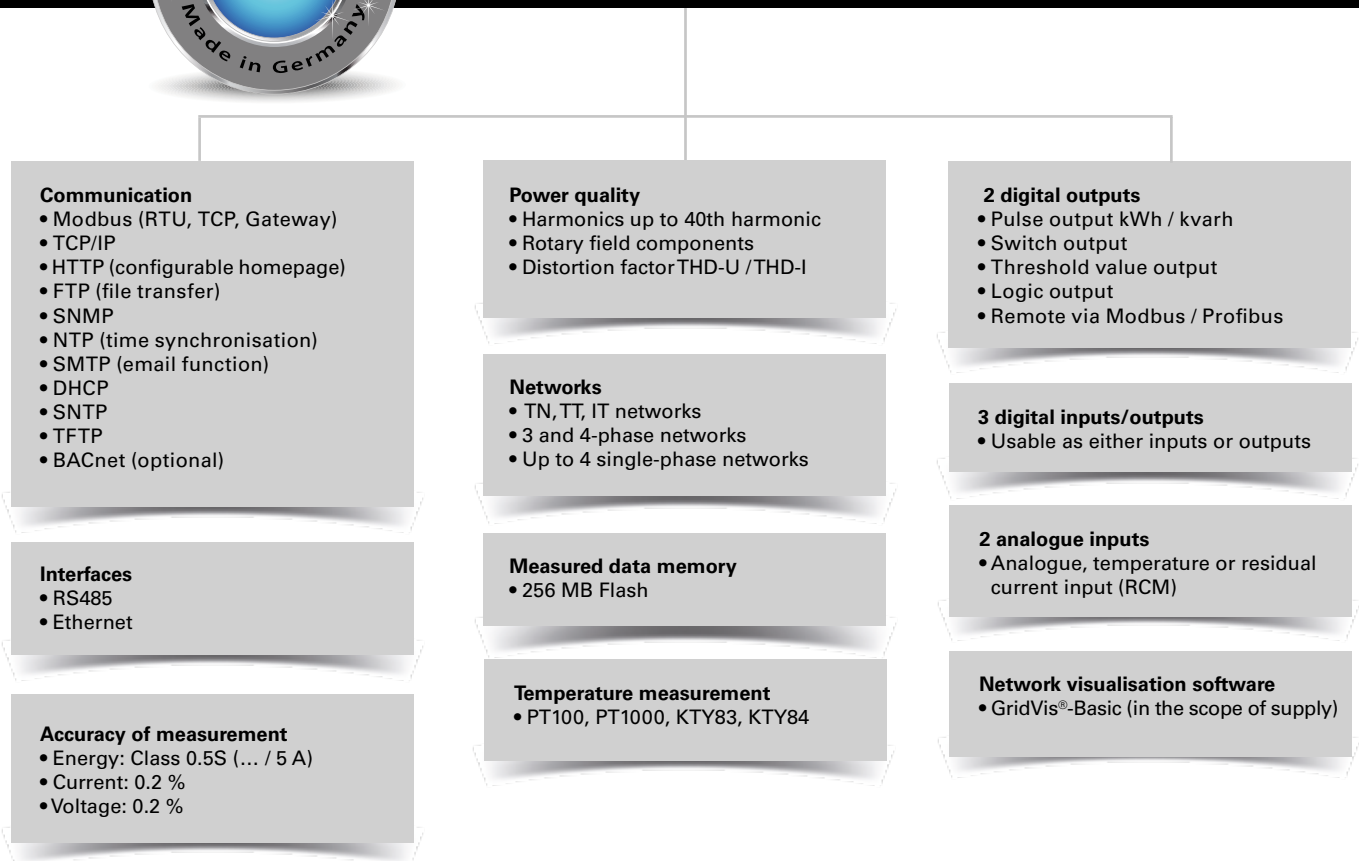
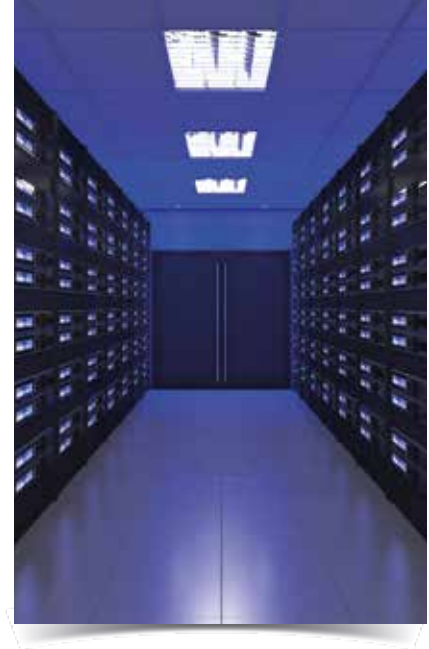




UMG 96RM-E – Power analyser with Ethernet and RCM





Areas of application



- Measurement, monitoring and checking of electrical characteristics in energy distribution systems
- Recording of load profiles in energy management systems (e.g. ISO 50001)
- Acquisition of the energy consumption for cost centre analysis
- Measured value transducer for building management systems or PLC (Modbus)
- Monitoring of power quality characteristics, e.g. harmonics up to 40th harmonic
- Residual current monitoring (RCM)

Main features

Universal meter

- Operating current monitoring for general electrical parameters
- High transparency through a multi-stage and scalable measurement system in the field of energy measurement
- Acquisition of events through continuous measurement with 200 ms high resolution



RCM device

- Continuous monitoring of residual currents (Residual Current Monitor, RCM)
- Alarming in case a preset threshold fault current reached
- Near-realtime reactions for triggering countermeasures
- Permanent RCM measurement for systems in permanent operation without the opportunity to switch off

Energy measurement device

- Continuous acquisition of the energy data and load profiles
- Essential both in relation to energy efficiency and for the safe design of power distribution systems



Harmonics analyser / event recorder

- Analysis of individual harmonics for current and voltage
- Prevention of production downtimes
- Significantly longer service life for equipment
- Rapid identification and analysis of power quality fluctuations by means of user-friendly tools (GridVis®)

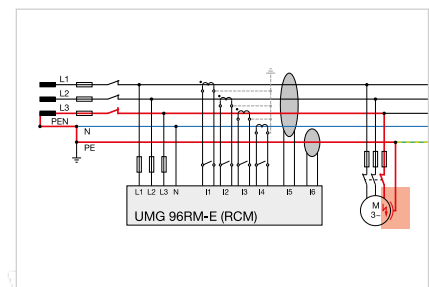


Fig.: UMG 96RM-E with residual current monitoring via measuring inputs I5 / I6

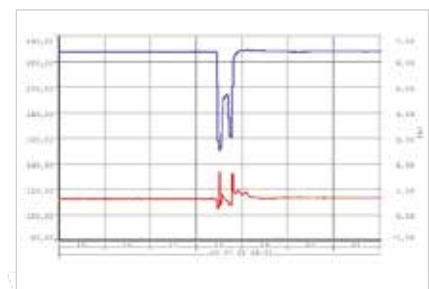


Fig.: Event logger: Voltage dip in the low voltage distribution system

7 Tariffs

Extensive selection of tariffs

- 7 tariffs each for effective energy (consumption, delivery and without backstop)
- 7 tariffs each for reactive energy (inductive, capacitive and without backstop)
- 7 tariffs for apparent energy
- L1, L2 and L3, for each phase

Highest possible degree of reliability

- Continuous leakage current measurement
- Historical data: Long-term monitoring of the residual current allows changes to be identified in good time, e.g. insulation faults
- Time characteristics: Recognition of time relationships
- Prevention of neutral conductor carryover
- RCM threshold values can be optimized for each individual case: Fixed, dynamic and stepped RCM threshold value
- Monitoring of the CGP (central ground point) and the sub-distribution panels

Analysis of fault current events

- Event list with time stamp and values
- Presentation of fault currents with characteristic and duration
- Reproduction of phase currents during the fault current surge
- Presentation of the phase voltages during the fault current surge

Analysis of the harmonic fault current components

- Frequencies of the fault currents (fault type)
- Current peaks of the individual frequency components in A and %
- Harmonics analysis up to 40th harmonic
- Maximum values with real-time bar display

Digital IOs

- Extensive configuration of IOs for intelligent integration, alarm and control tasks

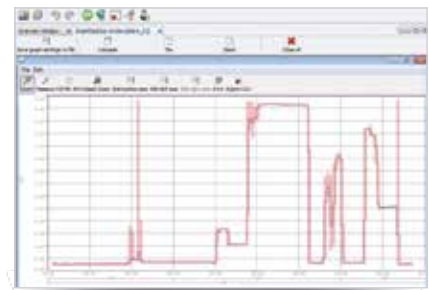


Fig.: Continuous leakage current measurement

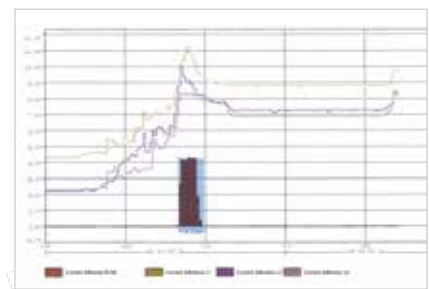


Fig.: Analysis of fault current events

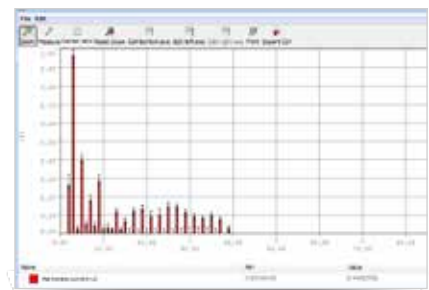


Fig.: Analysis of the harmonic fault current components



Ethernet (TCP/IP)- / Homepage- / Ethernet-Modbus gateway functionality

- Simple integration into the network
- More rapid and reliable data transfer
- Modern homepage
- World-wide access to measured values by means of standard web browsers via the device's inbuilt homepage
- Access to measurement data via various channels
- Reliable saving of measurement data possible over a very long periods of time in the 256 MByte measurement data memory
- Connection of Modbus slave devices via Ethernet-Modbus gateway



Fig.: Ethernet-Modbus gateway functionality



Measuring device homepage

- Webserver on the measuring device, i.e. device's own homepage
- Remote operation of the device display via the homepage
- Comprehensive measurement data incl. PQ
- Online data directly available via the homepage, historic data optional via the APP measured value monitor, 51.00.246

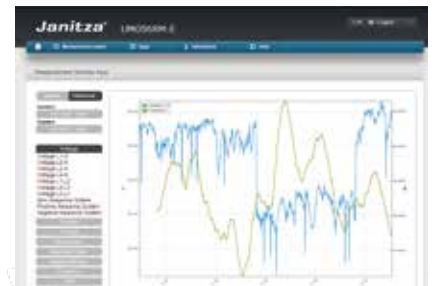
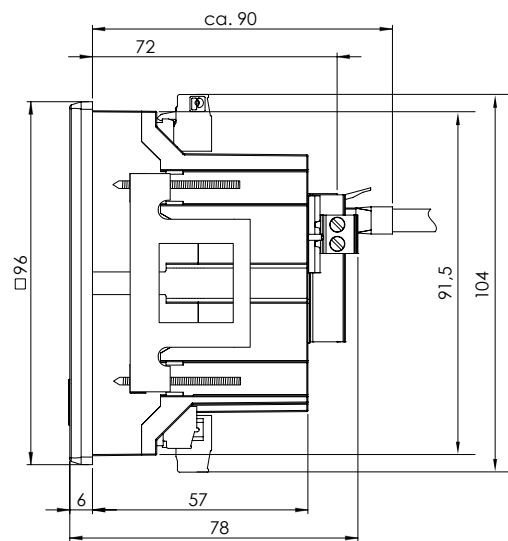


Fig.: Illustration of the online data via the device's inbuilt homepage



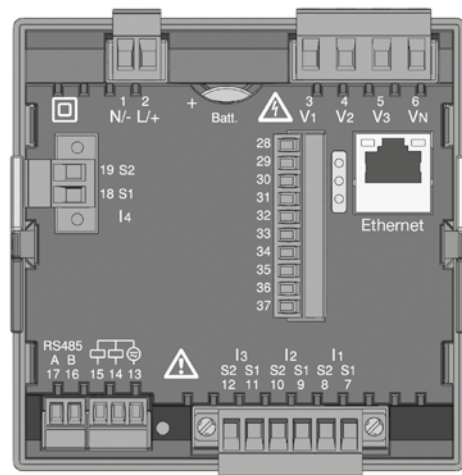
Dimension diagrams

All dimensions in mm



Side view

Cut out: 92^{+0,8} x 92^{+0,8} mm



Rear view



Typical connection

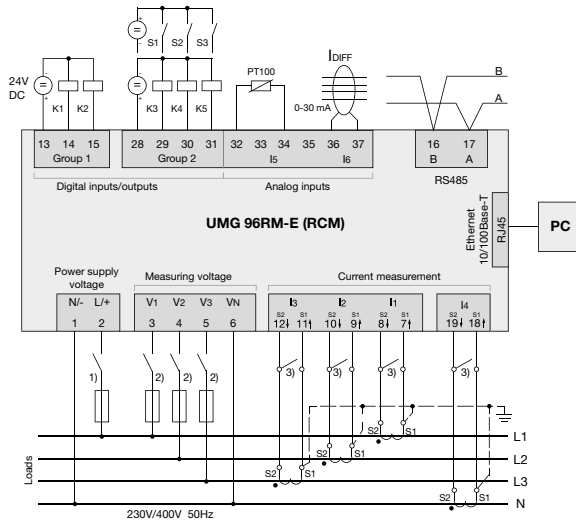


Fig.: Connection example with temperature and residual current measurement



Device overview and technical data

| | UMG 96RM-E*1 |
|--|--------------|
| Item number (90–277 V AC / 90–250 V DC) | 52.22.062 |
| Item number (24–90 V AC / 24–90 V DC) | 52.22.063 |
| General | |
| Use in low and medium voltage networks | • |
| Accuracy voltage measurement | 0.2 % |
| Accuracy current measurement | 0.2 % |
| Accuracy active energy (kWh, .../5 A) | Class 0.5S |
| Number of measurement points per period | 426 |
| Uninterrupted measurement | • |
| RMS - momentary value | |
| Current, voltage, frequency | • |
| Active, reactive and apparent power / total and per phase | • |
| Power factor / total and per phase | • |
| Energy measurement | |
| Active, reactive and apparent energy [L1, L2, L3, Σ L1–L3] | • |
| Number of tariffs | 14 |
| Recording of the mean values | |
| Voltage, current / actual and maximum | • |
| Active, reactive and apparent power / actual and maximum | • |
| Frequency / actual and maximum | • |
| Demand calculation mode (bi-metallic function) / thermal | • |

Comment:

For detailed technical information please refer to the operation manual and the Modbus address list.

• = included - = not included

*1 Inclusive UL certification.

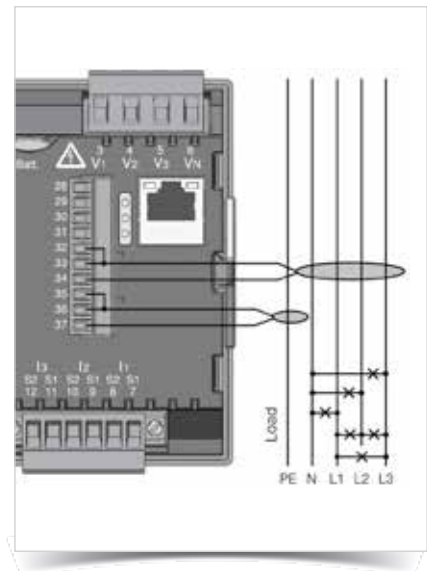


Fig.: Connection example residual current measurement and PE monitoring

| Other measurements | |
|--|---------------------|
| Operating hours measurement | • |
| Clock | • |
| Power quality measurements | |
| Harmonics per order / current and voltage | 1st – 40th |
| Distortion factor THD-U in % | • |
| Distortion factor THD-I in % | • |
| Rotary field indication | • |
| Current and voltage, positive, zero and negative sequence component | • |
| Error / event recorder function | • |
| Under and overvoltage recording | • |
| Measured data recording | |
| Memory (Flash) | 256 MB |
| Average, minimum, maximum values | • |
| Current measurement channel | 4 (+2) |
| Alarm messages | • |
| Time stamp | • |
| Time basis average value | freely user-defined |
| RMS averaging, arithmetic | • |
| Displays and inputs / outputs | |
| LCD display (with backlighting), 2 buttons | • |
| Digital outputs (as switch or pulse output) | 2 |
| Digital inputs and outputs (selectable) | 3 |
| Analogue inputs (RCM, temperature, analogue) | 2 |
| Voltage inputs | L1, L2, L3 + N |
| Password protection | • |
| Communication | |
| Interfaces | |
| RS485: 9.6 – 115.2 kbps (Screw-type terminal) | • |
| Ethernet 10/100 Base-TX (RJ-45 socket) | • |
| Protocols | |
| Modbus RTU | • |
| Modbus TCP/IP | • |
| Modbus RTU over Ethernet | • |
| Modbus Gateway for Master-Slave configuration | • |
| HTTP (homepage configurable) | • |
| SMTP (email) | • |
| NTP (time synchronisation) | • |
| TFTP | • |
| FTP (File-Transfer) | • |
| SNMP | • |
| DHCP | • |
| BACnet (optional) | • |
| ICMP (Ping) | • |
| Software GridVis®-Basic ^{*2} | |
| Online and historic graphs | • |
| Databases (Janitza DB, Derby DB); MySQL, MS SQL with higher GridVis® versions) | • |
| Manual reports (energy, power quality) | • |
| Topology views | • |
| Manual read-out of the measuring devices | • |
| Graph sets | • |
| Programming / threshold values / alarm management | |
| Comparator (5 Groups with 10 comparators each) | • |
| Comprehensive adjustment options for RCM | • |

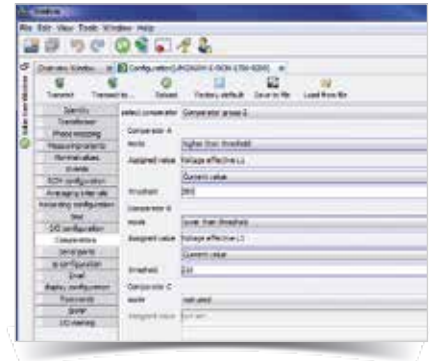


Fig.: GridVis® software, configuration menu

Comment:
For detailed technical information please refer to the operation manual and the Modbus address list.

• = included - = not included

*² Optional additional functions with the packages GridVis®-Professional, GridVis®-Service and GridVis®-Ultimate.

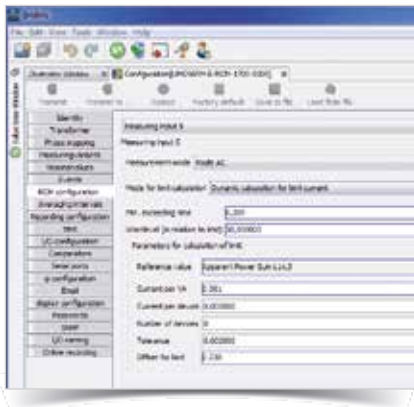


Fig.: RCM configuration, e.g. dynamic threshold value formation, for load-dependent threshold value adaptation



Fig.: Summation current transformer for the acquisition of residual currents. Wide range of different configurations and sizes allow use in almost all applications

| Technical data | |
|--|---|
| Type of measurement | Constant true RMS Up to 40th harmonic |
| Nominal voltage, three-phase, 4-conductor (L-N, L-L) | 277 / 480 V AC |
| Nominal voltage, three-phase, 3-conductor (L-L) | 480 V AC |
| Measurement in quadrants | 4 |
| Networks | TN, TT, IT |
| Measured voltage input | |
| Overvoltage category | 300 V CAT III |
| Measured range, voltage L-N, AC (without potential transformer) | 10 ... 300 Vrms |
| Measured range, voltage L-L, AC (without potential transformer) | 18 ... 520 Vrms |
| Resolution | 0.01 V |
| Impedance | 4 MOhm / phase |
| Frequency measuring range | 45 ... 65 Hz |
| Power consumption | approx. 0.1 VA |
| Sampling frequency per channel (50 / 60 Hz) | 21.33 / 25.6 kHz |
| Measured current input | |
| Rated current | 1 / 5 A |
| Resolution | 0.1 mA |
| Measurement range | 0.001 ... 6 Amps |
| Overvoltage category | 300 V CAT II |
| Measurement surge voltage | 2 kV |
| Power consumption | approx. 0.2 VA (Ri = 5 mOhm) |
| Overload for 1 sec. | 120 A (sinusoidal) |
| Sampling frequency per channel (50 / 60 Hz) | 21.33 / 25.6 kHz |
| Residual current input | |
| Analogue inputs | 2 (for residual current or temperature measurement) |
| Measurement range, residual current input*3 | 0.05 ... 30 mA |
| Digital outputs | |
| Switching voltage | max. 60 V DC, 33 V AC |
| Switching current | max. 50 mA Eff AC / DC |
| Response time | 10 / 12 periods + 10 ms |
| Pulse output (energy pulse) | max. 50 Hz |
| Maximum cable length | up to 30 m unshielded, from 30 m screened |
| Mechanical properties | |
| Weight | approx. 370 g |
| Device dimensions in mm (H x W x D)*4 | 96 x 96 x 78 |
| Battery | CR2032, 3 V, type Lithium |
| Protection class per EN 60529 | Front: IP40; Back: IP20 |
| Assembly per IEC EN 60999-1 / DIN EN 50022 | Front panel installation |
| Cable cross section | |
| Supply voltage | 0.2 to 2.5 mm ² |
| Current measurement | 0.2 to 2.5 mm ² |
| Voltage measurement | 0.08 to 4.0 mm ² |
| Environmental conditions | |
| Temperature range | Operation: K55 (-10 ... +70 °C) |
| Relative humidity | Operation: 0 to 75 % RH |
| Operating height | 0 ... 2,000 m above sea level |
| Degree of pollution | 2 |
| Installation position | user-defined |
| Electromagnetic compatibility | |
| Electromagnetic compatibility of electrical equipment | Directive 2004/108/EC |
| Electrical appliances for application within particular voltage limits | Directive 2006/95/EC |

Comment:

For detailed technical information please refer to the operation manual and the Modbus address list.

• = included - = not included

*3 Example of residual current input 30 mA with 600/1 residual current transformer: 600 x 30 mA = 18,000 mA

*4 Accurate device dimensions can be found in the operation manual.

| | |
|---|--|
| Equipment safety | |
| Safety requirements for electrical equipment for measurement, regulation, control and laboratory use – Part 1: General requirements | IEC/EN 61010-1 |
| Part 2-030: Particular requirements for testing and measuring circuits | IEC/EN 61010-2-030 |
| Noise immunity | |
| Class A: Industrial environment | IEC/EN 61326-1 |
| Electrostatic discharge | IEC/EN 61000-4-2 |
| Voltage dips | IEC/EN 61000-4-11 |
| Emissions | |
| Class B: Residential environment | IEC/EN 61326-1 |
| Radio disturbanc voltage strength 30 – 1000 MHz | IEC/CISPR11/EN 55011 |
| Radiated interference voltage 0.15 – 30 MHz | IEC/CISPR11/EN 55011 |
| Safety | |
| Europe | CE labelling |
| Firmware | |
| Firmware update | Update via GridVis® software. Firmware download (free of charge) from the website: http://www.janitza.com |

Comment:
For detailed technical information please refer to the operation manual and the Modbus address list.

• = included - = not included

