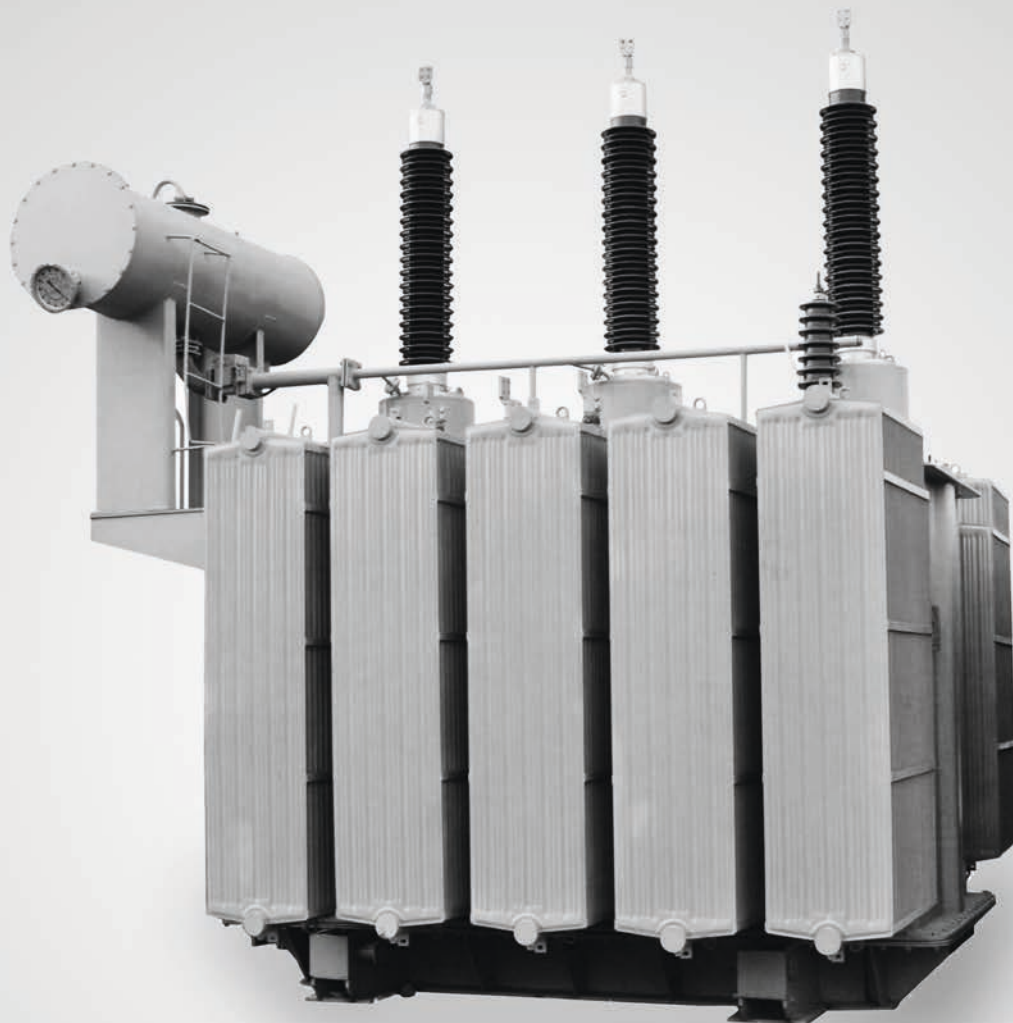


LIGHTNING IMPULSE

# Insulation Testing





This document has been optimized for electronic media



Smart navigation through technical specifications. Click the green links.



### Accredited Calibration

Quality at EMC PARTNER is based on an ISO 9001 management system. This is the foundation for an ISO 17025 accreditation verified by the Swiss Calibration Service (SCS). SCS No. 146 is the accreditation number of EMC PARTNER AG. Locally accredited but recognized worldwide through affiliation with the ILAC organisation



## IMPULSE INSULATION TEST SYSTEMS

# QUALITY AND RELIABILITY

The 1.2/50 $\mu$ s lightning impulse forms the basis for a variety of insulation test applications. From simple insulation tests of material to dielectric breakdown of transformers. Solutions are available for these and product safety testing.

- › Reliable solid state technology
- › Reproducible impulses
- › Integrated personnel safety features
- › Automatic PASS /FAIL detection

# THE NEW INS SERIES

The new INS series from EMC PARTNER is another ground-breaking advance in insulation technology. With impulse repetition rates of 1 pulse per second up to 3.5 kV, and 1 pulse per 8 seconds at 30 kV, INS is probably the fastest insulation test system in the world.



## A flexible offer

Optimal models corresponding to normative test levels up to 7.5 kV, 15 kV, 22.5 kV or 30 kV. The 7.5 kV model can be subsequently upgraded to 15 kV and the 22.5 kV model can be upgraded to 30 kV. Output impedance can be selected in the range 40  $\Omega$  - 4 k $\Omega$  (default 40  $\Omega$ ).

## Optimal personnel safety

Outputs of the generator are on top of the generator, allowing a safe manual control. Furthermore, a safety switch is always available on the front panel, while an additional remote (5 m cable included) safety switch can be optionally connected.

## Superior component technology

Impulse capacitors have an expected lifetime of 6 million cycles declared by manufacturer. INS test system hence becomes an optimal solution for long duration production testing.

## Outstanding precision

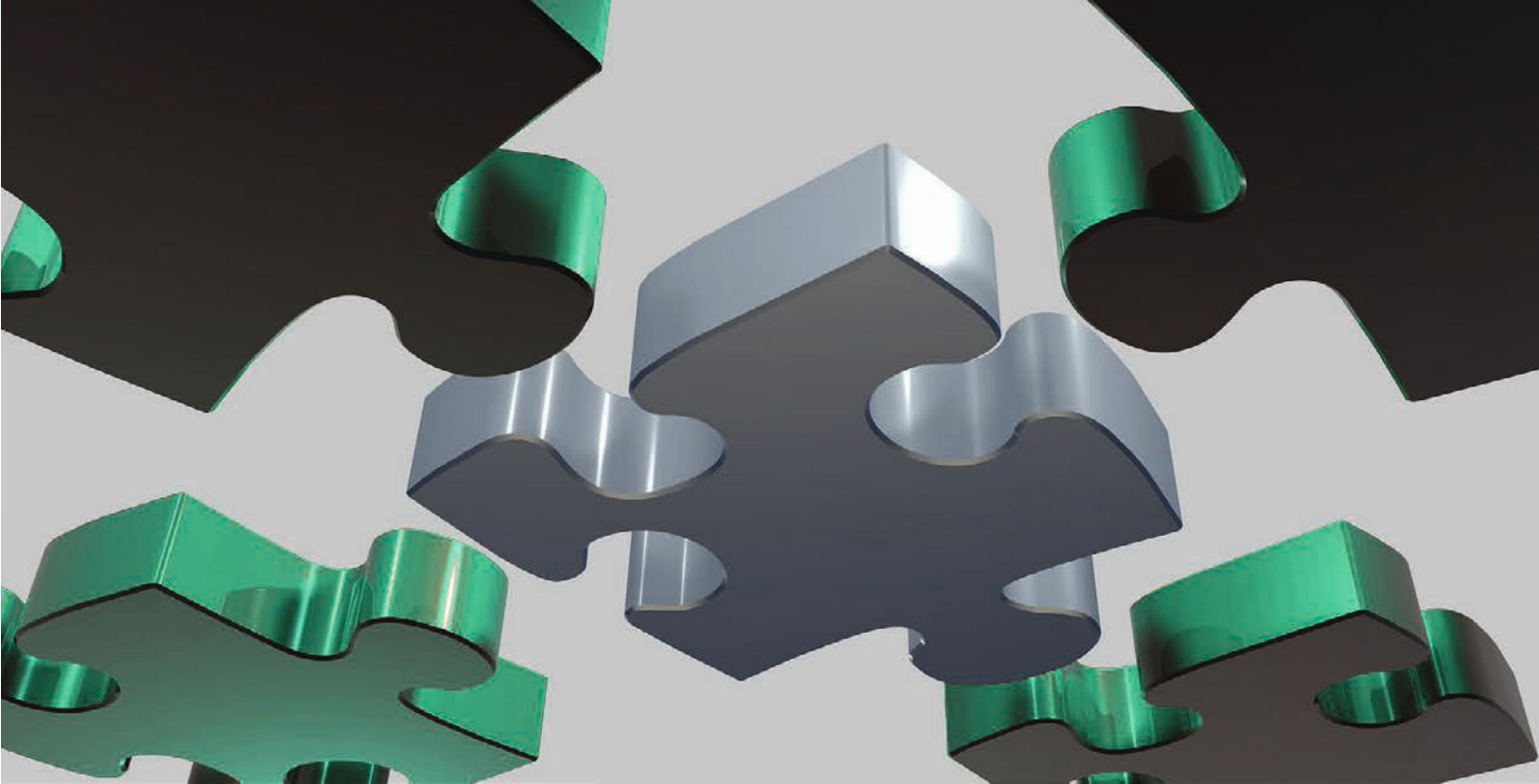
The tolerance of impulse voltage is just  $\pm 3\%$  while measurement circuits offer a  $\pm 2\%$  tolerance. This level of performance allows the implementation of voltage and current integrals (available with OPT-INS-MEAS).

## Unbeatable compactness

15 kV solution in standard 19" unit, 4 UH and 30 kV in 19" unit, 8 UH.

## Seamless test bench integration

With its programmable bi-directional connectors, INS is ready for an optimal PLC integration.



## UNIQUE FEATURES

### Robust test equipment that gets the job done

#### Integrated measurement



Evaluate breakdown characteristics using the integrated Voltage and Current measurement circuits. Use the BNC outputs for impulse visualisation on an oscilloscope.

#### Standard, but also application specific



There is a high degree of hardware commonality in EMC PARTNER impulse generators. Adapted for specific applications.

#### Wide ranging



Stable impulse voltages from 0.5kV up to 144kV for practically every test application.

#### Leading technology



Solid state high voltage switches deliver reproducible impulses. Increases confidence in test results.

# Tradition meets Technology

Over 25 years devoted to combining  
latest technologies into the best products.

 **100% Swiss made products**



# Technical Specifications

## INS OR MIG INSULATION TEST SYSTEM ?

Typical insulation test systems have energy levels high enough to maintain the waveform and amplitude in tolerances provided by standards when connected to a load. In this sense, the INS- 1250 generators maintain the waveform for following loads:  $R > 1 \text{ k}\Omega$  or  $L > 50 \text{ mH}$  or  $C < 6 \text{ nF}$ . The typical energy of an INS-1250-15K is 4.5 joules at 6 kV and 28.13 joules at 15 kV.

For heavier loads, the MIG series of insulation generators provides much more energy in order to maintain the voltage waveform in tolerance. Hence, the domain of loads that an MIG1203, for example, can be used with is wider:  $R > 500 \Omega$  or  $L > 10 \text{ mH}$  or  $C < 5 \text{ nF}$ . The energy available in the generator MIG1203 is 81 joules at 6 kV and 324 joules at 12 kV.

A MIG2403 has an energy of 648 joules at 24 kV. Hence, the energy delivered by a generator is not depending only on the output impedance but also on the storage capacitance, as the current waveform is not defined.

- › **For typical loads**, INS series can be employed.
- › **For heavier loads** that require more energy, the MIG series of generators is recommended.

## NEW INS TEST SYSTEM

INS-1250-7K5	7.5 kV impulse 1.2/50 $\mu\text{s}$ , 40 $\Omega$ and/or custom output
INS-1250-15K	15 kV impulse 1.2/50 $\mu\text{s}$ , 40 $\Omega$ and/or custom output
INS-1250-22K5	22.5 kV impulse 1.2/50 $\mu\text{s}$ , 40 $\Omega$ and/or custom output
INS-1250-30K	30 kV impulse 1.2/50 $\mu\text{s}$ , 40 $\Omega$ and/or custom output
INS-0805	500 ohm output/ 0.5 J with 0.5 kV, 1 kV, 1.5 kV, 2 kV, 2.5 kV, 3 kV, 4 kV, 5 kV, 6 kV and 8 kV test levels

## ACCESSORIES FOR INS TEST SYSTEM

CN-INS-500	matching network 500 $\Omega$
CN-INS-X	custom matching network with any value in the range 40 $\Omega$ 5 k $\Omega$
OPT-INS-MEAS	measurement board for Upeak, Ipeak on display, BNC outputs for U and I waveforms monitor and U and I integral calc/display
V-PROBE-30K	30 kV common mode voltage monitor probe for INS-1250 series
EXT-INS-CON	2 m cables and terminal box for INS-1250
INS-DSO	automation package for waveform monitoring from generator
NW-INS-05J	0.5 J matching networks for INS1250-15K. For 10, 12 and 15 kV
TC-ST	test cabinet with safety circuit mountable on top of generator
EXT-TC-INS	stand for TC-ST table-top mounting
WARNING LAMP	red/green signalization lamp
EMERGENCY STOP	remote emergency stop button with 5 m cable included



## MIG TEST SYSTEMS

MIG0603	6 kV, 1.2/50µs pulse
MIG1203	12 kV, 1.2/50µs pulse
MIG1203STEP	12 kV, 1.2/50µs pulse, prepared for IEC/EN 60065
MIG1203CWG	12 kV, 1.2/50µs & 6kV, 3 kA CWG, 1.2/50µs & 8/20µs
MIG1803	18 kV, 1.2/50µs pulse
MIG1803-12	18 kV, 1.2/50µs pulse, 12 Ohm
MIG1809	18 kV & 9 kA, 1.2/50 & 8/20µs pulse
MIG2403	24 kV, 1.2/50µs pulse
MIG2412	24 kV & 12 kA, 1.2/50 & 8/20µs pulse
MIG3603C	36 kV, 1.2/50µs pulse
MIG4803	48 kV, 1.2/50µs pulse
MIG7203	72 kV, 1.2/50µs pulse
MIG9603	96 kV, 1.2/50µs pulse
MIG12003	120 kV, 1.2/50µs pulse
MIG14403	144 kV, 1.2/50µs pulse

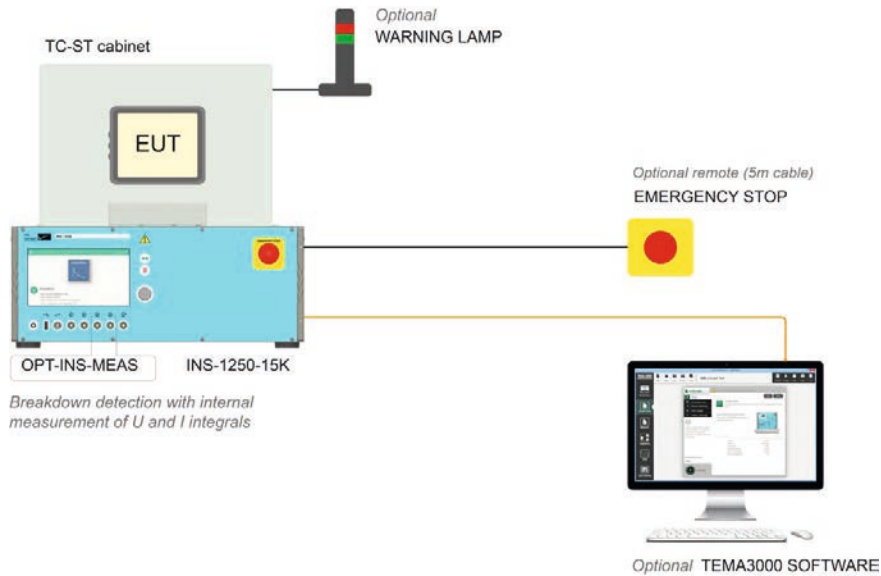
## ACCESSORIES FOR MIG TEST SYSTEM

CN12-XX-500	Matching network for electricity meter testing
NW-IEC61036C1	Matching network for electricity meter testing
NW-IEC61036C2	Matching network for protection relay testing
NW-IEC60255-524	Matching network for protection relay testing
NW-IEC60255-5SEA	Matching network for EN 50470-1 testing
NW-01-2000	Matching network for testing audio, video
NW-IEC60065-1	Matching network for testing audio, video
NW-IEC60065-1A	Matching network for testing digital alarm
NW-UL1635	Matching network for insulation test
CN18-XX-500	Matching network for electricity meter testing
NW-IEC61036C118	Matching network for electricity meter testing
NW-IEC61036C218	Matching network for protection relay testing
NW TO MIG1803	Matching network for protection relay testing
NW-NMI-M6C3C4	Matching network for electricity meter testing
CN24-40-80	Matching network for insulation test
CN24-XX-500	Matching network for insulation test
CN-MIG18 AMP	1.5m Matching network and test pistols for insulation test
CN-MIG24	1.2m Matching network and test pistols for insulation test
CN-MIG4803	1.2m Matching network and test pistols for insulation test
TC-ST	Test cabinet with safety circuit
STAGE 2403 4	Module used to extend MIG7203 up to 96 kV
STAGE 2403 5	Module used to extend MIG9603 up to 120 kV
STAGE 2403 6	Module used to extend MIG12003 up to 144 kV
CDN-M-6-32	External 3-phase mains CDN for surge up to 6kV and 32A per phase

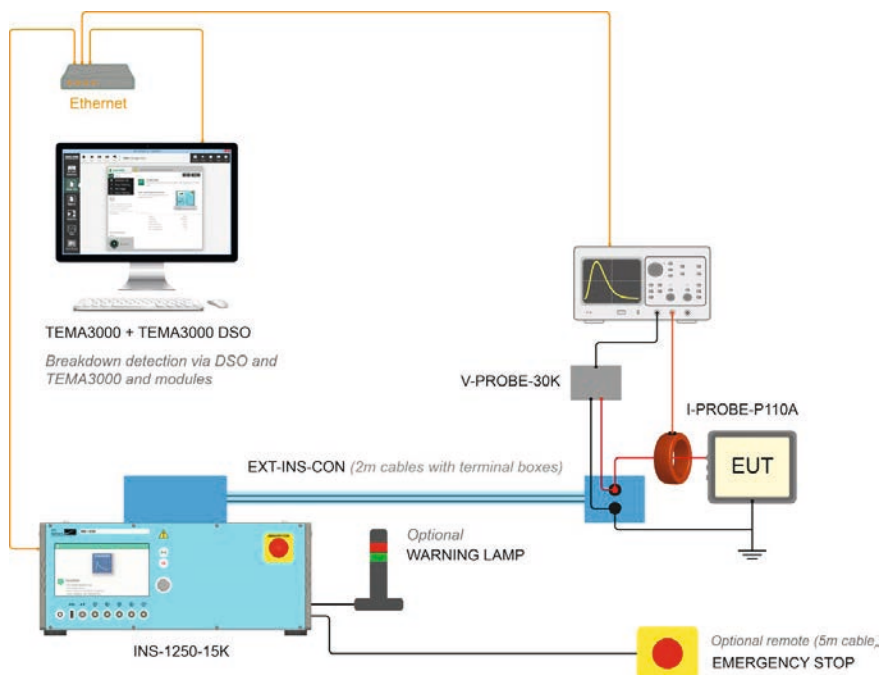
# TYPICAL INSULATION TEST SYSTEMS

Load:  $R > 1\text{ k}\Omega$  or  $L > 50\text{ mH}$  or  $C < 6\text{ nF}$

- › Test setup for small EUTs on top of the generator.



- › Test setup for small EUTs with calibrated waveform at 2m cable



## INS-1250-7K5

### INS-1250-7K5 circuit: voltage impulse 1.2/50 $\mu$ s, 7.5 kV

<b>Standards</b>	IEC60060-1, IEC61010-1, IEC61180, IEC60335-1, IEC60664-1, latest editions
<b>Application</b>	test insulation against voltage impulse
<b>Impulse capacitance</b>	250 nF $\pm$ 20 %
<b>Energy at max. voltage</b>	7.03 joules
<b>Default output impedance</b>	40 $\Omega$ , additional impedances on request
<b>Adjust. voltage OC (&gt;10 M<math>\Omega</math>)</b>	100 V – 7.5 kV
<b>Calibrated level</b>	500 V – 7.5 kV $\pm$ 3 % (waveform in tolerance also under load)
<b>Voltage waveform</b>	1.2 $\mu$ s $\pm$ 30 % / 50 $\mu$ s $\pm$ 20 %
<b>Waveform in tolerance for (with standard Zout)</b>	R > 1 k $\Omega$ (max. level may be reduced, ask for details) L > 50 mH C < 6 nF (max. level may be reduced, ask for details)
<b>SC current waveform</b>	not defined
<b>Pulse repetition</b>	up to 1 / 1 s @ 5 kV, 1 / 1.5 s @ 7.5 kV
<b>Polarity</b>	positive, negative, alternating



### INS-1250-7K5 control features

<b>User interface</b>	7" capacitive touch screen
<b>Processor, RAM</b>	Quad-core 1.2 GHz, 1 GB RAM
<b>Internal memory</b>	4 GB
<b>Communication interfaces</b>	Gigabit Ethernet, 2 x RS232, 2 x USB A
<b>Impulse counter</b>	programmable up to 29'999
<b>Trigger out</b>	BNC, max. 10 V on front panel
<b>Programmable BNCs</b>	4 programmable BNCs (2 front, 2 back)
<b>Input functions via BNC</b>	Start test, Stop test, EUT fail, EUT mark, External trigger in, Emergency stop
<b>Output functions via BNC</b>	Running state, Safety circuit state
<b>Emergency stop</b>	On front panel, standard red/yellow as in IEC 60947-5-5, IEC 60204-1, ISO 13850

### INS-1250-7K5 supply, weight, dimensions, climatic conditions

<b>Operating voltage</b>	100 – 240 V (50/60 Hz) ± 10%
<b>Power consumption</b>	ON < 150 VA, standby < 15 VA
<b>Weight</b>	approx. 24 kg
<b>W x d x h</b>	45 x 57 x 19 cm
<b>Version</b>	19" unit, 4 UH
<b>Temperature range</b>	10 – 35 °C
<b>Humidity</b>	< 80 % non-condensing
<b>Air pressure</b>	86 – 106 kPa
<b>Included articles</b>	
<b>Power cord</b>	with country plug
<b>EUT connection cables</b>	two 0.25 m cables with crocodile clips
<b>User manual</b>	with conformity declaration
<b>Calibration certificate</b>	factory calibration

### INS-1250-7K5 optional accessories

<b>500 Ω output impedance</b>	CN-INS-500 optional output impedance
<b>Custom output impedance</b>	CN-INS-X selectable impedance 40Ω - 4 kΩ
<b>Test cabinet</b>	TC-ST cabinet with safety circuit
<b>Table adapter for TC-ST</b>	EXT-TC-INS to mount TC-ST near generator
<b>2 m extension cable</b>	EXT-INS-CON extension cable with box
<b>Warning lamp</b>	WARNING-LAMP red/green
<b>Emergency stop button</b>	external EMRGENCY-STOP with 5m cable
<b>Measurement board</b>	OPT-INS-MEAS internal board for peak V, I.
<b>Voltage probe</b>	V-PROBE-30K optional voltage probe
<b>Software</b>	TEMA3000 with optional modules

## INS-1250-15K

### INS-1250-15K circuit: voltage impulse 1.2/50 $\mu$ s, 15 kV

<b>Standards</b>	IEC60060-1, IEC61010-1, IEC61180, IEC60335-1, IEC60664-1, latest editions
<b>Application</b>	test insulation against voltage impulse
<b>Impulse capacitance</b>	250 nF $\pm$ 20 %
<b>Energy at max. voltage</b>	28.12 joules
<b>Default output impedance</b>	40 $\Omega$ , additional impedances on request
<b>Adjust. voltage OC (&gt;10 M<math>\Omega</math>)</b>	200 V – 15 kV
<b>Calibrated level</b>	1 kV – 15 kV $\pm$ 3 % (waveform in tolerance also under load)
<b>Voltage waveform</b>	1.2 $\mu$ s $\pm$ 30 % / 50 $\mu$ s $\pm$ 20 %
<b>Waveform in tolerance for (with standard Zout)</b>	R > 1 k $\Omega$ (max. level may be reduced, ask for details) L > 50 mH C < 6 nF (max. level may be reduced, ask for details)
<b>SC current waveform</b>	not defined
<b>Pulse repetition</b>	up to 1 / 1 s @ 5 kV, 1 / 3 s @ 15 kV
<b>Polarity</b>	positive, negative, alternating



### INS-1250-15K control features

<b>User interface</b>	7" capacitive touch screen
<b>Processor, RAM</b>	Quad-core 1.2 GHz, 1 GB RAM
<b>Internal memory</b>	4 GB
<b>Communication interfaces</b>	Gigabit Ethernet, 2 x RS232, 2 x USB A
<b>Impulse counter</b>	programmable up to 29'999
<b>Trigger out</b>	BNC, max. 10 V on front panel
<b>Programmable BNCs</b>	4 programmable BNCs (2 front, 2 back)
<b>Input functions via BNC</b>	Start test, Stop test, EUT fail, EUT mark, External trigger in, Emergency stop
<b>Output functions via BNC</b>	Running state, Safety circuit state
<b>Emergency stop</b>	On front panel, standard red/yellow as in IEC 60947-5-5, IEC 60204-1, ISO 13850

## INS-1250-15K supply, weight, dimensions, climatic conditions

<b>Operating voltage</b>	100 – 240 V (50/60 Hz) ± 10%
<b>Power consumption</b>	ON < 150 VA, standby < 15 VA
<b>Weight</b>	approx. 26 kg
<b>W x d x h</b>	45 x 57 x 19 cm
<b>Version</b>	19" unit, 4 UH
<b>Temperature range</b>	10 – 35 °C
<b>Humidity</b>	< 80 % non-condensing
<b>Air pressure</b>	86 – 106 kPa
<b>Included articles</b>	
<b>Power cord</b>	with country plug
<b>EUT connection cables</b>	two 0.25 m cables with crocodile clips
<b>User manual</b>	with conformity declaration
<b>Calibration certificate</b>	factory calibration

## INS-1250-15K optional accessories

<b>500 Ω output impedance</b>	CN-INS-500 optional output impedance
<b>Custom output impedance</b>	CN-INS-X selectable impedance 40Ω - 4 kΩ
<b>Test cabinet</b>	TC-ST cabinet with safety circuit
<b>Table adapter for TC-ST</b>	EXT-TC-INS to mount TC-ST near generator
<b>2 m extension cable</b>	EXT-INS-CON extension cable with box
<b>Warning lamp</b>	WARNING-LAMP red/green
<b>Emergency stop button</b>	external EMRGNCY-STOP with 5m cable
<b>Measurement board</b>	OPT-INS-MEAS internal board for peak V, I.
<b>Voltage probe</b>	V-PROBE-30K optional voltage probe
<b>Software</b>	TEMA3000 with optional modules

## INS-1250-22K5

### INS-1250-22K5 circuit: voltage impulse 1.2/50 $\mu$ s, 22.5 kV

<b>Standards</b>	IEC60060-1, IEC61010-1, IEC61180, IEC60335-1, IEC60664-1, latest editions
<b>Application</b>	test insulation against voltage impulse
<b>Impulse capacitance</b>	250 nF $\pm$ 20 %
<b>Energy at max. voltage</b>	63.28 joules
<b>Default output impedance</b>	40 $\Omega$ , additional impedances on request
<b>Adjust. voltage OC (&gt;10 M<math>\Omega</math>)</b>	300 V – 22.5 kV
<b>Calibrated level</b>	1.5 kV – 22.5 kV $\pm$ 3 % (waveform in tolerance also under load)
<b>Voltage waveform</b>	1.2 $\mu$ s $\pm$ 30 % / 50 $\mu$ s $\pm$ 20 %
<b>Waveform in tolerance for (with standard Zout)</b>	R > 1 k $\Omega$ (max. level may be reduced, ask for details) L > 50 mH C < 6 nF (max. level may be reduced, ask for details)
<b>SC current waveform</b>	not defined
<b>Pulse repetition</b>	up to 1 / 1 s @ 5 kV, 1 / 4.5 s @ 22.5 kV
<b>Polarity</b>	positive, negative, alternating



### INS-1250-22K5 control features

<b>User interface</b>	7" capacitive touch screen
<b>Processor, RAM</b>	Quad-core 1.2 GHz, 1 GB RAM
<b>Internal memory</b>	4 GB
<b>Communication interfaces</b>	Gigabit Ethernet, 2 x RS232, 2 x USB A
<b>Impulse counter</b>	programmable up to 29'999
<b>Trigger out</b>	BNC, max. 10 V on front panel
<b>Programmable BNCs</b>	4 programmable BNCs (2 front, 2 back)
<b>Input functions via BNC</b>	Start test, Stop test, EUT fail, EUT mark, External trigger in, Emergency stop
<b>Output functions via BNC</b>	Running state, Safety circuit state
<b>Emergency stop</b>	On front panel, standard red/yellow as in IEC 60947-5-5, IEC 60204-1, ISO 13850

## INS-1250-22K5 supply, weight, dimensions, climatic conditions

<b>Operating voltage</b>	100 – 240 V (50/60 Hz) ± 10%
<b>Power consumption</b>	ON < 150 VA, standby < 15 VA
<b>Weight</b>	approx. 35 kg
<b>W x d x h</b>	45 x 57 x 43 cm
<b>Version</b>	19" unit, 8 UH
<b>Temperature range</b>	10 – 35 °C
<b>Humidity</b>	< 80 % non-condensing
<b>Air pressure</b>	86 – 106 kPa
<b>Included articles</b>	
<b>Power cord</b>	with country plug
<b>EUT connection cables</b>	two 0.25 m cables with crocodile clips
<b>User manual</b>	with conformity declaration
<b>Calibration certificate</b>	factory calibration

## INS-1250-22K5 optional accessories

<b>500 Ω output impedance</b>	CN-INS-500 optional output impedance
<b>Custom output impedance</b>	CN-INS-X selectable impedance 40 Ω - 4 kΩ
<b>Test cabinet</b>	TC-ST cabinet with safety circuit
<b>Table adapter for TC-ST</b>	EXT-TC-INS to mount TC-ST near generator
<b>2 m extension cable</b>	EXT-INS-CON extension cable with box
<b>Warning lamp</b>	WARNING-LAMP red/green
<b>Emergency stop button</b>	external EMRGNCY-STOP with 5m cable
<b>Measurement board</b>	OPT-INS-MEAS internal board for peak V, I.
<b>Voltage probe</b>	V-PROBE-30K optional voltage probe
<b>Software</b>	TEMA3000 with optional modules



## INS-1250-30K

### INS-1250-30K circuit: voltage impulse 1.2/50 $\mu$ s, 30 kV



<b>Standards</b>	IEC60060-1, IEC61010-1, IEC61180, IEC60335-1, IEC60664-1, latest editions
<b>Application</b>	test insulation against voltage impulse
<b>Impulse capacitance</b>	250 nF $\pm$ 20 %
<b>Energy at max. voltage</b>	112.5 joules
<b>Default output impedance</b>	40 $\Omega$ , additional impedances on request
<b>Adjust. voltage OC (&gt;10 M<math>\Omega</math>)</b>	400 V – 30 kV
<b>Calibrated level</b>	2 kV – 30 kV $\pm$ 3 % (waveform in tolerance also under load)
<b>Voltage waveform</b>	1.2 $\mu$ s $\pm$ 30 % / 50 $\mu$ s $\pm$ 20 %
<b>Waveform in tolerance for (with standard Zout)</b>	R > 1 k $\Omega$ (max. level may be reduced, ask for details) L > 50 mH C < 6 nF (max. level may be reduced, ask for details)
<b>SC current waveform</b>	not defined
<b>Pulse repetition</b>	up to 1 / 1 s @ 5 kV, 1 / 6 s @ 30 kV
<b>Polarity</b>	positive, negative, alternating

### INS-1250-30K control features

<b>User interface</b>	7" capacitive touch screen
<b>Processor, RAM</b>	Quad-core 1.2 GHz, 1 GB RAM
<b>Internal memory</b>	4 GB
<b>Communication interfaces</b>	Gigabit Ethernet, 2 x RS232, 2 x USB A
<b>Impulse counter</b>	programmable up to 29'999
<b>Trigger out</b>	BNC, max. 10 V on front panel
<b>Programmable BNCs</b>	4 programmable BNCs (2 front, 2 back)
<b>Input functions via BNC</b>	Start test, Stop test, EUT fail, EUT mark, External trigger in, Emergency stop
<b>Output functions via BNC</b>	Running state, Safety circuit state
<b>Emergency stop</b>	On front panel, standard red/yellow as in IEC 60947-5-5, IEC 60204-1, ISO 13850

## INS-1250-30K supply, weight, dimensions, climatic conditions

<b>Operating voltage</b>	100 – 240 V (50/60 Hz) ± 10%
<b>Power consumption</b>	ON < 150 VA, standby < 15 VA
<b>Weight</b>	approx. 40 kg
<b>W x d x h</b>	45 x 57 x 19 cm
<b>Version</b>	19" unit, 8 UH
<b>Temperature range</b>	10 – 35 °C
<b>Humidity</b>	< 80 % non-condensing
<b>Air pressure</b>	86 – 106 kPa
<b>Included articles</b>	
<b>Power cord</b>	with country plug
<b>EUT connection cables</b>	two 0.25 m cables with crocodile clips
<b>User manual</b>	with conformity declaration
<b>Calibration certificate</b>	factory calibration

## INS-1250-30K optional accessories

<b>500 Ω output impedance</b>	CN-INS-500 optional output impedance
<b>Custom output impedance</b>	CN-INS-X selectable impedance 40Ω - 4 kΩ
<b>Test cabinet</b>	TC-ST cabinet with safety circuit
<b>Table adapter for TC-ST</b>	EXT-TC-INS to mount TC-ST near generator
<b>2 m extension cable</b>	EXT-INS-CON extension cable with box
<b>Warning lamp</b>	WARNING-LAMP red/green
<b>Emergency stop button</b>	external EMRGNCY-STOP with 5m cable
<b>Measurement board</b>	OPT-INS-MEAS internal board for peak V, I.
<b>Voltage probe</b>	V-PROBE-30K optional voltage probe
<b>Software</b>	TEMA3000 with optional modules

## INS-0805

### INS-0805 circuit: voltage impulse 1.2/50 us, 0.5 J, 500 Ω



<b>Standards</b>	IEC 61180, IEC 60255-27, IEC 62052-11, IS 13779 IEC 60834-1/2, EN 50470-1 latest editions
<b>Application</b>	test insulation against voltage impulse
<b>Voltage test levels 0.5 J</b>	0.5 kV, 1 kV, 1.5 kV, 2 kV, 2.5 kV, 3 kV, 4 kV, 5 kV, 6 kV, 8 kV + 0 % / - 10 %
<b>Polarity</b>	positive, negative, alternating
<b>Output impedance</b>	500 Ω ± 10 %
<b>Impulse rise time</b>	1.2 μs ± 30 %
<b>Impulse duration</b>	50 μs ± 20 %
<b>Pulse energy at test levels</b>	0.5 J ± 10 %
<b>Repetition rate</b>	1 s – 655 s
<b>Included articles</b>	cables and test clips

### INS-0805 control features

<b>Operating system</b>	EMC PARTNER proprietary firmware
<b>Languages</b>	10 menu languages, selectable
<b>User interface</b>	7" colour touch display
<b>Connectivity</b>	ethernet, USB, RS485
<b>Surge voltage on display</b>	0.5 – 8 kV, accuracy ± 5%
<b>Peak check function</b>	yes, programmable limits for measured U
<b>Trigger out</b>	BNC, max. 12 V
<b>Trigger in</b>	auto, manual, external (BNC input)
<b>Impulse counter</b>	programmable up to 65'535
<b>Emergency stop</b>	Emergency Stop button, BNC input (EUT Fail)

### INS-0805 supply, weight and dimensions

<b>Operating voltage</b>	115 / 230 V (50/60 Hz) ± 10%
<b>Power consumption</b>	ON < 400 VA, standby < 10 VA
<b>Temperature range</b>	10 – 35 °C
<b>Weight</b>	approx. 19 kg
<b>W x d x h</b>	45 x 57 x 19 cm
<b>Version</b>	19" unit, 4 UH
<b>Humidity</b>	< 80 % non-condensing
<b>Air pressure</b>	86 – 106 kPa
<b>Included articles</b>	
<b>Power cord</b>	with country plug
<b>EUT connection cables</b>	two 0.5 m cables with crocodile clips
<b>User manual</b>	with conformity declaration
<b>Calibration certificate</b>	factory calibration

## ACCESSORIES FOR INS SERIES

### CN-INS-500

<b>Application</b>	matching network for insulation test
<b>Standard</b>	multiple, see generators
<b>Output impedance</b>	500 $\Omega$ +0/-10%, or direct generator output (40 $\Omega$ )
<b>Test level</b>	max. 30 kV
<b>Weight</b>	1.5 kg
<b>Dimensions</b>	24 x 10 x 8.5 cm
<b>For generators</b>	INS-1250-7K5, -15K, 22K5 or -30K



### CN-INS-X

<b>Application</b>	matching network for insulation test
<b>Standard</b>	multiple, see generators
<b>Output impedance</b>	custom, from 40 $\Omega$ to 5 k $\Omega$
<b>Test level</b>	max. 30 kV
<b>Weight</b>	2 kg
<b>Dimensions</b>	24 x 10 x 8.5 cm
<b>For generators</b>	INS-1250-7K5, -15K, 22K5 or -30K

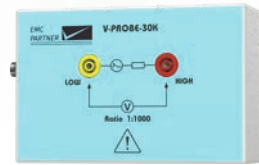


### OPT-INS-MEAS

<b>Application</b>	measurement board for U, I
<b>Type</b>	internal board with 2 BNC outputs
<b>Voltage input</b>	up to 30 kV peak, bandwidth DC – 3 MHz
<b>Current input</b>	up 2 kA peak, bandwidth 2 Hz – 20 MHz
<b>Values on screen</b>	U integral, I integral
<b>Output</b>	1 x BNC for U, 1 x BNC for I
<b>U output ratios via BNC</b>	1: 1000 $\pm$ 2 % for INS-1250-7K5 1: 2000 $\pm$ 2 % for INS-1250-15K 1: 3000 $\pm$ 2 % for INS-1250-22K5 1: 4000 $\pm$ 2 % for INS-1250-30K
<b>I output ratios via BNC</b>	1: 40 $\pm$ 2 % for INS-1250-7K5 1: 80 $\pm$ 2 % for INS-1250-15K 1: 120 $\pm$ 2 % for INS-1250-22K5 1: 160 $\pm$ 2 % for INS-1250-30K
<b>Internal measurements</b>	voltage integral, current integral with selectable thresholds
<b>For generators</b>	INS-1250-7K5, -15K, 22K5 or -30K
<b>Availability</b>	Can be ordered also after initial purchase

### V-PROBE-30K

<b>Application</b>	voltage monitor probe for INS-1250 series
<b>Type</b>	common mode passive, for impulse meas.
<b>Mounting</b>	on top of generator or on EXT-INS-CON
<b>Input voltage</b>	100 V – 30 kV waveform 1.2/50 $\mu$ s
<b>Accuracy</b>	2 %
<b>Factor</b>	1:1000
<b>Max. edge speed</b>	edges > 300kV / $\mu$ s can be detected
<b>3 dB bandwidth</b>	DC – 3 MHz
<b>Input impedance</b>	50 k $\Omega$
<b>Input connectors</b>	2 x 4 mm
<b>Output connector</b>	1 x BNC
<b>For generators</b>	INS-1250-7K5, -15K, 22K5 or -30K
<b>Availability</b>	Can be ordered also after initial purchase and mounted on site



### EXT-INS-CON

<b>Application</b>	2 m cables and terminal box for INS-1250
<b>Voltage capability</b>	max. 30 kV impulse 1.2/50 $\mu$ s
<b>Current capability</b>	max. 2 kA impulse 8/20 $\mu$ s
<b>For generators</b>	INS-1250-7K5, -15K, 22K5 or -30K



### TC-ST

<b>Standard</b>	multiple
<b>Application</b>	test cabinet with safety circuit
<b>Mounting</b>	on top of generator
<b>EUT volume</b>	20 x 20 x 30 cm
<b>Test cabinet material</b>	acrylic glass
<b>Insulation withstand</b>	pulse 1.2/50 $\mu$ s up to 30 kV
<b>Weight</b>	8 kg
<b>Dimensions</b>	43.5 x 47 x 25.4 cm
<b>Included</b>	control cable to generator
<b>For generators</b>	INS-1250-7K5, -15K, 22K5 or -30K
<b>Accessories</b>	WARNING-LAMP EXT-TC-INS



### EXT-TC-INS

<b>Application</b>	stand for TC-ST table-top mounting
<b>Insulation withstand</b>	pulse 1.2/50 $\mu$ s up to 30 kV
<b>Weight</b>	approx. 5 kg
<b>Dimensions</b>	45 x 57 x 10 cm
<b>Requires</b>	TC-ST



## INS-DSO

<b>Application</b>	package for monitoring waveforms during insulation test
<b>Control and setting</b>	directly on generator's screen no additional computer/software required
<b>Advantages</b>	automation of oscilloscope settings when changing test parameters, test report directly from generator including DSO screen dumps on USB stick
<b>Parameters measured</b>	Vpeak, Vduration, Vintegral, waveform Ipeak, Iduration, Iintegral, waveform
<b>Includes</b>	firmware license, oscilloscope, cables
<b>Oscilloscope type</b>	100 MHz, two channels, 10" touch screen
<b>Requires</b>	either internal measurement board OPT-INS-MEAS or external voltage probe V-PROBE-30K and eventually external current probe

## NW-INS-05J

<b>Application</b>	extends functionality of INS-1250 for 0.5 J low-energy
<b>Test levels with low energy</b>	10 kV, 12 kV and 15 kV
<b>For generator</b>	INS-1250-15K
<b>Construction type</b>	individual boxes for each voltage level



## WARNING-LAMP

<b>Application</b>	red/green signalization lamp
<b>Protection class</b>	IP65, IEC 61140, VDE 0140-1
<b>Mounting support</b>	magnetic support, screwable bracket included
<b>Lamp type</b>	red and green (2 lamps), LED technology
<b>Weight</b>	0.3 kg
<b>Dimensions</b>	277 x 70 cm
<b>Included</b>	control cable to TC-ST/generator
<b>For generators</b>	INS-1250 series, IMU series



## EMERGENCY-STOP

<b>Application</b>	remote emergency stop button
<b>Colours</b>	standard red/yellow as in IEC 60947-5-5, IEC 60204-1, and ISO 13850
<b>Mounting</b>	on table, magnetic support also included
<b>Weight</b>	0.5 kg
<b>Dimensions</b>	78 x 72 x 64 mm
<b>Included</b>	5 m cable
<b>For generators</b>	INS-1250 series, IMU series



# HEAVY LOAD INSULATION TEST SYSTEMS

For example MIG1203 loads:  $R > 500 \Omega$  or  $L > 10 \text{ mH}$  or  $C < 5 \text{ nF}$  (see for each generator)

## MIG0603

### MIG0603 circuit: voltage impulse 1.2/50 $\mu\text{s}$ , 6 kV

<b>Standards</b>	IEC60060-1, IEC61010-1 latest editions
<b>Application</b>	test insulation against voltage impulse
<b>Impulse capacitance</b>	10 $\mu\text{F} \pm 10 \%$
<b>Energy at max. voltage</b>	200 joules
<b>Output impedance</b>	40 $\Omega \pm 10 \%$
<b>Adjustable voltage OC</b>	250 V – 6.2 kV $\pm 10 \%$
<b>Calibrated level</b>	500 V – 6 kV
<b>Voltage waveform</b>	1.2 $\mu\text{s} \pm 30 \%$ / 50 $\mu\text{s} \pm 20 \%$
<b>Waveform in tolerance for</b>	$R > 500 \Omega$ $L > 10 \text{ mH}$ $C < 5 \text{ nF}$
<b>SC current waveform</b>	not defined
<b>Pulse repetition</b>	up to 1 / 4 s @ 500 V, 1 / 9 s @ 6 kV
<b>Polarity</b>	positive, negative, alternating
<b>Programmable ramp</b>	voltage



### MIG0603 control features

<b>User interface</b>	LCD and keypad, efficient menu structure
<b>Communication interface</b>	RS232 with (optional) adapter to USB
<b>Surge voltage monitor BNC</b>	10 V = 6 kV, accuracy $\pm 3\%$
<b>Surge current monitor BNC</b>	10 V = 150 A, accuracy $\pm 3\%$
<b>Surge voltage on display</b>	0.1 – 6.3 kV, accuracy $\pm 3\%$
<b>Surge current on display</b>	10 – 150 A, accuracy $\pm 3\%$
<b>Peak check function</b>	yes, programmable limits for measured U, I
<b>Trigger out</b>	BNC, max. 12 V
<b>Trigger in</b>	auto, manual, external (BNC input)
<b>Impulse counter</b>	programmable up to 29'999
<b>Emergency stop</b>	Emergency Stop button, BNC input (EUT Fail)
<b>Internal memory</b>	up to 15 tests can be saved and recalled

### MIG0603 supply, weight, dimensions, climatic conditions

<b>Operating voltage</b>	115 / 230 V (50/60 Hz) $\pm 10\%$
<b>Power consumption</b>	ON < 400 VA, standby < 10 VA
<b>Weight</b>	24 kg
<b>W x d x h</b>	45 x 57 x 19 cm
<b>Version</b>	19" unit, 4 UH
<b>Temperature range</b>	10 – 35 °C
<b>Humidity</b>	< 80 % non-condensing
<b>Air pressure</b>	86 – 106 kPa
<b>Included articles</b>	
<b>Power cord</b>	with country plug
<b>User manual</b>	with conformity declaration
<b>Calibration certificate</b>	factory calibration

## MIG0603 optional accessories

Test cabinet	TC-ST with warning lamps
Test pistols	CN-MIG24, with warning lamps and 1.2m cable
Software	TEMA: sequence, report, for latest Windows TEMA EXT-MEASURE for autom. DSO control

## MIG1203

### MIG1203 circuit: voltage impulse 1.2/50 $\mu$ s, 12 kV

Standards	IEC60060-1, IEC61010-1 latest editions
Application	test insulation against voltage impulse
Impulse capacitance	10 $\mu$ F $\pm$ 10 %
Energy at max. voltage	420 joules
Output impedance	40 $\Omega$ $\pm$ 10 %
Adjustable voltage OC	500 V – 13 kV $\pm$ 10 %
Calibrated level	1 kV – 12 kV
Voltage waveform	1.2 $\mu$ s $\pm$ 30 % / 50 $\mu$ s $\pm$ 20 %
Waveform in tolerance for	R > 500 $\Omega$ L > 10 mH C < 5 nF
SC current waveform	not defined
Pulse repetition	up to 1 / 5 s @ 1 kV, 1 / 14 s @ 12 kV
Polarity	positive, negative, alternating
Programmable ramp	voltage



### MIG1203 control features

User interface	LCD and keypad, efficient menu structure
Communication interface	RS232 with (optional) adapter to USB
Surge voltage monitor BNC	10 V = 12 kV, accuracy $\pm$ 3%
Surge current monitor BNC	10 V = 300 A, accuracy $\pm$ 3%
Surge voltage on display	0.1 – 13.2 kV, accuracy $\pm$ 3%
Surge current on display	10 – 300 A, accuracy $\pm$ 3%
Peak check function	yes, programmable limits for measured U, I
Trigger out	BNC, max. 12 V
Trigger in	auto, manual, external (BNC input)
Impulse counter	programmable up to 29'999
Emergency stop	Emergency Stop button, BNC input (EUT Fail)
Internal memory	up to 15 tests can be saved and recalled

### MIG1203 supply, weight, dimensions, climatic conditions

Operating voltage	115 / 230 V (50/60 Hz) $\pm$ 10%
Power consumption	ON < 400 VA, standby < 10 VA
Weight	28 kg
W x d x h	45 x 57 x 25 cm



<b>Version</b>	19" unit, 4 UH
<b>Temperature range</b>	10 – 35 °C
<b>Humidity</b>	< 80 % non-condensing
<b>Air pressure</b>	86 – 106 kPa
<b>Included articles</b>	
<b>Power cord</b>	with country plug
<b>User manual</b>	with conformity declaration
<b>Calibration certificate</b>	factory calibration

### MIG1203 optional accessories

<b>Test cabinet</b>	TC-ST with warning lamps
<b>Test pistols</b>	CN-MIG24, with warning lamps and 1.2m cable
<b>500 Ω output adapter</b>	CN12-XX-500
<b>500 Ω, 0.5 J energy out</b>	NW-IEC61036C1, for electricity meters NW-IEC61036C2, for electricity meters NW-IEC60255-524, for protection relays NW-IEC60255-5SEA, for protection relays
<b>Software</b>	TEMA: sequence, report, for latest Windows TEMA EXT-MEASURE for autom. DSO control

## MIG1203STEP

### MIG1203STEP circuit: voltage impulse 1.2/50 μs, 12 kV

<b>Standards</b>	IEC60060-1, IEC61010-1 latest editions
<b>Application</b>	test insulation against voltage impulse
<b>Impulse capacitance</b>	10 μF ± 10 %
<b>Energy at max. voltage</b>	420 joules
<b>Output impedance</b>	40 Ω ± 10 %
<b>Adjustable voltage OC</b>	500 V – 13 kV ± 10 %
<b>Calibrated level</b>	1 kV – 12 kV
<b>Voltage waveform</b>	1.2 μs ± 30 % / 50 μs ± 20 %
<b>Waveform in tolerance for</b>	R > 500 Ω L > 10 mH C < 5 nF
<b>Current waveform</b>	not defined
<b>Pulse repetition</b>	up to 1 / 5 s @ 1 kV, 1 / 14 s @ 12 kV
<b>Polarity</b>	positive, negative, alternating
<b>Programmable ramp</b>	voltage



### MIG1203STEP circuit: STEP voltage impulse, 12 kV

<b>To be used with NWS for Application</b>	IEC/EN 60065, IEC/EN 60950, UL1635 to be used with special NWS, not standalone
<b>Adjustable voltage OC</b>	500 V – 13 kV ± 10 %
<b>Calibrated level</b>	1 kV – 12 kV
<b>Voltage waveform</b>	rise time: $t_r < 1 \mu\text{s}$ duration 50 % – 50 %: $t_d > 1000 \mu\text{s}$
<b>Current waveform</b>	not defined
<b>Pulse repetition</b>	up to 1 / 5 s @ 1 kV, 1 / 14 s @ 12 kV
<b>Polarity</b>	positive, negative, alternating

### MIG1203STEP control features

<b>User interface</b>	LCD and keypad, efficient menu structure
<b>Communication interface</b>	RS232 with (optional) adapter to USB
<b>Surge voltage monitor BNC</b>	10 V = 12 kV, accuracy ± 3%
<b>Surge current monitor BNC</b>	10 V = 300 A, accuracy ± 3%
<b>Surge voltage on display</b>	0.1 – 13.2 kV, accuracy ± 3%
<b>Surge current on display</b>	10 – 300 A, accuracy ± 3%
<b>Peak check function</b>	yes, programmable limits for measured U, I
<b>Trigger out</b>	BNC, max. 12 V
<b>Trigger in</b>	auto, manual, external (BNC input)
<b>Impulse counter</b>	programmable up to 29'999
<b>Emergency stop</b>	Emergency Stop button, BNC input (EUT Fail)
<b>Internal memory</b>	up to 15 tests can be saved and recalled

### MIG1203STEP supply, weight, dimensions, climatic conditions

<b>Operating voltage</b>	115 / 230 V (50/60 Hz) ± 10%
<b>Power consumption</b>	ON < 400 VA, standby < 10 VA
<b>Weight</b>	28 kg
<b>W x d x h</b>	45 x 57 x 25 cm
<b>Version</b>	19" unit, 4 UH
<b>Temperature range</b>	10 – 35 °C
<b>Humidity</b>	< 80 % non-condensing
<b>Air pressure</b>	86 – 106 kPa
<b>Included articles</b>	
<b>Power cord</b>	with country plug
<b>User manual</b>	with conformity declaration
<b>Calibration certificate</b>	factory calibration

### MIG1203STEP optional accessories

<b>All accessories of MIG1203</b>	available
<b>Additionally</b>	NW012000, 1 J @ 7 kV, 1.3 J @ 8 kV NW-IEC60065-1, $C_{\text{IMPULSE}} = 1 \text{ nF}$ , 4 M $\Omega$ in    NW-IEC60065-1A, $C_{\text{IMPULSE}} = 1 \text{ nF}$ , no    resistor NW-UL1635
<b>Software</b>	TEMA: sequence, report, for latest Windows TEMA EXT-MEASURE for autom. DSO control

Overview [Generators](#) | [Accessories](#)

## MIG1203CWG

### MIG1203CWG circuit: voltage impulse 1.2/50 $\mu$ s, 40 $\Omega$ , 12 kV

Standards	IEC60060-1, IEC61010-1 latest editions
Application	recommended for electricity meter testing
Impulse capacitance	10 $\mu$ F $\pm$ 10 %
Energy at max. voltage	420 joules
Output impedance	40 $\Omega$ $\pm$ 10 %
Adjustable voltage OC	500 V – 12.2 kV $\pm$ 10 %
Calibrated level	1 kV – 12 kV
Voltage waveform	1.2 $\mu$ s $\pm$ 30 % / 50 $\mu$ s $\pm$ 20 %
Waveform in tolerance for	R > 500 $\Omega$ L > 10 mH C < 5 nF
SC current waveform	not defined
Pulse repetition	up to 1 / 5 s @ 1 kV, 1 / 15 s @ 12 kV
Polarity	positive, negative, alternating
Programmable ramp	voltage



### MIG1203CWG circuit: voltage impulse 1.2/50 $\mu$ s, 4 $\Omega$ , 12 kV

Standards	IEC60060-1, IEC61010-1, IEC60335-1
Application	recommended for household equip. testing
Impulse capacitance	10 $\mu$ F $\pm$ 10 %
Energy at max. voltage	420 joules
Output impedance	4 $\Omega$ $\pm$ 10 %
Adjustable voltage OC	500 V – 12 kV $\pm$ 10 %
Calibrated level	1 kV – 12 kV
Voltage waveform	1.2 $\mu$ s $\pm$ 30 % / 50 $\mu$ s $\pm$ 20 %
Waveform in tolerance for	R > 500 $\Omega$ L > 20 mH C < 10 nF
SC current waveform	not defined
Pulse repetition	up to 1 / 5 s @ 1 kV, 1 / 15 s @ 12 kV
Polarity	positive, negative, alternating
Programmable ramp	voltage

### MIG1203CWG circuit: CWG / Surge 2 $\Omega$ , 6 kV

Standard	IEC61000-4-5 latest edition
Application	recommended for electricity meter testing
Impulse capacitance	10 $\mu$ F $\pm$ 10 %
Energy at max. voltage	220 joules
Output impedance	2 $\Omega$ $\pm$ 10 %
Adjustable voltage OC	250 V – 6.1 kV $\pm$ 10 %
Calibrated level	500 V – 6 kV
Voltage waveform	1.2 $\mu$ s $\pm$ 30 % / 50 $\mu$ s $\pm$ 20 %
Calibrated current SC	0.25 kA – 3 kA $\pm$ 10 %

<b>Current waveform</b>	8 $\mu$ s $\pm$ 20 % / 20 $\mu$ s $\pm$ 20 %
<b>Undershoot</b>	< 30 %
<b>Pulse repetition</b>	up to 1 / 5 s @ 500 V, 1 / 15 s @ 6 kV
<b>Polarity</b>	positive, negative, alternating
<b>Synchronization</b>	0 – 360°, step 1°
<b>Programmable ramps</b>	voltage, synchronisation angle
<b>Requires</b>	requires external CDN, e.g. <a href="#">CDN-M-6-32</a>

### MIG1203CWG control features

<b>User interface</b>	LCD and keypad, efficient menu structure
<b>Communication interface</b>	RS232 with (optional) adapter to USB
<b>Surge voltage monitor BNC</b>	10 V = 12 kV, accuracy $\pm$ 3%, for 1.2/50 10 V = 6 kV, accuracy $\pm$ 3%, for CWG
<b>Surge current monitor BNC</b>	10 V = 300 A or 3 kA, acc. $\pm$ 3%, for 1.2/50 10 V = 3 kA, acc. $\pm$ 3%, for CWG
<b>Surge voltage on display</b>	0.1 – 13.2 kV, accuracy $\pm$ 3%
<b>Surge current on display</b>	10 – 3 kA, accuracy $\pm$ 3%
<b>Peak check function</b>	yes, programmable limits for measured U, I
<b>Trigger out</b>	BNC, max. 12 V
<b>Trigger in</b>	auto, manual, external (BNC input)
<b>Impulse counter</b>	programmable up to 29'999
<b>Emergency stop</b>	Emergency Stop button, BNC input (EUT Fail)
<b>Internal memory</b>	up to 15 tests can be saved and recalled

### MIG1203CWG supply, weight, dimensions, climatic conditions

<b>Operating voltage</b>	115 / 230 V (50/60 Hz) $\pm$ 10%
<b>Power consumption</b>	ON < 400 VA, standby < 10 VA
<b>Weight</b>	29 kg
<b>W x d x h</b>	45 x 57 x 25 cm
<b>Version</b>	19" unit, 4 UH
<b>Temperature range</b>	10 – 35 °C
<b>Humidity</b>	< 80 % non-condensing
<b>Air pressure</b>	86 – 106 kPa
<b>Included articles</b>	
<b>Power cord</b>	with country plug
<b>User manual</b>	with conformity declaration
<b>Calibration certificate</b>	factory calibration

### MIG1203CWG optional accessories

<b>Test cabinet</b>	TC-ST with warning lamps
<b>Test pistols</b>	CN-MIG24, with warning lamps and 1.2m cable
<b>500 Ω output adapter</b>	CN12-XX-500
<b>500 Ω, 0.5 J energy out</b>	NW-IEC61036C1, for electricity meters NW-IEC61036C2, for electricity meters NW-IEC60255-524, for protection relays
<b>CDN for CWG tests</b>	CDN-M-6-32
<b>Magnetic pulse antenna</b>	MF1000-1 or MF1000-2, as per IEC61000-4-9
<b>Software</b>	TEMA: sequence, report, for latest Windows TEMA EXT-MEASURE for autom. DSO control

### MIG1803

#### MIG1803 circuit: voltage impulse 1.2/50 μs, 18 kV

<b>Standards</b>	IEC60060-1, IEC61010-1 latest editions
<b>Application</b>	test insulation against voltage impulse
<b>Impulse capacitance</b>	3.33 μF ± 10 %
<b>Energy at max. voltage</b>	540 joules
<b>Output impedance</b>	40 Ω ± 10 %
<b>Adjustable voltage OC</b>	750 V – 19.5 kV ± 10 %
<b>Calibrated level</b>	1 kV – 18 kV
<b>Voltage waveform</b>	1.2 μs ± 30 % / 50 μs ± 20 %
<b>Waveform in tolerance for</b>	R > 500 Ω L > 20 mH C < 5 nF
<b>SC current waveform</b>	not defined
<b>Pulse repetition</b>	up to 1 / 4 s @ 1 kV, 1 / 10 s @ 18 kV
<b>Polarity</b>	positive, negative, alternating
<b>Programmable ramp</b>	voltage



#### MIG1803 control features

<b>User interface</b>	LCD and keypad, efficient menu structure
<b>Communication interface</b>	RS232 with (optional) adapter to USB
<b>Surge voltage monitor BNC</b>	10 V = 18 kV, accuracy ± 3%
<b>Surge current monitor BNC</b>	10 V = 400 A, accuracy ± 3%
<b>Surge voltage on display</b>	0.1 – 19.6 kV, accuracy ± 3%
<b>Surge current on display</b>	10 – 500 A, accuracy ± 3%
<b>Peak check function</b>	yes, programmable limits for measured U, I
<b>Trigger out</b>	BNC, max. 12 V
<b>Trigger in</b>	auto, manual, external (BNC input)
<b>Impulse counter</b>	programmable up to 29'999
<b>Emergency stop</b>	Emergency Stop button, BNC input (EUT Fail)
<b>Internal memory</b>	up to 15 tests can be saved and recalled

## MIG1803 supply, weight, dimensions, climatic conditions

<b>Operating voltage</b>	115 / 230 V (50/60 Hz) ± 10%
<b>Power consumption</b>	ON < 400 VA, standby < 10 VA
<b>Weight</b>	33 kg
<b>W x d x h</b>	45 x 57 x 25 cm
<b>Version</b>	19" unit, 4 UH
<b>Temperature range</b>	10 – 35 °C
<b>Humidity</b>	< 80 % non-condensing
<b>Air pressure</b>	86 – 106 kPa
<b>Included articles</b>	
<b>Power cord</b>	with country plug
<b>User manual</b>	with conformity declaration
<b>Calibration certificate</b>	factory calibration

## MIG1803 optional accessories

<b>Test cabinet</b>	TC-ST with warning lamps
<b>Test pistols</b>	CN-MIG24, with warning lamps and 1.2m cable
<b>500 Ω output adapter</b>	CN18-XX-500
<b>500 Ω, 0.5 J energy out</b>	NW-IEC61036C118, for electricity meters NW-IEC61036C218, for electricity meters NW-IEC60255-524, for protection relays NW to MIG1803, for protection relays
<b>Network for NMI M6</b>	NW-NMI-M6C3C4: 9 joules at 10 and 12 kV
<b>Software</b>	TEMA: sequence, report, for latest Windows TEMA EXT-MEASURE for autom. DSO control

## MIG1803-12

### MIG1803-12 circuit: voltage impulse 1.2/50 μs, 12 Ω, 500 Ω, 18 kV

<b>Standards</b>	IEC60060-1, IEC61010-1 latest editions IEC60335-1 (old and new editions)
<b>Application</b>	insulation test (also for household equipment)
<b>Impulse capacitance</b>	1.666 μF ± 10 %
<b>Energy at max. voltage</b>	270 joules
<b>Output impedance</b>	12 Ω ± 10 % 500 Ω ± 10 % selectable through manual switch
<b>Adjustable voltage OC</b>	Range 1: 200 V – 3 kV ± 10 % Range 2: 1.5 kV – 18.6 kV ± 10 %
<b>Calibrated voltage level</b>	200 V – 18 kV
<b>Voltage waveform</b>	1.2 μs ± 30 % / 50 μs ± 20 %
<b>Waveform in tolerance for</b>	R > 1 kΩ L > 40 mH C < 10 nF



<b>SC current waveform</b>	8 $\mu$ s $\pm$ 20 % / 20 $\mu$ s $\pm$ 20 %
<b>Calibrated current level</b>	16.67 A – 1.5 kA
<b>Pulse repetition</b>	up to 1 / 6 s @ 0.5 kV, 1 / 15 s @ 18 kV
<b>Polarity</b>	positive, negative, alternating
<b>Programmable ramp</b>	voltage

### MIG1803-12 control features

<b>User interface</b>	LCD and keypad, efficient menu structure
<b>Communication interface</b>	RS232 with (optional) adapter to USB
<b>Surge voltage monitor BNC</b>	10 V = 18 kV, accuracy $\pm$ 3%
<b>Surge current monitor BNC</b>	10 V = 1.5 kA, accuracy $\pm$ 3%
<b>Surge voltage on display</b>	0.1 – 19.6 kV, accuracy $\pm$ 3%
<b>Surge current on display</b>	10 – 500 A, accuracy $\pm$ 3%
<b>Peak check function</b>	yes, programmable limits for measured U, I
<b>Trigger out</b>	BNC, max. 12 V
<b>Trigger in</b>	auto, manual, external (BNC input)
<b>Impulse counter</b>	programmable up to 29'999
<b>Emergency stop</b>	Emergency Stop button, BNC input (EUT Fail)
<b>Internal memory</b>	up to 15 tests can be saved and recalled

### MIG1803-12 supply, weight, dimensions, climatic conditions

<b>Operating voltage</b>	115 / 230 V (50/60 Hz) $\pm$ 10%
<b>Power consumption</b>	ON < 400 VA, standby < 10 VA

<b>Weight</b>	32 kg
<b>W x d x h</b>	45 x 57 x 25 cm
<b>Version</b>	19" unit, 4 UH

<b>Temperature range</b>	10 – 35 °C
<b>Humidity</b>	< 80 % non-condensing
<b>Air pressure</b>	86 – 106 kPa

#### Included articles

<b>Power cord</b>	with country plug
<b>User manual</b>	with conformity declaration
<b>Calibration certificate</b>	factory calibration

### MIG1803-12 optional accessories

<b>Test cabinet</b>	TC-ST with warning lamps
<b>Software</b>	TEMA: sequence, report, for latest Windows TEMA EXT-MEASURE for autom. DSO control

## MIG1809

### MIG1809 circuit: CWG / Surge 18 kV

<b>Standards</b>	IEC60060-1, IEC61180, IEC61643-11 Part 1/Class III
<b>Impulse capacitance</b>	10 $\mu$ F $\pm$ 10 %
<b>Energy at max. voltage</b>	1650 joules
<b>Output impedance</b>	2 $\Omega$ $\pm$ 20 %
<b>Adjustable voltage OC</b>	0.75 kV – 18.3 kV $\pm$ 10 %
<b>Calibrated voltage level</b>	0.75 kV – 18 kV
<b>Voltage waveform</b>	1.2 $\mu$ s $\pm$ 30 % / 50 $\mu$ s $\pm$ 20 %
<b>Calibrated current SC</b>	0.375 kA – 9 kA $\pm$ 10 %
<b>Current waveform</b>	8 $\mu$ s $\pm$ 20 % / 20 $\mu$ s $\pm$ 20 %
<b>Undershoot</b>	< 30 %
<b>Pulse repetition</b>	up to 1 / 6 s @ 0.75 kV, 1 / 44 s @ 18 kV
<b>Polarity</b>	positive, negative, alternating
<b>Programmable ramp</b>	voltage



### MIG1809 control features

<b>User interface</b>	LCD and keypad, efficient menu structure
<b>Communication interface</b>	RS232 with (optional) adapter to USB
<b>Surge voltage monitor BNC</b>	10 V = 18 kV, accuracy $\pm$ 3%
<b>Surge current monitor BNC</b>	10 V = 9 kA, accuracy $\pm$ 3%
<b>Surge voltage on display</b>	0.75 – 18.8 kV, accuracy $\pm$ 3%
<b>Surge current on display</b>	0.375 – 9.4 kA, accuracy $\pm$ 3%
<b>Trigger out</b>	BNC, max. 12 V
<b>Trigger in</b>	auto, manual, external (BNC input)
<b>Synchro. source</b>	EUT power, direct out
<b>Impulse counter</b>	programmable up to 29'999
<b>Emergency stop</b>	Emergency Stop button, BNC input (EUT Fail)
<b>Internal memory</b>	up to 15 tests can be saved and recalled

### MIG1809 supply, weight, dimensions, climatic conditions

<b>Operating voltage</b>	115 / 230 V (50/60 Hz) $\pm$ 10%
<b>Power consumption</b>	ON < 400 VA, standby < 10 VA
<b>Weight</b>	64 kg
<b>W x d x h</b>	45 x 57 x 60 cm
<b>Version</b>	19" unit, 12 UH
<b>Temperature range</b>	10 – 35 °C
<b>Humidity</b>	< 80 % non-condensing
<b>Air pressure</b>	86 – 106 kPa



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**Included articles**

<b>Power cord</b>	with country plug
<b>User manual</b>	with conformity declaration
<b>Calibration certificate</b>	factory calibration

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**MIG1809 optional accessories**

<b>Test cabinet</b>	TC-ST with warning lamps
<b>Software</b>	TEMA: sequence, report, for latest Windows TEMA EXT-MEASURE for autom. DSO control

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**MIG2403****MIG2403 circuit: voltage impulse 1.2/50  $\mu$ s, 24 kV**

<b>Standards</b>	IEC60060-1, IEC61010-1, IEC61180, latest editions
<b>Application</b>	test insulation against voltage impulse
<b>Impulse capacitance</b>	2.5 $\mu$ F $\pm$ 10 %
<b>Energy at max. voltage</b>	720 joules
<b>Output impedance</b>	40 $\Omega$ $\pm$ 10 %
<b>Adjustable voltage OC</b>	1 kV – 26 kV $\pm$ 10 %
<b>Calibrated level</b>	2 kV – 24 kV
<b>Voltage waveform</b>	1.2 $\mu$ s $\pm$ 30 % / 50 $\mu$ s $\pm$ 20 %
<b>Waveform in tolerance for</b>	R > 1 k $\Omega$ L > 20 mH C < 5 nF
<b>SC current waveform</b>	not defined
<b>Pulse repetition</b>	up to 1 / 5 s @ 2 kV, 1 / 13 s @ 24 kV
<b>Polarity</b>	positive, negative, alternating
<b>Programmable ramp</b>	voltage

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**MIG2403 control features**

<b>User interface</b>	LCD and keypad, efficient menu structure
<b>Communication interface</b>	RS232 with (optional) adapter to USB
<b>Surge voltage monitor BNC</b>	10 V = 24 kV, accuracy $\pm$ 3%
<b>Surge current monitor BNC</b>	10 V = 600 A, accuracy $\pm$ 3%
<b>Surge voltage on display</b>	1 – 26.4 kV, accuracy $\pm$ 3%
<b>Surge current on display</b>	25 – 660 A, accuracy $\pm$ 3%
<b>Peak check function</b>	yes, programmable limits for measured U, I
<b>Trigger out</b>	BNC, max. 12 V
<b>Trigger in</b>	auto, manual, external (BNC input)
<b>Impulse counter</b>	programmable up to 29'999
<b>Emergency stop</b>	Emergency Stop button, BNC input (EUT Fail)
<b>Internal memory</b>	up to 15 tests can be saved and recalled

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## MIG2403 supply, weight, dimensions, climatic conditions

<b>Operating voltage</b>	115 / 230 V (50/60 Hz) $\pm$ 10%
<b>Power consumption</b>	ON < 400 VA, standby < 10 VA
<b>Weight</b>	43 kg
<b>W x d x h</b>	45 x 57 x 43 cm
<b>Version</b>	19" unit, 8 UH
<b>Temperature range</b>	10 – 35 °C
<b>Humidity</b>	< 80 % non-condensing
<b>Air pressure</b>	86 – 106 kPa
<b>Included articles</b>	
<b>Power cord</b>	with country plug
<b>User manual</b>	with conformity declaration
<b>Calibration certificate</b>	factory calibration

## MIG2403 optional accessories

<b>Test cabinet</b>	TC-ST with warning lamps
<b>80 <math>\Omega</math> output adapter</b>	CN24-40-80, with 1.5 m cables and clips
<b>500 <math>\Omega</math> output adapter</b>	CN24-XX-500, with AMP connectors
<b>500 <math>\Omega</math>, 0.5 J energy out</b>	NW-IEC60255-524
<b>Software</b>	TEMA: sequence, report, for latest Windows TEMA EXT-MEASURE for autom. DSO control

## MIG2412

### MIG2412 circuit: CWG / Surge 24 kV

<b>Standards</b>	IEC61000-4-5, ANSI C62.41, IEC60060-1, IEC61180, -2, IEC61643-11 /Class III
<b>Impulse capacitance</b>	10 $\mu$ F $\pm$ 10 %
<b>Energy at max. voltage</b>	3000 joules
<b>Output impedance</b>	2 $\Omega$ $\pm$ 20 %
<b>Adjustable voltage OC</b>	1 kV – 24.5 kV $\pm$ 10 %
<b>Calibrated voltage level</b>	2 kV – 24 kV
<b>Voltage waveform</b>	1.2 $\mu$ s $\pm$ 30 % / 50 $\mu$ s $\pm$ 20 %
<b>Calibrated current SC</b>	1 kA – 12 kA $\pm$ 10 %
<b>Current waveform</b>	8 $\mu$ s $\pm$ 20 % / 20 $\mu$ s $\pm$ 20 %
<b>Undershoot</b>	< 30 %
<b>Pulse repetition</b>	up to 1 / 10 s @ 2 kV, 1 / 30 s @ 24 kV
<b>Polarity</b>	positive, negative, alternating
<b>Programmable ramp</b>	voltage



### MIG2412 control features

<b>User interface</b>	LCD and keypad, efficient menu structure
<b>Communication interface</b>	RS232 with (optional) adapter to USB
<b>Surge voltage monitor BNC</b>	10 V = 24 kV, accuracy $\pm 3\%$
<b>Surge current monitor BNC</b>	10 V = 12 kA, accuracy $\pm 3\%$
<b>Surge voltage on display</b>	1 – 26.4 kV, accuracy $\pm 3\%$
<b>Surge current on display</b>	0.5 – 13.2 kA, accuracy $\pm 3\%$
<b>Trigger out</b>	BNC, max. 12 V
<b>Trigger in</b>	auto, manual, external (BNC input)
<b>Synchro. source</b>	EUT power, direct out
<b>Impulse counter</b>	programmable up to 29'999
<b>Emergency stop</b>	Emergency Stop button, BNC input (EUT Fail)
<b>Internal memory</b>	up to 15 tests can be saved and recalled

### MIG2412 supply, weight, dimensions, climatic conditions

<b>Operating voltage</b>	115 / 230 V (50/60 Hz) $\pm 10\%$
<b>Power consumption</b>	ON < 400 VA, standby < 10 VA

<b>Weight</b>	149 kg
<b>W x d x h</b>	60 x 65 x 123 cm
<b>Version</b>	19" rack (with wheels), 18 UH

<b>Temperature range</b>	10 – 35 °C
<b>Humidity</b>	< 80 % non-condensing
<b>Air pressure</b>	86 – 106 kPa

#### Included articles

<b>Power cord</b>	with country plug
<b>User manual</b>	with conformity declaration
<b>Calibration certificate</b>	factory calibration

### MIG2412 optional accessories

<b>No CDN for powered EUTs</b>	no CDN available for MIG2412
<b>Test cabinet</b>	TC-ST with warning lamps
<b>Software</b>	TEMA: sequence, report, for latest Windows TEMA EXT-MEASURE for autom. DSO control

## MIG3603C

### MIG3603C circuit: voltage impulse 1.2/50 $\mu$ s, 12 $\Omega$ , 36 kV

<b>Standards</b>	IEC60060-1, IEC61010-1, IEC60355-1, IEC61180, latest editions
<b>Application</b>	test insulation against voltage impulse
<b>Impulse capacitance</b>	1.666 $\mu$ F $\pm$ 10 %
<b>Energy at max. voltage</b>	1080 joules
<b>Output impedance</b>	12 $\Omega$ $\pm$ 10 %
<b>Adjustable voltage OC</b>	2 kV – 36.5 kV $\pm$ 10 %
<b>Calibrated voltage level</b>	4 kV – 36 kV
<b>Voltage waveform</b>	1.2 $\mu$ s $\pm$ 30 % / 50 $\mu$ s $\pm$ 20 %
<b>Waveform in tolerance for</b>	R > 500 $\Omega$ L > 20 mH C < 20 nF
<b>Pulse repetition</b>	up to 1 / 6 s @ 4 kV, 1 / 22 s @ 36 kV
<b>Polarity</b>	positive, negative, alternating
<b>Programmable ramp</b>	voltage



### MIG3603C circuit: voltage impulse 1.2/50 $\mu$ s, 500 $\Omega$ , 36 kV

<b>Standards</b>	IEC60060-1, IEC61010-1 latest editions
<b>Application</b>	test insulation against voltage impulse
<b>Impulse capacitance</b>	1.666 $\mu$ F $\pm$ 10 %
<b>Energy at max. voltage</b>	1080 joules
<b>Output impedance</b>	500 $\Omega$ $\pm$ 10 %
<b>Adjustable voltage OC</b>	2 kV – 36.5 kV $\pm$ 10 %
<b>Calibrated voltage level</b>	4 kV – 36 kV
<b>Voltage waveform</b>	1.2 $\mu$ s $\pm$ 30 % / 50 $\mu$ s $\pm$ 20 %
<b>Waveform in tolerance for</b>	R > 500 $\Omega$ L > 20 mH C < 20 nF
<b>Pulse repetition</b>	up to 1 / 6 s @ 4 kV, 1 / 22 s @ 36 kV
<b>Polarity</b>	positive, negative, alternating
<b>Programmable ramp</b>	voltage

### MIG3603C circuit: voltage impulse 1.2/50 $\mu$ s, 500 $\Omega$ , 6 kV

<b>Standard</b>	IEC60355-1
<b>Application</b>	test insulation against voltage impulse
<b>Impulse capacitance</b>	10 $\mu$ F $\pm$ 10 %
<b>Energy at max. voltage</b>	180 joules
<b>Output impedance</b>	500 $\Omega$ $\pm$ 10 %
<b>Adjustable voltage OC</b>	250 V – 6.1 kV $\pm$ 10 %
<b>Calibrated voltage level</b>	500 V – 6 kV
<b>Voltage waveform</b>	1.2 $\mu$ s $\pm$ 30 % / 50 $\mu$ s $\pm$ 20 %
<b>Pulse repetition</b>	up to 1 / 4 s @ 500 V, 1 / 10 s @ 6 kV
<b>Polarity</b>	positive, negative, alternating
<b>Programmable ramp</b>	voltage

### MIG3603C circuit: CWG / Surge 2 Ω, 6 kV

<b>Standard</b>	IEC61000-4-5 latest
<b>Application</b>	test insulation against voltage impulse
<b>Impulse capacitance</b>	10 μF ± 10 %
<b>Energy at max. voltage</b>	180 joules
<b>Output impedance</b>	2 Ω ± 10 %
<b>Adjustable voltage OC</b>	250 V – 6.1 kV ± 10 %
<b>Calibrated voltage level</b>	250 V – 6 kV
<b>Voltage waveform</b>	1.2 μs ± 30 % / 50 μs ± 20 %
<b>SC current waveform</b>	8 μs ± 20 % / 20 μs ± 20 %
<b>Pulse repetition</b>	up to 1 / 4 s @ 500 V, 1 / 10 s @ 6 kV
<b>Polarity</b>	positive, negative, alternating
<b>Programmable ramp</b>	voltage

### MIG3603C control features

<b>User interface</b>	LCD and keypad, efficient menu structure
<b>Communication interface</b>	RS232 with (optional) adapter to USB
<b>Surge voltage monitor BNC</b>	10 V = 36 kV o5 6 kV accuracy ± 3%
<b>Surge current monitor BNC</b>	10 V = 3 kA, accuracy ± 3%
<b>Surge voltage on display</b>	0.2 – 37.8 kV, accuracy ± 3%
<b>Surge current on display</b>	10 A – 3.3 kA, accuracy ± 3%
<b>Peak check function</b>	yes, programmable limits for measured U, I
<b>Trigger out</b>	BNC, max. 12 V
<b>Trigger in</b>	auto, manual, external (BNC input)
<b>Impulse counter</b>	programmable up to 29'999
<b>Emergency stop</b>	Emergency Stop button, BNC input (EUT Fail)
<b>Internal memory</b>	up to 15 tests can be saved and recalled

### MIG3603C supply, weight, dimensions, climatic conditions

<b>Operating voltage</b>	115 / 230 V (50/60 Hz) ± 10%
<b>Power consumption</b>	ON < 400 VA, standby < 10 VA
<b>Weight</b>	50 kg
<b>W x d x h</b>	45 x 57 x 43 cm
<b>Version</b>	19" unit, 8 UH
<b>Temperature range</b>	10 – 35 °C
<b>Humidity</b>	< 80 % non-condensing
<b>Air pressure</b>	86 – 106 kPa
<b>Included articles</b>	
<b>Power cord</b>	with country plug
<b>User manual</b>	with conformity declaration
<b>Calibration certificate</b>	factory calibration

### MIG3603C optional accessories

Test cabinet	TC-ST with warning lamps
Test cables	CN-MIG4803, 1.2 m length
CDNs for CWG tests	c, CDN KIT1000 ED3 up to 6 kV
Software	TEMA: sequence, report, for latest Windows TEMA EXT-MEASURE for autom. DSO control

### MIG4803

#### MIG4803 circuit: voltage impulse 1.2/50 $\mu$ s, 16 $\Omega$ , 48 kV

Standards	IEC60060-1, IEC61010-1 latest editions
Application	test insulation against voltage impulse
Impulse capacitance	1.25 $\mu$ F $\pm$ 10 %
Energy at max. voltage	1440 joules
Output impedance	16 $\Omega$ $\pm$ 10 %
Adjustable voltage OC	2 kV – 48.2 kV $\pm$ 10 %
Calibrated voltage level	8 kV – 48 kV
Voltage waveform	1.2 $\mu$ s $\pm$ 30 % / 50 $\mu$ s $\pm$ 20 %
Waveform in tolerance for	R > 500 $\Omega$ L > 20 mH C < 10 nF
SC current waveform	8 $\mu$ s $\pm$ 20 % / 20 $\mu$ s $\pm$ 20 %
Pulse repetition	up to 1 / 6 s @ 4 kV, 1 / 30 s @ 48 kV
Polarit	positive, negative, alternating
Programmable ramp	voltage



#### MIG4803 circuit: voltage impulse 1.2/50 $\mu$ s, 50 $\Omega$ , 48 kV

Standards	IEC60060-1, IEC61010-1 latest editions
Application	test insulation against voltage impulse
Impulse capacitance	1.25 $\mu$ F $\pm$ 10 %
Energy at max. voltage	1440 joules
Output impedance	50 $\Omega$ $\pm$ 10 %, manually switchable
Adjustable voltage OC	2 kV – 48.2 kV $\pm$ 10 %
Calibrated voltage level	8 kV – 48 kV
Voltage waveform	1.2 $\mu$ s $\pm$ 30 % / 50 $\mu$ s $\pm$ 20 %
Waveform in tolerance for	R > 500 $\Omega$ L > 20 mH C < 10 nF
SC current waveform	8 $\mu$ s $\pm$ 20 % / 20 $\mu$ s $\pm$ 20 %
Pulse repetition	up to 1 / 6 s @ 4 kV, 1 / 30 s @ 48 kV
Polarity	positive, negative, alternating
Programmable ramp	voltage

### MIG4803 circuit: CWG / Surge 2 $\Omega$ , 6 kV

<b>Standard</b>	IEC61000-4-5 latest
<b>Application</b>	test insulation against voltage impulse
<b>Impulse capacitance</b>	10 $\mu$ F $\pm$ 10 %
<b>Energy at max. voltage</b>	180 joules
<b>Output impedance</b>	2 $\Omega$ $\pm$ 10 %
<b>Adjustable voltage OC</b>	250 V – 6.1 kV $\pm$ 10 %
<b>Calibrated voltage level</b>	250 V – 6 kV
<b>Voltage waveform</b>	1.2 $\mu$ s $\pm$ 30 % / 50 $\mu$ s $\pm$ 20 %
<b>SC current waveform</b>	8 $\mu$ s $\pm$ 20 % / 20 $\mu$ s $\pm$ 20 %
<b>Pulse repetition</b>	up to 1 / 4 s @ 500 V, 1 / 10 s @ 6 kV
<b>Polarity</b>	positive, negative, alternating
<b>Programmable ramp</b>	voltage

### MIG4803 circuit: Surge 50 $\Omega$ , 6 kV

<b>Standard</b>	IEC61000-4-5 latest
<b>Application</b>	test insulation against voltage impulse
<b>Impulse capacitance</b>	10 $\mu$ F $\pm$ 10 %
<b>Energy at max. voltage</b>	180 joules
<b>Output impedance</b>	2 $\Omega$ $\pm$ 10 %
<b>Adjustable voltage OC</b>	250 V – 6.1 kV $\pm$ 10 %
<b>Calibrated voltage level</b>	250 V – 6 kV
<b>Voltage waveform</b>	1.2 $\mu$ s $\pm$ 30 % / 50 $\mu$ s $\pm$ 20 %
<b>Pulse repetition</b>	up to 1 / 4 s @ 500 V, 1 / 10 s @ 6 kV
<b>Polarity</b>	positive, negative, alternating
<b>Programmable ramp</b>	voltage

### MIG4803C control features

<b>User interface</b>	LCD and keypad, efficient menu structure
<b>Communication interface</b>	RS232 with (optional) adapter to USB
<b>Surge voltage monitor BNC</b>	10 V = 48 kV o5 6 kV accuracy $\pm$ 3%
<b>Surge current monitor BNC</b>	10 V = 3 kA, accuracy $\pm$ 3%
<b>Surge voltage on display</b>	0.2 – 48.2 kV, accuracy $\pm$ 3%
<b>Surge current on display</b>	10 A – 3.3 kA, accuracy $\pm$ 3%
<b>Peak check function</b>	yes, programmable limits for measured U, I
<b>Trigger out</b>	BNC, max. 12 V
<b>Trigger in</b>	auto, manual, external (BNC input)
<b>Impulse counter</b>	programmable up to 29'999
<b>Emergency stop</b>	Emergency Stop button, BNC input (EUT Fail)
<b>Internal memory</b>	up to 15 tests can be saved and recalled

### MIG4803 supply, weight, dimensions, climatic conditions

<b>Operating voltage</b>	115 / 230 V (50/60 Hz) $\pm$ 10%
<b>Power consumption</b>	ON < 400 VA, standby < 10 VA
<b>Weight</b>	66 kg
<b>W x d x h</b>	45 x 57 x 60 m
<b>Version</b>	19" unit, 12 UH
<b>Temperature range</b>	10 – 35 °C
<b>Humidity</b>	< 80 % non-condensing
<b>Air pressure</b>	86 – 106 kPa
<b>Included articles</b>	
<b>Power cord</b>	with country plug
<b>User manual</b>	with conformity declaration
<b>Calibration certificate</b>	factory calibration

### MIG4803 optional accessories

<b>Test cables</b>	CN-MIG4803, 1.2 m length
<b>CDNs for CWG tests</b>	CDN2000-06-32, CDN KIT1000 ED3 up to 6 kV
<b>Software</b>	TEMA: sequence, report, for latest Windows TEMA EXT-MEASURE for autom. DSO control

## MIG7203

### MIG7203 circuit: voltage impulse 1.2/50 $\mu$ s, 24 $\Omega$ , 72 kV

<b>Standards</b>	IEC60060-1, IEC61010-1 latest editions
<b>Application</b>	test insulation against voltage impulse
<b>Impulse capacitance</b>	2.5 $\mu$ F $\pm$ 10 %
<b>Energy at max. voltage</b>	840 joules
<b>Output impedance</b>	24 $\Omega$ $\pm$ 10 %
<b>Adjustable voltage OC</b>	1 kV – 72 kV $\pm$ 10 %, in 3 stages: 24, 48, 72 kV
<b>Calibrated level</b>	4 kV – 72 kV
<b>Voltage waveform</b>	1.2 $\mu$ s $\pm$ 30 % / 50 $\mu$ s $\pm$ 20 %
<b>Waveform in tolerance for</b>	R > 1 k $\Omega$ L > 20 mH C < 3 nF, for stage 1 (up to 24 kV) C < 2.5 nF for stage 2 (up to 48 kV) C < 2 nF for stage 3 (up to 72 kV) 1 k $\Omega$    max. 1 nF
<b>SC current waveform</b>	not defined
<b>Pulse repetition</b>	up to 1 / 5 s @ 1 kV, 1 / 30 s @ 72 kV
<b>Polarity</b>	positive, negative, alternating (alt. up to 48 kV)
<b>Programmable ramp</b>	voltage





### MIG7203 circuit: voltage impulse 1.2/50 $\mu$ s, 500 $\Omega$ , 72 kV

<b>Standards</b>	IEC60060-1, IEC61010-1 latest editions
<b>Application</b>	test insulation against voltage impulse
<b>Impulse capacitance</b>	2.5 $\mu$ F $\pm$ 10 %
<b>Energy at max. voltage</b>	840 joules
<b>Output impedance</b>	500 $\Omega$ $\pm$ 10 %, manually selectable
<b>Adjustable voltage OC</b>	1 kV – 72 kV $\pm$ 10 %, in 3 stages: 24, 48, 72 kV
<b>Calibrated level</b>	4 kV – 72 kV
<b>Voltage waveform</b>	1.2 $\mu$ s $\pm$ 30 % / 50 $\mu$ s $\pm$ 20 %
<b>SC current waveform</b>	not defined
<b>Pulse repetition</b>	up to 1 / 5 s @ 1 kV, 1 / 30 s @ 72 kV
<b>Polarity</b>	positive, negative, alternating (alt. up to 48 kV)
<b>Programmable ramp</b>	voltage

### MIG7203 control features

<b>User interface</b>	LCD and keypad, efficient menu structure
<b>Communication interface</b>	RS232 with (optional) adapter to USB
<b>Surge voltage monitor BNC</b>	10 V = total stage voltage, accuracy $\pm$ 3%
<b>Surge current monitor BNC</b>	10 V = 3 kA, accuracy $\pm$ 3%
<b>Surge voltage on display</b>	1 – 72 kV, accuracy $\pm$ 3%
<b>Surge current on display</b>	10 – 3300 A, accuracy $\pm$ 3%
<b>Peak check function</b>	yes, programmable limits for measured U, I
<b>Trigger out</b>	BNC, max. 12 V
<b>Trigger in</b>	auto, manual, external (BNC input)
<b>Impulse counter</b>	programmable up to 29'999
<b>Emergency stop</b>	Emergency Stop button, BNC input (EUT Fail)
<b>Internal memory</b>	up to 15 tests can be saved and recalled

### MIG7203 supply, weight, dimensions, climatic conditions

<b>Operating voltage</b>	115 / 230 V (50/60 Hz) $\pm$ 10%
<b>Power consumption</b>	ON < 2200 VA, standby < 100 VA

#### Unit 1 (generator rack)

<b>Weight</b>	117 kg
<b>W x d x h</b>	61 x 66 x 128 cm

#### Unit 2 (controller)

<b>Weight</b>	46 kg
<b>W x d x h</b>	45 x 60 x 37 cm
<b>Version</b>	19" unit / table top unit, 8 UH

<b>Temperature range</b>	10 – 35 °C
<b>Humidity</b>	< 80 % non-condensing
<b>Air pressure</b>	86 – 106 kPa

#### Included articles

<b>Power cord</b>	with country plug
<b>User manual</b>	with conformity declaration
<b>Calibration certificate</b>	factory calibration

### MIG7203 optional accessories

<b>Extension to 96 kV</b>	STAGE2403 4, upgrade performed at EMCP
<b>Extension to 120 kV</b>	STAGE2403 5, upgrade performed at EMCP
<b>Extension to 144 kV</b>	STAGE2403 6, upgrade performed at EMCP
<b>Software</b>	TEMA: sequence, report, for latest Windows TEMA EXT-MEASURE for autom. DSO control

### MIG9603

#### MIG9603 circuit: voltage impulse 1.2/50 $\mu$ s, 32 $\Omega$ , 96 kV

<b>Standards</b>	IEC60060-1, IEC61010-1 latest editions
<b>Application</b>	test insulation against voltage impulse
<b>Impulse capacitance</b>	0.59 $\mu$ F $\pm$ 10 %
<b>Energy at max. voltage</b>	2718 joules
<b>Output impedance</b>	32 $\Omega$ $\pm$ 10 %
<b>Adjustable voltage OC</b>	1 kV – 96 kV $\pm$ 10 %, in 4 stages: 24, 48, 72, 96 kV
<b>Calibrated level</b>	2 kV – 96 kV
<b>Voltage waveform</b>	1.2 $\mu$ s $\pm$ 30 % / 50 $\mu$ s $\pm$ 20 %
<b>Waveform in tolerance for</b>	R > 1 k $\Omega$ L > 20 mH C < 3 nF, for stage 1 (up to 24 kV) C < 2.5 nF for stage 2 (up to 48 kV) C < 2 nF for stage 3 (up to 72 kV) C < 1.5 nF for stage 4 (up to 96 kV) 1 k $\Omega$    max. 1 nF
<b>SC current waveform</b>	not defined
<b>Pulse repetition</b>	up to 1 / 5 s @ 1 kV, 1 / 40 s @ 96 kV
<b>Polarity</b>	positive, negative, alternating (alt. up to 48 kV)
<b>Programmable ramp</b>	voltage



#### MIG9603 circuit: voltage impulse 1.2/50 $\mu$ s, 500 $\Omega$ , 96 kV

<b>Standards</b>	IEC60060-1, IEC61010-1 latest editions
<b>Application</b>	test insulation against voltage impulse
<b>Impulse capacitance</b>	0.59 $\mu$ F $\pm$ 10 %
<b>Energy at max. voltage</b>	2718 joules
<b>Output impedance</b>	500 $\Omega$ $\pm$ 10 %, manually selectable
<b>Adjustable voltage OC</b>	1 kV – 96 kV $\pm$ 10 %, in 4 stages
<b>Calibrated level</b>	2 kV – 96 kV
<b>Voltage waveform</b>	1.2 $\mu$ s $\pm$ 30 % / 50 $\mu$ s $\pm$ 20 %
<b>SC current waveform</b>	not defined
<b>Pulse repetition</b>	up to 1 / 5 s @ 1 kV, 1 / 40 s @ 96 kV
<b>Polarity</b>	positive, negative, alternating (alt. up to 48 kV)
<b>Programmable ramp</b>	voltage

### MIG9603 control features

<b>User interface</b>	LCD and keypad, efficient menu structure
<b>Communication interface</b>	RS232 with (optional) adapter to USB
<b>Surge voltage monitor BNC</b>	10 V = total stage voltage, accuracy $\pm 3\%$
<b>Surge current monitor BNC</b>	10 V = 3 kA, accuracy $\pm 3\%$
<b>Surge voltage on display</b>	1 – 96 kV, accuracy $\pm 3\%$
<b>Surge current on display</b>	10 – 3300 A, accuracy $\pm 3\%$
<b>Peak check function</b>	yes, programmable limits for measured U, I
<b>Trigger out</b>	BNC, max. 12 V
<b>Trigger in</b>	auto, manual, external (BNC input)
<b>Impulse counter</b>	programmable up to 29'999
<b>Emergency stop</b>	Emergency Stop button, BNC input (EUT Fail)
<b>Internal memory</b>	up to 15 tests can be saved and recalled

### MIG9603 supply, weight, dimensions, climatic conditions

<b>Operating voltage</b>	115 / 230 V (50/60 Hz) $\pm 10\%$
<b>Power consumption</b>	ON < 2200 VA, standby < 100 VA

#### Unit 1 (generator rack)

<b>Weight</b>	142 kg
<b>W x d x h</b>	80 x 80 x 149 cm

#### Unit 2 (controller)

<b>Weight</b>	47 kg
<b>W x d x h</b>	45 x 60 x 37 cm
<b>Version</b>	19" unit / table top unit, 8 UH

<b>Temperature range</b>	10 – 35 °C
<b>Humidity</b>	< 80 % non-condensing
<b>Air pressure</b>	86 – 106 kPa

#### Included articles

<b>Power cord</b>	with country plug
<b>User manual</b>	with conformity declaration
<b>Calibration certificate</b>	factory calibration

### MIG9603 optional accessories

<b>Extension to 120 kV</b>	STAGE2403 5, upgrade performed at EMCP
<b>Extension to 144 kV</b>	STAGE2403 6, upgrade performed at EMCP
<b>Software</b>	TEMA: sequence, report, for latest Windows TEMA EXT-MEASURE for autom. DSO control

## MIG12003

### MIG12003 circuit: voltage impulse 1.2/50 $\mu$ s, 32 $\Omega$ , 120 kV

<b>Standards</b>	IEC60060-1, IEC61010-1 latest editions
<b>Application</b>	test insulation against voltage impulse
<b>Impulse capacitance</b>	0.1 $\mu$ F $\pm$ 10 %
<b>Energy at max. voltage</b>	720 joules
<b>Output impedance</b>	40 $\Omega$ $\pm$ 10 %
<b>Adjustable voltage OC</b>	1 kV – 120 kV $\pm$ 10 %, in 5 stages: 24, 48, 72, 96, 120 kV
<b>Calibrated level</b>	4 kV – 120 kV
<b>Voltage waveform</b>	1.2 $\mu$ s $\pm$ 30 % / 50 $\mu$ s $\pm$ 20 %
<b>Waveform in tolerance for</b>	R > 1 k $\Omega$ L > 20 mH C < 3 nF, for stage 1 (up to 24 kV) C < 2.5 nF for stage 2 (up to 48 kV) C < 2 nF for stage 3 (up to 72 kV) C < 1.5 nF for stage 4 (up to 96 kV) C < 1.0 nF for stage 5 (up to 120 kV) 1 k $\Omega$    max. 1 nF
<b>SC current waveform</b>	not defined
<b>Pulse repetition</b>	up to 1 / 5 s @ 1 kV, 1 / 45 s @ 120 kV
<b>Polarity</b>	positive, negative, alternating (alt. up to 48 kV)
<b>Programmable ramp</b>	voltage



### MIG12003 circuit: voltage impulse 1.2/50 $\mu$ s, 500 $\Omega$ , 120 kV

<b>Standards</b>	IEC60060-1, IEC61010-1 latest editions
<b>Application</b>	test insulation against voltage impulse
<b>Impulse capacitance</b>	0.1 $\mu$ F $\pm$ 10 %
<b>Energy at max. voltage</b>	720 joules
<b>Output impedance</b>	500 $\Omega$ $\pm$ 10 %, manually selectable
<b>Adjustable voltage OC</b>	1 kV – 120 kV $\pm$ 10 %, in 5 stages
<b>Calibrated level</b>	4 kV – 120 kV
<b>Voltage waveform</b>	1.2 $\mu$ s $\pm$ 30 % / 50 $\mu$ s $\pm$ 20 %
<b>SC current waveform</b>	not defined
<b>Pulse repetition</b>	up to 1 / 5 s @ 1 kV, 1 / 45 s @ 120 kV
<b>Polarity</b>	positive, negative, alternating (alt. up to 48 kV)
<b>Programmable ramp</b>	voltage

### MIG12003 control features

<b>User interface</b>	LCD and keypad, efficient menu structure
<b>Communication interface</b>	RS232 with (optional) adapter to USB
<b>Surge voltage monitor BNC</b>	10 V = total stage voltage, accuracy $\pm 3\%$
<b>Surge current monitor BNC</b>	10 V = 3 kA, accuracy $\pm 3\%$
<b>Surge voltage on display</b>	1 – 120 kV, accuracy $\pm 3\%$
<b>Surge current on display</b>	10 – 3300 A, accuracy $\pm 3\%$
<b>Peak check function</b>	yes, programmable limits for measured U, I
<b>Trigger out</b>	BNC, max. 12 V
<b>Trigger in</b>	auto, manual, external (BNC input)
<b>Impulse counter</b>	programmable up to 29'999
<b>Emergency stop</b>	Emergency Stop button, BNC input (EUT Fail)
<b>Internal memory</b>	up to 15 tests can be saved and recalled

### MIG12003 supply, weight, dimensions, climatic conditions

<b>Operating voltage</b>	115 / 230 V (50/60 Hz) $\pm 10\%$
<b>Power consumption</b>	ON < 2200 VA, standby < 100 VA

#### Unit 1 (generator rack)

<b>Weight</b>	151 kg
<b>W x d x h</b>	61 x 66 x 162 cm

#### Unit 2 (controller)

<b>Weight</b>	46 kg
<b>W x d x h</b>	45 x 60 x 37 cm
<b>Version</b>	19" unit / table top unit, 8 UH

<b>Temperature range</b>	10 – 35 °C
<b>Humidity</b>	< 80 % non-condensing
<b>Air pressure</b>	86 – 106 kPa

#### Included articles

<b>Power cord</b>	with country plug
<b>User manual</b>	with conformity declaration
<b>Calibration certificate</b>	factory calibration

### MIG12003 optional accessories

<b>Extension to 144 kV</b>	STAGE2403 6, upgrade performed at EMCP
<b>Software</b>	TEMA: sequence, report, for latest Windows TEMA EXT-MEASURE for autom. DSO control

## MIG14403

### MIG14403 circuit: voltage impulse 1.2/50 $\mu$ s, 48 $\Omega$ , 144 kV

<b>Standards</b>	IEC60060-1, IEC61010-1 latest editions
<b>Application</b>	test insulation against voltage impulse
<b>Impulse capacitance</b>	0.39 $\mu$ F $\pm$ 10 %
<b>Energy at max. voltage</b>	4095 joules
<b>Output impedance</b>	48 $\Omega$ $\pm$ 10 %
<b>Adjustable voltage OC</b>	1 kV – 144 kV $\pm$ 10 %, in 6 stages: 24, 48, 72, 96, 120, 144 kV
<b>Calibrated level</b>	4 kV – 144 kV
<b>Voltage waveform</b>	1.2 $\mu$ s $\pm$ 30 % / 50 $\mu$ s $\pm$ 20 %
<b>Waveform in tolerance for</b>	R > 10 k $\Omega$ L > 20 mH C < 3 nF, for stage 1 (up to 24 kV) C < 2.5 nF for stage 2 (up to 48 kV) C < 2 nF for stage 3 (up to 72 kV) C < 1.5 nF for stage 4 (up to 96 kV) C < 1 nF for stage 5 (up to 120 kV) C < 0.5 nF for stage 5 (up to 144 kV) 10 k $\Omega$    max. 1 nF
<b>SC current waveform</b>	not defined
<b>Pulse repetition</b>	up to 1 / 5 s @ 1 kV, 1 / 59 s @ 144 kV
<b>Polarity</b>	positive, negative, alternating (alt. up to 48 kV)
<b>Programmable ramp</b>	voltage

### MIG14403 circuit: voltage impulse 1.2/50 $\mu$ s, 500 $\Omega$ , 144 kV

<b>Standards</b>	IEC60060-1, IEC61010-1 latest editions
<b>Application</b>	test insulation against voltage impulse
<b>Impulse capacitance</b>	0.39 $\mu$ F $\pm$ 10 %
<b>Energy at max. voltage</b>	4095 joules
<b>Output impedance</b>	500 $\Omega$ $\pm$ 10 %, manually selectable
<b>Adjustable voltage OC</b>	1 kV – 144 kV $\pm$ 10 %, in 6 stages
<b>Calibrated level</b>	4 kV – 144 kV
<b>Voltage waveform</b>	1.2 $\mu$ s $\pm$ 30 % / 50 $\mu$ s $\pm$ 20 %
<b>SC current waveform</b>	not defined
<b>Pulse repetition</b>	up to 1 / 5 s @ 1 kV, 1 / 59 s @ 144 kV
<b>Polarity</b>	positive, negative, alternating (alt. up to 48 kV)
<b>Programmable ramp</b>	voltage



### MIG14403 control features

<b>User interface</b>	LCD and keypad, efficient menu structure
<b>Communication interface</b>	RS232 with (optional) adapter to USB
<b>Surge voltage monitor BNC</b>	10 V = total stage voltage, accuracy $\pm 3\%$
<b>Surge current monitor BNC</b>	10 V = 3 kA, accuracy $\pm 3\%$
<b>Surge voltage on display</b>	1 – 144 kV, accuracy $\pm 3\%$
<b>Surge current on display</b>	10 – 3300 A, accuracy $\pm 3\%$
<b>Peak check function</b>	yes, programmable limits for measured U, I
<b>Trigger out</b>	BNC, max. 12 V
<b>Trigger in</b>	auto, manual, external (BNC input)
<b>Impulse counter</b>	programmable up to 29'999
<b>Emergency stop</b>	Emergency Stop button, BNC input (EUT Fail)
<b>Internal memory</b>	up to 15 tests can be saved and recalled

### MIG14403 supply, weight, dimensions, climatic conditions

<b>Operating voltage</b>	115 / 230 V (50/60 Hz) $\pm 10\%$
<b>Power consumption</b>	ON < 2200 VA, standby < 100 VA

#### Unit 1 (generator rack)

<b>Weight</b>	168 kg
<b>W x d x h</b>	61 x 66 x 179 cm

#### Unit 2 (controller)

<b>Weight</b>	46 kg
<b>W x d x h</b>	45 x 60 x 37 cm
<b>Version</b>	19" unit / table top unit, 8 UH

<b>Temperature range</b>	10 – 35 °C
<b>Humidity</b>	< 80 % non-condensing
<b>Air pressure</b>	86 – 106 kPa

#### Included articles

<b>Power cord</b>	with country plug
<b>User manual</b>	with conformity declaration
<b>Calibration certificate</b>	factory calibration

### MIG14403 optional accessories

<b>Software</b>	TEMA: sequence, report, for latest Windows TEMA EXT-MEASURE for autom. DSO control
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# ACCESSORIES

## CN12-XX-500

<b>Application</b>	matching network for insulation test
<b>Standard</b>	IEC60060-1
<b>Output impedance</b>	500 $\Omega$ , or direct generator output (40 $\Omega$ )
<b>Test level</b>	max. 12 kV
<b>Output connectors</b>	AMP
<b>Weight</b>	1.5 kg
<b>Dimensions</b>	24 x 10 x 8.5 cm
<b>For generators</b>	<a href="#">MIG1203</a> , <a href="#">MIG1203CWG</a>
<b>Accessories</b>	<a href="#">CN-MIG18 AMP</a>



## NW-IEC61036C1

<b>Application</b>	matching network for electricity meter testing
<b>Standard</b>	IEC62052-11, section 5.6
<b>Output impedance / energy</b>	500 $\Omega$ / 0.5 J
<b>Test levels with 0.5 J energy</b>	800 V, 1.5 kV, 2.5 kV, 4 kV
<b>Output connectors</b>	AMP
<b>Weight</b>	2 kg
<b>Dimensions</b>	24 x 18 x 8.5 cm
<b>For generators</b>	<a href="#">MIG1203</a> , <a href="#">MIG1203CWG</a>
<b>Accessories</b>	<a href="#">CN-MIG18 AMP</a>



## NW-IEC61036C2

<b>Application</b>	matching network for electricity meter testing
<b>Standard</b>	IEC62052-11, section 5.6
<b>Outputs</b>	500 $\Omega$ / 0.5 J, or 50 $\Omega$
<b>Test levels with 0.5 J energy</b>	6 kV, 8 kV, 10 kV, 12 kV
<b>Test level with 400 J energy</b>	12 kV (50 $\Omega$ output)
<b>Output connectors</b>	AMP
<b>Weight</b>	2 kg
<b>Dimensions</b>	24 x 18 x 8.5 cm
<b>For generators</b>	<a href="#">MIG1203</a> , <a href="#">MIG1203CWG</a>
<b>Accessories</b>	<a href="#">CN-MIG18 AMP</a>



## NW-IEC60255-524

<b>Application</b>	matching network for protection relay testing
<b>Standard</b>	IEC60255-5
<b>Output impedance / energy</b>	500 $\Omega$ / 0.5 J
<b>Test levels with 0.5 J energy</b>	500 V, 1 kV, 2.5 kV, 5 kV
<b>Output connectors</b>	AMP
<b>Weight</b>	2 kg
<b>Dimensions</b>	24 x 18 x 8.5 cm
<b>For generators</b>	<a href="#">MIG1203</a> , <a href="#">MIG1203CWG</a> , <a href="#">MIG1803</a> , <a href="#">MIG2403</a>
<b>Accessories</b>	<a href="#">CN-MIG18 AMP</a>





### NW-IEC60255-5SEA

<b>Application</b>	matching network for protection relay testing
<b>Standard</b>	IEC60255-5, testing at sea level
<b>Output impedance / energy</b>	500 $\Omega$ / 0.5 J
<b>Test levels with 0.5 J energy</b>	900 V, 1.75 kV, 3 kV, 7.3 kV
<b>Output connectors</b>	AMP
<b>Weight</b>	2 kg
<b>Dimensions</b>	24 x 18 x 8.5 cm
<b>For generators</b>	<a href="#">MIG1203</a> , <a href="#">MIG1203CWG</a>
<b>Accessories</b>	<a href="#">CN-MIG18 AMP</a>



### NW-01-2000

<b>Application</b>	matching network for EN 50470-1 testing
<b>Impulse capacitance</b>	40 nF
<b>Output impedance</b>	50 $\Omega$ $\pm$ 20 %
<b>Test level / energy</b>	6 kV / 0.72 J, 7 kV / 1 J, 8 kV / 1.3 J, 12 kV / 2.9 J
<b>Waveform voltage</b>	100 ns $\pm$ 30 % / 2000 $\mu$ s $\pm$ 20 %, IEC60060-1 def.
<b>Output connectors</b>	AMP
<b>Weight</b>	2 kg
<b>Dimensions</b>	24 x 18 x 8.5 mm
<b>For generator</b>	<a href="#">MIG1203STEP</a>
<b>Accessories</b>	<a href="#">CN-MIG18 AMP</a> (or placed within <a href="#">TC-ST</a> )



### NW-IEC60065-1

<b>Application</b>	matching network for testing audio, video, electronic apparatus
<b>Standard</b>	IEC60065-1, publication before ed. 7
<b>Impulse capacitance</b>	1 nF
<b>Output impedance</b>	1 k $\Omega$ $\pm$ 10 % series, 4 M $\Omega$ $\pm$ 10 % parallel
<b>Test level</b>	max. 10 kV
<b>Rise time voltage</b>	approx. 100 ns
<b>Output connectors</b>	AMP
<b>Weight</b>	1 kg
<b>Dimensions</b>	24 x 10 x 8 cm
<b>For generator</b>	<a href="#">MIG1203STEP</a>
<b>Accessories</b>	<a href="#">CN-MIG18 AMP</a>



### NW-IEC60065-1A

<b>Application</b>	matching network for testing audio, video, electronic apparatus
<b>Standard</b>	IEC60065-1, ed. 7 and subsequent
<b>Impulse capacitance</b>	1 nF
<b>Output impedance</b>	1 k $\Omega$ $\pm$ 10 % series
<b>Test level</b>	max. 10 kV
<b>Rise time voltage</b>	approx. 100 ns
<b>Output connectors</b>	AMP



<b>Weight</b>	0.5 kg
<b>Dimensions</b>	24 x 10 x 8 cm
<b>For generator</b>	<a href="#">MIG1203STEP</a>
<b>Accessories</b>	<a href="#">CN-MIG18 AMP</a>

### NW-UL1635

<b>Application</b>	matching network for testing digital alarm comm. systems, safety related controls
<b>Standard</b>	UL1635 paragr. 46.4, UL991 paragr. 14.7
<b>Test level low range</b>	0.6 – 1.2 kV in 200 Ω (energy 0.3 – 1.2 J)
<b>Test level high range</b>	1.2 – 2.4 kV in 200 Ω (energy 0.3 – 1.2 J)
<b>Voltage rise time 0 – 100 %</b>	approx. 24 μs, for both ranges
<b>Volt. pulse duration 0 - 50%</b>	approx. 100 μs, for both ranges
<b>Output connectors</b>	banana plugs 4 mm
<b>Weight</b>	2 kg
<b>Dimensions</b>	24 x 24 x 10 cm
<b>For generator</b>	<a href="#">MIG1203STEP</a>



### CN18-XX-500

<b>Application</b>	matching network for insulation test
<b>Standard</b>	IEC60060-1
<b>Output impedance</b>	500 Ω, or direct generator output (40 Ω)
<b>Test level</b>	max. 18 kV
<b>Output connectors</b>	AMP
<b>Weight</b>	1.5 kg
<b>Dimensions</b>	24 x 10 x 8.5 cm
<b>For generators</b>	<a href="#">MIG1203</a> , <a href="#">MIG1203CWG</a>
<b>Accessories</b>	<a href="#">CN-MIG18 AMP</a>



### NW-IEC61036C118

<b>Application</b>	matching network for electricity meter testing
<b>Standard</b>	IEC62052-11, section 5.6
<b>Output impedance / energy</b>	500 Ω/ 0.5 J
<b>Test levels with 0.5 J energy</b>	800 V, 1.5 kV, 2.5 kV, 4 kV
<b>Output connectors</b>	AMP
<b>Weight</b>	2.5 kg
<b>Dimensions</b>	24 x 18 x 8.5 cm
<b>For generator</b>	<a href="#">MIG1803</a>
<b>Accessories</b>	<a href="#">CN-MIG18 AMP</a>



### NW-IEC61036C218

<b>Application</b>	matching network for electricity meter testing
<b>Standard</b>	IEC62052-11, section 5.6
<b>Output impedance / energy</b>	500 Ω / 0.5 J
<b>Test levels with 0.5 J energy</b>	6 kV, 8 kV, 10 kV, 12 kV
<b>Output connectors</b>	AMP
<b>Weight</b>	2.5 kg
<b>Dimensions</b>	24 x 18 x 8.5 cm
<b>For generator</b>	<a href="#">MIG1803</a>
<b>Accessories</b>	<a href="#">CN-MIG18 AMP</a>



### NW to MIG1803

<b>Application</b>	matching network for protection relay testing
<b>Standard</b>	IEC60255-5
<b>Output impedance / energy</b>	500 Ω / 0.5 J
<b>Test levels with 0.5 J energy</b>	900 V, 1.75 kV, 3 kV, 7.3 kV
<b>Output connectors</b>	AMP
<b>Weight</b>	2 kg
<b>Dimensions</b>	24 x 18 x 8.5 cm
<b>For generator</b>	<a href="#">MIG1803</a>
<b>Accessories</b>	<a href="#">CN-MIG18 AMP</a>



### NW-NMI-M6C3C4

<b>Application</b>	matching network for electricity meter testing
<b>Standard</b>	NMI M6
<b>Generator impedance</b>	40 Ω
<b>Pulse energy</b>	9 J ± 1 J @ 10 kV, 9 J ± 1 J @ 12 kV
<b>Test levels with 9 J energy</b>	10 kV, 12 kV ± 10 %
<b>Output connectors</b>	AMP connectors
<b>Weight</b>	2 kg
<b>Dimensions</b>	24 x 18 x 8.5 cm
<b>For generator</b>	<a href="#">MIG1803</a>



### CN24-40-80

<b>Application</b>	matching network for insulation test
<b>Standard</b>	IEC62055-31
<b>Output impedance</b>	80 Ω, or direct generator output (40 Ω)
<b>Test level</b>	max. 24 kV
<b>Weight</b>	1 kg
<b>Dimensions</b>	24 x 10 x 8 cm
<b>For generator</b>	<a href="#">MIG2403</a>
<b>Included</b>	1.5 m cables, alligator clips

### CN24-XX-500

<b>Application</b>	matching network for insulation test
<b>Standard</b>	IEC60060-1
<b>Output impedance</b>	500 $\Omega$ , or direct generator output (40 $\Omega$ )
<b>Test level</b>	max. 24 kV
<b>Output connectors</b>	AMP
<b>Weight</b>	1.5 kg
<b>Dimensions</b>	24 x 10 x 8.5 cm
<b>For generator</b>	<a href="#">MIG2403</a>
<b>Accessories</b>	<a href="#">CN-MIG4803</a>



### CN-MIG18 AMP

<b>Application</b>	1.5 m cables and test pistols for insulation test
<b>Voltage capability</b>	max. 12 kV impulse 1.2/50 $\mu$ s or 10/700 $\mu$ s
<b>Current capability</b>	max. 1000 A impulse 8/20 $\mu$ s or 5/320 $\mu$ s
<b>Input connectors</b>	AMP type
<b>Weight</b>	8.5 kg
<b>Dimensions</b>	43.5 x 47 x 25.4 cm
<b>For generators</b>	<a href="#">MIG1203</a> , <a href="#">MIG1203CWG</a>



### CN-MIG24

<b>Application</b>	1.2 m cables and test pistols for insulation test
<b>Voltage capability</b>	max. 18 kV impulse 1.2/50 $\mu$ s or 10/700 $\mu$ s
<b>Current capability</b>	max. 1000 A impulse 8/20 $\mu$ s or 5/320 $\mu$ s
<b>Connectors</b>	fixed pistols
<b>Weight</b>	8.5 kg
<b>Dimensions</b>	43.5 x 47 x 25.4 cm
<b>For generators</b>	<a href="#">MIG1203</a> , <a href="#">MIG1203CWG</a> , <a href="#">MIG1803</a>



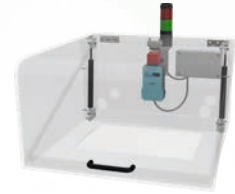
### CN-MIG4803

<b>Application</b>	1.5 m cables for insulation test
<b>Voltage capability</b>	max. 48 kV impulse 1.2/50 $\mu$ s or 10/700 $\mu$ s
<b>Current capability</b>	max. 3 kA impulse 8/20 $\mu$ s or 5/320 $\mu$ s
<b>Connectors</b>	fixed cables with banana output plugs
<b>Weight</b>	8.5 kg
<b>Dimensions</b>	43.5 x 47 x 25.4 cm
<b>For generators</b>	<a href="#">MIG4803</a>



### TC-ST

<b>Standard</b>	multiple
<b>Application</b>	test cabinet with safety circuit
<b>Mounting</b>	on top of generator
<b>EUT volume</b>	20 x 20 x 30 cm
<b>Test cabinet material</b>	acrylic glass
<b>Insulation withstand</b>	pulse 1.2/50 $\mu$ s up to 30 kV
<b>Weight</b>	8 kg
<b>Dimensions</b>	43.5 x 47 x 25.4 cm
<b>Included</b>	control cable to generator
<b>For generators</b>	for MIG series up to 30 kV
<b>Accessories</b>	WARNING-LAMP EXT-TC-INS



### WARNING LAMP

<b>Cable Length</b>	5m
<b>Dimensions</b>	diameter 7x cm x 25 cm
<b>Weight</b>	0.5 kg



### STAGE2403 4

<b>Standard</b>	IEC60060-1, IEC61010-1 latest editions
<b>Application</b>	module used to extend MIG7203 up to 96 kV
<b>Weight</b>	17 kg
<b>For generator</b>	<a href="#">MIG7203</a>
<b>Upgrade</b>	generator must return to EMCP for upgrade



### STAGE2403 5

<b>Standard</b>	IEC60060-1, IEC61010-1 latest editions
<b>Application</b>	module used to extend MIG9603 up to 120 kV
<b>Weight</b>	17 kg
<b>For generator</b>	<a href="#">MIG9603</a>
<b>For generator</b>	<a href="#">MIG7203</a> , together with STAGE2403 4
<b>Upgrade</b>	generator must return to EMCP for upgrade



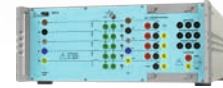
### STAGE2403 6

<b>Standard</b>	IEC60060-1, IEC61010-1 latest editions
<b>Application</b>	module used to extend MIG12003 up to 144 kV
<b>Weight</b>	17 kg
<b>For generator</b>	<a href="#">MIG12003</a>
<b>For generator</b>	<a href="#">MIG9603</a> , together with STAGE2403 5
<b>For generator</b>	<a href="#">MIG7203</a> , together with STAGE2403 4 and - 5
<b>Upgrade</b>	generator must return to EMCP for upgrade



### CDN-M-6-32

<b>Standards</b>	IEC61000-4-4, IEC61000-4-5, other
<b>Type</b>	3-ph., manual
<b>EUT voltage AC</b>	max. 3 x 480V L-L, 50 / 60 Hz
<b>EUT current AC</b>	max. 3 x 32A (covers 0 – 32 A as per standard)
<b>Current flow</b>	bi-directional (source to EUT and EUT to source)
<b>Test level EFT (as per IEC)</b>	max. 6 kV
<b>Test level surge (as per IEC)</b>	max. 6 kV
<b>Surge waveform</b>	as required for current EUT range 0 – 32A
<b>Residual voltage</b>	typically < 5 % for EFT and < 12 % for surge
<b>Dimensions</b>	19" unit, basic 4 UH
<b>Weight</b>	depending on options
<b>Included in delivery</b>	10 connectors (power, EUT), 5 EUT cables adapter for EFT calibration
<b>Generators</b>	IMU-MGE, IMU-MGS, MIG1203CWG, MIG3603C
<b>Options</b>	to be ordered additionally when required
<b>PROT32-AC690</b>	3-ph. AC 690V/32A automatic overcurrent circuit breaker (for tests on AC lines)



### CDN-KIT1000 ED3

<b>Standard</b>	IEC61000-4-5 latest edition
<b>Application</b>	surge on 2 asymmetrical lines, figure 9
<b>Test level surge</b>	max. 6 kV
<b>Low speed I/O</b>	
<b>EUT voltage per line</b>	max. 200 V DC or 240 V peak
<b>EUT current per line</b>	max. 3 A cont. or 5 A for 5 min.
<b>Coupling path 1</b>	40 $\Omega$ + 0.5 $\mu$ F capacitor
<b>Decoupling 1</b>	20 mH per line (protected 275 V max.)
<b>High speed I/O</b>	
<b>EUT voltage per line</b>	max. 24 V DC or peak
<b>EUT current per line</b>	max. 3 A cont. or 5 A for 5 min.
<b>Coupling path 2</b>	40 $\Omega$ + 27 V diode
<b>Decoupling 2</b>	500 $\Omega$ per line (protected 18 V max.)
<b>Dimensions</b>	4 modules in carrying case: 33 x 27 x 17 cm
<b>Weight</b>	7 kg (all modules and carrying case)



# THE EMC PARTNER PRODUCT RANGE

Find further brochures on our website [emc-partner.com/brochures](http://emc-partner.com/brochures) or contact your local representative for a hardcopy.

## IMMUNITY TESTS

Transient Test Systems for all EMC tests on electronic equipment. ESD, EFT, surge, AC dips, AC magnetic field, surge magnetic field, common mode, damped oscillatory and DC dips. According to IEC and EN 61000-4-2, -4, -5, -8, -9, -10, -11, -12, -13, -14, -16, -18, -19, -29.

## LIGHTNING TESTS

Impulse test equipment and accessories for aircraft, military and telecom applications. Complete solutions for RTCA / DO-160 and EUROCAE / ED-14 for indirect lightning on aircraft systems, MIL-STD-461 tests CS106, CS115, CS116, CS117, CS118 and Telecom, ITU-T K.44 for impulse, power contact and power induction.

## COMPONENT TESTS

Impulse generators for testing varistors, gas discharge tubes (GDT), surge protective devices (SPDs), X / Y capacitors, circuit breakers, electricity meters, protection relays, insulation material, suppressor diodes, connectors, chokes, fuses, resistors, emc-gaskets, cables, etc.

## EMISSION MEASUREMENTS

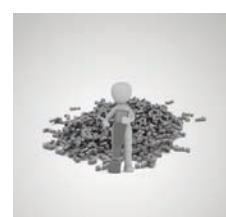
Measurement of Harmonics and Flicker in 1-phase and 3-phase electrical and electronic products according to IEC / EN 61000-3-2 and 61000-3-3. HARCS Immunity software adds interharmonic tests, voltage variation.

## SYSTEM AUTOMATION

A full range of accessories enhance the test systems. Test cabinets, test pistols, adapters and remote control software, simplify interfacing with the EUT. Programmable power supply unit, EMC hardened for frequencies from 16.7Hz to 400Hz. PS3-SOFT-EXT complies with IEC / EN 61000-4-14 and -4-28.

## SERVICE

Our commitment starts with a quality management system backing up our ISO 17025 accreditation. With the SCS number 146, EMC PARTNER provide accredited calibration and repairs. Our customer support team is at your service!



For further information please do not hesitate to contact your local EMC PARTNER AG representative.  
Visit our website for more information and contact details.

# [www.emc-partner.com](http://www.emc-partner.com)

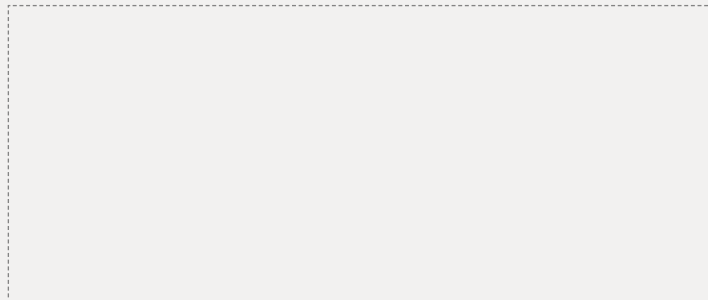


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## Your local representative



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