



UMG 96RM

Multifunction power analyser

Compact high performance



The image shows a Janitza UMG 96 RM Power Analyser, a compact black and blue device with a large LCD screen. The screen displays three-phase current readings: L1 at 25.8 A, L2 at 26.2 A, and L3 at 27.8 A. It also shows K1 and K2 indicators. The device has several buttons and ports on its front panel.

Memory 256 MB

Harmonics

Measurement accuracy 0,5

0,5 kWh Class

Alarm management

8 Tariffs

Puls inputs and outputs

Residual current measurement

Communication (device-specific)

- Modbus (RTU)
- Profibus DP V0
- TCP/IP
- M-Bus

Power quality

- Harmonics up to 40th harmonic
- Rotary field components
- Distortion factor THD-U / THD-I
- Waveform display (UMG 96RM-EL) via GridVis®-Basic software

Up to 4 digital inputs

- Pulse input
- Logic input
- State monitoring

Interfaces

- RS485 (UMG 96RM, UMG 96RM-P, UMG 96RM-CBM)
- Profibus (UMG 96RM-P)
- M-Bus (UMG 96RM-M)
- Ethernet (UMG 96RM-E, UMG 96RM-EL)
- USB (UMG 96RM-P, UMG 96RM-CBM)

Networks

- TN, TT, IT networks
- 3 and 4-phase networks
- Up to 4 single-phase networks

Up to 6 digital outputs

- Pulse output kWh / kvarh
- Switch output
- Threshold value output
- Logic output
- Remote via Modbus / Profibus

Accuracy of measurement

- Energy: Class 0.5S (... / 5 A)
- Current: 0.2 %
- Voltage: 0.2 %

Measured data memory (UMG 96RM-E, UMG 96RM-CBM, UMG 96RM-P)

(UMG 96RM, UMG 96RM-M und UMG 96RM-EL without measurement data memory, energy, minimum and maximum values will be saved in the EEPROM)

- 256 MB Flash

Network visualisation software

- GridVis®-Basic (in the scope of supply)

Residual current measurement

- Only available for UMG 96RM-E

Key features: Unrivalled in its class

The compact and powerful multi-function measurement device UMG 96RM for energy measurement. It collects the electrical energy consumption, electrical standard characteristics such as current, voltage, frequency, power and much more such as power quality characteristics, e.g. harmonics, up to the 40th order. The high measurement accuracy, compact construction, extensive measurement data, multi-faceted protocol for integration into upstream systems as well as the economical design result in the UMG 96RM being unrivalled.



Measurement accuracy of 0.2 % (V), kWh class = 0.5

The high sampling rate of 21.3 kHz, measurement accuracy of 0.2 % (V) as well as the effective energy class 0.5 (kWh) stand for a measurement of the highest quality.



Energy meter with 8 tariffs, effective energy and reactive energy

The energy measurement in 4 quadrants, each with 8 tariffs for effective energy and reactive energy ensures a precise and reliable acquisition of the energy data for individual consumers or for the complete supply.



Extensive communication options: Ethernet, Profibus, Modbus, M-Bus ...

An uncomplicated system integration (energy management system, PLC, SCADA, BMS) is assured through a multitude of interfaces and protocols. The GridVis software, which is included as part of the deliverables, is the basis for energy management systems and power quality investigations.



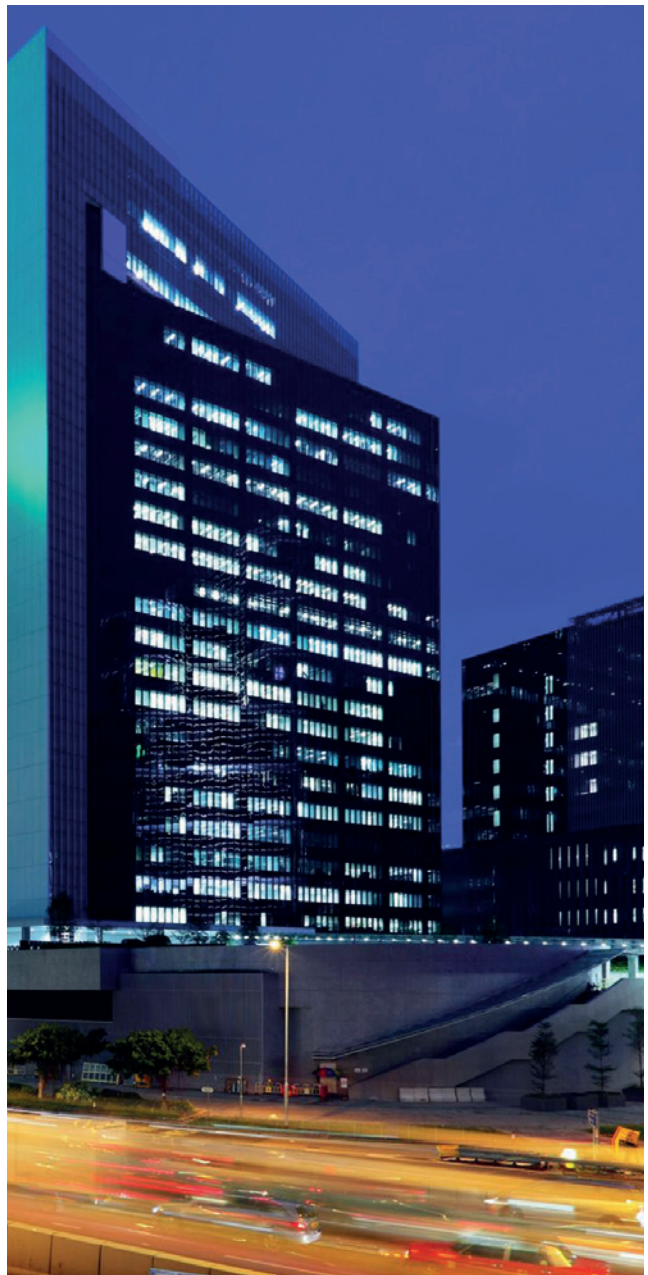
Large measurement data memory

A large 256 MB measurement data memory and a user-definable recording configuration enables measurement data to be stored over a very long period.



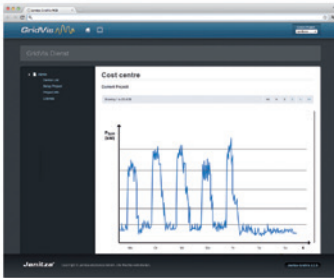
Harmonics analyser with harmonics up to 40th order

The measurement of the harmonics up to the 40th order yields information about the power quality, network disturbance and possible network "contaminators".



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Energy data acquisition & load profile

With the help of the UMG 96RM detailed acquisition of energy data and the load profile is a simple task within the scope of energy analysis. This is essential for tracking energy efficiency and the safe design of the energy distribution systems.



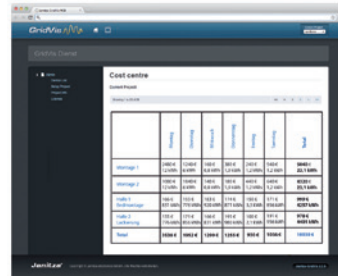
Energy management systems

Energy management systems per standard are essential for continuous improvements in energy efficiency and reduction of costs. Universal measurement devices from the UMG 96RM range are an important constituent part of energy management systems, which can also secure tax breaks amongst other benefits.



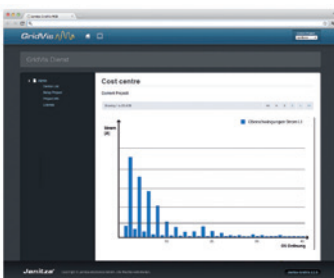
Transparency of energy supply

A higher degree of transparency can be attained through a multi-stage and scalable measurement system within the scope of energy measurement technology. Only by means of continuous measurement with high resolution meters, can sporadic events be analysed and corrective solutions identified.



Cost centre analysis

It is becoming more and more important in industrial enterprises to be able to assign energy costs to particular products and to be able to determine the breakdown and allocation of energy costs to charge them to the individual processes and consumers. This also allows employees to focus on specific cost optimisation and conservation of energy.



Power quality monitoring

UMG 96RM gives indispensable information about insufficient power quality and enables measures to be undertaken to address grid problems. This result is the prevention of production drop-outs, significantly longer service life for the manufacturing resources and thus an improved sustainability for the investment associated with them.

The variants of the UMG 96RM

The UMG 96RM is available in different versions to meet the various application specific market requirements. The differences between the variants are primarily with the interfaces, protocols and configuration of the inputs and outputs. The basic device is already comprehensively equipped with a fast RS485 interface with Modbus protocol and 2 digital outputs.

Profibus and digital IOs

The Profibus connection is particularly used in systems where the UMG 96RM is to be incorporated into the automation environment (PLC controllers).

4th current transformer input

The increasing proportion of non-linear loads leads to increasing pollution effects on the grid, in particular overloading of the neutral conductor by harmonic currents. The N-line can be continuously monitored through the 4th current input.

Temperature input and analogue output (RCM)

A multitude of inputs and outputs enable effective integration into upstream systems. Low voltage distribution systems, the transformer or the server cabinet can be protected from over-temperature simultaneously by means of the temperature input.

Ethernet (TCP/IP)

Increasingly communications are moving from typical field bus to Ethernet (TCP/IP). The UMG 96RM Ethernet connection guarantees a simple integration into the network and a fast and reliable communications architecture.

M-Bus

The M-Bus field bus connection for the acquisition of consumption data collection from various different consumption meters, such as water, gas, heat or electrical current. The UMG 96RM can be simply and cost-effectively integrated into economical consumption data acquisition systems via the M-Bus connection.

Digital inputs and outputs

Along with network transparency Smart Grid stands for the active control of energy flows and power. In addition the UMG 96RM offers a multitude of configurations for IOs for intelligent integration and control tasks.





GridVis® – network visualisation software

With GridVis®, Janitza offers powerful, user-friendly software for the development of energy and power quality monitoring systems. The basic version GridVis®-Basic, which is part of the scope of delivery of the measurement devices, serves both for the programming and configuration of the UMG 512 and also for the reading out, saving, display, processing and analysis of the measurement data. GridVis® is a comprehensive and scalable software solution for energy suppliers, industrial applications, facility management, building market and infrastructure projects. GridVis® provides technicians and managers with the required data to identify potential energy savings, reduce energy costs, avoid production shut-downs and optimise the utilisation of production resources.

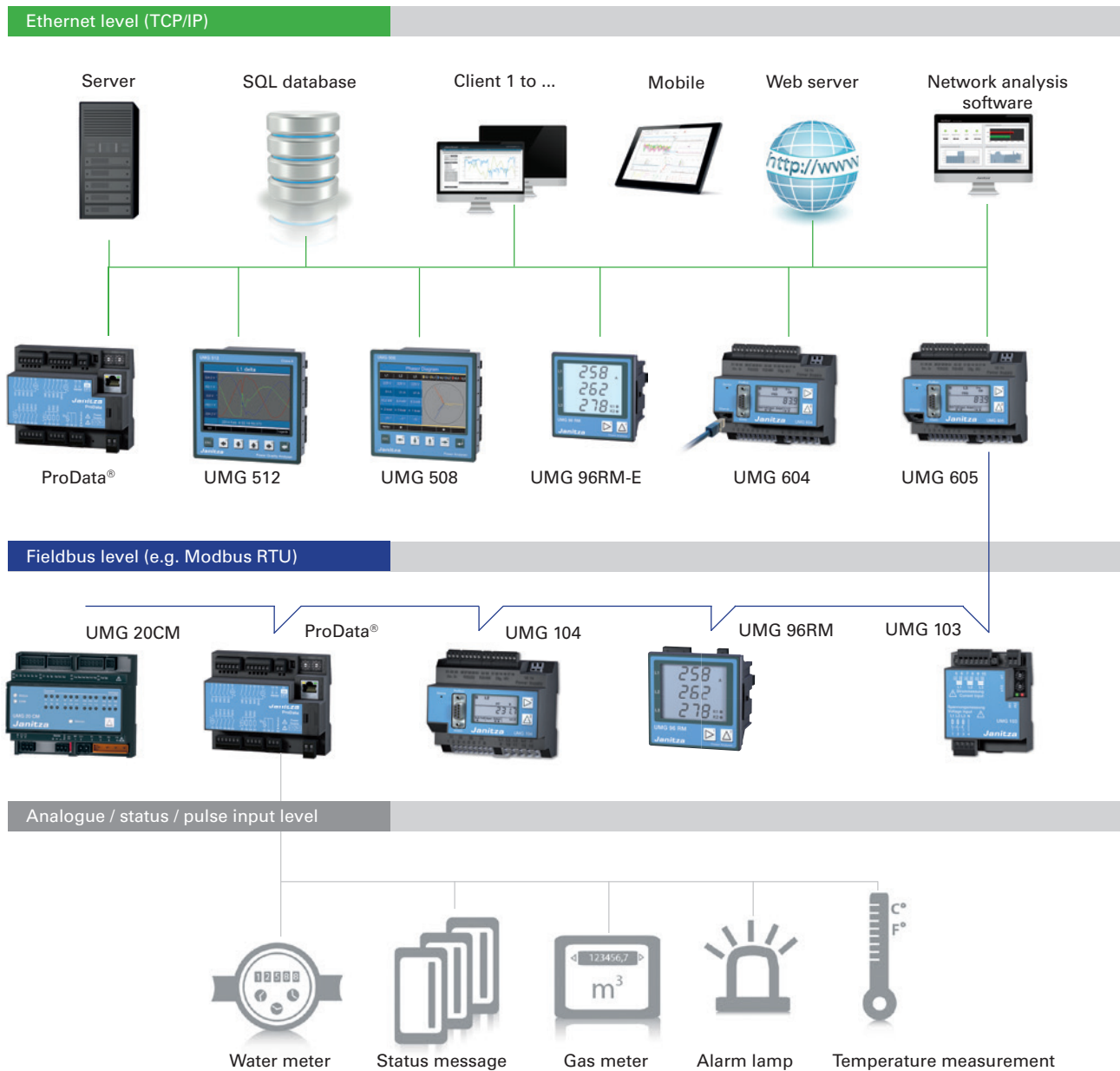
- Intuitive operation
- Configuration of the measurement system and the UMG measurement devices
- Certified ISO 50001 EnMS software
- Automatic or manual readout of measurement data
- Graphical illustration of online and historical measurement data
- Comprehensive alarm management
- User management
- Generic Modbus devices, virtual meters
- Graphic user interface (topological view) for visualising real-time data and messages

- Display of minimum, average and maximum values in a graph
- Statistical evaluation of the measured data
- Comprehensive export functions (e.g. Excel)
- Reports for energy usage and power quality (EN 50160, IEEE 519, EN 61000-2-4) manual or time-controlled with individual schedule
- Saving of data in a central database incl. database management (e.g. MySQL / MS SQL / Derby / Janitza DB)
- Open system architecture and scalability

Diverse attributes are dependent on the version



Example network topology

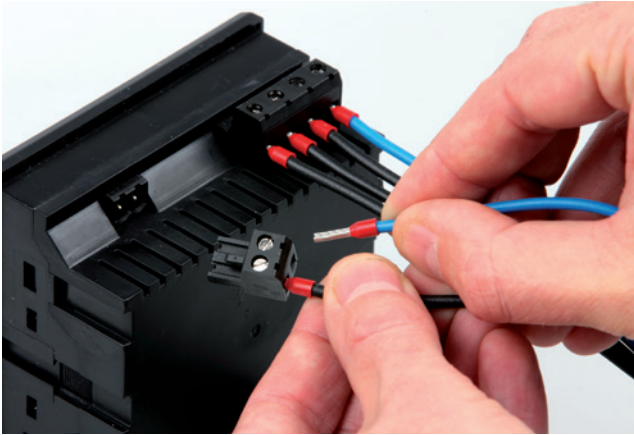


UMG 508 / UMG 604 = Janitza power analyser

UMG 512 / UMG 605 = Janitza power quality analyser

UMG 96RM / UMG 96RM-E / UMG 103 / UMG 104 = Janitza multifunction energy meters

UMG 96RM-E / UMG 20CM = Janitza 20 channel branch circuit monitoring device, for residual current monitoring (RCM) and energy data acquisition



Pluggable screw terminals

The pluggable screw terminals enable convenient installation even where spaces are tight.



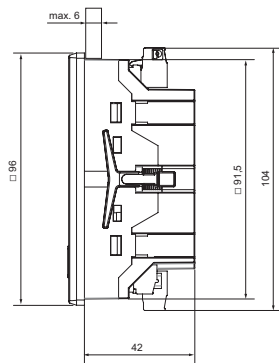
Backlight

The large high-contrast LCD display with backlighting ensures intuitive operation and good readability even in poor light conditions.



Dimension diagrams

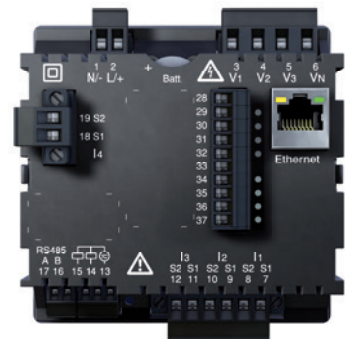
All dimensions in mm



Side view UMG 96RM



Rear view UMG 96RM (basic device)



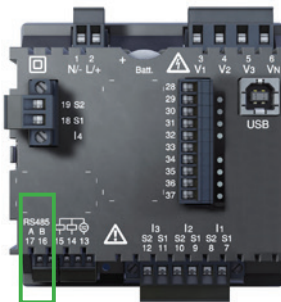
Rear view UMG 96RM-E



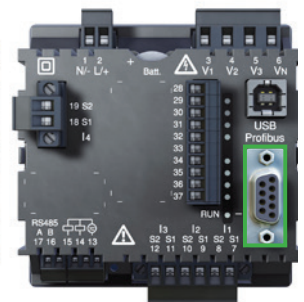
Rear view 96RM-M
M-Bus variant



Rear view 96RM-EL
Ethernet light variant



Rear view 96RM-CBM
Modbus variant

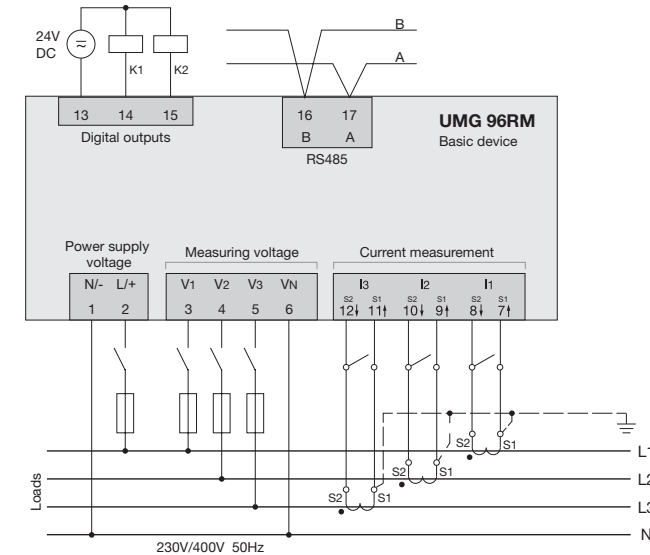


Rear view 96RM-P
Profibus variant

The illustrations shown here are examples. Further dimensional drawings and connection diagrams are available on request or can be viewed on our homepage.



Typical connection



Connection variant UMG 96RM

The illustration shown here is an example.
Further connection diagrams are available on request
or can be viewed on our homepage.



Device overview and technical data

	UMG 96RM	UMG 96RM-M	UMG 96RM-EL	UMG 96RM-CBM	UMG 96RM-P	UMG 96RM-E
Item number	52.22.035	52.22.039	52.22.040	52.22.038	52.22.037	52.22.036
Item number (ETL) ^{*1}	52.22.031	-	-	52.22.032	52.22.034	52.22.033
Interfaces	RS485	M-Bus	Ethernet	RS485, USB	RS485, Profibus, USB	RS485, Ethernet
Protocols						
Modbus RTU	•	-	-	•	•	•
Modbus TCP	-	-	•	-	-	•
Profibus DP V0	-	-	-	-	•	-
M-Bus	-	•	-	-	-	-
DHCP	-	-	•	-	-	•
ICMP (Ping)	-	-	•	-	-	•
Measured data recording						
Current measurement channel	3	3	3	4	4	4 (+2)
Memory (Flash)	-	-	-	256 MB	256 MB	256 MB
Battery	-	-	-	Typ VARTA CR1/2AA, 3 V, Li-Mn	Typ VARTA CR1/2AA, 3 V, Li-Mn	Typ VARTA CR1/2AA, 3 V, Li-Mn
Clock	-	-	-	•	•	•
Digital inputs and outputs						
Digital inputs	-	-	-	4	4	3 ^{*3}
Digital outputs (as switch or pulse output)	2	2	-	6	6	2 + 3 ^{*3}
Digital inputs (RCM, temperature)	-	-	-	-	-	•
Mechanical properties						
Dimensions in mm (H x W x D) ^{*2}	96 x 96 x ca. 48	96 x 96 x ca. 48	96 x 96 x ca. 48	96 x 96 x ca. 78	96 x 96 x ca. 78	96 x 96 x ca. 78

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

• = included - = not included

^{*1} The Intertek-ETL sign is well respected and widely accepted in the USA and Canada. It serves as verification of compliance with the relevant standards, e.g. UL, CSA, NEC, NFPA, NSF, ANSI, NOM. Further information on ETL can be found at <http://www.intertek.de/elektronik/etl-zeichen/>. Source: www.intertek.de

^{*2} Accurate device dimensions can be found in the operation manual.

^{*3} Digital inputs and outputs selectable.

UMG 96RM

Power analyser

General	
Supply voltage AC ^{*3}	20 ... 250 V AC
Supply voltage DC ^{*3}	20 ... 300 V DC
Supply voltage AC (ETL variants) ^{*4}	95 ... 240 V AC
Supply voltage DC (ETL variants) ^{*4}	100 ... 300 V DC
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	•
Other measurements	
Operating hours measurement	•
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	•
Rotary field indication	•
Measured data recording	
Average , minimum, maximum values	•
Alarm messages	•
Time stamp	•
Time basis average value	freely user-defined
RMS averaging, arithmetic	•
Displays and inputs / outputs	
LCD display (with backlighting), 2 buttons	•
Voltage inputs	L1, L2, L3 + N
Password protection	•
Software GridVis®-Basic ^{*5}	
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 (2 Groups with 3 comparators each)	•
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

Comment:

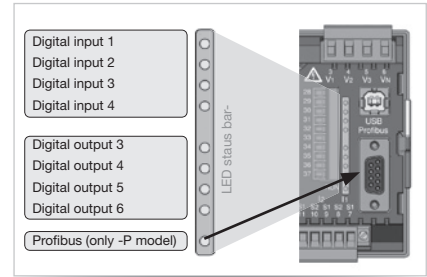
For detailed technical information please refer to the operation manual and the Modbus address list.

• = included - = not included

^{*3} Relates exclusively to item numbers 52.22.035, 52.22.037, 52.22.038, 52.22.039 and 52.22.040.

^{*4} Relates exclusively to ETL marked devices with item numbers 52.22.031, 52.22.032, 52.22.033 and 52.22.034.

^{*5} Optional additional functions with the packages GridVis®-Professional, GridVis®-Enterprise and GridVis®-Service.

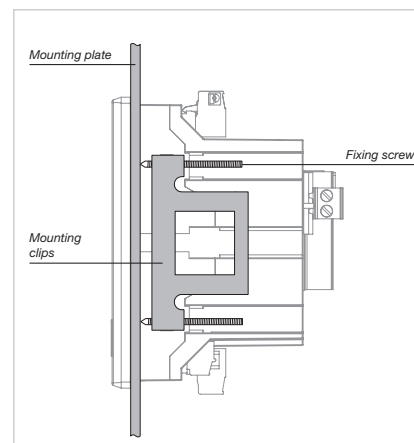


LED status bar for the inputs and outputs
(UMG 96RM-CBM and UMG 96RM-P)

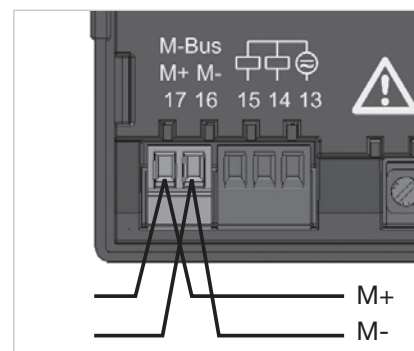


Battery insertion on the rear
(UMG 96RM-CBM, UMG 96RM-P and UMG 96RM-E)

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	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
Digital inputs and outputs	
Digital inputs*	
Maximum counting frequency	20 Hz
Input signal present	18 ... 28 V DC (typical 4 mA)
Input signal not present	0 ... 5 V DC, current < 0.5 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 unscreened, from 30 m screened
Mechanical properties	
Weight	approx. 0.3 kg
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 (-25 ... +70 °C)
Relative humidity	Operation: 0 to 90 % RH
Operating height	0 ... 2000 m above sea level
Degree of pollution	2
Installation position	user-defined
Electromagnetic compatibility	
Electromagnetic compatibility of electrical equipment	Directive 2004/108/EC
Electrical equipment for use within certain voltage limits	Directive 2006/95/EC
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
USA and Canada	ETL variants available
Firmware	
Firmware update	Update via GridVis® software. Firmware download (free of charge) from the website: http://www.janitza.com/downloads



The fastening into a switchboard is implemented via the side-mounted fastening clamps (UMG 96RM-P / UMG 96RM-CBM / UMG 96RM-E)



M-Bus interface with 2-pole plug contact



2-pole plug contact with cable connection (cable type: 2 x 0.75 mm²) via twin core end sheathes

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

• = included - = not included

*⁶ The information relates exclusively to the measurement devices UMG 96RM-CBM and UMG 96RM-P

*⁷ The information relates exclusively to the measurement devices UMG 96RM, UMG 96RM-M, UMG 96RM-CBM and UMG 96RM-P96RM-P

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