

UMG 96RM

Multifunctional power analyzer
for panel mounting 96 x 96 mm



Communication (device-specific)

- Modbus (RTU)
- Profibus DP V0 (Option)
- Profinet
- TCP/IP (Option)
- M-BUS

Interfaces (device-specific)

- RS485
- Profibus
- Profinet
- M-Bus
- Ethernet / USB

Accuracy of measurement

- Energy: class 0,5S (.../5 A)
- Current and voltage: 0,2%

Power quality

- Harmonics up to 40th harmonic
- Rotary field components
- Distortion factor THD-U/THD-I
- Wave form display (Option)

Networks

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

Measured data memory (device-specific)

- up to 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

Power Grid Monitoring Software

- Free GridVis®-Basic



Special features

- | | |
|---|--|
| <ul style="list-style-type: none"> • Compact construction saves space and costs during installation | <ul style="list-style-type: none"> • Simple report generation at the press of a button or automatically in accordance with defined time plans |
| <ul style="list-style-type: none"> • Seamless and sustained recording thanks to large measured data memory or via the online data acquisition (e.g. GridVis® -Service) | <ul style="list-style-type: none"> • Precision measurement results provide an effective infrastructure as well as high production availability |
| <ul style="list-style-type: none"> • Comprehensive communications options and protocols | <ul style="list-style-type: none"> • Generic Modbus profile: Arbitrary Modbus-capable devices and systems from other manufacturers can be incorporated and visualised in the monitoring solutions |
| <ul style="list-style-type: none"> • Multifaceted, pre-defined reports for power quality and energy consumption analysis (via GridVis® -Service) | <ul style="list-style-type: none"> • Long-term availability of the measurement devices guarantees simple retrofitting with system expansions |
| <ul style="list-style-type: none"> • High data security and redundancy | |



Main features

- 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

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

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

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

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

- High sampling rate at 21.3 kHz
- Reliable measurement accuracy of 0.2 % (V)
- Effective energy class (kWh): 0.55

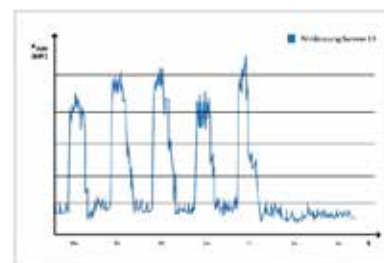


Fig.: Load profiles are the basis for energy management

	January	February	March	April		Share Ratio	Total
total intercompany receivable (ending)	2500	1200	900	800		2500	6000
	12,500%	6,000%	4,500%	4,000%		12,500%	21,000%
total intercompany payable (ending)	750	800	700	800		650	1670
	3,750%	4,000%	3,500%	4,000%		3,250%	16,700%
total 1	1750	400	200	0		1850	4330
intercompany	850	400	200	0		1450	4330
total 2	1750	400	200	0		1850	4330
total 3	1750	400	200	0		1850	4330
total 4	1750	400	200	0		1850	4330
Total	3350	1600	1100	800		3350	8000

Fig.: Cost centre analysis

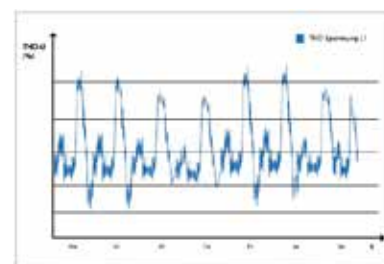


Fig.: Transparency of energy supply

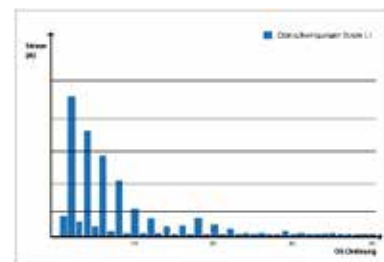


Fig.: Power quality monitoring (Harmonics analysis for the current up to 40th order harmonics)

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“

Pluggable screw terminals

- Convenient installation even where spaces are tight

Backlight

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

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 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

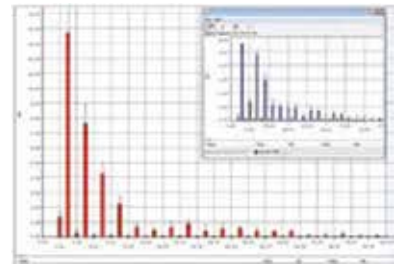


Fig.: Harmonics analysis



Fig.: Pluggable screw terminals for easy connection



Fig.: LCD Display backlight

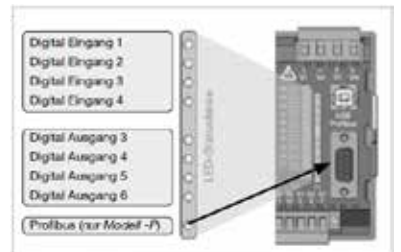
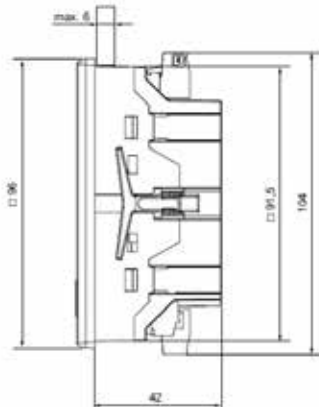


Fig.: LED status bar for the inputs and outputs (UMG 96RM-CBM and UMG 96RM-P)

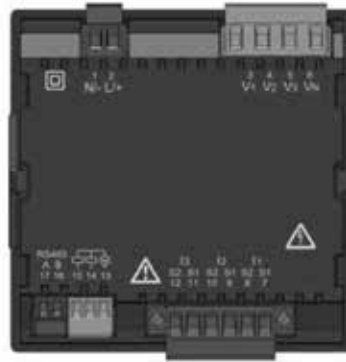


Dimensions

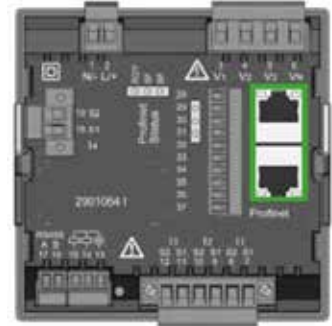


Side view UMG 96RM

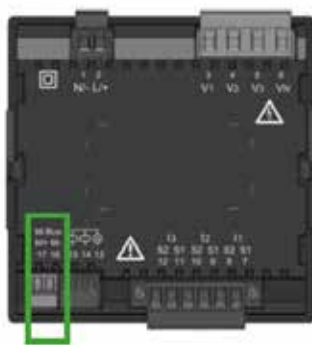
Cut out: $92^{+0.8} \times 92^{+0.8}$ mm



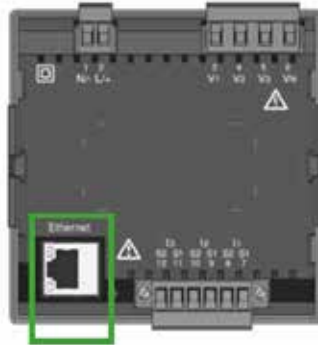
Rear view UMG 96RM
Basic device



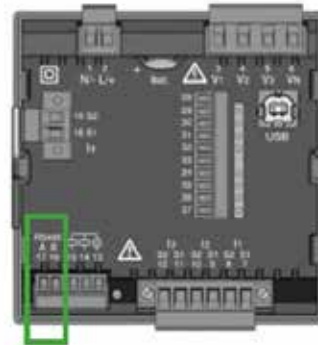
Rear view UMG 96RM-PN
Profinet variant



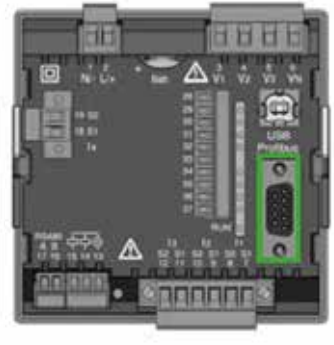
Rear view UMG 96RM-M
M-Bus variant



Rear view UMG 96RM-EL
Ethernet light variant



Rear view UMG 96RM-CBM
Modbus variant

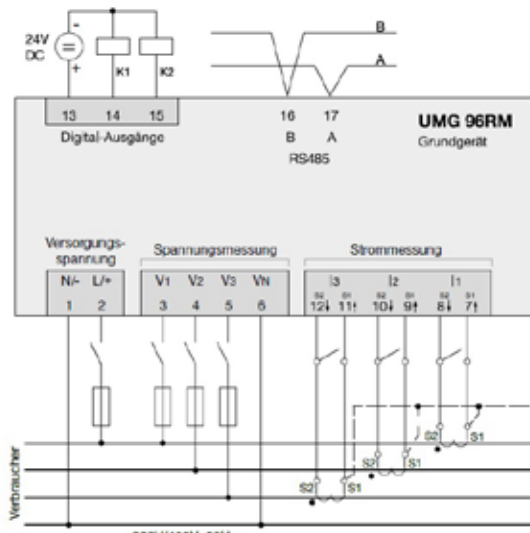


Rear view UMG 96RM-P
Profibus variant

The illustrations shown here are examples. Further dimensional drawings and connection diagrams are available on request.



Typical connection variant



Connection variant UMG 96RM

The illustration shown here is an example.
Further connection diagrams are available on request



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



Fig.: UMG 96RM-PN with Profinet interface



General data

General	Service life of backlight	40000 h (50% of the initial brightness)
Transport und storage	Free fall	1 m
	Temperature	K55 (-25° C to +70° C) (14° F to 158° F)
	Relative humidity	0 to 90% RH
Ambient conditions during operation	Protection class	II in acc. to IEC 60536 (VDE 0106, part 1)
	Rated temperature range	K55 (-10° C to +55° C) (14° F to 131° F)
	Relative humidity	0 to 75% RH
	Operating altitude	0 to 2000 m above sea level
	Pollution degree	2
	Installation position	any
	Ventilation	forced ventilation is not required
	Protection against ingress of solid foreign bodies and water	in acc. with EN 60529
	- Front	IP40
	- Rear	IP20
	- Front with seal	IP54



Technical data

Supply voltage	Option 230 V	
	Nominal range	90 V - 277 V (50/60 Hz) oder DC 90 V - 250 V, 300 V CAT III
	Power consumption	max. 4,5 VA / 2 W (RM-M) max. 5,5 VA / 3 W (RM) max. 5 VA / 2 W (RM-EL) max. 6 VA / 3 W (RM-CBM) max. 7,5 VA / 4 W (RM-P) max. 8,5 VA / 5 W (RM-PN)
	Option 24 V	
	Nominal range	24 V - 90 V AC/DC, 300 V CAT III
	Power consumption	max. 2,5 VA / 2 W (RM-M) max. 3,5 VA / 2 W (RM) max. 4,5 VA / 3 W (RM-EL) max. 5 VA / 3 W (RM-CBM) max. 6,5 VA / 5 W (RM-P) max. 7 VA / 5 W (RM-PN)
	Operating range	+/- 10% of nominal range
	Internal fuse (not replaceable)	Type T1A / 250 VDC / 227 VAC acc. to IEC 60127
	Recommended overcurrent protection device for line protection (certified under UL)	Option 230 V: 6-16 A Option 24 V: 1 - 6 A (Char. B)

Voltage measurement	3-phase 4-wire systems with rated voltages up to	277/480 V (+/- 10%)
	3-phase 3-wire systems unearthed, with rated voltages up to	IT 480 V (+/- 10%)
	Overvoltage category	300 V CAT III
	Measurement voltage surge	4 kV
	Metering range L-N	0 ¹⁾ - 300 Vrms (max. overvoltage 520 Vrms)
	Metering range L-L	0 ¹⁾ - 520 Vrms (max. overvoltage 900 Vrms)
	Measurement range exceedance L-N	U _{L-N} > 300 Vrms
	Resolution	0,01 V
	Crest factor	2,45 (related to the measurement range)
	Impedance	3 MΩ / phase
	Power consumption	ca. 0,1 VA
	Sampling rate	21,33 kHz (50 Hz), 25,6 kHz (60 Hz) for each measurm. channel
	Frequency of the fundamental oscillation	45 Hz ... 65 Hz, resolution 0,01 Hz
	¹⁾ The UMG 96RM can only determine measured values if a voltage L1-N greater than 20 Veff (4-wire measurement) or a voltage L1-L2 greater than 34 Veff (3-wire measurement) is applied at the voltage measurement input V1.	

Current measurement	Rated current	5 A
	Metering range	0-6 Arms
	Crest factor	1,98
	Resolution	0,1 mA (display 0,01 A)
	Overvoltage category	300 V CAT II
	Measurement voltage surge	2 KV
	Power consumption	ca. 0,2 VA (Ri = 5 m Ω)
	Overload for 1 sec.	120 A (sinusoidal))
	Sampling rate	21,33 kHz (50 Hz), 25,6 kHz (60 Hz) for each measurm. channel
Terminal connection capacity	Supply voltage	Connectable conductors (only one conductor can be connected per terminal!)
	Single core, multi-core, fine-stranded	0,2 - 2,5 mm ² , AWG 26-12
	Terminal pins, core end sheath	0,2 - 2,5 mm ²
	Tightening torque	0,4 - 0,5 Nm (3.54 - 4.43 lbf in)
	Stripping length	7 mm (0.2756 in)



Type overview / prices

Type	UMG 96RM	UMG 96RM-M	UMG 96RM-EL	UMG 96RM-CBM	UMG 96RM-P	UMG 96RM-PN
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 or DCP	-	-	•	-	-	•
ICMP (Ping)	-	-	•	-	-	•
Measurement data recording						
Current measurement channels	3	3	3	4	4	4 (+2)
Memory (Flash)	-	-	-	256 MB	256 MB	-
Battery	-	-	-	Type CR2032 3V, Li-Mn	Type CR2032 3V, Li-Mn	-
Clock	-	-	-	•	•	-
Digital inputs and outputs						
Digital inputs	-	-	-	4	4	3
Digital outputs (as switch or pulse output)	2	2	-	6	6	2 (+3)
Mechanical properties						
Device dimensions in mm (W x H x D)	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
Type	UMG 96RM	UMG 96RM-M	UMG 96RM-EL	UMG 96RM-CBM	UMG 96RM-P	UMG 96RM-PN
Version UH 230 V	52.22.061	52.22.069	no	52.22.066	52.22.064	52.22.090
Price	on request	on request	longer	on request	on request	on request
Version UH 24 V	52.22.070	52.22.073	available	52.22.067	52.22.065	52.22.091
Price	on request	on request		on request	on request	on request