UMG 96RM

Multifunction power analyser

Memory 256 MB

Harmonics

Measurement accuracy 0.5

8 Tariffs

Pulse inputs and outputs

Communication (device-specific)
- Modbus (RTU)
- Profibus DP V0
- Profinet
- TCP/IP
- M-Bus

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

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

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

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

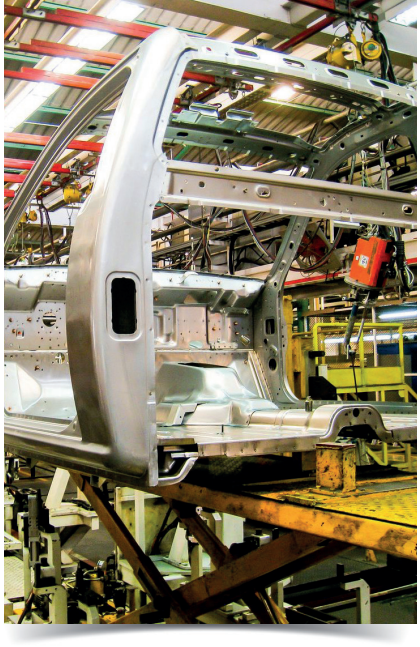
Measured data memory (UMG 96RM-CBM, UMG 96RM-P)
(UMG 96RM, UMG 96RM-M und UMG 96RM-EL without measurement data memory, energy, minimum and maximum values will be saved in the EEPROM)
- 256 MB Flash

Up to 4 digital inputs
- Pulse input
- Logic input
- State monitoring

Up to 6 digital outputs
- Pulse output kWh / kvarh
- Switch output
- Threshold value output
- Logic output
- Remote via Modbus / Profibus

Network visualisation software
- Free GridVis®-Basic

Janitza®



Areas of application

- Measurement, monitoring and checking of electrical characteristics in energy distribution systems
- Recording of load profiles for 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)

Main features

Particular advantages

- Compact construction saves space and costs during installation
- Seamless and sustained recording thanks to large measured data memory or via the online data acquisition (e.g. GridVis®-Service)
- High data security and redundancy
- Comprehensive communications options and protocols
- Multifaceted, pre-defined reports for power quality and energy consumption analysis (via GridVis®-Service)
- Simple report generation at the press of a button or automatically in accordance with defined time plans
- Precision measurement results provide an effective infrastructure as well as high production availability
- Generic Modbus profile: Arbitrary Modbus-capable devices and systems from other manufacturers can be incorporated and visualised in the monitoring solutions
- Long-term availability of the measurement devices guarantees simple retrofitting with system expansions

Energy data acquisition & load profile

- Detailed acquisition of the energy data and the load profile
- More transparency in energy supply through energy analyses
- Safer design of the power distribution systems

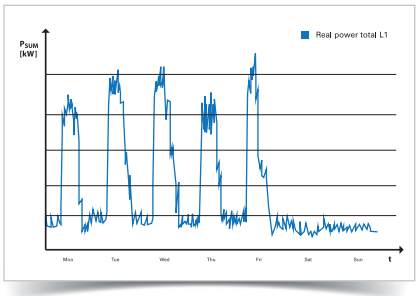
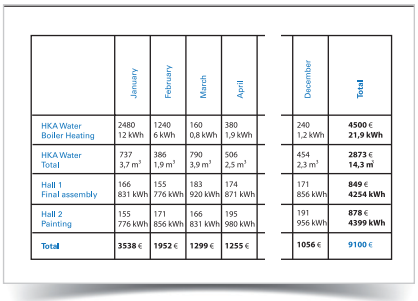


Fig.: Load profiles are the basis for energy management

Cost centre analysis

- Determination of energy costs
- Breakdown and allocation of energy consumers



	January	February	March	April	December	Total
HKA Water Boiler Heating	2480 12 kWh	1240 6 kWh	160 0,8 kWh	380 1,9 kWh	240 1,2 kWh	**4500 €** **21,9 kWh**
HKA Water Total	737 3,7 m³	386 1,9 m³	790 3,9 m³	506 2,5 m³	454 2,3 m³	**2873 €** **14,3 m³**
Hall 1 Final assembly	166 831 kWh	155 776 kWh	183 920 kWh	174 871 kWh	171 856 kWh	**849 €** **4254 kWh**
Hall 2 Painting	155 776 kWh	171 856 kWh	166 831 kWh	195 980 kWh	191 956 kWh	**878 €** **4399 kWh**
Total	**3538 €**	**1952 €**	**1299 €**	**1255 €**	**1056 €**	**9100 €**

Fig.: Cost centre analysis

Energy management systems (ISO 50001)

- Continuous increase in energy efficiency
- Cost reduction
- UMG 96RM series multifunctional power analysers are an important part of energy management systems

Transparency of energy supply

- More transparency through a multi-stage, scalable measurement system
- Acquisition of individual events through continuous measurement with high resolution

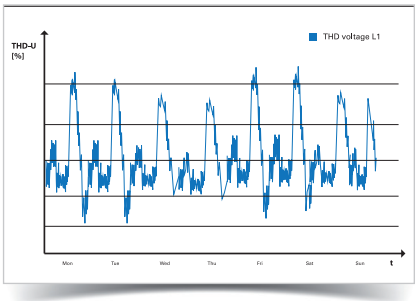


Fig.: Transparency of energy supply

Power quality monitoring

- Notification of inadequate power quality
- Introduction of measures to address network problems
- Prevention of production downtimes
- Significantly longer service life for equipment
- Improved sustainability

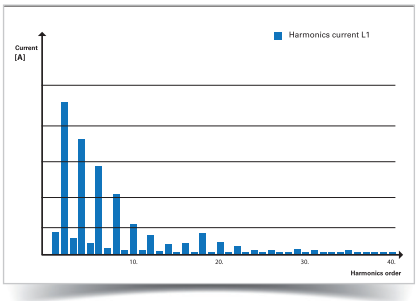


Fig.: Power quality monitoring (Harmonics analysis for the current up to 40th order harmonics)

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

- High sampling rate at 21.3 kHz
- Reliable measurement accuracy of 0.2 % (V)
- Effective energy class (kWh): 0.5S

Energy meter with 8 tariffs, effective and reactive energy

- Energy measurement in 4 quadrants, each with 8 tariffs for effective and reactive energy
- Safe and precise acquisition of operational values for individual electrical loads

Communications options: Ethernet, Profibus, Modbus, M-Bus, ...

- Numerous interfaces and protocols, guaranteeing an easy system connection (energy management system, PLC, SCADA, BMS)

Large measurement data memory

- Saving of measurement data possible over very long periods of time
- Recording freely user configurable

Harmonics analyser

- Harmonics analysis up to 40th harmonic
- Information about power quality, grid disturbances and possible "network polluters"

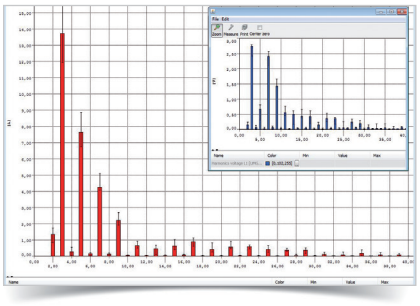


Fig.: GridVis® software: Harmonics analysis

Pluggable screw terminals

- Convenient installation even where spaces are tight

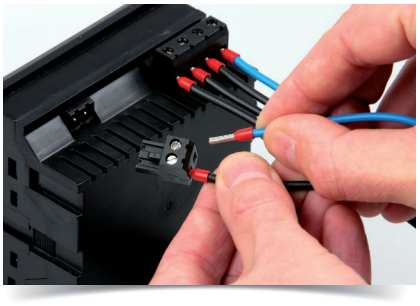


Fig.: Pluggable screw terminals for easy connection

Backlight

- Large, high-contrast LCD display with backlighting
- Very good readability and intuitive operation, even in poor lighting conditions

Fig.: LCD Display backlight

Basic device

- RS485 interface with Modbus protocol and 2 digital outputs enable quick and low-cost monitoring of power quality and energy consumption

Profibus and digital IOs

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

M-Bus

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

Ethernet (TCP/IP) with the UMG 96RM-EL

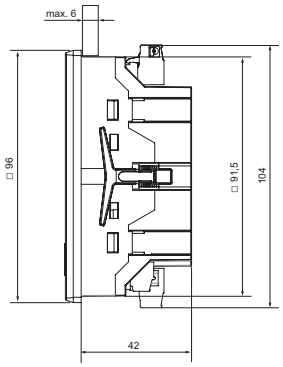
- Simple integration into the Ethernet (LAN) network
- Fast and reliable data communication

4th current transformer input

- Continuous monitoring of the N-conductor by means of the 4th current input
- Available with variants UMG 96RM-P and UMG 96RM-CBM

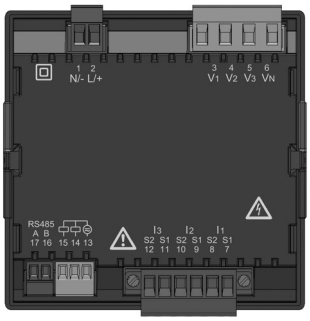
Dimension diagrams

All dimensions in mm

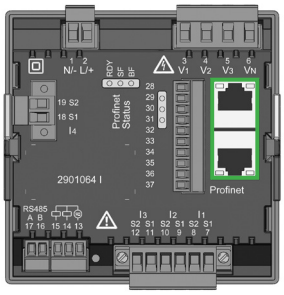


Side view UMG 96RM

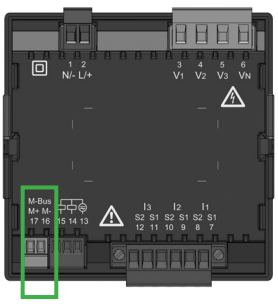
Cut out: $92^{+0,8}$ x $92^{+0,8}$ mm



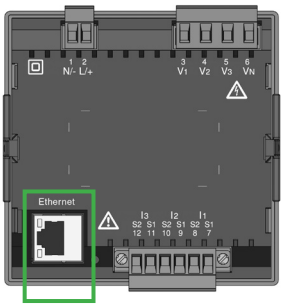
Rear view UMG 96RM (basic device)



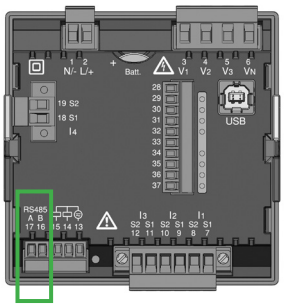
Rear view UMG 96RM-PN
Profinet variant



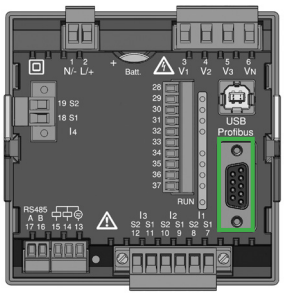
Rear view 96RM-M
M-Bus variant



Rear view 96RM-EL
Ethernet light variant



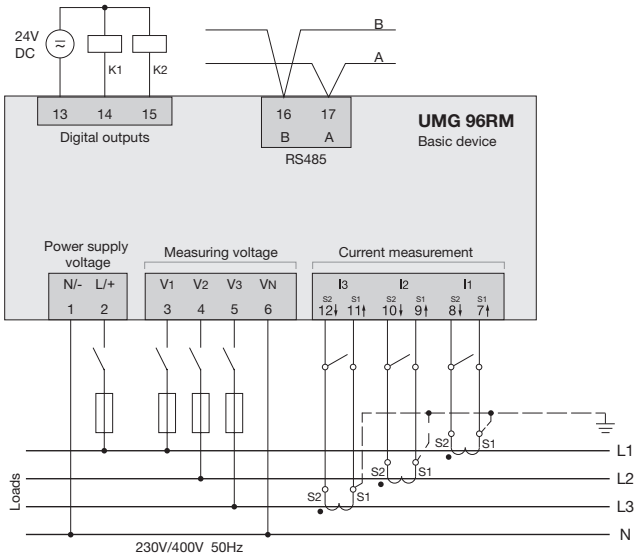
Rear view 96RM-CBM
Modbus variant



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*1	UMG 96RM-M*1	UMG 96RM-EL*1	UMG 96RM-CBM*1	UMG 96RM-P*1	UMG 96RM-PN*1
Item no. (90–277 V AC/90–250 V DC)	**52.22.061**	**52.22.069**	**52.22.068**	**52.22.066**	**52.22.064**	**52.22.090**
Item no. (24–90 V AC/24–90 V DC)	**52.22.070**	**52.22.073**	**52.22.072**	**52.22.067**	**52.22.065**	**52.22.091**
Interfaces	RS485	M-Bus	Ethernet	RS485, USB	RS485, Profibus, USB	RS485, Ethernet, Profinet
Protocols						
Modbus RTU	•	-	-	•	•	•
Modbus TCP	-	-	•	-	-	•
Profibus DP V0	-	-	-	-	•	-
Profinet	-	-	-	-	-	•
M-Bus	-	•	-	-	-	-
DHCP oder DCP	-	-	•	-	-	•
ICMP (Ping)	-	-	•	-	-	•
Measured data recording						
Current measurement channel	3	3	3	4	4	4 (+2)
Memory (Flash)	-	-	-	256 MB	256 MB	-
Battery	-	-	-	Type CR2032 3 V, Li-Mn	Type CR2032 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
Mechanical properties						
Device dimensions in mm (H x W x D)*2	96 x 96 x approx. 48	96 x 96 x approx. 48	96 x 96 x approx. 48	96 x 96 x approx. 78	96 x 96 x approx. 78	96 x 96 x approx. 78

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

• = included - = not included

*1 Inclusive UL certification.

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

*3 Optionally 3 digital inputs or outputs (no pulse output)

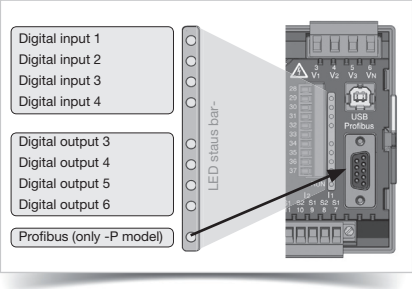


Fig.: LED status bar for the inputs and outputs
(UMG 96RM-CBM and UMG 96RM-P)

Fig.: UMG 96RM-PN with Profinet interface

Fig.: Battery insertion on the rear
(UMG 96RM-CBM and UMG 96RM-P)

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, ∑ 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	•
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*4	
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

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

Measured voltage input	
Overvoltage category	300 V CAT III
Measured range, voltage L-N, AC (without potential transformer)	0*8 ... 300 Vrms
Measured range, voltage L-L, AC (without potential transformer)	0*8 ... 520 Vrms
Resolution	0.01 V
Impedance	3 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	0.005 ... 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*5	
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*6	
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; Front with seal: IP54; Back: IP20
Assembly per IEC EN 60999-1 / DIN EN 50022	Front panel installation
Cable cross section	
Supply voltage	0.2 to 2.5 mm²
Current measurement	0.2 to 2.5 mm²
Voltage measurement	0.08 to 4.0 mm²
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*7	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
Firmware	
Firmware update	Update via GridVis® software. Firmware download (free of charge) from the website: http://www.janitza.com/downloads

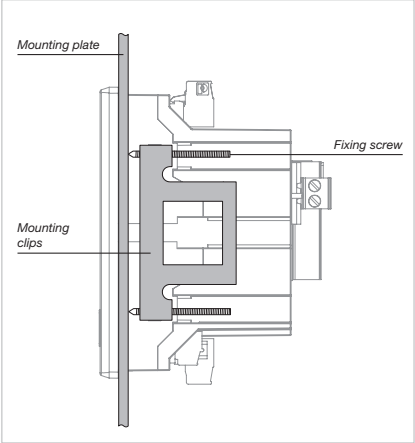


Fig.: The fastening into a switchboard is implemented via the side-mounted fastening clamps (UMG 96RM-P / UMG 96RM-CBM)

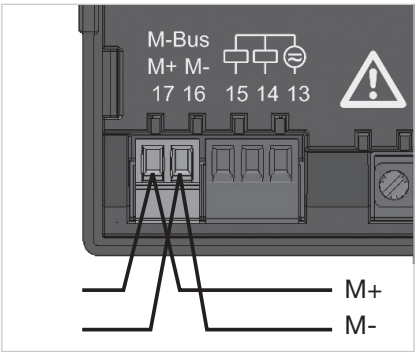


Fig.: M-Bus interface with 2-pole plug contact

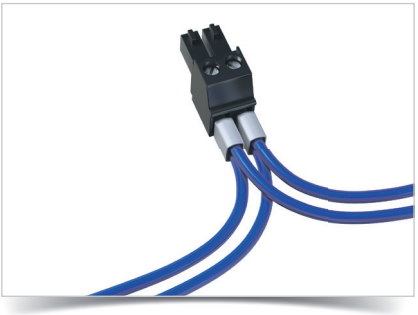


Fig.: 2-pole plug contact with cable connection (cable type: 2 x 0.75 mm²) via twin core end sheathes

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

• = included - = not included

*5 The information relates exclusively to the measurement devices UMG 96RM-CBM, UMG 96RM-P and UMG 96RM-PN.
*6 The information relates exclusively to the measurement devices UMG 96RM, UMG 96RM-M, UMG 96RM-CBM, UMG 96RM-P and UMG 96RM-PN.
*7 UMG 96RM-PN exclusive Class A: Industrial environment
*8 The UMG 96RM-M can only detect measurements when a voltage L1-N greater than 20 V eff (4-wire measurement) at voltage input V1 or a voltage L1-L2 greater than 34 V eff (3-wire measurement) is applied.