Art. no.: 33.03.834

Modular Power Analyzer

UMG 801

Data sheet

Doc no. 2.053.012.3.a 11/2023

Janitza®

Modular Power Analyzer UMG 801

UMG 801
Modular multifunctional meter for recording energy quantities

Doc. no.: 2.053.012.3.a
Status: 11/2023
The German version is the original version of the documentation

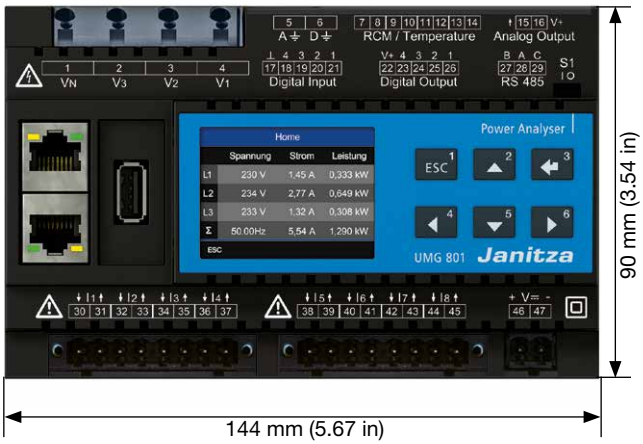
Subject to technical changes.

The content of our documentation has been compiled with the utmost care and is based on the latest information available to us. Nevertheless, we would like to point out that the updating of this document cannot always be performed simultaneously with the further technical development of our products. Information and specifications can be changed at any time.
Please consult www.janitza.com for information on the current version.

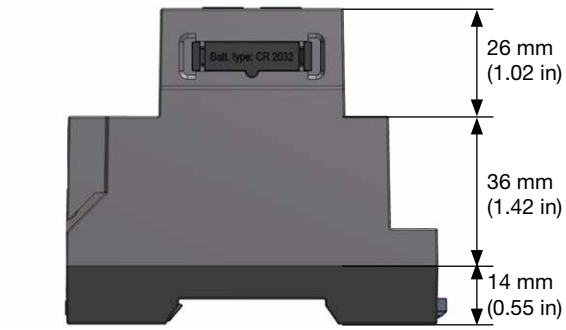
DEVICE VIEWS

· The figures serve as illustrations and are not true to scale.
· Please also note the dimensions of the terminals used during installation!
· Specifications in mm (in).

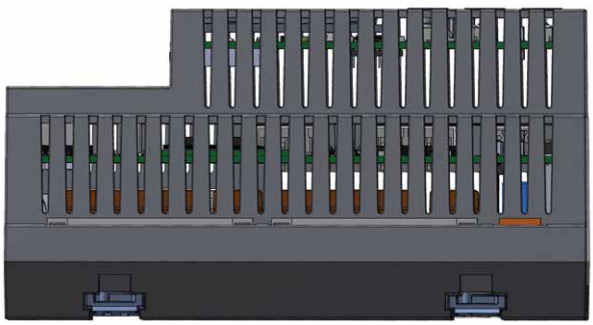
Front view



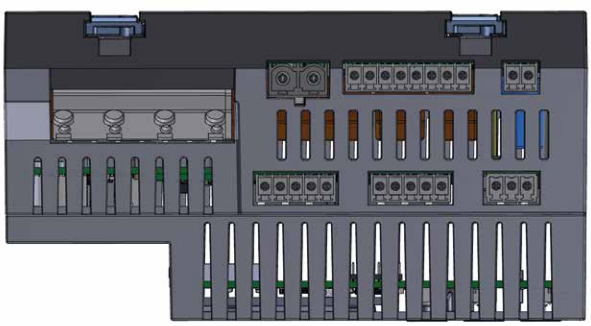
View from the left



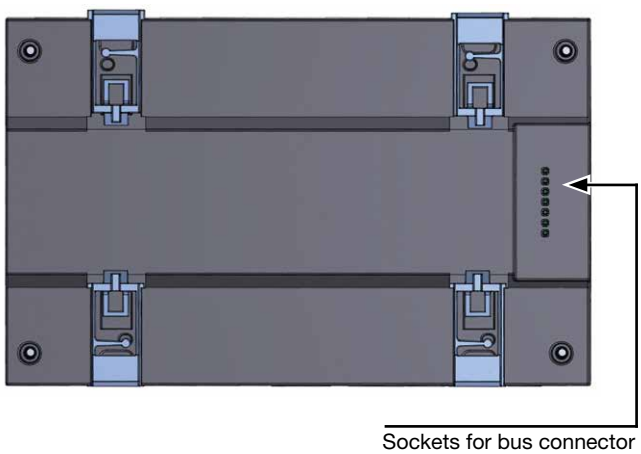
View from below



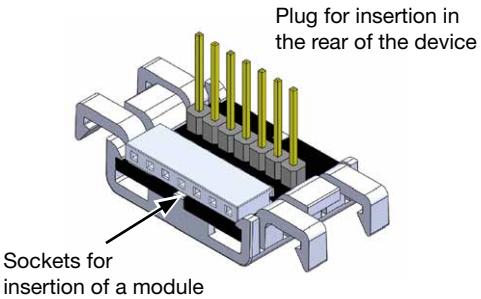
View from above



Rear view



Bus connector



TECHNICAL DATA

General	
Net weight	420 g (0.93 lb)
Device dimensions	Approx. B = 144 mm (5.67 in), H = 90 mm (3.54 in), D = 76 mm (2.99 in)
Width of the device in horizontal pitches	8 HP (1 HP = 18 mm)
Battery	Type: Lithium CR2032, 3 V (UL1642 approval)
Integrated memory	4 GB
Backlight service life	40000 h (50% of the start brightness)
Mounting orientation	As desired
Fastening/mounting - Suitable DIN rails - 35 mm (1.38 in)	· TS 35/7.5 according to EN 60715 · TS 35/10 · TS 35/15 x 1.5
Impact resistance	IK07 according to IEC 62262

Transport and storage The following specifications apply for devices transported and stored in the original packaging.	
Free fall	1 m (39.37 in)
Temperature	-25° C (-13 °F) to +70° C (158 °F)
Relative humidity	5 to 95% RH at 25 °C (77 °F), no condensation

Environmental conditions during operation	
The device: • For weather-protected and stationary use. • Fulfills operating conditions according to DIN IEC 60721-3-3. • Has protection class II according to IEC 60536 (VDE 0106, part 1), a ground wire connection is not required!	
Rated temperature range	-10 °C (14 °F) to +55 °C (131 °F)
Relative humidity	5 to 95% at 25 °C (77 °F), no condensation
Operating elevation	2000 m (1.24 mi) above sea level
	4000 m (2.49 mi) above sea level
Pollution degree	2
Ventilation	No forced ventilation required.
Protection against foreign matter and water	IP20 according to EN60529

Supply voltage	
Nominal range	DC: 24 V, PELV
Operating range	+/-10% of nominal range
Power consumption	max. 4 W
Maximum power consumption with modules	14 W (UMG 801: 4 W add. modules: max. 10 W)
Recommended overcurrent protective device for line protection	2-6 A, (Char. B), IEC-/UL approval

Voltage measurement	
3-phase 4-conductor systems with rated voltages up to	480 V_{LN} / 830 V_{LL} (+/-10%) according to IEC 347 V_{LN} / 600 V_{LL} (+/-10%) according to UL
3-phase 3-conductor systems (grounded) with rated voltages up to	830 V_{L-L} (+/-10%) according to IEC 600 V_{L-L} (+/-10%) according to UL
3-phase 3-conductor systems (non-grounded) with rated voltages up to	690 V_{L-L} (+/-10%) according to IEC 600 V_{L-L} (+/-10%) according to UL
Overvoltage category up to 2000 m	· 1000 V CAT III according to IEC · 600 V CAT III according to UL · 600 V CAT IV according to IEC
Overvoltage category up to 4000 m	· 600 V CAT III according to IEC
Rated surge voltage	8 kV
Protection of the voltage measurement	1 - 10 A tripping characteristic B (with IEC/UL approval)
Measuring range L-N	0[1)] .. 720 V_{eff} (max. overvoltage 1000 V_{eff})
Measuring range L-L	0[1)] .. 1000 V_{eff} (max. overvoltage 1000 V_{eff})
Measuring range N-PE	up to 100 V
Resolution	16 bit
Crest factor	1.6 (referred to measuring range 600 V L-N)
Impedance	4 MΩ/phase
Power consumption	approx. 0.1 VA
Sampling frequency	51.2 kHz
Frequency of fundamental oscillation - Resolution	40 Hz .. 70 Hz 0.01 Hz
Harmonics	1 .. 127.

1) ... The device only measures if at least one voltage measurement input has an L-N voltage of > 10 V_{eff} or an L-L voltage of > 18 V_{eff} present.

Current measurement (../1 A) (../5 A)	
Nominal current	5 A
Channels	8 · 2 systems - L1, L2, L3, N (optional) · Single channels
Measurement range	0.005 .. 6 A_{eff}
Crest factor (relative to nominal current)	1.98
Overload for 1 s	120 A (sinusoidal)
Resolution	0.1 mA (color graphic display 0.01 A)
Overvoltage category	300 V CATII
Rated surge voltage	2.5 kV
Power consumption	approx. 0.2 VA (R_i = 5 mΩ)
Sampling frequency	25.6 kHz
Harmonics	1 .. 63

The device has, optionally, 4 multifunction channels, for use as
· Residual current measuring inputs and/or temperature measuring inputs (mixed),
· Additional system inputs (L1, L2, L3; N)

Residual current measurement (RCM)	
Nominal current	30 mA_{eff}
Measurement range	0 .. 40 mA_{eff}
Operating current	50 µA
Resolution	1 µA (color graphic display 0.01 A)
Crest factor	1.414 (relative to 40 mA)
Load	4 Ω
Overload for 20 ms	50 A
Overload for 1 s	5 A
Permanent overload	1 A
Norm	IEC/TR 60755 (2008-01), Type A, Type B and B+ (via corresponding current transformers)

Temperature measurement				
Update time		1 s		
Total load (sensor and cable)		max. 4 kΩ		
Cable		Up to 30 m (32.81 yd) not shielded Greater than 30 m (32.81 yd) shielded		
Suitable temperature sensor types		KTY83, KTY84, PT100, PT1000		
Measuring accuracy	**Temperature sensor type**	**Temp. range**	**Resistance range**	**Measurement uncertainty**
	KTY83	-55 °C ... +175 °C (-67 °F ... +347 °F)	500 Ω ... 2.6 kΩ	±1.5% rng
	KTY84	-40 °C ... +300 °C (-40 °F ... +572 °F)	350 Ω ... 2.6 kΩ	±1.5% rng
	PT100	-99 °C ... +500 °C (-146 °F ... +932 °F)	60 Ω ... 180 Ω	±1.5% rng
	PT1000	-99 °C ... +500 °C (-146 °F ... +932 °F)	600 Ω ... 1.8 kΩ	±1.5% rng

Digital inputs 4 digital inputs, solid state relays, not short-circuit proof.	
Maximum counter frequency	20 Hz
Input signal applied	18 ... 28 V DC (typically 4 mA)
Input signal not applied	0 .. 5 V DC, current less than 0.5 mA

Digital outputs 4 digital outputs, solid state relays, not short-circuit proof.	
Switching voltage	max. 60 V DC
Switching current	max. 50 mA_{eff} DC
Response time	approx. 500 ms
Digital output (energy pulses)	max. 20 Hz

Cable length (digital inputs/outputs)	
Up to 30 m (32.81 yd)	Unshielded
Greater than 30 m (32.81 yd)	Shielded

Analog outputs 1 channel	
External supply	max. 33 V DC
Current	0/4...20 mA DC
Update time	0.2 s
Load	max. 300 Ω
Resolution	10 bit

RS-485 interface 3-conductor connection with A, B, GND	
Protocol	Modbus RTU/Server (formerly slave) Modbus RTU/Gateway
Transmission rate	9.6 kbps, 19.2 kbps, 38.4 kbps, 57.6 kbps, 115.2 kbps
Termination	DIP switches

Ethernet interfaces	
Connection	2 x RJ45 (separate use)
Function	Modbus gateway
Time synchronization	NTP
Protocols, services	**Ports**
Modbus/TCP - Modbus/UDP	502 (UDP / TCP), changeable
DNS (Client)	53 (UDP)
DHCP (Client)	67 / 68 (UDP)
HTTP	80 (TCP)
NTP	123 (UDP)
SFTP	22 (TCP)
OPC-UA (Binary)	4840 (TCP)
Device identification (since version 1.3.0)	1111 (UDP)
Error write for events and transients according to	· PQDIF (IEEE 1159.3-2019) - file format: pqd. · COMTRADE (IEC 60255-24 Edition 2.0 2013-04 and IEEE Std C37.111-2013) - file format: dat, cfg.

Potential isolation and electrical safety of the interfaces

The interfaces (RS-485, Ethernet) have:
- Double insulation to the inputs of the voltage and current measurement.
- Functional insulation relative to each other, to the supply voltage, to the measuring inputs for residual current and temperature, to the digital inputs/outputs and to the analog output.

The interfaces of the connected devices require double or reinforced insulation against mains voltages (according to IEC 61010-1: 2010).

Potential isolation and electrical safety of the multifunction channels (RCM, Temp., mA-current measurement)

The inputs of the multifunction channels have:
- Double insulation to the inputs of the voltage and current measurement.
- No insulation to each other or to the supply voltage.
- Functional isolation to the Ethernet, RS-485 interfaces, to the digital inputs/outputs and to the analog output.

External sensors and/or transformers require double insulation relative to system components with dangerous touch voltages (according to IEC61010-1:2010).

Potential isolation and electrical safety of the digital inputs and outputs (I/Os) and the analog output

The digital inputs and outputs as well as the analog output are equipped with:
- Double insulation to the inputs of the voltage and current measurement.
- Functional isolation relative to each other, to the supply voltage, to the Ethernet, RS-485 and multifunction channel interfaces.

Connecting capacity of the terminals (supply voltage) Connectible conductors. Only connect one conductor per terminal point!	
Single core, multi-core, fine-stranded	0.2 - 2.5 mm^2, AWG 26-12
Wire ferrules (non-insulated) - Recommended strip length	0.2 - 2.5 mm^2, AWG 26-12 - 10 mm (0.39 in)
Wire ferrules (insulated) * - Recommended strip length **	0.2 - 2.5 mm^2, AWG 26-12 - 12 mm (≤1.5 mm^2), 10 mm (>1.5 mm^2) / 0.47 in (≤1.5 mm^2), 0.39 in (>1.5 mm^2)
Wire ferrules: Length of the contact sleeve **	8 - 12 mm (0.31 - 0.47 in)

* ... Applies to ferrules with a maximum outer diameter of the plastic collar up to 4.5 mm (0.18 in).
**.. Depending on the type of ferrule used (ferrule manufacturer).

Connecting capacity of the terminals (current measurement) Connectible conductors. Only connect one conductor per terminal point!	
Single core, multi-core, fine-stranded	0.2 - 2.5 mm^2, AWG 26-12
Wire ferrules (non-insulated) - Recommended strip length	0.2 - 2.5 mm^2, AWG 26-12 - 10 mm (0.39 in)
Wire ferrules (insulated) * - Recommended strip length **	0.2 - 2.5 mm^2, AWG 26-12 - 12 mm (≤1.5 mm^2), 10 mm (>1.5 mm^2) / 0.47 in (≤1.5 mm^2), 0.39 in (>1.5 mm^2)
Screw flange tightening torque	0.2 Nm (1.77 lbf in)
Wire ferrules: Length of the contact sleeve **	8 - 12 mm (0.31 - 0.47 in)

* ... Applies to ferrules with a maximum outer diameter of the plastic collar up to 4.5 mm (0.18 in).
**.. Depending on the type of ferrule used (ferrule manufacturer).

Connecting capacity of the terminals (voltage measurement) Connectible conductors. Only connect one conductor per terminal point!	
Single core, multi-core, fine-stranded	0.08 - 4 mm^2, AWG 28-12
Wire ferrules (insulated/non-insulated)	0.25 - 2.5 mm^2, AWG 24-14
Strip length	8 - 9 mm (0.31 - 0.35 in)

Connecting capacity of the terminals (functional earth A/D) Connectible conductors. Only connect one conductor per terminal point!	
Single core, multi-core, fine-stranded	0.2 - 4 mm², AWG 24-12
Wire ferrules (non-insulated)	0.2 - 4 mm², AWG 24-12
Wire ferrules (insulated)	0.2 - 2.5 mm², AWG 26-14
Tightening torque	0.4 - 0.5 Nm (3.54 - 4.43 lbf in)
Strip length	7 mm (0.28 in)

Connecting capacity of the terminals - Multifunction channels (RCM, Temp., mA-current measurement) Connectible conductors. Only connect one conductor per terminal point!	
Single core, multi-core, fine-stranded	0.2 - 1.5 mm², AWG 24-16
Wire ferrules (non-insulated)	0.2 - 1.5 mm², AWG 26-16
Wire ferrules (insulated)	0.2 - 1 mm², AWG 26-18
Tightening torque	0.2 - 0.25 Nm (1.77 - 2.21 lbf in)
Strip length	7 mm (0.28 in)

Connecting capacity of the terminals (digital inputs/outputs, analog output)	
Single core, multi-core, fine-stranded	0.2 - 1.5 mm², AWG 24-16
Wire ferrules (non-insulated)	0.2 - 1.5 mm², AWG 26-16
Wire ferrules (insulated)	0.2 - 1 mm², AWG 26-18
Tightening torque	0.2 - 0.25 Nm (1.77 - 2.21 lbf in)
Strip length	7 mm (0.28 in)

Connecting capacity of the terminals (RS-485)	
Single core, multi-core, fine-stranded	0.2 - 1.5 mm², AWG 24-16
Wire ferrules (non-insulated)	0.2 - 1.5 mm², AWG 26-16
Wire ferrules (insulated)	0.2 - 1 mm², AWG 26-18
Tightening torque	0.2 - 0.25 Nm (1.77 - 2.21 lbf in)
Strip length	7 mm (0.28 in)

Optional accessory pack (part. no., see user manual)

Connection capacity of the terminals - Functional earth A/D - Spring terminal (push-in terminal) Connectible conductors - only connect one conductor per terminal point!	
Single core, multi-core, fine-stranded (min. - max.)	0.5 mm^2 - 2.5 mm^2, AWG 20-13
- Wire ferrules with collar * to DIN 46 228/4, (min. - max.)	0.5 mm^2 - 2.5 mm^2, AWG 20-13
- Wire ferrules without collar to DIN 46 228/1, (min. - max.)	0.5 mm^2 - 2.5 mm^2, AWG 20-13
Wire ferrules: - Contact sleeve length ** - Strip length	 - 10 - 12 mm (0.39 - 0.47 in) - 10 - 12 mm (0.39 - 0.47 in)

***** ... Applies to wire ferrules with a maximum plastic collar outer diameter of up to 3.5 mm (0.14 in).
******.. Depending on the type of wire ferrules used (wire ferrules manufacturer).

Connection capacity of the terminals - Multifunction channels (RCM, temp., mA current measurement) - Spring terminal (push-in terminal) Connectible conductors - only connect one conductor per terminal point!	
Single core, multi-core, fine-stranded (min. - max.)	0.14 mm^2 - 1.5 mm^2, AWG 26-16
- Wire ferrules with collar * to DIN 46 228/4, (min. - max.)	0.25 mm^2 - 1 mm^2, AWG 22-17
- Wire ferrules without collar to DIN 46 228/1, (min. - max.)	0.25 mm^2 - 1.5 mm^2, AWG 22-16
Wire ferrules: - Contact sleeve length ** - Strip length	 - 8 - 12 mm (0.31 - 0.47 in) - 10 - 12 mm (0.39 - 0.47 in)

***** ... Applies to wire ferrules with a maximum plastic collar outer diameter of up to 3.5 mm (0.14 in).
******.. Depending on the type of wire ferrules used (wire ferrules manufacturer).

Connection capacity of the terminals - Digital inputs/outputs, analog output - Spring terminal (push-in terminal) Connectible conductors - only connect one conductor per terminal point!	
Single core, multi-core, fine-stranded (min. - max.)	0.14 mm^2 - 1.5 mm^2, AWG 26-16
- Wire ferrules with collar * to DIN 46 228/4, (min. - max.)	0.25 mm^2 - 1 mm^2, AWG 22-17
- Wire ferrules without collar to DIN 46 228/1, (min. - max.)	0.25 mm^2 - 1.5 mm^2, AWG 22-16
Wire ferrules: - Contact sleeve length ** - Strip length	 - 8 - 12 mm (0.31 - 0.47 in) - 10 - 12 mm (0.39 - 0.47 in)

***** ... Applies to wire ferrules with a maximum plastic collar outer diameter of up to 3.5 mm (0.14 in).
******.. Depending on the type of wire ferrules used (wire ferrules manufacturer).

Connection capacity of the terminals - RS-485 - Spring terminal (push-in terminal) Connectible conductors - only connect one conductor per terminal point!	
Single core, multi-core, fine-stranded (min. - max.)	0.14 mm^2 - 1.5 mm^2, AWG 26-16
- Wire ferrules with collar * to DIN 46 228/4, (min. - max.)	0.25 mm^2 - 1 mm^2, AWG 22-17
- Wire ferrules without collar to DIN 46 228/1, (min. - max.)	0.25 mm^2 - 1.5 mm^2, AWG 22-16
Wire ferrules: - Contact sleeve length ** - Strip length	 - 8 - 12 mm (0.31 - 0.47 in) - 10 - 12 mm (0.39 - 0.47 in)

***** ... Applies to wire ferrules with a maximum plastic collar outer diameter of up to 3.5 mm (0.18 in).
******.. Depending on the type of wire ferrules used (wire ferrules manufacturer).

FUNCTION PERFORMANCE CHARACTERISTICS

Function	Symbol	Accuracy class	Measurement range	Display range
Frequency	f	0.05 (IEC61557-12)	40 .. 70 Hz	40.00 .. 70.00 Hz
Voltage	U_{L-N}	0.2 (IEC61557-12)	10 .. 720 V_{eff}	0 .. 999 kV
Voltage	U_{L-L}	0.2 (IEC61557-12)	18 .. 1000 V_{eff}	0 .. 999 kV
Voltage harmonics	Uh	Cl. 1 (IEC61000-4-7)	1 .. 127	0 .. 999 kV
THD of the voltage	THDu	1.0 (IEC61557-12)	0 .. 999%	0 .. 999%

Function	Symbol	Accuracy class - 5 A nominal current	Measurement range	Display range
Total active power	P	0.2 (IEC61557-12)	0 .. 12.6 kW	0 .. 999 GW
Total reactive power	QA, Qv	1 (IEC61557-12)	0..16.6 kvar	0 .. 999 Gvar
Total apparent power	SA, Sv	0.5 (IEC61557-12)	0 .. 12.6 kVA	0 .. 999 GVA
Total active energy	Ea	0.2 (IEC61557-12) 0.2S (IEC62053-22) 0.5 (ANSI C12.20)	0 .. 999 GWh	0 .. 999 GWh
Total reactive energy	ErA, ErV	1 (IEC61557-12)	0 .. 999 Gvarh	0 .. 999 Gvarh
Total apparent energy	EapA, EapV	0.5 (IEC61557-12)	0 .. 999 GVAh	0 .. 999 GVAh
Phase current	I	0.2 (IEC61557-12)	0.005 .. 6 A_{eff}	0 .. 999 kA
Neutral conductor current calculated	INc	1.0 (IEC61557-12)	0.03 .. 25 A	0.03 .. 999 kA
Power factor	PFA, PFV	0.5 (IEC61557-12)	0.00 .. 1.00	0.00 .. 1.00
Current harmonics	Ih	Cl. 1 (IEC61000-4-7)	1 .. 63	0 .. 999 kA
THD of the current	THDi	1.0 (IEC61557-12)	0 .. 999%	0 .. 999%

Function	Symbol	Accuracy class - 1 A nominal current	Measurement range	Display range
Total active power	P	0.5 (IEC61557-12)	0 .. 12.6 kW	0 .. 999 GW
Total reactive power	QA, Qv	1 (IEC61557-12)	0 .. 16.6 kvar	0 .. 999 Gvar
Total apparent power	SA, Sv	0.5 (IEC61557-12)	0 .. 12.6 kVA	0 .. 999 GVA
Total active energy	Ea	0.5 (IEC61557-12) 0.5S (IEC62053-22)	0 .. 999 GWh	0 .. 999 GWh
Total reactive energy	ErA, ErV	1 (IEC61557-12)	0 .. 999 Gvarh	0 .. 999 Gvarh
Total apparent energy	EapA, EapV	0.5 (IEC61557-12)	0 .. 999 GVAh	0 .. 999 GVAh
Phase current	I	0.5 (IEC61557-12)	0.005 .. 6 A_{eff}	0 .. 999 kA
Neutral conductor current calculated	INc	1.0 (IEC61557-12)	0.03 .. 25 A	0.03 .. 999 kA
Power factor	PFA, PFV	1 (IEC61557-12)	0.00 .. 1.00	0.00 .. 1.00
Current harmonics	Ih	Cl. 1 (IEC61000-4-7)	1 .. 63	0 .. 999 kA
THD of the current	THDi	1.0 (IEC61557-12)	0 .. 999%	0 .. 999%

INFORMATION

Detailed information on the device functions and data can be found in the usage information, which is enclosed with the device or is available as a download at www.janitza.com!

NOTES

NOTES

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