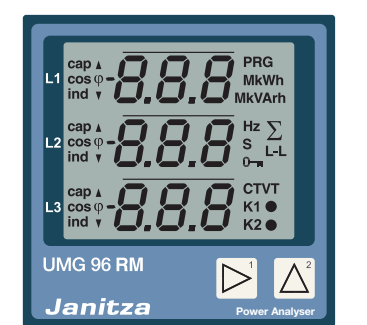


# Power Analyser UMG 96 RM-PN

## Installationsanleitung



Janitza electronics GmbH  
Vor dem Postlack 6  
D-38533 Lahnaas  
Support Tel. +49 6441 9642-22  
Fax +49 6441 9642-30  
E-Mail: info@janitza.de  
Internet: http://www.janitza.de



### 1 Allgemeines

**Allgemeines**  
Die Beachtung der Installationsanleitungen stellt kein vollständiges Verzeichnis aller für den Betrieb des Geräts erforderlichen Sicherheitsmaßnahmen dar. Besondere Betriebsbedingungen können weitere Maßnahmen erfordern. Die Installationsanleitung enthält Hinweise, die Sie zu Ihrer persönlichen Sicherheit und zur Vermeidung von Sachschäden beachten müssen.

**Sicherheitshinweise**  
Die Installationsanleitung stellt kein vollständiges Verzeichnis aller für den Betrieb des Geräts erforderlichen Sicherheitsmaßnahmen dar. Besondere Betriebsbedingungen können weitere Maßnahmen erfordern. Die Installationsanleitung enthält Hinweise, die Sie zu Ihrer persönlichen Sicherheit und zur Vermeidung von Sachschäden beachten müssen.

### 2 Sicherheit

**Sicherheitshinweise**  
Die Installationsanleitung stellt kein vollständiges Verzeichnis aller für den Betrieb des Geräts erforderlichen Sicherheitsmaßnahmen dar. Besondere Betriebsbedingungen können weitere Maßnahmen erfordern. Die Installationsanleitung enthält Hinweise, die Sie zu Ihrer persönlichen Sicherheit und zur Vermeidung von Sachschäden beachten müssen.

### 3 Geräte-Kurzbeschreibung

Das UMG 96 RM-PN ist ein multifunktionaler Netzanalysator, der für den Einbau in Schaltkasten und Installationen in der zentralen Erdungspunkt (ZEP) misst. Die Differenzstrommessung erfolgt über einen externen Differenzstromwandler (Nennstrom 30 mA) an den Stromeinleitungen I5 und I6.

### 4 Montage

Bauen Sie das UMG 96 RM-PN in die wettergeschützte Fronttafel von Schaltkästen ein. Ausrichung: 92° x 92° mm. Beachten Sie! Für ausreichende Belüftung einbauen! Abstände zu benachbarten Bauteilen einhalten!

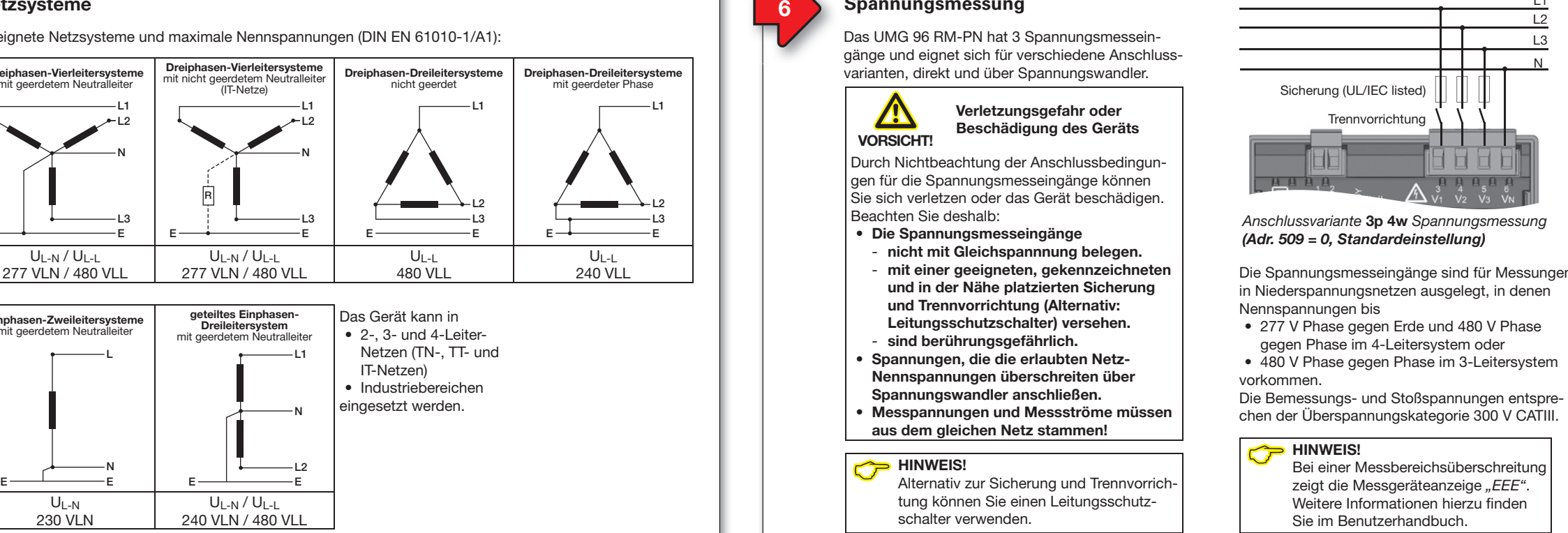
### 5 Netzsysteme

Gezielte Netzsysteme und maximale Nennspannungen (DIN EN 61010-1/A1): Dreiphasen-Verteilersysteme mit getrenntem Neutralleiter, Dreiphasen-Verteilersysteme mit getrenntem Neutralleiter, Dreiphasen-Verteilersysteme mit getrenntem Neutralleiter, Dreiphasen-Verteilersysteme mit getrenntem Neutralleiter.

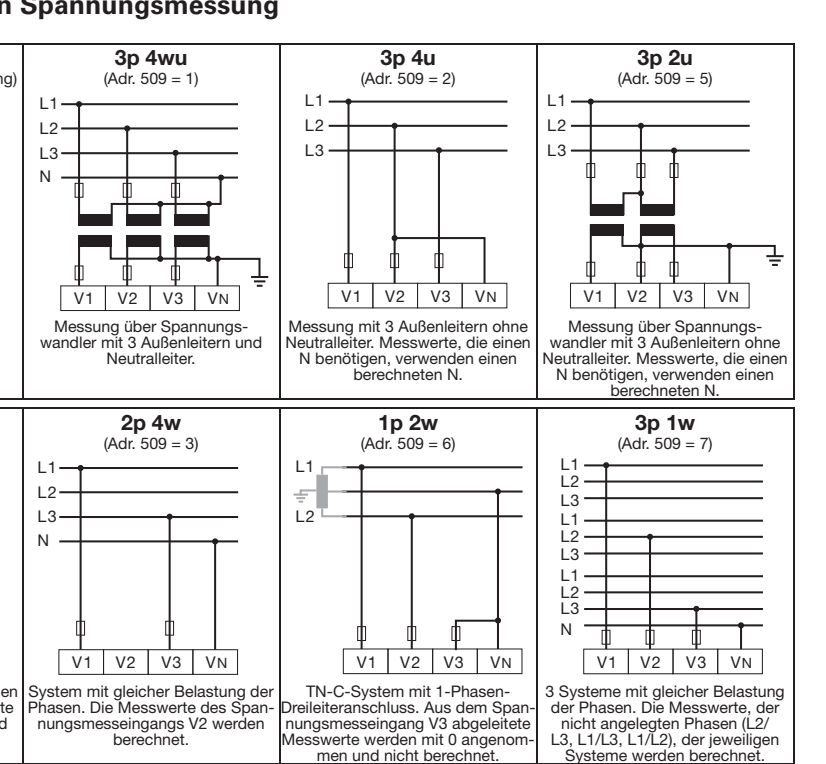
### 6 Spannungsmessung

Das UMG 96 RM-PN hat 3 Spannungsmessgänge und eignet sich für verschiedene Anschlussvarianten, direkt und über Spannungswandler.

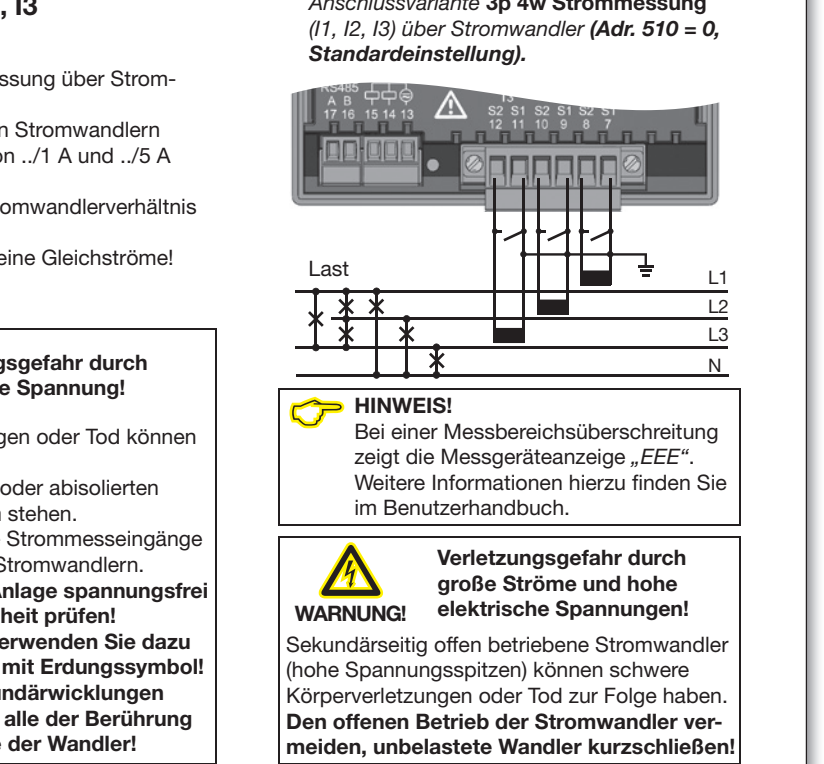
### 7 Anschlussvarianten Spannungsmessung



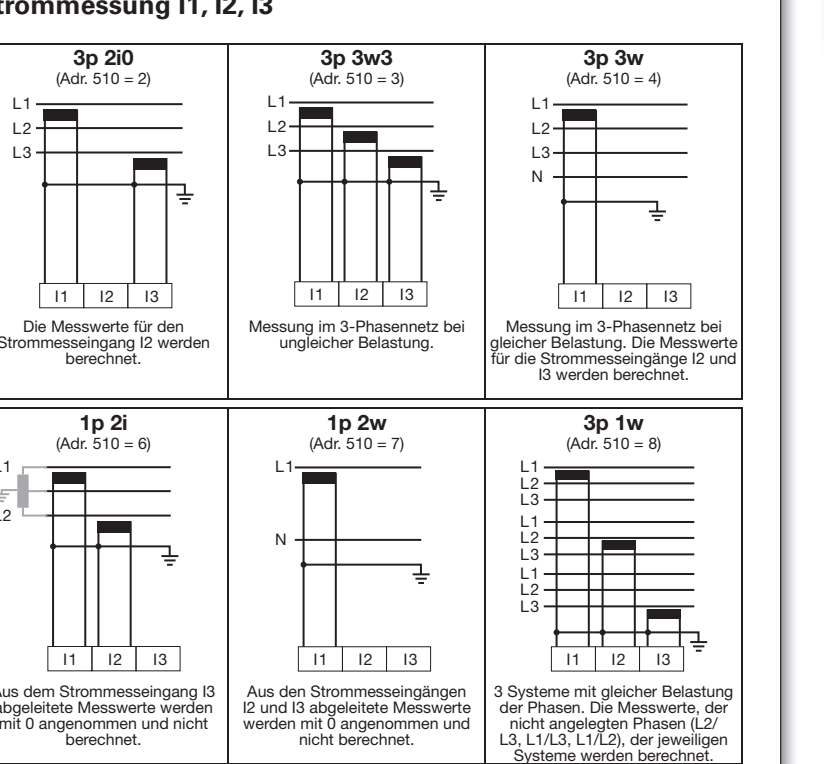
### 8 Strommessung I1, I2, I3



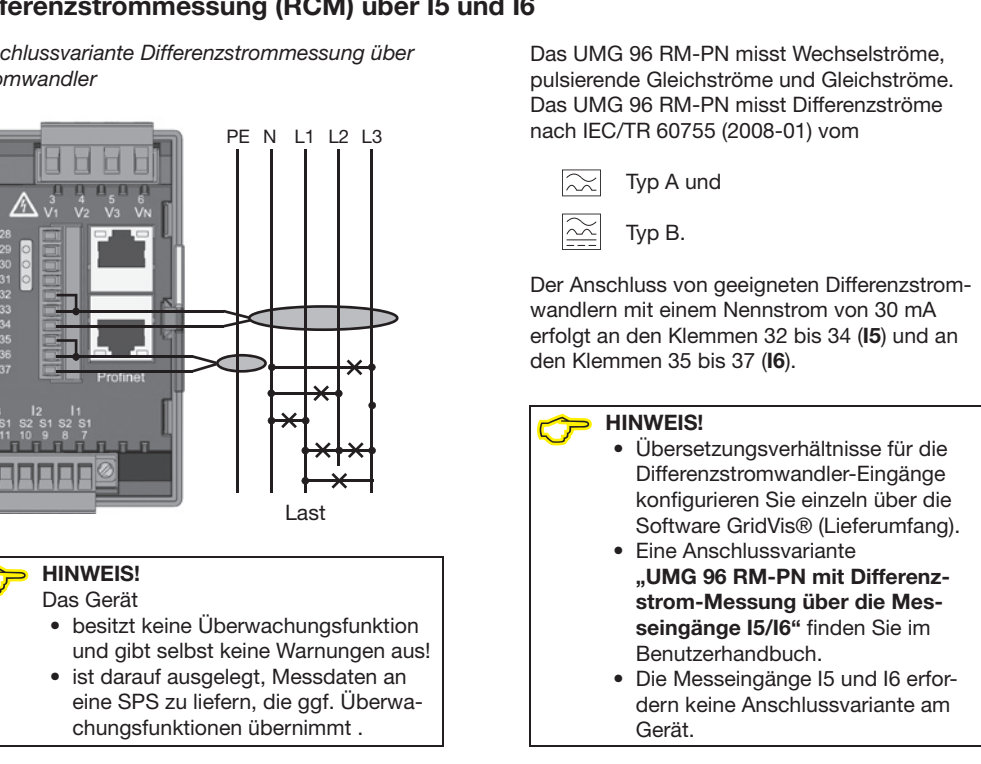
### 9 Anschlussvarianten Strommessung I1, I2, I3



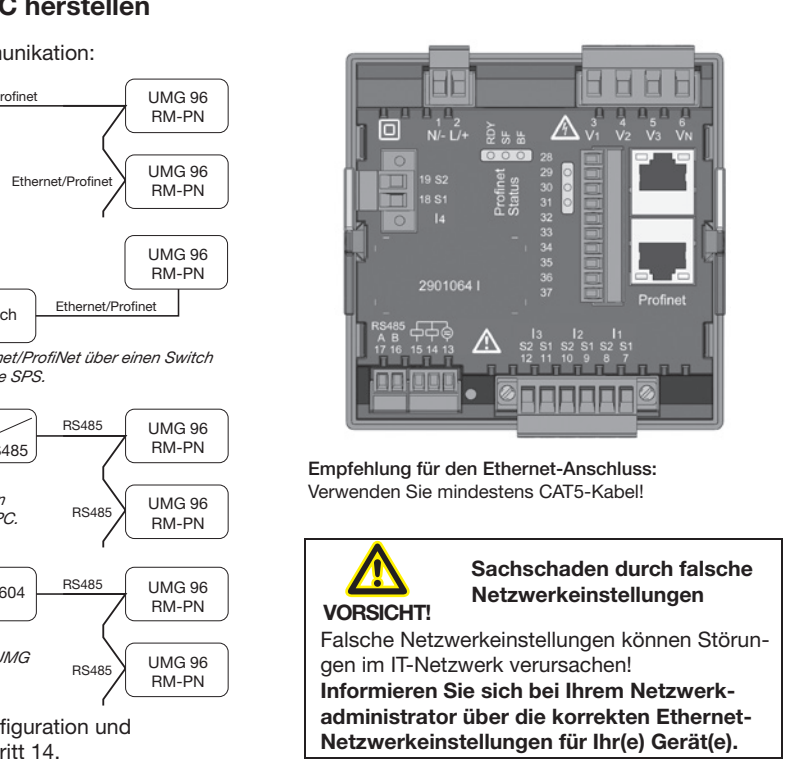
### 10 Strommessung I4



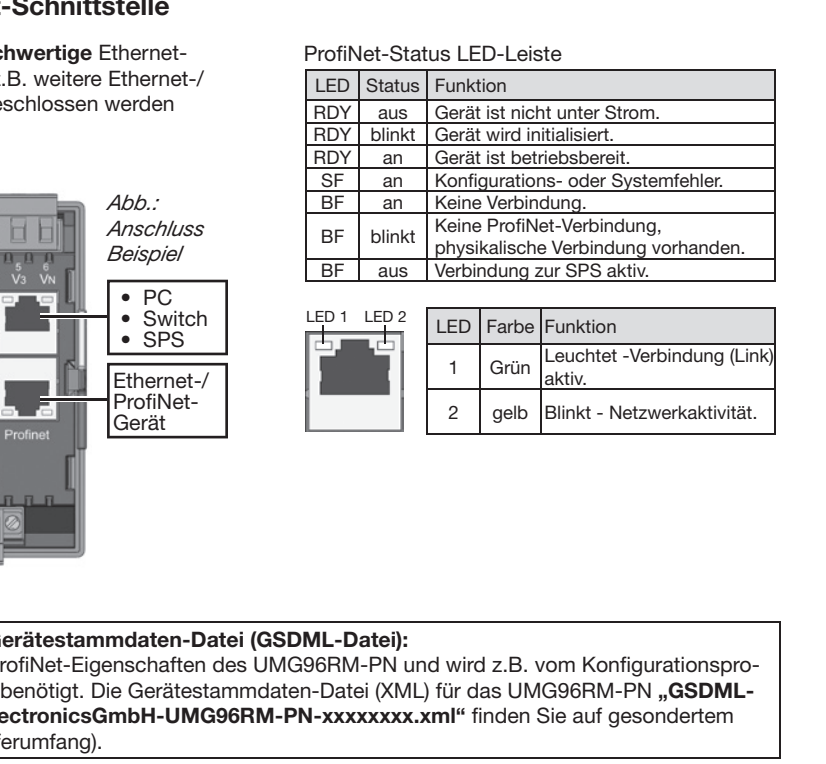
### 11 Differenzstrommessung (RCM) über I5 und I6



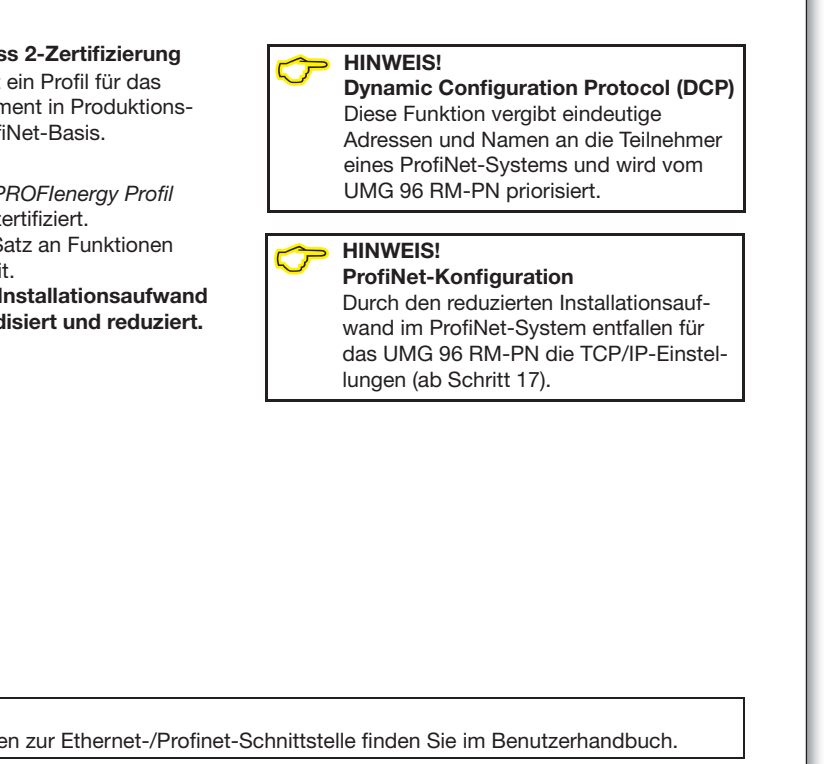
### 12 Verbindung zum PC herstellen



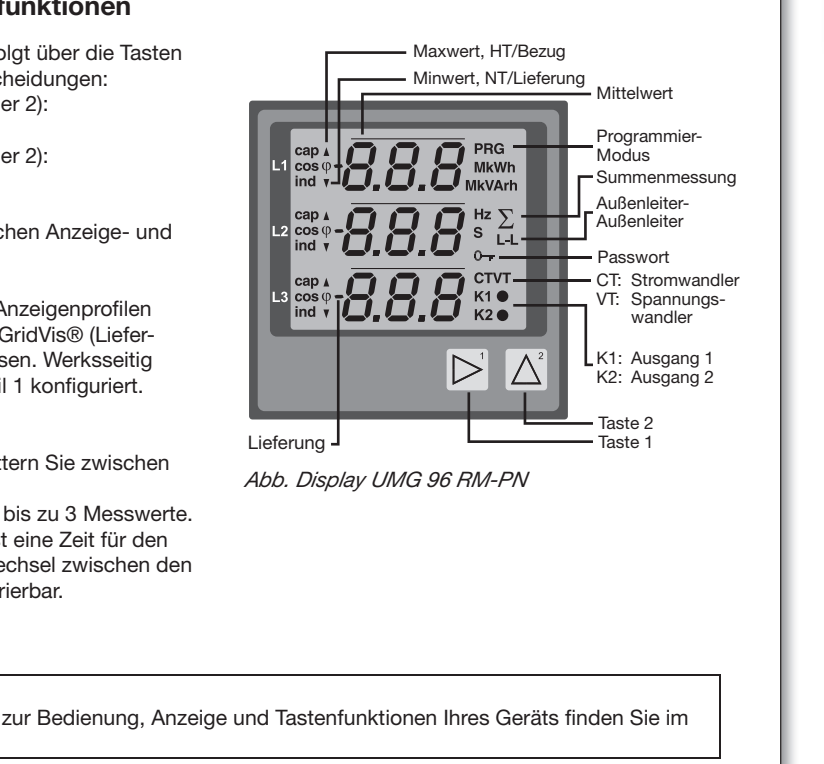
### 13 Ethernet-/ProfiNet-Schnittstelle



### 14 Bedienung und Tastenfunktionen



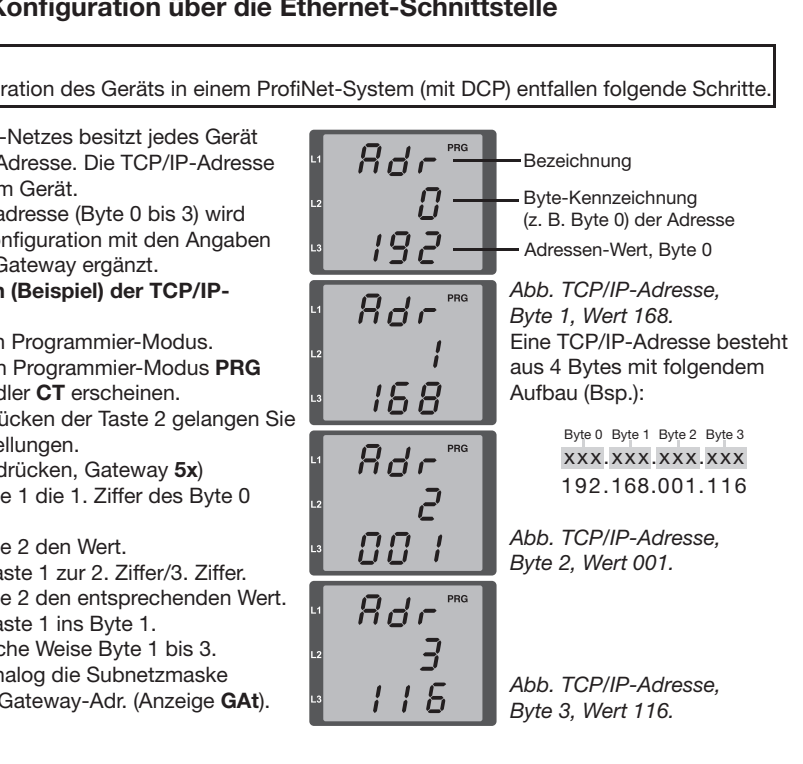
### 15 Programmier-Modus



### 16 Stromwandler programmieren



### 17 Manuelle TCP/IP Konfiguration über die Ethernet-Schnittstelle



### 18 Technische Daten

Table with 2 columns: Parameter and Value. Includes sections for Umgebungsbedingungen im Betrieb, Spannungsmessung, Strommessung I1 - I4, Differenzstrommessung I5 / I6, and Versorgungsanpassung.

### 19 Vorgehen im Fehlerfall

Table with 3 columns: Fehlermöglichkeit, Ursache, Abhilfe. Lists common error messages and their solutions.

### 19 Anschlussvarianten der Klemmstellen (Strommessung)

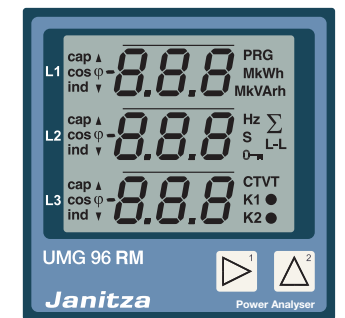
Table with 2 columns: Parameter and Value. Lists connection variants for current measurement terminals.

### 19 Anschlussvarianten der Klemmstellen (Spannungsmessung)

Table with 2 columns: Parameter and Value. Lists connection variants for voltage measurement terminals.

**Power Analyser**  
**UMG 96 RM-PN**  
Residual current monitoring (RCM)

- Installation
- Device settings



User manual:  
http://www.janitzatron.com



Janitza electronics GmbH  
Vor dem Poststück 6  
D-35553 Lahau / Germany  
Support tel. +49 6441 9642-22  
Fax +49 6441 9642-30  
e-mail: info@janitzatron.com  
Website: http://www.janitzatron.com

**1 General**

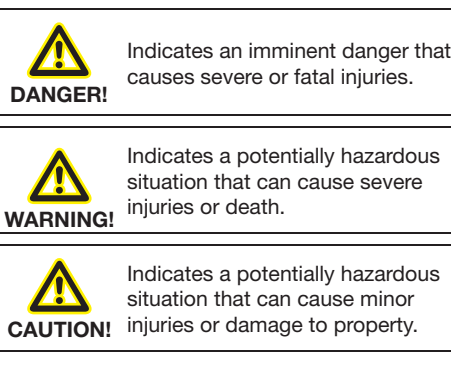
**Disclaimer**  
The observation of the information products for the devices is a prerequisite for safe operation and to achieve the stipulated performance characteristics and product characteristics. Janitza electronics GmbH accepts no liability for injuries to personnel, property damage or financial losses arising due to a failure to comply with the information products. Ensure that your information products are accessible and legible.

**Further information** can be found on our website www.janitzatron.com at Support > Downloads.  
**Copyright notice**  
© 2016 - Janitza electronics GmbH - Lahau. All rights reserved. Duplication, editing, distribution and any form of exploitation, also as excerpts, is prohibited.  
**Subject to technical amendments**  
• Make sure that your device agrees with the installation manual.  
• Read and understand first product-related documents.

• Keep product supporting documentation throughout the life available and, where appropriate, to pass on to subsequent users.  
• Please inform yourself about device reservations and the associated adjustments to the product-related documentation on www.janitzatron.com.  
**Disposal**  
Please observe national regulations! If disposing of individual parts, please dispose of them in accordance with their nature and existing country-specific regulations, for example as:  
• Electrical scrap  
• Plastic  
• Metals  
Or, task a certified disposal business with the scrapping.  
**Relevant laws, applied standards and directives**  
The laws, standards and directives for the device applied by Janitza electronics GmbH can be found in the declaration of conformity on our website.

**2 Safety**

**Safety information**  
The "Installation manual" is not a complete directory of all safety measures required to operate the device.  
Special operating conditions may require further measures. The "Installation manual" contains instructions that must be observed to ensure your personal safety and to prevent damage to property.  
**Symbols used:**  
This symbol is an addition to the safety instructions and indicates an electrical hazard.  
This symbol is an addition to the safety instructions and indicates a potential hazard.  
This symbol with the word NOTE describes:  
• Procedures that do not pose any risks of injuries.  
• Important information, procedures or handling steps.  
**Safety measures**  
When operating electrical devices, certain parts of these devices are invariably subjected to hazardous voltage. Therefore, severe bodily injuries or damage to property can occur if they are not handled properly.  
• Before connecting connections, earth the device at the ground wire connection if present.  
• Hazardous voltages may be present in all switching parts that are connected to the power supply.



Hazardous voltages may also be present in the device even after disconnecting the supply voltage (capacitor storage).  
• Do not operate equipment with current transformer circuits while open.  
• Do not exceed the threshold values specified in the user manual and on the rating plate.  
Also adhere to this when inspecting and commissioning.  
• Observe the safety and warning instructions in the documents that belong to the device!  
**Qualified staff**  
In order to prevent personal injuries and damage to property, only qualified staff with electrical training may work on the device, with knowledge of:  
• the national accident prevention regulations  
• the safety engineering standards  
• installing, commissioning and operating the device.  
**Proper use**  
The device is:  
• intended for installation in switch cabinets and small installations  
• not intended for installation in vehicles!  
The use of the device in mobile equipment is considered to be non-standard environmental conditions and is therefore only permitted after separate agreement.  
• not intended for installation in environments with hazardous oils, acids, gases, vapours, dusts, radiation, etc.  
**Prerequisites of faultless, safe operation**  
of this device are proper transport and proper storage. Set-up, installation, operation and maintenance.

**3 Device short description**

The UMG 96 RM-PN is a multi-functional network analyser, which:  
• measures residual currents (RCM) and currents at the central grounding point (CGP). The residual current monitoring is carried out via an external residual current transformer (30 mA rated current) on the current measurement inputs I5 and I6.  
• measures and calculates electrical variables such as voltage, current, power, energy, harmonics, etc. in building installations, on distribution units, circuit breakers and busbar trunking systems.  
• displays and saves measurement results and transmits them via interfaces.  
**NOTE**  
The device:  
• possesses no monitoring function and does not send warnings itself!  
• is designed to deliver measuring data to a PLC, which performs monitoring functions if necessary.  
**NOTE**  
For further information on device functions, data and assembly, see the user manual.  
**Assembly**  
Install the UMG 96 RM-PN in the weatherproof front panel of switch cabinets.  
**Damage to property due to disregard of the installation instructions**  
Failing to observe the installation instructions can result in damage or destruction of your device.  
**CAUTION!**  
Ensure that there is adequate air circulation in your installation environment! If the ambient temperatures are high, ensure there is adequate cooling if required.

**4 Connecting the supply voltage**

The supply voltage level for your device is specified on the rating plate.  
After connecting the supply voltage, an indication is shown on the display. If no indication appears, check whether the supply voltage is within the rated voltage range.  
**Risk of injury due to electric voltage!**  
Serious bodily injury or death can result from:  
• Contact with bare or stripped live wires.  
• Device inputs that are dangerous to touch.  
• De-energise your device before starting work! Check that it is de-energised.  
**Damage to property due to disregard of the connection conditions or impermissible voltage swings**  
Your device can be damaged or destroyed by a failure to comply with the connection conditions or by exceeding the permissible voltage range.  
Before connecting the device to the supply voltage, please check:  
• Voltage and frequency correspond to the details on the ratings plate! Threshold values stipulated in the user manual have been complied with!  
• In building installations, the supply voltage must be protected with a UL/IEC approved circuit breaker / fuse!  
• The circuit breaker / fuse:  
- must be easily accessible for the user and be installed close to the device.  
- must be labelled for the relevant device.  
• Do not connect the supply voltage to the voltage transformers.  
• Provide a fuse for the neutral conductor if the source's neutral conductor connection is not earthed.

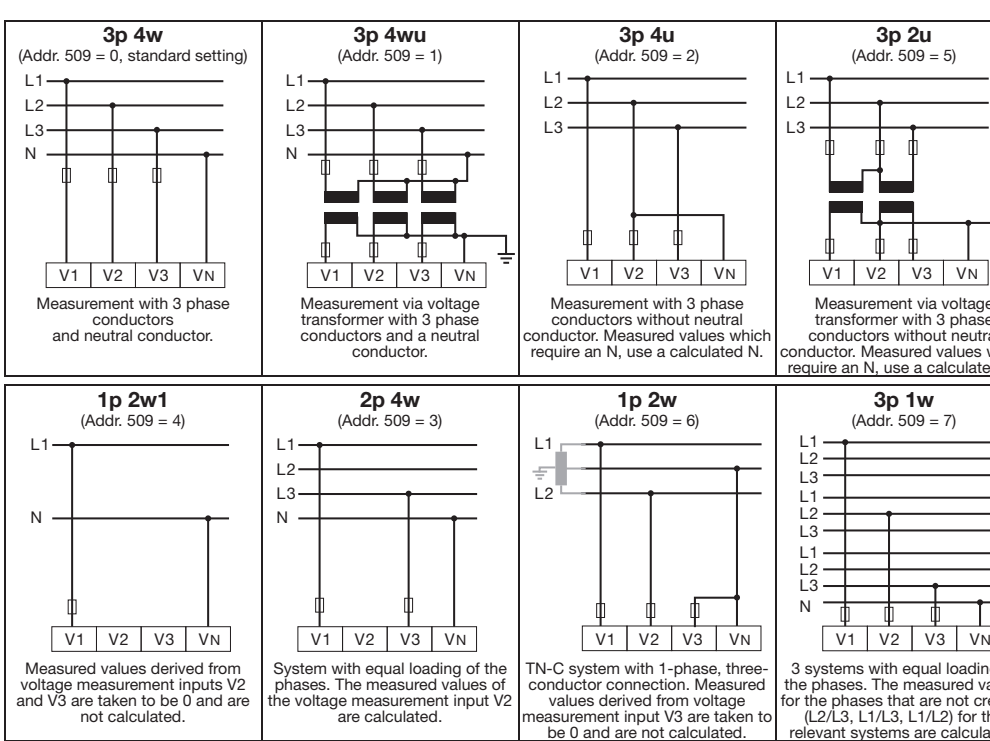
**5 Network systems**

Suitable network systems and maximum rated voltages (DIN EN 61010-1/A1):  
Three-phase four-conductor systems with earthing neutral conductor:  
• 277 VLN / 480 VLL  
• 277 VLN / 480 VLL  
• 480 VLL  
• 240 VLL  
Single-phase two-conductor systems with earthing neutral conductor:  
• 230 VLN  
• 240 VLN / 480 VLL  
The device can be used in:  
• 2, 3 and 4 conductor networks (TN, TT and IT networks)  
• Industrial areas  
• Measured voltages and measured currents must derive from the same network!  
**NOTE**  
As an alternative to the fuse and circuit breaker, you can use a line safety switch.

**6 Voltage measurement**

The UMG 96 RM-PN has 3 voltage measurement inputs and is suitable for various connection variants, with direct connection or via voltage transformer.  
**CAUTION!**  
Risk of injuries or damage to the device  
Disregard of the connection conditions for the voltage measurement inputs can result in injuries or to the device being damaged.  
Therefore, note the following:  
• The voltage measurement inputs must not be occupied with DC voltage.  
• Must be provided with a suitable, labelled fuse that is positioned close by and a circuit breaker (alternatively: a line safety switch).  
• Voltages that exceed the allowed network rated voltages must be connected via a voltage transformer.  
• Measured voltages and measured currents must derive from the same network!  
**NOTE**  
With measurement range exceeding, the measurement device display shows "EE". Further information on this can be found in the user manual.

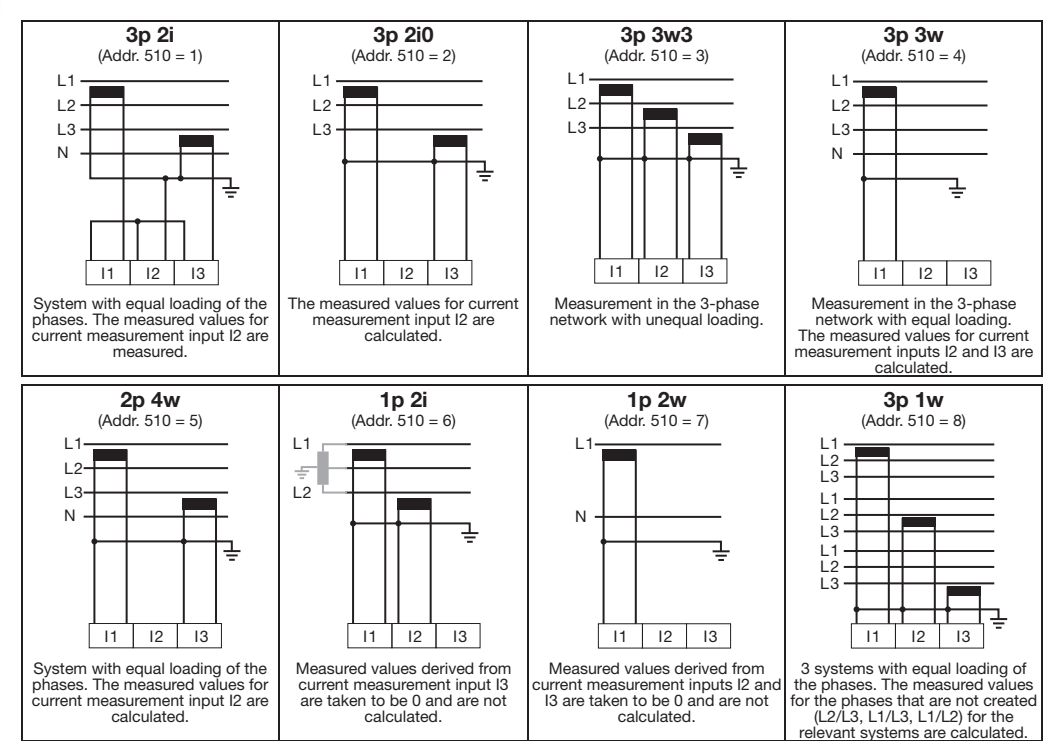
**7 Voltage measurement connection variants**



**8 Current measurement I1, I2, I3**

The UMG 96 RM-PN is:  
• only approved for measuring current with a current transformer.  
• not intended for connecting current transformers with secondary currents of „I1 A and „I5 A.  
• has the current transformer ratio 5/5 A set as standard.  
• measures AC currents, does not measure DC currents!  
**NOTE**  
With measurement range exceeding, the measurement device display shows "EE". Further information on this can be found in the user manual.  
**Risk of injury due to electric voltage!**  
Serious bodily injury or death can result from:  
• Contact with bare or stripped live wires.  
• Current measurement inputs that are dangerous to touch on the device and on the current transformer.  
Earth your system! Use the earth connection points with earthing symbols for this! Earth the secondary windings of current transformers and all of the metal parts of the transformer that could be touched!  
**NOTE**  
Current transformers operating with an open secondary circuit (high voltage peaks) can result in serious or even fatal injuries.  
Avoid open operation of the current transformers - short-circuit unloaded transformer!

**9 Connection variants for current measurement I1, I2, I3**



**10 Current measurement I4**

Connection variant for current measurement (I4) via current transformer:  
**NOTE**  
The current measurement input I4 does not require a connection variant on the device.  
**NOTE**  
Further information on current transformers can be found in the user manual.

**11 Residual current monitoring (RCM) via I5 and I6**

Connection variant of residual current monitoring via current transformer  
Suitable residual current transformers with a rated current of 30 mA are connected to terminals 32 to 34 (I5) and terminals 35 to 37 (I6).  
**NOTE**  
The device:  
• possesses no monitoring function and does not send warnings itself!  
• is designed to deliver measuring data to a PLC, which performs monitoring functions if necessary.

**12 Establish the connection to the PC**

Communication connections:  
1. Ethernet/ProfNet  
2. Ethernet/ProfNet  
3. Ethernet/ProfNet  
4. Ethernet/ProfNet  
**Damage to property due to incorrect network settings**  
Incorrect network settings can cause faults in the IT network!  
Obtain information from your network administrator about the correct Ethernet network settings for your device(s).

**13 Ethernet/ProfNet interface**

The device is equipped with 2 equivalent Ethernet interfaces, via which further Ethernet/ProfNet and devices can be connected for example.  
**NOTE**  
The device master data file (GSDML file): Describes the ProfNet characteristics of the UMG96RM-PN and is required by the configuration program of the PLC for example. The device master file (XML) for the UMG96RM-PN has the file name "GSDML-V2.31-JanitzaelectronicsGmbH-UMG96RM-PN-xxxxxxx.xml" and can be found on a separate data carrier (included).

**PROEnergy/Entity Class 2 certification**

PROEnergy/Entity Class 2 certification  
The UMG 96 RM-PN is:  
• certified as Entity Class 2 for use of the PROEnergy ProfNet V1.1.  
• provides a defined set of functions and information.  
The configuration and installation effort are thereby standardised and reduced.  
**NOTE**  
For further information on the Ethernet/ProfNet interface see the user manual.

**14 Operation and button functions**

The device is operated with buttons 1 and 2, whereby the following distinctions are made:  
• Short press (Button 1 or 2): Next step (+1).  
• Long press (button 1 or 2): previous step (-1).  
The device differentiates between display and programming mode.  
**Display mode**  
• You can use buttons 1 and 2 to scroll between the measured value indications.  
• The measured value indication shows up to 3 measured values.  
• A time for an automatic indication change between the measured value indications can be configured in the GridVis® software.  
**NOTE**  
More detailed information on operation, display and button functions for your device can be found in the user manual.

**15 Programming mode**

Press and hold buttons 1 and 2 simultaneously for 1 second to switch between display mode and programming mode. The text PRG appears in the display.  
Configure the necessary settings for the operation of the device in programming mode.  
The programming mode can be protected with a user password.  
Button 2 switches between the programming menu:  
1. Current transformer  
2. Voltage transformer  
3. Parameter list  
4. TCP/IP device address  
5. Subnet mask  
6. Gateway address  
The device switches from programming mode to display mode if:  
• no buttons are pressed for 60 seconds.  
• buttons 1 and 2 are pressed simultaneously for 1 second.  
**NOTE**  
Changes are only applied after exiting programming mode.

**16 Programming the current transformer**

1. Switch to programming mode.  
2. The symbols for programming mode PRG and for the current transformer CT appear.  
3. Press button 1 - the first digit of the input field for the primary current flashes.  
4. Use button 2 to select the value for the 1st digit.  
5. Use button 1 to move to the 2nd digit.  
6. Use button 2 to select the value of the 2nd digit.  
7. Use button 1 to move to the 3rd digit.  
8. Use button 2 to select the value of the 3rd digit.  
9. Confirm with button 1.  
10. The complete number flashes.  
11. Use button 2 to select the decimal place and thus the unit of the primary current.  
12. Confirm with button 1.  
13. The input range of the secondary current flashes.  
14. Use button 2 to set the secondary current (value 1 A or 5 A).  
15. Confirm with button 1.  
16. Pressing buttons 1 and 2 simultaneously (1. sec.) exits the programming mode.  
Use button 2 to change to the input field for the voltage transformer.

**17 Manual TCP/IP configuration via the Ethernet interface**

**NOTE**  
The following steps are omitted with configuration of the device in a ProfNet system (with DCP).  
Each device within an Ethernet network has a unique TCP/IP address. The TCP/IP address is assigned manually on the device.  
The 4-byte-long device address (Byte 0 to 3) is appended within the TCP/IP configuration with the subnet mask and gateway details.  
**Manual configuration (example) of the TCP/IP device address (Addr):**  
1. Switch to programming mode.  
2. The symbols for programming mode PRG and for the current transformer CT appear.  
3. Pressing button 2 3 times takes you to the TCP/IP settings.  
4. Press the subnet mask A and the gateway Bx (selection flashes).  
5. Use button 2 to select the value.  
6. Use button 1 to move to the 2nd digit / 3rd digit (selection flashes).  
7. Use button 2 to select the corresponding value.  
8. Use button 1 to move to byte 1.  
9. Select bytes 1 to 3 in the same way.  
10. Configure the subnet mask (display SuB) and gateway address (display GA) in the same way.

**18 Technical data**

General information		Ambient conditions during operation	
Net weight (with attached connectors)	approx. 380 g	Operating temperature range	ICES 100°C ... 45°C (2)
Packaging weight (including accessories)	approx. 780 g	Relative humidity	0 to 75% RH
Battery	Lithium battery CR2032, 3 V (approval in acc. UL 1944)	Operating altitude	0 ... 2000 m above sea level
Service life	> 1000 h (at 25°C)	Protection of position	2
Free fall	1 m	Mounting position	vertical
Transport and storage	The following information applies to devices which are transported or stored in the original packaging.	Prevention against ingress of solid foreign bodies and dust	IP40 (i.e. EN60529)
Free fall	1 m	Prevention against ingress of liquids	IP00 (i.e. EN60529)
Temperature	-10 to 55°C (0 to 127°C)	Prevention against ingress of steam	IP00 (i.e. EN60529)
Relative humidity	0 to 90% RH	Prevention against ingress of dust	IP00 (i.e. EN60529)
Supply voltage	Nominal range: 0 to 40 mA	Frequency range of the fundamental oscillation (1)	45 Hz to 65 Hz
Current measurement I1 - I4	Nominal current: 5 A Measuring range: 0 to 5 Arms Crest factor: 1.88 Resolution: 0.1 mA (display 0.01 A) Overvoltage category: 300 V CAT II Power consumption: approx. 0.2 VA (IR = 5 mΩ) Overload for 1 sec.: 120 A (20x rated current) Sampling rate: 21.53 MHz (50 Hz), 25.6 MHz (60 Hz), 51.2 MHz (120 Hz) for each measurement channel	Residual current monitoring I5 / I6	Nominal current: 0 to 40 mA Triggering current: 50 mA Residual: 1 µA Crest factor: 1.414 (related to 40 mA) Burden: 4 Ohm Overload for 1 sec.: 5 A Sustained overload: 1 A Overload for 20 ms: 50 A
Digital outputs	2 and 3 optional digital outputs, semiconductor relays, not electrical output Switching voltage: max. 33 V AC, 60 V DC Switching current: max. 50 mA AC/DC Response time: 10/12 µsec ( + 1.0 ms) Pulse output (energy pulse): max. 50 Hz Response time e.g. at 50 Hz: 200 ms + 10 ms = 210 ms	Serial interface	RS485 - Modbus RTU/Slave 9.6 kbps, 19.2 kbps, 38.4 kbps, 76.8 kbps, 151.2 kbps Stripping length: 7 mm
Terminal connection capacity (current measurement)	Conductors to be connected: 1 conductor only Single core, multi-core, twisted Terminal pins, core and sheath: 0.2 - 2.5 mm² Tightening torque: 0.4 - 0.5 Nm Stripping length: 7 mm	Terminal connection capacity (residual current / outputs)	Single core, multi-core, twisted Terminal pins, core and sheath: 0.2 - 2.5 mm² Tightening torque: 0.4 - 0.5 Nm Stripping length: 7 mm
Terminal connection capacity (power supply voltage)	Conductors to be connected: 1 conductor only Single core, multi-core, twisted Terminal pins, core and sheath: 0.2 - 2.5 mm² Tightening torque: 0.4 - 0.5 Nm Stripping length: 7 mm	Terminal connection capacity (serial interface)	Single core, multi-core, twisted Terminal pins, core and sheath: 0.2 - 1.5 mm² Tightening torque: 0.2 - 0.5 Nm Stripping length: 7 mm
Terminal connection capacity (voltage measurement)	Conductors to be connected: 1 conductor only Single core, multi-core, twisted Terminal pins, core and sheath: 0.2 - 2.5 mm² Tightening torque: 0.4 - 0.5 Nm Stripping length: 7 mm	Temperature measurement input	2 optional inputs Update time: 1 second Connectable sensors: PT100, PT1000, KTY88, KTY84 Total burden (sensor + cable): max. 4.030 m

**19 Procedure in the event of faults**

Possible fault	Cause	Remedy
No display	External fusing for the power supply voltage has tripped.	Replace fuse.
No current display	Measurement voltage is not connected. Measurement current is not connected.	Connect the measuring-circuit voltage. Connect measuring-circuit current.
Current displayed is too large or too small.	Current transformer factor is incorrectly programmed. The current range value at the measurement input was exceeded by harmonic components. The current at the measurement input fell short of the rated value.	Check connection and correct if necessary. Read out and program the current transformer transformation ratio at the current transformer. Install current transformer with a suitable transformation ratio. Install current transformer with a suitable transformation ratio.
Voltage displayed is too large or too small.	Voltage transformer incorrectly programmed. Overvoltage.	Read out and program the voltage transformer transformation ratio at the voltage transformer. Install voltage transformers.
"EE!" in the display	The peak voltage value at the measurement input has been exceeded by harmonic components.	Caution! Ensure the measurement inputs are not overloaded.
Device still does not work despite the above measures.	Device defective.	Send the device to the manufacturer for inspection and return along with an accurate fault description.