L-force catalogue

Automation systems
Drive solutions

Controls
Inverters
Motors
Gearboxes
Engineering tools

Motors: MH three-phase AC motors, **Gearboxes:** Helical-worm gearboxes

Lenze
As easy as that.

Contents of the L-force catalogue

Selected portfolio

Additional portfolio

Lenze makes many things easy for you.

With our motivated and committed approach, we work together with you to create the best possible solution and set your ideas in motion - whether you are looking to optimise an existing machine or develop a new one. We always strive to make things easy and seek perfection therein. This is anchored in our thinking, in our services and in every detail of our products. It's as easy as that!

1

Developing ideas

Are you looking to build the best machine possible and already have some initial ideas? Then get these down on paper together with us, starting with small innovative details and stretching all the way to completely new machines. Working together, we will develop an intelligent and sustainable concept that is perfectly aligned with your specific requirements.

2

Drafting concepts

We see welcome challenges in your machine tasks, supporting you with our comprehensive expertise and providing valuable impetus for your innovations. We take a holistic view of the individual motion and control functions here and draw up consistent, end-to-end drive and automation solutions for you - keeping everything as easy as possible and as extensive as necessary.

3

Implementing solutions

Our easy formula for satisfied customers is to establish an active partnership with fast decision making processes and an individually tailored offer. We have been using this easy principle to meet the ever more specialised customer requirements in the field of machine building for many years.

4

Manufacturing machines

Functional diversity in perfect harmony: as one of the few full-range providers in the market, we can provide you with precisely those products that you actually need for any machine task – no more and no less. Our L-force product portfolio, a consistent platform for implementing drive and automation tasks, is invaluable in this regard.

5

Ensuring productivity

Productivity, reliability and new performance peaks on a daily basis – these are our key success factors for your machine. After delivery, we offer you cleverly devised service concepts to ensure continued safe operation. The primary focus here is on technical support, based on the excellent application expertise of our highly-skilled and knowledgeable after-sales team.

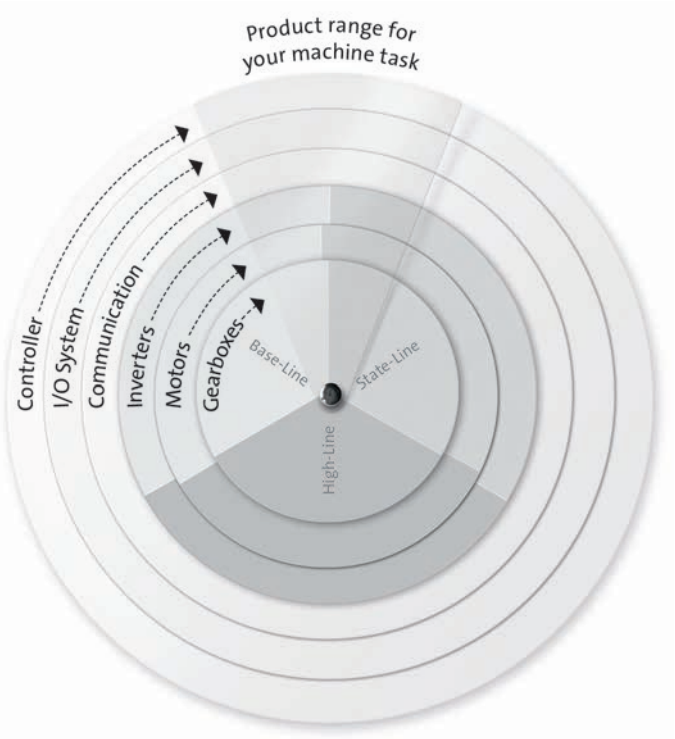
A matter of principle: the right products for every application.

Lenze's extensive L-force product portfolio follows a very simple principle. The functions of our finely scaled products are assigned to the three lines Base-Line, State-Line or High-Line.

But what does this mean for you? It allows you to quickly recognise which products represent the best solution for your own specific requirements.

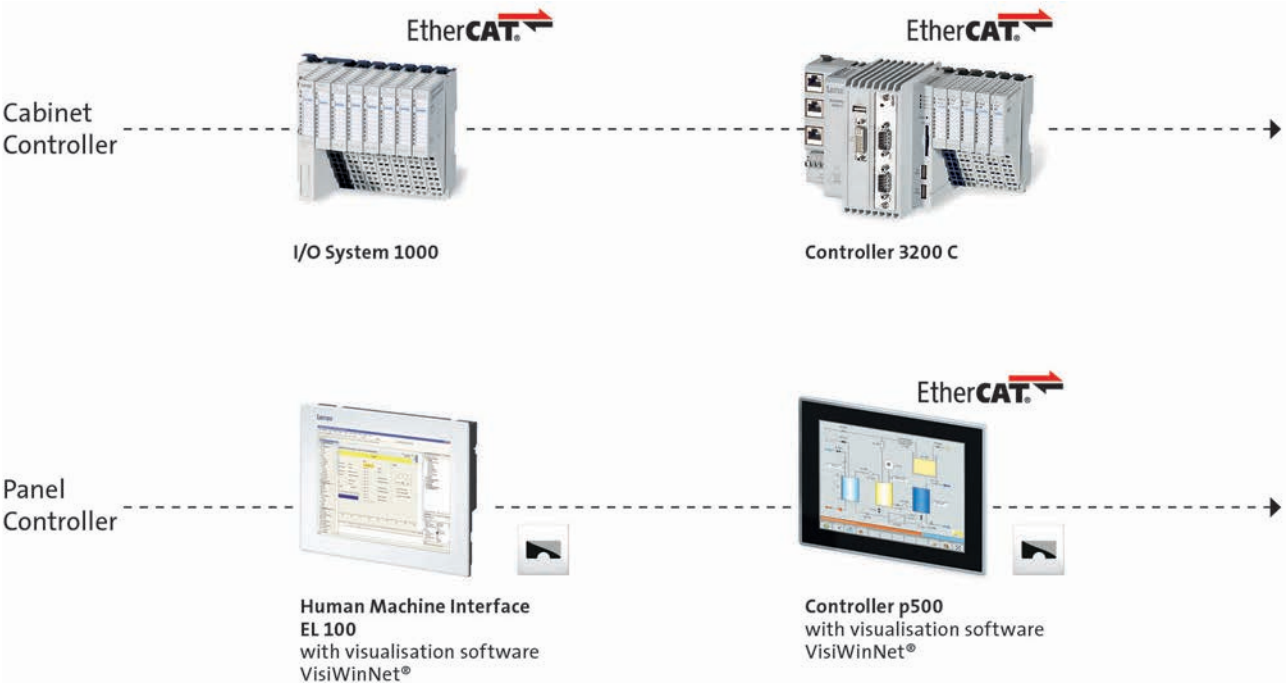
Powerful products with a major impact:
- Easy handling
- High quality and durability
- Reliable technologies in tune with the latest developments

Lenze products undergo the most stringent testing in our own laboratory. This allows us to ensure that you will receive consistently high quality and a long service life. In addition to this, five logistics centres ensure that the Lenze products you select are available for quick delivery anywhere across the globe. It's as easy as that!

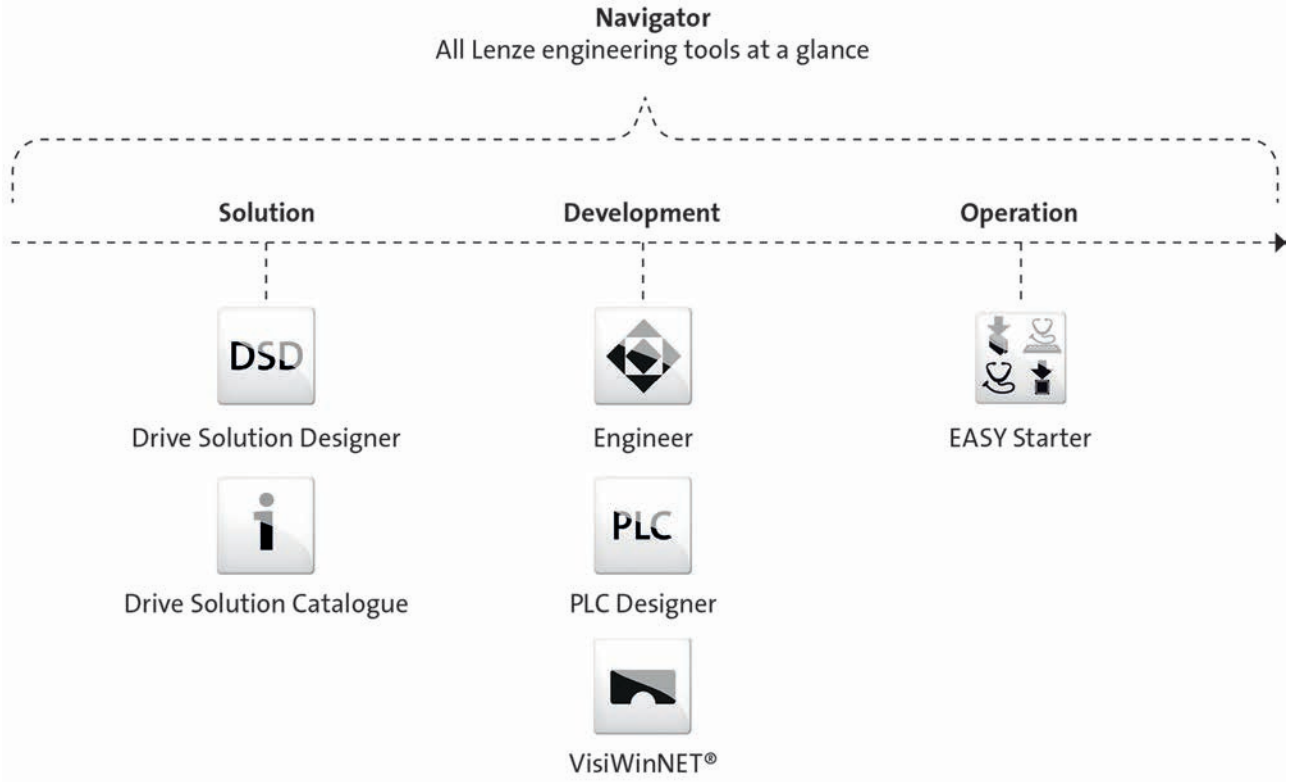


L-force product portfolio

Controls

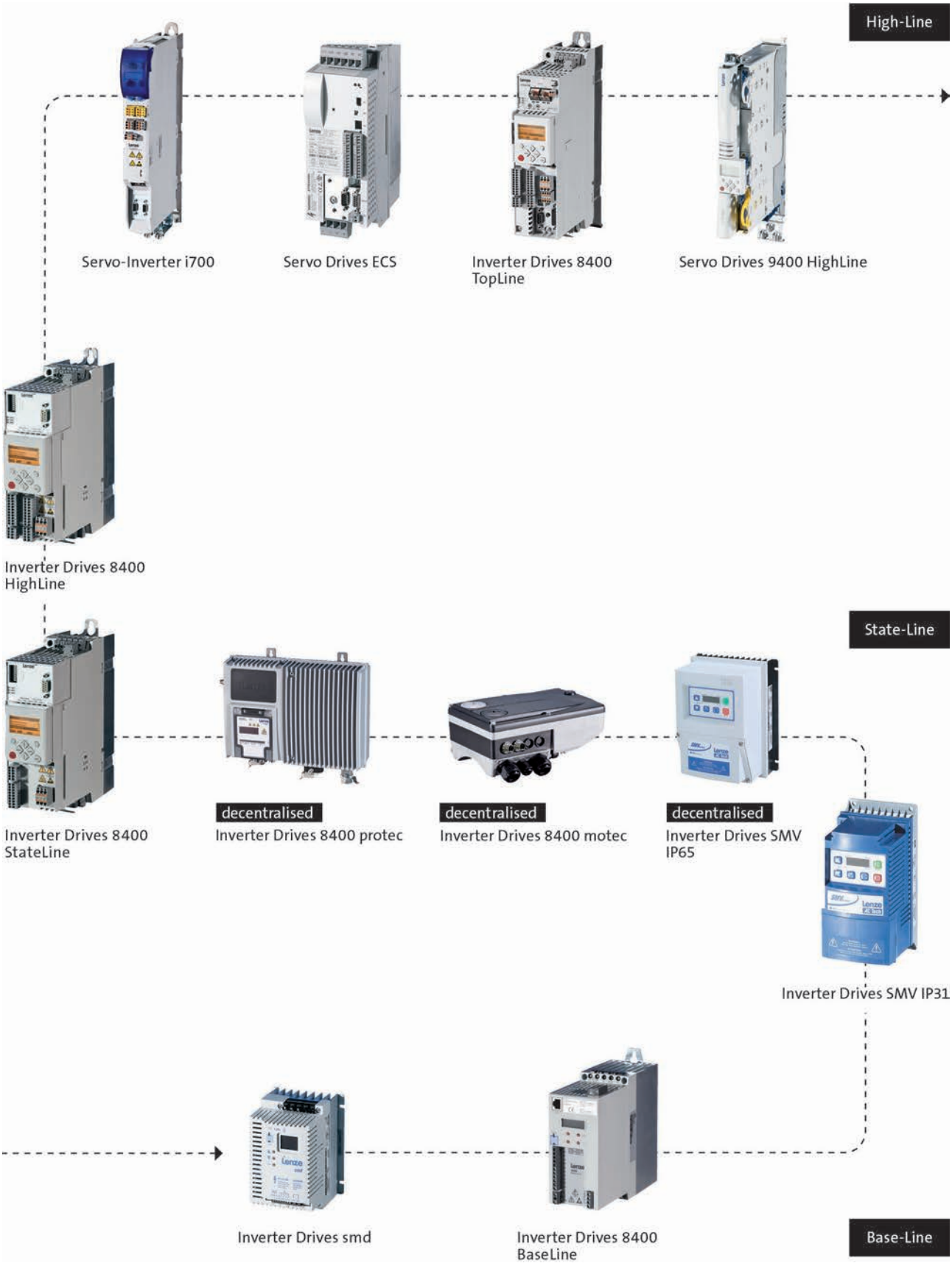


Engineering tools



L-force product portfolio

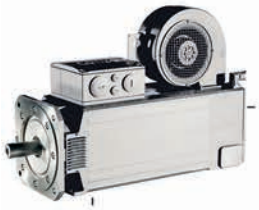
Inverters



L-force product portfolio

Motors

High-Line



MQA asynchronous servo motors

SDSGS synchronous servo motors

MDXKS synchronous servo motors

Synchronous servo motors MCS

Asynchronous servo motors MCA

Asynchronous servo motors SDSGA

State-Line

MF three-phase AC motors

MH three-phase AC motors

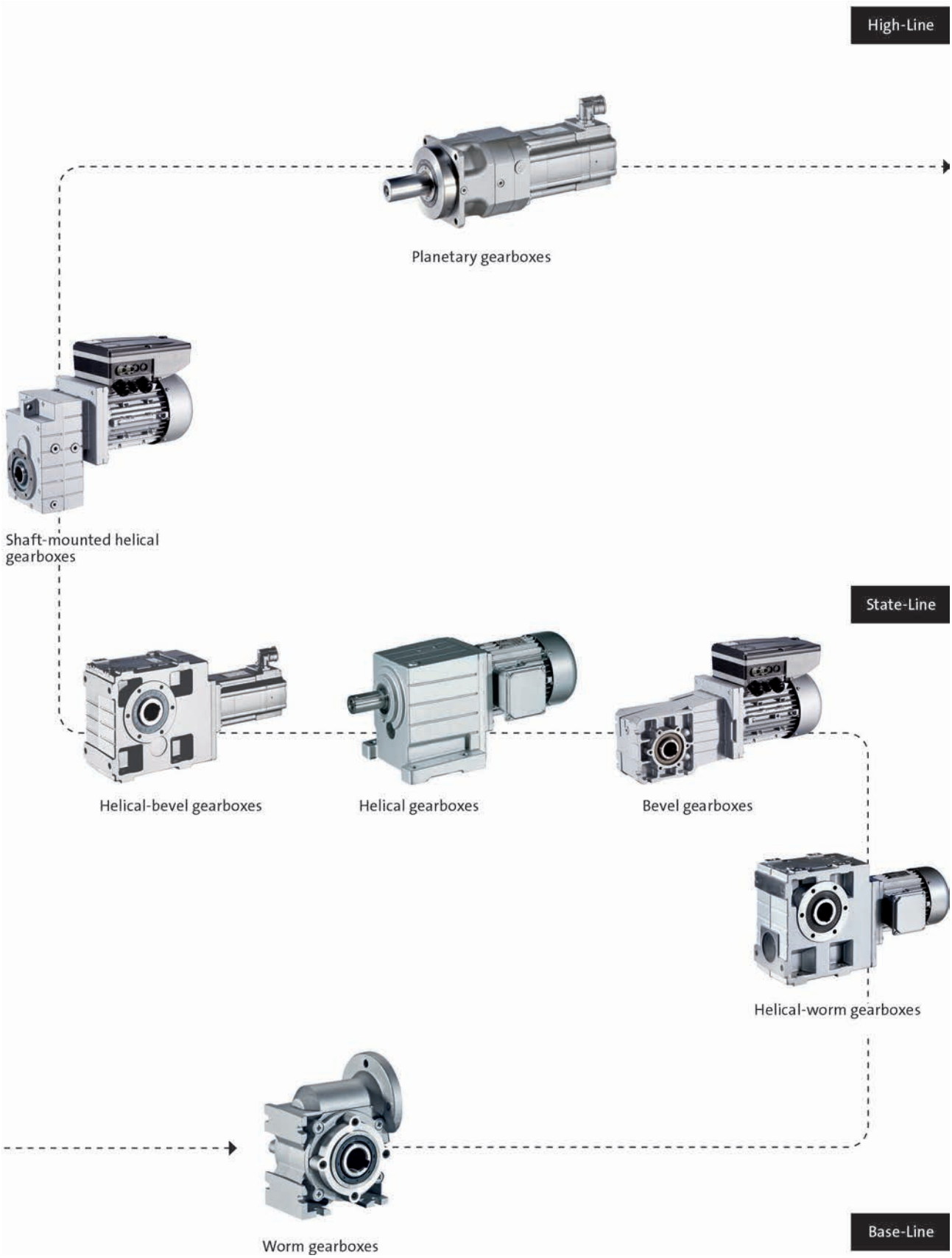
MD three-phase AC motors

Basic MD/MH three-phase AC motors

Base-Line

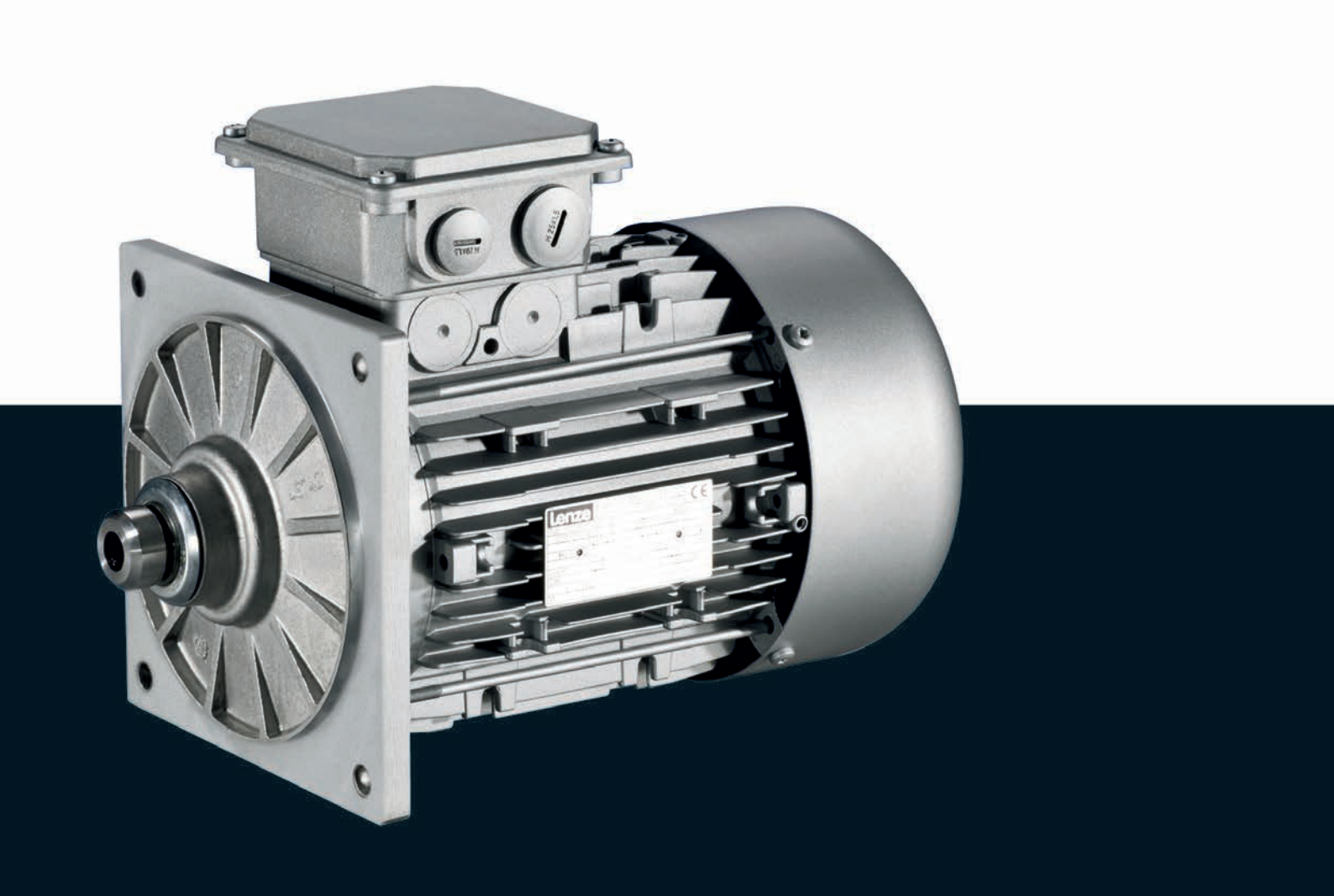
L-force product portfolio

Gearboxes



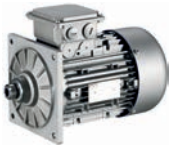
MH three-phase AC motors

0.75 ... 45 kW



MH three-phase AC motors

Contents



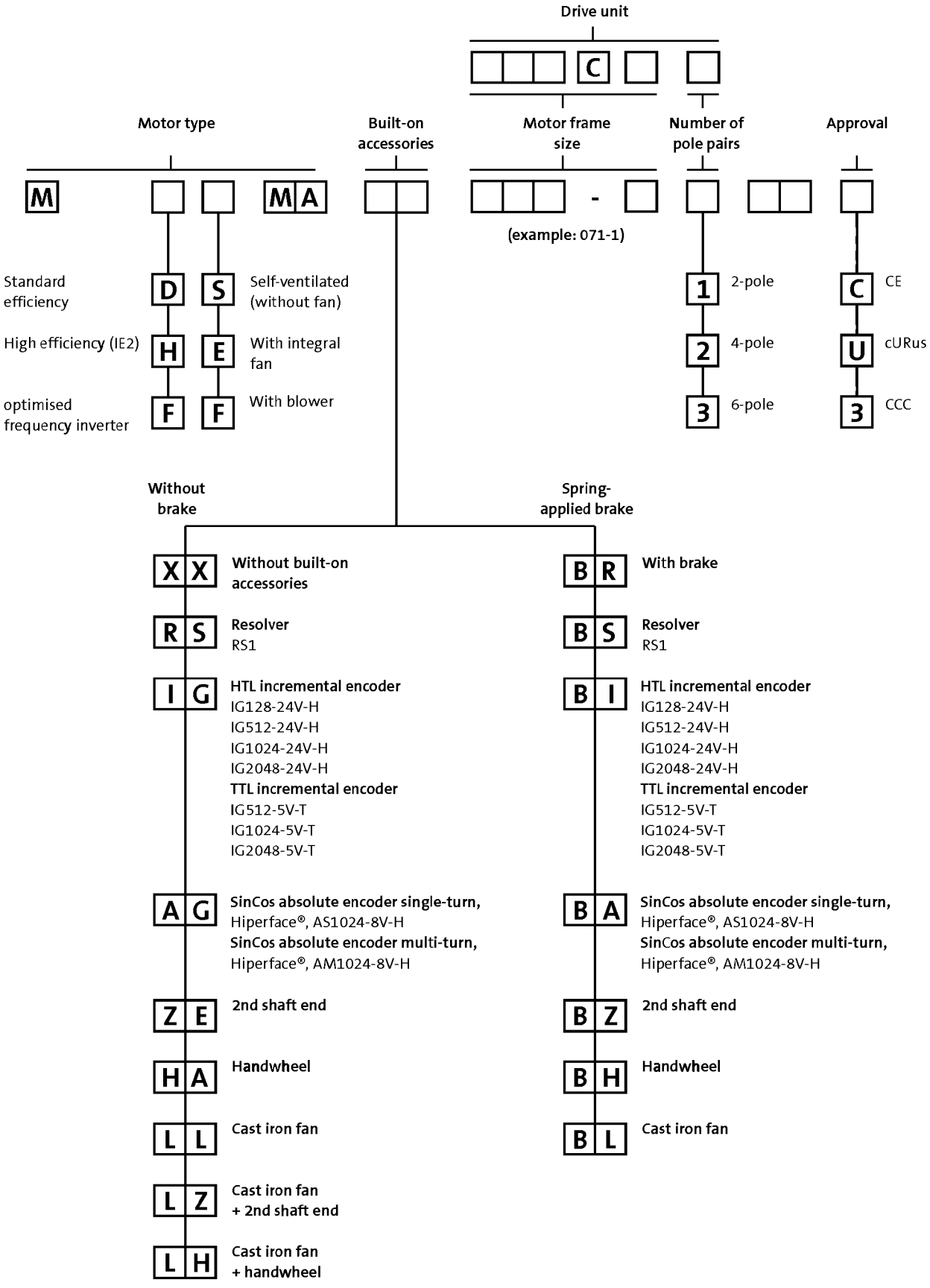
List of abbreviations

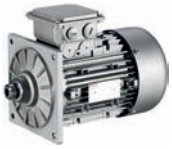
$\eta_{100\,\%}$	[%]	Efficiency
$\eta_{75\,\%}$	[%]	Efficiency
$\eta_{50\,\%}$	[%]	Efficiency
cos φ		Power factor
I_N	[A]	Rated current
I_{max}	[A]	Max. current consumption
J	[kgcm²]	Moment of inertia
m	[kg]	Mass
M_a	[Nm]	Starting torque
M_b	[Nm]	Stalling torque
M_{max}	[Nm]	Max. torque
M_N	[Nm]	Rated torque
n_N	[r/min]	Rated speed
P_N	[kW]	Rated power
P_{max}	[kW]	Max. power input

U_{max}	[V]	Max. mains voltage
U_{min}	[V]	Min. mains voltage
$U_{N,\Delta}$	[V]	Rated voltage
$U_{N,Y}$	[V]	Rated voltage

CE	Communauté Européenne
CSA	Canadian Standards Association
DIN	Deutsches Institut für Normung e.V.
EMC	Electromagnetic compatibility
EN	European standard
IEC	International Electrotechnical Commission
IM	International Mounting Code
IP	International Protection Code
NEMA	National Electrical Manufacturers Association
UL	Underwriters Laboratory Listed Product
UR	Underwriters Laboratory Recognized Product
VDE	Verband deutscher Elektrotechniker (Association of German Electrical Engineers)
CCC	China Compulsory Certificate
GOST	Certificate for Russian Federation
cURus	Combined certification marks of UL for the USA and Canada
UkrSEPRO	Certificate for Ukraine

Product key

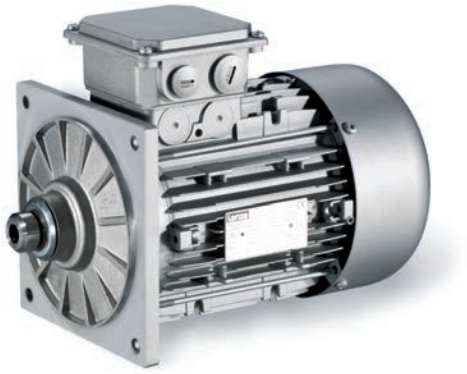

Drive unit
C
Motor type
Built-on accessories
Motor frame size
Number of pole pairs
Approval
M
M A
-
(example: 071-1)
Standard efficiency
D
S
Self-ventilated (without fan)
High efficiency (IE2)
H
E
With integral fan
optimised frequency inverter
F
F
With blower
1
2-pole
2
4-pole
3
6-pole
C
CE
U
cURus
3
CCC
Without brake
Spring-applied brake
X X
Without built-on accessories
R S
Resolver
RS1
I G
HTL incremental encoder
IG128-24V-H
IG512-24V-H
IG1024-24V-H
IG2048-24V-H
TTL incremental encoder
IG512-5V-T
IG1024-5V-T
IG2048-5V-T
A G
SinCos absolute encoder single-turn,
Hiperface®, AS1024-8V-H
SinCos absolute encoder multi-turn,
Hiperface®, AM1024-8V-H
Z E
2nd shaft end
H A
Handwheel
L L
Cast iron fan
L Z
Cast iron fan
+ 2nd shaft end
L H
Cast iron fan
+ handwheel
B R
With brake
B S
Resolver
RS1
B I
HTL incremental encoder
IG128-24V-H
IG512-24V-H
IG1024-24V-H
IG2048-24V-H
TTL incremental encoder
IG512-5V-T
IG1024-5V-T
IG2048-5V-T
B A
SinCos absolute encoder single-turn,
Hiperface®, AS1024-8V-H
SinCos absolute encoder multi-turn,
Hiperface®, AM1024-8V-H
B Z
2nd shaft end
B H
Handwheel
B L
Cast iron fan



Product information

Special motors have been designed for direct attachment to Lenze gearboxes.

These motors are attached to the gearbox without the use of a clutch. Torque transmission between the toothing and the motor shaft is friction-locked via a tapered connection here.
This motor design means that the geared motors only require a small installation space.



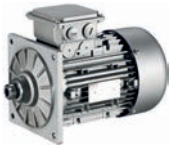
L-force MH three-phase AC motors are available in a power range from 0.75 ... 45 kW and comply with efficiency class IE2 (high efficiency) as per IEC 60034-30.
Since almost all IE2 motors are designed with the same dimensions as the standard efficiency motors, it is easy to switch between the two.
The energy efficiency of the L-force MH three-phase AC motors has been approved by Underwriters Labratories (UL) as an independent third-party.

Basic versions
- The thermal sensors integrated as standard allow for permanent temperature monitoring and are coordinated to the motor winding's temperature class F (155°C).
- The motors of the basic version are adapted to ambient conditions by enclosure IP55.
- In tough operating conditions, the surface and corrosion protection system is provided to reliably protect the motor from corrosive media.

Options
- Various brake sizes – each available with several braking torques – can be combined with the three-phase AC motors.
- The LongLife version of the brake can easily reach 10 x 10^6 switching cycles.
- A resolver and various incremental and absolute value encoders can be fitted for speed and position detection.
- For fast commissioning, the motors are also available with connectors for the power connection, brake, blower and feedback.
- Instead of an integral fan, the motor can optionally be equipped with a blower. No torque reduction is then necessary, even at speeds below 20 Hz.
- For drive tasks in decentralised applications, the motor can be ordered with the motec inverter connected to the terminal box.
- The motors are available with cURus, GOST-R, CCC and UkrSepro approval.
- Smooth start/braking is possible by increasing the motor's centrifugal mass with a cast iron fan.
- The motor can be equipped with a handwheel for manual setup or emergency operations.
- To protect the fan from falling objects, the fan cover can be equipped with a protection cover.
- A 2nd shaft end is available for further modifications.

Functions and features

Size			
Motor	080	090	100
Spring-applied brake			
Design	Standard or LongLife design Reduced, standard or increased braking torque With rectifier With manual release lever Low noise		
Feedback			
Design	Resolver Incremental encoder Absolute value encoder (multi-turn)		
Temperature sensor			
Thermal contact	TKO		
Thermal detector	KTY83-110 KTY84-130		
PTC thermistor	PTC		
Motor connection			
Power connection	Terminal box ICN connector HAN10E connector HAN modular connector		
Brake connection	Terminal box ICN connector HAN modular connector HAN10E connector		
Blower connection	Terminal box ICN connector		
Feedback connection	Terminal box ICN connector		
Temperature sensor connection	Terminal box TKO or PTC at connector in the power connection KTY at connector in the feedback connection		
Shaft bearings			
Position of the locating bearing	Standard motors (B3, B5, B14): side B Motors for gearbox direct mounting: side A		
Bearing type	Deep-groove ball bearing with high-temperature resistant grease, 2 sealing discs or cover plates		
Colour			
	Primed Not coated Paint in various corrosion-protection designs in accordance with RAL colours		
Further options			
	Increased centrifugal mass Protection cover Handwheel 2nd shaft end		



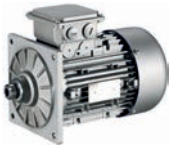
Functions and features

Size			
Motor	112	132	160
Spring-applied brake			
Design	Standard design Reduced, standard or increased braking torque With rectifier With manual release lever Low noise		
Feedback			
Design	Resolver Incremental encoder Absolute value encoder (multi-turn)		
Temperature sensor			
Thermal contact	TKO		
Thermal detector	KTY83-110 KTY84-130		
PTC thermistor	PTC		
Motor connection			
Power connection	Terminal box ICN connector HAN10E connector HAN modular connector	Terminal box ICN connector HAN modular connector	Terminal box HAN modular connector
Brake connection	Terminal box ICN connector HAN modular connector HAN10E connector	Terminal box ICN connector HAN modular connector	Terminal box HAN modular connector
Blower connection	Terminal box ICN connector		
Feedback connection	Terminal box ICN connector		
Temperature sensor connection	Terminal box TKO or PTC at connector in the power connection KTY at connector in the feedback connection		
Shaft bearings			
Position of the locating bearing	Standard motors (B3, B5, B14): side B Motors for gearbox direct mounting: side A		
Bearing type	Deep-groove ball bearing with high-temperature resistant grease, 2 sealing discs or cover plates		
Colour			
	Primed Not coated Paint in various corrosion-protection designs in accordance with RAL colours		
Further options			
	Increased centrifugal mass Protection cover Handwheel 2nd shaft end		Protection cover

5.8

Functions and features

Size			
Motor	180	200	225
Spring-applied brake			
Design	Standard design Reduced, standard or increased braking torque With rectifier With manual release lever Low noise		
Feedback			
Design	Resolver Incremental encoder Absolute value encoder (multi-turn)		
Temperature sensor			
Thermal contact	TKO		
Thermal detector	KTY83-110 KTY84-130		
PTC thermistor	PTC		
Motor connection			
Power connection	Terminal box		
Brake connection	Terminal box		
Blower connection	Terminal box ICN connector		
Feedback connection	Terminal box ICN connector		
Temperature sensor connection	Terminal box		
Shaft bearings			
Position of the locating bearing	Standard motors (B3, B5, B14): side B Motors for gearbox direct mounting: side A		Drive end
Bearing type	Deep-groove ball bearing with high-temperature resistant grease, 2 sealing discs or cover plates		
Colour			
	Primed Not coated Paint in various corrosion-protection designs in accordance with RAL colours		
Further options			



Functions and features

Surface and corrosion protection

For optimum protection of three-phase AC motors against ambient conditions, the surface and corrosion protection system (OKS) offers tailor-made solutions.

Various surface coatings ensure that the motors operate reliably even at high air humidity, in outdoor installation or in the presence of atmospheric impurities. Any colour from the RAL Classic collection can be chosen for the top coat. The three-phase AC motors are also available unpainted (no surface and corrosion protection).

Surface and corrosion protection system	Applications	Measures
OKS-G (primed)	• Dependent on subsequent top coat applied	• 1K priming coat (grey)
OKS-S (small)	• Standard applications • Internal installation in heated buildings • Air humidity up to 90%	• Surface coating as per corrosivity category C1 (in line with EN 12944-2)
OKS-M (medium)	• Internal installation in non-heated buildings • Covered, protected external installation • Air humidity up to 95%	• Surface coating as per corrosivity category C2 (in line with EN 12944-2)
OKS-L (high)	• External installation • Air humidity above 95% • Chemical industry plants • Food industry	• Surface coating as per corrosivity category C3 (in line with EN 12944-2) Optional measures: • Motor recesses sealed off (on request) • Blower cover and B end shield additionally primed • Screws zinc-coated • Cable glands with gaskets • Corrosion-resistant brake with cover ring, stainless friction plate, and chrome-plated armature plate (on request)

Structure of surface coating

Surface and corrosion protection system	Corrosivity category	Surface coating	Colour
	DIN EN ISO 12944-2	Structure	
Without OKS (uncoated)			
OKS-G (primed)		1K priming coat	
OKS-S (small)	C1	2K-PUR top coat	Standard: RAL 7012 Optional: RAL Classic
OKS-M (medium)	C2	1K priming coat 2K-PUR top coat	
OKS-L (high)	C3	2K-EP priming coat 2K-PUR top coat	

Motor – inverter assignment

Rated frequency 50/60 Hz

- ► Decentralised inverter 8400 motec (E84DVB)
- ► Inverter Drives 8400 (E84AV)

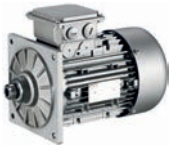
Rated power	Product key		
	Motor	Inverter	
P_N			
[kW]			
0.75	MH□□□□□080-32	E84DVB□7514S□□□2□	E84AV□□□7514□□0
1.10	MH□□□□□090-12	E84DVB□1124S□□□2□	E84AV□□□1124□□0
1.50	MH□□□□□090-32	E84DVB□1524S□□□2□	E84AV□□□1524□□0
2.20	MH□□□□□100-12	E84DVB□2224S□□□2□	E84AV□□□2224□□0
3.00	MH□□□□□100-32	E84DVB□3024S□□□2□	E84AV□□□3024□□0
4.00	MH□□□□□112-22	E84DVB□4024S□□□2□	E84AV□□□4024□□0
5.50	MH□□□□□132-12	E84DVB□5524S□□□2□	E84AV□□□5524□□0
7.50	MH□□□□□132-22	E84DVB□7524S□□□2□	E84AV□□□7524□□0
11.0	MH□□□□□160-22		E84AV□□□1134□□0
15.0	MH□□□□□160-32		E84AV□□□1534□□0
18.5	MH□□□□□180-12		E84AV□□□1834□□0
22.0	MH□□□□□180-32		E84AV□□□2234□□0
30.0	MH□□□□□180-42		E84AV□□□3034□□0
37.0	MH□□□□□225-12		E84AV□□□3734□□0
45.0	MH□□□□□225-22		E84AV□□□4534□□0

Motor – inverter assignment

Rated frequency 87 Hz

- Decentralised inverter 8400 motec (E84DVB)
- Inverter Drives 8400 (E84AV)

Rated power	Product key		
	Motor	Inverter	
P_N			
[kW]			
1.35	MH□□□□□080-32	E84DVB□1524S□□□2□	E84AV□□□1524□□0
2.00	MH□□□□□090-12	E84DVB□2224S□□□2□	E84AV□□□2224□□0
2.70	MH□□□□□090-32	E84DVB□3024S□□□2□	E84AV□□□3024□□0
3.90	MH□□□□□100-12	E84DVB□4024S□□□2□	E84AV□□□4024□□0
5.40	MH□□□□□100-32	E84DVB□5524S□□□2□	E84AV□□□5524□□0
7.10	MH□□□□□112-22	E84DVB□7524S□□□2□	E84AV□□□7524□□0
9.70	MH□□□□□132-12		E84AV□□□1134□□0
13.2	MH□□□□□132-22		E84AV□□□1534□□0
19.4	MH□□□□□160-22		E84AV□□□2234□□0
26.4	MH□□□□□160-32		E84AV□□□3034□□0
32.5	MH□□□□□180-12		E84AV□□□3734□□0

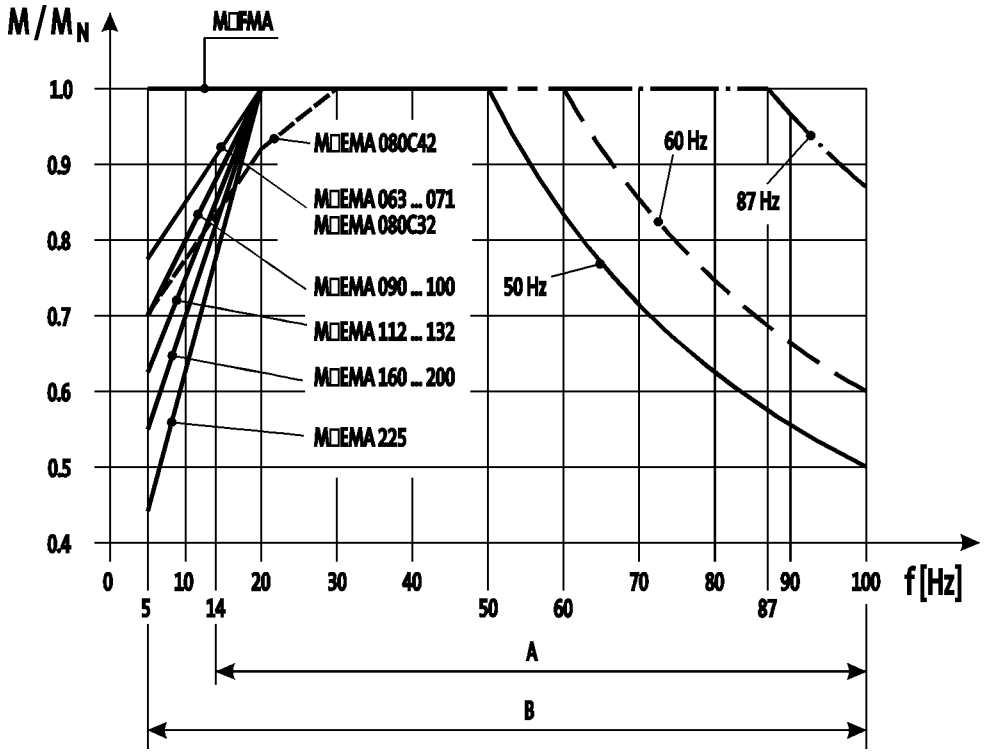


Dimensioning

Torque derating at low motor frequencies

Motor size-dependent torque reduction, taking into account the thermal response during operation on the inverter.

Torque characteristics



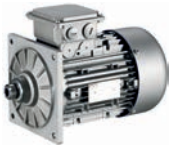
A = Operation with integral fan and brake
B = Operation with integral fan and brake control "Holding current reduction"

► The motor specifications stated in this catalogue for inverter operation apply to operation with a Lenze inverter. If you are uncertain, get in touch with the manufacturer of the inverter to ask whether the device is capable of driving the motor with the stated specifications (e.g. setting range, base frequency).

You can use the Drive Solution Designer for precise drive dimensioning.

The Drive Solution Designer helps you to carry out a fast and high-quality drive dimensioning.
The software includes well-founded and proven knowledge on drive applications and electro-mechanical drive components.

Please contact your Lenze sales office.



Standards and operating conditions

Degree of protection			
EN 60529			IP55
Energy efficiency class			
IEC 60034-30			IE2
IEC 60034-2-1			Methodology for measuring efficiency
Approval			
Class			cURus/UL Energy-verified [1)] CCC GOST-R UkrSepro
Temperature class			
IEC/EN 60034-1; utilisation			B
IEC/EN 60034-1; insulation system (enamel-insulated wire)			F
Min. ambient operating temperature			
	$T_{opr,min}$	[°C]	-20
Max. ambient operating temperature			
	$T_{opr,max}$	[°C]	40
With power reduction	$T_{opr,max}$	[°C]	60
Site altitude			
Amsl	H_{max}	[m]	4000
Max. speed			
	n_{max}	[r/min]	4500

[1)] Motor frame size 225, in preparation.

► In the European Union, the ErP Directive stipulates minimum efficiency levels for three-phase AC motors. Geared three-phase AC motors that do not conform with this Directive do not meet CE requirements and must not be marketed in the European Economic Area. For further information about the ErP Directive and the Lenze products to which it relates, please refer to the brochure entitled "International efficiency directives for three-phase AC motors".

Rated data for 50 Hz

4-pole motors

	P_N	n_N	$U_{N,\Delta}$ [2]	$I_{N,\Delta}$	$U_{N,Y}$	$I_{N,Y}$	I_a/I_N
			± 10 %		± 10 %		
	[kW]	[r/min]	[V]	[A]	[V]	[A]	
MH□□□□□080-32	0.75	1410	230	3.10	400	1.80	5.00
MH□□□□□090-12	1.10	1430	230	4.60	400	2.70	5.40
MH□□□□□090-32	1.50	1435	230	5.80	400	3.30	6.30
MH□□□□□100-12	2.20	1445	230	8.60	400	5.00	6.00
MH□□□□□100-32	3.00	1445	230	12.1	400	7.00	6.50
MH□□□□□112-22	4.00	1455	230	14.5	400	8.40	6.00
MH□□□□□132-12	5.50	1470	230 400 [3]	20.6 11.9	400	11.9	6.10
MH□□□□□132-22	7.50	1460	230 400 [3]	27.0 15.6	400	15.6	8.50
MH□□□□□160-22	11.0	1470	230 400 [3]	37.7 21.8	400	21.8	8.00
MH□□□□□160-32	15.0	1470	230 400 [3]	50.3 29.1	400	29.1	8.20
MH□□□□□180-12	18.5	1475	230 400 [3]	58.8 34.0	400	34.0	8.40
MH□□□□□180-32	22.0	1470	230 400 [3]	68.9 39.8	400	39.8	7.80
MH□□□□□180-42	30.0	1465	230 400 [3]	93.8 53.9	400	53.9	7.00
MH□□□□□225-12	37.0	1483	230 400 [3]	113 65.0	400	65.0	7.50
MH□□□□□225-22	45.0	1480	230 400 [3]	137 79.0	400	79.0	7.60

	M_N	M_a	M_b	cos φ	$\eta_{50\,\%}$	$\eta_{75\,\%}$	$\eta_{100\,\%}$	J [1]	m [1]
	[Nm]	[Nm]	[Nm]		[%]	[%]	[%]	[kgcm²]	[kg]
MH□□□□□080-32	5.08	12.0	12.1	0.84	74.9	79.6	79.6	28.0	11.0
MH□□□□□090-12	7.35	20.3	24.2	0.76	77.4	81.6	82.0	32.0	16.0
MH□□□□□090-32	10.0	33.0	34.0	0.76	82.2	83.4	82.8	36.0	18.0
MH□□□□□100-12	14.5	48.0	55.0	0.80	85.4	86.7	86.3	61.0	24.0
MH□□□□□100-32	19.8	67.0	76.0	0.73	83.8	85.6	85.5	66.0	26.5
MH□□□□□112-22	26.3	81.0	100	0.80	86.3	88.2	88.3	135	38.0
MH□□□□□132-12	35.7	90.0	108	0.77	88.2	89.3	89.2	290	59.0
MH□□□□□132-22	49.1	110	175	0.79	87.6	88.9	88.7	336	66.0
MH□□□□□160-22	71.5	164	243	0.82	89.4	90.0	89.8	570	109
MH□□□□□160-32	97.4	224	292	0.82	90.2	90.8	90.6	760	124
MH□□□□□180-12	120	359	371	0.86	90.8	91.4	91.2	1390	175
MH□□□□□180-32	143	400	372	0.87	91.4	92.0	91.6	1440	180
MH□□□□□180-42	196	469	528	0.87	91.9	92.5	92.3	1850	200
MH□□□□□225-12	238	620	620	0.87	94.0	94.6	94.3	4610	395
MH□□□□□225-22	290	698	669	0.88	93.7	94.5	94.3	5300	415

[1] Without accessories
[2] Operation at 87 Hz is possible with 4-pole motors whose rated data at 50 Hz displays the voltage values Δ 230 V.
With motor frame sizes 132-12 to 225-22, the required voltage must also be specified in your order.
[3] Star/delta start-up possible at 400 V.

Rated data for 60 Hz

4-pole motors

- The motors are designed for an operation at 265/460 V but are also able to be operated at 230 V, 60 Hz. The same technical data apply, the starting torque is a bit lower.
- The motors have a service factor of 1.15 at 60 Hz. The service factor indicates the permissible overload during operation within the mains voltage fluctuations.

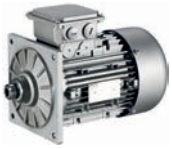
	P_N	n_N	$U_{N,\Delta}$ [2]	$I_{N,\Delta}$	$U_{N,Y}$	$I_{N,Y}$	I_a/I_N
			± 10 %		± 10 %		
	[kW]	[r/min]	[V]	[A]	[V]	[A]	
MH□□□□□080-32	0.75	1720	265	2.80	460	1.60	5.80
MH□□□□□090-12	1.10	1740	265	4.00	460	2.30	6.50
MH□□□□□090-32	1.50	1745	265	5.10	460	3.00	7.20
MH□□□□□100-12	2.20	1750	265	7.70	460	4.40	6.90
MH□□□□□100-32	3.00	1755	265	10.6	460	6.10	7.70
MH□□□□□112-22	4.00	1760	265	12.8	460	7.40	7.00
MH□□□□□132-12	5.50	1775	265 460 [3]	18.0 10.4	460	10.4	7.10
MH□□□□□132-22	7.50	1765	265 460 [3]	24.2 14.0	460	14.0	9.70
MH□□□□□160-22	11.0	1775	265 460 [3]	32.5 18.7	460	18.7	9.40
MH□□□□□160-32	15.0	1775	265 460 [3]	44.1 24.5	460	24.5	9.80
MH□□□□□180-12	18.5	1775	265 460 [3]	51.1 29.4	460	29.4	9.70
MH□□□□□180-32	22.0	1775	265 460 [3]	59.7 34.4	460	34.4	9.00
MH□□□□□180-42	30.0	1770	265 460 [3]	80.7 46.5	460	46.5	8.10
MH□□□□□225-12	37.0	1787	265 460 [3]	92.5 53.4	460	53.4	8.70
MH□□□□□225-22	45.0	1784	265 460 [3]	111 64.2	460	64.2	8.80

	M_N	M_a	M_b	cos φ	$\eta_{50\,\%}$	$\eta_{75\,\%}$	$\eta_{100\,\%}$	J [1]	m [1]
	[Nm]	[Nm]	[Nm]		[%]	[%]	[%]	[kgcm²]	[kg]
MH□□□□□080-32	4.16	9.37	9.89	0.82	77.9	81.5	82.5	28.0	11.0
MH□□□□□090-12	6.04	17.0	20.0	0.71	79.3	83.0	84.0	32.0	16.0
MH□□□□□090-32	8.21	27.0	28.0	0.75	79.3	83.0	84.0	36.0	18.0
MH□□□□□100-12	12.0	40.0	47.0	0.78	82.6	86.5	87.5	61.0	24.0
MH□□□□□100-32	16.3	55.0	64.0	0.71	84.2	86.6	87.5	66.0	26.5
MH□□□□□112-22	21.7	69.0	84.0	0.79	84.2	86.6	87.5	135	38.0
MH□□□□□132-12	29.6	74.0	92.0	0.77	86.1	88.6	89.5	290	59.0
MH□□□□□132-22	40.6	92.0	147	0.79	86.1	88.6	89.5	336	66.0
MH□□□□□160-22	59.2	148	231	0.81	89.3	90.9	91.0	570	109
MH□□□□□160-32	80.7	210	274	0.81	89.3	90.9	91.0	760	124
MH□□□□□180-12	99.5	338	348	0.86	90.6	92.3	92.4	1390	175
MH□□□□□180-32	118	379	355	0.87	90.6	92.3	92.4	1440	180
MH□□□□□180-42	162	440	505	0.87	92.0	92.9	93.0	1850	200
MH□□□□□225-12	198	590	590	0.87	92.0	92.9	93.0	4610	395
MH□□□□□225-22	241	660	635	0.88	92.6	93.5	93.6	5300	415

[1] Without accessories

[2] Operation at 87 Hz is possible with 4-pole motors whose rated data at 60 Hz displays the voltage values Δ 265 V.
With motor frame sizes 132-12 to 225-22, the required voltage must also be specified in your order.

[3] Star/delta start-up possible at 460 V.



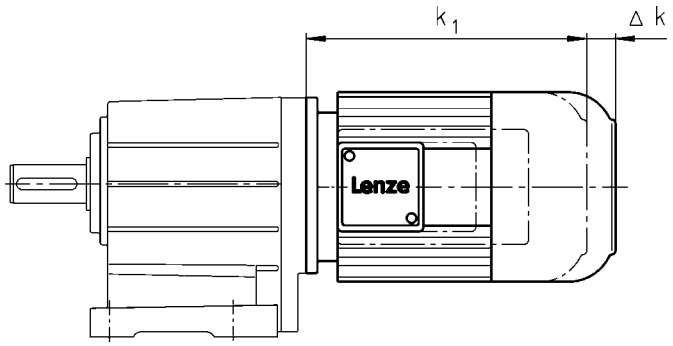
Rated data for 87 Hz

4-pole motors

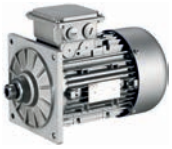
	P_N	n_N	M_N	M_{max}	$U_{N,\Delta}$	$I_{N,\Delta}$	cos φ	$\eta_{50\,\%}$	$\eta_{75\,\%}$	$\eta_{100\,\%}$	J [1]	m [1]
					± 10 %							
	[kW]	[r/min]	[Nm]	[Nm]	[V]	[A]		[%]	[%]	[%]	[kgcm²]	[kg]
MH□□□□□080-32	1.35	2520	5.12	20.0	400	3.10	0.84	77.3	81.6	83.5	28.0	11.0
MH□□□□□090-12	2.00	2540	7.52	30.0	400	4.60	0.78	80.4	84.9	86.5	32.0	16.0
MH□□□□□090-32	2.70	2545	10.1	40.0	400	5.80	0.76	82.3	85.5	86.0	36.0	18.0
MH□□□□□100-12	3.90	2555	14.6	60.0	400	8.60	0.83	85.7	89.6	90.0	61.0	24.0
MH□□□□□100-32	5.40	2555	20.2	80.0	400	12.1	0.76	84.7	87.9	88.5	66.0	26.5
MH□□□□□112-22	7.10	2565	26.4	106	400	14.5	0.83	87.4	90.2	90.9	135	38.0
MH□□□□□132-12	9.70	2580	35.9	144	400	20.6	0.82	88.2	91.4	91.8	290	59.0
MH□□□□□132-22	13.2	2570	49.1	196	400	27.0	0.82	88.2	90.1	90.7	336	66.0
MH□□□□□160-22	19.4	2580	71.8	287	400	37.7	0.81	90.6	91.0	91.6	570	109
MH□□□□□160-32	26.4	2580	97.7	391	400	50.3	0.81	91.4	91.0	91.6	760	124
MH□□□□□180-12	32.5	2585	120	480	400	58.8	0.86	92.0	92.2	92.8	1390	175
MH□□□□□180-32	38.7	2580	143	573	400	68.9	0.87	92.1	92.9	93.4	1440	180
MH□□□□□180-42	52.7	2575	196	782	400	92.6	0.87	92.6	92.7	93.2	1850	200
MH□□□□□225-12	64.0	2593	236	920	400	113	0.87	93.0	94.4	94.8	4610	395
MH□□□□□225-22	78.0	2590	288	1150	400	137	0.85	93.5	94.3	94.7	5300	415

[1] Without accessories

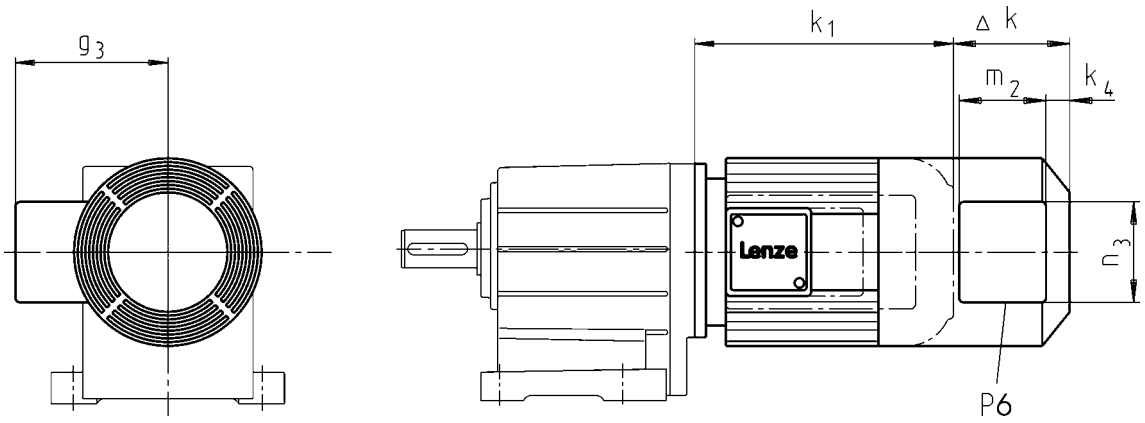
Dimensions, self-ventilated (4-pole)



	Motor type			
	MHEMAXX	MHEMABR	MHEMABS MHEMABI MHEMABA	MHEMABS MHEMABI MHEMABA
Motor frame size				
	Δ k	Δ k	Δ k	Δ k
	[mm]	[mm]	[mm]	[mm]
080-32	0	73	111	111
090-12 090-32		68	105	87
100-12 100-32		76	101	81
112-22		90	120	80
132-12 132-22		110	125	103
160-22 160-32		105	191	83
180-12 180-32		113	192	79
180-42				
225-12 225-22			193	80

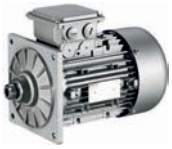


Dimensions, forced ventilated (4-pole)



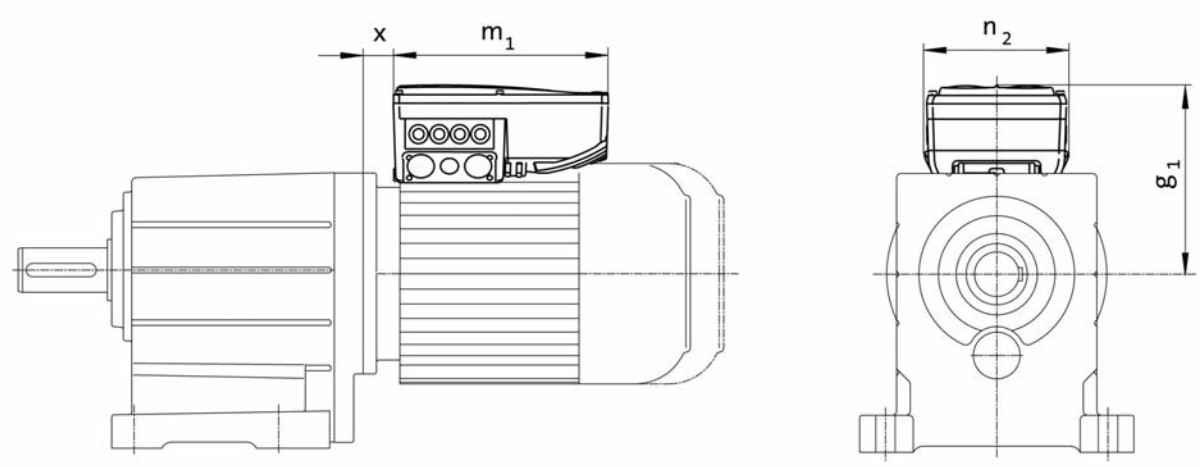
Motor type									
	MHFMAXX	MHFMABR	MHFMABS MHFMABI MHFMABA	MHFMARS MHFMAIG MHFMAAG					

Motor frame size									
	Δ k	Δ k	Δ k	Δ k	k_4	g_3	m_2	n_3	P_6
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
080-32	128	183	183	128	13	132	96	106	1x M16x1.5
090-12 090-32		181	181		22	141	95	105	
100-12 100-32	109	170	170	109		150			
112-22	102	183	183	183		162			
132-12 132-22	115	202	202	202	32	182			
160-22 160-32	149	179	237	224	31	209	96	106	
180-12 180-32		215	275	215					
180-42	155		260						
225-12 225-22	213	213	213	213					

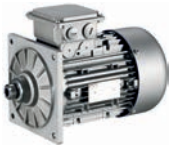


Dimensions, 8400 motec inverter

Rated frequency 50/60 Hz

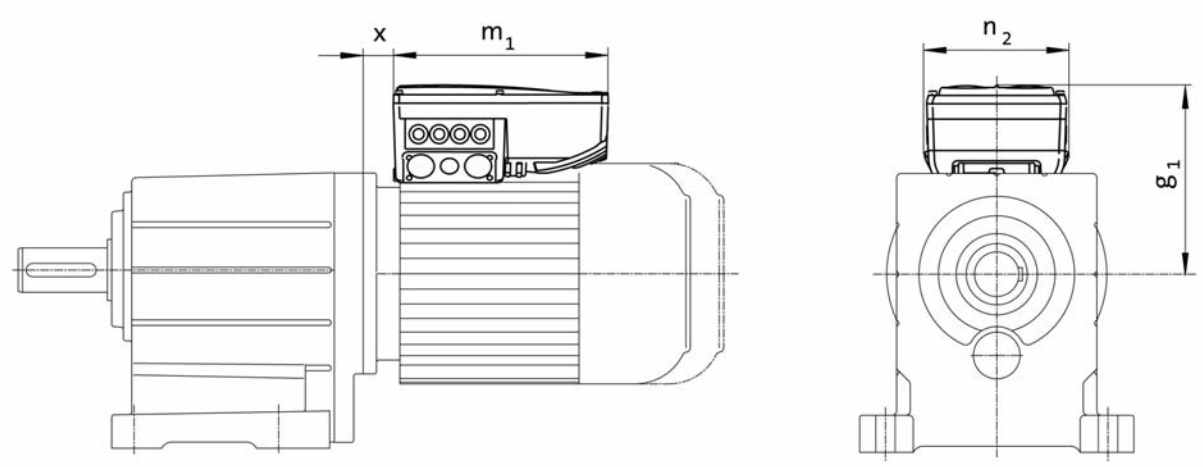


Product key					
Motor	Inverter				
		$g_{1,\ 50Hz}$	$m_{1,\ 50Hz}$	$n_{2,\ 50Hz}$	x_{50Hz}
		[mm]	[mm]	[mm]	[mm]
MH□□□□□080-32	E84DVB□7514S□□□2□	172	241	161	25.5
MH□□□□□090-12	E84DVB□1124S□□□2□	177			28.8
MH□□□□□090-32	E84DVB□1524S□□□2□				
MH□□□□□100-12	E84DVB□2224S□□□2□	217	260	176	29.6
MH□□□□□100-32	E84DVB□3024S□□□2□				
MH□□□□□112-22	E84DVB□4024S□□□2□	282	325	195	19.0
MH□□□□□132-12	E84DVB□5524S□□□2□	301			34.5
MH□□□□□132-22	E84DVB□7524S□□□2□				



Dimensions, 8400 motec inverter

Rated frequency 87 Hz



Product key					
Motor	Inverter				
		$g_{1,\ 87Hz}$	$m_{1,\ 87Hz}$	$n_{2,\ 87Hz}$	x_{87Hz}
		[mm]	[mm]	[mm]	[mm]
MH□□□□□080-32	E84DVB□1524S□□□2□	172	241	161	25.5
MH□□□□□090-12	E84DVB□2224S□□□2□	206	260	176	27.8
MH□□□□□090-32	E84DVB□3024S□□□2□				
MH□□□□□100-12	E84DVB□4024S□□□2□	272	325	195	17.1
MH□□□□□100-32	E84DVB□5524S□□□2□				
MH□□□□□112-22	E84DVB□7524S□□□2□	282			19.0

5.8

Spring-applied brake

Three-phase AC motors can be fitted with a spring-applied brake. This is activated after the supply voltage is switched off (closed-circuit principle). For optimum adjustment of the brake motor to the application, a range of braking torques and control modes is available for every motor frame size. For applications with very high operating frequencies the brake is also available in a LongLife version, with reinforced mechanical brake components.

Features

Versions
- **Standard**

1 x 10^6 repeating switching cycles
1 x 10^6 reversing switching cycles
- **LongLife**

10 x 10^6 repeating switching cycles
15 x 10^6 reversing switching cycles

Control
- DC supply
- AC supply via rectifier in the terminal box

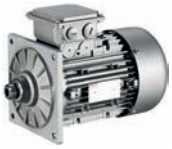
Enclosure
- Without manual release IP55
- With manual release IP54

Friction lining
- Non-asbestos, low wearing

Options
- Manual release
- UL/CSA approval
- Noise-reduced

Assignment of 4-pole motors and brakes

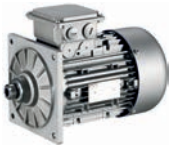
Design	Standard		LongLife	
Motor frame size	Size	Rated torque	Size	Rated torque
	Brake		Brake	
		M_k		M_k
		[Nm]		[Nm]
080-32	08 08 10	3.50 8.00 7.00	08 10	8.00 7.00
090-12 090-32	08 08 10 10 10	3.50 8.00 7.00 16.0 23.0	08 10 10	8.00 7.00 16.0
100-12	10 10 12 12	7.00 16.0 14.0 32.0	10 12 12	16.0 14.0 32.0
100-32	10 10 12 12 12	7.00 16.0 14.0 32.0 46.0		



Spring-applied brake

Assignment of 4-pole motors and brakes

Design				
	Standard		LongLife	
Motor frame size	**Size**	**Rated torque**	**Size**	**Rated torque**
	Brake		Brake	
		M_k		M_k
		[Nm]		[Nm]
112-22	12 12 14 14	14.0 32.0 35.0 60.0		
132-12	14 14 16 16	35.0 60.0 60.0 80.0		
132-22	14 14 16 16 16	35.0 60.0 60.0 80.0 100		
160-22	16 16 18 18	60.0 80.0 80.0 150		
160-32	18 18 18	80.0 150 200		
180-12	18 18 20 20	80.0 150 145 260		
180-32	18 18 20 20 20	80.0 150 145 260 315		
200-32	18 18 20 20 20 20	80.0 150 145 260 315 400		
225-12	25 25 25	265 400 490		
225-22	25 25 25 25	265 400 490 600		



Spring-applied brake

Direct connection without rectifier

If the brake is activated directly without a rectifier, a freewheeling diode or a spark suppressor is required to protect against induction peaks.

- Supply voltages
  DC 24 V
  DC 180 V
  DC 205 V

Connection via mains voltage with brake rectifier

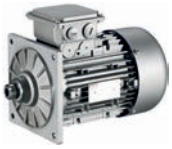
If the brake is not directly supplied with DC voltage, a rectifier is required. This is included in the scope of supply and is located in the terminal box of the motor. The rectifier converts the AC voltage of the connection into DC voltage. The following rectifiers are available:

Half-wave rectifier, 6-pole

- Ratio of supply voltage to brake coil voltage = 2.22
- Approved by UL/CSA
- Supply voltages
  AC 230 V
  AC 400 V
  AC 460 V

Bridge rectifier, 6-pole

- Ratio of supply voltage to brake coil voltage = 1.11
- Supply voltage
  AC 230 V



Spring-applied brake

Connection via mains voltage with brake rectifier

Bridge/half-wave rectifier, 6-pole
- Ratio of supply voltage to brake coil voltage
  up to overexcitation time = 1.11
  beyond overexcitation time = 2.22

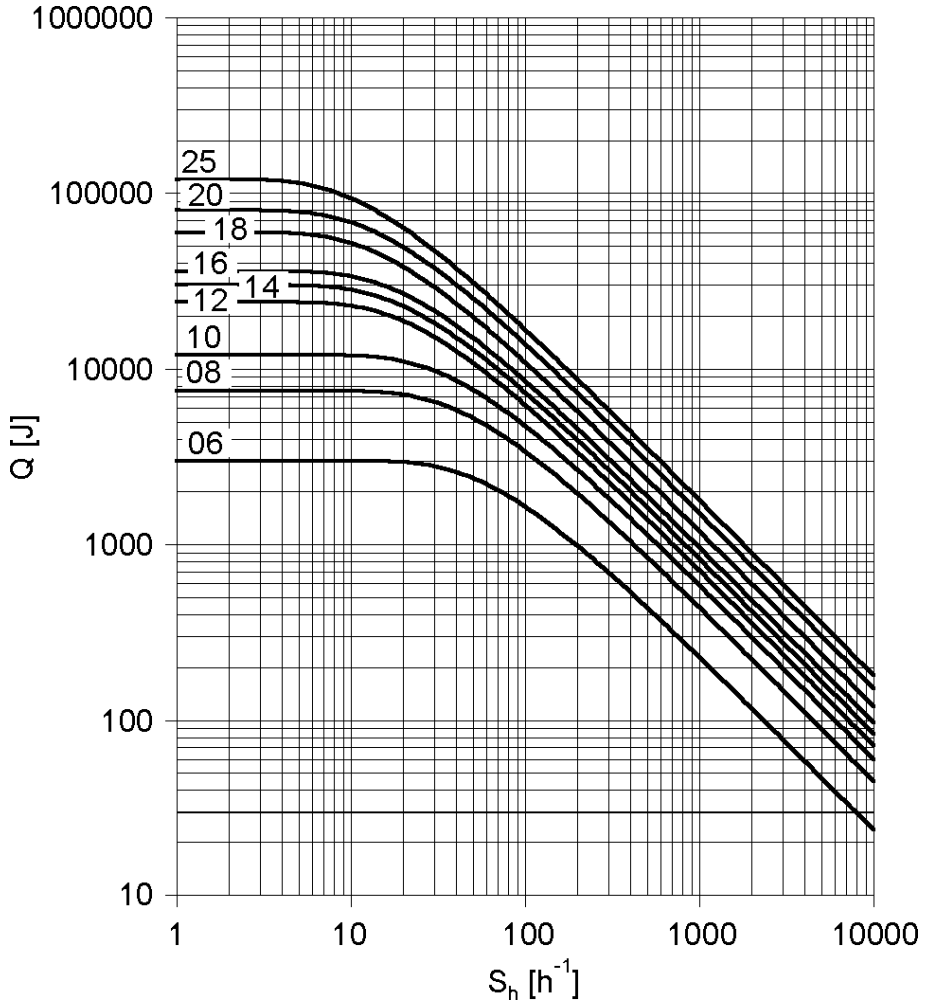
Supply voltages:
- AC 230 V
- AC 400 V

During the switching operation the bridge/half-wave rectifier functions as a bridge rectifier for the overexcitation time $t_{ü}$ and then as a half-wave rectifier. This combination optimises the performance of the brake – depending on the assignment of brake coil voltage and supply voltage:

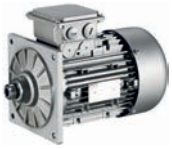
- **Short-time overexcitation of the brake coil**
  Activating the brake coil for the overexcitation time $t_{ü}$ with twice the rated voltage allows the disengagement time to be reduced. The brake opens more quickly and wear on the friction lining is reduced.
  These features make this activation version particularly suitable for lifting applications. It is therefore only available in combination with a brake with increased braking torque.
- **Holding current reduction (cold brake)**
  By reducing the holding current, the bridge/half-wave rectifier is able to reduce the power input to the open brake. As the brake heats up less, this type of activation is known as "cold brake".

Spring-applied brake

Permissible friction energy



Q =Switching energy per switching cycle
S_h =Operating frequency
Brake size = 06 ... 25



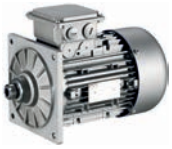
Spring-applied brake

Rated data with reduced braking torque

► Please enquire for braking torques and maximum switching work values not listed here.

Size			06	08	10	12	14	16	18	20	25
Coil power											
	P_{in}	[kW]	0.020	0.025	0.030	0.040	0.050	0.055	0.085	0.10	0.11
Braking torque											
100	M_B	[Nm]	2.50	3.50	7.00	14.0	35.0	60.0	80.0	145	265
1000	M_B	[Nm]	2.30	3.10	6.10	12.0	30.0	50.0	65.0	115	203
1200	M_B	[Nm]	2.30	3.10	6.00	12.0	29.0	48.0	63.0	112	199
1500	M_B	[Nm]	2.20	3.00	5.80	11.0	28.0	47.0	61.0	109 [1)]	193 [1)]
1800	M_B	[Nm]	2.10	2.90	5.70	11.0	28.0	46.0	60.0 [1)]		
3000	M_B	[Nm]	2.00	2.80	5.30	10.0	26.0 [1)]	43.0 [1)]			
3600	M_B	[Nm]	2.00	2.70	5.20	10.0 [1)]					
Maximum switching energy											
100	Q_E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	80.0	120
1000	Q_E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	80.0	120
1200	Q_E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	80.0	120
1500	Q_E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	24.0 [1)]	36.0 [1)]
1800	Q_E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	36.0 [1)]		
3000	Q_E	[KJ]	3.00	7.50	12.0	24.0	18.0 [1)]	11.0 [1)]			
3600	Q_E	[KJ]	3.00	7.50	12.0	7.00 [1)]					
Transition operating frequency											
	$S_{hü}$	[1/h]	79.0	50.0	40.0	30.0	28.0	27.0	20.0	19.0	15.0
Moment of inertia											
	J	[kgcm²]	0.015	0.061	0.20	0.45	0.63	1.50	2.90	7.30	20.0
Mass											
	m	[kg]	0.90	1.50	2.60	4.20	5.80	8.70	12.6	19.5	31.0

[1)] In the region of the load limit the value for friction energy Q_{BW} can be reduced to 40 %.



Spring-applied brake

Rated data with reduced braking torque

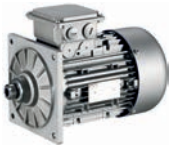
► Activation via half-wave or bridge rectifier

Size										
			06	08	10	12	14	16	18	20	25
Friction energy											
	Q_{BW}	[MJ]	113	210	264	706	761	966	1542	2322	3522
Delay time											
Engaging	t_{11}	[ms]	11.0	14.0	20.0	21.0	37.0	53.0	32.0	47.0	264
Rise time											
Braking torque	t_{12}	[ms]	13.0	10.0	17.0	19.0	22.0	30.0	20.0	100	120
Engagement time											
	t_1	[ms]	24.0		37.0	40.0	59.0	83.0	52.0	147	384
Disengagement time											
	t_2	[ms]	35.0	37.0	57.0	65.0	148	169	230	207	269

► Activation via bridge/half-wave rectifier

Design										
			Holding current reduction (cold brake)							
Size										
			06	08	10	12	14	16	18	20	25
Friction energy											
	Q_{BW}	[MJ]	113	210	264	706	761	966	1542	2322	3522
Overexcitation time											
	$t_ü$	[ms]	300				1300				
Min. rest time											
	t	[ms]	900				3900				
Delay time											
Engaging	t_{11}	[ms]	12.0	22.0	35.0	49.0	61.0	114	83.0	126	304
Rise time											
Braking torque	t_{12}	[ms]	14.0	16.0	30.0	45.0	37.0	65.0	52.0	269	138
Engagement time											
	t_1	[ms]	26.0	38.0	66.0	93.0	97.0	180	134	395	443
Disengagement time											
	t_2	[ms]	35.0	37.0	57.0	65.0	148	169	230	207	269

► The brake response and application times are guide values. The engagement time is 10 times longer with AC-side switching. With the maximum air gap the disengagement time t_2 – depending on the brake and control – is up to 4 times longer than the disengagement time with the rated air gap.



Spring-applied brake

Rated data with standard braking torque

► Please enquire for braking torques and maximum switching work values not listed here.

Size			06	08	10	12	14	16	18	20	25
Coil power											
	P_{in}	[kW]	0.020	0.025	0.030	0.040	0.050	0.055	0.085	0.10	0.11
Braking torque											
100	M_B	[Nm]	4.00	8.00	16.0	32.0	60.0	80.0	150	260	400
1000	M_B	[Nm]	3.70	7.20	14.0	27.0	51.0	66.0	121	206	307
1200	M_B	[Nm]	3.60	7.00	14.0	27.0	50.0	65.0	118	201	300
1500	M_B	[Nm]	3.50	6.80	13.0	26.0	48.0	63.0	115	195 [1)]	291 [1)]
1800	M_B	[Nm]	3.40	6.70	13.0	26.0	47.0	61.0	112 [1)]		
3000	M_B	[Nm]	3.20	6.30	12.0	24.0	44.0 [1)]	57.0 [1)]			
3600	M_B	[Nm]	3.20	6.10	12.0	23.0 [1)]					
Maximum switching energy											
100	Q_E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	80.0	120
1000	Q_E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	80.0	120
1200	Q_E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	80.0	120
1500	Q_E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	60.0	24.0 [1)]	36.0 [1)]
1800	Q_E	[KJ]	3.00	7.50	12.0	24.0	30.0	36.0	36.0 [1)]		
3000	Q_E	[KJ]	3.00	7.50	12.0	24.0	18.0 [1)]	11.0 [1)]			
3600	Q_E	[KJ]	3.00	7.50	12.0	7.00 [1)]					
Transition operating frequency											
	$S_{hü}$	[1/h]	79.0	50.0	40.0	30.0	28.0	27.0	20.0	19.0	15.0
Moment of inertia											
	J	[kgcm²]	0.015	0.061	0.20	0.45	0.63	1.50	2.90	7.30	20.0
Mass											
	m	[kg]	0.90	1.50	2.60	4.20	5.80	8.70	12.6	19.5	31.0

[1)] In the region of the load limit the value for friction energy Q_{BW} can be reduced to 40 %.

Spring-applied brake

Rated data with standard braking torque

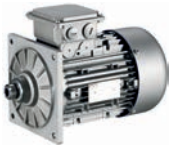
► Activation via half-wave or bridge rectifier

Size										
			06	08	10	12	14	16	18	20	25
Friction energy											
	Q_{BW}	[MJ]	85.0	158	264	530	571	966	1542	2322	3522
Delay time											
Engaging	t_{11}	[ms]	15.0		28.0		17.0	27.0	33.0	65.0	110
Rise time											
Braking torque	t_{12}	[ms]	13.0	16.0	19.0	25.0		30.0	45.0	100	120
Engagement time											
	t_1	[ms]	28.0	31.0	47.0	53.0	42.0	57.0	78.0	165	230
Disengagement time											
	t_2	[ms]	45.0	57.0	76.0	115	210	220	270	340	390

► Activation via bridge/half-wave rectifier

Design										
			Holding current reduction (cold brake)							
Size										
			06	08	10	12	14	16	18	20	25
Friction energy											
	Q_{BW}	[MJ]	85.0	158	264	530	571	966	1542	2322	3522
Overexcitation time											
	$t_{ü}$	[ms]	300				1300				
Min. rest time											
	t	[ms]	900				3900				
Delay time											
Engaging	t_{11}	[ms]	16.0	25.0	31.0	48.0	33.0	58.0	80.0	102	154
Rise time											
Braking torque	t_{12}	[ms]	14.0	27.0	21.0	43.0	49.0	64.0	109	157	168
Engagement time											
	t_1	[ms]	30.0	52.0		90.0	82.0	122	189	259	322
Disengagement time											
	t_2	[ms]	45.0	57.0	76.0	115	210	220	270	340	390

► The brake response and application times are guide values. The engagement time is 10 times longer with AC-side switching. With the maximum air gap the disengagement time t_2 – depending on the brake and control – is up to 4 times longer than the disengagement time with the rated air gap.



Spring-applied brake

Rated data with increased braking torque

► Please enquire for braking torques and maximum switching work values not listed here.

Size			10	12	14	16	16	18	20	20	25	25
Coil power												
	P_{in}	[kW]	0.030	0.040	0.050	0.055	0.055	0.085	0.10	0.10	0.11	0.11
Braking torque												
100	M_B	[Nm]	23.0	46.0	75.0	100	125	200	315	400	490	600
1000	M_B	[Nm]	20.0	39.0	64.0	83.0	103	162	249	317	376	461
1200	M_B	[Nm]	20.0	39.0	62.0	81.0	101	158	244	309	367	449
1500	M_B	[Nm]	19.0	38.0	60.0	78.0	98.0	153	237 [1)]	300 [1)]	356 [1)]	436 [1)]
1800	M_B	[Nm]	19.0	37.0	59.0	77.0	96.0	150 [1)]				
3000	M_B	[Nm]	17.0	34.0	55.0 [1)]	71.0 [1)]	89.0 [1)]					
3600	M_B	[Nm]	17.0	33.0 [1)]								
Maximum switching energy												
100	Q_E	[KJ]	12.0	24.0	30.0	36.0	36.0	60.0	80.0	80.0	120	120
1000	Q_E	[KJ]	12.0	24.0	30.0	36.0	36.0	60.0	80.0	80.0	120	120
1200	Q_E	[KJ]	12.0	24.0	30.0	36.0	36.0	60.0	80.0	80.0	120	120
1500	Q_E	[KJ]	12.0	24.0	30.0	36.0	36.0	60.0	24.0 [1)]	24.0 [1)]	36.0 [1)]	36.0 [1)]
1800	Q_E	[KJ]	12.0	24.0	30.0	36.0	36.0	36.0 [1)]				
3000	Q_E	[KJ]	12.0	24.0	18.0 [1)]	11.0 [1)]	11.0 [1)]					
3600	Q_E	[KJ]	12.0	7.00 [1)]								
Transition operating frequency												
	$S_{hü}$	[1/h]	40.0	30.0	28.0	27.0	27.0	20.0	19.0	19.0	15.0	15.0
Moment of inertia												
	J	[kgcm²]	0.20	0.45	0.63	1.50	1.50	2.90	7.30	7.30	20.0	20.0
Mass												
	m	[kg]	2.60	4.20	5.80	8.70	8.70	12.6	19.5	19.5	31.0	31.0

5.8

[1)] In the region of the load limit the value for friction energy Q_{BW} can be reduced to 40 %.

► Activation via half-wave or bridge rectifier

Size			10	12	14	16		18	20		25	
Friction energy												
	Q_{BW}	[MJ]	198	353	253	563	241	578	1596	580	2465	1409
Delay time												
Engaging	t_{11}	[ms]	10.0	16.0	11.0	22.0	17.0	24.0	46.0	17.0	77.0	38.0
Rise time												
Braking torque	t_{12}	[ms]	19.0	25.0		30.0		45.0	100		120	
Engagement time												
	t_1	[ms]	29.0	41.0	36.0	52.0	47.0	69.0	146	117	197	158
Disengagement time												
	t_2	[ms]	109	193	308	297	435	356	378	470	451	532

Spring-applied brake

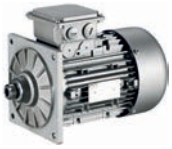
Rated data with increased braking torque

► Activation via bridge/half-wave rectifier

Design			Holding current reduction (cold brake)									
Size												
			10	12	14	16		18	20		25	
Friction energy												
	Q_{BW}	[MJ]	198	353	253	563	241	578	1596	580	2465	1409
Overexcitation time												
	$t_ü$	[ms]	300			1300						
Min. rest time												
	t	[ms]	900			3900						
Delay time												
Engaging	t_{11}	[ms]	24.0	27.0	17.0	41.0	21.0	60.0	69.0	17.0	123	85.0
Rise time												
Braking torque	t_{12}	[ms]	44.0	43.0	37.0	55.0	37.0	113	148	100	190	270
Engagement time												
	t_1	[ms]	68.0	70.0	54.0	97.0	57.0	173	217	334	313	355
Disengagement time												
	t_2	[ms]	109	193	308	297	435	356	378	470	451	532

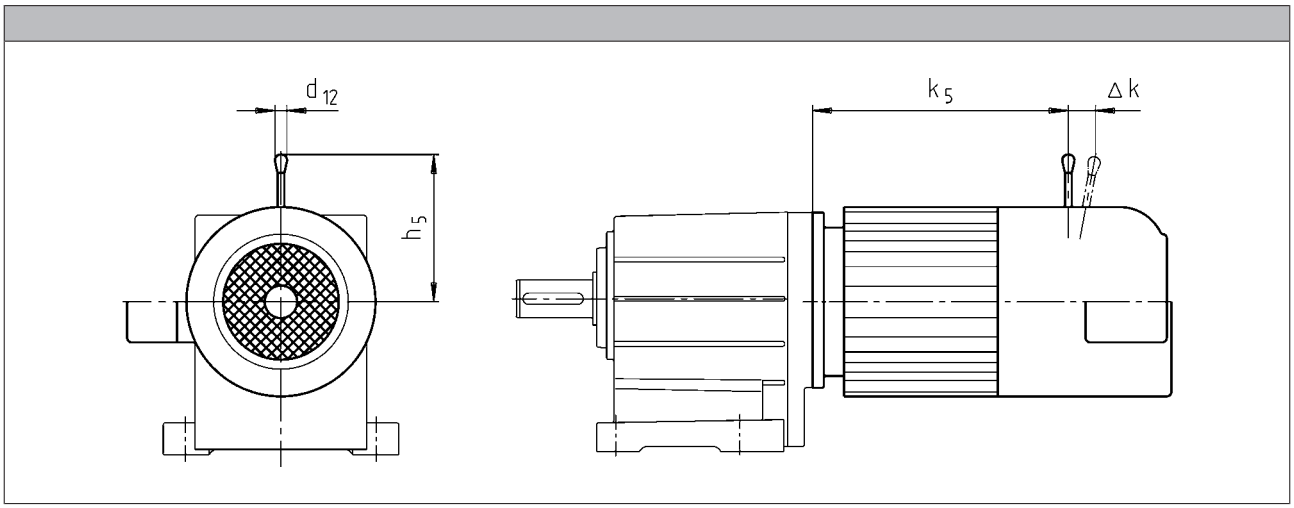
Design			Over-excitation									
Size												
			10	12	14	16		18	20		25	
Friction energy												
	Q_{BW}	[MJ]	264	706	761	966		1542	2322		3522	
Overexcitation time												
	$t_ü$	[ms]	300			1300						
Min. rest time												
	t	[ms]	900			3900						
Delay time												
Engaging	t_{11}	[ms]	29.0	54.0	31.0	70.0	46.0	86.0	103	55.0	171	135
Rise time												
Braking torque	t_{12}	[ms]	53.0	87.0	68.0	93.0	83.0	160	222	319	266	430
Engagement time												
	t_1	[ms]	82.0	141	99.0	163	129	246	325	374	437	565
Disengagement time												
	t_2	[ms]	53.0	81.0	117	141	168	151	160	167	184	204

► The brake response and application times are guide values. The engagement time is 10 times longer with AC-side switching. With the maximum air gap the disengagement time t_2 – depending on the brake and control – is up to 4 times longer than the disengagement time with the rated air gap.



Spring-applied brake

Manual release lever



Motor frame size	Size				
	Brake				
		k_5	Δ k	h_5	d_{12}
		[mm]	[mm]	[mm]	[mm]
080-32	06 08	207 218	29 27	107 116	13.0 13.0
090-12 090-32	08 10	245 256	27 28	116 132	13.0 13.0
100-12	10 12	279 281	28 37	132 161	13.0 13.0
100-32	10 12	294 296	28 37	132 161	13.0 13.0
112-22	12 14	292 296	37 41	161 195	13.0 24.0
132-12 132-22	14 16	373 373	41 55	195 240	24.0 24.0
160-22	16 18	420 423	55 59	240 279	24.0 24.0
160-32	16 18	464 467	55 59	240 279	24.0 24.0
180-12 180-32	18 20	539 546	59 74	279 319	24.0 24.0
180-42	18 20	596 603	59 74	279 319	24.0 24.0
225-12 225-22	25 25	785 785	103 103	445 445	24.0 24.0

The following combinations with manual release lever and motor connection in the same position are not possible:

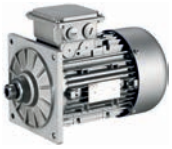
- HAN connector with connection in position 1
- Inverter motec
- Terminal box of motor sizes 080, 090, for brake and retracting (M□□MA BR/BS/BA/BI)

Resolver

Stator-fed resolver with two stator windings offset by 90° and one rotor winding with transformer winding.

► The three-phase AC motors with resolver cannot be used for speed-dependent safety functions in connection with the SM 301 safety module.

Product key				
				RS1
Accuracy				
			[']	-10 ... 10
Absolute positioning				
				1 revolution
Max. input voltage				
DC	$U_{in,max}$		[V]	10.0
Max. input frequency				
	$f_{in,max}$		[kHz]	4.00
Ratio				
Stator / rotor		± 5 %		0.30
Rotor impedance				
	Z_{ro}		[Ω]	51 + j90
Stator impedance				
	Z_{so}		[Ω]	102 + j150
Impedance				
	Z_{rs}		[Ω]	44 + j76
Min. insulation resistance				
At DC 500 V	R		[MΩ]	10.0
Number of pole pairs				
				1



Incremental encoder and SinCos absolute value encoder

► The three-phase AC motors with incremental encoders or SinCos absolute value encoders cannot be used for speed-dependent safety functions in connection with the SM 301 safety module.

Encoder type			HTL incremental				TTL incremental			SinCos absolute value
Product key			IG128-24V-H	IG512-24V-H	IG1024-24V-H	IG2048-24V-H	IG512-5V-T	IG1024-5V-T	IG2048-5V-T	AM1024-8V-H
Encoder type										Multi-turn
Pulses			128	512	1024	2048	512	1024	2048	1024
Output signals			HTL				TTL			1 Vss
Interfaces			A, B track	A, B, N track and inverted						Hiperface
Absolute revolutions			0							4096
Accuracy		[']	-22.5 ... 22.5	-2 ... 2						-0.8 ... 0.8
Min. input voltage										
DC	$U_{in,min}$	[V]	8.00				4.75			7.00
Max. input voltage										
DC	$U_{in,max}$	[V]	26.0	30.0			5.25			12.0
Max. current consumption										
	I_{max}	[A]	0.040	0.15						0.080
Limit frequency										
	f_{max}	[kHz]	30.0	160			300			200
Inverter assignment			E84AVSC E84AVHC	E84AVHC			E84AVTC E94A ECS EVS93			

Inverters
- Inverter Drives 8400 StateLine (E84AVSC)
- Inverter Drives 8400 HighLine (E84AVHC)
- Inverter Drives 8400 TopLine (E84AVTC)

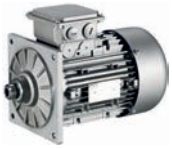
Servo-Inverters
- Servo Drives 9400 (E94A)
- 9300 servo inverters (EVS93)
- Servo Drives ECS

Blower

► The use of a blower enables operation below 20 Hz without torque derating.

Rated data for 50 Hz

Size	Number of phases	Connection method					
Motor							
			U_{min}	U_{max}	P_{max}	I_{max}	m
			[V]	[V]	[kW]	[A]	[kg]
063	1		230	277	0.027	0.11	2.00
	3	Δ	200	303	0.028	0.12	
		Y	346	525		0.070	
071	1		230	277	0.027	0.10	2.10
	3	Δ	200	303	0.031	0.11	
		Y	346	525		0.060	
080	1		230	277	0.029	0.11	2.30
	3	Δ	200	303	0.031		
		Y	346	525		0.060	
090	1		220	277	0.065	0.29	2.70
	3	Δ	200	303	0.091	0.38	
		Y	346	525		0.22	
100	1		220	277	0.066	0.28	3.00
	3	Δ	200	303	0.091	0.37	
		Y	346	525		0.22	
112	1		220	277	0.071	0.28	3.10
	3	Δ	200	303	0.097	0.35	
		Y	346	525		0.20	
132	1		230	277	0.098	0.40	4.20
	3	Δ	200	303	0.12	0.58	
		Y	346	525		0.33	
160	1		230	277	0.25	0.97	6.20
	3	Δ	200	303		0.87	
		Y	346	525		0.50	
180	1		230	277		0.97	8.00
	3	Δ	200	303		0.87	
		Y	346	525		0.50	



Blower

Rated data for 50 Hz

Size	Number of phases	Connection method					
Motor							
			U_{min}	U_{max}	P_{max}	I_{max}	m
			[V]	[V]	[kW]	[A]	[kg]
200	1		230	277	0.25	0.97	8.00
	3	Δ	200	303		0.87	
		Y	346	525		0.50	
225		Δ	200	400	0.28	1.10	15.0
		Y	346	525	0.17	0.35	

Rated data for 60 Hz

Size	Number of phases	Connection method					
Motor							
			U_{min}	U_{max}	P_{max}	I_{max}	m
			[V]	[V]	[kW]	[A]	[kg]
063	1		230	277	0.032	0.12	2.00
	3	Δ	220	332	0.028	0.10	
		Y	380	575		0.060	
071	1		230	277	0.033	0.12	2.10
	3	Δ	220	332	0.029	0.10	
		Y	380	575		0.060	
080	1		230	277	0.037	0.14	2.30
	3	Δ	220	332	0.034	0.10	
		Y	380	575		0.060	
090	1		220	277	0.065	0.25	2.70
	3	Δ		332	0.077	0.33	
		Y	380	575		0.19	
100	1		220	277	0.075	0.30	3.00
	3	Δ		332	0.087	0.31	
		Y	380	575		0.18	
112	1		220	277	0.094	0.37	3.10
	3	Δ		332	0.10	0.31	
		Y	380	575		0.18	
132	1		230	277	0.15	0.57	4.20
	3	Δ	220	332		0.44	
		Y	380	575		0.25	
160		Δ	220	332	0.36	0.93	6.20
		Y	380	575		0.56	
180		Δ	220	332		0.93	8.00
		Y	380	575		0.56	
200		Δ	220	332		0.93	
		Y	380	575		0.56	
225		Δ	220	400	0.28	0.76	15.0
		Y	380	575	0.26	0.43	

Temperature monitoring

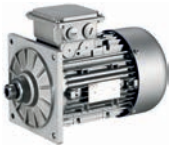
► The thermal sensors are integrated in the windings. The use of an additional motor protection switch is recommended.

TKO thermal contacts

Function	Operating temperature	Min. reset temperature	Max. reset temperature	Max. input current	Max. input voltage
					AC
	T	T_{min}	T_{max}	$I_{in,max}$	$U_{in,max}$
	-5 ... 5				
	[°C]	[°C]	[°C]	[A]	[V]
NC contact	150	90.0	135	2.50	250

PTC thermistor

Function	Operating temperature	Rated resistance			Standard
		155 °C	-20 °C	140 °C	
	T	R_N	R_N	R_N	
	-5 ... 5				
	[°C]	[Ω]	[Ω]	[Ω]	
Sudden change in resistance	150	550	30.0	250	DIN 44080 DIN VDE 0660 Part 303

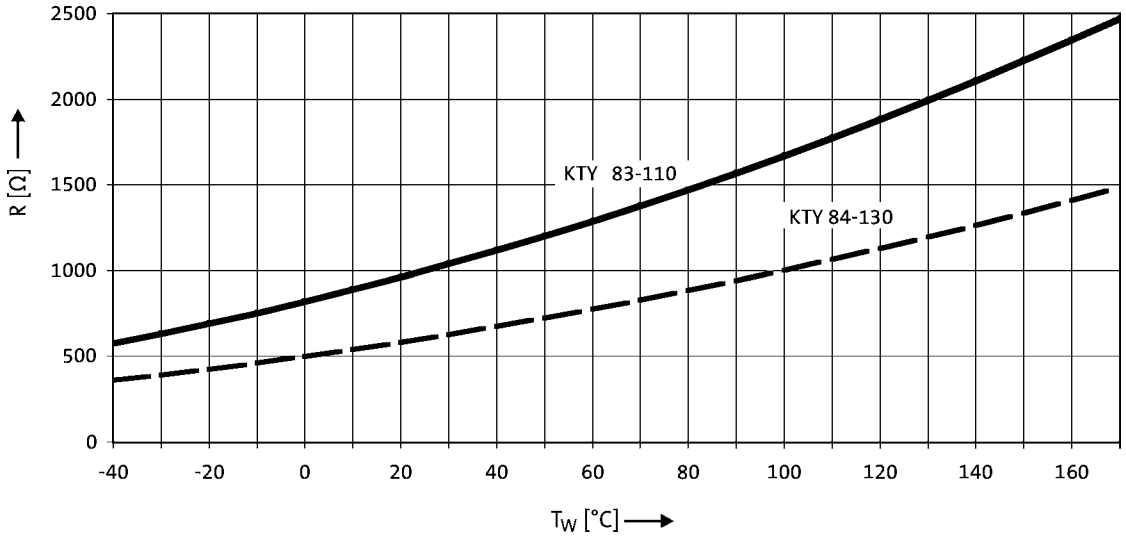


Temperature monitoring

KTY temperature sensor

	Function	Rated resistance			Max. input current	
		25 °C	150 °C	170 °C	25 °C	170 °C
		R_N	R_N	R_N	$I_{in,max}$	$I_{in,max}$
		[Ω]	[Ω]	[Ω]	[A]	[A]
KTY83-110	Continuous resistance change	1000	2225	2471	0.010	0.002
KTY84-130	Continuous resistance change	603	1334	1482	0.010	0.002

Variation of resistance



► If the detector is supplied with a measured current of 1 mA, the above relationship between the temperature and the resistance applies.

5.8

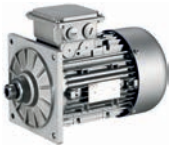
Terminal box

The three-phase AC motors are designed for operation at a constant mains frequency and with an inverter.
For 50 Hz operation, the motors are operated in Δconfiguration at 230 V or in star configuration at 400 V.
For inverter operation, the base frequency has been specified as 87 Hz at a rated voltage of 400 V in Δconfiguration.

In the standard version, the motors are connected in the terminal box. As an option, the motors are also available with the connectors described on the following pages as long as the permissible ratings are not exceeded.

Motor terminal box - built-on accessories assignment: 4-pole / 6-pole motors

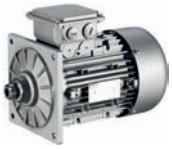
Motor type	M□□MAXX	M□□MARS M□□MAIG M□□MAAG	M□□MAZE M□□MAHA	M□□MALL	M□□MALZ M□□MALH
Motor frame size					
	Terminal box				
063-02 063-22	KK1	KK2			
063-12 063-32 063-42	KK1	KK2			
071-32 071-42 071-13 071-33	KK1	KK2	KK2	KK1	KK1
080-13 080-32 080-33 080-42	KK1	KK2	KK2	KK1	KK1
090-12 090-32	KK1	KK2	KK2	KK1	KK1
100-12 100-32	KK1	KK2	KK2	KK2	KK2
112-22 112-32	KK1	KK2	KK2	KK1	KK1
132-12 132-22 132-32	KK1	KK3	KK3	KK1	KK1
160-22 160-32	KK3	KK3			
180-12 180-32 180-42 180-42	KK3	KK3			
225-12 225-22	KK3	KK3			



Terminal box

Motor terminal box - built-on accessories assignment: 4-pole / 6-pole motors

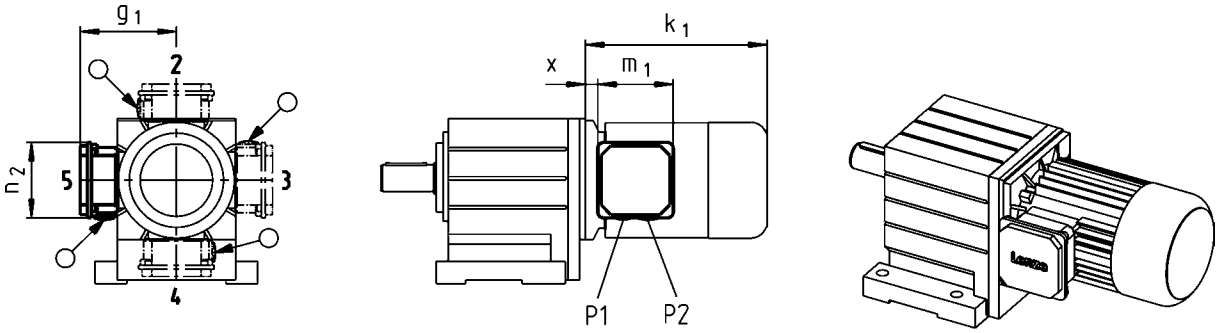
Motor type	M□□MABR	M□□MABS M□□MABI M□□MABA	M□□MABZ M□□MABH	M□□MABL
Motor frame size				
	Terminal box			
063-02 063-22	KK2	KK3		
063-12 063-32 063-42	KK2	KK3		
071-32 071-42 071-13 071-33	KK2	KK3	KK2	KK2
080-13 080-32 080-33 080-42	KK2	KK3	KK2	KK2
090-12 090-32	KK2	KK3	KK2	KK2
100-12 100-32	KK2	KK3	KK2	KK2
112-22 112-32	KK2	KK3	KK2	KK2
132-12 132-22 132-32	KK3	KK3	KK3	KK3
160-22 160-32	KK3	KK3		
180-12 180-32 180-42	KK3	KK3		
225-12 225-22	KK3	KK3		



Terminal box

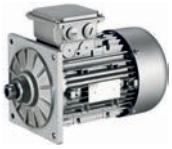
Dimensions of KK1

- ► For motors with motor terminal box KK1, the connector position can be selected in accordance with the terminal box position.
- ► If preferred positions are not specified in the order, the cable entry will be positioned as circled on the diagram below.



Size						
Motor						
	x	g_1	m_1	n_2	P_1	P_2
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
063	21 12 [1)]	100 117 [1)]	75.0 93.0 [1)]	75.0 93.0 [1)]	M16x1.5 M20x1.5 [1)]	M20x1.5 M20x1.5
071	24 15 [1)]	109 126 [1)]				
080	14	150	115	115	M20x1.5	M25x1.5
090	19	157				
100	20	166				
112	22	176				
132	33	195	122	122	M32x1.5	M32x1.5

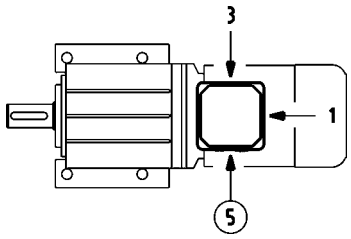
[1)] UL/CSA approval: cURus



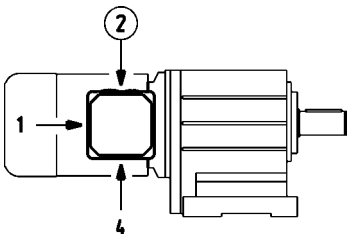
Terminal box

Cable entry position when using KK1

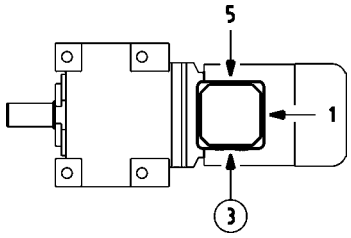
Terminal box in position 2



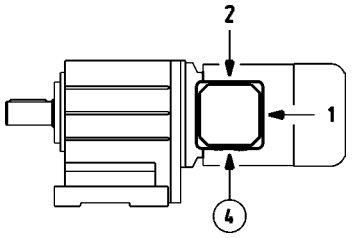
Terminal box in position 3



Terminal box in position 4

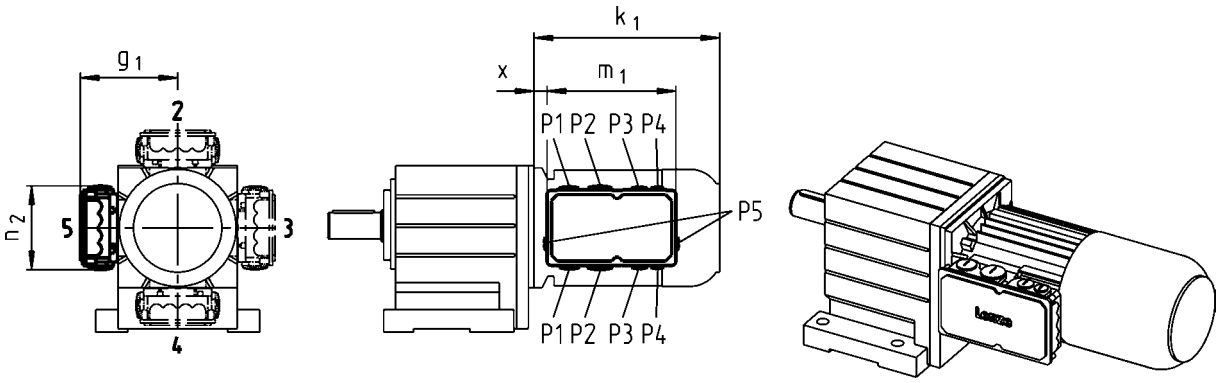


Terminal box in position 5



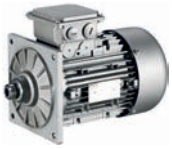
Terminal box

Dimensions of KK2



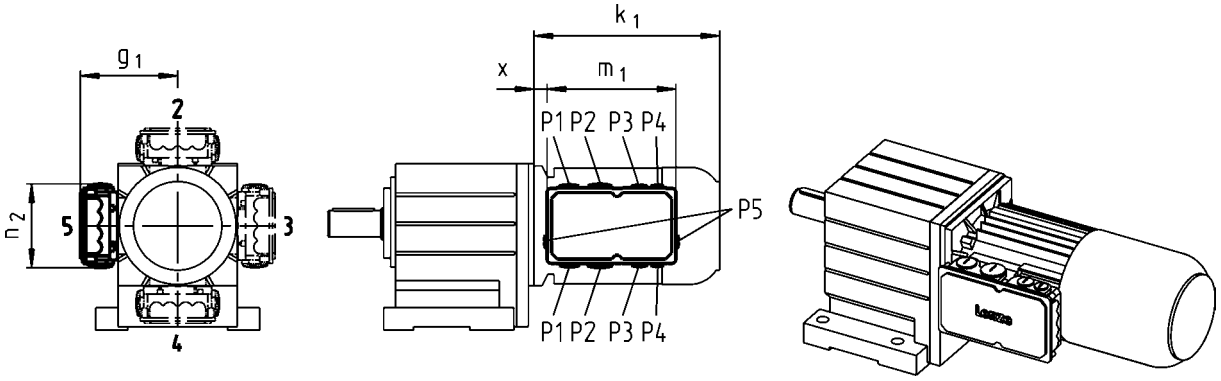
Size						
Motor						
	x	g_1	m_1	n_2	P_1	P_2
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
063	13	107	136	103	M16x1.5	M20x1.5
071	15	118				
080	17	132	152	121	M20x1.5	M25x1.5
090	22	137				
100	23	147				
112	25	158				

5.8



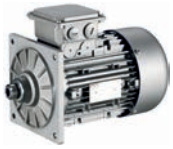
Terminal box

Dimensions of KK3



Size									
Motor									
	x	g_1	m_1	n_2	P_1	P_2	P_3	P_4	P_5
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
063	2	124	195	125	M25x1.5	M32x1.5	M20x1.5	M20x1.5	
071	5	133							
080	15	142							
090	20	147							
100	21	158							
112	23	168							
132	38	187							
160	35	210	226	127	M50x1.5	M16x1.5		M16x1.5	
180	73	230							
225	95	346	354	205		M63x1.5 [1)]	M50x1.5 [1)]		M16x1.5

[1)] Cable entry only possible at one position.
Terminal box position 2: cable entry at position 5.
Terminal box position 3: cable entry at position 2.
Terminal box position 4: cable entry at position 3.
Terminal box position 5: cable entry at position 4.

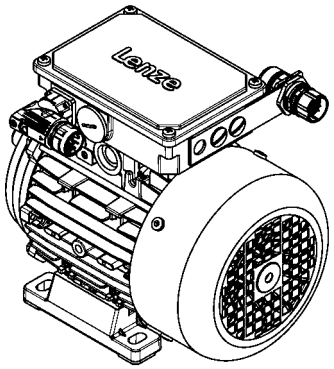


Connectors

ICN, HAN and M12 connectors (only for IG128-24V-H incremental encoder) are available for the three-phase AC motors.

ICN connector

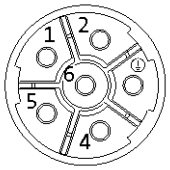
A connector is used for power, brake and temperature monitoring. The connections to the feedback system and the blower each employ a separate connector.



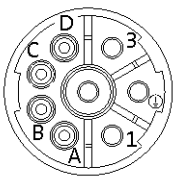
Connection for power, brake and temperature monitoring

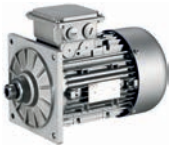
The connectors can be rotated through 270° and are fitted with a bayonet catch for SpeedTec connectors. As this connector is also compatible with conventional union nuts, existing mating connectors can continue to be used without difficulty. The motor connection is determined in the terminal box and must be checked before commissioning.

► ICN 6-pole

Pin assignment			
Contact	Designation	Meaning	
1	BD1 / BA1	Brake +/AC	
2	BD2 / BA2	Brake /AC	
PE	PE	PE conductor	
4	U	Phase U power	
5	V	Phase V power	
6	W	Phase W power	

► ICN 8-pole

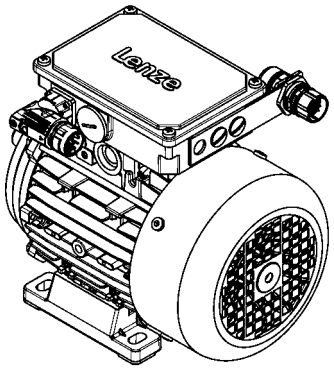
Pin assignment			
Contact	Designation	Meaning	
1	U	Phase U power	
PE	PE	PE conductor	
3	V	Phase V power	
4	W	Phase W power	
A	TB1 / TP1 / R1	Thermal sensor: TKO/PTC/ +KTY	
B	TB2 / TP2 / R2	Thermal sensor: TKO/PTC/-KTY	
C	BD1 / BA1	Brake +/AC	
D	BD2 / BA2	Brake /AC	



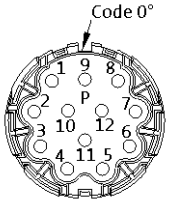
ICN connector

Feedback connection

All encoder systems (apart from IG128-24V-H) are also available with an ICN connector fixed to the motor terminal box for exceptionally fast commissioning. The connectors are fitted with a bayonet fixing, which is also compatible with conventional union nuts. Existing mating connectors can therefore continue to be used without difficulty.

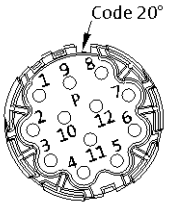


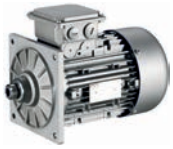
► Resolver

Pin assignment			
Contact	Designation	Meaning	
1	+Ref	Transformer windings	
2	-Ref		
3	+VCC ETS	Supply: Electronic nameplate	
4	+COS	Cosine stator windings	
5	-COS		
6	+SIN	Sine stator windings	
7	-SIN		
8		Not assigned	
9			
10			
11	+KTY	KTY temperature sensor	
12	-KTY		

5.8

► Hiperface incremental encoder and SinCos absolute value encoder

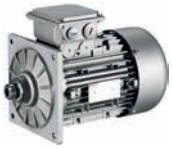
Pin assignment			
Contact	Designation	Meaning	
1	B	Track B/+SIN	
2	A^-	Track A inverse/-COS	
3	A	Track A/+COS	
4	$+U_B$	Supply +	
5	GND	Mass	
6	Z^-	Zero track inverse/-RS485	
7	Z	Zero track/+RS485	
8		Not assigned	
9	B^-	Track B inverse/-SIN	
10		Not assigned	
11	+KTY	KTY temperature sensor	
12	-KTY		



ICN connector

Motor terminal box with ICN connectors - built-on accessories assignment: 4-pole / 6-pole motors

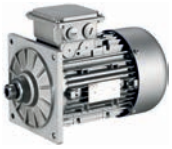
Motor type	M□□MAXX	M□□MARS M□□MAIG M□□MAAG	M□□MAZE M□□MAHA	M□□MALL	M□□MALZ M□□MALH
Motor frame size	Terminal box with ICN connector				
063-02 063-22	KK1	KK2			
063-12 063-32 063-42	KK1	KK2			
071-32 071-42 071-13 071-33	KK1	KK2	KK2	KK1	KK1
080-13 080-32 080-33 080-42	KK1	KK2	KK2	KK1	KK1
090-12 090-32	KK1	KK2	KK2	KK1	KK1
100-12 100-32	KK1	KK2	KK2	KK2	KK2
112-22 112-32	KK1	KK2	KK2	KK1	KK1
132-12 132-22 132-32	KK1	KK3	KK3	KK1	KK1



ICN connector

Motor terminal box with ICN connectors - built-on accessories assignment: 4-pole / 6-pole motors

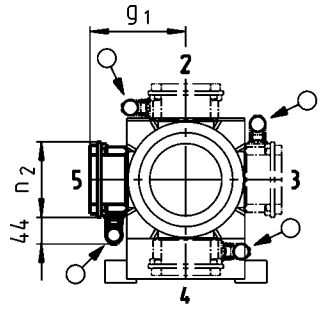
Motor type	M□□MABR	M□□MABS M□□MABI M□□MABA	M□□MABZ M□□MABH	M□□MABL
Motor frame size				
	Terminal box with ICN connector			
063-02 063-22	KK2	KK2		
063-12 063-32 063-42	KK2	KK2		
071-32 071-42 071-13 071-33	KK2	KK2	KK2	KK2
080-13 080-32 080-33 080-42	KK2	KK2	KK2	KK2
090-12 090-32	KK2	KK2	KK2	KK2
100-12 100-32	KK2	KK2	KK2	KK2
112-22 112-32	KK2	KK2	KK2	KK2
132-12 132-22 132-32	KK3	KK3	KK3	KK3

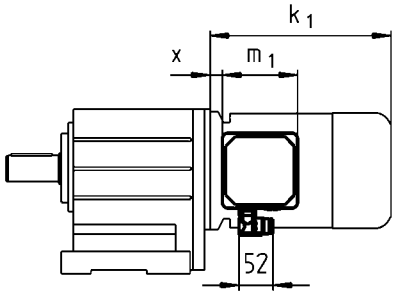


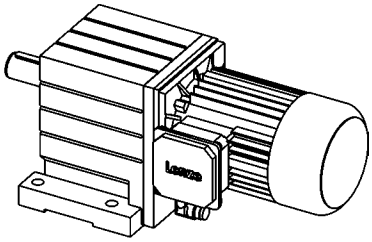
ICN connector

Dimensions of KK1

- ► For motors with connectors, the connector position can be selected in accordance with the terminal box position.
- ► If preferred positions are not specified in the order, the connector will be positioned as circled on the diagram below.

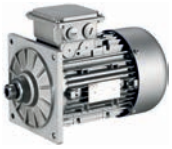






Size				
Motor				
	x	g_1	m_1	n_2
	[mm]	[mm]	[mm]	[mm]
063	12	117	93.0	93.0
071	15	126		
080	14	150	115	115
090	19	157		
100	20	166		
112	22	176		
132	33	195	122	122

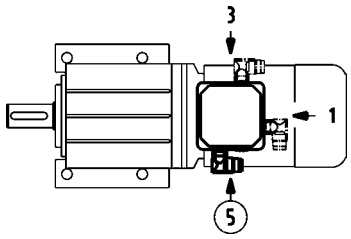
5.8



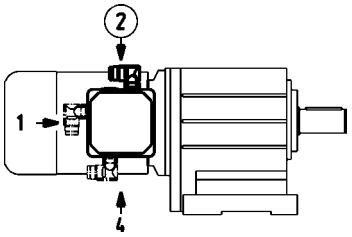
ICN connector

Connector position when using KK1

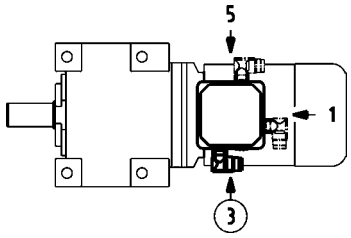
Terminal box in position 2



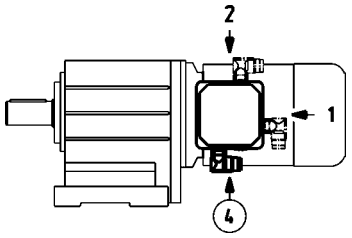
Terminal box in position 3



Terminal box in position 4



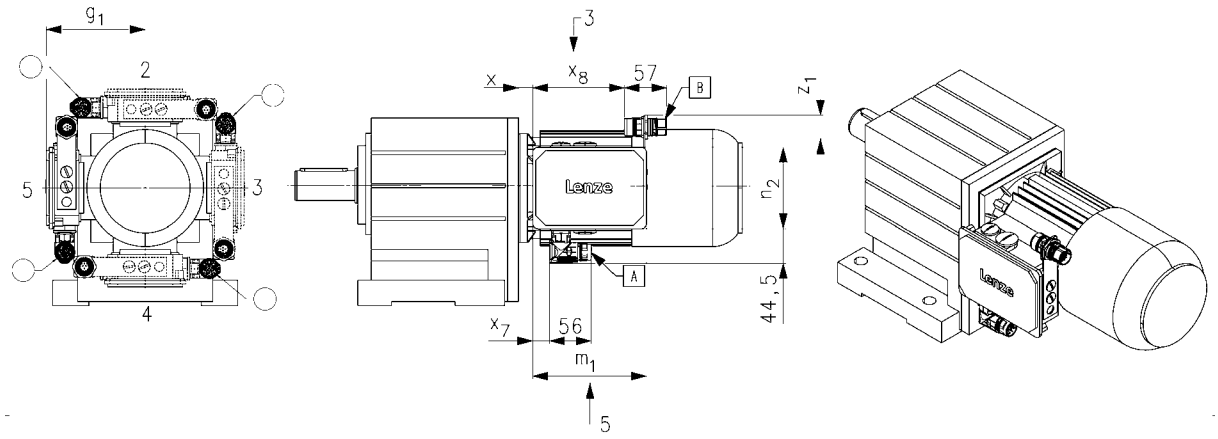
Terminal box in position 5



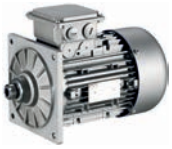
ICN connector

Dimensions of KK2/KK3

- For motors with connectors, the connector position can be selected in accordance with the terminal box position.
- If preferred positions are not specified in the order, the connector will be positioned as circled on the diagram below.



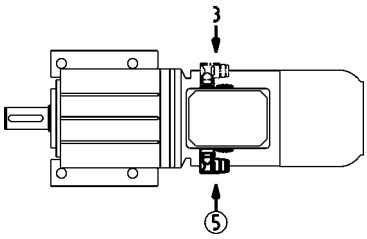
Size							
Motor							
	x	g_1	m_1	n_2	x_7	x_8	$z_{1, max}$
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
063	13	107	136	103	16	109	43
071	15	118					
080	17	132	152	121	23	125	41
090	22	137					
100	23	147					
112	25	158					
132	38	187	195	125		166	71



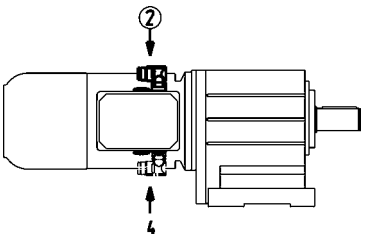
ICN connector

Connector position when using KK2/KK3

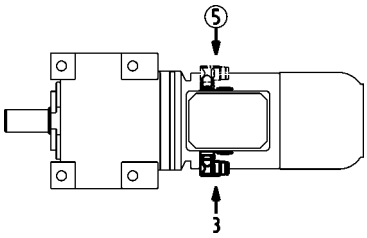
Terminal box in position 2



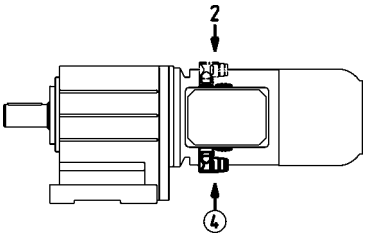
Terminal box in position 3

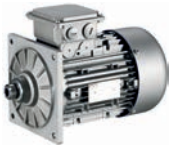


Terminal box in position 4



Terminal box in position 5

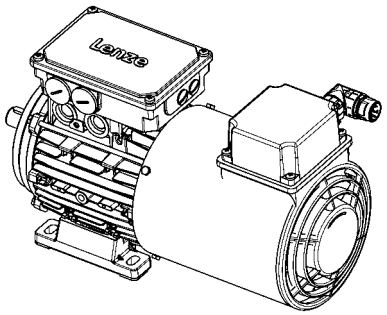




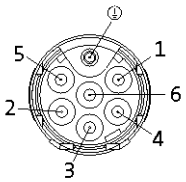
ICN connector

Blower connection

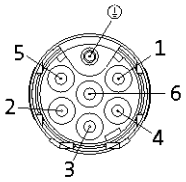
The blower is also optionally available with an ICN connector fixed to the terminal box of the blower for exceptionally fast commissioning. The connectors are fitted with a bayonet fixing, which is also compatible with conventional union nuts. Existing counter plugs can therefore continue to be used without difficulty.

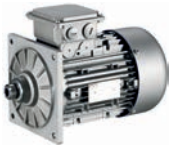


► Blower 1-ph

Pin assignment			
Contact	Designation	Meaning	
PE	PE	PE conductor	
1	U1	Fan	
2	U2		
3		Not assigned	
4			
5			
6			

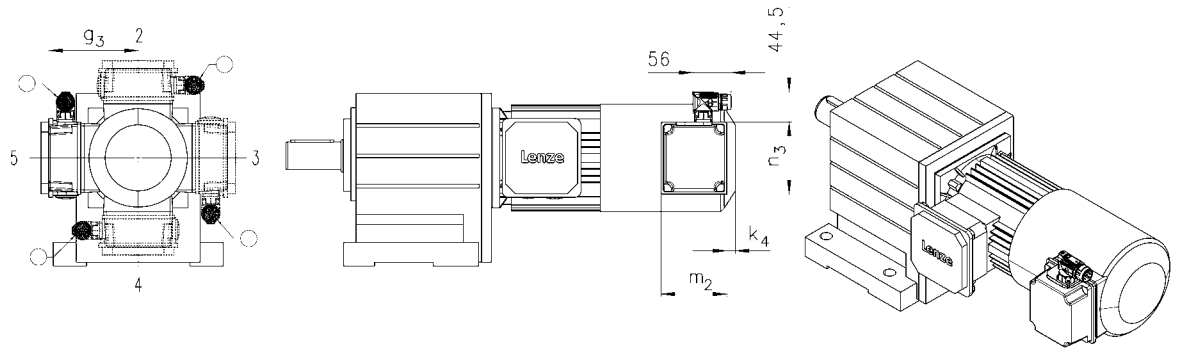
► Blower 3-ph

Pin assignment			
Contact	Designation	Meaning	
PE	PE	PE conductor	
1	U	Phase U power	
2		Not assigned	
3	V	Phase V power	
4		Not assigned	
5			
6	W	Phase W power	



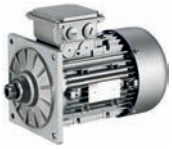
ICN connector

Dimensions of blower



Size				
Motor				
	k_4	g_3	m_2	n_3
	[mm]	[mm]	[mm]	[mm]
063	12	115	95	105
071		122		
080	13	132	96	106
090	22	141	95	105
100		150		
112		162		
132	32	182		
160	31	209	96	106
180				
225				

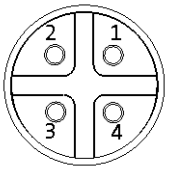
► In addition, the cover of the blower terminal box (including connectors) can be rotated progressively through 90° if necessary.

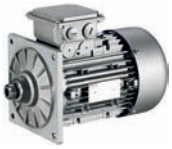


M12 connector

IG128-24V-H incremental encoder connection

As a standard this incremental encoder is equipped with a connection cable of about 0.5 m length and with a common industry standard M12 connector at its end.

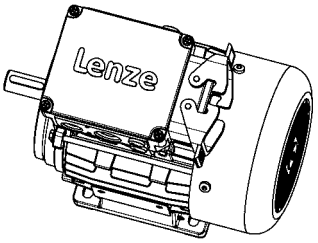
Pin assignment			
Contact	Designation	Meaning	
1	$+U_B$	Supply +	
2	B	Track B	
3	GND	Mass	
4	A	Track A	

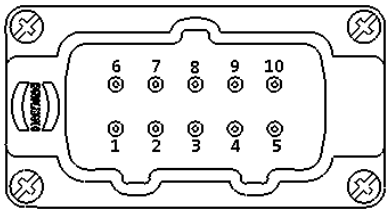


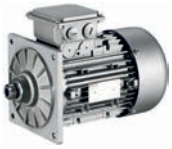
HAN connector

10E

In the case of the rectangular HAN-10E connectors, all six ends of the three winding phases are taken out to the power contacts. The motor circuit is therefore determined in the mating connector.



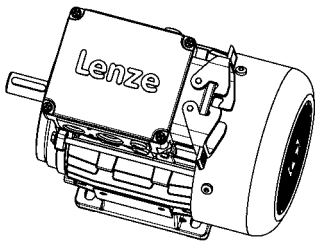
Pin assignment		
Contact	Meaning	
1	Terminal board: U1	
2	Terminal board: V1	
3	Terminal board: W1	
4	Brake +/AC	
5	Brake -/AC	
6	Terminal board: W2	
7	Terminal board: U2	
8	Terminal board: V2	
9	Thermal sensor: +KTY/PTC/TKO	
10	Thermal sensor: KTY/PTC/TKO	



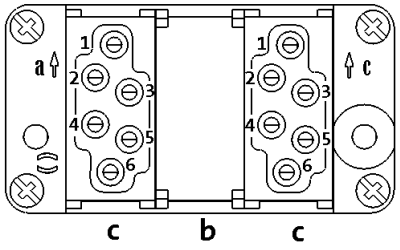
HAN connector

Modular

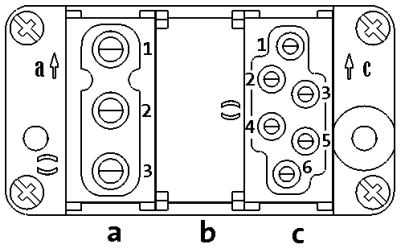
The connector is available with two different power modules (16 A or 40 A), depending on the rated motor current. The motor connection is determined in the terminal box and must be checked before commissioning.

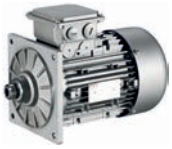


► HAN modular 16 A

Pin assignment			
Module	Contact	Meaning	
B		Dummy module	
C	1	Thermal sensor: +KTY/PTC/TKO	
	2	Brake +/AC	
	3	Brake -/AC	
	4	Rectifier: Switching contact	
	5		
	6	Thermal sensor: KTY/PTC/TKO	

► HAN modular 40 A

Pin assignment			
Module	Contact	Meaning	
A	1	Terminal board: U1	
	2	Terminal board: V1	
	3	Terminal board: W1	
B		Dummy module	
C	1	Thermal sensor: +KTY/PTC/TKO	
	2	Brake +/AC	
	3	Brake -/AC	
	4	Rectifier: Switching contact	
	5		
	6	Thermal sensor: KTY/PTC/TKO	



HAN connector

Motor terminal box with HAN connectors - built-on accessories assignment: 4-pole / 6-pole motors

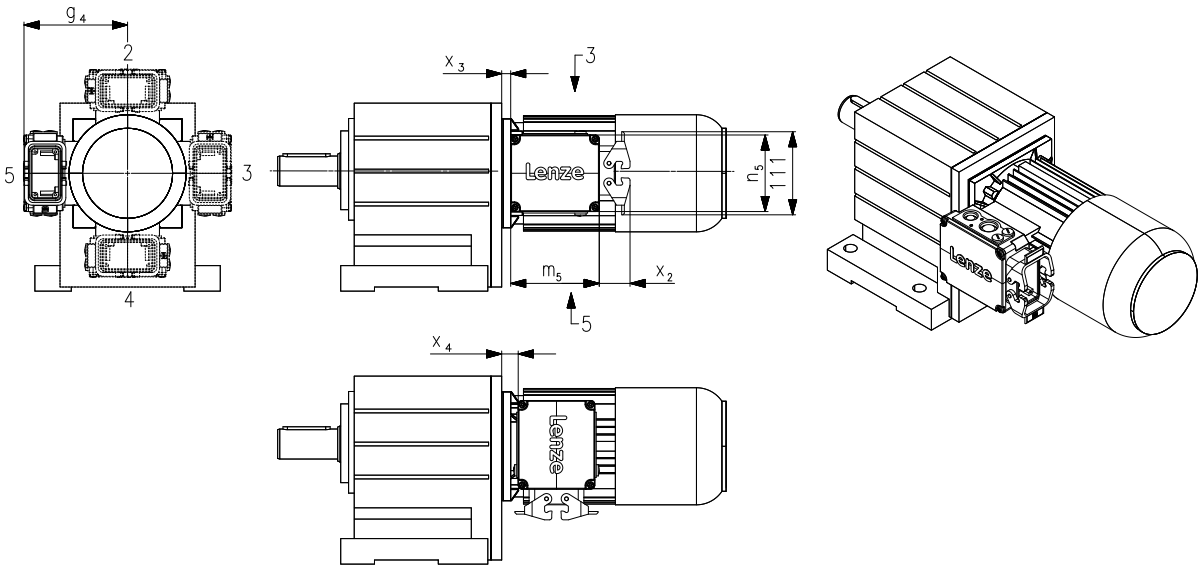
Motor type				
	M□□MAXX M□□MABR	M□□MAZE M□□MAHA M□□MABZ M□□MABH	M□□MALL M□□MABL	M□□MALZ M□□MALH

Motor frame size				
	Terminal box with HAN connector			
063-02 063-22	HAN-10E HAN modular			
063-12 063-32 063-42	HAN-10E HAN modular			
071-32 071-42 071-13 071-33	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular
080-13 080-32 080-33 080-42	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular
090-12 090-32	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular
100-12 100-32	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular
112-22 112-32	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular	HAN-10E HAN modular
132-12 132-22 132-32	HAN modular	HAN modular	HAN modular	HAN modular
160-22 160-32	HAN modular			

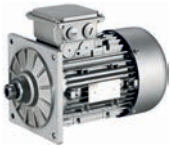
HAN connector

Dimensions

- For motors with connectors, the connector position can be selected in accordance with the terminal box position.
- Unless the connector position is specified, it will be supplied in position 1.



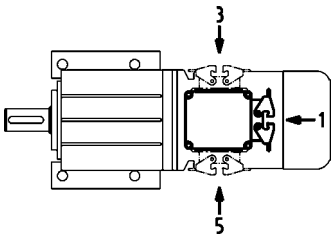
Size			
Motor			
	g_4	x_3	x_4
	[mm]	[mm]	[mm]
063	120	5.00	6.00
071	129	7.00	8.00
080	138	11.0	19.0
090	143	15.0	23.0
100	154	16.0	24.0
112	164	13.5	21.5
132	233	34.5	4.50
160	248	39.0	9.00



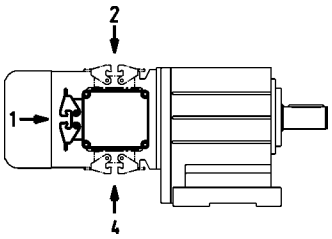
HAN connector

Position of connector

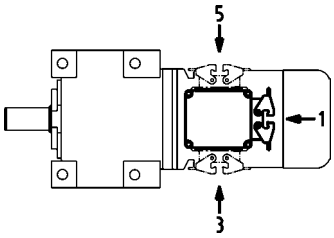
Connector in position 2



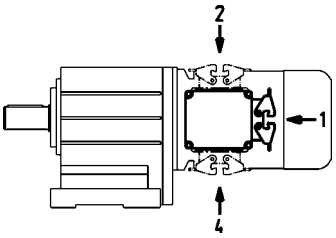
Connector in position 3

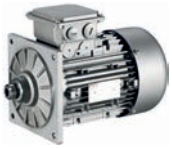


Connector in position 4



Connector in position 5





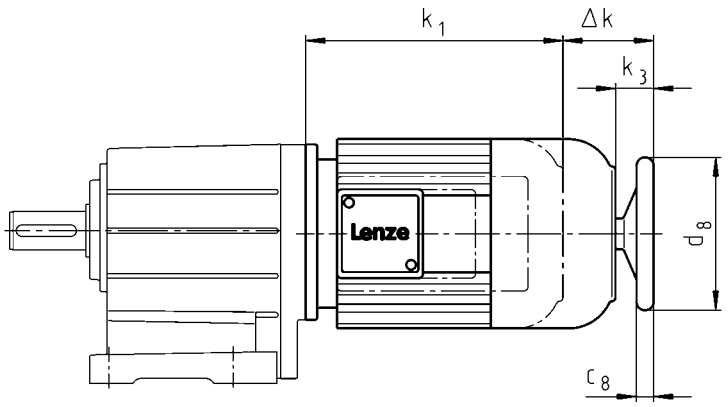
Handwheel

Design	Handwheel made from alloy, smooth wheel surface
Function	Manual operation: • Emergency operation • Setting-up operation for machines/systems
Note	The increased moment of inertia must be taken into account during project planning! For frequent switching operations, in particular if the direction of rotation changes: Please contact Lenze.

Size	Moment of inertia	Mass
Motor	Additional	Additional
	J	m
	[kgcm²]	[kg]
071	16.0	0.60
080	16.0	0.60
090	16.0	0.60
100	16.0	0.60
112	16.0	0.60
132	139	1.80

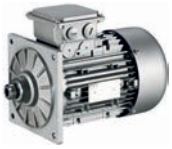
Handwheel

Dimensions, self-ventilated (4/6-pole)



Motor type	
Built-on accessories	M□□MAHA M□□MABH M□□MALH

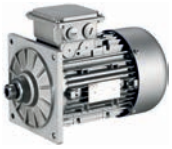
Motor frame size				
	Δ k	k_3	c_8	d_8
	[mm]	[mm]	[mm]	[mm]
071-32 071-42 071-13 071-33	70	34.0	18.0	160
080-32 080-42 080-13 080-33	91	34.0	18.0	160
090-12 090-32	80	32.0	18.0	160
100-12 100-32	94	42.0	18.0	160
112-22 112-32	107	39.0	18.0	160
132-12 132-22 132-32	126	50.0	26.0	250



Centrifugal mass

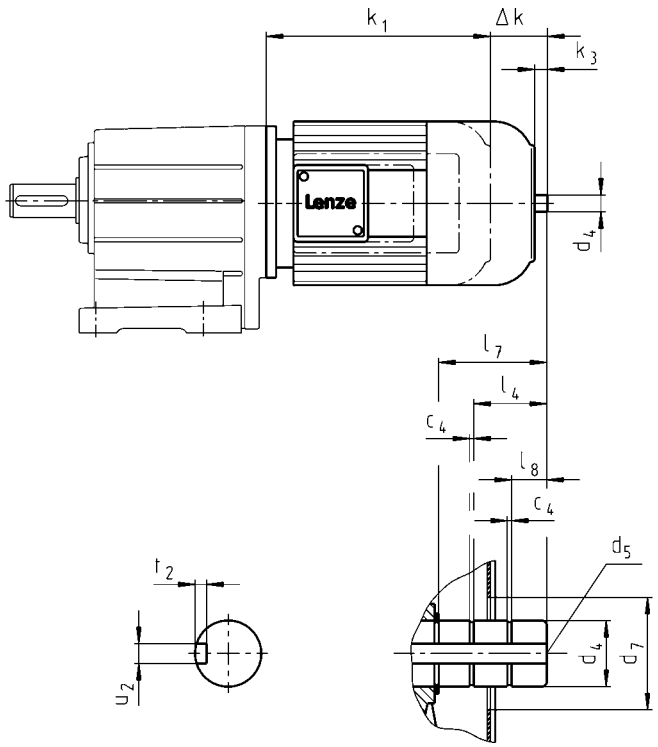
Note	The increased moment of inertia must be taken into account during project planning! For frequent switching operations, in particular if the direction of rotation changes: Please contact Lenze.
Function	Increased motor centrifugal mass for smooth starting/braking
Design	Integral fan made from cast iron

	Moment of inertia	**Mass**
Motor frame size	Additional	Additional
	J	m
	[kgcm²]	[kg]
071	18.0	1.20
080	29.0	1.40
090-□1	83.0	2.80
090-□2	55.0	2.00
100	77.0	2.50
112	153	3.80
132	356	6.00



2nd shaft end

Dimensions, self-ventilated (4/6-pole)



Motor type	
Built-on accessories	M□□MAZE M□□MABZ M□□MALZ

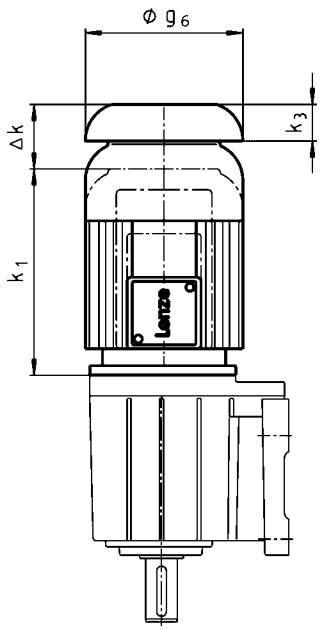
5.8

Motor frame size												
	Δ k	k_3	c_4	d_4	d_4	d_5	d_7 [1]	l_4	l_7	l_8	u_2	t_2
				h6	j6							
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
071-32 071-42 071-13 071-33	47	11.0	1.10	14.0		M5	34.0		19.0	3.00	5.00	3.00
080-32 080-42 080-13 080-33	68	9.00	1.10	14.0		M5	34.0		19.0	4.50	5.00	3.00
090-12 090-32	57	9.00	1.10	14.0		M5	34.0		19.0	5.00	5.00	3.00
100-12 100-32	71	18.5	1.30		20.0	M6	34.0	17.0	32.5	10.5	6.00	3.50
112-22 112-32	84	16.0	1.30		20.0	M6	34.0	17.0	28.5	7.00	6.00	3.50
132-12 132-22 132-32	101	24.5	1.60		30.0	M10	46.0	24.5	42.0	8.50	8.00	4.00

[1] During operation, appropriate measures must be taken to make fan cover opening safe.

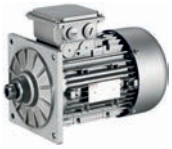
Protection cover

Dimensions, self-ventilated (4/6-pole)



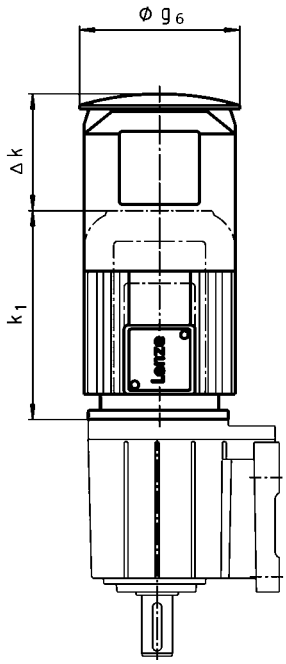
	Motor type							
	M□□MAXX	M□□MABR	M□□MABS M□□MABI M□□MABA	M□□MABL	M□□MARS M□□MAIG M□□MAAG	M□□MALL		

Motor frame size								
	Δ k	Δ k	Δ k	Δ k	Δ k	Δ k	k_3	g_6
	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
063-02 063-22		97	160		97		11.0	123
063-12 063-32 063-42	26	66	129		82		11.0	123
071-32 071-42 071-13 071-33	26	78	122	78	78	26	12.0	138
080-32 080-42 080-13 080-33	26	99	137	99	127	30	16.0	156
090-12 090-32	26	94	131	94	113	26	15.0	176
100-12 100-32	31	107	132	107	112	107	17.0	194
112-22 112-32	31	121	151	121	111	31	18.0	218
132-12 132-22 132-32	31	141	156	141	134	31	20.0	257
160-22 160-32	37	142	228		120		25.0	310



Protection cover

Dimensions, forced ventilated (4/6-pole)



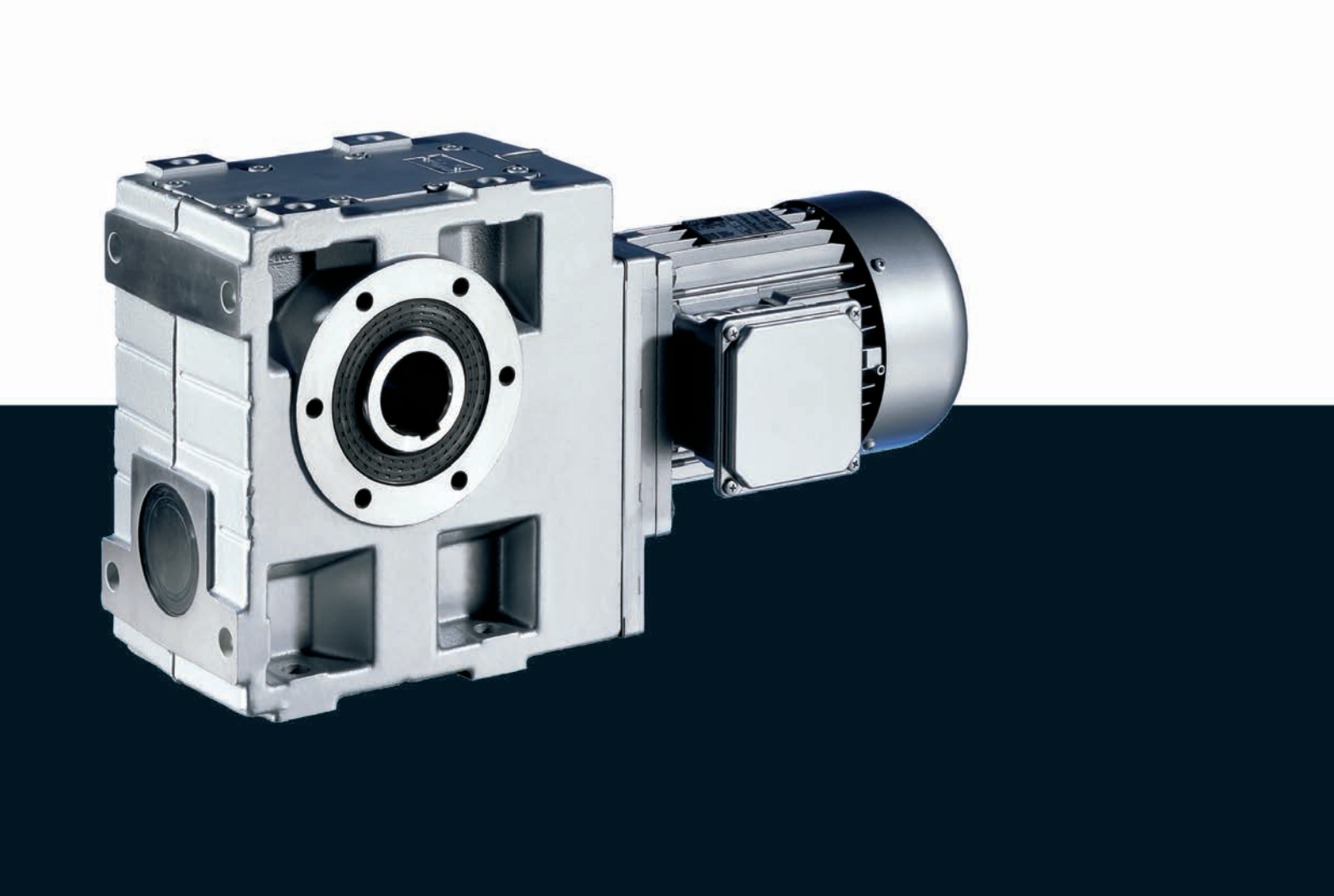
	Motor type			
	M□□MAXX	M□□MABR M□□MABS M□□MABI M□□MABA	M□□MARS M□□MAIG M□□MAAG	

5.8

Motor frame size				
	Δ k	Δ k	Δ k	g_6
	[mm]	[mm]	[mm]	[mm]
063-12 063-32 063-42	169	209	209	133
071-32 071-42 071-13 071-33	165	202	202	150
080-32 080-42 080-13 080-33	168	224	224	170
090-12 090-32	157	210	210	188
100-12 100-32	137	198	198	210
112-22 112-32	135	216	216	249
132-12 132-22 132-32	140	226	226	300
160-22 160-32	155	267	267	338

GSS Helical-worm gearbox

0.75 ... 15 kW



GSS Helical-worm gearbox

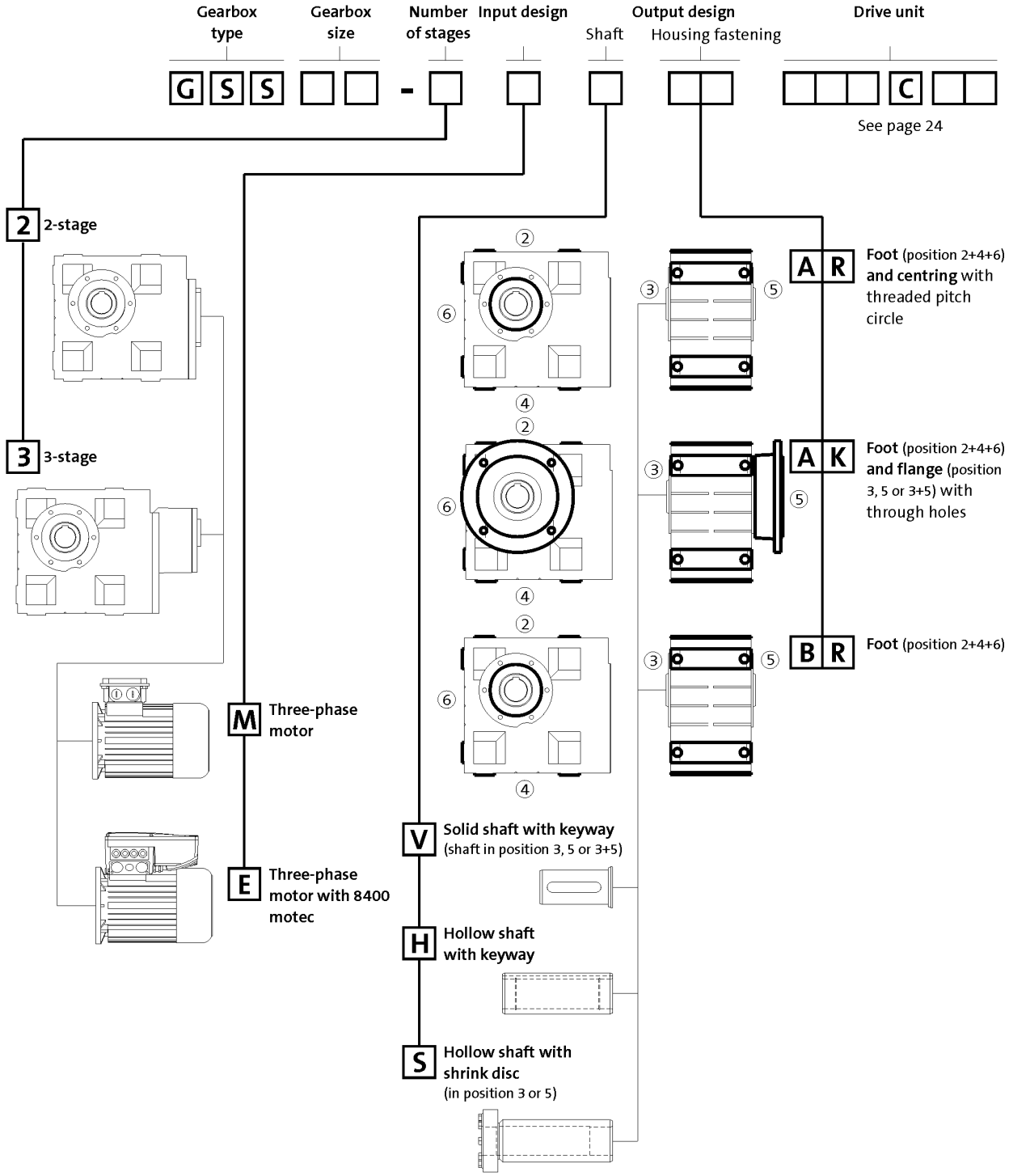
Contents

List of abbreviations

$\eta_{c=1}$		Efficiency
c		Load capacity
f_N	[Hz]	Rated frequency
$F_{ax,max}$	[N]	Max. axial force
$F_{rad,max}$	[N]	Max. radial force
H_{max}	[m]	Site altitude
i		Ratio
J	[kgcm²]	Moment of inertia
m	[kg]	Mass
M_2	[Nm]	Output torque
n_2	[r/min]	Output speed
n_N	[r/min]	Rated speed
P_N	[kW]	Rated power
$S_{hü}$	[1/h]	Transition operating frequency
$T_{opr,max}$	[°C]	Max. ambient operating temperature
$T_{opr,min}$	[°C]	Min. ambient operating temperature
$U_{N,\Delta}$	[V]	Rated voltage
$U_{N,Y}$	[V]	Rated voltage

CE	Communauté Européenne
CSA	Canadian Standards Association
DIN	Deutsches Institut für Normung e.V.
EMC	Electromagnetic compatibility
EN	European standard
IEC	International Electrotechnical Commission
IM	International Mounting Code
IP	International Protection Code
NEMA	National Electrical Manufacturers Association
UL	Underwriters Laboratory Listed Product
UR	Underwriters Laboratory Recognized Product
VDE	Verband deutscher Elektrotechniker (Association of German Electrical Engineers)
CCC	China Compulsory Certificate
GOST	Certificate for Russian Federation
cURus	Combined certification marks of UL for the USA and Canada
UkrSEPRO	Certificate for Ukraine

Product key

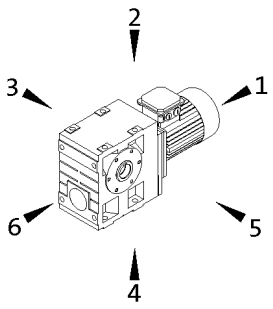
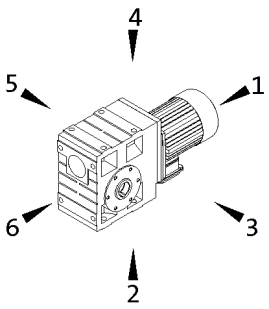
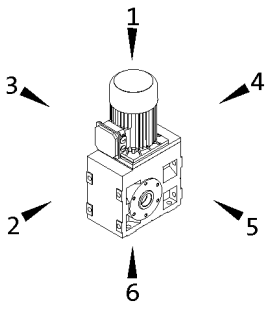
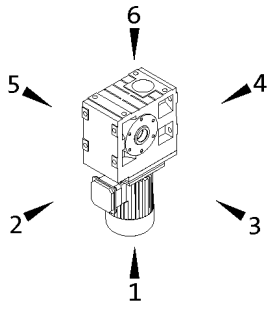
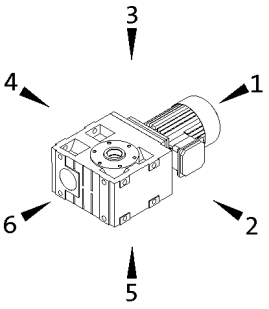
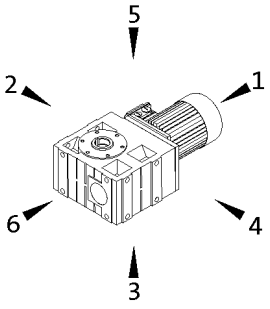


	Output design			
	V	H	S	K
	d x l [mm]	d [mm]	d [mm]	Øa2 [mm]
GSS04-2	25x50	25/30	25/30	160
GSS05-2/3	30x60	30/35	35	200
GSS06-2/3	40x80	40/45	40	200[1)]/250
GSS07-2/3	50x100	50/55	50	250/300

[1)] Only in the case of H and S type of output

Product key

Mounting position (A...F) and position of system blocks (1...6)

A	B	C
		
D	**E**	**F**
		

Hollow shaft: 0
Solid shaft: 3, 5, 8 (3+5)
Hollow shaft with shrink disc: 3, 5

Without flange: 0
Flange: 3, 5, 8 (3+5)
Terminal box / motec: 2, 3, 4, 5

Gearbox designs

Basic versions	
Motor efficiency	Standard efficiency Increased efficiency (IE2)
Surface and corrosion protection	OKS-G (primer: grey) OKS-S (paint: RAL 7012)
Lubricant	CLP PG 460 (synthetic)
Ventilation	Oil control plugs for GSS05 ... 07 Breather elements for GSS05 ... 07

Options	
Surface and corrosion protection	OKS-S (special paint according to RAL) OKS-M (special paint according to RAL) OKS-L (special paint according to RAL)
Lubricant	CLP HC 220 USDA H1 (synthetic)
Shaft sealing rings	Driven shaft: Viton
Accessories	Torque plate on threaded pitch circle Housing foot torque plate 2nd output shaft end Shrink disc cover Hoseproof hollow shaft cover Mounting set for hollow shaft circlip
Nameplate	Metal nameplate (supplied loose) Adhesive nameplate (supplied loose)

Product information

Lenze provides a geared motor construction kit, which covers a wide range of requirements. Numerous drive-side and output-side options enable precise adaptation of the drive to the specific application. This is the basis for versatile applications and functional scalability of our gearboxes and geared motors.
The modular concept and high power density make extremely compact sizes possible. Optimised teeth profiles and ground gears ensure a low-noise operation and low backlash. The gearboxes have a compact and hence space-saving construction.

A low noise solution

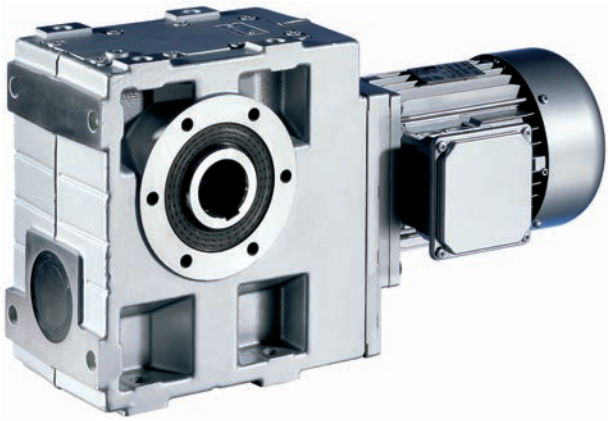
Helical worm gearboxes are particularly low noise drive components. They create a compact drive unit in combination with our servo motors. The helical worm gearboxes are designed in 2- and 3-stage versions and can reach a torque of up to 1,250 Nm and a ratio of up to i=1847.

Inverters for motor-proximity installation

The Drive Package with decentralised Inverter Drives 8400 motec covers a power range up to 7.5 kW.

Designs

- 2-stage and 3-stage gearboxes
- Hollow shaft with keyway or shrink disc
- Solid shaft with keyway
- Foot or flange mounting
- Torque plate, including rubber buffer
- With MH three-phase AC motors (efficiency classes IE2)power range 0.75 ... 15 kW



Helical-bevel geared motor GSS07-2M HBR 100-32

Functions and features

Gearbox type	GSS
Housing	
Design	Cuboid
Material	Aluminium / cast iron
Solid shaft	
Design	with keyway to DIN 6885
Tolerance	m6 (d > 50 mm) k6 (d ≤ 50 mm)
Material	Tempered steel C45 or 42CrMo4
Hollow shaft	
Design	H: with keyway S: smooth
Tolerance	Bore H7
Material	Tempered steel C45
Toothed parts	
Design	Optimised tooth flanks and profile geometry Ground tooth flanks
Material	Case-hardened steel, bronze (worm gear only)
Shaft-hub joint	1st stage/prestage/helical (bevel) gearbox: Friction-type connection Output stage (= 2nd, 3rd or 4th stage): Friction-type or positive-fit connection
Shaft sealing rings	
Design	With dust lip
Material	NB / FP
Bearing	
Design	Ball bearing / tapered-roller bearing depending on size and design
Lubricants	
Standard	DIN 51502
Quantities	corresponding to mounting position (see operating instructions)
Mechanical efficiency	
1-stage gearboxes [$\eta_{c=1}$]	
2-stage gearboxes [$\eta_{c=1}$]	0.62 ... 0.92 [1)]
3-stage gearboxes [$\eta_{c=1}$]	0.64 ... 0.92 [1)]
4-stage gearboxes [$\eta_{c=1}$]	
Notes	Dependent on transmission ratio Housing at operating temperature and teeth run in

[1)] 32 - Efficiencies depending on ratio

Functions and features

Lubricants

Lenze gearboxes and geared motors are ready for operation on delivery and are filled with lubricants that are specific to both the drive and the design. The mounting position and design specified in the order are decisive factors in choosing the volume of lubricant.

The lubricants listed in the lubricant table are approved for use in Lenze drives.

Lubricant table

Mode	CLP PG 460	CLP HC 220 USDA H1
Ambient temperature [°C]	-20 ... +40	
Specification	Synthetic-based oil (polyglycol)	Synthetic-based oil (synthetic hydrocarbon / poly-alpha-olefin oil)
Note	Cannot be mixed with other oil types.	For food processing industry
Changing interval	25000 operating hours not later than after three years (oil temperature 70...80 °C)	16000 operating hours not later than after three years (oil temperature 70...80 °C)
Fuchs		bremer & leguil Cassida Fluid GL 220
Klüber	Klübersynth GH 6-460	Klüberoil 4 UH1-220 N
Shell	Shell Tivela S 460	

- ► Please contact your Lenze office if you are operating in areas with < -20 °C bzw. >ambient temperatures +40°C.
- ► Caution: when using the lubricant CLP HC 220 with the GSS helical-worm gearbox, the load capacity c is reduced to 80 % of the values stated in the catalogue.

Functions and features

Surface and corrosion protection

For optimum protection of geared motors against ambient conditions, the surface and corrosion protection system (OKS) offers tailor-made solutions.

Various surface coatings combined with other protective measures ensure that the geared motors operate reliably even at high air humidity, in outdoor installation or in the presence of atmospheric impurities. Any colour from the RAL Classic collection can be chosen for the top coat. The geared motors are also available unpainted (no surface and corrosion protection).

Surface and corrosion protection system	Applications	Measures
	Catalogue text	Catalogue text
OKS-G (primed)	• Dependent on subsequent top coat applied	• 1K priming coat (grey) • Zinc-coated screws • Rust-free breather elements Optional measures • Stainless steel nameplate
OKS-S (small)	• Standard applications • Internal installation in heated buildings • Air humidity up to 90%	• Surface coating as per corrosivity category C1 (in line with EN 12944-2) • Zinc-coated screws • Rust-free breather elements Optional measures • Stainless steel nameplate
OKS-M (medium)	• Internal installation in non-heated buildings • Covered, protected external installation • Air humidity up to 95%	• Surface coating as per corrosivity category C2 (in line with EN 12944-2) • Zinc-coated screws • Rust-free breather elements Optional measures • Stainless steel shaft • Stainless steel nameplate • Rust-free shrink disc (on request)
OKS-L (high)	• External installation • Air humidity above 95% • Chemical industry plants • Food industry	• Surface coating as per corrosivity category C3 (in line with EN 12944-2) • Blower cover and B end shield additionally primed • Cable glands with gaskets • Corrosion-resistant brake with cover ring, stainless friction plate, and chrome-plated armature plate (on request) • All screws/screw plugs zinc-coated • Stainless breather elements • Threaded holes that are not used are closed by means of plastic plugs Optional measures • Sealed recesses on motor (on request) • Stainless steel shaft • Stainless steel nameplate • Rust-free shrink disc (on request) • Additional priming coat on cast iron fan • Oil expansion tank and torque plates painted separately and supplied loose

Functions and features

Structure of surface coating

Surface and corrosion protection system	Corrosivity category	Surface coating	Colour
	DIN EN ISO 12944-2	Structure	
Without OKS (uncoated)		Dipping primed gearbox	
OKS-G (primed)		Dipping primed gearbox 1K priming coat	
OKS-S (small)	C1	Dipping primed gearbox 2K-PUR top coat	Standard: RAL 7012 Optional: RAL Classic
OKS-M (medium)	C2	Dipping primed gearbox 1K priming coat 2K-PUR top coat	Standard: RAL 7012 Optional: RAL Classic
OKS-L (high)	C3	Dipping primed gearbox 2K-EP priming coat 2K-PUR top coat	Standard: RAL 7012 Optional: RAL Classic

Functions and features

Ventilation

Gearboxes without ventilation
No ventilation measures are required for gearbox GSS04.

Gearboxes with ventilation
Gearboxes GSS05 ... 07 are supplied with breather elements as standard.

Dimensioning

General information about the data provided in this catalogue

Powers, torques and speeds
The powers, torques and speeds specified in this catalogue are rounded values and are valid under the following conditions:
- Operating time/day = 8 h (100% OT)
- Duty class I for up to 10 switching operations/h
- Mounting positions and designs in this catalogue
- Standard lubricant
- T_{amb} = 20 °C for gearboxes,
  T_{amb} = 40 °C for motors (in accordance with EN 60034)
- Site altitude < = 1000 m amsl
- The selection tables provide the permissible mechanical powers and torques. For notes on the thermal power limit, see chapter drive dimensioning.
- The rated power specified for motors and geared motors applies to operating mode S1 (in accordance with EN 60034).

Under different operating conditions, the values obtained may vary from those listed here.
In the case of extreme operating conditions, please consult your Lenze sales office.

Dimensioning

Thermal power limit

The thermal power limit, defined by the heat balance, limits the permissible gearbox continuous power. It may be less than the mechanical power ratings listed in the selection tables.

The thermal power limit is affected by:
- The churning losses in the lubricant. These are determined by the mounting position and the circumferential speed of the wheels
- The load and the speed
- The ambient conditions: temperature, air circulation, input or dissipation via shafts and the foundation

Please consult your Lenze subsidiary
- if the following input speeds n_1 are exceeded on a continuous basis (continuous is defined as more than 8 h/day):

Motor frame size	Mounting position A, B, E, F	Mounting position C, D
063 ... 100	3000 r/min	3000 r/min
112 ... 132	3000 r/min	1500 r/min
160 ... 225	2000 r/min	1500 r/min

- if the following input speeds n_1 are exceeded:

Motor frame size	Mounting position A, B, E, F	Mounting position C, D
063 ... 100	4000 r/min	3000 r/min
112 ... 132	4000 r/min	2000 r/min
160 ... 225	3000 r/min	1500 r/min

Possible ways of extending the application area

- Synthetic lubricant (option)
- Shaft sealing rings made from FP material/Viton (option)
- Reduction in lubricant quantity
- Cooling of the geared motor by means of air convection on the machine/system

Dimensioning

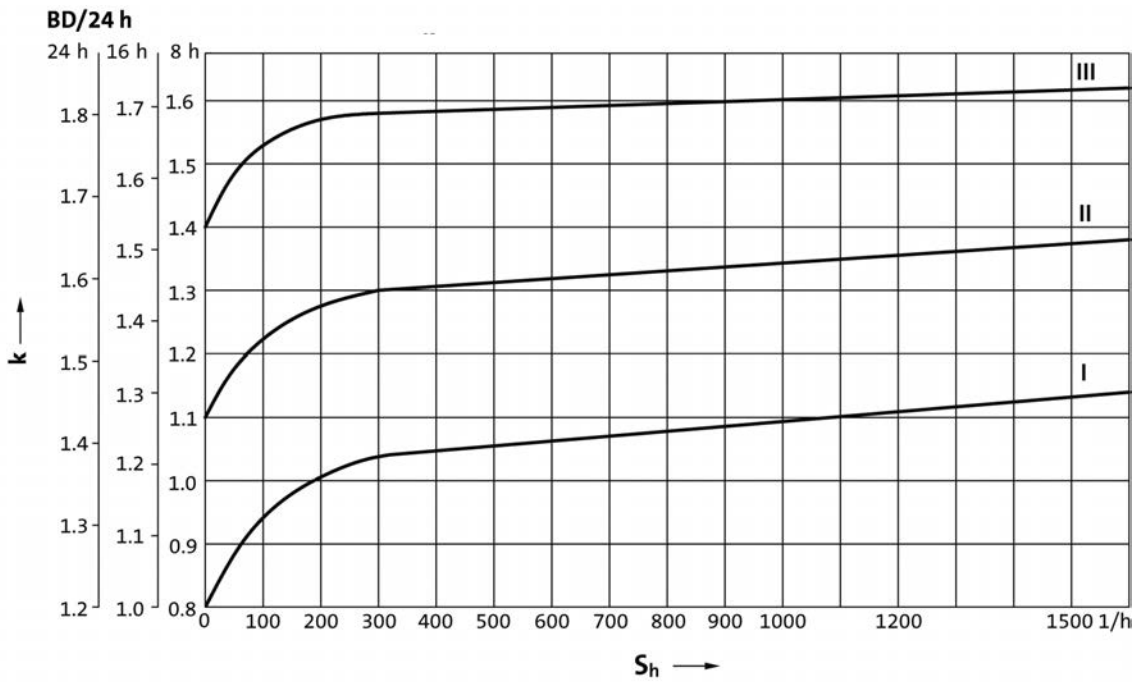
Load capacity and application factor

Load capacity c of gearbox
Rated value for the load capacity of Lenze geared motors.
- c is the ratio of the permissible rated torque of the gearbox to the rated torque supplied by the drive component (e.g. the built-in Lenze motor).
- The value of c must always be greater than the value of the application factor k calculated for the application.

Application factor k (according to DIN 3990)
Takes into account the influence of temporally variable loads which are actually present during the anticipated operating time of gearboxes and geared motors.
k is determined by:
- The type of load
- The load intensity
- Temporal influences

Duty class	Load type
I	Smooth operation, small or light jolts
II	Uneven operation, average jolts
III	Uneven operation, severe jolts and/or alternating load

Application factor k

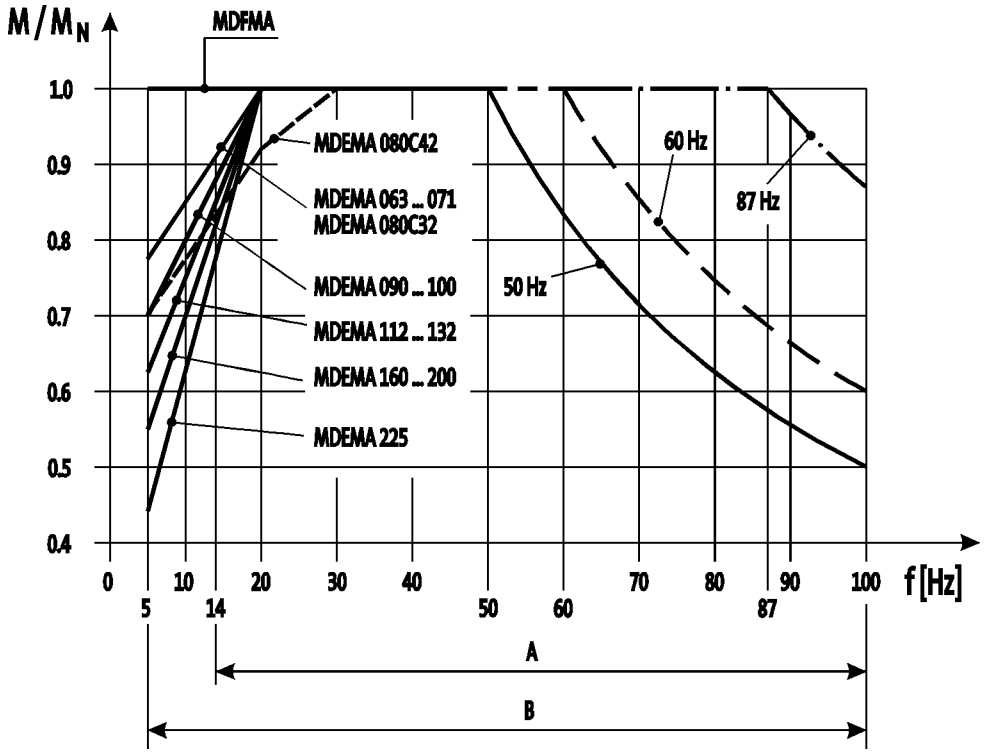


Dimensioning

Torque derating at low motor frequencies

Motor size-dependent torque reduction, taking into account the thermal response during operation on the inverter.

Torque characteristics



A = Operation with integral fan and brake
B = Operation with integral fan and brake control "Holding current reduction"

You can use the Drive Solution Designer for precise drive dimensioning.

The Drive Solution Designer helps you to carry out a fast and high-quality drive dimensioning.
The software includes well-founded and proven knowledge on drive applications and electro-mechanical drive components.

Please contact your Lenze sales office.

Dimensioning

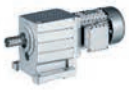
Notes on the selection tables

The selection tables shown the available combinations of gearbox type, number of stages, ratio and motor. The following legend indicates the structure of the selection tables.

Gearbox type

GST helical gearbox

Technical data



Selection tables

Rated speed n_N of the drive motor

Product key of geared motor

Rated power P_N of the drive motor in relation to the rated frequency

► 50 Hz, 60 Hz: P_N = 0.75 kW

n_N	1410 r/min			1720 r/min			i		
f_N	50 Hz			60 Hz					
	n_2 [r/min]	M_2 [Nm]	c	n_2 [r/min]	M_2 [Nm]	c			
	881	8.0	2.4	1069	6.6	2.8	1.600	GST04-1M □□□080C32	76
	689	10	2.2	835	8.4	2.6	2.048	GST04-1M □□□080C32	76

Output speed n_2

Output torque M_2 (constant for all listed frequencies)

The load capacity c of the gearbox c is the ratio of the gearbox's rated torque to the rated torque of the three-phase motor (calculated in respect of its application to the output shaft). c must always be greater than the application factor k determined for the application

Ratio i

Page number for dimensions

$$c = \frac{M_{2,zul}}{M_{1N} \cdot i \cdot \eta_{Getr}} > k$$

Dimensioning

Notes on the selection tables

Motor voltages

The power values and torques indicated in the selection tables relate to the following motor voltages:
- 50 Hz : Δ 230 V / Y 400 V
- 60 Hz : Δ 265 V / Y 460 V
- 87 Hz : Δ 400 V

Operation at 87 Hz

In 87 Hz operation, the three-phase AC motor (which is designed for a voltage of Δ 230 V / Y 400 V at 50 Hz) is operated on an inverter with 400 V rated voltage in a delta connection. It is important to note here that the inverter must be designed configured for 87Hz output. This offers the following advantages over 50 Hz operation:
- The setting range of the motor is increased by a factor of 1.73.
- The motor can then provide around 1.73 times greater output, which in turn allows a smaller and more affordable motor to be selected for the application.
- The efficiency of the motor is also improved.

Notes on ordering

We want to be sure that you receive the correct products in good time.

To allow us to achieve this we need:
- Your address and your company data
- Our product key for the individual products in this catalogue
- Your delivery data such as delivery date and delivery address

Ordering procedure
Please use the ordering information checklist to ensure that you provide all the order information required for the various products.

The ordering information checklist, the product key, the basic versions, options, mounting position and position of the system blocks will be found in the General – Product key section.

A list of Lenze's worldwide sales offices can be found on the Internet: www.Lenze.com.

Ordering details checklist

☐ **Offer**

Page __ of __

☐ **Order**

Customer No.

Job No.

Fax No. _____

Sender

Company _____ Made out by (name) _____

Street/P.O. Box _____ Department _____

P.O. Box, City _____ Telephone No. _____

Date _____ Signature _____

Delivery address (if different)

Street/P.O. Box _____ Desired delivery date _____

P.O. Box, City _____ Dispatching notes _____

Invoice recipient (if different)

Street/P.O. Box _____

Postal code, City _____

Helical-worm geared motors

Customer No. ☐☐☐☐☐☐☐☐

Job No. ☐☐☐☐☐☐☐☐☐☐

Page __

Quantity ☐

Efficiency class ☐ Standard efficiency ☐ High efficiency (IE2)

Rated frequency ☐ 50 Hz ☐ 60 Hz ☐ 87 Hz

Ratio i ☐

GSS ☐☐ – ☐ 2 / 3 ☐ M / E ☐ V / H / S ☐ A / B ☐ R / K

Motor frame size ☐☐☐C☐☐

Hollow shaft d = ☐ mm

Flange a_2 = ☐ mm

Mounting position A ☐ B ☐ C ☐ D ☐ E ☐ F ☐

Position of system blocks

Shaft/shrink disc				Flange				Terminal box			
0	3	4	8	0	3	5	8	2	3	4	5
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Surface and corrosion protection ☐ OKS-S colour: RAL 7012 ☐ OKS-G (primed)

Options

Special lubricants ☐ CLP HC 220 USDA H1 (for the food industry)

Surface and corrosion protection ☐ OKS-S (small) ☐ OKS-M (medium) RAL ☐ ☐ OKS-L (high) ☐ OKS-G (primed)

Accessories

- ☐ Torque support for housing foot
- ☐ Torque support for threaded pitch circle
- ☐ 2nd output shaft end
- ☐ Mounting set for hollow-shaft circlip
- ☐ Shrink disc cover
- ☐ Hollow shaft cover, hoseproof

Shaft sealing rings ☐ Viton

Breathing ☐ Breather elements for GSS05

Ordering details checklist

Three-phase AC motors options

Customer No. ☐☐☐☐☐☐☐☐

Job No. ☐☐☐☐☐☐☐☐☐☐

Page __

Motor connection

Terminal box
- ☐ with plug-in connector ICN 6-pin. Adhere to permissible rated motor current 20 A!
- ☐ with plug-in connector ICN 8-pin. Adhere to permissible rated motor current 20 A!
- ☐ with plug-in connector HAN10E. Adhere to permissible rated current 16 A!
- ☐ with plug-in connector HAN-Modular. Adhere to permissible rated current 16 / 40 A!

Cable entry
only with M□□MAXX/LL063 ... 132
or terminal box with plug-in connector
in position 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

Blower

☐ 1~ ☐ 3~

☐ Terminal box with plug-in connector ICN

Terminal box position 2 ☐ 3 ☐ 4 ☐ 5 ☐

Spring-applied brake

Brake version ☐ Standard ☐ Longlife

Brake size ☐

Characteristic torque ☐ Nm

Rated voltage AC ☐ DC ☐ ☐ V

Rectifier
Only in the case of AC supply voltage

- ☐ Half-wave rectifier
- ☐ Bridge rectifier
- ☐ Bridge/half-wave rectifier (overexcitation)
- ☐ Bridge/half-wave rectifier (holding current reduction)

Brake options
Manual release lever in position 2 ☐ 3 ☐ 4 ☐ 5 ☐

☐ Low-noise version (Standard in the case of brake with speed/position encoder)

6.6

Ordering details checklist

Three-phase AC motors options

Customer No. ☐☐☐☐☐☐☐☐

Job No. ☐☐☐☐☐☐☐☐☐☐

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Speed/position encoder

Resolver	☐ RS1				
Incremental encoder HTL	☐ IG128-24V-H	☐ IG512-24V-H	☐ IG1024-24V-H	☐ IG2048-24V-H	
Incremental encoder TTL		☐ IG512-5V-T	☐ IG1024-5V-T	☐ IG2048-5V-T	
Feedback with ICN connector	☐ IG128-24V-H not possible with plug-in connector!				

Motor protection

☐ PTC ☐ KTY 83-110 ☐ KTY 84-130

Approval

☐ UL/CSA approval: cURus ☐ CCC ☐ China Energy Label

Further options

Indication of supply voltage only for motor frame sizes 112C32 to 225C22

☐ Δ; 400V-50Hz; 460V-60Hz

☐ Y/Δ; 400/230V-50Hz; 460/265V-60Hz (-/400V-87Hz possible in operation with frequency inverter)

☐ Protection cover

☐ 2nd shaft end

☐ Handwheel

☐ Increased centrifugal mass

☐ 2nd nameplate (adhesive nameplate/metal nameplate)

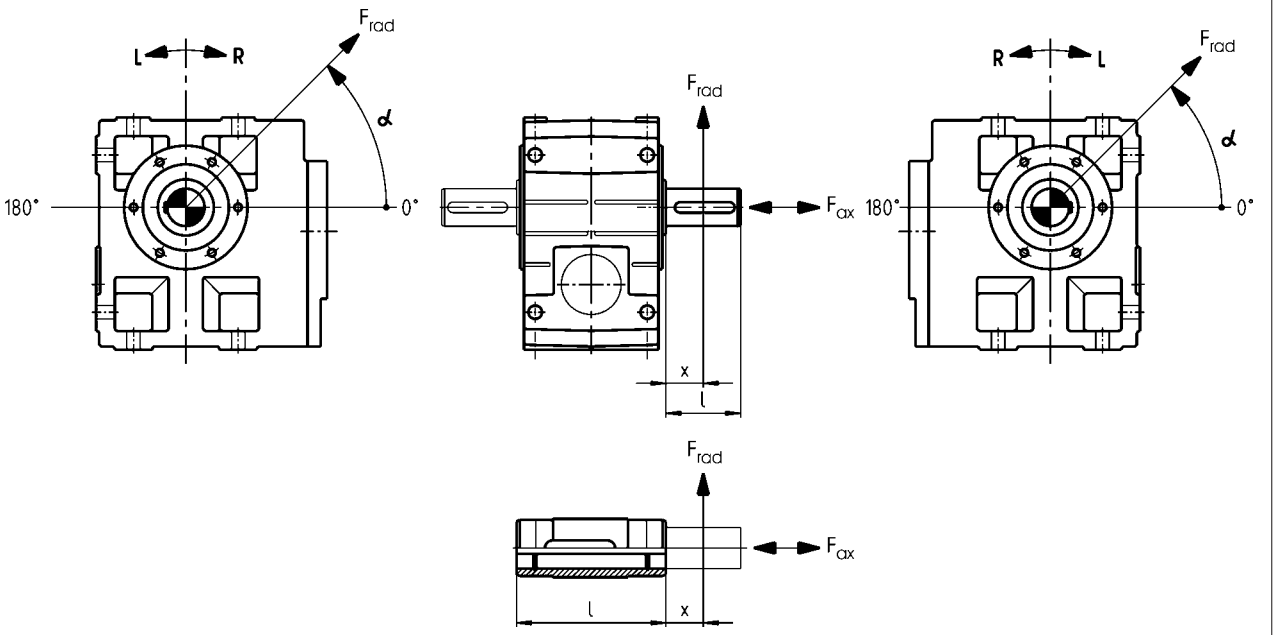
Permissible radial and axial forces at output

Permissible radial force
$F_{rad,per} = \min(f_w \times f_\alpha \times F_{rad,max}$; $f_w \times F_{rad,max}$ at $n_2 \leq 16$ r/min)

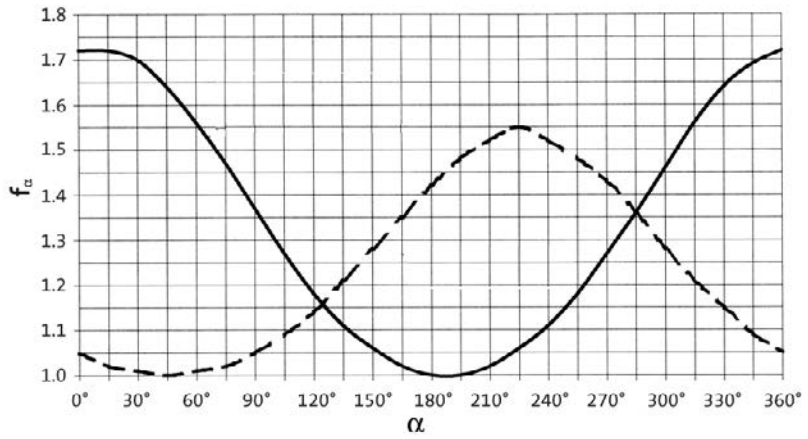
Permissible axial force
$F_{ax,per} = F_{ax,max}$ if $F_{rad} = 0$

If F_{rad} **and** $F_{ax} \neq 0$; please contact Lenze.

Application of forces



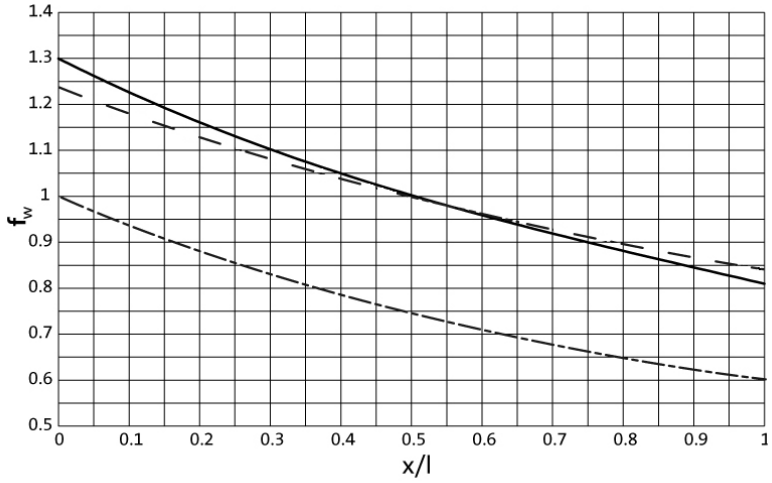
Effective direction factor f_α at output shaft



——— Direction of rotation R
— — — Direction of rotation L

Permissible radial and axial forces at output

Additional load factor f_w at output shaft



——— Solid shaft (V□□)
— · — Hollow shaft (H□□)
— — — Solid shaft with flange (V□K)

GSS□□-2/3□ H□□

Size	n_2 [r/min]								
Gearbox	630	400	250	160	100	63	40	25	≤16

	Max. radial force, Hollow shaft								
	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$
	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]
GSS04	2800	3000	3800	4500	5300	6000	6000	6000	6000
GSS05	3000	3200	3600	4300	5100	6000	7000	7500	7500
GSS06	4400	4600	4800	5600	6600	7700	9100	10700	11500
GSS07	4600	5100	5600	6700	8200	10000	12100	14800	16000

	Max. axial force, Hollow shaft								
	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$
	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]
GSS04	2200	2900	3700	4200	4900	5500	5500	5500	5500
GSS05	1600	2200	2800	3500	4400	5500	6000	6000	6000
GSS06	1900	2500	3200	4100	5200	6500	8200	9000	9000
GSS07	1800	2400	3100	4100	5500	7200	9500	12500	12500

- Application of force F_{rad}: at hollow shaft end face (x = 0)
- $F_{ax,max}$ only valid with F_{rad} = 0
- Neither radial nor axial forces are permissible for the hollow shaft with shrink disc (S□□).

Permissible radial and axial forces at output

GSS□□-2/3□ V□R

Size	n_2 [r/min]								
Gearbox	630	400	250	160	100	63	40	25	≤16

	Max. radial force, Solid shaft without flange								
	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$
	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]
GSS04	2200	2400	3000	3500	4100	4200	4200	4200	4200
GSS05	2300	2500	2900	3400	4000	4300	4300	4300	4300
GSS06	3400	3500	3600	4200	5000	5900	6900	8200	8500
GSS07	3700	4000	4200	5100	6300	7700	9300	11300	12000

	Max. axial force, Solid shaft without flange								
	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$
	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]
GSS04	2200	2900	3700	4200	4900	5500	5500	5500	5500
GSS05	1600	2200	2800	3500	4400	5500	6000	6000	6000
GSS06	1900	2500	3200	4100	5200	6500	8200	9000	9000
GSS07	1800	2400	3100	4100	5500	7200	9500	12500	12500

GSS□□-2/3□ V□K

Size	n_2 [r/min]								
Gearbox	630	400	250	160	100	63	40	25	≤16

	Max. radial force, Solid shaft with flange								
	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$	$F_{rad,max}$
	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]
GSS04	2750	3000	4100	4400	4700	4700	4700	4700	4700
GSS05	3450	3750	4900	4900	4900	4900	4900	4900	4900
GSS06	5100	5250	7000	8100	9400	9400	9400	9400	9400
GSS07	5500	6000	7900	9100	10600	12400	14000	14000	14000

	Max. axial force, Solid shaft with flange								
	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$	$F_{ax,max}$
	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]	[N]
GSS04	2100	2800	3500	4000	4200	4200	4200	4200	4200
GSS05	1500	2000	2500	3100	4000	4900	5500	5500	5500
GSS06	1600	2200	2800	3500	4500	5700	7300	8800	8800
GSS07	1400	1900	2400	3200	4300	5900	8000	10000	10000

► Application of force F_{rad}: centre of shaft journal (x = l/2)
► $F_{ax,max}$ only valid with F_{rad} = 0

Moments of inertia

GSS□□-2

► Moment of inertia (J) depending on ratio i

Gearbox			GSS04
5.639	J	[kgcm²]	1.120
7.733	J	[kgcm²]	0.652
9.042	J	[kgcm²]	0.809
9.897	J	[kgcm²]	0.430
10.827	J	[kgcm²]	0.368
12.400	J	[kgcm²]	0.487
13.810	J	[kgcm²]	0.247
15.869	J	[kgcm²]	0.329
17.360	J	[kgcm²]	0.284
20.417	J	[kgcm²]	0.673
22.143	J	[kgcm²]	0.195
24.800	J	[kgcm²]	0.420
27.125	J	[kgcm²]	0.145
31.738	J	[kgcm²]	0.288
34.100	J	[kgcm²]	0.096
39.200	J	[kgcm²]	0.247
43.917	J	[kgcm²]	0.064
50.000	J	[kgcm²]	0.173
54.250	J	[kgcm²]	0.131
61.250	J	[kgcm²]	0.130
68.200	J	[kgcm²]	0.087
77.000	J	[kgcm²]	0.086
87.833	J	[kgcm²]	0.059
99.167	J	[kgcm²]	0.058
111.318	J	[kgcm²]	0.039
125.682	J	[kgcm²]	0.038
139.500	J	[kgcm²]	0.027
157.500	J	[kgcm²]	0.026
183.786	J	[kgcm²]	0.016
207.500	J	[kgcm²]	0.016

Gearbox			GSS05
5.639	J	[kgcm²]	2.821
7.733	J	[kgcm²]	1.664
9.042	J	[kgcm²]	2.014
9.897	J	[kgcm²]	1.102
10.827	J	[kgcm²]	0.941
12.400	J	[kgcm²]	1.235
13.810	J	[kgcm²]	0.638
15.869	J	[kgcm²]	0.840
17.360	J	[kgcm²]	0.722
20.417	J	[kgcm²]	1.601
22.143	J	[kgcm²]	0.504
24.800	J	[kgcm²]	1.059
27.125	J	[kgcm²]	0.377
31.738	J	[kgcm²]	0.733
35.306	J	[kgcm²]	0.233
39.200	J	[kgcm²]	0.610
43.917	J	[kgcm²]	0.167
50.000	J	[kgcm²]	0.435
54.250	J	[kgcm²]	0.341
61.250	J	[kgcm²]	0.332
70.611	J	[kgcm²]	0.211
79.722	J	[kgcm²]	0.206
87.833	J	[kgcm²]	0.153
99.167	J	[kgcm²]	0.149
113.667	J	[kgcm²]	0.096
128.333	J	[kgcm²]	0.094
137.950	J	[kgcm²]	0.070
155.750	J	[kgcm²]	0.069
176.313	J	[kgcm²]	0.045
199.063	J	[kgcm²]	0.044

► The moments of inertia relate to the drive shaft of the gearbox.
► The total moment of inertia is calculated by adding the values of gearbox, motor and accessories.

Moments of inertia

GSS□□-2

► Moment of inertia (J) depending on ratio i

Gearbox			GSS06
5.833	J	[kgcm²]	6.966
8.000	J	[kgcm²]	4.219
9.042	J	[kgcm²]	5.541
10.238	J	[kgcm²]	2.811
11.200	J	[kgcm²]	2.393
12.400	J	[kgcm²]	3.461
14.286	J	[kgcm²]	1.630
15.869	J	[kgcm²]	2.348
17.360	J	[kgcm²]	2.006
20.417	J	[kgcm²]	4.172
22.143	J	[kgcm²]	1.392
24.800	J	[kgcm²]	3.056
27.125	J	[kgcm²]	1.039
31.738	J	[kgcm²]	2.101
35.306	J	[kgcm²]	0.660
39.200	J	[kgcm²]	1.635
43.917	J	[kgcm²]	0.475
50.000	J	[kgcm²]	1.164
54.250	J	[kgcm²]	0.955
61.250	J	[kgcm²]	0.887
70.611	J	[kgcm²]	0.610
79.722	J	[kgcm²]	0.570
87.833	J	[kgcm²]	0.443
99.167	J	[kgcm²]	0.417
113.667	J	[kgcm²]	0.276
128.333	J	[kgcm²]	0.260
137.950	J	[kgcm²]	0.201
155.750	J	[kgcm²]	0.191
174.375	J	[kgcm²]	0.130
196.875	J	[kgcm²]	0.123

Gearbox			GSS07
5.862	J	[kgcm²]	21.357
8.125	J	[kgcm²]	12.754
9.086	J	[kgcm²]	17.436
10.000	J	[kgcm²]	9.140
11.200	J	[kgcm²]	7.498
12.594	J	[kgcm²]	10.713
14.286	J	[kgcm²]	4.837
15.500	J	[kgcm²]	7.792
17.360	J	[kgcm²]	6.424
20.517	J	[kgcm²]	13.579
22.143	J	[kgcm²]	4.177
25.188	J	[kgcm²]	9.590
27.125	J	[kgcm²]	3.130
31.000	J	[kgcm²]	7.051
35.306	J	[kgcm²]	1.955
39.200	J	[kgcm²]	5.368
43.271	J	[kgcm²]	1.433
50.000	J	[kgcm²]	3.527
54.250	J	[kgcm²]	2.888
61.250	J	[kgcm²]	2.698
70.611	J	[kgcm²]	1.812
79.722	J	[kgcm²]	1.700
86.542	J	[kgcm²]	1.338
97.708	J	[kgcm²]	1.263
113.667	J	[kgcm²]	0.833
128.333	J	[kgcm²]	0.789
137.950	J	[kgcm²]	0.609
155.750	J	[kgcm²]	0.579
174.375	J	[kgcm²]	0.391
196.875	J	[kgcm²]	0.373

► The moments of inertia relate to the drive shaft of the gearbox.
► The total moment of inertia is calculated by adding the values of gearbox, motor and accessories.

Moments of inertia

GSS□□-3

► Moment of inertia (J) depending on ratio i

Gearbox			GSS05
125.476	J	[kgcm²]	0.154
153.708	J	[kgcm²]	0.117
193.233	J	[kgcm²]	0.078
222.133	J	[kgcm²]	0.206
250.952	J	[kgcm²]	0.151
283.333	J	[kgcm²]	0.148
307.417	J	[kgcm²]	0.115
347.083	J	[kgcm²]	0.113
386.467	J	[kgcm²]	0.077
436.333	J	[kgcm²]	0.076
497.722	J	[kgcm²]	0.053
561.944	J	[kgcm²]	0.052
630.803	J	[kgcm²]	0.035
712.197	J	[kgcm²]	0.034
790.500	J	[kgcm²]	0.024
892.500	J	[kgcm²]	0.024
1041.452	J	[kgcm²]	0.015
1175.833	J	[kgcm²]	0.015

Gearbox			GSS06
126.531	J	[kgcm²]	0.310
142.857	J	[kgcm²]	0.298
155.000	J	[kgcm²]	0.271
175.000	J	[kgcm²]	0.263
194.857	J	[kgcm²]	0.144
220.000	J	[kgcm²]	0.139
238.700	J	[kgcm²]	0.128
269.500	J	[kgcm²]	0.124
310.689	J	[kgcm²]	0.112
350.778	J	[kgcm²]	0.110
386.467	J	[kgcm²]	0.103
436.333	J	[kgcm²]	0.102
497.722	J	[kgcm²]	0.069
561.944	J	[kgcm²]	0.068
630.803	J	[kgcm²]	0.045
712.197	J	[kgcm²]	0.044
816.333	J	[kgcm²]	0.042
921.667	J	[kgcm²]	0.042
1023.000	J	[kgcm²]	0.029
1155.000	J	[kgcm²]	0.029
1241.550	J	[kgcm²]	0.028
1401.750	J	[kgcm²]	0.028
1635.693	J	[kgcm²]	0.017
1846.750	J	[kgcm²]	0.017

► The moments of inertia relate to the drive shaft of the gearbox.
► The total moment of inertia is calculated by adding the values of gearbox, motor and accessories.

Moments of inertia

GSS□□-3

► Moment of inertia (J) depending on ratio i

Gearbox			GSS07
126.531	J	[kgcm²]	0.857
142.857	J	[kgcm²]	0.822
155.000	J	[kgcm²]	0.742
175.000	J	[kgcm²]	0.719
201.746	J	[kgcm²]	0.372
227.778	J	[kgcm²]	0.358
247.139	J	[kgcm²]	0.327
279.028	J	[kgcm²]	0.317
321.673	J	[kgcm²]	0.281
363.179	J	[kgcm²]	0.276
394.245	J	[kgcm²]	0.258
445.116	J	[kgcm²]	0.255
490.403	J	[kgcm²]	0.183
553.681	J	[kgcm²]	0.181
634.639	J	[kgcm²]	0.114
716.528	J	[kgcm²]	0.113
833.556	J	[kgcm²]	0.105
941.111	J	[kgcm²]	0.105
1011.633	J	[kgcm²]	0.076
1142.167	J	[kgcm²]	0.076
1227.755	J	[kgcm²]	0.074
1386.175	J	[kgcm²]	0.073
1569.181	J	[kgcm²]	0.047
1771.656	J	[kgcm²]	0.047

► The moments of inertia relate to the drive shaft of the gearbox.
► The total moment of inertia is calculated by adding the values of gearbox, motor and accessories.

Efficiencies

► During start-up, the start-up efficiency η_a of a helical-worm gearbox is lower than its operative efficiency at rated speed.
The start-up efficiency η_a must therefore always be considered when starting under load.

GSS04-2

				n_2 [r/min]											
				10	16	25	32	40	63	100	160	250	400	630	800
5.639	η_a	0.71	$\eta_{c=1}$	0.83	0.86	0.88	0.89	0.89	0.90	0.90	0.90	0.90	0.90	0.89	0.89
7.733	η_a	0.71	$\eta_{c=1}$	0.83	0.86	0.88	0.89	0.89	0.90	0.90	0.90	0.90	0.90	0.89	0.89
9.042	η_a	0.67	$\eta_{c=1}$	0.81	0.84	0.86	0.87	0.87	0.88	0.88	0.87	0.87	0.87	0.87	
9.897	η_a	0.71	$\eta_{c=1}$	0.83	0.86	0.88	0.89	0.89	0.90	0.90	0.90	0.90	0.90	0.89	0.89
10.827	η_a	0.71	$\eta_{c=1}$	0.83	0.86	0.88	0.89	0.89	0.90	0.90	0.90	0.90	0.90	0.89	0.89
12.400	η_a	0.67	$\eta_{c=1}$	0.81	0.84	0.86	0.87	0.87	0.88	0.88	0.87	0.87	0.87	0.87	
13.810	η_a	0.71	$\eta_{c=1}$	0.83	0.86	0.88	0.89	0.89	0.90	0.90	0.90	0.90	0.90	0.89	0.89
15.869	η_a	0.67	$\eta_{c=1}$	0.81	0.84	0.86	0.87	0.87	0.88	0.88	0.87	0.87	0.87	0.87	
17.360	η_a	0.67	$\eta_{c=1}$	0.81	0.84	0.86	0.87	0.87	0.88	0.88	0.87	0.87	0.87	0.87	
20.417	η_a	0.55	$\eta_{c=1}$	0.76	0.78	0.79	0.79	0.79	0.79	0.79	0.78	0.78			
22.143	η_a	0.67	$\eta_{c=1}$	0.81	0.84	0.86	0.87	0.87	0.88	0.88	0.87	0.87	0.87	0.87	
24.800	η_a	0.56	$\eta_{c=1}$	0.77	0.79	0.80	0.81	0.81	0.81	0.80	0.80	0.79			
27.125	η_a	0.67	$\eta_{c=1}$	0.81	0.84	0.86	0.87	0.87	0.88	0.88	0.87	0.87	0.87	0.87	
31.738	η_a	0.56	$\eta_{c=1}$	0.77	0.79	0.80	0.81	0.81	0.81	0.80	0.80	0.79			
34.100	η_a	0.67	$\eta_{c=1}$	0.81	0.84	0.86	0.87	0.87	0.88	0.88	0.87	0.87	0.87	0.87	
39.200	η_a	0.55	$\eta_{c=1}$	0.76	0.78	0.79	0.79	0.79	0.79	0.79	0.78	0.78			
43.917	η_a	0.67	$\eta_{c=1}$	0.81	0.84	0.86	0.87	0.87	0.88	0.88	0.87	0.87	0.87	0.87	
50.000	η_a	0.55	$\eta_{c=1}$	0.76	0.78	0.79	0.79	0.79	0.79	0.79	0.78	0.78			
54.250	η_a	0.56	$\eta_{c=1}$	0.77	0.79	0.80	0.81	0.81	0.81	0.80	0.80	0.79			
61.250	η_a	0.55	$\eta_{c=1}$	0.76	0.78	0.79	0.79	0.79	0.79	0.79	0.78	0.78			
68.200	η_a	0.56	$\eta_{c=1}$	0.77	0.79	0.80	0.81	0.81	0.81	0.80	0.80	0.79			
77.000	η_a	0.55	$\eta_{c=1}$	0.76	0.78	0.79	0.79	0.79	0.79	0.79	0.78	0.78			
87.833	η_a	0.56	$\eta_{c=1}$	0.77	0.79	0.80	0.81	0.81	0.81	0.80	0.80	0.79			
99.167	η_a	0.55	$\eta_{c=1}$	0.76	0.78	0.79	0.79	0.79	0.79	0.79	0.78	0.78			
111.318	η_a	0.56	$\eta_{c=1}$	0.77	0.79	0.80	0.81	0.81	0.81	0.80	0.80	0.79			
125.682	η_a	0.55	$\eta_{c=1}$	0.76	0.78	0.79	0.79	0.79	0.79	0.79	0.78	0.78			
139.500	η_a	0.56	$\eta_{c=1}$	0.77	0.79	0.80	0.81	0.81	0.81	0.80	0.80	0.79			
157.500	η_a	0.55	$\eta_{c=1}$	0.76	0.78	0.79	0.79	0.79	0.79	0.79	0.78	0.78			
183.786	η_a	0.56	$\eta_{c=1}$	0.77	0.79	0.80	0.81	0.81	0.81	0.80	0.80	0.79			
207.500	η_a	0.55	$\eta_{c=1}$	0.76	0.78	0.79	0.79	0.79	0.79	0.79	0.78	0.78			

Efficiencies

► During start-up, the start-up efficiency η_a of a helical-worm gearbox is lower than its operative efficiency at rated speed.
The start-up efficiency η_a must therefore always be considered when starting under load.

GSS05-2

				n_2 [r/min]											
				10	16	25	32	40	63	100	160	250	400	630	800
5.639	η_a	0.71	$\eta_{c=1}$	0.85	0.87	0.89	0.90	0.90	0.91	0.91	0.91	0.91	0.90	0.90	0.90
7.733	η_a	0.71	$\eta_{c=1}$	0.85	0.87	0.89	0.90	0.90	0.91	0.91	0.91	0.91	0.90	0.90	0.90
9.042	η_a	0.67	$\eta_{c=1}$	0.83	0.86	0.87	0.88	0.88	0.89	0.89	0.88	0.88	0.88	0.88	
9.897	η_a	0.71	$\eta_{c=1}$	0.85	0.87	0.89	0.90	0.90	0.91	0.91	0.91	0.91	0.90	0.90	0.90
10.827	η_a	0.71	$\eta_{c=1}$	0.85	0.87	0.89	0.90	0.90	0.91	0.91	0.91	0.91	0.90	0.90	0.90
12.400	η_a	0.67	$\eta_{c=1}$	0.83	0.86	0.87	0.88	0.88	0.89	0.89	0.88	0.88	0.88	0.88	
13.810	η_a	0.71	$\eta_{c=1}$	0.85	0.87	0.89	0.90	0.90	0.91	0.91	0.91	0.91	0.90	0.90	0.90
15.869	η_a	0.67	$\eta_{c=1}$	0.83	0.86	0.87	0.88	0.88	0.89	0.89	0.88	0.88	0.88	0.88	
17.360	η_a	0.67	$\eta_{c=1}$	0.83	0.86	0.87	0.88	0.88	0.89	0.89	0.88	0.88	0.88	0.88	
20.417	η_a	0.55	$\eta_{c=1}$	0.79	0.80	0.81	0.81	0.81	0.81	0.81	0.81	0.81			
22.143	η_a	0.67	$\eta_{c=1}$	0.83	0.86	0.87	0.88	0.88	0.89	0.89	0.88	0.88	0.88	0.88	
24.800	η_a	0.57	$\eta_{c=1}$	0.79	0.81	0.82	0.82	0.83	0.83	0.82	0.82	0.82			
27.125	η_a	0.67	$\eta_{c=1}$	0.83	0.86	0.87	0.88	0.88	0.89	0.89	0.88	0.88	0.88	0.88	
31.738	η_a	0.57	$\eta_{c=1}$	0.79	0.81	0.82	0.82	0.83	0.83	0.82	0.82	0.82			
35.306	η_a	0.67	$\eta_{c=1}$	0.83	0.86	0.87	0.88	0.88	0.89	0.89	0.88	0.88	0.88	0.88	
39.200	η_a	0.55	$\eta_{c=1}$	0.79	0.80	0.81	0.81	0.81	0.81	0.81	0.81	0.81			
43.917	η_a	0.67	$\eta_{c=1}$	0.83	0.86	0.87	0.88	0.88	0.89	0.89	0.88	0.88	0.88	0.88	
50.000	η_a	0.55	$\eta_{c=1}$	0.79	0.80	0.81	0.81	0.81	0.81	0.81	0.81	0.81			
54.250	η_a	0.57	$\eta_{c=1}$	0.79	0.81	0.82	0.82	0.83	0.83	0.82	0.82	0.82			
61.250	η_a	0.55	$\eta_{c=1}$	0.79	0.80	0.81	0.81	0.81	0.81	0.81	0.81	0.81			
70.611	η_a	0.57	$\eta_{c=1}$	0.79	0.81	0.82	0.82	0.83	0.83	0.82	0.82	0.82			
79.722	η_a	0.55	$\eta_{c=1}$	0.79	0.80	0.81	0.81	0.81	0.81	0.81	0.81	0.81			
87.833	η_a	0.57	$\eta_{c=1}$	0.79	0.81	0.82	0.82	0.83	0.83	0.82	0.82	0.82			
99.167	η_a	0.55	$\eta_{c=1}$	0.79	0.80	0.81	0.81	0.81	0.81	0.81	0.81	0.81			
113.667	η_a	0.57	$\eta_{c=1}$	0.79	0.81	0.82	0.82	0.83	0.83	0.82	0.82	0.82			
128.333	η_a	0.55	$\eta_{c=1}$	0.79	0.80	0.81	0.81	0.81	0.81	0.81	0.81	0.81			
137.950	η_a	0.57	$\eta_{c=1}$	0.79	0.81	0.82	0.82	0.83	0.83	0.82	0.82	0.82			
155.750	η_a	0.55	$\eta_{c=1}$	0.79	0.80	0.81	0.81	0.81	0.81	0.81	0.81	0.81			
176.313	η_a	0.57	$\eta_{c=1}$	0.79	0.81	0.82	0.82	0.83	0.83	0.82	0.82	0.82			
199.063	η_a	0.55	$\eta_{c=1}$	0.79	0.80	0.81	0.81	0.81	0.81	0.81	0.81	0.81			

Efficiencies

► During start-up, the start-up efficiency η_a of a helical-worm gearbox is lower than its operative efficiency at rated speed.
The start-up efficiency η_a must therefore always be considered when starting under load.

GSS05-3

				n_2 [r/min]										
				10	16	25	32	40	63	100	160	250	400	630
125.476	η_a	0.67	$\eta_{c=1}$	0.83	0.86	0.87	0.88	0.88	0.89	0.89	0.88	0.88	0.88	0.88
153.708	η_a	0.67	$\eta_{c=1}$	0.83	0.86	0.87	0.88	0.88	0.89	0.89	0.88	0.88	0.88	0.88
193.233	η_a	0.67	$\eta_{c=1}$	0.83	0.86	0.87	0.88	0.88	0.89	0.89	0.88	0.88	0.88	0.88
222.133	η_a	0.55	$\eta_{c=1}$	0.79	0.80	0.81	0.81	0.81	0.81	0.81	0.81	0.81		
250.952	η_a	0.57	$\eta_{c=1}$	0.79	0.81	0.82	0.82	0.83	0.83	0.82	0.82	0.82		
283.333	η_a	0.55	$\eta_{c=1}$	0.79	0.80	0.81	0.81	0.81	0.81	0.81	0.81	0.81		
307.417	η_a	0.57	$\eta_{c=1}$	0.79	0.81	0.82	0.82	0.83	0.83	0.82	0.82	0.82		
347.083	η_a	0.55	$\eta_{c=1}$	0.79	0.80	0.81	0.81	0.81	0.81	0.81	0.81	0.81		
386.467	η_a	0.57	$\eta_{c=1}$	0.79	0.81	0.82	0.82	0.83	0.83	0.82	0.82	0.82		
436.333	η_a	0.55	$\eta_{c=1}$	0.79	0.80	0.81	0.81	0.81	0.81	0.81	0.81	0.81		
497.722	η_a	0.57	$\eta_{c=1}$	0.79	0.81	0.82	0.82	0.83	0.83	0.82	0.82	0.82		
561.945	η_a	0.55	$\eta_{c=1}$	0.79	0.80	0.81	0.81	0.81	0.81	0.81	0.81	0.81		
630.803	η_a	0.57	$\eta_{c=1}$	0.79	0.81	0.82	0.82	0.83	0.83	0.82	0.82	0.82		
712.197	η_a	0.55	$\eta_{c=1}$	0.79	0.80	0.81	0.81	0.81	0.81	0.81	0.81	0.81		

Efficiencies

► During start-up, the start-up efficiency η_a of a helical-worm gearbox is lower than its operative efficiency at rated speed.
The start-up efficiency η_a must therefore always be considered when starting under load.

GSS06-2

				n_2 [r/min]											
				10	16	25	32	40	63	100	160	250	400	630	800
5.833	η_a	0.72	$\eta_{c=1}$	0.87	0.89	0.90	0.91	0.91	0.91	0.92	0.92	0.92	0.91	0.91	0.91
8.000	η_a	0.72	$\eta_{c=1}$	0.87	0.89	0.90	0.91	0.91	0.91	0.92	0.92	0.92	0.91	0.91	0.91
9.042	η_a	0.67	$\eta_{c=1}$	0.85	0.87	0.88	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	
10.238	η_a	0.72	$\eta_{c=1}$	0.87	0.89	0.90	0.91	0.91	0.91	0.92	0.92	0.92	0.91	0.91	0.91
11.200	η_a	0.72	$\eta_{c=1}$	0.87	0.89	0.90	0.91	0.91	0.91	0.92	0.92	0.92	0.91	0.91	0.91
12.400	η_a	0.67	$\eta_{c=1}$	0.85	0.87	0.88	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.80
14.286	η_a	0.72	$\eta_{c=1}$	0.89	0.90	0.91	0.91	0.91	0.92	0.92	0.92	0.91	0.91	0.91	
15.869	η_a	0.67	$\eta_{c=1}$	0.85	0.87	0.88	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	
17.360	η_a	0.67	$\eta_{c=1}$	0.85	0.87	0.88	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	
20.417	η_a	0.57	$\eta_{c=1}$	0.81	0.82	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
22.143	η_a	0.67	$\eta_{c=1}$	0.85	0.87	0.88	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	
24.800	η_a	0.57	$\eta_{c=1}$	0.81	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
27.125	η_a	0.67	$\eta_{c=1}$	0.85	0.87	0.88	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	
31.738	η_a	0.57	$\eta_{c=1}$	0.81	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
35.306	η_a	0.67	$\eta_{c=1}$	0.85	0.87	0.88	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	
39.200	η_a	0.57	$\eta_{c=1}$	0.81	0.82	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
43.917	η_a	0.67	$\eta_{c=1}$	0.85	0.87	0.88	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	
50.000	η_a	0.57	$\eta_{c=1}$	0.81	0.82	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
54.250	η_a	0.57	$\eta_{c=1}$	0.81	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
61.250	η_a	0.57	$\eta_{c=1}$	0.81	0.82	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
70.611	η_a	0.57	$\eta_{c=1}$	0.81	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
79.722	η_a	0.57	$\eta_{c=1}$	0.81	0.82	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
87.833	η_a	0.57	$\eta_{c=1}$	0.81	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
99.167	η_a	0.57	$\eta_{c=1}$	0.81	0.82	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
113.667	η_a	0.57	$\eta_{c=1}$	0.81	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
128.333	η_a	0.57	$\eta_{c=1}$	0.81	0.82	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
137.950	η_a	0.57	$\eta_{c=1}$	0.81	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
155.750	η_a	0.57	$\eta_{c=1}$	0.81	0.82	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
174.375	η_a	0.57	$\eta_{c=1}$	0.81	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
196.875	η_a	0.57	$\eta_{c=1}$	0.81	0.82	0.83	0.83	0.83	0.83	0.83	0.83	0.83			

Efficiencies

► During start-up, the start-up efficiency η_a of a helical-worm gearbox is lower than its operative efficiency at rated speed.
The start-up efficiency η_a must therefore always be considered when starting under load.

GSS06-3

				n_2 [r/min]											
				10	16	25	32	40	63	100	160	250	400	630	800
126.531	η_a	0.57	$\eta_{c=1}$	0.81	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.91	0.91	0.91
142.857	η_a	0.57	$\eta_{c=1}$	0.81	0.82	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
155.000	η_a	0.57	$\eta_{c=1}$	0.81	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
175.000	η_a	0.57	$\eta_{c=1}$	0.81	0.82	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
194.857	η_a	0.57	$\eta_{c=1}$	0.81	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
220.000	η_a	0.57	$\eta_{c=1}$	0.81	0.82	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
238.700	η_a	0.57	$\eta_{c=1}$	0.81	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
269.500	η_a	0.57	$\eta_{c=1}$	0.81	0.82	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
310.689	η_a	0.57	$\eta_{c=1}$	0.81	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
350.778	η_a	0.57	$\eta_{c=1}$	0.81	0.82	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
386.467	η_a	0.57	$\eta_{c=1}$	0.81	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
436.333	η_a	0.57	$\eta_{c=1}$	0.81	0.82	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
497.722	η_a	0.57	$\eta_{c=1}$	0.81	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
561.945	η_a	0.57	$\eta_{c=1}$	0.81	0.82	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
630.803	η_a	0.57	$\eta_{c=1}$	0.81	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
712.197	η_a	0.57	$\eta_{c=1}$	0.81	0.82	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
816.333	η_a	0.57	$\eta_{c=1}$	0.81	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
921.667	η_a	0.57	$\eta_{c=1}$	0.81	0.82	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
1023.000	η_a	0.57	$\eta_{c=1}$	0.81	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
1155.000	η_a	0.57	$\eta_{c=1}$	0.81	0.82	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
1241.550	η_a	0.57	$\eta_{c=1}$	0.81	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
1401.750	η_a	0.57	$\eta_{c=1}$	0.81	0.82	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
1635.693	η_a	0.57	$\eta_{c=1}$	0.81	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83			
1846.750	η_a	0.57	$\eta_{c=1}$	0.81	0.82	0.83	0.83	0.83	0.83	0.83	0.83	0.83			

Efficiencies

► During start-up, the start-up efficiency η_a of a helical-worm gearbox is lower than its operative efficiency at rated speed.
The start-up efficiency η_a must therefore always be considered when starting under load.

GSS07-2

				n_2 [r/min]											
				10	16	25	32	40	63	100	160	250	400	630	800
5.862	η_a	0.74	$\eta_{c=1}$	0.89	0.91	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
8.125	η_a	0.74	$\eta_{c=1}$	0.89	0.91	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
9.086	η_a	0.69	$\eta_{c=1}$	0.88	0.89	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	
10.000	η_a	0.74	$\eta_{c=1}$	0.89	0.91	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
11.200	η_a	0.74	$\eta_{c=1}$	0.89	0.91	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
12.594	η_a	0.69	$\eta_{c=1}$	0.88	0.89	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	
14.286	η_a	0.74	$\eta_{c=1}$	0.89	0.91	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
15.500	η_a	0.69	$\eta_{c=1}$	0.88	0.89	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	
17.360	η_a	0.69	$\eta_{c=1}$	0.88	0.89	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	
20.517	η_a	0.60	$\eta_{c=1}$	0.84	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85			
22.143	η_a	0.69	$\eta_{c=1}$	0.88	0.89	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	
25.188	η_a	0.60	$\eta_{c=1}$	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85			
27.125	η_a	0.69	$\eta_{c=1}$	0.88	0.89	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	
31.000	η_a	0.60	$\eta_{c=1}$	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85			
35.306	η_a	0.69	$\eta_{c=1}$	0.88	0.89	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	
39.200	η_a	0.60	$\eta_{c=1}$	0.84	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85			
43.271	η_a	0.69	$\eta_{c=1}$	0.88	0.89	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	
50.000	η_a	0.60	$\eta_{c=1}$	0.84	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85			
54.250	η_a	0.60	$\eta_{c=1}$	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85			
61.250	η_a	0.60	$\eta_{c=1}$	0.84	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85			
70.611	η_a	0.60	$\eta_{c=1}$	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85			
79.722	η_a	0.60	$\eta_{c=1}$	0.84	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85			
86.542	η_a	0.60	$\eta_{c=1}$	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85			
97.708	η_a	0.60	$\eta_{c=1}$	0.84	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85			
113.667	η_a	0.60	$\eta_{c=1}$	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85			
128.333	η_a	0.60	$\eta_{c=1}$	0.84	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85			
137.950	η_a	0.60	$\eta_{c=1}$	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85			
155.750	η_a	0.60	$\eta_{c=1}$	0.84	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85			
174.375	η_a	0.60	$\eta_{c=1}$	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85			
196.875	η_a	0.60	$\eta_{c=1}$	0.84	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85			

Efficiencies

► During start-up, the start-up efficiency η_a of a helical-worm gearbox is lower than its operative efficiency at rated speed.
The start-up efficiency η_a must therefore always be considered when starting under load.

GSS07-3

				n_2 [r/min]								
				10	16	25	32	40	63	100	160	250
126.531	η_a	0.60	$\eta_{c=1}$	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
142.857	η_a	0.60	$\eta_{c=1}$	0.84	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85
155.000	η_a	0.60	$\eta_{c=1}$	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
175.000	η_a	0.60	$\eta_{c=1}$	0.84	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85
201.746	η_a	0.60	$\eta_{c=1}$	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
227.778	η_a	0.60	$\eta_{c=1}$	0.84	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85
247.139	η_a	0.60	$\eta_{c=1}$	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
279.028	η_a	0.60	$\eta_{c=1}$	0.84	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85
321.673	η_a	0.60	$\eta_{c=1}$	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
363.179	η_a	0.60	$\eta_{c=1}$	0.84	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85
394.245	η_a	0.60	$\eta_{c=1}$	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
445.116	η_a	0.60	$\eta_{c=1}$	0.84	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85
490.403	η_a	0.60	$\eta_{c=1}$	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
553.681	η_a	0.60	$\eta_{c=1}$	0.84	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85
634.639	η_a	0.60	$\eta_{c=1}$	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
716.528	η_a	0.60	$\eta_{c=1}$	0.84	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85
833.556	η_a	0.60	$\eta_{c=1}$	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
941.111	η_a	0.60	$\eta_{c=1}$	0.84	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85
1011.633	η_a	0.60	$\eta_{c=1}$	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
1142.167	η_a	0.60	$\eta_{c=1}$	0.84	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85
1227.755	η_a	0.60	$\eta_{c=1}$	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
1386.175	η_a	0.60	$\eta_{c=1}$	0.84	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85
1569.181	η_a	0.60	$\eta_{c=1}$	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
1771.656	η_a	0.60	$\eta_{c=1}$	0.84	0.84	0.85	0.85	0.85	0.85	0.85	0.85	0.85

Weights

GSS□□-2M HAR / HBR

			080C32	090C12	090C32	100C12	100C32	112C22	132C12	132C22	160C22	160C32
GSS04	m	[kg]	23	29	31							
GSS05	m	[kg]	32	38	40	46	49					
GSS06	m	[kg]	45	51	53	59	61	74	96	103		
GSS07	m	[kg]	70	76	78	84	86	99	122	129	172	187

GSS□□-2M HAK

			080C32	090C12	090C32	100C12	100C32	112C22	132C12	132C22	160C22	160C32
GSS04	m	[kg]	26	31	33							
GSS05	m	[kg]	36	42	44	50	53					
GSS06	m	[kg]	52	58	60	66	68	81	103	110		
GSS07	m	[kg]	81	87	89	95	97	110	133	140	183	198

► Weights with oil filling for mounting position A; all values are approximate.
The weights relate to the basic version. Bear in mind that additional weights may be needed (e.g. for motor options).

Weights

GSS□□-2M VAR / VBR

			080C32	090C12	090C32	100C12	100C32	112C22	132C12	132C22	160C22	160C32
GSS04	m	[kg]	24	29	31							
GSS05	m	[kg]	33	39	41	47	50					
GSS06	m	[kg]	47	53	55	61	64	77	99	106		
GSS07	m	[kg]	75	81	83	89	91	104	127	134	177	192

GSS□□-2M VAK

			080C32	090C12	090C32	100C12	100C32	112C22	132C12	132C22	160C22	160C32
GSS04	m	[kg]	26	32	34							
GSS05	m	[kg]	37	43	45	51	54					
GSS06	m	[kg]	54	60	62	68	71	84	106	113		
GSS07	m	[kg]	86	92	94	100	102	115	138	145	188	203

► Weights with oil filling for mounting position A; all values are approximate.
The weights relate to the basic version. Bear in mind that additional weights may be needed (e.g. for motor options).

Weights

GSS□□-2M SAR / SBR

			080C32	090C12	090C32	100C12	100C32	112C22	132C12	132C22	160C22	160C32
GSS04	m	[kg]	24	29	31							
GSS05	m	[kg]	33	39	41	47	50					
GSS06	m	[kg]	46	52	54	60	62	75	97	104		
GSS07	m	[kg]	71	77	79	85	88	101	123	130	173	188

GSS□□-2M SAK

			080C32	090C12	090C32	100C12	100C32	112C22	132C12	132C22	160C22	160C32
GSS04	m	[kg]	26	32	34							
GSS05	m	[kg]	37	43	45	51	54					
GSS06	m	[kg]	53	59	61	67	69	82	104	111		
GSS07	m	[kg]	82	88	90	96	99	112	134	141	184	199

► Weights with oil filling for mounting position A; all values are approximate.
The weights relate to the basic version. Bear in mind that additional weights may be needed (e.g. for motor options).

Weights

GSS□□-3M HAR / HBR

			080C32	090C12	090C32	100C12
GSS06	m	[kg]	49	54		
GSS07	m	[kg]	78	83	85	91

GSS□□-3M HAK

			080C32	090C12	090C32	100C12
GSS06	m	[kg]	56	61		
GSS07	m	[kg]	89	94	96	102

GSS□□-3M VAR / VBR

			080C32	090C12	090C32	100C12
GSS06	m	[kg]	51	57		
GSS07	m	[kg]	83	88	90	96

GSS□□-3M VAK

			080C32	090C12	090C32	100C12
GSS06	m	[kg]	58	64		
GSS07	m	[kg]	94	99	101	107

GSS□□-3M SAR / SBR

			080C32	090C12	090C32	100C12
GSS06	m	[kg]	50	55		
GSS07	m	[kg]	79	85	87	93

GSS□□-3M SAK

			080C32	090C12	090C32	100C12
GSS06	m	[kg]	57	62		
GSS07	m	[kg]	90	96	98	104

► Weights with oil filling for mounting position A; all values are approximate.
The weights relate to the basic version. Bear in mind that additional weights may be needed (e.g. for motor options).

Selection tables

► 50 Hz, 60 Hz: P_N = 0.75 kW

n_N	1410 r/min				1720 r/min			i		
f_N	50 Hz				60 Hz					
	n_2 [r/min]	M_2 [Nm]	c		n_2 [r/min]	M_2 [Nm]	c			
	250	25	4.2		303	20	5.1	5.639	GSS04-2M □□□080C32	58
	182	34	4.2		221	28	5.1	7.733	GSS04-2M □□□080C32	58
	156	39	3.8		189	32	4.4	9.042	GSS04-2M □□□080C32	58
	143	45	3.5		173	36	4.3	9.897	GSS04-2M □□□080C32	58
	130	49	3.2		158	40	3.9	10.827	GSS04-2M □□□080C32	58
	114	54	3.1		138	44	3.5	12.400	GSS04-2M □□□080C32	58
	102	63	2.5		124	51	3.1	13.810	GSS04-2M □□□080C32	58
	89	69	2.5		108	57	3.0	15.869	GSS04-2M □□□080C32	58
	81	76	2.3		99	62	2.8	17.360	GSS04-2M □□□080C32	58
	69	82	1.9		84	67	2.1	20.417	GSS04-2M □□□080C32	58
	69	81	3.0		84	66	3.5	20.417	GSS05-2M □□□080C32	58
	64	97	1.8		77	79	2.2	22.143	GSS04-2M □□□080C32	58
	57	101	1.7		69	83	1.9	24.800	GSS04-2M □□□080C32	58
	52	118	1.5		63	97	1.8	27.125	GSS04-2M □□□080C32	58
	52	120	2.9		63	98	3.4	27.125	GSS05-2M □□□080C32	58
	44	129	1.4		54	106	1.6	31.738	GSS04-2M □□□080C32	58
	44	131	2.3		54	107	2.6	31.738	GSS05-2M □□□080C32	58
	41	148	1.2		50	122	1.5	34.100	GSS04-2M □□□080C32	58
	40	157	2.3		48	128	2.8	35.306	GSS05-2M □□□080C32	58
	36	155	1.2		44	128	1.4	39.200	GSS04-2M □□□080C32	58
	36	159	2.0		44	130	2.3	39.200	GSS05-2M □□□080C32	58
	32	190	0.9		39	156	1.1	43.917	GSS04-2M □□□080C32	58
	32	196	1.8		39	160	2.2	43.917	GSS05-2M □□□080C32	58
	32	191	2.9		39	156	3.5	43.917	GSS06-2M □□□080C32	58
	28	196	0.9		34	162	1.1	50.000	GSS04-2M □□□080C32	58
	28	204	1.7		34	167	2.0	50.000	GSS05-2M □□□080C32	58
	26	217	0.8		32	179	1.0	54.250	GSS04-2M □□□080C32	58
	26	226	1.6		32	184	1.9	54.250	GSS05-2M □□□080C32	58
	23	251	1.4		28	205	1.7	61.250	GSS05-2M □□□080C32	58
	20	294	1.2		24	241	1.5	70.611	GSS05-2M □□□080C32	58
	20	285	2.5		24	234	3.0	70.611	GSS06-2M □□□080C32	58
	18	328	1.1		21	268	1.3	79.722	GSS05-2M □□□080C32	58
	18	318	2.2		21	262	2.7	79.722	GSS06-2M □□□080C32	58
	16	365	1.0		20	300	1.2	87.833	GSS05-2M □□□080C32	58
	16	352	2.0		20	290	2.4	87.833	GSS06-2M □□□080C32	58
	14	405	0.9		17	334	1.1	99.167	GSS05-2M □□□080C32	58
	14	393	1.8		17	324	2.2	99.167	GSS06-2M □□□080C32	58
	12	451	1.6		15	372	1.9	113.667	GSS06-2M □□□080C32	58
	12	462	2.7		15	379	3.2	113.667	GSS07-2M □□□080C32	58
	11	478	1.5		14	394	1.8	126.531	GSS06-3M □□□080C32	66
	11	490	2.5		14	402	3.0	126.531	GSS07-3M □□□080C32	66

Selection tables

► 50 Hz, 60 Hz: P_N = 0.75 kW

n_N	1410 r/min				1720 r/min			i		
f_N	50 Hz				60 Hz					
	n_2 [r/min]	M_2 [Nm]	c		n_2 [r/min]	M_2 [Nm]	c			
	11	503	1.4		13	415	1.7	128.333	GSS06-2M □□□080C32	58
	11	515	2.4		13	424	2.9	128.333	GSS07-2M □□□080C32	58
	10	544	1.3		12	449	1.6	137.950	GSS06-2M □□□080C32	58
	10	560	2.2		12	459	2.7	137.950	GSS07-2M □□□080C32	58
	9.9	530	1.4		12	439	1.6	142.857	GSS06-3M □□□080C32	66
	9.9	546	2.3		12	449	2.7	142.857	GSS07-3M □□□080C32	66
	9.1	579	1.2		11	479	1.5	155.000	GSS06-3M □□□080C32	66
	9.1	599	2.1		11	492	2.5	155.000	GSS07-3M □□□080C32	66
	9.1	605	1.2		11	500	1.4	155.750	GSS06-2M □□□080C32	58
	9.1	623	2.0		11	512	2.4	155.750	GSS07-2M □□□080C32	58
	8.1	679	1.1		9.8	561	1.3	174.375	GSS06-2M □□□080C32	58
	8.1	701	1.8		9.8	579	2.1	174.375	GSS07-2M □□□080C32	58
	8.1	645	1.1		9.8	532	1.3	175.000	GSS06-3M □□□080C32	66
	8.1	664	1.9		9.8	547	2.2	175.000	GSS07-3M □□□080C32	66
	7.2	722	1.0		8.8	595	1.2	194.857	GSS06-3M □□□080C32	66
	7.2	755	1.0		8.7	625	1.1	196.875	GSS06-2M □□□080C32	58
	7.2	782	1.6		8.7	644	1.9	196.875	GSS07-2M □□□080C32	58
	7.0	768	1.6		8.5	636	1.9	201.746	GSS07-3M □□□080C32	66
	6.4	803	0.9		7.8	664	1.1	220.000	GSS06-3M □□□080C32	66
	6.2	855	1.5		7.5	707	1.8	227.778	GSS07-3M □□□080C32	66
	5.9	876	0.8		7.2	724	1.0	238.700	GSS06-3M □□□080C32	66
	5.7	935	1.3		6.9	770	1.6	247.139	GSS07-3M □□□080C32	66
	5.1	1039	1.2		6.1	858	1.4	279.028	GSS07-3M □□□080C32	66
	4.4	1203	1.0		5.3	994	1.3	321.673	GSS07-3M □□□080C32	66
	3.9	1335	0.9		4.7	1105	1.1	363.179	GSS07-3M □□□080C32	66
	3.6	1455	0.9		4.3	1207	1.0	394.245	GSS07-3M □□□080C32	66

Selection tables

► 50 Hz, 60 Hz: P_N = 1.1 kW

n_N	1430 r/min				1740 r/min			i		
f_N	50 Hz				60 Hz					
	n_2 [r/min]	M_2 [Nm]	c		n_2 [r/min]	M_2 [Nm]	c			
	254	36	4.0		307	30	4.2	5.639	GSS04-2M □□□090C12	58
	185	50	3.1		224	41	3.7	7.733	GSS04-2M □□□090C12	58
	158	58	2.6		191	47	3.0	9.042	GSS04-2M □□□090C12	58
	145	65	2.4		175	53	2.9	9.897	GSS04-2M □□□090C12	58
	132	72	2.2		160	58	2.7	10.827	GSS04-2M □□□090C12	58
	115	79	2.1		140	65	2.4	12.400	GSS04-2M □□□090C12	58
	104	92	1.8		125	75	2.1	13.810	GSS04-2M □□□090C12	58
	104	91	3.0		125	74	3.6	13.810	GSS05-2M □□□090C12	58
	90	101	1.8		109	83	2.0	15.869	GSS04-2M □□□090C12	58
	90	101	2.9		109	83	3.3	15.869	GSS05-2M □□□090C12	58
	82	111	1.6		100	91	1.9	17.360	GSS04-2M □□□090C12	58
	82	111	2.7		100	91	3.1	17.360	GSS05-2M □□□090C12	58
	70	119	1.3		85	98	1.5	20.417	GSS04-2M □□□090C12	58
	70	119	2.1		85	97	2.4	20.417	GSS05-2M □□□090C12	58
	65	141	1.3		78	116	1.5	22.143	GSS04-2M □□□090C12	58
	65	142	2.3		78	116	2.7	22.143	GSS05-2M □□□090C12	58
	58	147	1.2		70	121	1.3	24.800	GSS04-2M □□□090C12	58
	58	148	1.9		70	121	2.1	24.800	GSS05-2M □□□090C12	58
	53	172	1.0		64	142	1.3	27.125	GSS04-2M □□□090C12	58
	53	175	2.0		64	143	2.3	27.125	GSS05-2M □□□090C12	58
	45	187	1.0		55	155	1.1	31.738	GSS04-2M □□□090C12	58
	45	191	1.6		55	156	1.8	31.738	GSS05-2M □□□090C12	58
	45	188	3.2		55	155	3.6	31.738	GSS06-2M □□□090C12	58
	41	229	1.6		49	187	1.9	35.306	GSS05-2M □□□090C12	58
	41	223	3.2		49	182	3.8	35.306	GSS06-2M □□□090C12	58
	36	225	0.8		44	186	1.0	39.200	GSS04-2M □□□090C12	58
	37	232	1.4		44	190	1.6	39.200	GSS05-2M □□□090C12	58
	37	231	2.7		44	190	3.1	39.200	GSS06-2M □□□090C12	58
	33	285	1.3		39	234	1.5	43.917	GSS05-2M □□□090C12	58
	33	277	2.6		39	228	3.1	43.917	GSS06-2M □□□090C12	58
	29	297	1.2		35	243	1.3	50.000	GSS05-2M □□□090C12	58
	29	294	2.3		35	242	2.6	50.000	GSS06-2M □□□090C12	58
	26	328	1.1		32	269	1.3	54.250	GSS05-2M □□□090C12	58
	26	321	2.2		32	264	2.6	54.250	GSS06-2M □□□090C12	58
	23	365	1.0		28	299	1.2	61.250	GSS05-2M □□□090C12	58
	23	359	2.0		28	296	2.3	61.250	GSS06-2M □□□090C12	58
	20	427	0.8		25	351	1.0	70.611	GSS05-2M □□□090C12	58
	20	416	1.7		25	343	2.1	70.611	GSS06-2M □□□090C12	58
	20	421	2.9		25	346	3.5	70.611	GSS07-2M □□□090C12	58
	18	464	1.5		22	383	1.9	79.722	GSS06-2M □□□090C12	58
	18	473	2.6		22	389	3.1	79.722	GSS07-2M □□□090C12	58

Selection tables

► 50 Hz, 60 Hz: P_N = 1.1 kW

n_N	1430 r/min				1740 r/min			i		
f_N	50 Hz				60 Hz					
	n_2 [r/min]	M_2 [Nm]	c		n_2 [r/min]	M_2 [Nm]	c			
	17	515	2.4		20	424	2.9	86.542	GSS07-2M □□□090C12	58
	16	513	1.4		20	424	1.7	87.833	GSS06-2M □□□090C12	58
	15	577	2.1		18	476	2.6	97.708	GSS07-2M □□□090C12	58
	14	572	1.3		17	473	1.5	99.167	GSS06-2M □□□090C12	58
	13	657	1.1		15	544	1.3	113.667	GSS06-2M □□□090C12	58
	13	674	1.8		15	556	2.2	113.667	GSS07-2M □□□090C12	58
	11	695	1.0		14	576	1.2	126.531	GSS06-3M □□□090C12	66
	11	715	1.7		14	589	2.1	126.531	GSS07-3M □□□090C12	66
	11	731	1.0		14	606	1.2	128.333	GSS06-2M □□□090C12	58
	11	752	1.6		14	621	2.0	128.333	GSS07-2M □□□090C12	58
	10	791	0.9		13	655	1.1	137.950	GSS06-2M □□□090C12	58
	10	816	1.5		13	672	1.8	137.950	GSS07-2M □□□090C12	58
	10	771	0.9		12	641	1.1	142.857	GSS06-3M □□□090C12	66
	10	796	1.6		12	658	1.9	142.857	GSS07-3M □□□090C12	66
	9.2	842	0.9		11	699	1.0	155.000	GSS06-3M □□□090C12	66
	9.2	874	1.4		11	720	1.7	155.000	GSS07-3M □□□090C12	66
	9.2	880	0.8		11	729	1.0	155.750	GSS06-2M □□□090C12	58
	9.2	907	1.4		11	750	1.7	155.750	GSS07-2M □□□090C12	58
	8.2	1021	1.2		9.9	847	1.5	174.375	GSS07-2M □□□090C12	58
	8.2	968	1.3		9.9	801	1.6	175.000	GSS07-3M □□□090C12	66
	7.3	1137	1.1		8.8	941	1.3	196.875	GSS07-2M □□□090C12	58
	7.1	1117	1.1		8.6	930	1.3	201.746	GSS07-3M □□□090C12	66
	6.3	1244	1.0		7.6	1032	1.2	227.778	GSS07-3M □□□090C12	66
	5.8	1359	0.9		7.0	1124	1.1	247.139	GSS07-3M □□□090C12	66
	5.1	1510	0.8		6.2	1251	1.0	279.028	GSS07-3M □□□090C12	66

Selection tables

► 50 Hz, 60 Hz: P_N = 1.5 kW

n_N	1435 r/min				1745 r/min			i		
f_N	50 Hz				60 Hz					
	n_2 [r/min]	M_2 [Nm]	c		n_2 [r/min]	M_2 [Nm]	c			
	255	50	2.9		308	41	3.1	5.639	GSS04-2M □□□090C32	58
	186	69	2.3		224	57	2.7	7.733	GSS04-2M □□□090C32	58
	159	79	1.9		192	65	2.2	9.042	GSS04-2M □□□090C32	58
	159	78	3.1		192	64	3.6	9.042	GSS05-2M □□□090C32	58
	145	89	1.8		175	73	2.2	9.897	GSS04-2M □□□090C32	58
	145	88	3.0		175	72	3.6	9.897	GSS05-2M □□□090C32	58
	133	98	1.6		160	80	2.0	10.827	GSS04-2M □□□090C32	58
	133	97	2.8		160	79	3.3	10.827	GSS05-2M □□□090C32	58
	116	108	1.6		140	89	1.8	12.400	GSS04-2M □□□090C32	58
	116	108	2.5		140	88	2.9	12.400	GSS05-2M □□□090C32	58
	104	126	1.3		126	103	1.6	13.810	GSS04-2M □□□090C32	58
	104	125	2.2		126	102	2.6	13.810	GSS05-2M □□□090C32	58
	90	138	1.3		109	114	1.5	15.869	GSS04-2M □□□090C32	58
	90	139	2.1		109	114	2.4	15.869	GSS05-2M □□□090C32	58
	83	151	1.2		100	124	1.4	17.360	GSS04-2M □□□090C32	58
	83	152	2.0		100	125	2.3	17.360	GSS05-2M □□□090C32	58
	70	163	0.9		85	134	1.1	20.417	GSS04-2M □□□090C32	58
	70	163	1.5		85	133	1.8	20.417	GSS05-2M □□□090C32	58
	65	192	0.9		78	158	1.1	22.143	GSS04-2M □□□090C32	58
	65	195	1.7		78	160	2.0	22.143	GSS05-2M □□□090C32	58
	58	201	0.8		70	166	1.0	24.800	GSS04-2M □□□090C32	58
	58	203	1.4		70	166	1.6	24.800	GSS05-2M □□□090C32	58
	53	239	1.5		64	196	1.7	27.125	GSS05-2M □□□090C32	58
	53	234	3.0		64	192	3.4	27.125	GSS06-2M □□□090C32	58
	45	261	1.2		55	214	1.3	31.738	GSS05-2M □□□090C32	58
	45	258	2.3		55	213	2.6	31.738	GSS06-2M □□□090C32	58
	41	312	1.2		49	256	1.4	35.306	GSS05-2M □□□090C32	58
	41	305	2.3		49	251	2.8	35.306	GSS06-2M □□□090C32	58
	37	317	1.0		44	260	1.2	39.200	GSS05-2M □□□090C32	58
	37	316	2.0		44	261	2.3	39.200	GSS06-2M □□□090C32	58
	33	375	2.9		40	308	3.6	43.271	GSS07-2M □□□090C32	58
	33	389	0.9		40	319	1.1	43.917	GSS05-2M □□□090C32	58
	33	379	1.9		40	312	2.3	43.917	GSS06-2M □□□090C32	58
	29	405	0.9		35	332	1.0	50.000	GSS05-2M □□□090C32	58
	29	403	1.7		35	332	1.9	50.000	GSS06-2M □□□090C32	58
	29	407	3.0		35	334	3.5	50.000	GSS07-2M □□□090C32	58
	26	447	0.8		32	367	0.9	54.250	GSS05-2M □□□090C32	58
	27	439	1.6		32	362	1.9	54.250	GSS06-2M □□□090C32	58
	23	491	1.5		28	405	1.7	61.250	GSS06-2M □□□090C32	58
	20	568	1.3		25	469	1.5	70.611	GSS06-2M □□□090C32	58
	20	578	2.1		25	476	2.6	70.611	GSS07-2M □□□090C32	58

Selection tables

► 50 Hz, 60 Hz: P_N = 1.5 kW

n_N	1435 r/min				1745 r/min			i		
f_N	50 Hz				60 Hz					
	n_2 [r/min]	M_2 [Nm]	c		n_2 [r/min]	M_2 [Nm]	c			
	18	634	1.1		22	524	1.4	79.722	GSS06-2M □□□090C32	58
	18	648	1.9		22	534	2.3	79.722	GSS07-2M □□□090C32	58
	17	706	1.8		20	582	2.1	86.542	GSS07-2M □□□090C32	58
	16	700	1.0		20	580	1.2	87.833	GSS06-2M □□□090C32	58
	15	790	1.6		18	652	1.9	97.708	GSS07-2M □□□090C32	58
	15	780	0.9		18	647	1.1	99.167	GSS06-2M □□□090C32	58
	13	896	0.8		15	743	1.0	113.667	GSS06-2M □□□090C32	58
	13	922	1.4		15	761	1.6	113.667	GSS07-2M □□□090C32	58
	11	978	1.3		14	807	1.5	126.531	GSS07-3M □□□090C32	66
	11	1028	1.2		14	850	1.5	128.333	GSS07-2M □□□090C32	58
	10	1114	1.1		13	920	1.4	137.950	GSS07-2M □□□090C32	58
	10	1088	1.1		12	901	1.4	142.857	GSS07-3M □□□090C32	66
	9.3	1193	1.0		11	984	1.3	155.000	GSS07-3M □□□090C32	66
	9.2	1238	1.0		11	1025	1.2	155.750	GSS07-2M □□□090C32	58
	8.2	1392	0.9		10	1157	1.1	174.375	GSS07-2M □□□090C32	58
	8.2	1321	0.9		9.9	1094	1.1	175.000	GSS07-3M □□□090C32	66
	7.3	1551	0.8		8.8	1284	1.0	196.875	GSS07-2M □□□090C32	58
	7.1	1524	0.8		8.6	1270	1.0	201.746	GSS07-3M □□□090C32	66

Selection tables

► 50 Hz, 60 Hz: P_N = 2.2 kW

n_N	1445 r/min				1750 r/min			i		
f_N	50 Hz				60 Hz					
	n_2 [r/min]	M_2 [Nm]	c		n_2 [r/min]	M_2 [Nm]	c			
	256	73	3.0		310	60	3.2	5.639	GSS05-2M □□□100C12	58
	187	101	2.6		226	83	2.9	7.733	GSS05-2M □□□100C12	58
	160	115	2.2		193	94	2.5	9.042	GSS05-2M □□□100C12	58
	146	130	2.1		176	107	2.5	9.897	GSS05-2M □□□100C12	58
	134	143	1.9		161	117	2.3	10.827	GSS05-2M □□□100C12	58
	117	159	1.7		141	131	2.0	12.400	GSS05-2M □□□100C12	58
	117	157	3.2		141	130	3.4	12.400	GSS06-2M □□□100C12	58
	105	183	1.5		126	151	1.8	13.810	GSS05-2M □□□100C12	58
	101	188	2.8		122	154	3.3	14.286	GSS06-2M □□□100C12	58
	91	204	1.5		110	168	1.7	15.869	GSS05-2M □□□100C12	58
	91	202	2.9		110	166	3.2	15.869	GSS06-2M □□□100C12	58
	83	223	1.4		101	184	1.6	17.360	GSS05-2M □□□100C12	58
	83	221	2.8		101	182	3.1	17.360	GSS06-2M □□□100C12	58
	71	239	1.1		86	196	1.2	20.417	GSS05-2M □□□100C12	58
	71	243	2.0		86	201	2.1	20.417	GSS06-2M □□□100C12	58
	65	285	1.2		79	235	1.3	22.143	GSS05-2M □□□100C12	58
	65	281	2.4		79	232	2.7	22.143	GSS06-2M □□□100C12	58
	58	297	0.9		70	245	1.1	24.800	GSS05-2M □□□100C12	58
	58	297	1.9		70	246	2.0	24.800	GSS06-2M □□□100C12	58
	53	350	1.0		64	289	1.2	27.125	GSS05-2M □□□100C12	58
	53	345	2.1		64	285	2.3	27.125	GSS06-2M □□□100C12	58
	47	375	2.8		56	309	2.9	31.000	GSS07-2M □□□100C12	58
	46	381	0.8		55	314	0.9	31.738	GSS05-2M □□□100C12	58
	46	379	1.6		55	314	1.8	31.738	GSS06-2M □□□100C12	58
	41	449	1.6		49	371	1.9	35.306	GSS06-2M □□□100C12	58
	41	449	2.7		49	370	3.3	35.306	GSS07-2M □□□100C12	58
	37	464	1.4		45	385	1.5	39.200	GSS06-2M □□□100C12	58
	37	470	2.5		45	388	2.7	39.200	GSS07-2M □□□100C12	58
	33	550	2.2		40	454	2.7	43.271	GSS07-2M □□□100C12	58
	33	556	1.3		40	461	1.6	43.917	GSS06-2M □□□100C12	58
	29	590	1.2		35	489	1.3	50.000	GSS06-2M □□□100C12	58
	29	599	2.1		35	495	2.4	50.000	GSS07-2M □□□100C12	58
	27	644	1.1		32	534	1.3	54.250	GSS06-2M □□□100C12	58
	27	655	1.9		32	541	2.3	54.250	GSS07-2M □□□100C12	58
	24	719	1.0		29	597	1.2	61.250	GSS06-2M □□□100C12	58
	24	734	1.7		29	606	2.0	61.250	GSS07-2M □□□100C12	58
	21	831	0.9		25	691	1.0	70.611	GSS06-2M □□□100C12	58
	21	848	1.5		25	703	1.8	70.611	GSS07-2M □□□100C12	58
	18	950	1.3		22	787	1.6	79.722	GSS07-2M □□□100C12	58
	17	1035	1.2		20	858	1.4	86.542	GSS07-2M □□□100C12	58
	15	1157	1.1		18	961	1.3	97.708	GSS07-2M □□□100C12	58

Selection tables

► 50 Hz, 60 Hz: P_N = 2.2 kW

n_N	1445 r/min				1750 r/min			i		
f_N	50 Hz				60 Hz					
	n_2 [r/min]	M_2 [Nm]	c		n_2 [r/min]	M_2 [Nm]	c			
	13	1350	0.9		15	1120	1.1	113.667	GSS07-2M □□□100C12	58
	11	1431	0.9		14	1187	1.1	126.531	GSS07-3M □□□100C12	66
	11	1504	0.8		14	1251	1.0	128.333	GSS07-2M □□□100C12	58

Selection tables

► 50 Hz, 60 Hz: P_N = 3.0 kW

n_N	1445 r/min				1755 r/min			i		
f_N	50 Hz				60 Hz					
	n_2 [r/min]	M_2 [Nm]	c		n_2 [r/min]	M_2 [Nm]	c			
	256	101	2.2		310	82	2.3	5.639	GSS05-2M □□□100C32	58
	187	139	1.9		226	114	2.1	7.733	GSS05-2M □□□100C32	58
	160	158	1.6		193	129	1.8	9.042	GSS05-2M □□□100C32	58
	160	158	2.6		193	130	2.8	9.042	GSS06-2M □□□100C32	58
	146	179	1.5		176	146	1.8	9.897	GSS05-2M □□□100C32	58
	141	183	2.8		170	150	3.3	10.238	GSS06-2M □□□100C32	58
	134	196	1.4		161	160	1.7	10.827	GSS05-2M □□□100C32	58
	129	201	2.6		156	164	3.1	11.200	GSS06-2M □□□100C32	58
	117	217	1.3		141	178	1.5	12.400	GSS05-2M □□□100C32	58
	117	217	2.4		141	179	2.5	12.400	GSS06-2M □□□100C32	58
	105	251	1.1		126	206	1.3	13.810	GSS05-2M □□□100C32	58
	101	258	2.0		122	212	2.5	14.286	GSS06-2M □□□100C32	58
	91	279	1.1		110	229	1.2	15.869	GSS05-2M □□□100C32	58
	91	278	2.2		110	228	2.4	15.869	GSS06-2M □□□100C32	58
	83	305	1.0		101	251	1.2	17.360	GSS05-2M □□□100C32	58
	83	304	2.0		101	250	2.3	17.360	GSS06-2M □□□100C32	58
	71	334	1.5		86	275	1.5	20.417	GSS06-2M □□□100C32	58
	65	390	0.9		79	321	1.0	22.143	GSS05-2M □□□100C32	58
	65	386	1.7		79	318	2.0	22.143	GSS06-2M □□□100C32	58
	65	385	3.1		79	317	3.3	22.143	GSS07-2M □□□100C32	58
	58	408	1.4		70	336	1.5	24.800	GSS06-2M □□□100C32	58
	53	473	1.5		64	390	1.7	27.125	GSS06-2M □□□100C32	58
	53	473	2.6		64	388	3.1	27.125	GSS07-2M □□□100C32	58
	47	515	2.0		56	424	2.2	31.000	GSS07-2M □□□100C32	58
	46	520	1.2		55	430	1.3	31.738	GSS06-2M □□□100C32	58
	41	615	1.2		49	507	1.4	35.306	GSS06-2M □□□100C32	58
	41	617	2.0		49	507	2.4	35.306	GSS07-2M □□□100C32	58
	37	636	1.0		45	526	1.1	39.200	GSS06-2M □□□100C32	58
	37	646	1.8		45	532	2.0	39.200	GSS07-2M □□□100C32	58
	33	756	1.6		40	623	2.0	43.271	GSS07-2M □□□100C32	58
	33	761	0.9		40	629	1.1	43.917	GSS06-2M □□□100C32	58
	29	808	0.9		35	667	1.0	50.000	GSS06-2M □□□100C32	58
	29	822	1.5		35	678	1.8	50.000	GSS07-2M □□□100C32	58
	27	881	0.8		32	729	0.9	54.250	GSS06-2M □□□100C32	58
	27	898	1.4		32	741	1.7	54.250	GSS07-2M □□□100C32	58
	24	1006	1.2		29	829	1.5	61.250	GSS07-2M □□□100C32	58
	21	1162	1.1		25	961	1.3	70.611	GSS07-2M □□□100C32	58
	18	1301	1.0		22	1076	1.2	79.722	GSS07-2M □□□100C32	58
	17	1417	0.9		20	1172	1.1	86.542	GSS07-2M □□□100C32	58

Selection tables

► 50 Hz, 60 Hz: P_N = 4.0 kW

n_N	1455 r/min				1760 r/min			i		
f_N	50 Hz				60 Hz					
	n_2 [r/min]	M_2 [Nm]	c		n_2 [r/min]	M_2 [Nm]	c			
	249	138	2.5		301	114	2.7	5.833	GSS06-2M □□□112C22	58
	182	190	2.5		219	157	2.4	8.000	GSS06-2M □□□112C22	58
	161	211	2.0		194	174	2.1	9.042	GSS06-2M □□□112C22	58
	160	211	2.9		193	174	3.1	9.086	GSS07-2M □□□112C22	58
	142	245	2.1		171	201	2.5	10.238	GSS06-2M □□□112C22	58
	130	268	1.9		157	221	2.3	11.200	GSS06-2M □□□112C22	58
	130	267	3.2		157	220	3.4	11.200	GSS07-2M □□□112C22	58
	117	289	1.8		142	239	1.9	12.400	GSS06-2M □□□112C22	58
	116	293	2.7		139	242	2.8	12.594	GSS07-2M □□□112C22	58
	102	344	1.5		123	283	1.8	14.286	GSS06-2M □□□112C22	58
	102	343	2.6		123	282	3.1	14.286	GSS07-2M □□□112C22	58
	94	361	2.5		113	298	2.7	15.500	GSS07-2M □□□112C22	58
	92	370	1.6		111	306	1.8	15.869	GSS06-2M □□□112C22	58
	84	404	1.5		101	334	1.7	17.360	GSS06-2M □□□112C22	58
	84	404	2.5		101	334	2.6	17.360	GSS07-2M □□□112C22	58
	71	444	1.1		86	367	1.2	20.417	GSS06-2M □□□112C22	58
	71	451	1.7		86	373	1.8	20.517	GSS07-2M □□□112C22	58
	66	514	1.3		79	426	1.5	22.143	GSS06-2M □□□112C22	58
	66	514	2.3		79	426	2.4	22.143	GSS07-2M □□□112C22	58
	59	542	1.0		71	449	1.1	24.800	GSS06-2M □□□112C22	58
	58	558	1.6		70	462	1.7	25.188	GSS07-2M □□□112C22	58
	54	629	1.1		65	521	1.3	27.125	GSS06-2M □□□112C22	58
	54	631	2.0		65	521	2.3	27.125	GSS07-2M □□□112C22	58
	47	686	1.5		57	568	1.6	31.000	GSS07-2M □□□112C22	58
	46	691	0.9		55	573	1.0	31.738	GSS06-2M □□□112C22	58
	41	822	1.5		50	679	1.8	35.306	GSS07-2M □□□112C22	58
	37	859	1.4		45	711	1.5	39.200	GSS07-2M □□□112C22	58
	34	1005	1.2		41	832	1.5	43.271	GSS07-2M □□□112C22	58
	29	1094	1.1		35	906	1.3	50.000	GSS07-2M □□□112C22	58
	27	1194	1.0		32	990	1.3	54.250	GSS07-2M □□□112C22	58
	24	1337	0.9		29	1107	1.1	61.250	GSS07-2M □□□112C22	58
	21	1544	0.8		25	1282	1.0	70.611	GSS07-2M □□□112C22	58

Selection tables

► 50 Hz, 60 Hz: P_N = 5.5 kW

n_N	1470 r/min				1775 r/min			i		
f_N	50 Hz				60 Hz					
	n_2 [r/min]	M_2 [Nm]	c		n_2 [r/min]	M_2 [Nm]	c			
	252	189	1.9		303	156	2.0	5.833	GSS06-2M□□□132C12	58
	251	190	2.8		302	157	2.9	5.862	GSS07-2M □□□132C12	58
	184	260	1.9		221	216	1.8	8.000	GSS06-2M□□□132C12	58
	181	265	2.5		218	219	2.7	8.125	GSS07-2M □□□132C12	58
	163	289	1.4		196	239	1.5	9.042	GSS06-2M□□□132C12	58
	162	290	2.1		195	240	2.3	9.086	GSS07-2M □□□132C12	58
	147	327	2.4		177	270	2.5	10.000	GSS07-2M □□□132C12	58
	144	335	1.5		173	276	1.8	10.238	GSS06-2M□□□132C12	58
	131	367	1.4		158	303	1.7	11.200	GSS06-2M□□□132C12	58
	131	367	2.3		158	303	2.5	11.200	GSS07-2M □□□132C12	58
	119	395	1.3		143	328	1.4	12.400	GSS06-2M□□□132C12	58
	117	402	2.0		141	333	2.1	12.594	GSS07-2M □□□132C12	58
	103	470	1.1		124	388	1.4	14.286	GSS06-2M□□□132C12	58
	103	469	2.2		124	387	2.3	14.286	GSS07-2M □□□132C12	58
	95	495	1.9		114	410	2.0	15.500	GSS07-2M □□□132C12	58
	93	506	1.2		112	419	1.3	15.869	GSS06-2M□□□132C12	58
	85	553	1.1		102	458	1.3	17.360	GSS06-2M□□□132C12	58
	85	554	1.8		102	459	1.9	17.360	GSS07-2M □□□132C12	58
	72	606	0.8		87	503	0.9	20.417	GSS06-2M□□□132C12	58
	72	618	1.2		86	512	1.3	20.517	GSS07-2M □□□132C12	58
	66	702	1.0		80	583	1.1	22.143	GSS06-2M□□□132C12	58
	66	705	1.7		80	584	1.8	22.143	GSS07-2M □□□132C12	58
	58	763	1.2		70	633	1.3	25.188	GSS07-2M □□□132C12	58
	54	859	0.8		65	713	0.9	27.125	GSS06-2M□□□132C12	58
	54	864	1.4		65	715	1.7	27.125	GSS07-2M □□□132C12	58
	47	939	1.1		57	778	1.2	31.000	GSS07-2M □□□132C12	58
	42	1123	1.1		50	931	1.3	35.306	GSS07-2M □□□132C12	58
	38	1175	1.0		45	974	1.1	39.200	GSS07-2M □□□132C12	58
	29	1494	0.8		35	1240	1.0	50.000	GSS07-2M □□□132C12	58

Selection tables

► 50 Hz, 60 Hz: P_N = 7.5 kW

n_N	1460 r/min				1765 r/min			i		
f_N	50 Hz				60 Hz					
	n_2 [r/min]	M_2 [Nm]	c		n_2 [r/min]	M_2 [Nm]	c			
	250	261	1.4		302	216	1.4	5.833	GSS06-2M□□□132C22	58
	249	263	2.0		300	217	2.1	5.862	GSS07-2M □□□132C22	58
	183	360	1.4		220	297	1.3	8.000	GSS06-2M□□□132C22	58
	180	366	1.9		217	303	2.0	8.125	GSS07-2M □□□132C22	58
	162	398	1.0		195	329	1.1	9.042	GSS06-2M□□□132C22	58
	161	401	1.6		194	331	1.6	9.086	GSS07-2M □□□132C22	58
	146	452	1.8		176	373	1.9	10.000	GSS07-2M □□□132C22	58
	143	462	1.1		172	381	1.3	10.238	GSS06-2M□□□132C22	58
	130	506	1.0		157	417	1.3	11.200	GSS06-2M□□□132C22	58
	130	507	1.7		157	418	1.8	11.200	GSS07-2M □□□132C22	58
	118	545	1.0		142	451	1.0	12.400	GSS06-2M□□□132C22	58
	116	555	1.4		140	459	1.5	12.594	GSS07-2M □□□132C22	58
	102	648	0.8		123	534	1.0	14.286	GSS06-2M□□□132C22	58
	102	647	1.6		123	535	1.7	14.286	GSS07-2M □□□132C22	58
	94	683	1.4		114	565	1.4	15.500	GSS07-2M □□□132C22	58
	92	697	0.9		111	577	1.0	15.869	GSS06-2M□□□132C22	58
	84	762	0.8		102	630	0.9	17.360	GSS06-2M□□□132C22	58
	84	765	1.3		101	633	1.4	17.360	GSS07-2M □□□132C22	58
	71	851	0.9		86	705	1.0	20.517	GSS07-2M □□□132C22	58
	66	972	1.2		80	806	1.3	22.143	GSS07-2M □□□132C22	58
	58	1052	0.9		70	872	0.9	25.188	GSS07-2M □□□132C22	58
	54	1191	1.0		65	985	1.2	27.125	GSS07-2M □□□132C22	58
	47	1293	0.8		57	1071	0.9	31.000	GSS07-2M □□□132C22	58
	41	1547	0.8		50	1282	1.0	35.306	GSS07-2M □□□132C22	58

Selection tables

► 50 Hz, 60 Hz: P_N = 11.0 kW

n_N	1470 r/min				1775 r/min			i		
f_N	50 Hz				60 Hz					
	n_2 [r/min]	M_2 [Nm]	c		n_2 [r/min]	M_2 [Nm]	c			
	251	386	1.4		302	319	1.5	5.862	GSS07-2M □□□160C22	58
	181	537	1.3		218	444	1.3	8.125	GSS07-2M □□□160C22	58
	162	587	1.1		195	486	1.1	9.086	GSS07-2M □□□160C22	58
	147	662	1.2		177	548	1.3	10.000	GSS07-2M □□□160C22	58
	131	742	1.2		158	614	1.2	11.200	GSS07-2M □□□160C22	58
	117	813	1.0		141	673	1.0	12.594	GSS07-2M □□□160C22	58
	95	1000	0.9		114	829	1.0	15.500	GSS07-2M □□□160C22	58
	85	1119	0.9		102	928	1.0	17.360	GSS07-2M □□□160C22	58

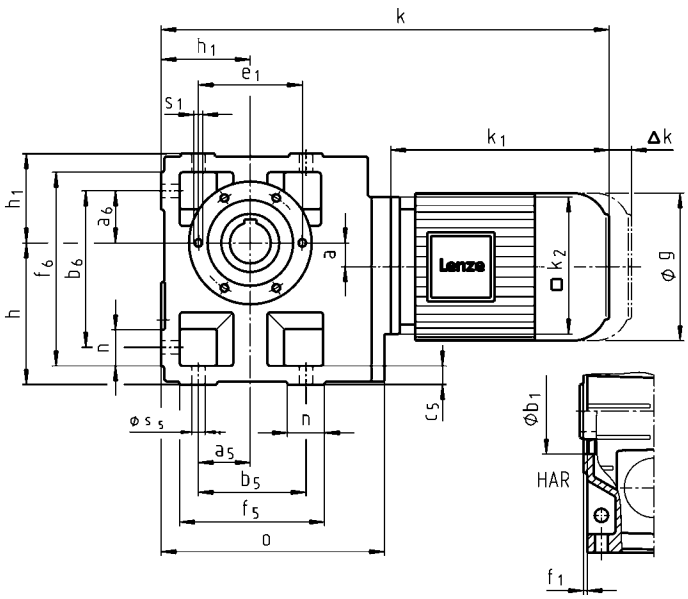
Selection tables

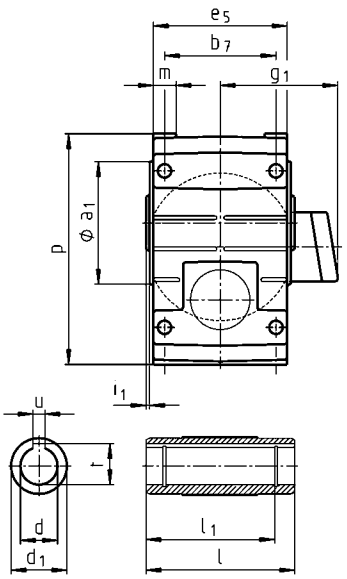
► 50 Hz, 60 Hz: P_N = 15.0 kW

n_N	1470 r/min				1775 r/min			i		
f_N	50 Hz				60 Hz					
	n_2 [r/min]	M_2 [Nm]	c		n_2 [r/min]	M_2 [Nm]	c			
	251	529	1.0		302	437	1.1	5.862	GSS07-2M □□□160C32	58
	181	735	0.9		218	608	1.0	8.125	GSS07-2M □□□160C32	58
	147	906	0.9		178	749	0.9	10.000	GSS07-2M □□□160C32	58
	131	1015	0.9		158	840	0.9	11.200	GSS07-2M □□□160C32	58

Dimensions

GSS□□-2M H□R





		080C32	090C12	090C32	100C12
g		156	176		194
g_1	MHEMAXX	150	152	157	166
	MHEMABR	132	137		147
k_1	MHEMAXX	224.5	274		309
k_2		145	180		
Δ k	MHEMABR	73	68		76
	MHFMAXX	128			109
	MHFMABR	183	181		170
		k			
GSS04		420	479		
GSS05		441	501		536
GSS06		481	541		576
GSS07		524	584		619

GSS Helical-worm gearbox

Technical data

		100C32	112C22	132C12 132C22	160C22	160C32
g		194	218	258	310	
g_1	MHEMAXX	166	176	195	210	
	MHEMABR	147	158	187	210	
k_1	MHEMAXX	324	363	403	457.5	501.5
k_2		180	222	265	300	
Δ k	MHEMABR	76	90	109.5	105	
	MHFMAXX	109	102	115	149	
	MHFMABR	170	183	201.5	179	
		k				
GSS05		551				
GSS06		591	636	684		
GSS07		634	679	727	786	830

	a	h[1)]	h_1	o	p[1)]
GSS04	20	100	71	181	171
GSS05	23	125	80	212	205
GSS06	26	150	100	255	250
GSS07	33	190	120	305	310

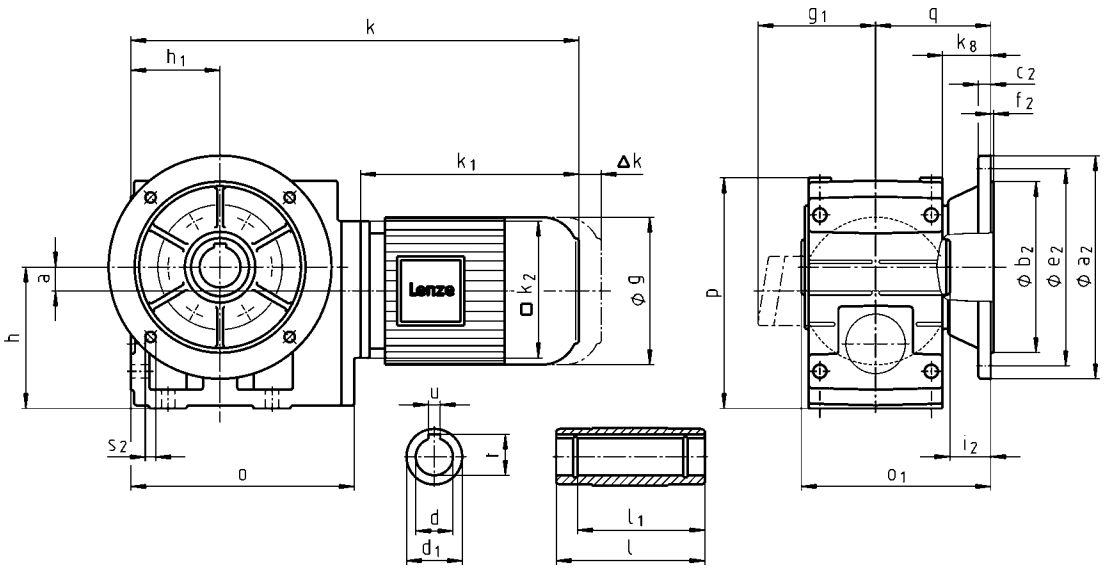
	d	d_1	l[1)]	l_1	u	t	i_1	a_1	b_1	e_1	f_1	s_1
	H7				JS9	+0,2			H7			
GSS04	25 30	45 45	115 115	100 100	8 8	28.3 33.3	2.5 2.5	104	75	90	3	M6x12
GSS05	30 35	50 50	140 140	124 124	8 10	33.3 38.3	4 4	118	80	100	4	M8x15
GSS06	40 45	65 65	160 160	140 140	12 14	43.3 48.8	5 5	140	100	120	4	M10x16
GSS07	50 55	75 75	200 200	175 175	14 16	53.8 59.3	5 5	165	115	140	5	M12x18

	a_5	a_6	b_5	b_6	b_7	c_5	e_5	f_5	f_6	m	n	s_5
GSS04	45	45	90	119	85	14	100	112	141	20	22	9
GSS05	47.5	47.5	95	140	105	17	115	124	169	21	29	11
GSS06	60	60	120	170	120	20	145	156	206	23	36	14
GSS07	70	70	140	210	150	25	180	185	255	28	45	18

[1)] k_2 !

Dimensions

GSS□□-2M HAK



		080C32	090C12	090C32	100C12
g		156	176		194
g_1	MHEMAXX	150	152	157	166
	MHEMABR	132	137		147
k_1	MHEMAXX	224.5	274		309
k_2		145	180		
Δ k	MHEMABR	73	68		76
	MHFMAXX	128			109
	MHFMABR	183	181		170
		k			
GSS04		420	479		
GSS05		441	501		536
GSS06		481	541		576
GSS07		524	584		619

GSS Helical-worm gearbox

Technical data

		100C32	112C22	132C12 132C22	160C22	160C32
g		194	218	258	310	
g_1	MHEMAXX	166	176	195	210	
	MHEMABR	147	158	187	210	
k_1	MHEMAXX	324	363	403	457.5	501.5
k_2		180	222	265	300	
Δ k	MHEMABR	76	90	109.5	105	
	MHFMAXX	109	102	115	149	
	MHFMABR	170	183	201.5	179	
		k				
	GSS05	551				
	GSS06	591	636	684		
	GSS07	634	679	727	786	830

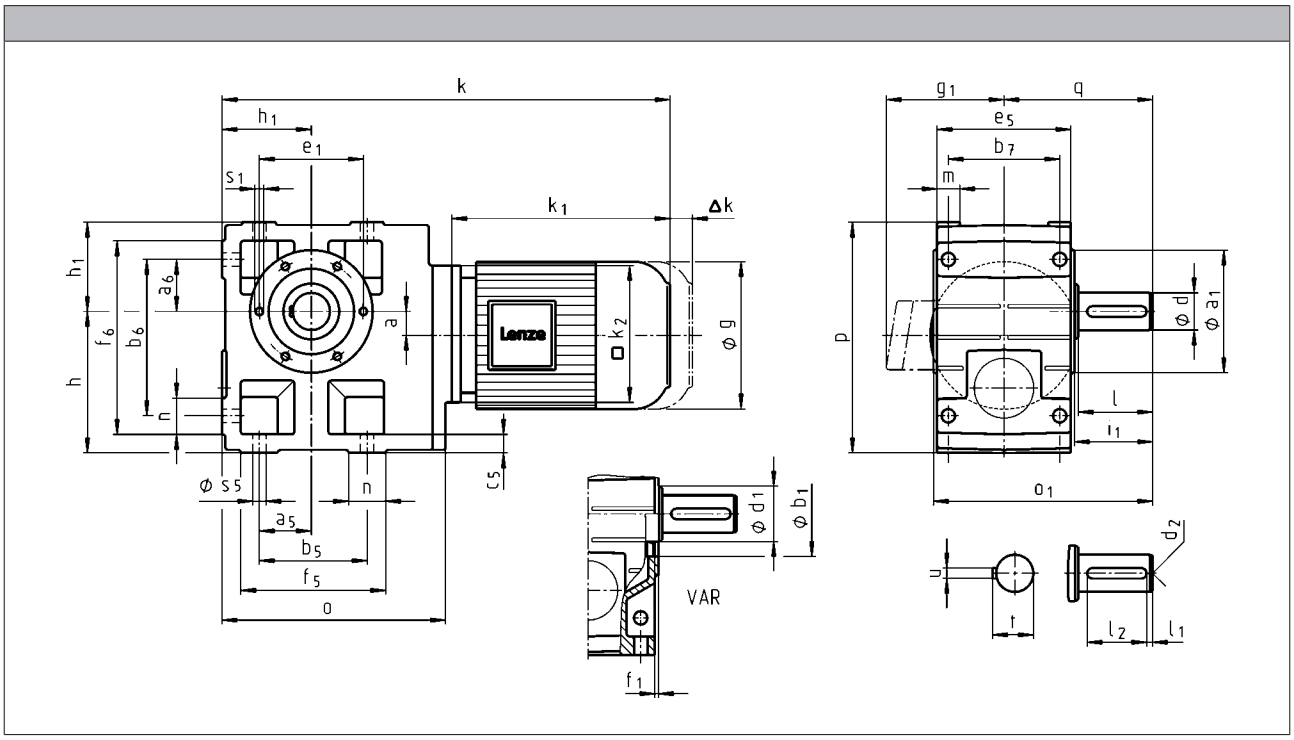
	a	h[1)]	h_1	k_8	o	p[1)]	q
GSS04	20	100	71	41	181	171	91
GSS05	23	125	80	40	212	205	103.5
GSS06	26	150	100	49	255	250	121.5
GSS07	33	190	120	65.5	305	310	155.5

	d	d_1	l	l_1	u	t	i_2	o_1[1)]	a_2	b_2	c_2	e_2	f_2	s_2
	H7				JS9	+0,2				j7				
GSS04	25 30	45 45	115 115	100 100	8 8	28.3 33.3	33.5 33.5	148.5 148.5	160	110	10	130	3.5	4 x 9
GSS05	30 35	50 50	140 140	124 124	8 10	33.3 38.3	33 33	173.5 173.5	200	130	12	165	4	4 x 11
GSS06	40 45	65 65	160 160	140 140	12 14	43.3 48.8	42 41	201.5 201.5	200 250	130 180	12 15	165 215	3.5 4	4 x 11 4 x 14
GSS07	50 55	75 75	200 200	175 175	14 16	53.8 59.3	55 55	255.5 255.5	250 300	180 230	15 17	215 265	4 4	4 x 14 4 x 14

[1)] k_2 !

Dimensions

GSS□□-2M V□R



		080C32	090C12	090C32	100C12
g		156	176		194
g_1	MHEMAXX	150	152	157	166
	MHEMABR	132	137		147
k_1	MHEMAXX	224.5	274		309
k_2		145	180		
Δ k	MHEMABR	73	68		76
	MHFMAXX		128		109
	MHFMABR	183	181		170
		k			
	GSS04	420	479		
	GSS05	441	501		536
	GSS06	481	541		576
	GSS07	524	584		619

		100C32	112C22	132C12 132C22	160C22	160C32
g		194	218	258	310	
g_1	MHEMAXX	166	176	195	210	
	MHEMABR	147	158	187	210	
k_1	MHEMAXX	324	363	403	457.5	501.5
k_2		180	222	265	300	
Δ k	MHEMABR	76	90	109.5	105	
	MHFMAXX	109	102	115	149	
	MHFMABR	170	183	201.5	179	
		k				
GSS05		551				
GSS06		591	636	684		
GSS07		634	679	727	786	830

	a	h[1)]	h_1	o	p[1)]	q
GSS04	20	100	71	181	171	107.5
GSS05	23	125	80	212	205	130
GSS06	26	150	100	255	250	160
GSS07	33	190	120	305	310	200

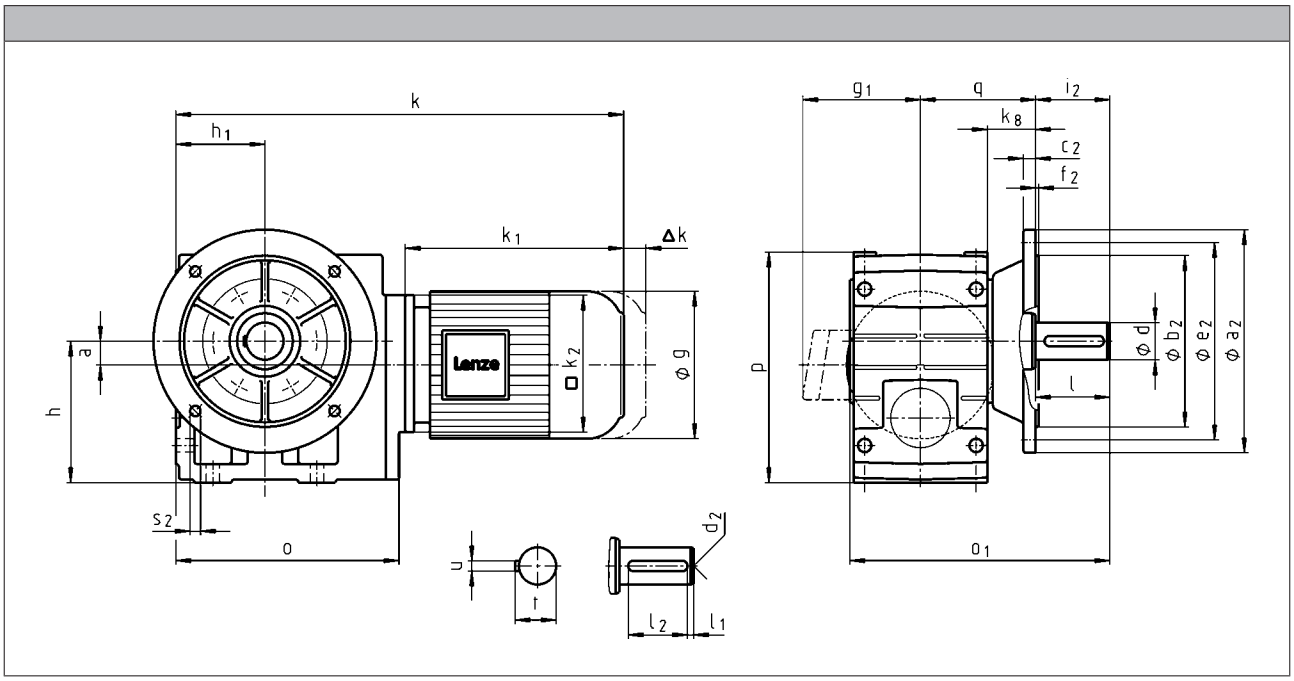
	d	d_1	d_2	l	l_1	l_2	u	t	i_1	o_1[1)]	a_1	b_1	e_1	f_1	s_1
	k6											H7			
GSS04	25	45	M10	50	6	40	8	28	52.5	162.5	104	75	90	3	M6x12
GSS05	30	45	M10	60	6	45	8	33	64	196.5	118	80	100	4	M8x15
GSS06	40	65	M16	80	7	63	12	43	85	235.5	140	100	120	4	M10x16
GSS07	50	75	M16	100	8	80	14	53.5	105	295.5	165	115	140	5	M12x18

	a_5	a_6	b_5	b_6	b_7	c_5	e_5	f_5	f_6	m	n	s_5
GSS04	45	45	90	119	85	14	100	112	141	20	22	9
GSS05	47.5	47.5	95	140	105	17	115	124	169	21	29	11
GSS06	60	60	120	170	120	20	145	156	206	23	36	14
GSS07	70	70	140	210	150	25	180	185	255	28	45	18

[1)] k_2 !

Dimensions

GSS□□-2M VAK



		080C32	090C12	090C32	100C12
g		156	176		194
g_1	MHEMAXX	150	152	157	166
	MHEMABR	132	137		147
k_1	MHEMAXX	224.5	274		309
k_2		145	180		
Δ k	MHEMABR	73	68		76
	MHFMAXX		128		109
	MHFMABR	183	181		170
		k			
GSS04		420	479		
GSS05		441	501		536
GSS06		481	541		576
GSS07		524	584		619

		100C32	112C22	132C12 132C22	160C22	160C32
g		194	218	258	310	
g_1	MHEMAXX	166	176	195	210	
	MHEMABR	147	158	187	210	
k_1	MHEMAXX	324	363	403	457.5	501.5
k_2		180	222	265	300	
Δ k	MHEMABR	76	90	109.5	105	
	MHFMAXX	109	102	115	149	
	MHFMABR	170	183	201.5	179	
		k				
GSS05		551				
GSS06		591	636	684		
GSS07		634	679	727	786	830

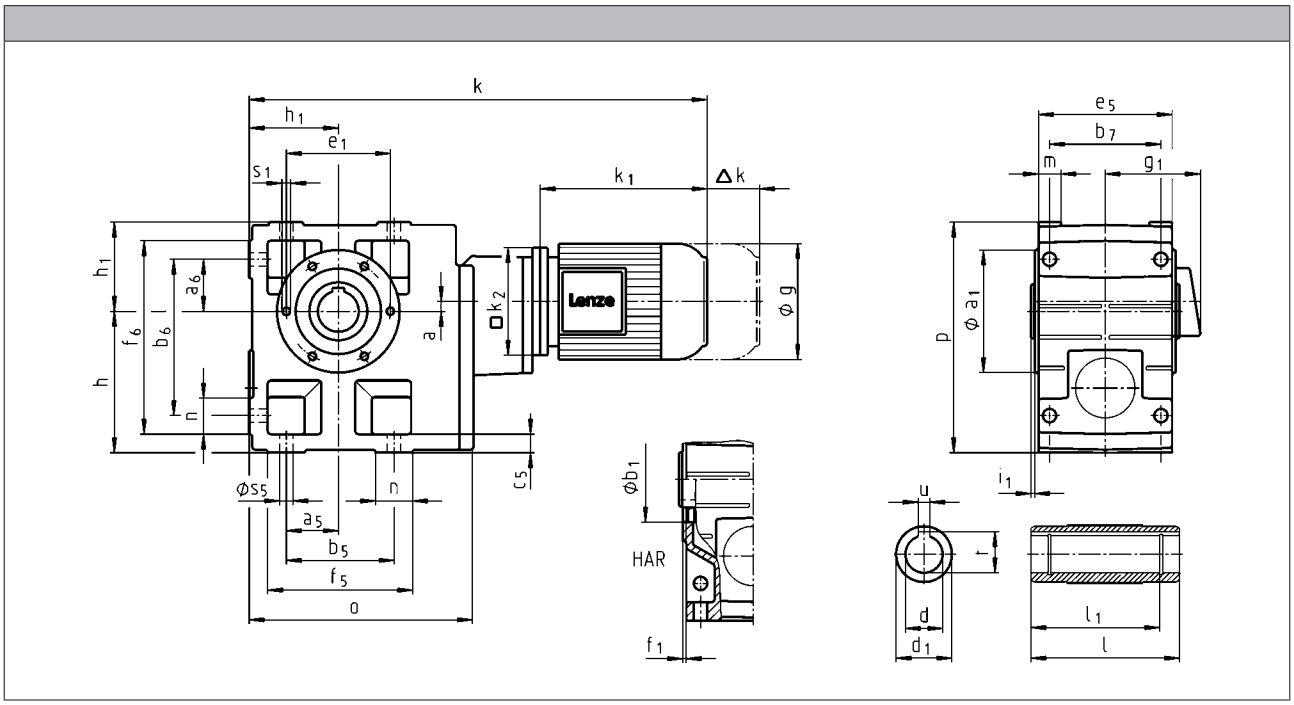
	a	h[1)]	h_1	k_8	o	p[1)]	q
GSS04	20	100	71	41	181	171	91
GSS05	23	125	80	40	212	205	103.5
GSS06	26	150	100	49	255	250	121.5
GSS07	33	190	120	65.5	305	310	155.5

	d	d_2	l	l_1	l_2	u	t	i_2	o_1[1)]	a_2	b_2	c_2	e_2	f_2	s_2
	k6										j7				
GSS04	25	M10	50	6	40	8	28	50	195.5	160	110	10	130	3.5	4 x 9
GSS05	30	M10	60	6	45	8	33	60	229.5	200	130	12	165	4	4 x 11
GSS06	40	M16	80	7	63	12	43	80	276.5	250	180	15	215	4	4 x 14
GSS07	50	M16	100	8	80	14	53.5	100	350.5	250 300	180 230	15 17	215 265	4 4	4 x 14 4 x 14

[1)] k_2 !

Dimensions

GSS□□-3M H□R



		080C32	090C12	090C32	100C12
g		156	176		194
g_1	MHEMAXX	150	152	157	166
	MHEMABR	132	137		147
k_1	MHEMAXX	224.5	274		309
k_2		145	180		
Δ k	MHEMABR	73	68		76
	MHFMAXX		128		109
	MHFMABR	183	181		170
		k			
GSS06		575	634		
GSS07		629	688		723

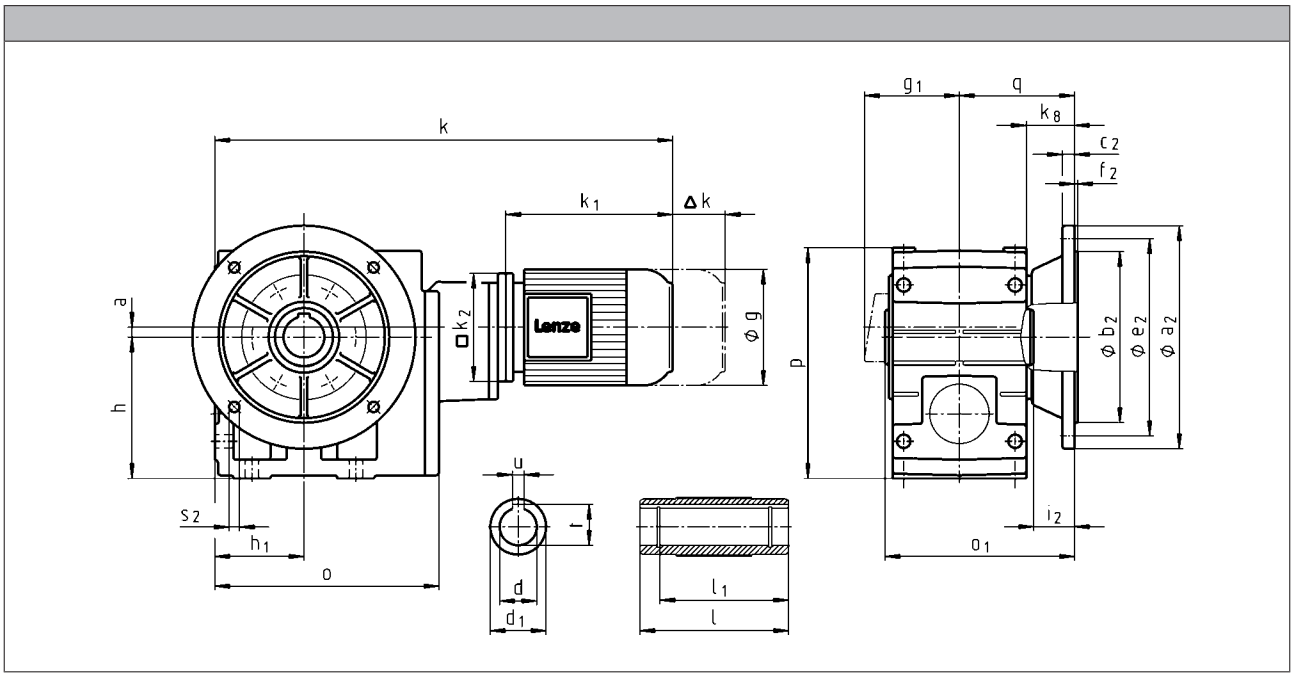
	a	h	h_1	o	p
GSS06	10	150	100	252	250
GSS07	12	190	120	299	310

	d	d_1	l	l_1	u	t	i_1	a_1	b_1	e_1	f_1	s_1
	H7				JS9	+0,2			H7			
GSS06	40 45	65 65	160 160	140 140	12 14	43.3 48.8	5 5	140	100	120	4	M10x16
GSS07	50 55	75 75	200 200	175 175	14 16	53.8 59.3	5 5	165	115	140	5	M12x18

	a_5	a_6	b_5	b_6	b_7	c_5	e_5	f_5	f_6	m	n	s_5
GSS06	60	60	120	170	120	20	145	156	206	23	36	14
GSS07	70	70	140	210	150	25	180	185	255	28	45	18

Dimensions

GSS□□-3M HAK



GSS Helical-worm gearbox

Technical data

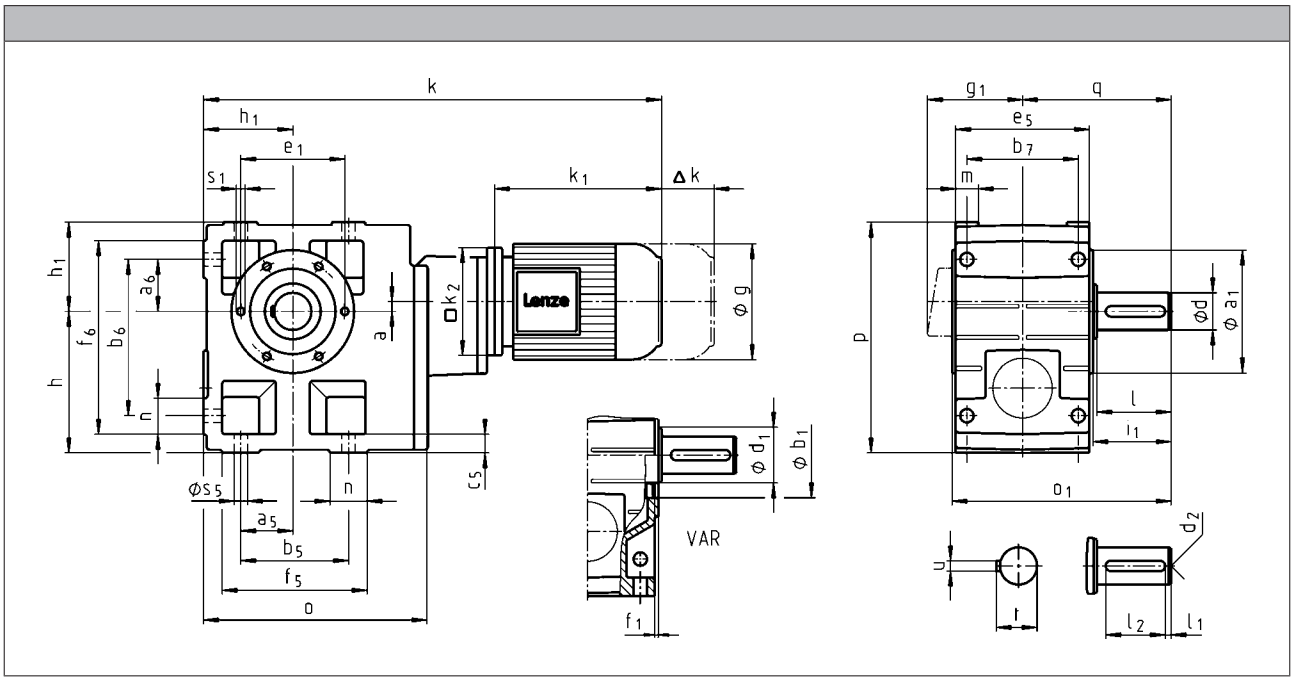
		080C32	090C12	090C32	100C12
g		156	176		194
g_1	MHEMAXX	150	152	157	166
	MHEMABR	132	137		147
k_1	MHEMAXX	224.5	274		309
k_2		145	180		
Δ k	MHEMABR	73	68		76
	MHFMAXX		128		109
	MHFMABR	183	181		170
		k			
GSS06		575	634		
GSS07		629	688		723

	a	h	h_1	k_8	o	p	q
GSS06	10	150	100	49	252	250	121.5
GSS07	12	190	120	65.5	299	310	155.5

	d	d_1	l	l_1	u	t	i_2	o_1	a_2	b_2	c_2	e_2	f_2	s_2
	H7				JS9	+0,2				j7				
GSS06	40 45	65 65	160 160	140 140	12 14	43.3 48.8	42 41	201.5 201.5	200 250	130 180	12 15	165 215	3.5 4	4 x 11 4 x 14
GSS07	50 55	75 75	200 200	175 175	14 16	53.8 59.3	55 55	255.5 255.5	250 300	180 230	15 17	215 265	4 4	4 x 14 4 x 14

Dimensions

GSS□□-3M V□R



GSS Helical-worm gearbox

Technical data

		080C32	090C12	090C32	100C12
g		156	176		194
g_1	MHEMAXX	150	152	157	166
	MHEMABR	132	137		147
k_1	MHEMAXX	224.5	274		309
k_2		145	180		
Δ k	MHEMABR	73	68		76
	MHFMAXX		128		109
	MHFMABR	183	181		170
		k			
GSS06		575	634		
GSS07		629	688		723

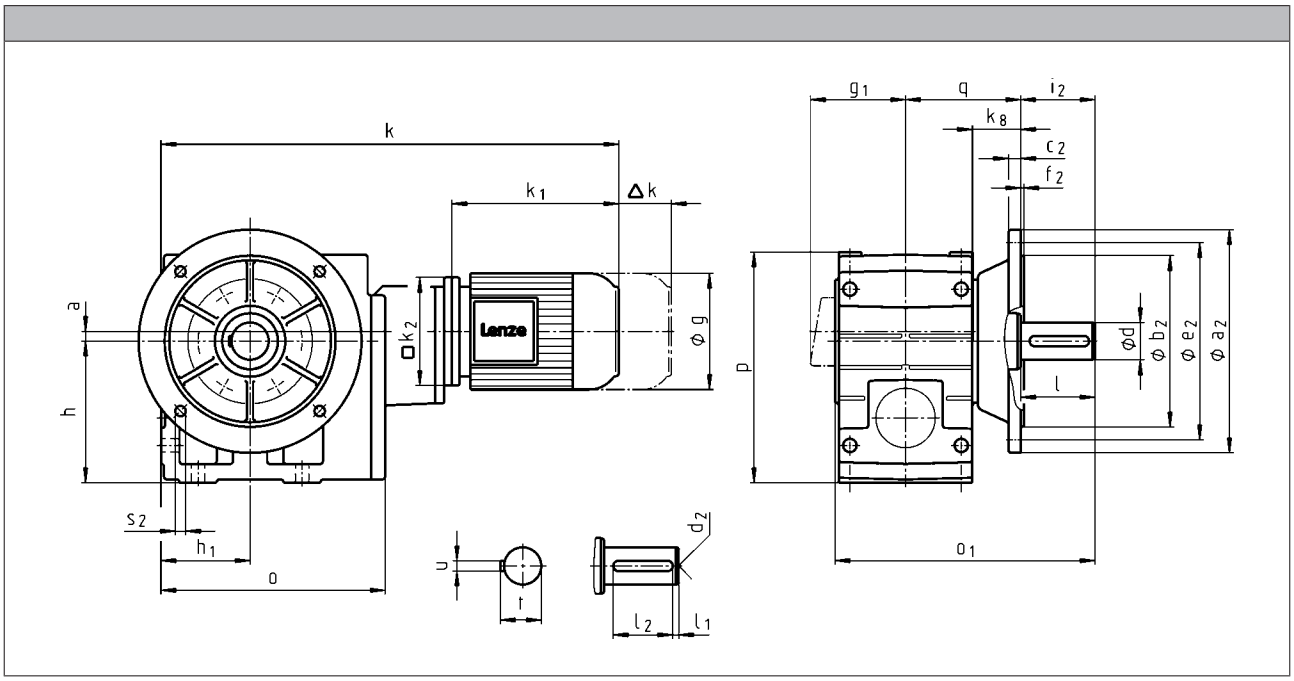
	a	h	h_1	o	p	q
GSS06	10	150	100	252	250	160
GSS07	12	190	120	299	310	200

	d	d_1	d_2	l	l_1	l_2	u	t	i_1	o_1	a_1	b_1	e_1	f_1	s_1
	k6											H7			
GSS06	40	65	M16	80	7	63	12	43	85	235.5	140	100	120	4	M10x16
GSS07	50	75	M16	100	8	80	14	53.5	105	295.5	165	115	140	5	M12x18

	a_5	a_6	b_5	b_6	b_7	c_5	e_5	f_5	f_6	m	n	s_5
GSS06	60	60	120	170	120	20	145	156	206	23	36	14
GSS07	70	70	140	210	150	25	180	185	255	28	45	18

Dimensions

GSS□□-3M VAK



GSS Helical-worm gearbox

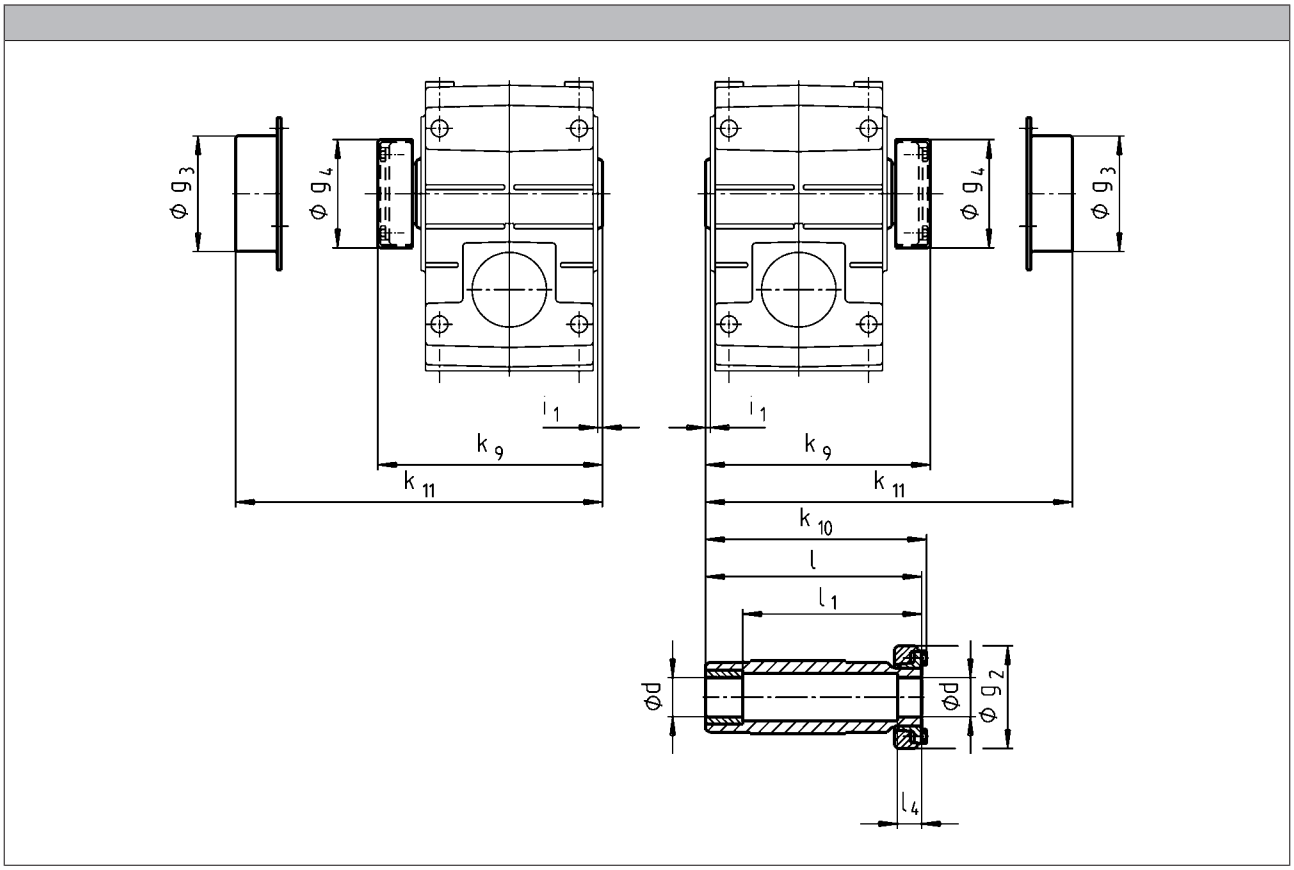
Technical data

		080C32	090C12	090C32	100C12
g		156	176		194
g_1	MHEMAXX	150	152	157	166
	MHEMABR	132	137		147
k_1	MHEMAXX	224.5	274		309
k_2		145	180		
Δ k	MHEMABR	73	68		76
	MHFMAXX		128		109
	MHFMABR	183	181		170
		k			
GSS06		575	634		
GSS07		629	688		723

	a	h	h_1	k_8	o	p	q
GSS06	10	150	100	49	252	250	121.5
GSS07	12	190	120	65.5	299	310	155.5

	d	d_2	l	l_1	l_2	u	t	i_2	o_1	a_2	b_2	c_2	e_2	f_2	s_2
	k6										j7				
GSS06	40	M16	80	7	63	12	43	80	276.5	250	180	15	215	4	4 x 14
GSS07	50	M16	100	8	80	14	53.5	100	350.5	250 300	180 230	15 17	215 265	4 4	4 x 14 4 x 14

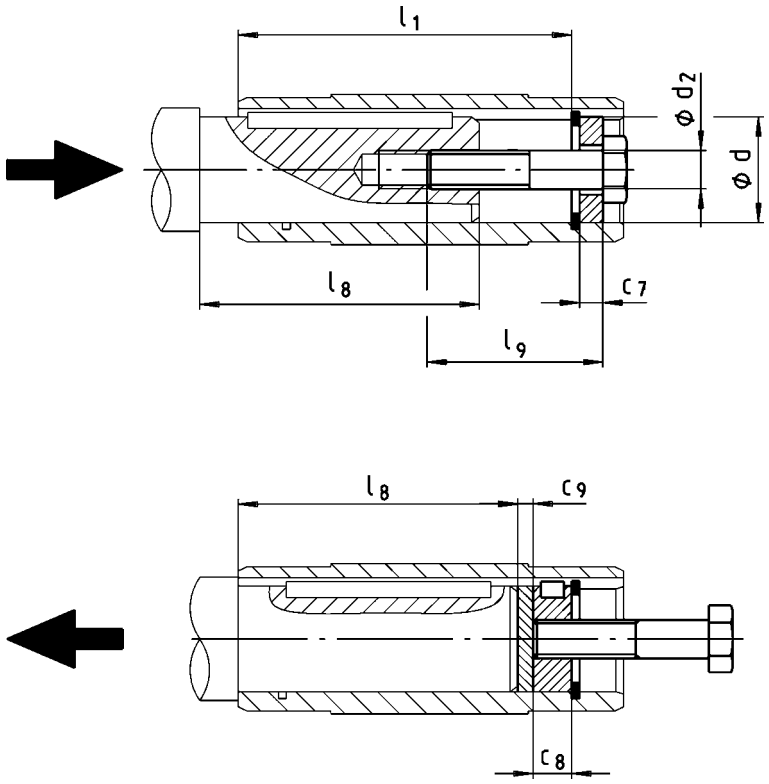
Hollow shaft with shrink disc



	d	g_2	g_3	g_4	i_1	k_9	k_{10}	k_{11}	l	l_1	l_4
	h6										
GSS04	25 30	72	79	76	2.5	150	148	154	142	122	26
GSS05	35	80	90	84	4.0	176	174	179	168	148	28
GSS06	40	90	100	94	5.0	202	200	204	194	164	30
GSS07	50	110	124	116		241	238	244	232	192	26

- ► Output flange and hollow shaft with shrink disc (output version SAK) are not possible in the same location. For additional dimensions see output version H□□.
- ► Ensure that the strength of the machine shaft material is adequate in shrink disc designs.
  When using typical steels (e.g. C45, 42CrMo4), the torques listed in the selection tables can be used without restriction.
  Please consult us if you wish to use material that is considerably weaker. Medium surface roughness Rz must not exceed 15 µm (turning is sufficient).

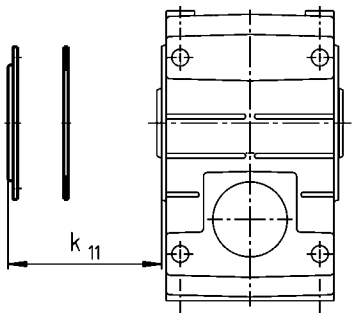
Mounting set for hollow shaft circlip:
Proposed design for auxiliary tools



	d	l_1	d_2	l_9	c_7	c_8	c_9	$l_{8,\,max}$
	H7							
GSS04	25 30	100	M10	40	5	10	3	85
					6			
GSS05	30 35	124						107
			M12	50	7	12		
GSS06	40 45	140	M16	60	8	16	4	118
					9			
GSS07	50 55	175			10		5	148
			M20	80	11	20		

6.6

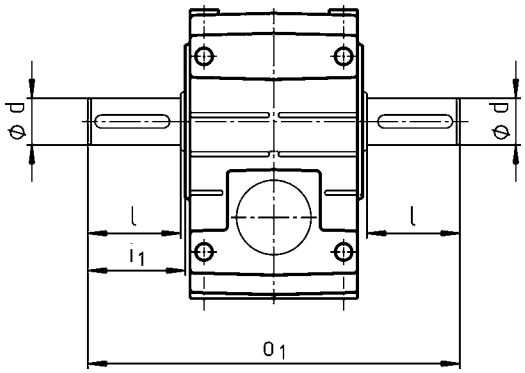
Hoseproof hollow shaft cover



► Cover including gasket

	k_{11}
	[mm]
GSS04	9
GSS05	10
GSS06	11
GSS07	

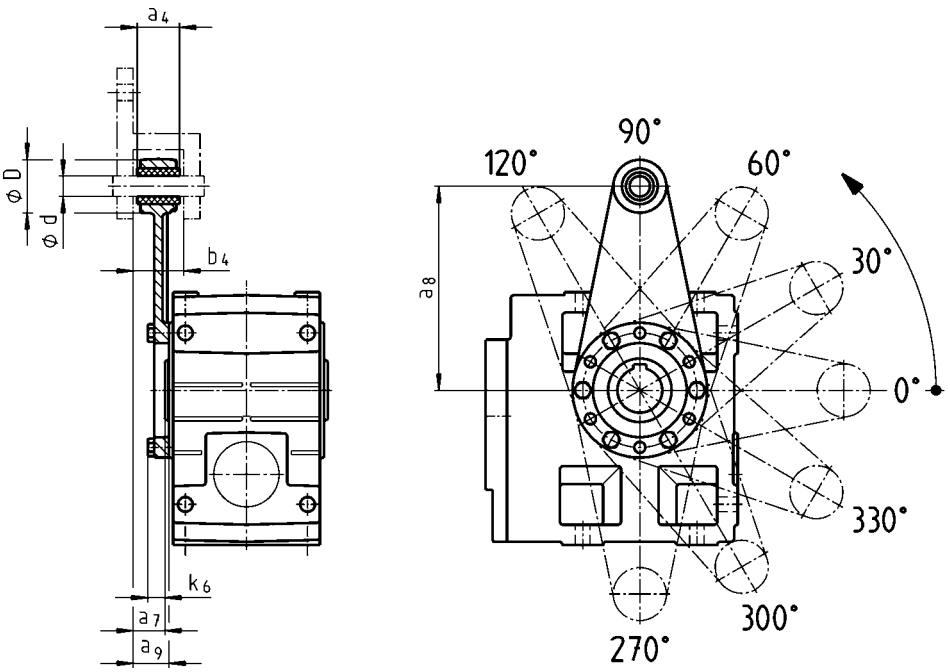
Gearbox with 2nd output shaft end



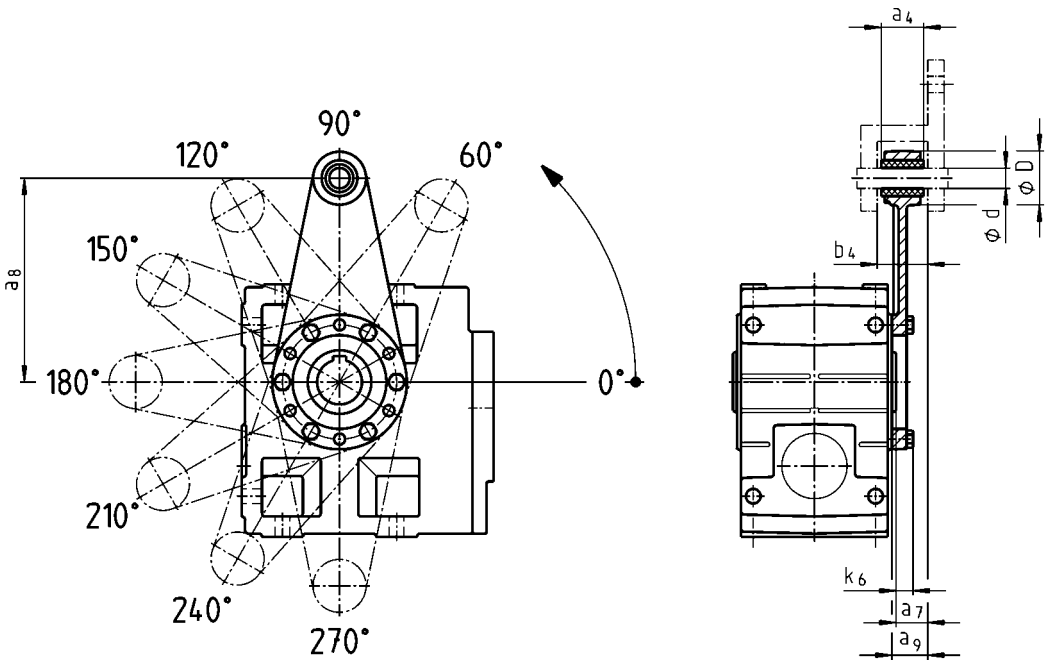
	d	l	i_1	o_1
	k6			
GSS04	25	50	52.5	215
GSS05	30	60	64.0	260
GSS06	40	80	85.0	320
GSS07	50	100	105.0	400

Torque plate on threaded pitch circle

In position 3



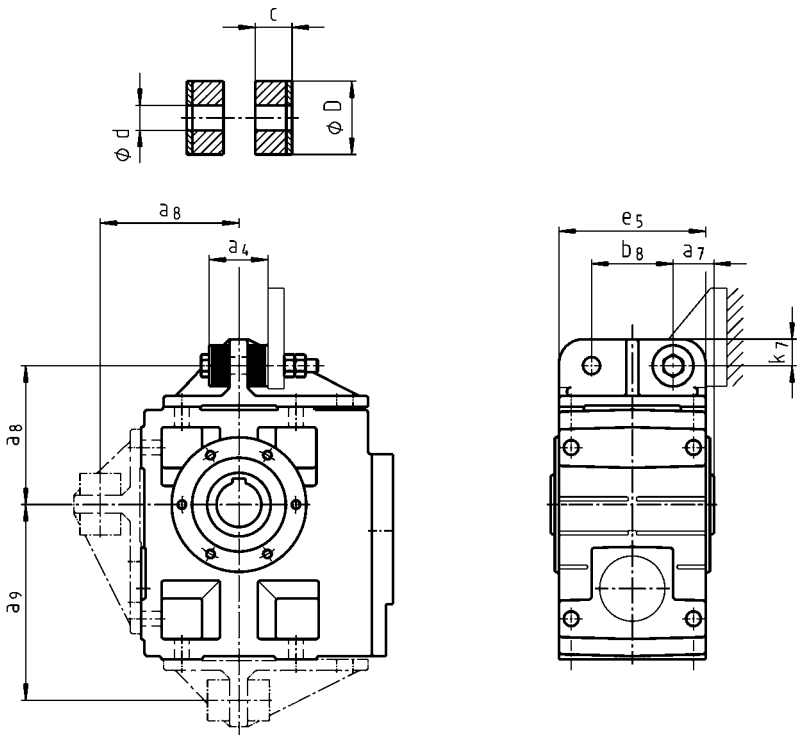
In position 5



	a_4	a_7	a_8	a_9	b_4	d	D	k_6
GSS04	30	24.0	130	26.5	34.5	12	35	16
GSS05	34	23.5	160	27.5	38.5	16	45	15
GSS06	40	28.0	200	33.0	44.5	20	50	18
GSS07	46	32.5	250	37.5	50.5	25	65	21

Torque plate at housing foot

In position 2, 4 or 6

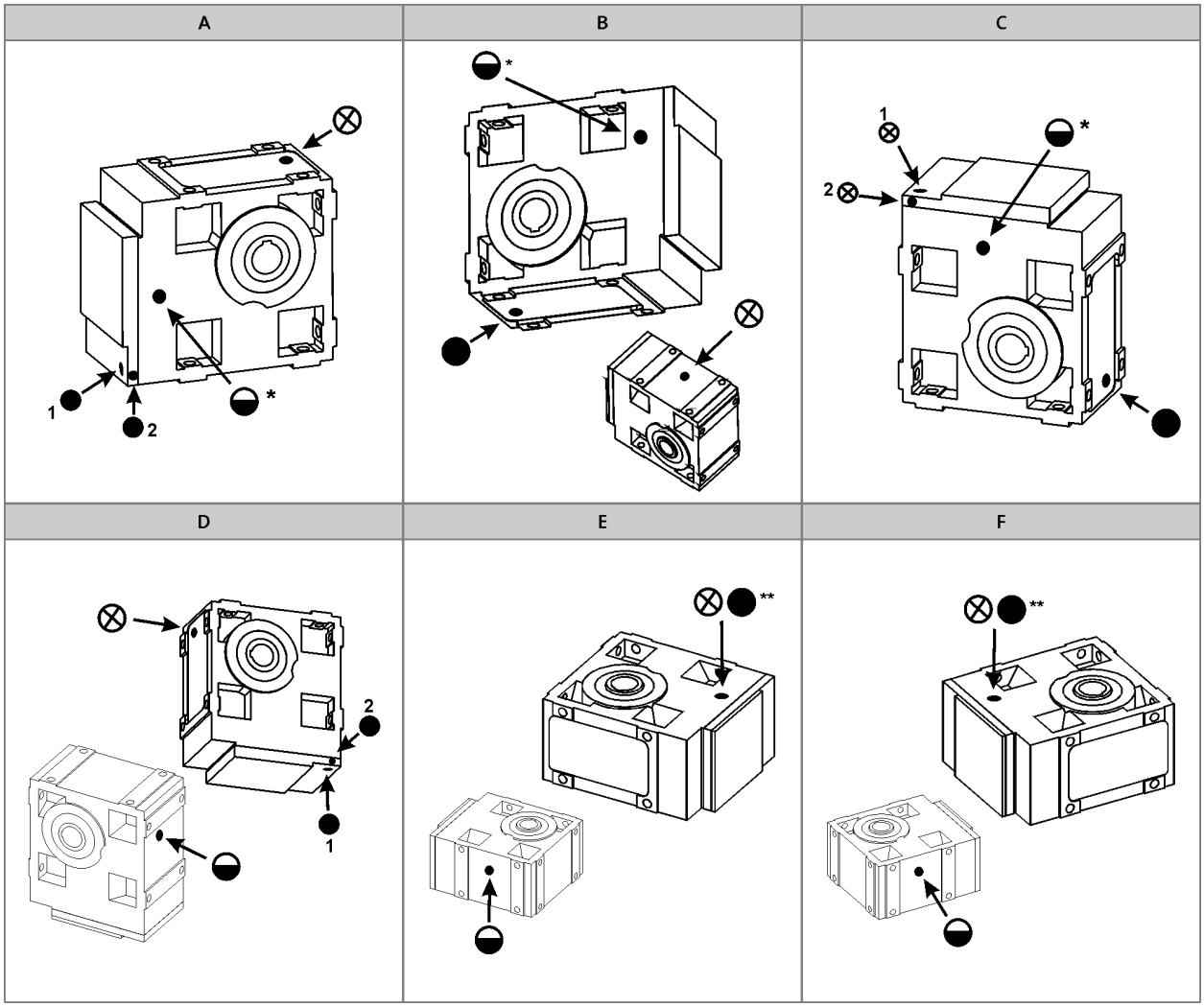


	a_4	a_7	a_8	a_9	b_8	c	d	D	e_5	k_7
GSS04	41	27.5	106	135.0	60	14.5	11	30	100	20
GSS05	45	35.0	115	160.0	70	15.0	13	40	127	25
GSS06	72	40.0	145	195.0	80	27.0	17	50	145	28
GSS07	78	50.0	170	240.0	100	28.0	21	60	180	35

Ventilations

Position of ventilation, sealing elements and oil level check

GSS05...07-2



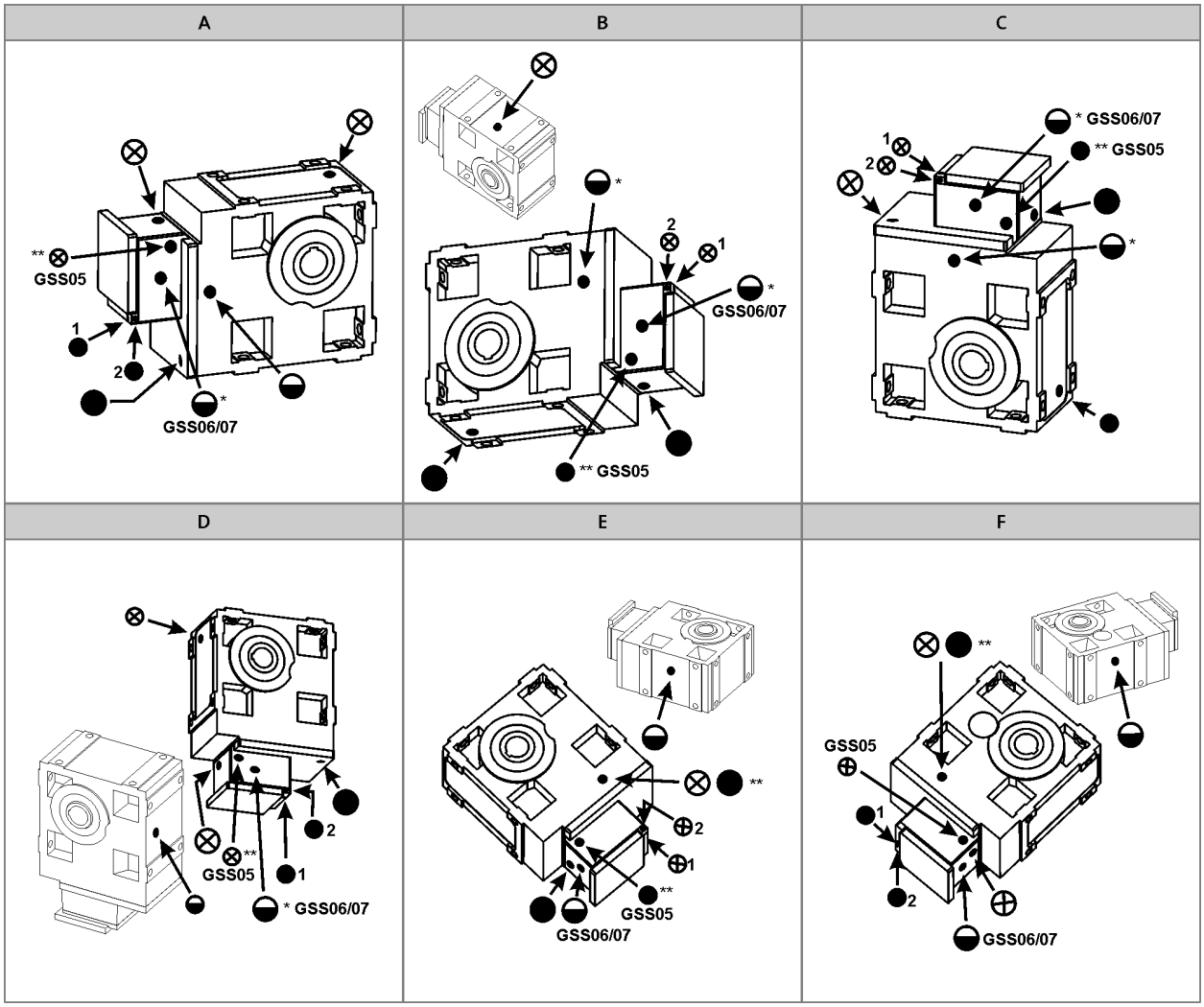
A ... F Mounting position
⊗ Ventilation / Oil filler plug
● Oil drain plug
◒ Oil control plug
* On both sides
** On opposite side

Item 1 standard
Item 2 only with:
- GSS05-2M □□□ 090C□□
- GSS05-2M □□□ 100C□□
- GSS06-2M □□□ 112C□□
- GSS07-2M □□□ 160C□□

Ventilations

Position of ventilation, sealing elements and oil level check

GSS05...07-3



A ... F Mounting position
⊗ Ventilation / Oil filler plug
● Oil drain plug
◒ Oil control plug
* On both sides
** On opposite side

Item 1 standard
Item 2 only on:
- GSS07-3M □□□ 090C□□
- GSS07-3M □□□ 100C□□

Web version

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