mains units of the components. Causes data errors.



6. Short voltage interruption

Short-term (up to circa 10 ms) interruption of the mains voltage through short-circuit in neighbouring mains or by startup of large electrical machines.

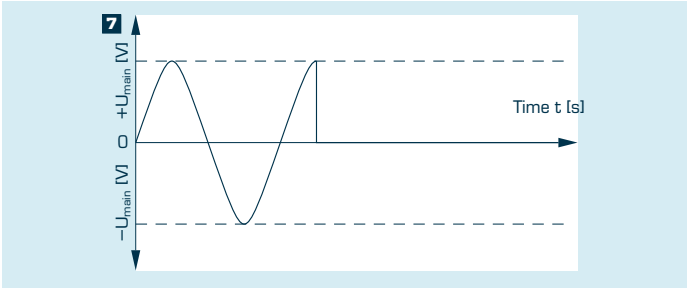
Circa 8–10 % involvement in mains interruptions. Leads to non-defined operating states for the mains units of the components, particularly those with insufficient mains bridging. Causes data errors.



7. Long voltage interruption

Long (more than circa 10 ms) interruption of the mains voltage.

Circa 2–5 % involvement in mains interruptions. Causes data errors.



Countermeasures and their effect

Mains socket

1 2 3 4 5 6 7

Mains socket via seperate power supply lines

1 2 ☐ ☐ 5 6 7

Isolating Transformator e.g.: BLOCK ETTK, TT3 …

1 2 ☐ ☐ ☐ 6 7

Interference protection transformer, e.g.: BLOCK STT, SMTT …

1 2 **3** 4 **5** 6 7

Magnetic voltage stabiliser, e.g.: BLOCK KH, BSD …

1 **2** ☐ **4** ☐ **6** 7

Online UPS

1 **2** **3** **4** **5** **6** **7**

■ = no
☐ = conditionally
■ = yes

Evaluation of the efficiency

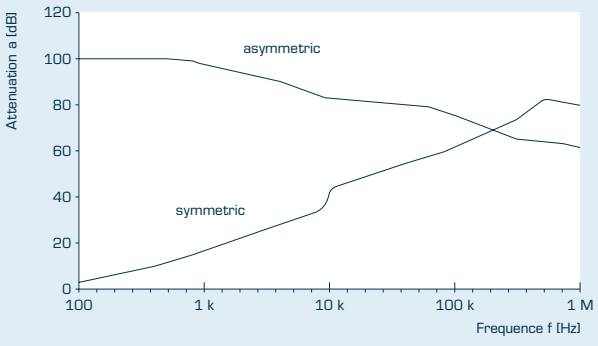
The voltage attenuation a (dB, decibel) describes a logarithmic ratio between two electrical voltage values:

a = 20 x lg (U1 : U2) [dB]

Values often applied for U1 : U2 include:

0 dB = 1 : 1
3 dB = 1 : 1.41
6 dB = 1 : 2
10 dB = 1 : 3.16
20 dB = 1 : 10
40 dB = 1 : 100
60 dB = 1 : 1,000
80 dB = 1 : 10,000
100 dB = 1 : 100,000
120 dB = 1 : 1,000,000
140 dB = 1 : 10,000,000

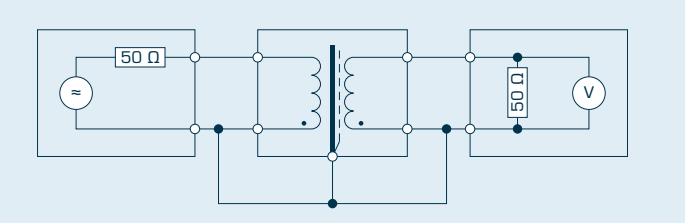
In cases of Interference protection transformers and magnetic voltage stabilisers, it is desirable to obtain an attenuation of interference which is as high as possible. Depending on a (sine) measuring frequency, If one applies the associated attenuation a (calculated according to the formula shown above), then one will obtain the attenuation characteristic curve:



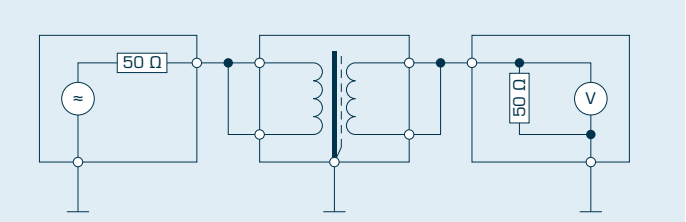
distinction is made in accordance with two types of mains borne interference:

- **Symmetrical interference**
- **Asymmetrical interference**

Symmetrical interference occurs between the two power supply lines (L and N). Below the associated basic measurement configuration



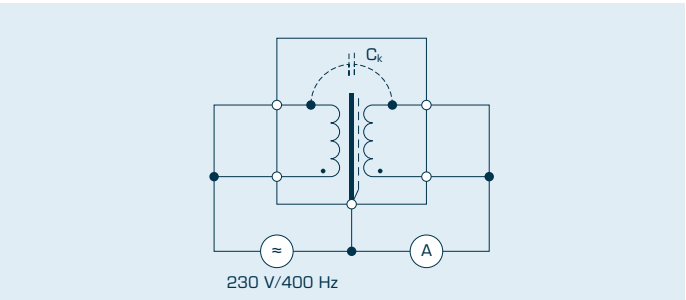
Asymmetrical interference occurs between one of the two power supply lines (L, N) and earth (PE). Below the associated basic measurement configuration



The attenuation represents a non-system-dependent evaluation criterion, preferably with real terminal resistors of 50 Ω, and based on a standardised norm measuring procedure (Ref.: CISPR 17).

Coupling capacity

The coupling capacity represents a measure for the possible transmission of interference between the input and the output sides in cases inductive components are present, such as transformers with metallic isolation of the coils. The value of the coupling capacity should be kept as small as possible and can be influenced by design measures. The decisive influence on the determination of the coupling capacity is the selection of the applied measurement methods and measurement frequencies (despite theoretical frequency independence). In addition, for direct measurement using a C-measuring bridge, a measuring configuration using a test voltage selected to reflect orderly operation appears to make more sense:



the interference suppression measures (e.g. shield and core earthing), in series connection to the testing generator. The coupling capacity C_K is calculated using:

I = electrical current A

$$C_K = \frac{I}{2 \times \pi \times f \times U} [F]$$

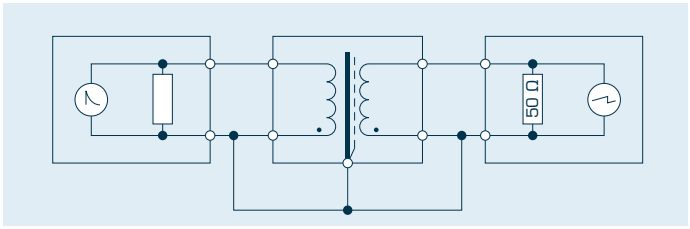
π = 3.14

f = frequency Hz

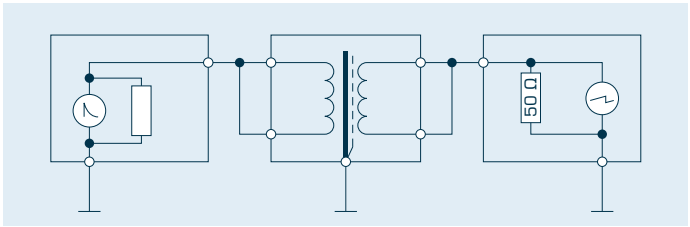
U = voltage V

Impulse attenuation

The specification of the voltage impulse attenuation in dB is a further criterion for the evaluation of the interference protection characteristics for inductive component parts such as Interference protection transformers and magnetic interference protection voltage stabilisers. Impulses of many kilovolts (kV) are not at all unknown in mains as the result of the effects of lightning. To simulate the impulse, the standard lightning surge voltage in the form of 1.2/50 µs can be applied. Here possible measurement configurations:



Symmetrical impulse attenuation

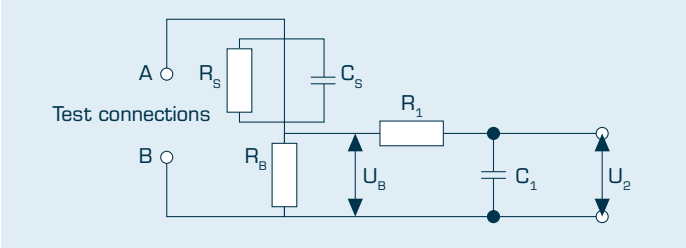


asymmetrical impulse attenuation

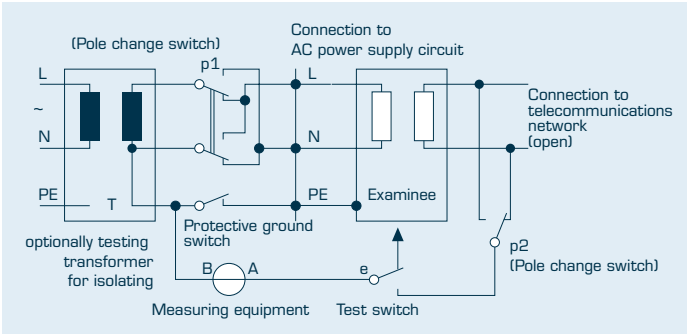
The statements already made concerning attenuation can be applied in their essentials for the determination of the impulse attenuation. One difference, however, is that an impulse with a buildup time of 1.2 µs and a fall time of 50 µs with a voltage level of 5 kV will be applied instead of that of the (Sine) measurement frequencies.

Leakage current

Leakage current is an unwanted flowing alternating current between electrical poles which possesses different levels of voltage potential. The maximum limit values for the leakage current are established in some regulations for installations and devices (e.g. DIN VDE 0100 maximum 0.75 mA, DIN VDE 0750 maximum 0.25 mA). Some of the possible measurement configurations are listed below (e.g. substitute leakage current measurement based upon DIN VDE 0701). The leakage current of a piece of electrical equipment ought to be small, since an additive buildup of current takes place on the mains as a result of the simultaneous operation of several devices.



DIN EN 60990: Measuring circuit for touch current, evaluated for appreciability and reaction



Measurement configuration for the determination of the touch current to EN 60950-1

Insulation resistance

The level of the insulation resistance offers information concerning the insulation capability of an electrical insulation system. For isolating and safety transformers with double or enhanced insulation (Ref.: VDE 0570/EN 61558/IEC 61558), minimum limit values apply ranging from 2 MΩ to 7 MΩ. As far as the measurement configuration used for the determination of the insulation resistance is concerned, one can proceed the same as with leakage current. One difference, however, is that a direct current voltage of 500 V_{dc} is put into place for testing purposes. The Insulation resistance is then computed as R = U/I.

POWER VISION

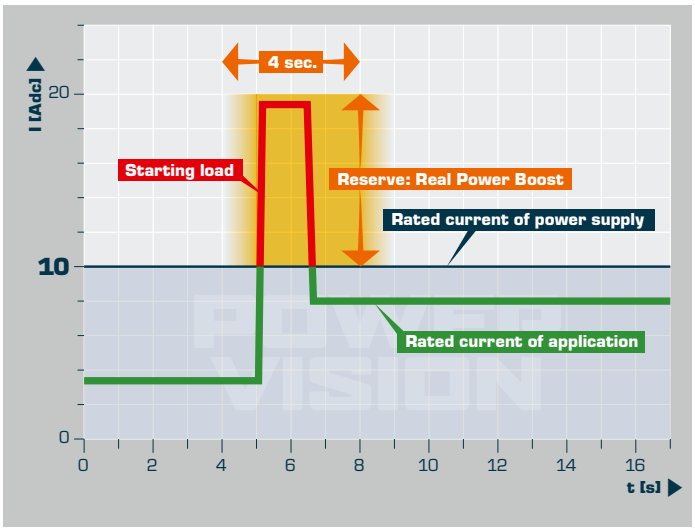
powerful
comprehensive
communicative
programmable
energy-efficient

The perfect power supply system

Real Power Boost: For reliable starting up to 200 % power reserve

Conventional switch mode power supplies typically set current limiting at 1.1 times the rated output current. The use of these power supplies becomes very problematic as soon as heavystarting loads are switched in, since these power supplies are not able to make available suffi cient current for them. The PowerVision series has power reserves which can make available twice the current at constant voltage for at least 4 seconds. This makes for reliable operation and removes the need for expensive overdimensioning of switch mode power supplies.

Heavy-starting motors and drives (as here in the case of a robot-controlled production facility) require power supplies with high power reserves.



Heavy starting: In rated operation, power can be supplied to the system via a switch mode power supply without problems. However, should a more powerful drive start up, there will be a transient increase in power requirement which goes way above the rated current of the power supply. In order to prevent the supply voltage failing completely, the power supply could be overdimensioned. However, BLOCK's PowerVision with real power boost is a more appropriate solution.

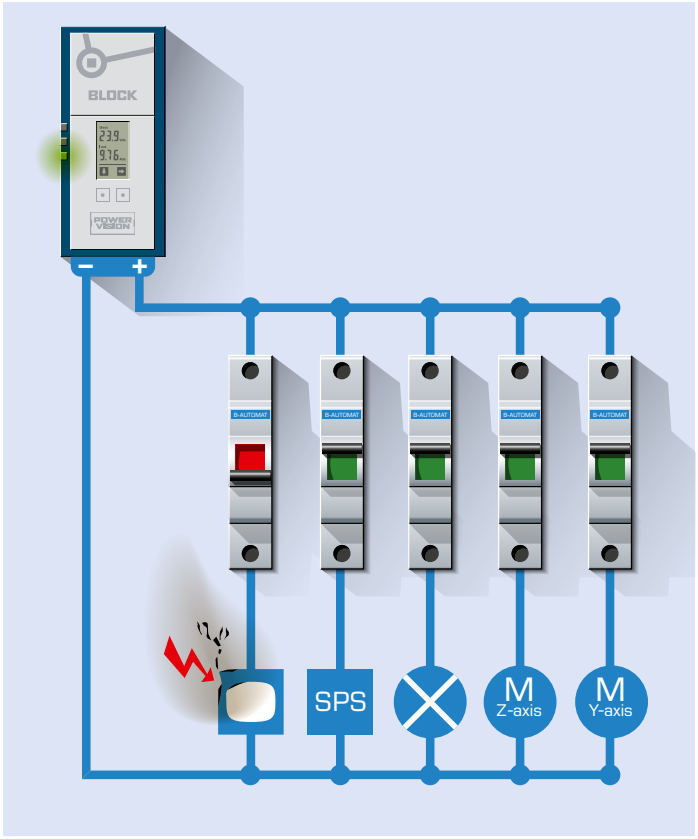
Ingenious proportions and three mounting options

All PowerVision devices are slim, compact and easy to mount. The mounting system has been developed specifically for PowerVision. In addition to the standard 35mm DIN rail mounting snap device integrated into the rear of the unit, the customer also has the possibility to mount it at a 90° angle to the mounting surface, either on a 35 mm DIN rail using the PV-TS35M or screwed directly to the wall with the PV-WB2. This allows a very high flexibility in wiring cabinet installation. Also the direct insert cage clamp terminals that ensure a permanent connection even when under vibration, makes installation even easier. Furthermore, all devices share the same structural shape. This creates more space and transparency in the wiring cabinet.

Top Boost: +60 A additional reserve
Cost-effective protection in the form of miniature circuit breakers

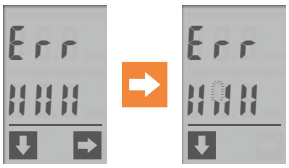
In automation technology, the system availability rates required today are generating increased overheads with regard to protection devices for 24 V load circuits. Previously, it was not possible to shut down faulty current paths selectively using conventional miniature circuit breakers, since the required high tripping current could not be provided by the switch mode power supplies. With its stabilised switch mode power supplies, BLOCK can provide a solution offering up to 60 A in excess of the rated current in the event of a short-circuit. The proven short-circuit and line protection provided by cost-effective miniature circuit breakers is also suitable for use with switch mode power supplies.

PowerVision's integrated top boost function provides a reliable means of tripping low-cost miniature circuit breakers.



In order for high-speed magnetic miniature circuit breakers to trip, urrents which are signifi cantly higher than the rated current are required for a period of 10 to 12 milliseconds. BLOCK's switch mode power supplies are able to supply a powerful 60 A above the rated current for 50 ms. This enables a faulty branch to be shut down selectively in the event of a short-circuit whilst the remaining consumers continue to run unaffected.

Fault memory

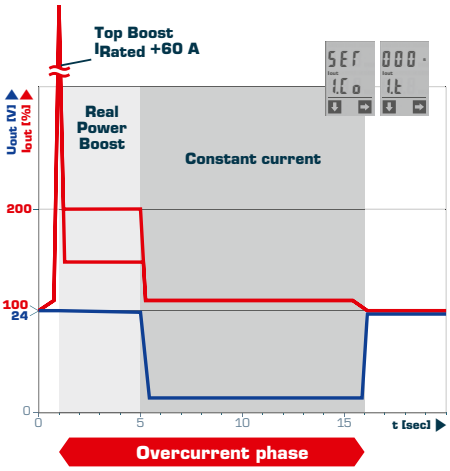


Critical operational statuses are detected by the internal electronics and memorised. The device features an integrated fault manager for self-diagnostics.

Possible errors and faults can be identifi ed by matching the flashing segments on the display to the corresponding error code. Since fault diagnostics data is saved to non-volatile memory, it will be retained even in the event of the power supply being disconnected.

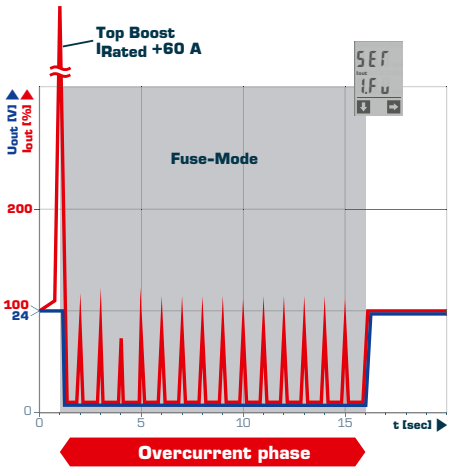
Configurable overcurrent behavior

On the Basic and Line models of the PowerVision switch mode power supplies, the output characteristics can be adapted to the most diverse requirements of a system or machine. Three different characteristics can be set.



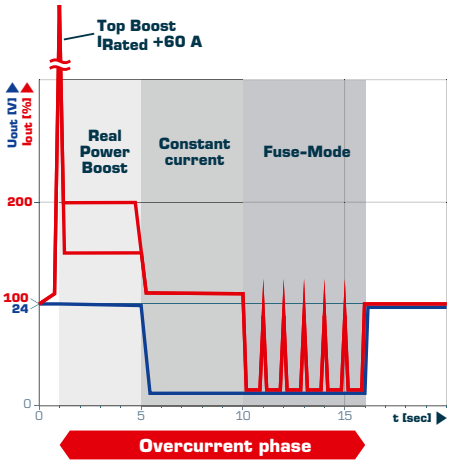
1. Permanent constant current

In constant current mode, in the event of overload following power boost, the output current is typically limited to 110 % of the rated current with simultaneously lowered output voltage.



2. Permanently reduced current

In fuse mode, the output current is reduced markedly. However, the switch mode power supply does not switch off here. The display, signal outputs and the interface continue working. After around one second, the device attempts to restart the connected consumers. This procedure is repeated until the overload or short-circuit has been eliminated.



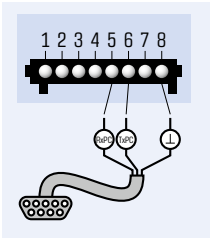
3. Time-limited constant current

The switch mode power supply initially operates in constant current mode for a time that can be specifi ed. Once the specifi ed time has elapsed, the device switches to fuse mode and remains in this mode until the overload has been eliminated.

*Instead of the fuse mode, the semi-stabilised switch mode power supplies have a hiccup mode, during which the output of the devices is switched off. The display, signal outputs and the interface are also switched off.

RS-232 interface

All PowerVision devices fitted with a serial interface can communicate with a PC or higher-level control system. Key data and possible faults are sent cyclically by the devices. Accordingly, the interface also provides a means of responding to critical operational statuses quickly. Furthermore, many parameter settings can be made via the interface. The software packages can be downloaded free of charge from the Internet. The communication cable (PV-KOK2) can be purchased as an accessory from BLOCK.



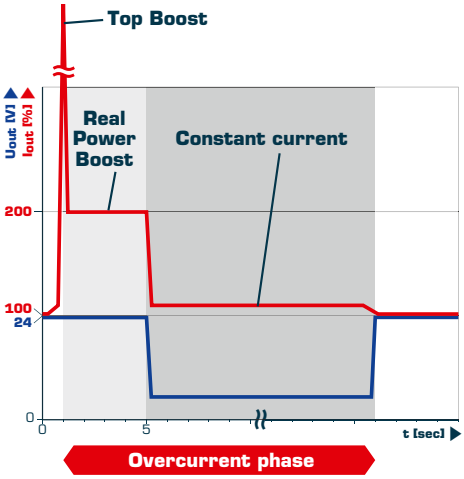
PVSE 230

Single-phase, Economy

Unparalleled power reserves due to real power boost and top boost functions increase operational reliability for machines and systems. The device is available with active starting current limiting as an option.

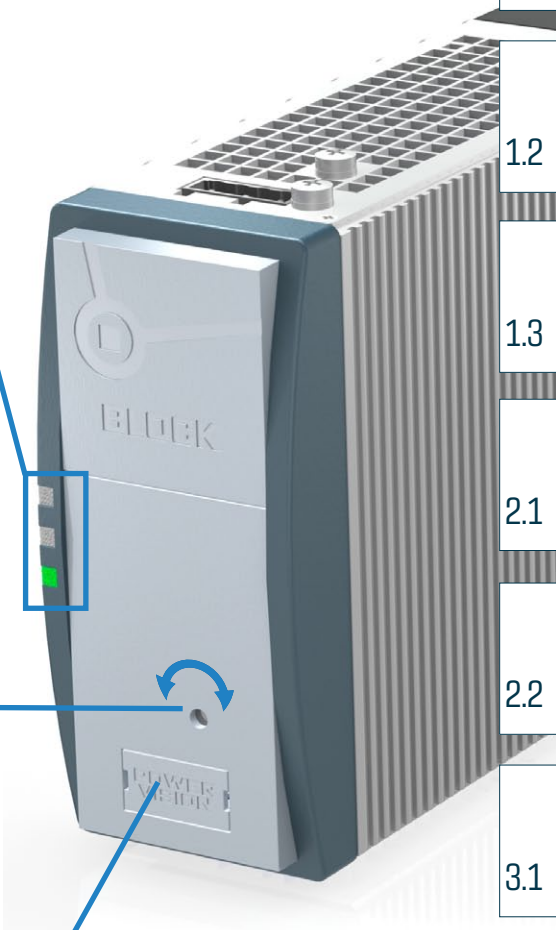
POWER VISION

Overload behavior



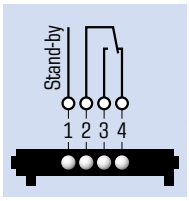
LED signaling

The Economy version is equipped with two LEDs that indicate the current operational status. When the device is running without any errors, the green LED lights up. The red LED signals undervoltage at the power supply output.



Setting the output voltage

The output voltage can be set to between 22.0 and 29.5 V DC on the front panel.



Isolated signal contact

The PVSE 230 switched mode power supply is equipped with an isolated DC OK signalling output. If the output voltage falls below the level set previously, the internal relay drops out. This fault can be queried via the changeover contact.

Stand-by input

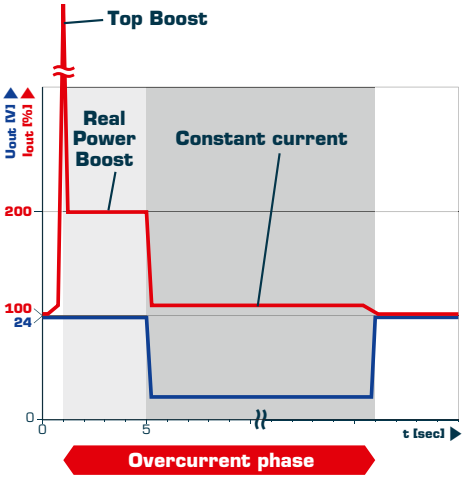
The stand-by input allows targeted switch-on and switch-off of the power supply. When an external DC voltage is applied at the stand-by input, the output of the device is not enabled and the switched mode power supply remains on stand-by.

PVSE 400

Three-phase, Economy

The PVSE 400 is an affordable Economy switched mode power supply with high-precision output voltage, and is designed to meet all automation technology requirements. The power supply is optimised for the key task of supplying the voltage and current. Unparalleled power reserves due to real power boost and top boost functions increase operational reliability for machines and systems. The device is available with active starting current limiting as an option.

Overload behavior

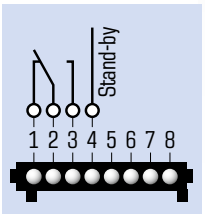


LED signaling

The Economy version is equipped with two LEDs to indicate the operational status. When the device is running without any errors, the green LED lights up. The red LED signals undervoltage at the power supply output.

Setting the output voltage

The output voltage can be set to between 22.0 and 28.8 V DC on the front panel.



Isolated DC OK output

The PVSE 400 switched mode power supply can be supplied with an isolated DC OK signal output as an option. In the event of undervoltage at the output, the internal relay drops out. This fault can be queried via the changeover contact.

Stand-by input

The stand-by input allows targeted switch-on and switch-off of the power supply. When an external DC voltage is applied at the stand-by input, the output of the device is not enabled and the switched mode power supply remains on stand-by.

PVSB 400

Three-phase, Basic

A smart combination: high-performance power supply with additional output monitoring. In carrying out its key task of supplying voltage and current, the PVSB switched mode power supply is able to increase the operational reliability of machines and systems by drawing on the unparalleled power reserves provided by its real power boost and top boost functions. The device is available with active starting current limiting as an option. Its major plus point is the integrated control unit, which continuously monitors voltage and current at the output. The device also boasts a display and function keys as well as four active signal outputs and an RS-232 interface.

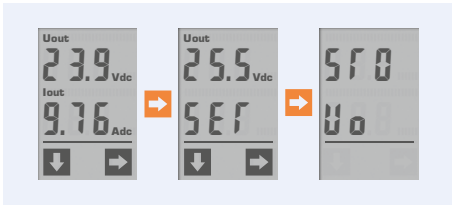
POWER VISION

Output monitoring for a more preventive approach

The current and voltage of the PVSB switched mode power supply output are monitored continuously. Key information can be read directly from the display. The integrated control unit is able to detect potential faults affecting equipment at an early stage, store the associated data and output signals accordingly.

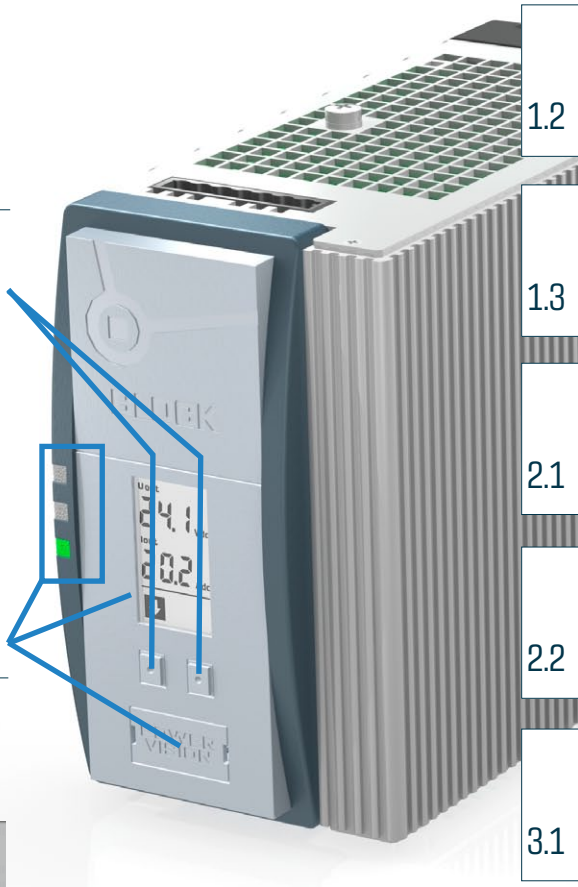
Potential faults the PVSB is able to detect:
Overcurrent When the output current exceeds the rated output current.
Undervoltage When the output voltage falls below the configurable DC OK limit value.
Hardware fault When the device's internal self-testing function fails.

Key information that can be obtained via the display or the interface:
Output current
Output voltage
Max. output current
Min./max. output voltage
Visualisation of all faults
Types of faults
Hour counter



Setting the output voltage

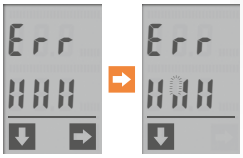
The output voltage can be set to between 22.0 and 28.8 V DC either digitally using the keys on the device itself or automatically via the interface. Whenever the device is switched on, it will automatically restore the final voltage value stored in its memory.



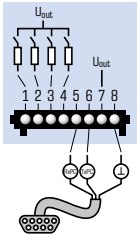
Communication with the user

Via the LEDs: Non-critical faults are indicated as warnings by the yellow LED, whilst critical faults are signalled by the red LED.

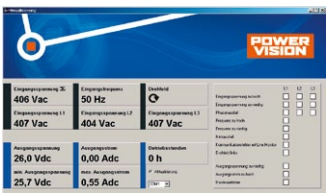
Via the display: The device features an integrated fault memory for self-diagnostics. The precise nature of any potential faults can be easily identified due to the display's system of flashing segments.



Via the active signal outputs: There are four active signal outputs on the front of the PVSB for watchdog functions. The corresponding statuses can be transferred to the higher-level control system. Because the outputs switch the output voltage, they do not need to be conditioned prior to digital signal processing. Two of the four signal outputs can be user-defined with the free parameterisation software, e.g. for the purpose of generating a group signal for all critical statuses.



Via the interface: The devices can communicate with a PC or higher-level control system via the serial interface. All the switched mode power supply's key data is sent cyclically, so the user can both view relevant data and respond to critical operational statuses. The PVSB can also be parameterised via this interface.
The PowerVision software packages required for communication can be downloaded free of charge from **block.eu.**



PVSL 400

Three-phase, Line

Our top-of-the-range model featuring built-in input and output monitoring: The integrated control unit also supports permanent current and voltage output monitoring for comprehensive supply input monitoring. With real power boost and top boost, the PVSL switched mode power supply boasts high power reserves to ensure maximum operational reliability. The device is available with active starting current limiting as an option. It features a display and function keys as well as four active signal outputs and an RS-232 interface..

POWER VISION

PVSL for tidier wiring cabinets

A PVSL renders the use of various other modules in the wiring cabinet superfluous. The Line version is able to monitor the phase sequence direction and check for failed input phases - as well as keeping an eye on the quality of the incoming supply! Due to faster response times in the event of a power failure, there is even time for important data to be stored for restarting the machine.

Input and output monitoring for a more preventive approach

In addition to the features supported by the PVSB model, the PVSL switched mode power supply is equipped with an integrated supply input monitoring function.

Potential faults the PVSL is able to detect:
Supply undervoltage When the input voltage of at least one supply input phase falls below a configurable threshold value.
Supply overvoltage When the input voltage of at least one supply input phase exceeds a configurable threshold value.
Phase error When a supply input phase fails.
Phase sequence error When the connected phase sequence direction is anticlockwise.
Frequency error When the power frequency is outside the frequency range of 44 to 66 Hz.
Power failure When at least two supply input phases fail (typical response time 4 ms).
Communication error When the internal communication test fails.
Overcurrent When the output current exceeds the rated output current.
Undervoltage When the output voltage falls below the configurable DC OK limit value.
Hardware fault When the device's internal self-testing function fails.

Key information that can be obtained via the display:
Supply input voltage
Power frequency
Phase sequence direction
Output current
Output voltage
Max. output current
Min./max. output voltage
Types of faults
Hour counter

Key information that can be obtained via the display or the interface:a
Supply input voltage
Power frequency
Phase sequence direction
Output current
Output voltage
Max. output current
Min./max. output voltage
Visualisation of all faults
Types of faults
Hour counter

Information that can only be obtained via the interface:
Supply input voltage of the individual phases

PVUC

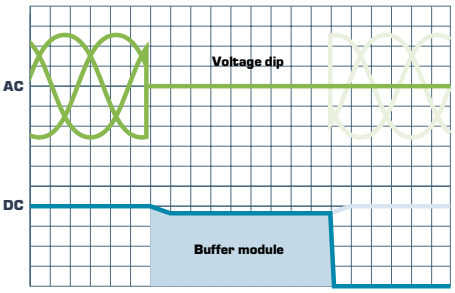
Capacitor-based buffer module

The PVUC – powerful and service-free: A buffer module is able to compensate brief power supply interruptions safely. Mains buffer times are extended for the power supplies and this increases the operational reliability of machines and systems. Transient faults are buffered and in the case of longer failures, there is sufficient time to back up important data for restarting purposes. PowerVision buffer modules are characterised by particularly long buffer times..

POWER VISION

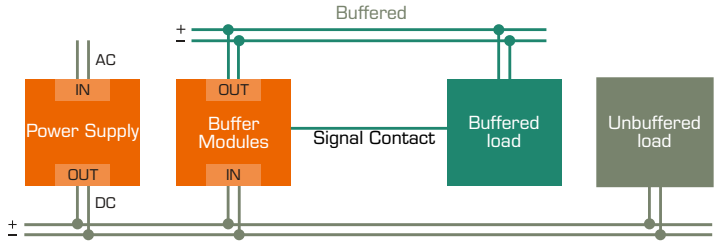
Long buffer times

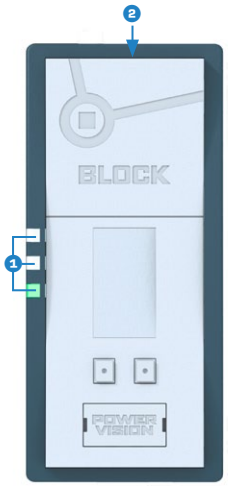
In the event of a oltage dip, the buffer modules ensure that the voltage supply to connected consumers remains stable. Voltage dips can be compensated for up to 0.4 seconds at a rated current of 20 A, for example. This means that even in the case of power supply interruptions lasting longer than this, there is still enough time to back up relevant data and switch the machine to a safe state under controlled conditions.



Decoupled output

Multiple buffer modules can easily be connected in parallel. The module outputs are decoupled from the inputs. This means that it is possible to specifically buffer just selected consumers.





Signalling

❶ Via the LEDs: There are 3 LEDs for signalling individual operational statuses. When the device is running without any errors, the green LED lights up. The red LED signals undervoltage at the buffered output of the module. The yellow LED lights up when the device is charging.

❷ Via the isolated signal contact: Once the internal capacitors have finished charging and there is sufficient voltage at the buffer module input, the isolated signalling output is activated. The contact drops out as soon as the module runs out of charge and the control level can respond to this change of state.

PVUA

Uninterruptible power supply

The PVUA module – much more than an ordinary UPS:
A key feature of the PVUA module is its optimum battery management. It also supports complete current and voltage monitoring with numerous signalling options. The module features a display, function keys, several signal outputs and an RS-232 interface. The charging voltage for the connected accumulator module is temperature-controlled; this helps to extend the service life of the accumulator significantly, thereby minimising service overheads.

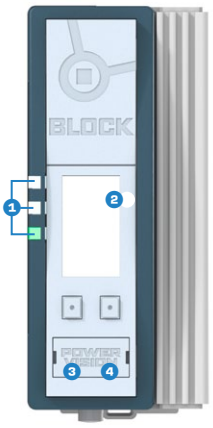
POWER VISION

Integrated control unit for maximum safety

The PVUA module monitors current and voltage continuously. Key information can be read directly from the display. The integrated control unit is able to detect potential faults affecting the equipment to which power is being supplied at an early stage, output signals accordingly and store the associated data for subsequent analysis.

Potential faults the PVUA module is able to detect:
Overcurrent When the output current exceeds a configurable limit value.
Output shut down When the output is shut down briefly due to an increased overcurrent.
Undervoltage at input When the input voltage falls below a configurable limit value.
Undervoltage at output When the output voltage falls below a configurable limit value.
Low accumulator charge When the charge of the connected accumulator is less then 85%.
Accumulator mode When the module is in accumulator mode.
Accumulator mode not possible When the accumulator test fails.
Low accumulator voltage When the accumulator voltage falls to a critical value in accumulator mode.
Accumulator replacement recommended When the accumulator quality test fails. It is recommended that you replace the accumulator.
Hardware fault When the device's internal self-testing function fails.

Key information that can be obtained via the display or the interface:
Input voltage
Output voltage
Output current
Output current
Charging voltage
Charging current
Min. input voltage
Max. output current
Accumulator running hours
Visualisation of all faults
Types of faults

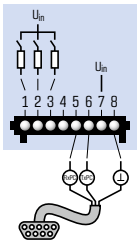


Communication with the user

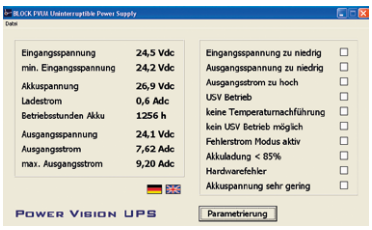
❶ Via the LEDs: When the device is running without any errors, the green LED lights up. Non-critical statuses are indicated as warnings by the yellow LED, whilst critical situations are signalled by the red LED.

❷ Via the display: All currents and voltages are shown continuously on the display. Important parameter settings can be made with ease using the keys on the device. The device features an integrated fault memory for self-diagnostics in the event of a fault.

❸ Via the signalling outputs: The PVUA module has three active signal outputs and one isolated signal contact for watchdog functions. The active 24 V signal outputs do not need to be conditioned prior to processing as a digital signal. Signal output 1 is linked to an isolated signal contact. It can be user-defined with the free parameterisation software, e.g. for the purpose of generating a group signal for possible faults.



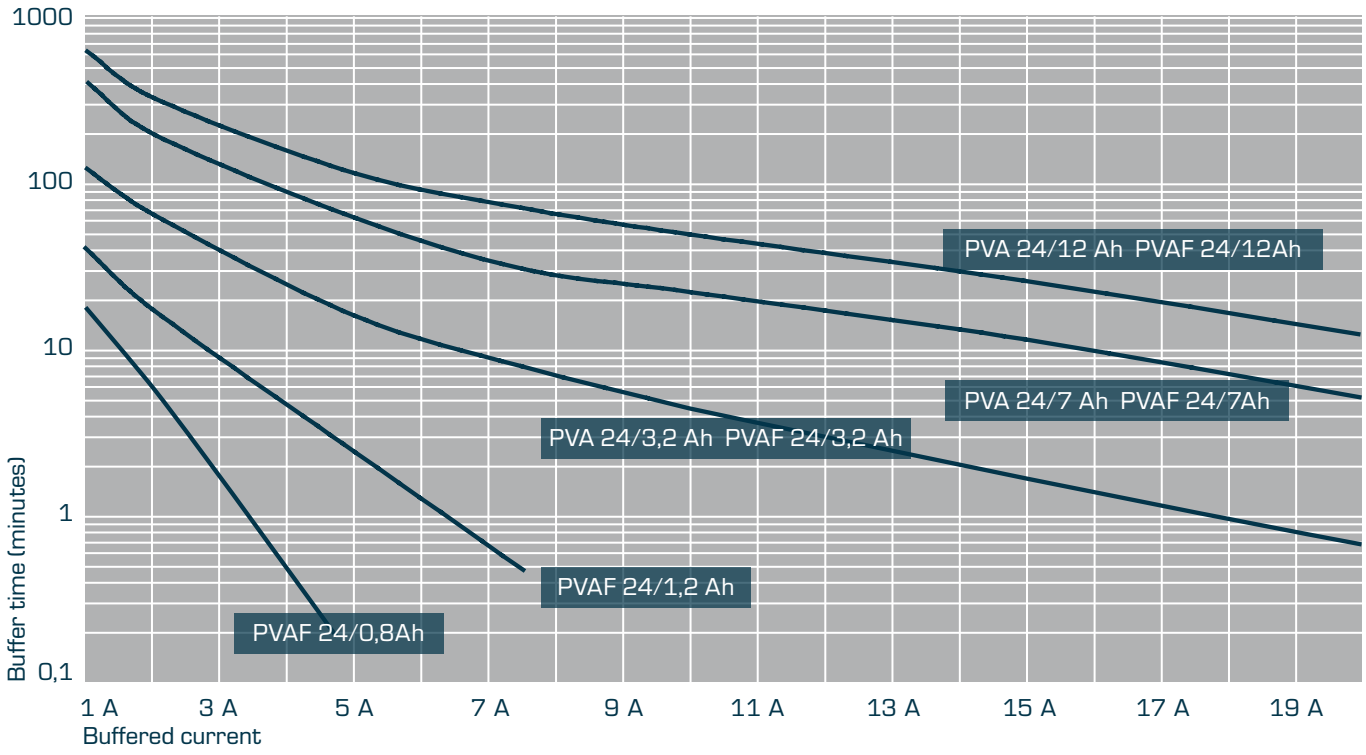
❹ Via the interface: The module can communicate with a PC or higher-level control system via the serial interface. Cyclic sending of information means that the user can both view relevant data and respond to faults. Parameter settings can also be made via this interface. The PowerVision software packages required for communication can be downloaded free of charge from **block.eu.**



PVA / PVAF
Battery modules

The accumulator module works in conjunction with the PVUA accumulator manager to provide a backup 24 V DC voltage in the event that the supply voltage fails. What is really special about this system is its integrated temperature meter. This is located in the accumulator housing, which can be placed in a specific location inside the wiring cabinet. Optimum accumulator charge and therefore long service life is assured.

Buffer times in relation to load current



Power supplies

General technical information

A DC power supply is a static device with one or more inputs and one or more outputs. It uses electromagnetic induction to convert the AC voltage and AC current, and/or the DC current, into a system with DC voltage and DC current (usually at different values) for the purpose of transferring electrical energy.

Requirements

The ways in which the designs of DC power supplies differ mainly depend on their intended use. The relevant requirements are set out in installation and device standards (e.g. VDE 0100, VDE 0113/EN 60204/
IEC 60204, VDE 0700/EN 60335/
IEC 60335, VDE 0805/EN 60950/
IEC 60950) and in the standards available for DC power supplies with a general end use
(e.g. VDE 0570/EN 61558/IEC 61558, VDE 0557/EN 61204/IEC 61204).

An important selection criterion is the structure of the insulation between the input and output circuits (as already described in “Transformer requirements”).

A further distinction is made based on how the AC voltage/AC current and DC voltage/DC current are converted:

- AC-DC converter
  AC voltage input, DC voltage output
- DC-DC converter
  DC voltage input, DC voltage output
- DC-AC converter
  DC voltage input, AC voltage output

Another important selection criterion is the stability and ripple levels of the DC output voltage. This results in the following categories:

- Unregulated DC power supplies
- Regulated DC power supplies

Standards

Unless otherwise agreed with the customer, we manufacture our devices according to the state of the art and the following standards:

Unregulated DC power supplies:

- VDE 0570: Sicherheit von Transformatoren, Netzgeräten und dergleichen
  Teil 1: Allgemeine Anforderungen und Prüfungen, in Verbindung mit dem jeweilig zutreffenden Teil 2.
  EN 61558, IEC 61558: Safety of power transformers, power supply units and similar, Part 1: General requirements and tests, in accordance with the relevant Part 2.

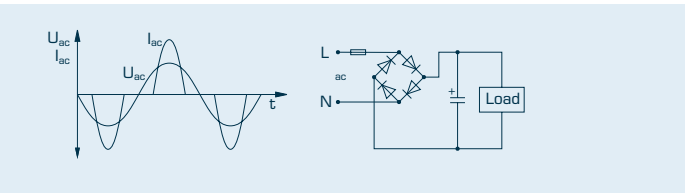
Regulated DC power supplies:

- VDE 0570: Sicherheit von Transformatoren, Netzgeräten und dergleichen,
  Teil 1: Allgemeine Anforderungen und Prüfungen, in Verbindung mit dem jeweilig zutreffenden Teil 2.
  EN 61558, IEC 61558: Safety of power transformers, power supply units and similar, Part 1: General requirements and tests, in accordance with the relevant Part 2-17.
- And/or:
  VDE 0557: Stromversorgungsgeräte für Niederspannung mit Gleichstromausgang
  EN 61204, IEC 61204: Low-voltage power supply devices, D. C. output – Performance characteristics and safety requirements.
- And:
  VDE 0805: Sicherheit von Einrichtungen der Informationstechnik, EN 60950, IEC 60950: Safety of information technology equipment

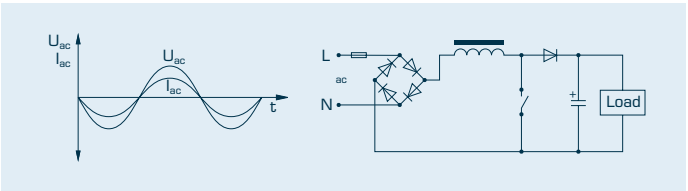
Power Factor Correction (PFC)

For financial reasons, energy providers strive to keep harmonic content and, consequently, the loads on their mains supplies to a minimum. EMC standards relating to this (see: EN 61000-3-2, for example) have already been brought into force. Efforts are centred around minimising harmonic currents whilst simultaneously correcting the power factor, which refers to the relationship between the active power consumed and the apparent power consumed by a consumer. A power factor of 1 with Sine current consumption yields the lowest mains supply load.

Unfortunately, DC power supplies also cause the phenomena described here (amongst others) due to rectification of the (supply) input voltage with subsequent capacitor smoothing. If the DC voltage falls below the peak value of the feed AC voltage, then the capacitor will be recharged with brief, pulsating currents. In this case, it is less important whether this configuration is operated directly on the mains or with an upstream transformer.



The harmonic content can be reduced within certain limits by connecting a frequency-dependent resistor upstream (see “Line reactors” for information on this). However, correcting the power factor directly and in a way that is dependent on the load requires an electronic control system which ensures that the electrical current is drawn from the mains in a Sine shape and in the same phase position as the voltage. The figure below shows a possible circuit concept:



A semiconductor switch, which is controlled by the magnitude of the load, clock pulse-controls the 50 Hz (supply) input current consumed using a high switching frequency (e.g. 20 kHz) and working in conjunction with the storage reactor. This is “modulated” in synchronism with the phase position of the (supply) input voltage in such a way that a power factor of almost 1 is produced.

Unregulated DC power supplies

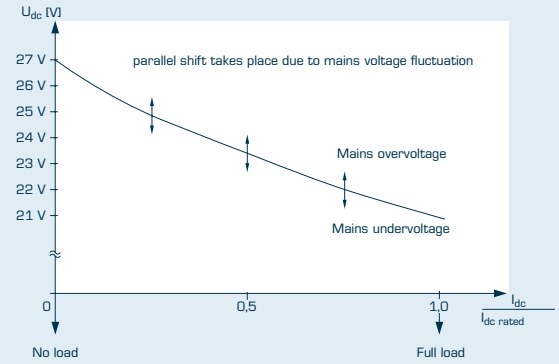
With unregulated DC power supplies, the DC output voltage is not regulated in relation to a specific value, but instead changes on the basis of the fluctuation in the (supply) input voltage and the load associated with this value.

The ripple is within the volt range and may depend on the load. Ripple is usually specified as a percentage value proportional to the DC output voltage level.

Even today, unregulated DC power supplies are still being used in applications thanks mainly to their robust, uncomplicated, stripped-down structure that is built to last.

Stability

The output characteristic below illustrates typical dimensioning of the DC output voltage relative to a rated voltage of 24 V_{DC}:



The rated voltage of 24 V_{DC} is set in relation to the rated input voltage at 50 – 75% of the load. This operational status generally corresponds to real-life requirements, such as a 24 V_{DC} control voltage in the system structure.

The "No load" and "Full load" limit values both determine the internal resistance of an unregulated DC power supply that is to be achieved by means of the structure. The more level the output characteristic is required to be, the more complex the component structure needed to achieve this level of "rigidity". Limit value requirements are defined by the intended use of the application or in device standards

(e.g. VDE 0411 Part 500/EN 61131-2/IEC 61131-2):

Limit values VDE 0411 Part 500: Programmable controllers: Equipment requirements and tests		
DC voltage upper limit		
Peak value	≤ 30.0 V_S	With mains overvoltage and no load at output
Arithmetical mean	28.8 V	
DC voltage lower limit		
Peak value	≤ 19.2 V_S	At rated DC output current with mains undervoltage
Arithmetical mean	20.4 V	

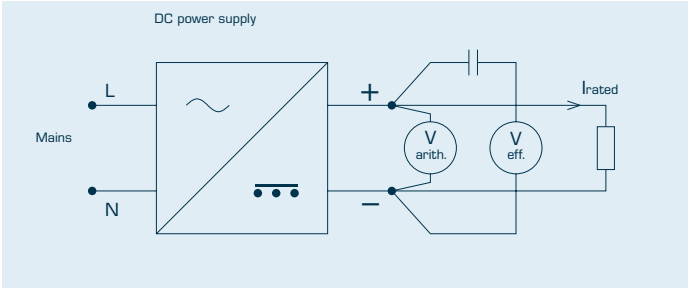
The values specified for the upper and lower voltage limits are adhered to consistently even in the case of mains overvoltage (+10%) and undervoltage (–10%) in accordance with VDE 0175/HD 475S1/IEC 60038, regardless of the load (0 – 100%) associated with our DC power supplies. Operation up to +10% of the mains voltage is permissible, as the DC power supplies are not thermally overloaded up to this point.

Ripple

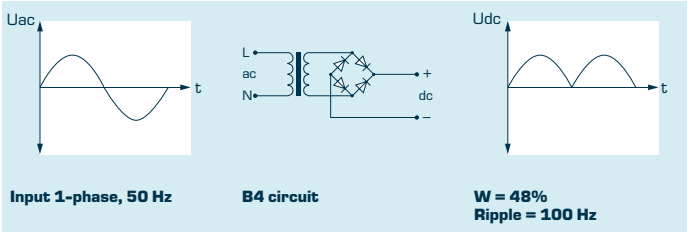
Ripple (see: DIN 41 755-1) is the ratio of the effective value of the superimposed AC voltage U_s to the value of the arithmetical DC voltage U_d and is specified as a percentage value

$$W = \frac{U_{s\ (eff\ only\ ac)}}{U_{d\ (arithm.)}} \times 100\ \%$$

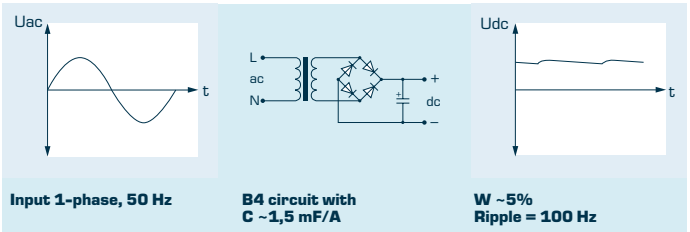
The test setup is identical for single-phase and three-phase DC power supplies:



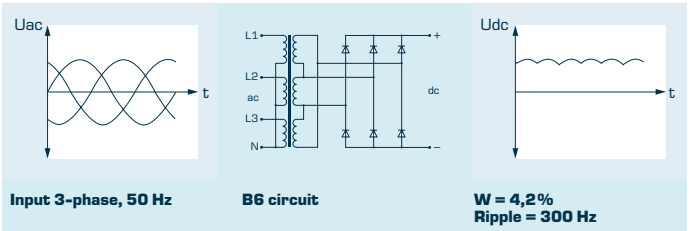
Unless otherwise specified, the ripple value refers to the load with rated DC current and an actual load impedance. The figures below show typical circuits for unregulated DC power supplies and the ripple levels associated with them:



Input 1-phase, 50 Hz | **B4 circuit** | **W = 48%**
Ripple = 100 Hz



Input 1-phase, 50 Hz | **B4 circuit with C ~1,5 mF/A** | **W ~5%**
Ripple = 100 Hz



Input 3-phase, 50 Hz | **B6 circuit** | **W = 4,2%**
Ripple = 300 Hz

Mains buffering

Particularly where unregulated DC power supplies are concerned, it is often necessary to prevent mains interruptions that last just a few milliseconds (e.g. as a result of switching processes) from leading to control errors. An additional circuit containing a charging capacitor, which is connected in parallel to the DC output, is able to store energy and redeliver it in the event of a brief mains interruption. The capacitance of the additional charging capacitor can be determined as follows:

$$C = \frac{I_{dc} \times t}{dU_{dc}}$$

C Capacitance of the capacitor charging (mF)
t Power interruption (MS)
I_{dc} removed DC (A)
dU_{dc} permissible DC voltage reduction relative to the power failure duration (V)

Example: Switching processes in the mains lead to mains interruptions lasting 1.5 ms. The output voltage of an unregulated DC power supply is 22 V_{DC} at a rated DC current of 3 A_{DC} and the rated (supply) input voltage. What size does the additional charging capacitor need to be in order to prevent the output voltage dropping below 21 V_{DC}?

$$C = \frac{3\ A_{dc} \times 1{,}5\ ms}{1\ V_{dc}}$$

In this case, a circuit with 4700 µF (next-highest standard value) enables the required level of mains buffering.

Note:

1. When adding to a circuit at a later point, it is necessary to check whether the rectifier (in the existing DC power supply) is able to supply the additional energy required at the point when the system is switched on without the power supply being destroyed as a result.
2. In the case of DC power supplies with high ratings, it is often enough to simply equip the sensitive control component (which consumes a low amount of current) with an additional charging capacitor via a decoupling diode.

A side benefit of a circuit containing a supplementary charging capacitor is that it has a positive effect on ripple levels. In most applications, however, the benefits of mains buffering are far more significant than those associated with lower ripple levels.

Regulated DC power supplies

Regulated DC power supplies feature electronic regulation circuits in order to keep the DC output voltage (or, in special cases, the DC output current) at a particular value as consistently as possible. Influences such as (supply) input voltage fluctuations or variations in the output load are regulated electronically in the assigned functional area.

The DC output voltage ripple is in the millivolt range and is largely unaffected by the load at the output. The DC output voltage stability settles in the range of 1 - 3%, depending on the switching concept. In many cases, regulated DC power supplies also offer the advantage of electronic current limiting. This can provide protection both for the connected consumer and in the event of the DC power supply being overloaded.

There are two different concepts:

- Linearly regulated DC power supplies
- Clock pulse-controlled DC power supplies

Linearly regulated DC power supplies

These DC power supplies are often also referred to as linear regulators or longitudinal regulators.

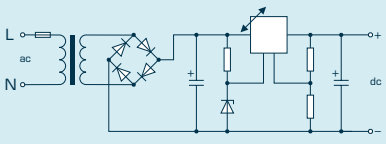
In many cases, the basic structure consists of a 50 Hz transformer (which meets the safety requirements for electrical isolation from the mains), rectification with filtering, and a regulator. This regulator chiefly consists of power transistors and behaves in the same way as a variable resistor. The electronics ensure a stable DC output voltage. The actual value of the DC output voltage is queried at the output by means of a voltage distributor and continually compared with the setpoint (reference voltage, frequently generated by a Zener diode). These two correcting variables permanently control the regulator and determine the DC output voltage level.

Benefits:

- No safety issues in terms of mains isolation by means of 50 Hz transformer
- Multiple input voltages can be implemented easily due to primary tapping
- Straightforward circuit concept
- Short settling times
- Extremely low ripple
- Very few EMC problems
- Inexpensive concept up to approx. 50 W

Drawbacks:

- Low level of efficiency
- Efficiency highly dependent on mains voltage fluctuations and the DC output voltage level; approx. 60% at 24 V_{DC}, 35% at 5 V_{DC}
- Pronounced heat build-up, particularly with high DC output currents
- High construction volume
- High weight



Linear regulator

Clock pulse-controlled DC power supplies

These power supplies are also often referred to as switched-mode regulators or switched mode power supplies. In contrast to linearly regulated DC power supplies, where the DC voltage and DC current are regulated continuously, these quantities are switched (chopped) in the case of clock pulse-controlled DC power supplies. As part of this concept, the **power semiconductors used are operated exclusively as switches**. Only slight switching and forward losses occur, which explains the high levels of efficiency that characterise these power supplies.

Regulation is carried out either by modifying the pulse duty ratio (switch-on time to switch-off time) with a constant frequency or by modifying the frequency with a constant pulse duty ratio. The **square-wave voltage** generated as a result can be transformed into practically any voltage level and rectified. A **high clock pulse frequency** ranging from around 20 kHz up to several MHz enables the **use of small ferrite transformers, inductors and capacitors**.

For the sake of clarity, the figures below do not show the (mains) transformer or the rectifier connected downstream. This **intermediate circuit** usually forms the input for the **DC-DC converters**.

A fundamental distinction is drawn between two transformational converter principles on the basis of their transformation behavior:

With a **feed forward converter**, energy is transported between the primary and the secondary circuit with a closed semiconductor switch.

Description: With the semiconductor switch closed, energy is delivered to the output via the first secondary diode (connected in series to the secondary winding). If the semiconductor switch is open, however, then this diode acts as a block, and the second secondary diode takes on the current (magnetically stored energy) from the storage reactor and delivers it to the output. The third winding and the diode connected in series limit the voltage level at the semiconductor switch. In addition, the energy stored in the ferrite transformer during the switch-on phase is delivered back to the input source (intermediate circuit) during the switch-off phase.

The flyback converter first stores the energy in the ferrite transformer whilst the semiconductor switch is closed, until it is ready to deliver it to the secondary circuit during the blocking phase.

Description: The ferrite transformer collects energy whilst the semiconductor switch is closed. The diode in the secondary circuit acts as a block and no energy is transferred to the output. It is only once the semiconductor switch is opened that the polarity is reversed, the diode becomes conducting and the energy stored in the ferrite transformer is transferred to the output in the secondary circuit.

The key benefits of the feed forward converter are a clean DC output voltage as well as higher performance, e.g. when acting as a push-pull feed forward converter in a half-bridge or full-bridge circuit. The flyback converter is a cheaper option by comparison, but its operating behavior is less stable.

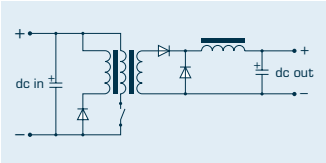
Two reactor converter principles are often used for applications **without electrical isolation** between the input (intermediate circuit) and output:

The **step-down converter** is able to convert a higher DC input voltage into a lower DC output voltage (with a correspondingly higher DC output current).

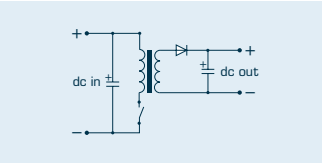
Description: When the semiconductor switch is closed, current flows to the output via the reactor. In the reactor, part of the current is converted into magnetic energy, which in turn is converted back into electrical energy during the blocking phase (with the semiconductor switch open). The polarity at the reactor reverses so that the current can flow to the output via the diode. This means that the DC output voltage is always lower than the DC input voltage.

With the **step-up converter**, it is possible to convert the DC input voltage into a higher DC output voltage (with a correspondingly lower DC output current).

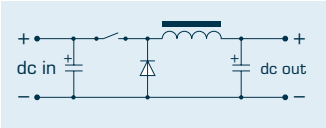
Description: When the semiconductor switch is open, current flows to the output via the reactor and the diode connected in a way that enables it to act as a feed-through. When the semiconductor switch is closed, electrical energy is converted into magnetic energy in the reactor and stored there. During this process, the diode prevents the output from being short-circuited. When the semiconductor switch is open, the magnetic energy is converted back into electrical energy and a DC voltage builds up in series to the output. This means that the DC output voltage is always higher than the DC input voltage..



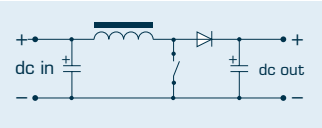
Feed forward converter



Flyback converter



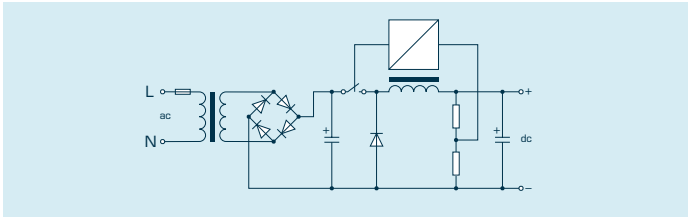
Step-down converter



Step-up converter

Secondary clock pulse-controlled DC power supplies

Diese Gleichstromversorgungen werden u.a. auch als „Sekundär-Schaltregler“ bezeichnet. Ein typisches Schaltungskonzept zeigt die prinzipielle Funktion.



A **50 Hz transformer** which meets the safety requirements for electrical isolation is used for adaptation to the mains. Following rectification, an intermediate circuit DC voltage which is higher than the desired DC output voltage should be produced at the charging capacitor. A **step-down converter** with a typical **switching frequency of > 20 kHz** is connected downstream of the intermediate circuit. The regulator controls (clock pulse-controls) the semiconductor switch in a way that establishes a stable DC output voltage. As part of this, the reference voltage integrated into the regulator is compared with the actual value of the output (generated by the voltage distributor). These correcting variables are used to regulate the switch-on and switch-off times for the semiconductor switch.

Benefits:

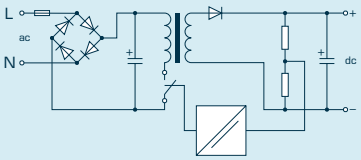
- No safety issues in terms of mains isolation by means of 50 Hz transformer
- Multiple input voltages can be implemented easily due to primary tapping
- Circuitry even easier to understand than before
- Relatively high efficiency level; largely unaffected by mains voltage fluctuations and the DC output voltage (approx. 70 – 80%)

Drawbacks:

- High construction volume
- High weight
- Relatively long settling times (compared to linearly regulated DC power supplies) which depend on the switching frequency
- Relatively unclean DC output voltage (spikes, wide-band spectrum)
- EMC problems due to clock pulse control, but a relatively low noise leve

Primary clock pulse-controlled DC power supplies

These DC power supplies are also referred to as primary switched-mode regulators (amongst other things). Their main function is shown by the circuit concept below, which is used in many applications



A **converter** with a typical **switching frequency of > 20 kHz** is connected downstream of the intermediate circuit. The regulator controls (clock pulse-controls) the semiconductor switch in a way that establishes a stable DC output voltage. As part of this, the reference voltage integrated into the regulator is compared with the actual value of the output (generated by the voltage distributor). These correcting variables are used to regulate the switch-on and switch-off times for the semiconductor switch.

With this type of circuit concept, the ferrite transformer must meet the safety requirements for electrical isolation from the mains; this also applies to the regulator (by using an optocoupler, for example).

Benefits:

- Extremely high efficiency level; largely unaffected by mains voltage fluctuations and the DC output voltage (approx. 75% to over 90%)
- Low construction volume
- Low weight
- Option of wide input voltage range
- Option of AC and DC input voltage, depending on circuit concept

Drawbacks:

- Complex circuitry (number of components; likelihood of failure)
- Relatively long settling times, which also depend on the switching frequency
- Relatively unclean DC output voltage (spikes, wide-band spectrum)
- EMC problems due to clock pulse control, plus a high noise level

Stability

The stability of the DC output voltage of regulated DC power supplies is primarily determined by the **functional area** of the assigned requirements. This includes:

- **Line regulation**
  Defined between the permissible limit values for the lowest and highest input voltage, usually when the rated DC output current is at its maximum (but only with half the rated DC output current in accordance with VDE 0557/ EN 61204/IEC 61204). Line regulation is typically −15% to +10% relative to the rated input voltage, e.g. 230 V_{AC}.
- **Load regulation**
  Defined with the least favourable input voltage within the range where line regulation is taking place with load variations from 0 – 100% of the rated DC output current. Regulated DC power supplies without no-load-proof capability should be evaluated at the lower limit values of 10%, 25% or 50% and designated accordingly.
- **Effect of temperature**
  Often, it is particularly useful to look at how temperature affects the stability of the DC output voltage in the following worst-case scenarios:
  - Cold DC power supply at lower limit value of the assigned ambient temperature (e.g. 0°C) and minimum permissible load
  - DC power supply at operating temperature and in steady-state condition, at upper limit value of the assigned ambient temperature (e.g. 50°C) and maximum load.

In line with the relevant standards (see: VDE 0557/EN 61204/IEC 61204), the effect of temperature is represented as the temperature coefficient in % or °C.

Stability refers to the **potential variation in the DC output voltage** relative to the functional area of various parameters, such as line regulation, load regulation and temperature. The value assigned by the manufacturer is specified as a percentage **relative to the rated DC output voltage**.

Typical values:
0.5% for linearly regulated DC power supplies
2% for clock pulse-controlled DC power supplies

Tolerance

The DC output voltage of regulated DC power supplies **can normally be set** and referred to the rated value. The setting accuracy (resolution) depends on the circuit concept and the assigned setting range. Typical setting ranges (relative to a rated DC output voltage of 24 V_{DC}) are ±5% or 22 V_{DC} to 28.8 V_{DC}. It is important to remember that the **stability** of the DC output voltage may **change** if the rated value setting is different!

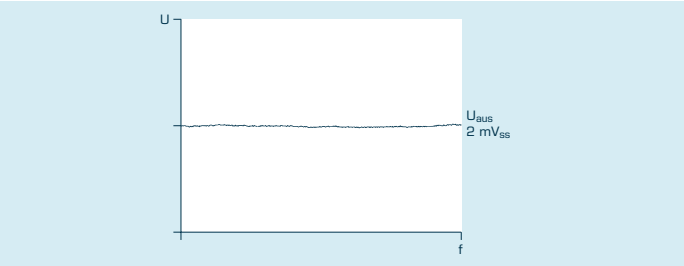
In the case of regulated DC power supplies which cannot be set, the DC output voltage tolerance is usually 2% or 5%, relative to the rated value.

Ripple

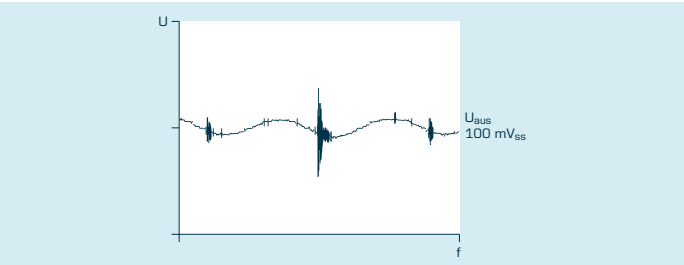
In contrast to unregulated DC power supplies with ripples in the volt range, regulated DC power supplies only demonstrate very low levels of ripple. For this reason, ripple is no longer specified as a percentage, but rather as an absolute voltage value in mV_{pp} (millivolt peak-to-peak). As far as possible, it is also independent of the DC output current level in the assigned functional area. Non-Sine ripples (e.g. spikes) which exhibit wide-band frequency behavior can occur as a result of regulating and switching procedures within the regulated DC power supply.

The quality of the DC output voltage ripple also differs depending on whether the DC power supply is linearly regulated or clock pulse-controlled.

If the supply DC voltage needs to be as "clean" as possible (as is the case in measurement and control technology, for example), then the linearly regulated DC power supply should be given preference over the other type of power supply..



Linearly regulated

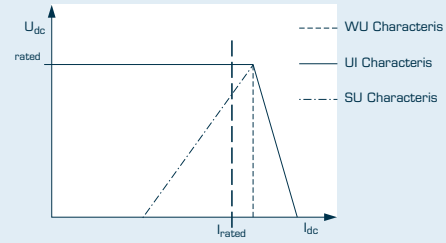


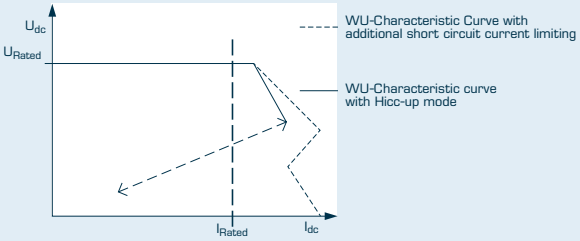
Clock pulse-controlled

Current limiting

Regulated DC power supplies usually feature an electronic current limiting function that acts on the output. This not only prevents the load (consumer) from becoming a source of danger (i.e. creating a risk of fire) as a result of excessive current consumption, but also protects the DC power supply itself from being destroyed due to a defective load (consumer).

Depending on the assigned requirements profile and the selected circuit concept, the following load characteristics (see: DIN 41 745, DIN 41 772) or combinations of these are often used:





Combination Example

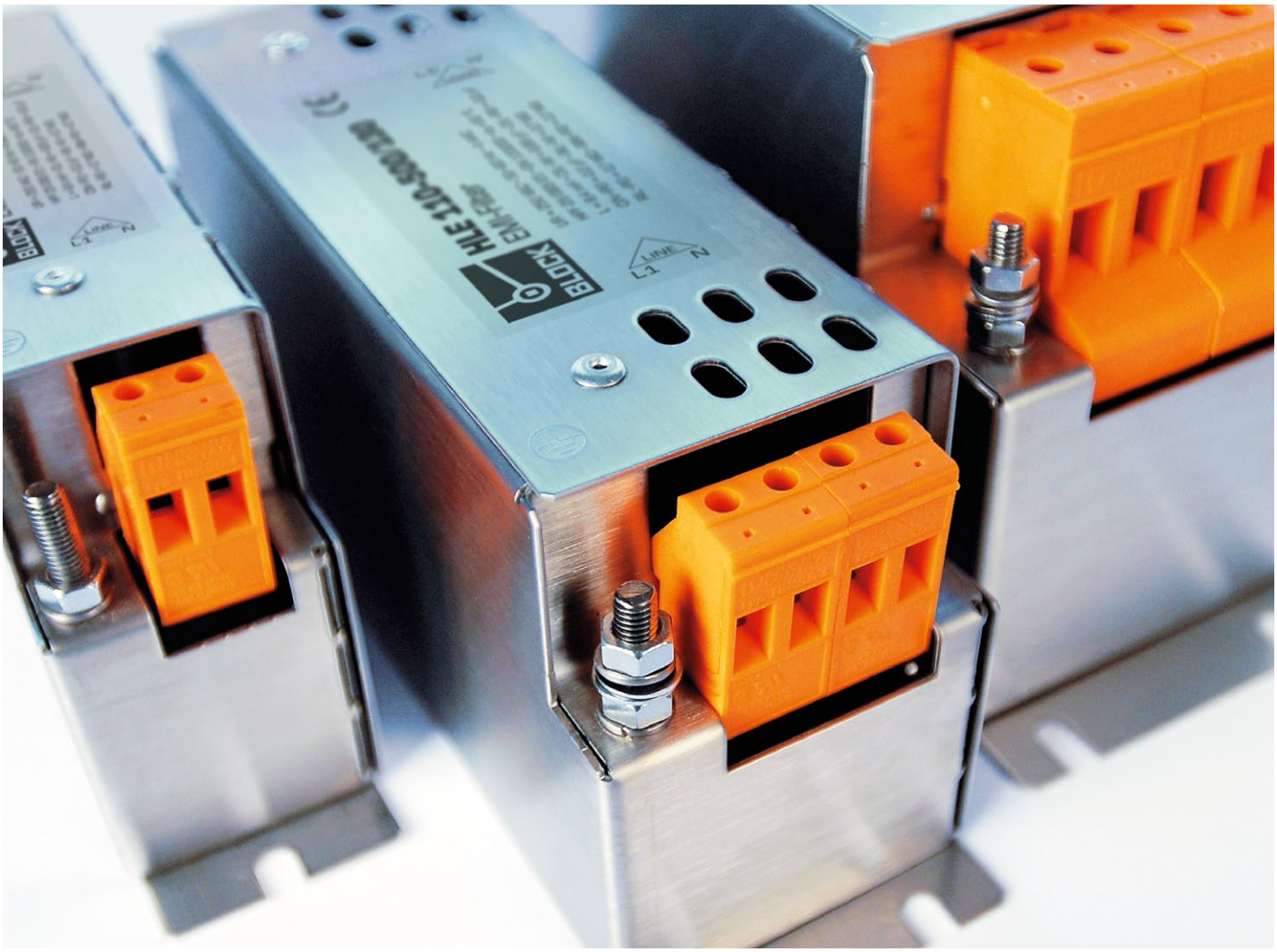
Mains buffering

The mains buffer time - also known as the dwell time (see: VDE 0557/EN 61204/IEC 61204) – is the time during which a regulated DC power supply is still able to supply the rated DC output current even though the (supply) input voltage has been switched off. In this case, the rated DC output voltage remains within the assigned tolerance range and the (supply) input voltage was at 90% of the rated value before it was switched off.

The most efficient way to increase the mains buffer time is when the **intermediate circuit charging capacitor** of the regulated DC power supply (see the "Primary clock pulse-controlled DC power supplies" wiring diagram, for example) has a **high capacitance** and is therefore able to store a large amount of energy. The charging capacitor which is connected in parallel to the output of a regulated DC power supply can, in principle, be increased in size as well in order to achieve a longer mains buffer time, although this may lead to undesirable effects on the regulating characteristics of the circuit. Furthermore, the DC output voltage may only build up slowly following switch-on, depending on the electronic current limiting concept selected.

In most cases, mains buffer times of 3 - 10 ms can be achieved; this may even be increased to 20 ms with some additional effort. To provide buffering for longer periods (e.g. for backing up data on storage media), a UPS (uninterruptible power supply) is usually required.


BLOCK
SWITCHED MODE POWER SUPPLY
PVSA 230/30-3
BLOCK
POWER VISION



Passive filters and interference suppression components

General technical information

It is essentially the following components which are utilised for the suppression mains borne electromagnetic interference:

- **Passive filters**
  An assembly of individual parts and inductive, capacitive and resistor elements which are utilised for the reduction of electromagnetic interference caused by electrical or electronic devices or other sources.
- **Reactor**
  An element which exhibits a slight impedance at low frequencies and a high inductively-marked reactance at high frequencies.
- **Capacitor**
  An element which exhibits a high impedance at low frequencies and a low capacitively-marked reactance at high frequencies.

Requirements

The constructive differences between passive electrical filters and interference suppression components, referred to below under the general title “filters”, are generally determined by their intended utilisation. Corresponding requirements are established in the installation, device and EMC-standards
(e.g. VDE 0100, VDE 0113/
EN 60204/IEC 60204, VDE 0700/
EN 60335/IEC 60335, VDE 0805/
EN 60950/IEC 60950, EN 61000-6-1 to EN 61000-6-4, EN 61800-3,
EN 62041).

An important selection criterion is the achievable attenuation effect against mains borne interference, depending on the interfering frequency:

Filters against low-band interference

- Power reactors*
- Filtering circuit reactors*

Filters against low and high-frequency interference

- Interference suppression filters
- Motor reactors
- Motor filters
- Sine filters

Filters against high-frequency interference

- Reactors for the suppression of electromagnetic interference (EMI reactors), current-compensated
- Passive filters for the suppression of electromagnetic interference (EMI filters)

Note:
Proof of whether the limit values of the EMC standards (see “Electromagnetic Interference” and “Electromagnetic Interference Immunity”) can be maintained can be obtained only by means of measurement technology as a systems test which takes into account all participating individual components.

*see chapter “reactors”

Standards

Unless otherwise agreed upon with ordering party, we manufacture in accordance with the latest “State of Technology” and with the following standards:

VDE 0565 Teil 3: Passive filters for the suppression of electromagnetic interference

EN 60939/IEC 60939: Passive filters units for electromagnetic interference suppression

EN 60939-1/IEC 60939-1: Passive filters units for electromagnetic interference suppression

VDE 0565 Teil 2: Reactors for electromagnetic interference suppression

EN 60938/IEC 60938: Fixed Reactors for electromagnetic interference suppression

VDE 0570: Safety of power transformers, power supply units and similar, Part 1: General requirements and tests, Part 2-20: Particular requirements for small reactors

EN 61558, IEC 61558: Safety of power transformers, power supply units and similar, Part 1: General requirements and tests, Parts 2–20: Particular requirements for small reactors

Rated voltage

The rated voltage (UR) is either the highest effective operating voltage(1) at rated frequency or the highest operating direct current voltage which can be continuously present at the filter location in conjunction with temperatures between the lower category temperature(2) and the rated ambient temperature (Ref.: VDE 0565 Part 3/EN 60939/IEC 60939).

(1)Supplement: in cases of alternating current systems, the voltage of the external conductor to one another

(2)Supplement: of the lowest permitted ambient temperature, see Test class

Note (Ref.: VDE 0565 Part 3/EN 60939/ IEC 60939): Passive filters for the suppression of electromagnetic interference (EMI filters) must be selected in such a way that their rated voltage is equal to or larger than the rated voltage of the voltage mains to which they are connected. It must be taken into account thereby that the mains voltage can increase up to 10 % over its rated value(3).

(3)Supplement: see “Conversation of the low-voltage mains”.

Note: The specification of the rated voltage with filters often leads to misunderstandings since it deviates from the usual electrical equipment designations which are also in conformance with standard norms.

An example of this: An industry PC, a frequency converter and a passive filter for the suppression of electromagnetic interference is to be operated on a low-voltage mains with the standard norm voltage 230 V (tolerance -10 % to +6 %, which corresponds to 207 V to 244 V) in accordance with VDE 0175/HD 472 S1/
IEC 60038.

A rated voltage of 230 V is to be displayed on the type plates of the industry PC and of the frequency converter. It is established in the standard norms for the device
(Ref.: VDE 0805/EN 60950/IEC 60950 and VDE 0160/EN 61800/IEC 61800) that the industry PC and the frequency converter may be operated continuously up to 110 % of their rated voltage. This means that safe functioning is ensured for these two pieces of electrical equipment, even after the year 2008 (in accordance with VDE 0175/
HD 472 S1/IEC 60038: Tolerance range -10 % to +10 %, which corresponds to 207 V to 253 V), on the 230 V low-voltage mains.

The type plate of the passive filters displays a rated voltage of 250 V. This specification, however, already refers to the upper voltage limit at which the passive filters is permitted to be placed in continuous operation
(Ref.: VDE 0565 Part 3–1/EN 133200). Starting with the year 2008, the passive filters can carry a load of 253 V, which puts it in the limit range of safe functioning.

Passive filters from our company will, in the interests of the greatest possible application security, generally be labelled with rated voltage (as electrical equipment) and with rated voltage (UR) in accorddance with
VDE 0565 Teil 3/EN 60939/IEC 60939.

Voltage range

The voltage range has been assigned to the filters and it is expressed in terms of the upper and lower limits within which the filters is permitted to be placed in continuous operation. Whereas it is true that the lower limit is generally non-critical, the upper limit is determined by the insulation system and the dielectric strength, e.g. of the capacitors.

In a departure from the otherwise usual standard norm-oriented allocation of voltages for electrical equipment, here the upper limit will be marked by the rated voltage of the filter, unless labelled otherwise.

Rated frequency

The rated frequency is the frequency allocated to the filter for the established operating conditions.

Unless other arrangements have been made, radio interference filters will be designed for 50 to 60 Hz.

Rated current

The rated electrical current (Ref.: VDE 0565 Part 3/EN 60939/IEC 60939) is the greatest effective operating current at rated frequency or the greatest operating direct current with which a filter may be operated continuously at its rated temperature (1). It is specified by the manufacturer for one or both of the following conditions:

a) open-air (I_{RO})

b) with a specified heat sink (I_{RH})

(1)Ergänzung: rated ambient temperature

Unless other arrangements have been made, filters will be designed accordingly, mounted on a wooden foundation in position for use, in accordance with Condition b).

Ambient temperature and rated electrical current

The rated electrical current assigned to a filter refers to the surrounding rated ambient temperature of the immediate surroundings. Higher ambient temperatures require an electrical current derating in accordance with the following function:

$$I_{max} = I_B \times \sqrt{\frac{T_K - T}{T_K - T_B}}$$

I_{max} = maximum electrical current at ambient temperature T [A]
I_B = rated electrical current at rated ambient temperature T_B [A]
T_K = upper temperature value of the climate category [°C], z. B. 85 °C
T = ambient temperature [°C]
T_B = rated ambient temperature [°C]

Example: A filter of the test class 25/085/21 is assigned a rated electrical current of 16 A for a rated ambient temperature of 40 °C. With which maximum electrical current may the filter be loaded for an ambient temperature of 55 °C?

$$I_{max} = 16\ A \times \sqrt{\frac{85\ °C - 55\ °C}{85\ °C - 40\ °C}} = 13\ A$$

In cases of lower ambient temperatures than the rated ambient temperature, one is advised against the possibility of using an increase of electrical current over the rated electrical current, since this can then easily lead to saturation phenomena on the parts of the inductances.

Leakage current

Leakage current is an undesired flowing alternating current between electrical poles which possesses different levels of voltage potential. An internal wiring of filters with capacitors to earth (PE) is often indispensable for an efficient damping of high-frequency asymmetrical interference. This/these capacity/capacities bring about a leakage current to earth (PE) in terms of the rated frequency of the mains.

The maximum limit values for the leakage current are established in several installation and device regulations. The usual values range from 0.1 mA (medical devices) to 5 mA (household appliances).

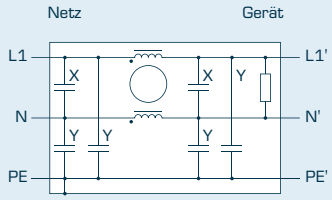
Higher leakage currents with filters are mainly to be encountered in the industrial sector. These filters are equipped with a respective warning and earthing notice. In cases of multiphase systems, the highest leakage current (worst-case scenario) occurs with the connection of only one external conductor to earth (PE). The utilisation of FI safety switches should be dispensed with when filters with a great leakage current are being used, since it can lead to unwanted triggering at the moment of being turning on.

Passive filters for the suppression of electromagnetic interference (EMI filters)

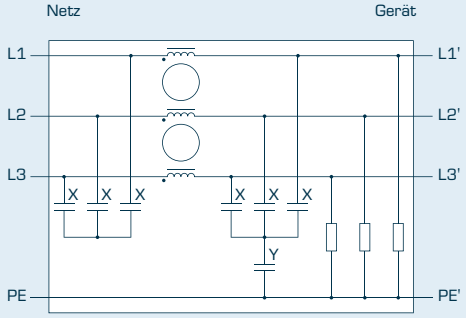
The utilisation of passive filters for the suppression of electromagnetic interference (EMI filters) is the mains borne suppression of interference on the mains in the frequency range located between 150 kHz (9 kHz)[1)] and 30 MHz. Here are several low-pass principal circuits:

[1)] not yet included as part of the EMC standardisation.

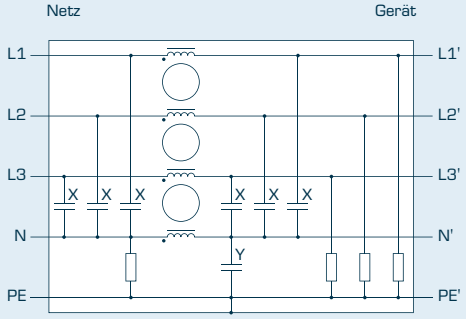
single-phase, universally utilisable



three-phase, utilisable for equivalent (symmetrical) current distribution in L1, L2, L3 (e.g. for the individual interference suppression of frequency converters, motors)



three-phase+N, utilisable for equivalent (asymmetrical) current distribution in L1, L2, L3, because the differential current can flow via N (e.g. cumulative interference suppression of entire machines)



Interference suppression components utilised:

- Capacitors Class Y (L-PE, N-PE)
- Capacitors Class X (L-L, L-N)
- Resistance for discharge of the capacitors
- Current-compensated magnetic core reactor

An even more efficient suppression of interference, and with it a greater insertion attenuation, is achieved when additional elements (interference suppression components) are added, thus creating multi stage constructions.

Y-capacitors

In passive filters for the suppression of electromagnetic interference (Ref.: VDE 0565 Part 3/EN 60939/ IEC 60939), designed essentially for the operation of mains alternating voltage, the capacitors need to fulfil the requirements of Class X or Y (depending on the position of the circuit).

Class Y capacitors are suitable for applications where the failure of the capacitor could lead to a dangerous electrical shock. A failure of the Y-capacitor resulting from a short-circuit or a disruptive breakdown is thus prevented from occurring during the course of orderly use.

The switching of Class Y capacitors takes place to earth (PE) in relation to the application.

Sub-class	Type of Bridged-over insulation	Rated voltage ranges	Peak value of the surge value
Y1	Double or reinforced insulation	≤500 V	8.0 kV
Y2	Basic or supplementary insulation	≥150 V ≤300 V	5.0 kV
Y3	Basic or supplementary insulation	≥150 V ≤250 V	-
Y4	Basic or supplementary insulation	<150 V	2.5 kV

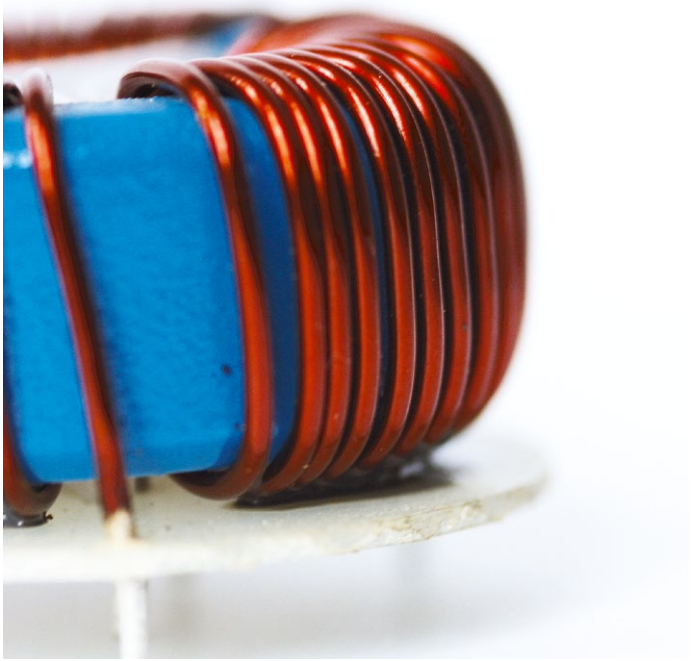
X-capacitors

In passive filters for the suppression of electromagnetic interference (Ref.: VDE 0565 Part 3/EN 60939/IEC 60939), designed essentially for the operation of mains alternating voltage, the capacitors need to fulfil the requirements of Class X or Y (depending on the position of the circuit).

Class X capacitors are catagorised according to the peak voltages of impulses superimposed on the mains alternating voltage to which they are exposed.

The switching of Class X capacitors takes place, depending on application, L-L and L-N.

Sub-class	Impulse peak voltage in operation	Installation category in accordance with IEC 60664
X1	>2.5 kV ≤4.0 kV	III
X2	≤2.5 kV	II
X3	≤1.2 kV	-

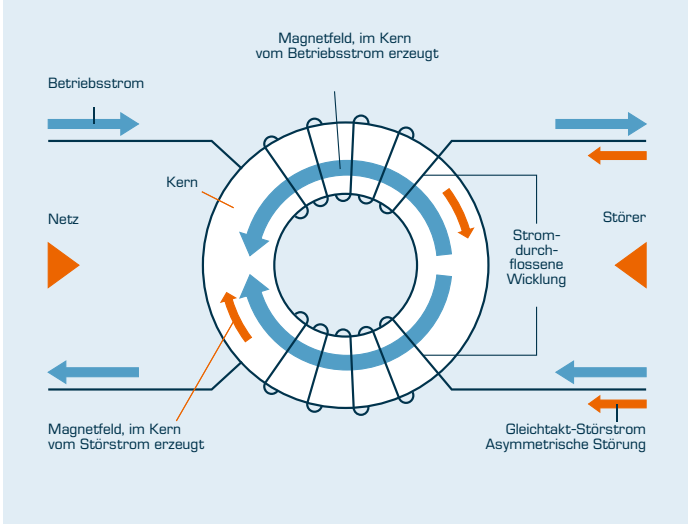


Discharging resistor

The discharge voltage resistors integrated in a filter aid the voltage degradation of charged capacitors. Capacitors should be discharged down to a voltage of less than 60 V within 5 seconds of the switching-off of the supply voltage in order to avoid the danger of an electric shock.

Current-compensated magnetic core reactor

Current-compensated reactors for the suppression of electromagnetic interference are reactors whose coils are configured upon a normally closed core in such a way that the magnetisation occurring as a result of the (symmetrical) is neutralised. A greater inductive resistor is, however, effective against asymmetrical parasitic currents.



Example of a current-compensated magnetic core reactor

Insertion attenuation

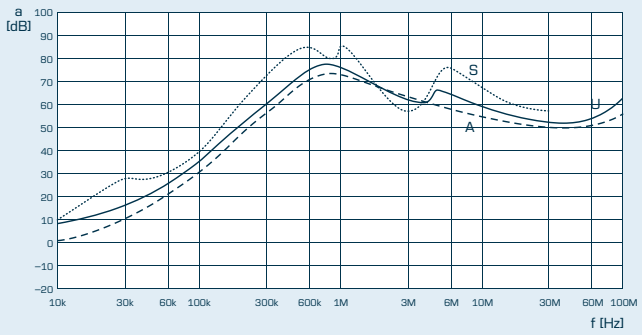
Insertion attenuation represents a non-system-dependent benchmark criterion for passive filters. The measuring procedure has been standardised (Ref.: CISPR 17) and adapted from communications engineering. It describes the logarithmic ratio U1: U2 of the (interference) voltage before and after the insertion of a filter into a circuit in terms of the frequency, measured at the output.

$a = 20 \times l_g (U_1 : U_2)$ [dB]

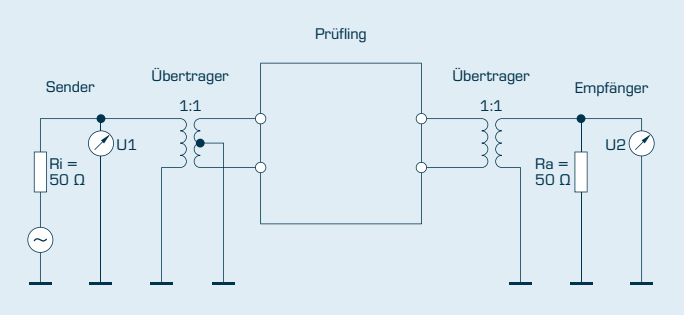
Values often applied for U1: U2 include:

0 db = 1 : 1
3 db = 1 : 1,41
6 db = 1 : 2
10 db = 1 : 3,16
20 db = 1 : 10
40 db = 1 : 100
60 db = 1 : 1.000
80 db = 1 : 10.000
100 db = 1 : 100.000
120 db = 1 : 1.000.000
140 db = 1 : 10.000.000

If the filter is terminated on both sides with a real resistor of e.g. 50 Ω during measurement of the insertion attenuation, then one speaks of a 50 Ω insertion attenuation.



A = asymmetrisch
S = symmetrisch
U = unsymmetrisch (mit Abschluss des Nachbarzweiges)
A = asymmetric
S = symmetric
U = non-symmetric

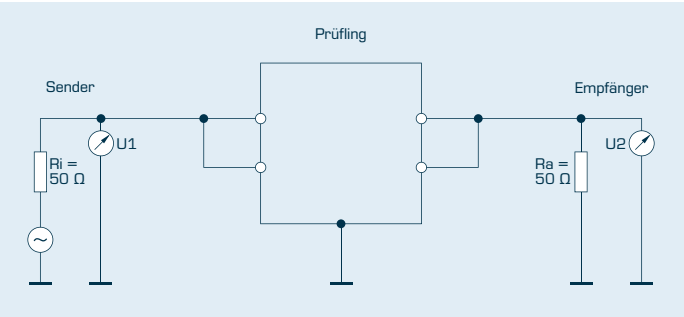


Basic measurement setup for measurement of the symmetrical 50 Ω insertion attenuation (differential mode) of a filter

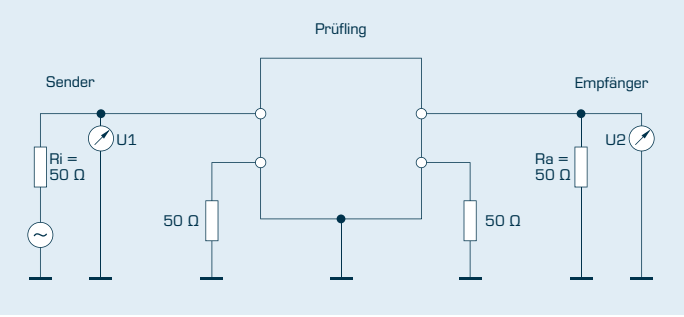
Measurement with unequal real terminating resistors (e.g. 0.1 Ω/100 Ω or 100 Ω/0.1 Ω) can also be carried out. These combinations make it possible to evaluate a filter in case of a mismatch. Even a negative insertion attenuation, meaning an (interference) voltage increase, is thereby possible.

While these measuring procedures do permit a comparison of different filters and make possible a preselection of the desired attenuation characteristics, they do not provide much information concerning the effectiveness of the filter in individual applications. The reason for this is to be found in the fact that neither the source of the interference (interference sink) nor the connected power line system exhibits a real resistor of 50 Ω. In addition to this there is the fact that the measurement of the 50 Ω insertion attenuation takes place in the small signal range (circa 1 V) and that the operating current (non-linear magnetisation characteristic curve, pre-magnetisation) is not achieved for the inductances of the filter. The interference voltage level itself, however, lies once again in the small signal range.

Proof of whether the limit values of the EMC standards (see “Electromagnetic Interference” and “Electromagnetic Interference Immunity”) can be maintained can be obtaines only by means of measurement technology as a systems test which takes into account all participating individual components.



Basic measurement setup for measurement of the non-symmetrical 50 Ω insertion attenuation (common mode) of a filter



Basic measurement setup for measurement of the asymmetrical 50 Ω insertion attenuation of a filter with termination of the neighbouring branch.

Current-compensated magnetic core reactor

The usual utilisation of mains interference filters takes place between the mains and the input of the consumer (e.g. frequency converters). 1-phase and 3-phase models are available. A mains interference filter efficiently brings together the characteristic of a power reactor (see "reactors") and that of a "passive filter for the suppression of electromagnetic interference (EMI-filter)" to make just a single filter which is very effective across a wide band. Optimal tuning of the components makes it possible to have a mains borne suppression of interference from the mains frequency up to 30 MHz.

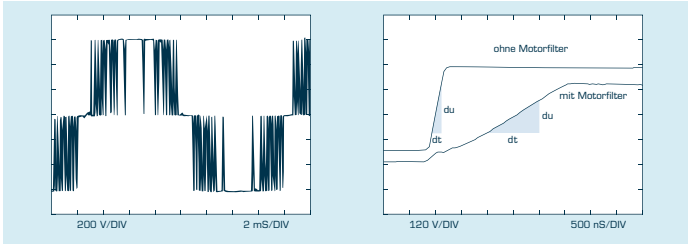
Motor reactor

The problems connected with the operation of alternating current motors at the frequency converter are increased with the utilisation of rapidly-switching power semiconductors. The steep buildup and falloff of the voltage (edge steepness dv/dt up to 12 kV/µs) causes, among other things, the following:

- Problems with the insulation strength and service life of the coil wires in the motor
- Generates harmonic oscillations of greater intensity up into the high frequency range

As a result of the utilisation of motor reactors,

- the edge steepness is reduced to circa 500 V/µs, which protects the motor
- the high-frequency harmonic oscillation share is reduced, which means that electromagnetic compatibility with other systems components is improved



Output voltage of a phase of the frequency converter

Resolution of an edge of the output voltage with and without a motor reactor

Motor reactors represent a minimum degree of protection. A higher level of usefulness can be obtained with motor filters or sine filters.

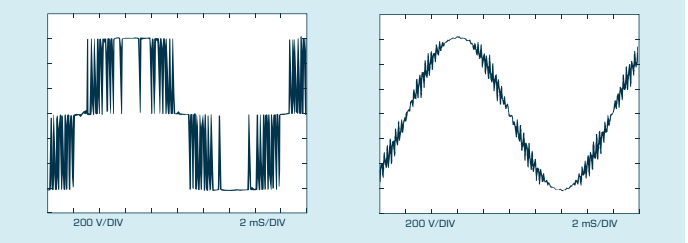
Sine filters

The utilisation of the sine filters extends itself to include the mains borne suppression of interference, from the frequency converter output to the shielded motor feed line with the alternating current motor attached to it, for clock frequencies from circa 500 Hz and higher.

The sine filter achieves a very high filtering effect as a result of its precise low-pass tuning to the clock frequency of the frequency converter. The wanted signal (the motor operation frequency) up to circa 120 Hz passes the sine filter with only a slight effective voltage drop, while the clock frequency (typically 8 kHz to 10 kHz) is already being reduced by circa 90%. Harmonic oscillations of the clock frequency are filtered out almost completely.

The special andvantages in summary:

- very high filtering effect throughprecise low-pass tuning
- practically the only edge steepness of the output voltage still remaining is that which is usual for mains
- clock frequency and harmonic oscillation of the frequency converter output voltage become severely attenuated
- long shielded motor feed line possible
- low-noise motor operation through high attenuation of the clock frequency
- reduction of leakage currents



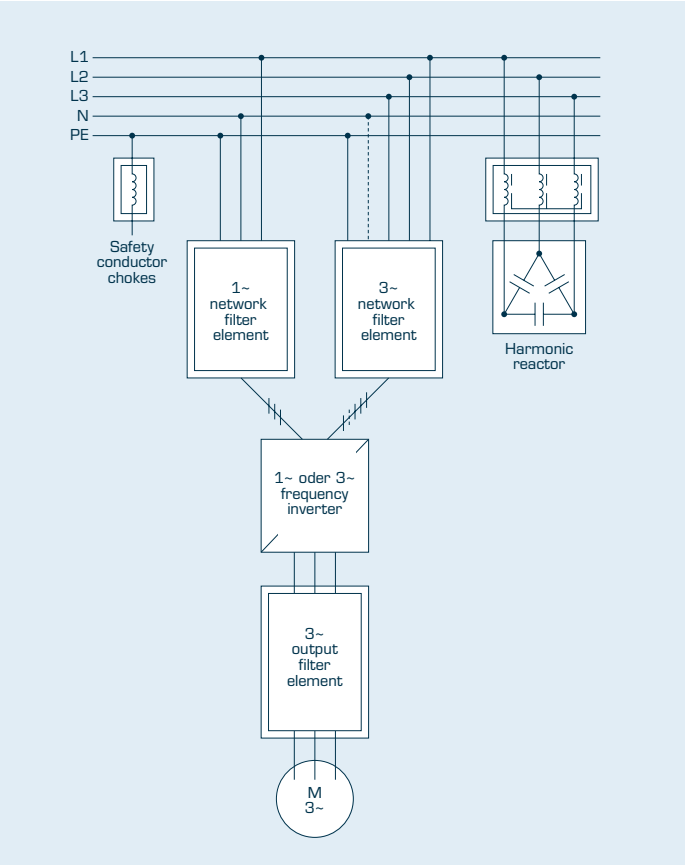
Output voltage of a phase of the frequency converter

Output voltage of a phase of the Sine filter

It can be seen in the oscillogram that the clock frequency of the frequency converter is present only in conjunction with a low-level amplitude superimposed on the wanted signal (motor operation frequency).

Overview for the utilisation of reactors and passive filters connected with the frequency converter

Frequency converters represent the optimal form of general motive power engineering for the control and regulation of motors, both from a technical and from an economic point of view. A typical configuration for this of the pieces of electrical equipment utilised is presented in the illustration:



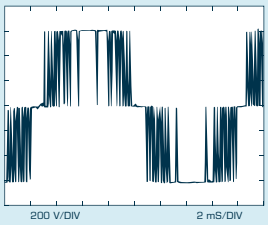
Electrical energy is obtained from the 400 V/50 Hz alternating current mains via an alternately 1-phase (230 V) or 3-phase (3 x 400 V) mains filter element and fed to the alternately 1-phase or 3-phase frequency converter input. Depending on individual requirements, the mains filter element can be designed as a power reactor, a radio interference suppression filter or an EMI filter (see in this connection "Passive Filters and Interference Suppression components, Requirements").

The rectification of the 50 Hz mains voltage and the storage of the electrical energy takes place in a direct current "intermediate circuit" in the frequency converter. The feeding of the intermediate circuit can take place in 1-phase (usual: B 4 rectifier bridge) or even 3-phase form (usual: B 6 rectifier bridge). The intermediate circuit energy is clock-pulse controlled by means of a targeted switching on and off using six semiconductor switches. This clock-pulse control takes place fundamentally as alternating current voltage with 120° phase displacement and is made available at the output of the frequency converter. The level of the clock-pulse controlled 3-phase-output voltage is oriented to the input voltage of the frequency converter, i.e. 1-phase 230 V devices supply 3 x 230 V, 3-phase 3 x 400 V devices supply 3 x 400 V at the output. Control and regulation functions such as soft start, constant torque, current limitation or modification of the motor operation frequency are realisable through the targeted clock-pulse controlling of the output. The operation of a commercially-available alternating current asynchronous motor then takes place via the (always) 3-phase output filter element via amore or less long cable. Depending on individual requirements, the output filter element can be designed as a motor reactor, a motor interference suppression filter or a sine filter (see in this connection "Passive Filters and Interference Suppression components, Requirements").

The problems of modern frequency converters

A distinction is made between I frequency converters and U frequency converters. Both variants have technical advantages and disadvantages in terms of their respective applications. Due to advantages which are conceptional and thus also economic, the U frequency converter is utilised by far the most often – the statements made apply mainly to it.

Large numbers of manufacturing pieces and sophisticated circuit technology make possible the development of ever smaller and ever more efficient devices, qualities which keep them inexpensive. These advantages are achieved through ever-greater clock frequencies and through more rapidly-switching semiconductor switches (IGBT) which are linked to a lower level of power dissipation. The illustration shows the oscillogram of the (pulse width-controlled) clock-pulse controlled frequency converter output voltage of one of the three phases:



The oscillogram is resolved to a period of the "wanted signal" of the alternating current frequency for the operation of the motor (typically up to circa 150 Hz). This alternating current voltage is formed by precisely time-controlled switch-on and switch-off processes of the intermediate circuit direct current voltage with clock frequency of the frequency converter (typically starting from 4 kHz). The steep buildup and falloff of the voltage (edge steepness dv/dt to 12 kV/µs) causes considerable problems, however, with the insulation strenghth of the coil wires in the motor. The stress permitted should not exceed 500 V/µs, since otherwise either a malfunction caused by short-circuit in coil will occur or there will be a reduction in the expected service life of the motors. An important additional aspect to be considered is electromagnetic compatibility (EMC) with other system components. The high degree of edge steepness of the clock-pulse controlled voltage generates harmonic oscillations of great intensity extending up into the high frequency range. The elimination of the problems mentioned and the lessened motor noise make it possible to have mains filters and output filters elements specially tailored to the operating needs of the frequency converter technology. The power line length of all system components should be structured to be as short as possible in order to avoid a scattering of high frequencies (antenna effect) through the power lines.

Passive filters in the input range of frequency converters

From the point of view of measuring technology, verification of whether the EMC Requirements of an electrical drive system are being fulfilled in connection with a frequency converter can only be achieved in the form of a system inspection which includes all of the components involved.

EMI filters

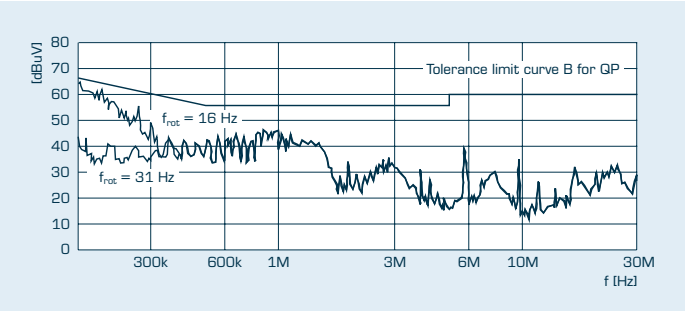
The European standard norm EN 55011: Industrial, scientific and medicinial high frequency devices (ISM devices) is considered the fundamental principle to be applied in connection with mains borne emitted interference in the frequency range extending between 150 kHz and 30 MHz, which is essentially responsible for the dimensioning of the input-side EMI (electromagnetic interference) filters between mains and frequency converters. The frequency converter generates HF energy, which is required for internal functioning, and thus becomes classified as an ISM device belonging to Group 1. If it can be assumed that the electrical drive system is not connected exclusively to its own low-voltage supply mains (industrial mains), but rather that a power feed from the public mains can also take place, then the frequency converter must be considered to be a Class B device. Class B devices must adhere to the Class B limit values for radio disturbance. If the utilisation of the electrical drive system takes place by means of a low-voltage supply mains (industrial mains), then the frequency converter is regarded as a Class A device. In such cases, it is then only the less-strict Class A limit values for radio disturbance which must be adhered to.

A passive filter for the suppression of electromagnetic interference in connection with frequency converters must be adjusted to accommodate the different operating states of the electrical drive system. Numbered among the most important operating parameters, the variations of which can lead to aberrant emitted interference, are the following:

- Rotating field frequency (speed of the motors)
- Switching frequency
- Length of the shielded motor line

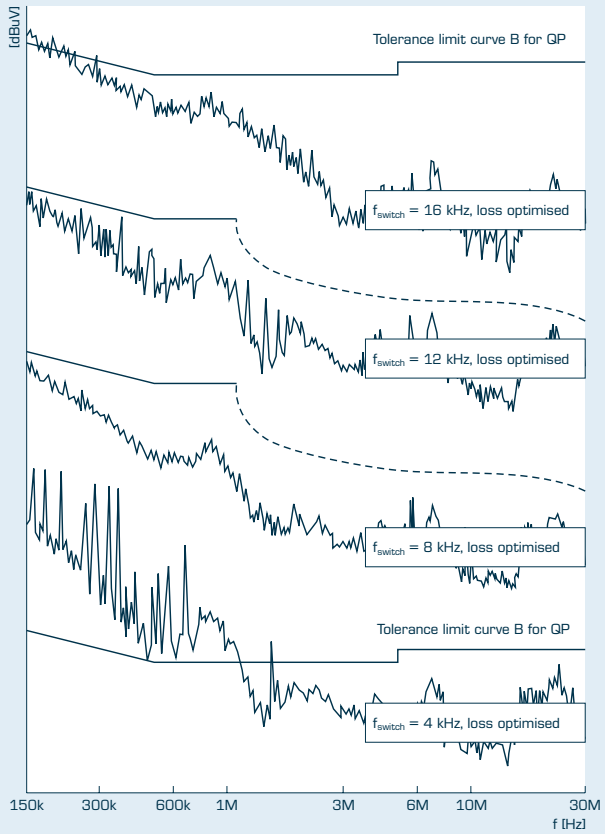
Variation of the rotating field frequency

The ability to carry out simple changes of speed of completely normal, commercially available alternating current asychronous motors is one of the most important reasons for the utilisation of a frequency converter. Even the modification of this operating parameter has an effect on the interference voltage released. Increased emissions were detected in many frequency converters, particularly for the lower rpm range. As a result, the “worst case situation” must be determined for each filter by means of continuous modification of the (output) rotating field frequency as early as in its development stage, the required filtering effect can be dimensioned by extrapolating from this. The following diagram of the interference voltage measurement in accordance with EN 55011 presents typical behavior:



Variation of the switching frequency

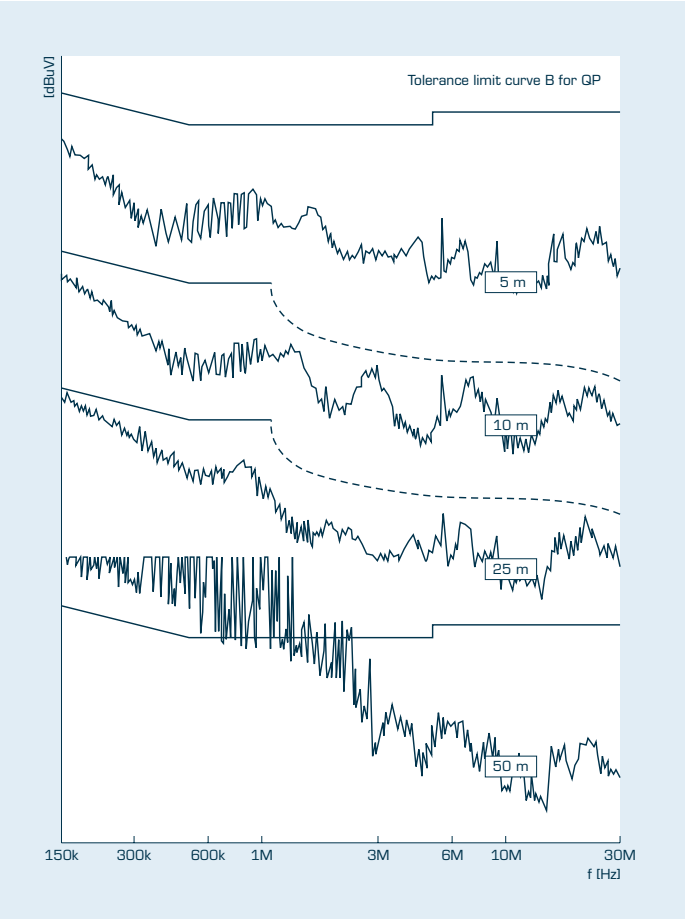
Modern frequency converters with their rapidly-switching IGBT terminal stages permit step-by-step adjustment of the switching frequency within the typical range between 4 kHz and 16 kHz. There are, however, devices on the market which feature automatically changing switching frequency (chopper frequency) for the purpose of avoiding device overheating. When faced with extreme situations, these models automatically reduce the specified high switching frequency to a lower frequency. This variation possibility also exercises a significant influence on the insertion attenuation of the filter which is to be provided. In the following diagram, various switching frequencies were set on the frequency converter in conjunction with the same filter. Whereas the interference voltage measured with the switching frequencies 16 kHz, 12 kHz and 8 kHz was close to and/or just above the limit value curve B, the same filter is completely overwhelmed when faced with a switching frequency of 4 kHz.



Variation of the shielded motor line

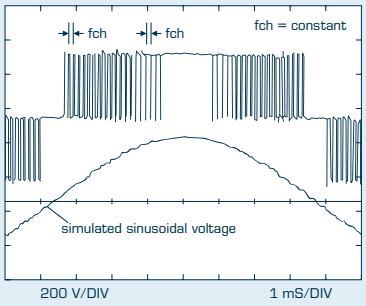
The length of the motor line connected to the output of the frequency converter, and thereby also the shield area, has an effect on the design of an EMI filter. The dependency of the interference voltage at the input of the frequency converter upon the cable length connected to the output is illustrated in the following diagram.

The increase on the mains borne emitted interference in connection with increasing cable length is clearly recognisable. The limit for Class B in the lower frequency range is already exceeded at 25 m, while a 50 m cable length overwhelms the filter.



Passive filters in the output range of frequency converters

Frequency converters have the task of propelling alternate current motors forward. This task should be accomplished for the operating behavior of the almost exclusively-used alternating current asynchronous motor in a way reflecting a high degree of efficiency and user-friendly setting options. For this, it is necessary to supply the three-phase output voltages of the frequency converter with clock pulses. The following illustration shows the oscillographic output voltage of one of the phases of a typical U frequency converter, each of which has been shifted by 120°:

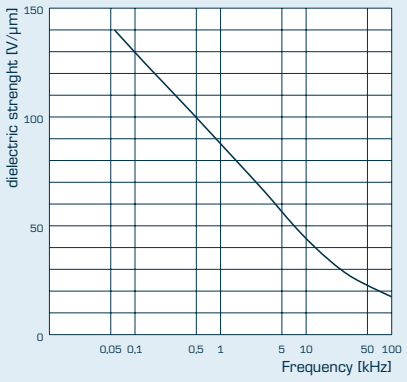


The superimposed sine semioscillation is intended as an aid to understanding the processes connected with simulation mains of the operating voltage. A direct current voltage generated in the frequency converter is split up with unchanging switching frequency (in pre-selectable intervals between 4 kHz and 16 kHz) into individual packets with an unchanging curve summit value. Starting at the first zero crossing of the sine curve, initially very narrow impulse packets with low energy content are to be found, the later progression then witnesses a steady prolongation of the impulse duration up to the amplitude maximum of the shape of the curve to be mains balanced. After that, the impulse duration shortens again back to the renewed zero crossing. In the second half-wave, the process repeats itself with reversed polarity.

The control of the connected motor takes place by means of variation of pulse and interlude times in terms of rotating field frequency, torque and startup and braking behavior. These advantages unfortunately also involve a few disadvantages:

- reduction of the motor service life as the result of steep switch edges
- overvoltages at the motor
- EMC problems
- increasing problems with long power lines
- additional noise development in the motor

Designed for a low-band sine operating voltage, there have been no problems in the past in terms of insulation strength of the commercially available enameled copper wires used in virtually all electric motors. Whereas in the early days of frequency converter technology frequencies were relatively low and switching procedures were relatively slow, nowadays determined further development of semiconductor components have established ever-shorter switching times and steadily increasing switching frequencies. No development progress of equal import can be recorded for the insulation strength of the enameled copper wires in standard electric motors. In addition to their previous dynamic loads, nowadays the coil wires are also subjected to a frequency-dependent insulation stress which has the effect of reducing expected service life. The dependency of insulation strength on enameled copper wire as a function of frequency is presented in the following diagram:



Varnish insulation, based on modified polyester, layer thichness approx. 75 µm, test voltage increased until voltage breakdown, within 10–20 s.

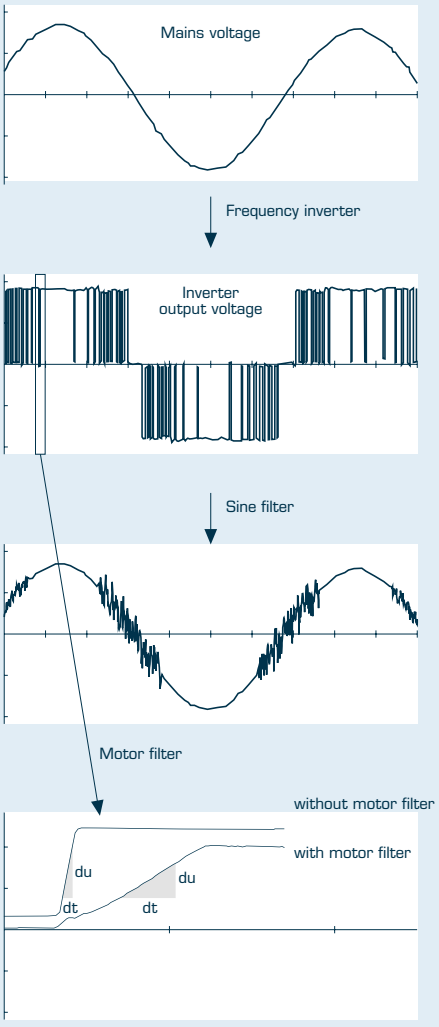
Even in the presence of a sinusoidal voltage with as little as 10 kHz, insulation strength will be reduced by more than a factor of 3. If one considers the quite energetic harmonic oscillation spectrum present in the steep impulse edges of the switching frequency, then the dielectric strength falls to dramatically low values.

The uncontrolled emergence of overvoltages are the result of stationary or wandering harmonic oscillations upon the motor line. The frequency spectrum is not at all constant, it changes with the impulse packets to the control system of the motor. Because the transfer system consisting of frequency converter—motor line—motor needs to be optimised to the power transfer in the rotating field frequency range of the motor, a constant mismatching takes place for the harmonic oscillation spectrum, which promotes the uncontrolled appearance of resonances.

The noise development of the motor, though not important in terms of electrical reliability, is still felt to be extremely disturbing in some areas of use (particularly in the residential sector). It is precisely in the audible range under 16 kHz that the magnetostriction of the sheet steel of the motor occurring with the switching frequency and the mechanical oscillations of the coils in the motor are felt to be particularly disturbing.

In critical cases, a frequency converter with enhanced output power can become necessary. The source of the trouble is an increased frequency converter load caused by parasitic cables and earth currents.

Corrective help for the weak points named can be had from motor reactors, a motor filters and a sine filter on the output side of the frequency converter.



Compared to a commercially-available frequency converter with 8 kHz switching frequency, the motor filter reduces the dv/dt value from approx. 12 kV/µs down to a non-critical 500 V/µs. The original expected service life of the motor is thus restored once again. In addition, a low-loss measure for the attenuation of stationary waves on the lines is also integrated into the filter. This installation provides for stable operating behavior at different power line lengths.

Sine filters form a sine voltage with low levels of distortion from the clock-pulse controlled frequency converter output voltage. The ratios in front of and behind a sine filter are illustrated in the oscillogram. Only a few remaining harmonic oscillations on the sine fundamental oscillation of the of the rotating field frequency of the motor are indicative of the original progression of the frequency converter output voltage. This is the way the builder of electrical installations avoids the following points of weakness in the area of frequency converter motive power engineering:

- dv/dt loading of the coil wires
- overvoltages at the motor coils
- noise development in the motor caused by the switching frequency
- problems with long motor power lines

The problems outlined are now all to be attributed to the filter utilised, which assumes a key position in the transmission system of frequency converter—filter—motor power line. Only many years of experience and careful selection of materials, coupled with extensive testing techniques makes possible the development and manufacture of reliable filter products for frequency converter motive power engineering.

Installation directions for the frequency converter motive power engineering

The installation of a good filter does not also automatically ensure the successful interference suppression of a switch cabinet.

Basic information concerning service cabinet construction

It is only when the correct concept for service cabinet construction in view of high-frequency interference emissions and immissions has been selected that all EMC efforts will exercise their effective influence. The first step to professional handling of the complex techniques is the recognition of critical components. Included among these in the context of an installation are for example frequency converters, switched mode mains power supplies and SPS devices. Mutual influencing and negative effects upon other consumers are to be assumed when they are connected to a shared mains and when they are physically close to one another. Possible points of weakness as well as suitable solution approaches are shown in the following illustration 1:

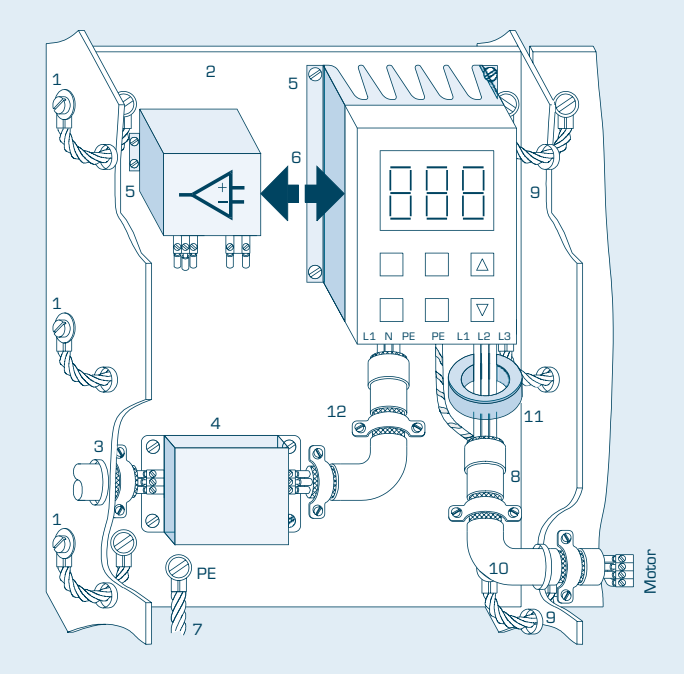


Illustration 1

- Single filters are to be provided for as needed before each source of interference for the purpose of decoupling conducted interference dissemination, thus contributing to the minimisation of its influence. The use of this procedural method leads to the reduction of the conducted interference potential down to permitted values and to the simultaneous improvement of the interference immunity of the shielded component against line-commutated voltage influences.
- In cases of single interferences, the filter is to be placed as close as possible to the emission site. If this is not possible due to space considerations, then a shielded cable is to be selected for the connection (Ill.: 1/12).
- Relays, contactors, solenoid valves, etc., which are located in the same electrical circuit with electronics components are to be provided with corresponding spark extinction combinations and/or overvoltage protection circuits.
- The total sum of suppression filters take over the limiting of conducted interference for the entire installation. Their position is to be as close as possible to the mains input (Ill.: 1/3). As a positive side effect, this measure leads to an increase of the conducted immission resistance of the attached product in relation to the spike, burst and surge pulses carried on the mains side.
- Suppression filters must channel off corresponding currents against PE for emission suppression. The Y capacities necessary for this allow leakage currents to flow through the protective conductors. For the majority of three-phase filters, only very low levels of leakage current occur during normal operation. This changes however in the presence of non-symmetrical mains conditions: then a few 100 mA of leakage current can be expected. For that reason it is absolutely imperative to take care to ensure the presence of a dimensioned PE connection.
- Many manufacturers use the maximum permissible highest value as the basis for the voltage specification for suppression filters. Warning! In such cases, the maximum permitted operating voltage – without any upward tolerances – is to be equated with the printed value.
- An essential part of secure EMC construction is an HF-suitable bonding of all devices and/or installation components. This means that they are bonded in a way which is large-area, of low impedance and protected against corrosion with the PE reference potential (Ill.: 1/5).
- The enhancement of the interference immunity against radiated immission leads to an improved level of operational safety. Adherence to a sufficient spatial separation between sources of radio noise and loaded components is in this connection an effective an inexpensive procedural method (Ill.: 1/6). In cases where spatial opportunities are absent, metallic separating walls are of help (Ill.: 2/7).
- Connect all metallic parts of the switch cabinet, such as rear and side walls, ceiling and floor sheet metal together in a way which is HF-suitable. If this is not done, then the elements will function as junction transistors (Ill.: 1/1). Cross-section-sized fine-wired strands or earthing straps are suitable as connection lines. Solid wire should be dispensed with altogether (Ill.: 1/1). This also applies to the PE connection
(Ill.: 1/7).
- All metallic parts in the switch cabinet (devices, mounting plates, etc.) are to be bonded together in an HF-suitable manner (Ill.: 1/9).
- Unfortunately, coloured lacquered mounting plates are still to be used in switch cabinets. These could hardly be less appropriate for an EMC-suitable construction, since it would take an unacceptable amount of effort to establish an adequate HF bonding. Anodised surfaces are equally unsuitable for good bonding because of the high level of contact resistance in the high frequency range.
- For custom-made structures, one must remember that the only metal surfaces which meet the requirements of HF technology are those which have been permanently protected against corrosion damage.

Selection of cables and their placement

The correct selection and placement of the connecting cable is numbered among the basic prerequisites of a successful EMC setup. Greater problems with installation components accompanied the appearance on the market a few years ago of modern versions of frequency converters, the IGBT final phases of which generate voltage units of up to 12 kV/µs, which means they release a considerable interference potential. Illustration 2 shows typical methods for the placement of connection lines:

- There must be a spatial separation between "hot" and "cold" cables. What is meant here is the placement of interference-prone lines parallel or in the immediate proximity of already shielded or non-interfering lines (Ill.: 2/1). Where necessary, a shielding or metallic separation wall is to be placed between the cable strands (Ill.: 2/7).
- Interference-prone lines should be placed as close as possible to reference potentials such as rear wall, side wall, etc. This will cause a part of the radiated emission to be absorbed by the reference surface (Ill.: 2/6).
- An "orderly" parallel and spatially-narrow arrangement of the wiring between interference-prone and "clean" connections is to be avoided. Each cable has an E-field component which leads to capacitive coupling and thus also to the contamination of the previously interference-free cable (Ill.: 2/2).
- If interference-prone power cables and control cables cross over one another, then this is to be carried out at a 90° angle as much as possible (Ill.: 2/3).
- Cut off "safety lengths" and thus overlong lines, do not roll them up and store them in the switch cabinet. These "coils" act like antennas and "suck up" interference and/or radiate it off.
- The simple measure of drilling unshielded analog lines protects against symmetrical interference couplings
  (Ill.: 2/5).
- Connect non-occupied wires with PE voltage. Otherwise they will act like antennas (Ill.: 2/4).
- Only use cables which have copper-mesh shielding, YCY. As for steel mesh or braids, their electric conductance is insufficiently high for HF applications. There is only a very low shield effect. The latest cable shields consist of a synthetic foil with woven-in ferrite material. Cost/benefit considerations are to be pondered in this connection.
- In cases where shield unraveling is required, this should be woven back together again over as large a surface as possible. The free wire ends for the connection clamps should be kept as short as possible.
- Do not place any further lines such as for example control or data cables within a shielded motor line.
- Set up the connection between the suppression filter and the emission source to be as shielded as possible. In cases of extremely short lengths (≤20 cm) this can in some cases be dispensed with.

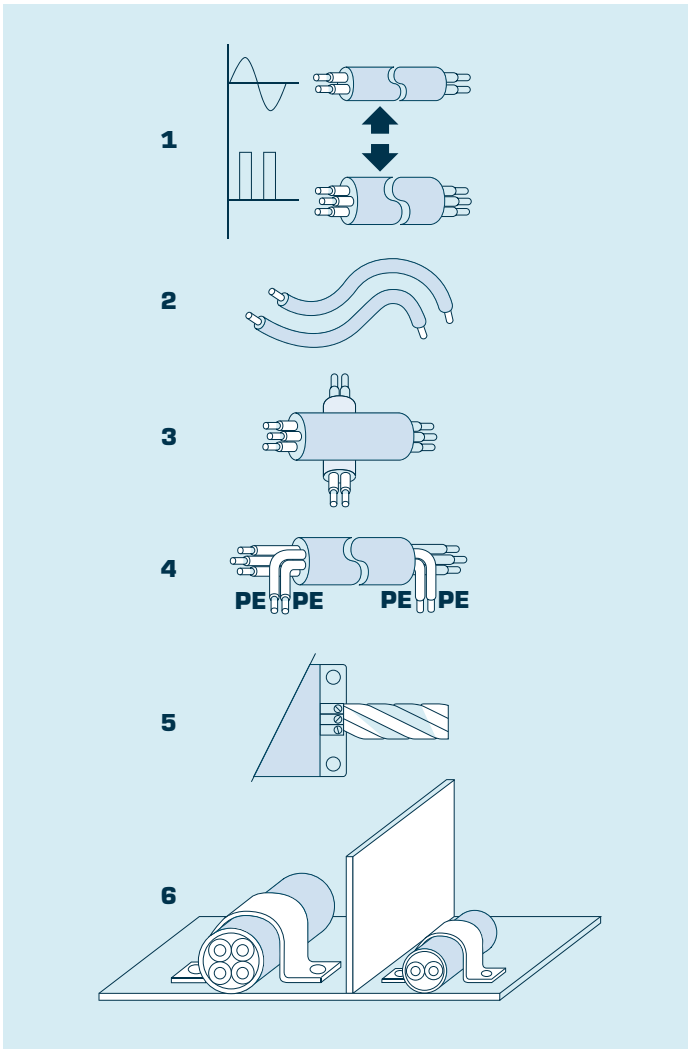


Illustration 2

Proper placement of the cable shield

An opinion widely shared concerning the bonding of a cable shield rests on the state of technology relating to power lines with analogue signals. Here only a single-sided placement of the shield is to be recommended for avoiding humming and earth circuits. This is often also practiced for connections with digital signals (e.g. of the frequency converter output voltage). Unfortunately, this is an unfavourable procedural method. Illustration 3:

- In cases of shielded cables with digital voltage forms, both shield ends must be put on (Ill.: 3/4).
- Always put the shield on over a large surface, e.g. with a cable clip (Ill.: 3/4).
- Completely insufficient is any bonding of the shield by means of simple drilling and subsequent bonding of the thin end with a PE terminal (Pigtail) (Ill.: 3/1).
- Similarly, the shield may not be connected by means of a soldered strand end to a PE clamp (Pigtail) (Ill.: 3/2).
- Connecting the shield weave with a pressure ring and a soldered-on strand end will also yield only unsatisfactory results (Ill.: 3/3).
- The distance between the shield strap and the clamping point is to be kept short (Ill.: 1/8,12). If this requirement cannot be met, then the shield should be carried further up to a position close to the clamping point. The shield end should also be mechanically secured with a heat- shrinkable sleeve as necessary (Ill.: 3/5).
- Use special PG threaded connections for cable bushings use HF-suitable shield layers.
- The motor feed line carries the greatest emission potential. For this reason, do not fail to use shielded cable, particularly in connection with longer connections (Ill.: 1/10).
- A great deal of energy is lost in the shield on long shielded lines. The cause of this is the high speed of voltage increase (dv/dt) of the generated motor voltage. A high dv/dt can, in the case of small frequency converters, lead to a situation where all of the power is extinguished in the cable itself. Motor reactors offer some aid here, as do motor filters and/or Sine filters by means of a flattening of the speed of voltage increase. Besides the EMC problems, there also exists a high dv/dt, in addition to the danger of a rapid shortening of the service life of the motor coil insulation. A useful side effect of the suggested EMC measure is the improvement of the expected service life of the connected motor.
- Sine filters re-form a Sine operating voltage out of the clock-pulse controlled frequency converter signal. This makes it possible to maintain extremely long shielded motor feed lines. An additional plus point is the noise minimisation at the motor.
- Guide the motor cables of frequency converters as directly as possible out of the switch cabinet. This handling method reduces the internal susceptibility to interference (Ill.: 1/10).
- A ferrite ring over the motor line can under certain circumstances reduce radiated interference as well as the leakage currents to the motor cable shield (Ill.: 1/11).

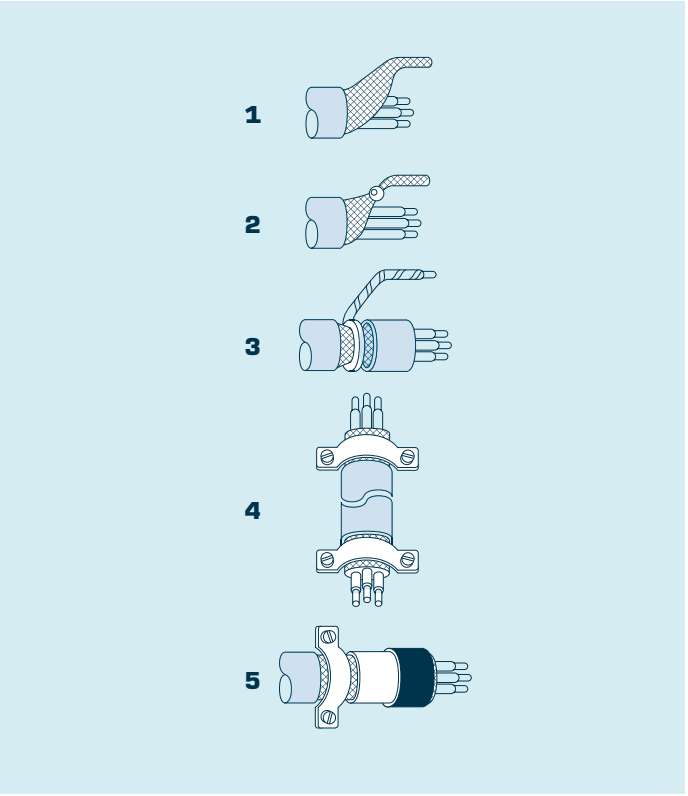
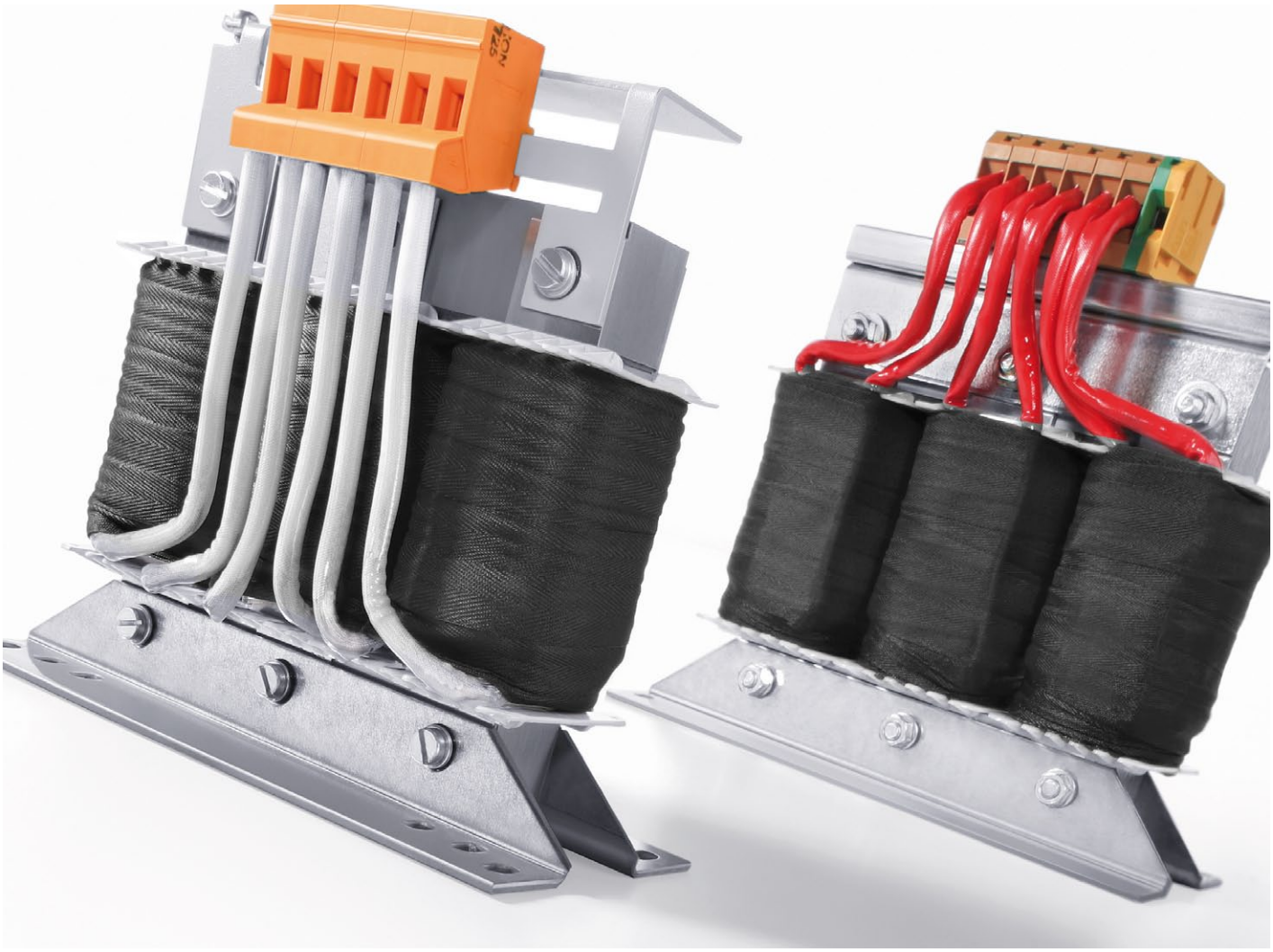


Illustration 3



Reactors

General technical information

A reactor is a device which is made up of one or several coils with a frequency-dependent impedance and which works in accordance with the principle of self-induction, whereby a magnetising electrical current generates a magnetic field which is directed through a magnetically-charged core or through air (Ref.: Ref.: VDE 0570 Teil 2–20/IEN 61558-2-20/IEC 61558-2-20).

Requirements

The general statements already made concerning such things as protection class, type of protection, insulation material class, rated ambient temperature and (to the extent applicable) transformers also apply to reactors.

Usually, and unless otherwise agreed upon with the ordering party, reactors will be manufactured with basic insulation between voltage-bearing parts and the core.
As a result of the laws of physics, the presence of at least one air gap in reactors causes an operating frequency magnetic leakage field which cannot be ignored and an acoustic noise development which corresponds to twice the operating frequency.
There is a need for providing sufficient clearance to neighbouring electrical equipment and ferromagnetic materials
(e.g. steel switch cabinet).
An important criterion for dimensioning is utilisation of reactors provided for in the low-band range, e.g. as:

- Power reactor
- Smoothing/commutating reactor
- Filtering circuit reactor
- Motor reactor
- Motor filters
- Sine filters

Standards

Unless otherwise agreed upon with the ordering party, we manufacture in accordance with the latest "State of Technology" and with the following standards:

VDE 0570: Safety of transformers, power supply units and similar devices, Part 1: General requirements and tests, Part 2-20: Particular requirements for small reactors

EN 61558, IEC 61558: Safety of power transformers, power supply units and similar, Part 1: General requirements and tests, Parts 2–20: Particular requirements for small reactors.

Frequency behavior

Non-dependence on frequency for the inductance can only be expected from ideal inductances and air-core coils. Actual inductances and reactors with a ferromagnetic core exhibit a more-or-less marked frequency dependency, even in the low-band range, which is essentially determined by the core material utilised.

The usual utilisation of reactors in the area of application of VDE 0570 Teil 2–20/ IEN 61558-2-20/IEC 61558-2-20
(see chart).

Harmonic oscillations generate exponentially increasing attenuation in a reactor as frequency increases. These increases will be determined by BLOCK theoretically and optimized for the best possible use in the application. The usual thermal dimensioning (e.g. of a power reactor) on the rated electrical current with rated frequency takes into account only an increase of load through the sum of all harmonic oscillation currents of up to a maximum of 5%. An increase of the core power is required for greater increase of load.

Furthermore, in addition to the rated electrical current at the rated frequency (fundamental oscillation), the effective value of the current of each emerging harmonic oscillation must be known for the thermal dimensioning of the reactor. In critical cases, when a harmonic oscillation current exceeds circa 10% of the fundamental oscillation current, then the phase position of the oscillations to one another is also to be taken into account.

Usual use of reactors within the purview of the standards:

laminated (lamellar) cores	iron powder cores ironres	ferrite fecoresrores
<3 kHz*	**<250 kHz***	**<1 MHz**
Smoothing/ Commutating reactor Line reactor	Smoothing/ Commutating reactor Motor reactor	Smoothing/ Commutating reactor Motor reactor
Filtering circuit reactor	Motorfilter	Motorfilter
Motor reactor	Sine filter	Sine filter
		Motor filter
		Sine filter

*still working on Sine frequence

Tolerance

The voltage drop (Ref.: VDE 0570 Teil 2–20/ IEN 61558-2-20/IEC 61558-2-20) may not deviate by more than 25% from the rated value in the equilibrium state with rated frequency and rated electrical current. For biased reactors and reactors with such additional components as capacitors, rectifiers, etc., the voltage drop may not deviate by more than 30% from the rated value.

Special models of reactors, such as filtering circuit reactors, must be precisely calibrated, which means that they are subject to considerably lower tolerances.

Proportional to rated voltage drop, inductance is calculated to:

$$L = \frac{U_{rated}}{I_{rated} \times 2 \times \pi \times f_{rated}}$$

Linearity

The linearity of the inductance of a reactor can be influenced within certain limits by constructive design. The illustration A shows a common layout, e.g. as a power reactor (with a linear air gap).

Inductance proceeds in an almost linear manner up to the rated electrical current (thermal dimensioning) and falls off in the presence of over-current in a relatively undefined manner as the result of the magnetic saturation of the core. As a rule, the only way to avoid loss of linearnetic saturation of the core. As a rule, the only way to avoid loss of linearity in the over-current range is to increase core power.

If a greater initial inductivity of up to a current of circa 10–20% of the rated current is required, this can be realised by means of a nonlinear air gap. The disadvantageous effect of this, however, is a relatively undefined curve progression and the associated greater inductance tolerance.

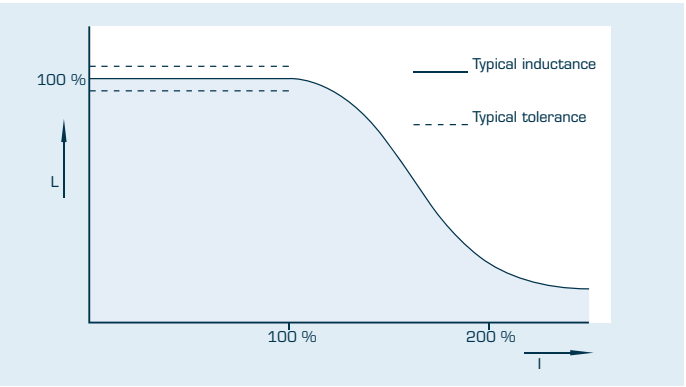


Illustration A

Rated power

The rated power (Ref.: VDE 0570 Teil 2–20/IEN 61558-2-20/IEC 61558-2-20) of a reactor is the sum of the products of rated voltage drop and of rated electrical current with rated frequency. The specification of the reactive power is given in kVAR or VAR (Volt Ampere Reactive).

$$W = U \times I \times t = \frac{L \times I^2}{2}$$

with W = energy in Watt seconds (Ws)

U = voltage drop in Volts (V)

I = current in Amperes (A)

t = time in seconds (s)

L = inductance in Henry (H)

Note concerning magnetic energy of the rated power

Smoothing/Commutating reactors

These reactors are often utilised as storage reactors for electrical energy in direct current circuits. The core is thereby often biased with a direct current, which is either superimposed upon an alternating current characterised by the most eccentric curve progressions and frequencies or used for current direction changes (commutation). Dimensioning is highly dependent on circuits and applications.

Line reactors

These reactors are usually used in the mains in series connections to the user. Single-phase and three-phase models are available. They provide the following important safety functions:

- Attenuation of harmonic oscillation currents resulting from frequency-dependent inductive resistance
- Starting current limitation for the user and thus reduced module stress, e.g. for rectifier circuits
- Guarantee of the short-circuit voltage UK of 4% to the mains frequently demanded by the EVUs (electric supply companies)

Example: With rated electrical current (e.g. 4 A) and rated frequency (e.g. 50 Hz) of a reactor with UK = 4 %, 96 % of the mains voltage (3 * 384 V) is still available to the consumer (ohmic resistance) on a 3-phase mains of 3 * 400 V/50 Hz. The rated voltage drop of each phase at the reactor amounts to 16 V * 1/w3 = 9.2 V and the rated inductance is calculated to

$$L_{rated} = \frac{U_{rated}}{I_{rated} \times 2 \times \pi \times f_{rated}}$$

$$= \frac{9{,}2\ V}{4\ A \times 2 \times 3{,}14 \times 50\ Hz}$$

$$= 7{,}3\ mH \text{ per phase}$$

For the rated frequency (fundamental oscillation), the inductive resistance is calculated to

$$XL = 2 \times \pi \times f_{rated} \times L_{rated}$$

$$= 2 \times 3{,}14 \times 50\ Hz \times 7{,}3\ mH$$

$$= 2{,}3\ \Omega \text{ per phase}$$

an idealised point of view, harmonic oscillation currents are reduced in relation to fundamental oscillation (1st harmonic = 50 Hz) by the factor of the ordinal number (e.g. 3rd harmonic = 150 Hz = factor 3). However, the statements made concerning the “frequency behavior” of reactors should be taken into account for this.

Detuned reactors

Power converters and frequency converters are used nowadays with increasing frequency on the mains. This leads to harmonic oscillations on the mains, which causes additional attenuation, especially in the capacitors of reactive power compensation installations. Among the advantages offered by detuned reactors are:

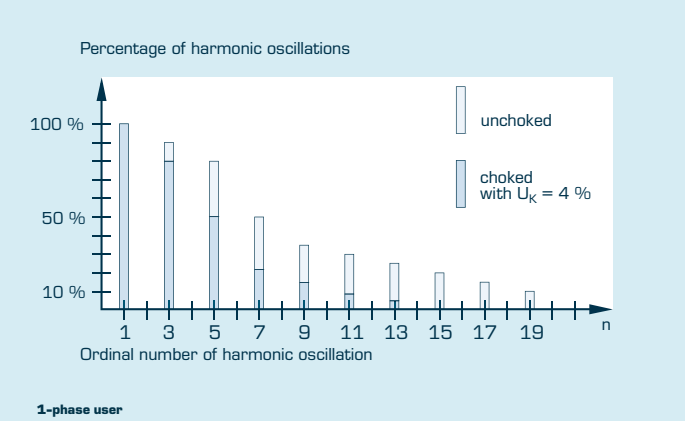
- less attenuation and no overloading of the capacitors of a reactive power compensation installation,
- the impedance behavior of the mains becomes improved.

Detuned reactors require special dimensioning for safe and long-lasting operation:

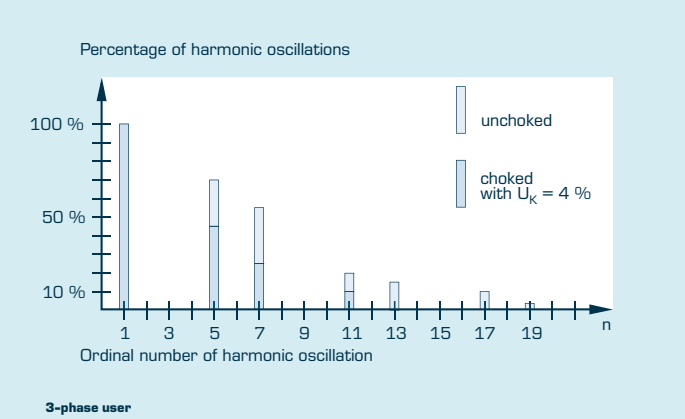
- low inductance tolerance,
- linear inductance progression extending far beyond the rated electrical current and with harmonic oscillations,
- thermal design construction for continuous operation for mains frequency and harmonic oscillations.

The series connection to the capacitors is carried out almost exclusively in 3-phase design, which means that it has an effect upon the entire alternating current mains.

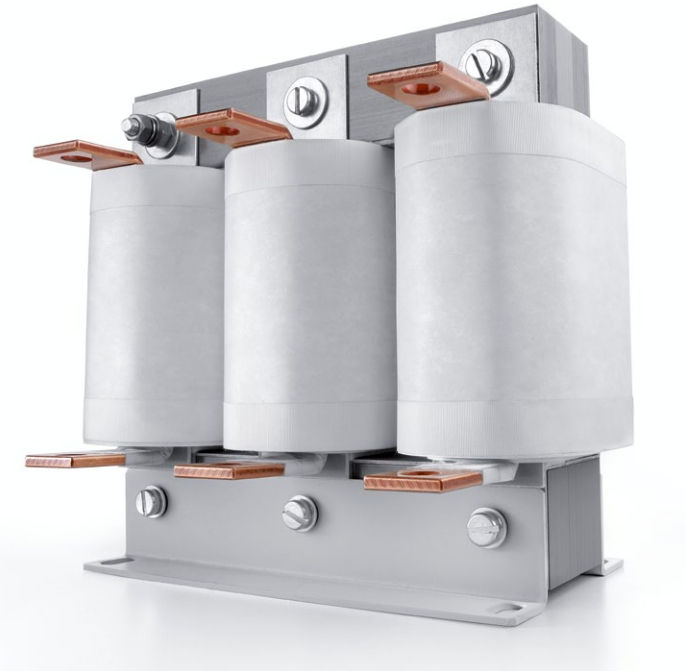
Typical effect for consumers with direct current intermediate circuit (rectification and filterung of the mains voltage):



1-phase user



3-phase user



Detuned reactors for reactive power compensation installations

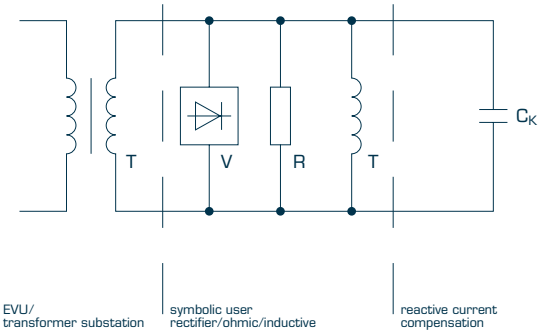
An economic operation of inductive consumers such as motors, transformers and fluorescent lamps is possible only through appropriate measures involving reactive power compensation. A capacitive reactive power has a compensating effect to counter the inductive reactive power of consumers. This means that it becomes possible to approach the desired power factor cos 0.9 ind. up to 1. Reactive power costs will continue to be minimised and the load on the mains of the electric supply companies (EVUs) will be lightened.

Mains with harmonic oscillations

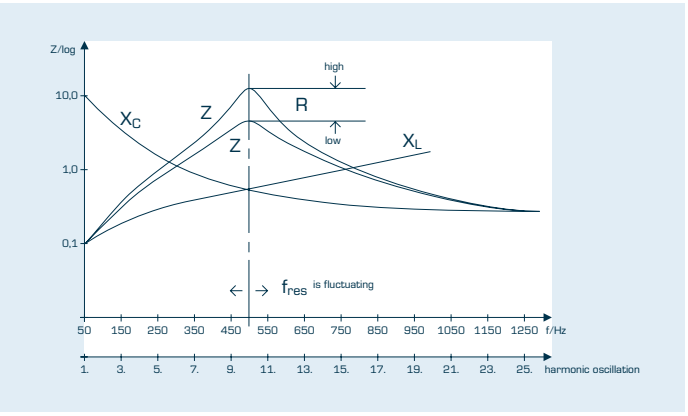
Harmonic oscillations on the mains occur, for example, as the result of the operation of power converters and frequency converters. The frequency spectrum of the harmonic oscillations that arises is dependent on the generator of the harmonic oscillations and extends well up into the Kilohertz range. Generally speaking, however, an assessment which extends up to the 25th harmonic oscillation (in terms of the mains frequency) is sufficient. Installations and components are usually designed for compatibility levels in accordance with the VDEW guidelines “Fundamentals for the evaluation of mains reactions”.

The usual reactive power compensation

The illustration shows the basic construction of a reactive current compensation at a mains which is loaded with harmonic oscillations:



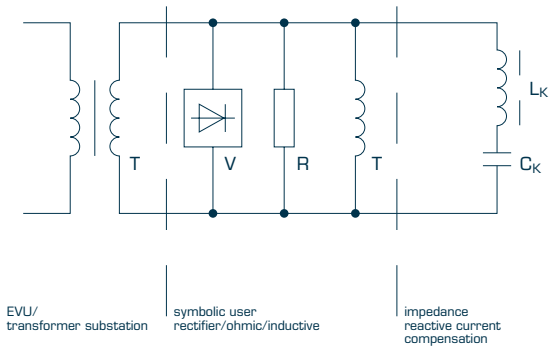
The harmonic oscillations are caused by the user V. Even just a relatively low share of harmonic oscillations leads to additional losses in power lines, transformers, switching elements and in the capacitor of the reactive power compensation, which is to be regarded as particularly critical. To this is added an undefined impedance behavior on the part of the mains. The following illustration shows a typical impedance behavior:



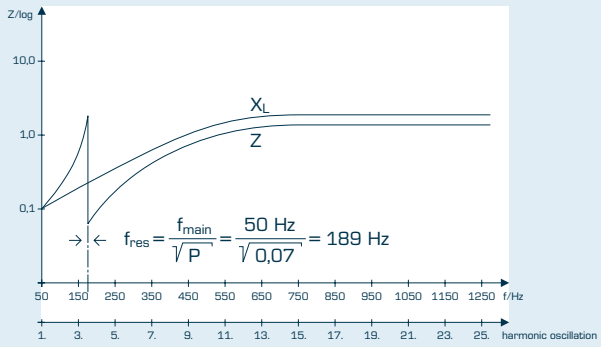
Depending on the load and the effect of the existing parallel oscillation circuit, which consists of the sum of all inductances and the capacitor of the reactive power compensation, resonance increases occur. The resonance frequency which arises can fluctuate and, in conjunction with the generated harmonic oscillations, can lead to the destruction of individual components of the mains being observed.

The impedance reactive power compensation

The following illustration shows the basic structure of an impedance reactive power compensation:



Defined mains conditions are created through the addition of a detuned reactor LK in series connection to the capacity CK of the reactive power compensation. Generally speaking, an impedance becomes absolutely mandatory when the apparent power of the consumer generating harmonic oscillations amounts to more than 1/5 of the rated power of the feeding transformer. By adjusting the series oscillation circuit (LK, CK) to match a non-critical frequency, undefined resonance increases are avoided and the capacitor of the reactive power compensation, which is to be regarded as critical (particularly in conjunction with high frequency harmonic oscillations), is protected. The following illustration shows in this connection a typical example of mains impedance behavior in conjunction with the most frequently selected impedance of 7% (p = 0.07):



The impedance factor p is expressed as the ratio of the reactive impedances:

$$p = \frac{X_{LK}}{X_{CK}}$$

The ensuing resonance frequency of the series oscillation circuit is

$$f_{res} = \frac{f_{mains}}{\sqrt{p}}\ (Hz)$$

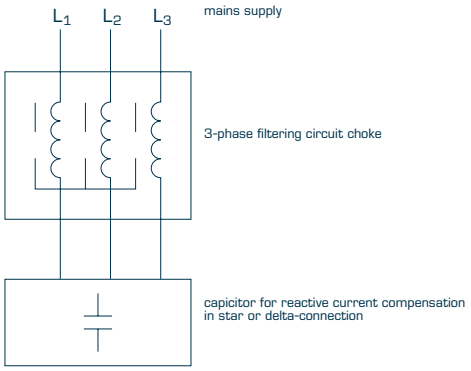
This means the resonance frequency in a 50 Hz mains calculates out to 189 Hz. This resonance frequency, which is considered to be non-critical, lies clearly above the mains frequency of 50 Hz on the one hand, but below the base frequency of the harmonic oscillation-generating consumer and below the audio frequency multi-station control system of the electric supply company (EVUs) on the other.

The compatibility is, however, to be individually adjusted in conjunction with the local electric supply company (EVUs).

Detuned reactors have special requirements to fulfil as a result of their utilisation, e.g.:

- low inductance tolerance
- linear inductance progression extending far beyond the rated current
- linear inductance progression with harmonic oscillations
- thermal design construction for continuous operation with mains frequency and harmonic oscillations

Detuned reactors are utilised almost exclusively in 3-phase models:



In cases of regulated reactive power compensation installations, each capacitor group is to be allocated to a detuned reactor which is adjusted for this purpose.

APPENDIX

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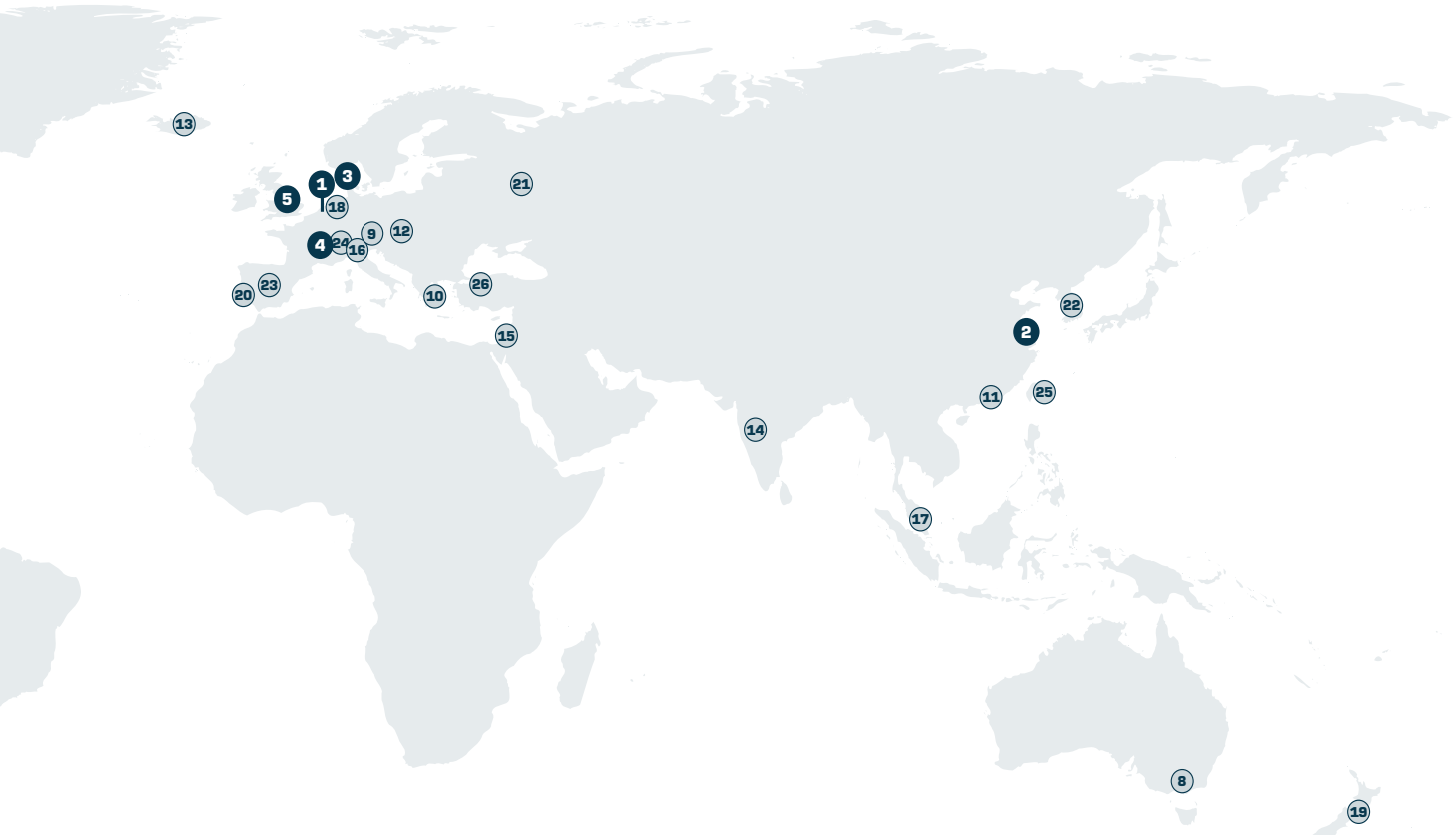

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69400–69439
96000–96199
96400–96489
97000–97999
98600–98679

CONTRACT DISTRIBUTORS

Advanced Controls and Distribution
www.acdsupply.com

Allied Electronics
www.alliedelec.com

Avnet Abacus
www.avnet-abacus.eu

Bürklin GmbH & Co. KG
www.buerklin.com

Conrad Electronic SE
www.conrad.de

DEG Deutsche Elektro-Gruppe-Elektrogrosshandel GmbH
www.deutsche-elektrogruppe.de

DEHA Elektrogrosshandelsgesellschaft mbH & Co. KG
www.deha.de

Distrelec Schuricht GmbH
www.distrelec.biz

EFG Cordes & Graefe Brand KG
www.efg-gruppe.de

Element 14 S. de R.L. DE C.V.
mexico.newark.com

ELFA DISTRELEC
www.elfa.se

E.T.N. Groupe
www.etn.fr

EVE GmbH
www.eve-electronics.com

FEGA & Schmitt Elektrogroßhandel GmbH
www.fega-schmitt.de

Hagemeyer Deutschland GmbH & Co. KG
www.hagemeyerce.com

09
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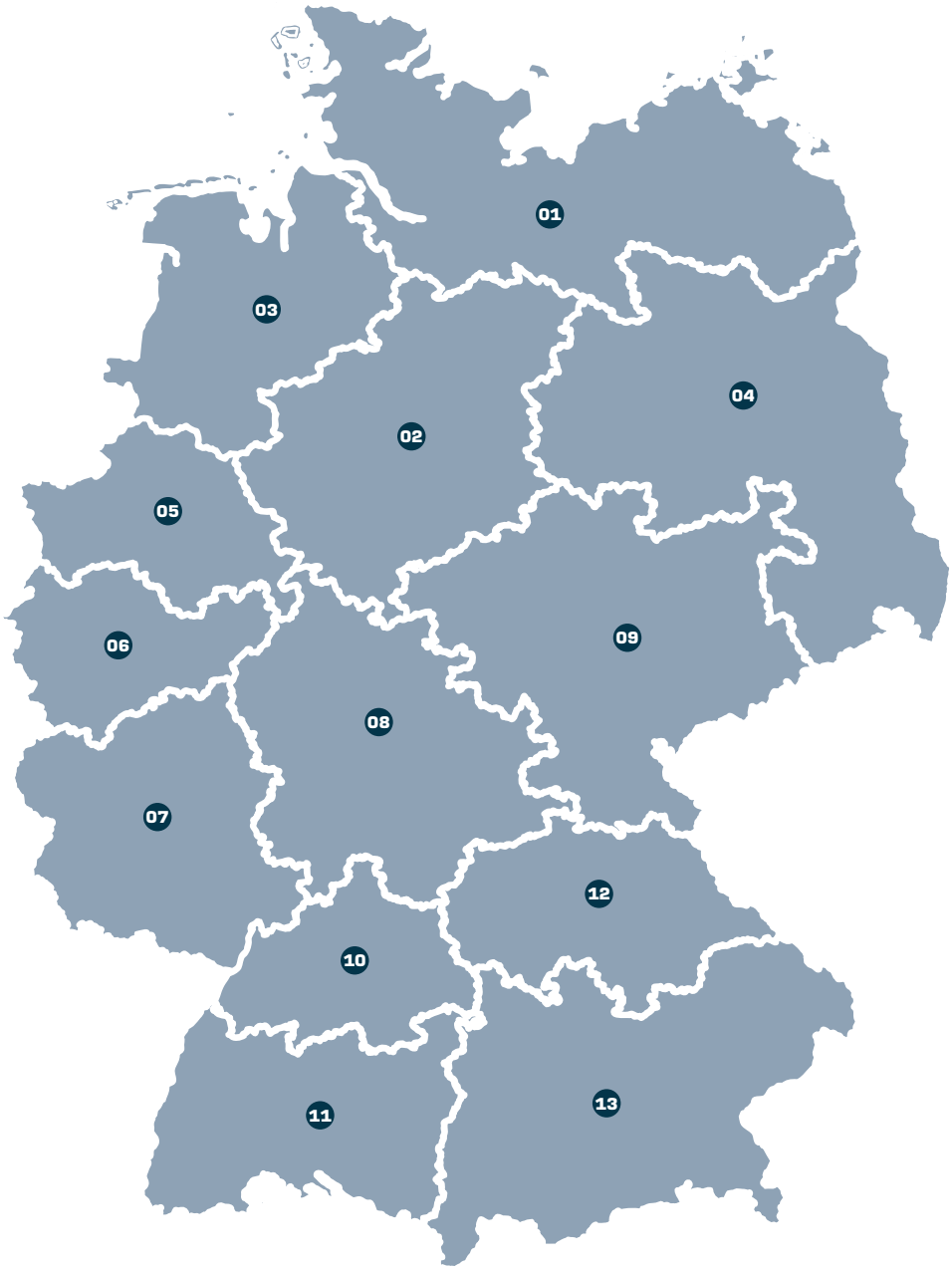


HANSETRONIK Elektronikbauteile
www.hansetronik.de

HARDY SCHMITZ GmbH
www.hardy-schmitz.de

MÜTRON Müller GmbH & Co. KG
www.muetron.de

Newark element14
www.newark.com

Premier Farnell UK Limited
www.uk.farnell.com

reichelt elektronik GmbH & Co. KG
www.reichelt.de

RFD electronic gmbh
www.rfd-electronic.de

RS Components
www.rs-online.com

Solar Danmark A/S
www.solar.dk

Solar Deutschland GmbH
www.solar-elektro.de

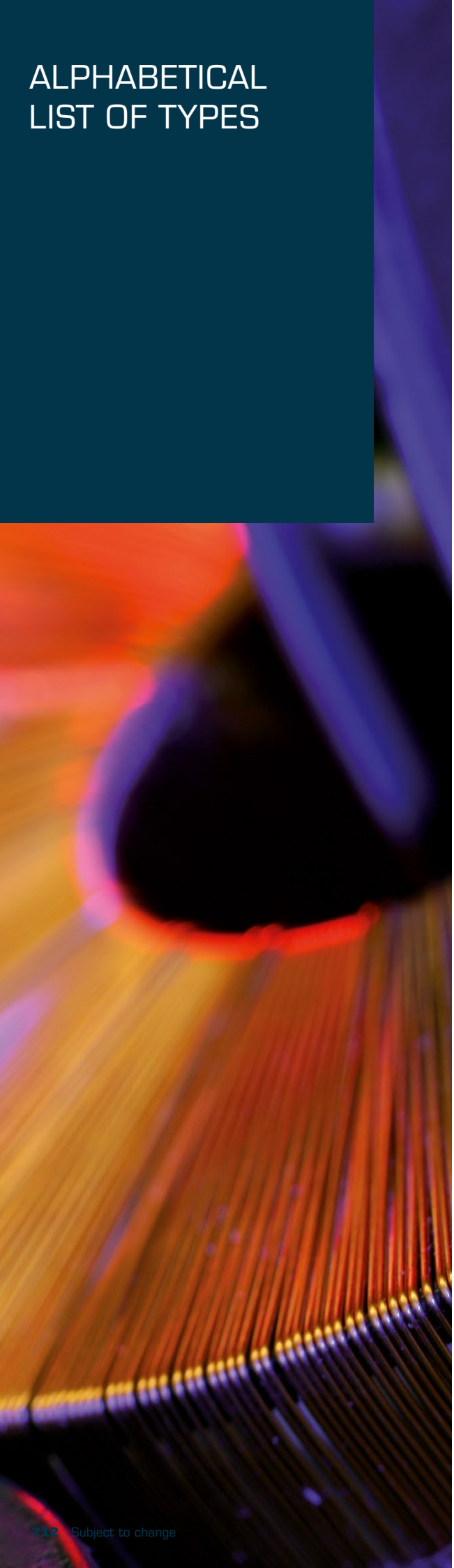
Sonepar Deutschland GmbH
www.sonepar.de

Straschu Elektro-Vertriebs GmbH
www.straschu-ev.de

Treetop Technical Products
www.treetoptech.com

Tonar Industries, Inc.
www.tonar.com

ALPHABETICAL LIST OF TYPES



DISCONTINUED MODELS

Auslauftyp	Alternativtyp
ARC	DNC
DDB	DNC, PC 3AC
DG	DNC
DGU	PC 3AC
DTT	TT3
DYB	DNC
EMKK	BSD
ETM	TTMS
FLN	FL
GBC	GNC
HFD 503	HLD 103
HFD 510-400	HFD 510-500
LPS 230	PEL 230
NKD	LR3
NTD	ACT
PALM	GNC
PLAN	GNC
PSR 230	PC 1AC, PM 1AC
PSR 500	PC 2AC, PC 3AC, PVSE 400
PSRA3	PVSA 230
PVFB	BASIC SMART
PVFE	ECONOMY SMART
PVRB	PC RE
PVRE	PC RE
RK	RKD
RKE	RKD
RT	RTE
SKAN	DNC
SKY	DNC
STS	STE, STEU
UDNC	PC 3AC
UPAL	PC 2AC
USKY	PC 3AC
VBN	VB
VCN	VC, VCM
VP	VB
VV	VB

ALPHABETICAL INDEX

GENERAL TERMS OF SALE AND DELIVERY

1. General

1. These General Terms and Conditions of Sale and Delivery of BLOCK Transformatoren-Elektronik GmbH, Max-Planck-Strasse 36-46, 27283 Verden (hereinafter referred to as "Seller"), apply exclusively to companies within the meaning of Section 14 BGB (German Civil Code) i.e. natural persons or legal entities, which, in respect of the purchase of goods, are acting in the performance of their commercial or independent professional activities (hereinafter referred to as "Purchasers").
2. These General Terms and Conditions of Sale and Delivery apply exclusively to all contracts concluded between the Seller and the Purchaser for the delivery of goods. Differing terms and conditions of purchase or other differing terms and conditions of the Purchaser shall not apply unless the Seller has expressly acknowledged them in writing. The Seller's silence regarding such differing terms and conditions shall not be deemed in particular to be acknowledgment or consent, and this shall also apply to future contracts.
3. The General Terms and Conditions of Sale and Delivery shall also apply to all future deliveries and services to the Purchaser until the Seller's new General Terms and Conditions of Sale and Delivery apply.

2. Quotation, conclusion of contracts, scope of delivery

1. The Seller's quotations are subject to change and are not binding. The Seller reserves the right to make insignificant deviations or deviations due to technical progress in the design, execution and performance of the products compared with any catalogue, brochure or Internet information of the Seller. If the Purchaser places a delivery order/purchase order based on quotations subject to change, a contract shall be concluded, also in day-to-day business, only upon the written order confirmation if the Purchaser requests such confirmation. In all other cases, the contract shall be concluded by delivery of the goods. If an order confirmation is provided, this alone shall govern the content of the contract, in particular the scope of delivery and date of delivery.
2. If a purchase order received by the Seller is not confirmed in writing within 2 weeks of its receipt, although confirmation was requested, or is not executed, the Purchaser shall have the right to cancel the purchase order but without being able to assert any claims for damages against the Seller.
3. Prices and performance data and other declarations or assurances shall be binding for the Seller only if they have been made or confirmed by the Seller in writing. Price lists, catalogue or internet price quotations or pricing in quotations are subject to change.
4. Any documents, drawings, details of weight, samples etc. enclosed with a quotation of the Seller or otherwise forwarded to the Purchaser are only determined approximately. In particular, these are neither a guarantee nor is hereby a procurement risk assumed unless this is expressly indicated in writing as "guaranteed by law" resp. "assumption of the procurement risk". Any reference to standards and similar technical regulations as well shall not indicate a property of the Seller's products unless this is expressly indicated as a "property of the product". Paragraph 2.1, sentence 5, of these General Terms and Conditions of Sale and Delivery (relevance of the order confirmation) remains unaffected by this.
5. The Seller shall only be obliged to deliver from its own stock (obligation to deliver from stock). Assumption of a procurement risk or a procurement guarantee is also not based solely on our obligation to deliver an item which is defined solely by its class.
6. Partial deliveries are permitted if this can be reasonably expected of the Purchaser. Furthermore, the Seller shall have the right to deviate from the quantity agreed in the contract (excess or short deliveries) to the extent customary in the trade and reasonable for the Purchaser but not more than 5 %.
7. Estimates of cost, drawings and other documents provided by the Seller shall remain the Seller's property and copyright. They may not be made accessible to third parties without the Seller's prior written consent.

3. Prices

1. Prices are euro prices unless otherwise stated and do not include value added tax. This shall be invoiced separately at the respectively valid rate in accordance with respectively applicable tax provisions.
2. If no other agreements have been confirmed in writing, prices are ex works or ex warehouse of the Seller (EXW Incoterms 2010), unless otherwise stated Verden/Aller, Max-Planck-Str. 36-46, Germany, excluding packaging and shipping charges, assembly, commissioning and other ancillary costs (e.g. customs duty).
3. The minimum order value for articles is € 100.- resp. € 250.- for custom made products. Aluminium and copper surcharges are imposed separately in accordance with the DEL quotation of the order entry date and shown accordingly in the quotation.

4. Terms of payment

1. Unless otherwise agreed, all payments shall be made free Seller's payment office at the latest within 30 calendar days of the invoice date without any deduction. The right to deduct discount shall require a separate written agreement. Terms of payment shall be deemed met if the amount is at the Seller's disposal within the term of payment. The Seller shall be free to choose the method of transmission for the invoice. In particular, the Seller shall also have the right to transmit the invoice electronically e.g. by email.
2. The Purchaser shall have no right of retention if it is not based on the same contractual relationship. Set-off against disputed claims or claims which have not been recognised by declaratory judgment shall be excluded. The Seller shall have the right to avert the exercise of a right of retention by provision of security, also by guarantee.
3. If the Purchaser suspends its payments, there is an over-indebtedness or a petition for the institution of insolvency proceedings has been filed or the Purchaser is in default with the payment of due bills of exchange or cheques, the Seller's total claim shall become due immediately.
4. The Seller shall have the right to request advance payment.

5. Retention of title

1. The Seller shall retain title to the goods (hereinafter referred to as "Goods Subject to Retention of Title") until all claims against the Purchaser, to which the Seller is entitled, have been met. Pledging or assigning Goods Subject to Retention of Title as security shall not be admissible.
2. The Purchaser now already assigns to the Seller, by way of precaution, the future claims against its customers arising for it from the resale or rental, without the need for special declarations at a later date, in the event of the admissible resale or rental of the Goods Subject to Retention of Title in the ordinary course of business, until all the Seller's claims are paid back. The assignment shall also cover balance claims resulting from existing current account relationships or from the termination of such relationships of the Purchaser with its customers. If the Goods Subject to Retention of Title are resold or rented together with other items, without a unit price being agreed for the Goods Subject to Retention of Title, the Purchaser shall assign to the Seller, with priority over the remaining claim, that portion of the total price claimed resp. the total rent which corresponds to the value of the Goods Subject to Retention of Title invoiced by the Seller. The Purchaser shall be authorised to collect the assigned claims from the resale or rental until this is revoked. The Purchaser shall not, however, have the right to dispose of the assigned claims in another way e.g. by assignment. At the Seller's request, the Purchaser shall notify the customer of the assignment and shall deliver the documents required e.g. invoices to assert the Seller's rights against the customer to the Seller and shall provide the required information. All costs of collection and any intervention shall be borne by the Purchaser.
3. If the Purchaser processes the Goods Subject to Retention of Title, transforms them or combines them with other items, they shall be processed, transformed or combined for the Seller. The Seller shall become direct owner of the article produced by processing, transformation or combination. If this is not possible for legal reasons, the Seller and the Purchaser agree that the Seller shall become the owner of the new article at all times during processing, transformation or combination. The Purchaser shall keep the new article for the Seller with the due diligence of prudent commercial judgment. Articles created from processing, transformation or combination shall be deemed Goods Subject to Retention of Title. Where an item is processed, transformed or combined with other items that do not belong to the Seller, the Seller shall have co-ownership of the new article in the amount of the portion resulting from the ratio of the value of the processed, transformed or combined Goods Subject to Retention of Title to the new article. In the event of the sale or rental of the new article, the Purchaser herewith assigns to the Seller its claim arising from the sale or rental against its customer with all ancillary rights by way of precaution, without the need for subsequent special declarations. The assignment shall only apply, however, in the amount which corresponds to the value of the processed, transformed or combined Goods Subject to Retention of Title invoiced by the Seller. The portion of the claim assigned to the Seller shall take precedence over the remaining claim.
4. The Purchaser shall be obliged to treat the Goods Subject to Retention of Title with care at all times and to insure them at its own expense, in particular against fire and water damage and theft.
5. If the value of the security exceeds the Seller's claims against the Purchaser arising from the ongoing business relationship in total by more than 20%, the Seller shall be obliged, at the Purchaser's request, to release securities, to which it is entitled, at its option.

6. Delivery, delivery period, default in delivery, force majeure

1. Unless otherwise agreed in an individual case, deliveries shall be made on the basis of EXW Verden/Aller, Max-Planck-Str. 36-46, Germany (Incoterms 2010). If the Purchaser does not inform the Seller in good time prior to the agreed delivery date, at the latest 2 working days in advance, of the method of shipment, forwarding agent etc., the Seller shall have the right itself to commission a forwarding agent, carrier or third party otherwise designated to carry out the shipment at the Purchaser's expense.
2. Specified delivery times are not binding unless otherwise agreed in writing. If delivery dates and periods are not binding or approximate (ca., about etc.), the Seller shall use its best efforts to comply with them. Delivery periods agreed as binding in writing shall commence upon receipt of the order confirmation by the Purchaser but not before all details about the execution of the order have been clarified and all other requirements to be fulfilled by the Purchaser (e.g. provision of necessary documents, authorisations and clearances) are met. The same shall apply to delivery dates. Deliveries shall be admissible before expiry of the delivery period.
3. The delivery period shall be deemed met when the goods are made available for collection by the forwarding agent, carrier or other third party designated to carry out the shipment within the period (EXW Verden/Aller, Max-Planck-Str. 36-46, Germany, in accordance with Incoterms 2010).
4. If the Seller does not receive deliveries or services from its sub-contractors for the Seller to provide deliveries or services which are due from the Seller under the contract, despite due and sufficient stocking in terms of quantity and quality under its delivery or service agreement with the Purchaser, for reasons for which the Seller is not responsible, or they are incorrect or not in due time, or events of force majeure occur of significant duration (i.e. of longer than 14 calendar days), the Seller shall notify the Purchaser in writing or text form in due time. In such case, the Seller shall have the right to postpone the delivery for the duration of the obstruction, or to rescind the contract in whole or in part for that part of the contract not yet fulfilled if the Seller has met its foregoing duty to provide information and has not assumed a procurement risk. Events of force majeure are strikes, lock-outs, official intervention, energy shortages and shortages of raw materials, transport bottlenecks through no fault of the Seller, company obstructions through no fault of the Seller, e.g. due to fire and water damage, and damage to machinery, and any other obstructions which, when considered objectively, were not caused by the Seller's negligence.
5. If a delivery and/or service date or a delivery and/or service period is agreed with binding force and the agreed delivery or service date or the agreed delivery and/or service period is exceeded due to events according to paragraph 6.4 above, the Purchaser shall have the right, after a reasonable extension of time has elapsed without effect, to rescind the contract for that part not yet fulfilled. The Purchaser shall have no further claims, especially claims for damages, in such case if the Seller has met its foregoing duty to provide information. The above provisions pursuant to paragraph 6.5, sentence 1 and 2, shall apply accordingly if, for the reasons stated in paragraph 6.4, also without contractual agreement of a fixed delivery and/or service date, the Purchaser cannot be objectively expected to adhere further to the contract.
6. If the Purchaser causes a delay in shipment or delivery of the delivery items, the Seller shall have the right to charge the Purchaser for the additional costs incurred as a result.
7. Unless agreed by the parties in individual cases, the scope, type and any taking back of packaging of the goods to be delivered shall be at the Seller's option, taking into account statutory provisions.

7. Passing of risk

1. The risk of accidental loss or accidental deterioration of the goods shall pass to the Purchaser upon the delivery item being made available for collection by the forwarding agent, carrier or third parties otherwise designated to carry out the shipment (EXW Verden/Aller, Max-Planck-Str. 36-46, Germany, pursuant to Incoterms 2010). This shall also apply if partial deliveries are made or the Seller has taken over other services (e.g. shipment or installation).
2. If shipment is delayed due to circumstances for which the Purchaser is responsible or the shipment is made at the Purchaser's request at a later date than the agreed delivery date, the risk shall pass to the Purchaser from the date of notification of readiness for shipment for the duration of the delivery.
3. Deliveries shall not be insured against theft, breakage, transport and fire damage without specific request by the Purchaser. If the Purchaser requests the conclusion of an insurance policy, this shall be concluded at the Purchaser's expense. The Purchaser shall provide any cooperation required.

8. Claims for defects

1. The Purchaser shall inspect the goods immediately upon receipt if this is expedient in the ordinary course of business and, if a defect is found, shall notify the Seller immediately in writing. The inspection shall also include checking the function of the equipment and checking the correct display of measuring instruments. By negotiating any notices of defects, the Seller shall not waive the objection that the notice was not in due time, unfounded in fact or otherwise insufficient.
2. If the Purchaser fails to provide this notice, the goods shall be deemed approved unless it is a defect which was not recognisable during the inspection. Section 377 et seq. HGB (German Commercial Code) shall furthermore apply.
3. Obvious damages sustained during transport or other defects identifiable already at the time of delivery must also be confirmed by the deliverer's signature on the respective transport document when delivery is accepted. The Purchaser shall ensure that a corresponding confirmation is provided.
4. Supplementary performance shall be provided at the Seller's option by remedying the defect or supplying an article free from defects. If supplementary performance fails, the Purchaser shall have the right at its option to make a reduction or rescind the contract. This shall not affect the right to assert damages according to paragraph 9 of these General Terms and Conditions of Sale and Delivery.
5. Claims for defects shall become statute-barred within one year after the risk passes pursuant to paragraph 7 of these General Terms and Conditions of Sale and Delivery. This shall not apply in the cases pursuant to paragraph 9.2 of these General Terms and Conditions of Sale and Delivery. Furthermore, this shall not apply to goods which were used for a structure according to their customary manner of use and caused its defectiveness. In the above-mentioned cases, statutory time limits shall apply.

9. Liability

1. The Seller shall not be liable, in particular not for claims by the Purchaser for damages or reimbursement of expenses, for whatever legal reason, and/or in the case of breach of duty from the obligation and tort.
2. The above exclusion of liability shall not apply
   - in the case of own intentional or grossly negligent breach of duty and intentional or grossly negligent breach of duty by legal representatives or vicarious agents;
   - in the case of violation of material contractual obligations; material contractual obligations are obligations, the fulfilment of which defines the contract, and on which the Purchaser may rely;
   - in the event of injury to life, limb and health, also by legal representatives or vicarious agents;
   - in the case of default if delivery and/or service by a fixed date was agreed;
   - where the Seller has assumed a guarantee for the quality of the goods or the existence of an outcome of performance or a procurement risk;
   - in the case of liability under the Produkthaftungsgesetz (German Product Liability Act) or other mandatory statutory liability.
3. If the Seller or its vicarious agents are responsible only for slight negligence and none of the cases specified in bullet points 1., 3., 4., 5. and 6. of paragraph 9.2 above exist, the Seller's liability shall be limited in amount to the damages foreseeable and typical for the contract at the time of concluding the contract, also in the case of violation of material contractual obligations.
4. Any further liability shall be excluded.
5. Exclusion resp. limitation of liability pursuant to paragraph 9.1 to 9.4 above and paragraph 9.6 shall apply to the same extent for the benefit of executive and non-executive employees and other vicarious agents as well as the Seller's sub-contractors.
6. If the Purchaser is entitled to claims for damages in accordance with this paragraph 9, these shall become statute-barred upon expiry of the limitation period pursuant to paragraph 8.5 of these General Terms and Conditions of Sale and Delivery unless there are mandatory legal limitation periods to the contrary, such as in the case of supplier recourse pursuant to Section 445b BGB. Paragraph 9.2 of these General Terms and Conditions of Sale and Delivery shall apply mutatis mutandis.
7. There is no connection between the reversal of the burden of proof and the foregoing provisions.

10. Prohibition of assignment

The Purchaser may assign claims against the Seller only with the prior written consent of the Seller. This reservation of consent shall not apply to purchase price claims and other pecuniary claims.

11. Delivery of equipment for a trial period

In the case of delivery of equipment for a trial period, the Purchaser shall, unless otherwise agreed, pay the freight charges as well as the costs for packaging and insurance and for any reduction in value that may have occurred. The Purchaser shall also be liable for any loss of or damage to the delivered goods during the trial period. If goods are returned, they must always be in a perfectly cleaned condition and insured for transport at the expense of the Purchaser.

12. Final provisions

1. Unless otherwise stated in the Seller's order confirmation, the place of performance for deliveries and payments shall always be the Seller's registered office.
2. Amendments to and modifications of the contract between the Purchaser and the Seller shall only be valid when given in writing. This shall also apply to the cancellation of this written form agreement itself. The precedence of an individual agreement - also verbal - pursuant to 305b BGB remains unaffected by this.
3. Any disputes shall be settled exclusively before a competent court of law at the location of the Seller's registered office. The Seller shall, however, have the right to bring an action against the Purchaser at its place of general jurisdiction.
4. The law of the Federal Republic of Germany shall apply, to the exclusion of the UN Sales Convention (CISG).

Status: 11/2018

BLOCK


BLOCK
INPUT
OUTPUT
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PEL-0124-013-0

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