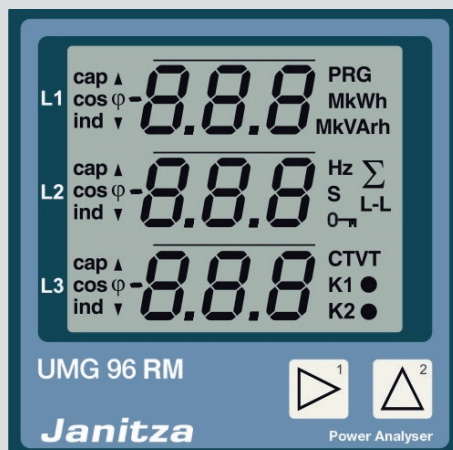




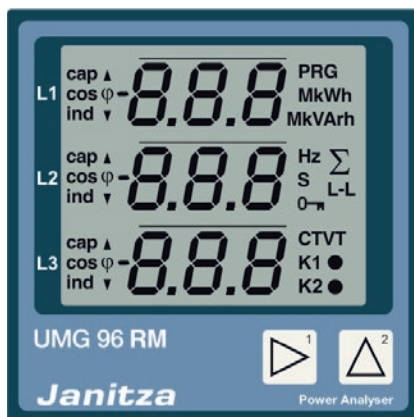
Power Analyser

UMG 96RM-E

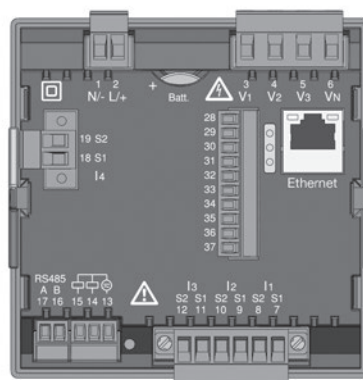
Data sheet

DEVICE VIEWS

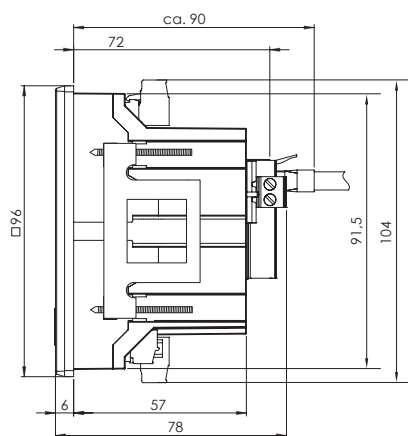
Front view



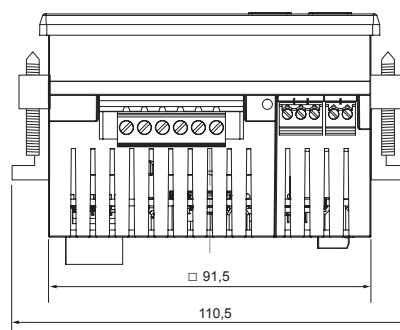
Rear view



Side view



Bottom view



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

All dimensions in mm

TECHNICAL DATA

General information	
Net weight (with attached connectors)	approx. 370g
Packaging weight (including accessories)	approx. 950g
Battery	Lithium battery CR2032, 3V (approval i.a.w. UL 1642)
Service life of background lighting	40000h (after this period of time the background lighting efficiency will reduce by approx. 50 %)

Transport and storage	
The following information applies to devices which are transported or stored in the original packaging.	
Free fall	1m
Temperature	K55 (-25°C to +70°C)
Relative humidity	0 to 90 % RH

Ambient conditions during operation	
The UMG 96RM is intended for weather-protected, stationary use. Protection class II i.a.w. IEC 60536 (VDE 0106, Part 1).	
Operating temperature range	K55 (-10°C .. +55°C)
Relative humidity	0 to 75 % RH
Operating altitude	0 .. 2000m above sea level
Degree of pollution	2
Mounting position	vertical
Ventilation	Forced ventilation is not required.
Protection against ingress of solid foreign bodies and water - Front side - Rear side - Front with seal	IP40 i.a.w. EN60529 IP20 i.a.w. EN60529 IP54 i.a.w. EN60529

Power supply voltage		
Option 230V	Nominal range	90V - 277V (50/60Hz) or DC 90V - 250V; 300V CATIII
	Power consumption	max. 7.5VA / 4W
Option 24V	Nominal range	24V - 90V AC / DC; 150V CATIII
	Power consumption	max. 7.5VA / 5W
Operating range	+-10% of nominal range	
Internal fuse, not replaceable	Typ T1A / 250V/277V according IEC 60127	
Recommended overcurrent protection device for line protection (certified under UL)		Option 230V: 6 - 16A Option 24V: 1 - 6A (Char. B)

Recommendation for a maximum number of devices on a circuit breaker:

Option 230V : Circuit breaker B6A: max. 4 devices / Circuit breaker B16A: max. 11 devices
Option 24V : Circuit breaker B6A: max. 3 devices / Circuit breaker B16A: max. 9 devices

Digital outputs

2 and 3 optional digital outputs, semiconductor relays, not short-circuit proof.

Switching voltage	max. 33V AC, 60V DC
Switching current	max. 50mAeff AC/DC
Response time	10/12 periods + 10ms *
Pulse output (energy pulse)	max. 50Hz

* Reaction time at 50 Hz, for example: 200 ms + 10 ms = 210 ms

Digital inputs

3 optional digital inputs, semiconductor relays, not short-circuit proof.

Maximum counter frequency	20Hz
Input signal present	18V .. 28V DC (typical 4mA)
Input signal not present	0 .. 5V DC, current less than 0.5mA

Temperature measurement input

2 optional inputs.

Update time	1 second
Connectable sensors	PT100, PT1000, KTY83, KTY84
Total burden (sensor + cable)	max. 4 kOhm

Sensor type	Temperature range	Resistor range	Uncertainty in measurement
KTY83	-55°C ... +175°C	500Ohm ... 2,6kOhm	± 1,5% rng
KTY84	-40°C ... +300°C	350Ohm ... 2,6kOhm	± 1,5% rng
PT100	-99°C ... +500°C	60Ohm ... 180Ohm	± 1,5% rng
PT1000	-99°C ... +500°C	600Ohm ... 1,8kOhm	± 1,5% rng

Cable length (digital inputs and outputs, temperature measurement input)

Up to 30m	Unshielded
More than 30m	Shielded

Serial interface	
RS485 - Modbus RTU/Slave	9.6kbps, 19.2kbps, 38.4kbps, 57.6 kbps, 115.2kbps
Stripping length	7mm

Measuring voltage	
Three-phase 4-conductor systems with nominal voltages up to	277V/480V (+-10%)
Three-phase 3-conductor systems, unearthed, with nominal voltages up to	IT 480V (+-10%)
Overvoltage category	300V CAT III
Measurement surge voltage	4kV
Measurement range L-N	0 ¹⁾ .. 300Vrms (max. surge voltage 520Vrms)
Measurement range L-L	0 ¹⁾ .. 520Vrms (max. surge voltage 900Vrms)
Resolution	0.01V
Crest factor	2,45 (related to the measurement range)
Impedance	3M Ω /phase
Power consumption	apporx. 0,1VA
Sampling frequency	21.33kHz (50Hz); 25.6 kHz (60Hz) per measurement channel
Frequency range of the basic oscillation - Resolution	45Hz .. 65Hz 0.01Hz

¹⁾ The UMG 96RM can only detect measurements when a voltage L1-N greater than 20Veff (4-wire measurement) at voltage input V1 or a voltage L1-L2 greater than 34Veff (3-wire measurement) is applied.

Current measurement I1 - I4	
Rated current	5A
Measurement range	0 .. 6Arms
Crest factor	1.98
Resolution	0.1mA (Display 0.01A)
Overvoltage category	300V CAT II
Measurement surge voltage	2kV
Power consumption	approx. 0.2 VA (Ri=5mOhm)
Overload for 1 sec.	120A (sinusoidal)
Sampling frequency	20kHz

Residual current measurement I5 / I6	
Rated current	30mArms
Measurement range	0 .. 40mArms
Operating current	50 μ A
Resolution	1 μ A
Crest factor	1.414 (related to 40mA)
Burden	4 Ohm
Overload for 1 sec.	5A
Sustained overload	1A
Overload for 20 ms	50A
Residual current measurement	i.a.w. IEC/TR 60755 (2008-01), Type A Type B



Ethernet connection	
Connection	RJ45
Functions	Modbus gateway, embedded web server (HTTP)
Protocols	TCP/IP, DHCP-Client (BootP), Modbus/TCP (Port 502), ICMP (Ping), NTP, Modbus RTU over Ethernet (Port 8000), FTP, SNMP

Terminal connection capacity (power supply voltage)	
Conductors to be connected. Only one conductor can be connected per terminal!	
Single core, multi-core, fine-stranded	0.2 - 2.5mm ² , AWG 26 - 12
Terminal pins, core end sheath	0.2 - 2.5mm ²
Tightening torque	0.4 - 0.5Nm
Stripping length	7mm

Terminal connection capacity (voltage and current measurement)		
Conductors to be connected. Only one conductor can be connected per terminal!		
	Current	Voltage
Single core, multi-core, fine-stranded	0.2 - 2.5mm ² , AWG 26-12	0.08 - 4.0mm ² , AWG 28-12
Terminal pins, core end sheath	0.2 - 2.5mm ²	0.2 - 2.5mm ²
Tightening torque	0.4 - 0.5Nm	0.4 - 0.5Nm
Stripping length	7mm	7mm

Terminal connection capacity (residual current or temperature measurement inputs and digital inputs / outputs)	
Rigid/flexible	0.14 - 1.5mm ² , AWG 28-16
Flexible with core end sheath without plastic sleeve	0.20 - 1.5mm ²
Flexible with core end sheath with plastic sleeve	0.20 - 1.5mm ²
Tightening torque	0.20 - 0.25Nm
Stripping length	7mm

Terminal connection capacity: serial interface	
Single core, multi-core, fine-stranded	0.20 - 1.5mm ²
Terminal pins, core end sheath	0.20 - 1.5mm ²
Tightening torque	0.20 - 0.25Nm
Stripping length	7mm

FUNCTION PERFORMANCE CHARACTERISTICS

Function	Symbol	Precision class	Measurement range	Display range
Total effective power	P	0.5 ⁵⁾ (IEC61557-12)	0 .. 5.4 kW	0 W .. 999 GW *
Total reactive power	QA, Qv	1 (IEC61557-12)	0 .. 5.4 kvar	0 varh .. 999 Gvar *
Total apparent power	SA, Sv	0.5 ⁵⁾ (IEC61557-12)	0 .. 5.4 kVA	0 VA .. 999 GVA *
Total active energy	Ea	0.5 ⁵⁾ (IEC61557-12) 0.5S ⁵⁾ (IEC62053-22)	0 .. 5.4 kWh	0 Wh .. 999 GWh *
Total reactive power	ErA, ErV	1 (IEC61557-12)	0 .. 5.4 kvarh	0 varh .. 999 Gvarh *
Total apparent energy	EapA, EapV	0.5 ⁵⁾ (IEC61557-12)	0 .. 5.4 kVAh	0 VAh .. 999 GVAh *
Frequency	f	0.05 (IEC61557-12)	45 .. 65Hz	45.00Hz .. 65.00Hz
Phase current I1 - I3	I	0.2 (IEC61557-12)	0 .. 6 Arms	0 A .. 999 kA
Measured neutral conductor current I4	IN	1 (IEC61557-12)	0 .. 6 Arms	0 A .. 999 kA
Residual currents I5, I6	IRes	1 (IEC61557-12)	0 .. 40 mArms	0 A .. 999 kA
Computed neutral conductor current	INc	1.0 (IEC61557-12)	0.03 .. 25 A	0.03 A .. 999 kA
Voltage	U L-N	0.2 (IEC61557-12)	10 .. 300 Vrms	0 V .. 999 kV
Voltage	U L-L	0.2 (IEC61557-12)	18 .. 520 Vrms	0 V .. 999 kV
Power factor	PFA, PFV	0.5 (IEC61557-12)	0.00 .. 1.00	0.00 .. 1.00
Short-term flicker, long-term flicker	Pst, Plt	-	-	-
Voltage drops (L-N)	Udip	-	-	-
Voltage increases (L-N)	Uswl	-	-	-
Transient overvoltages	Utr	-	-	-
Voltage drops	Unit	-	-	-
Voltage unbalance (L-N) ¹⁾	Unba	-	-	-
Voltage unbalance (L-N) ²⁾	Unb	-	-	-
Voltage harmonics	Uh	KI. 1 (IEC61000-4-7)	up to 2.5 kHz	0 V .. 999 kV
THD of the voltage ³⁾	THDu	1.0 (IEC61557-12)	up to 2.5 kHz	0 % .. 999 %
THD of the voltage ⁴⁾	THD-Ru	-	-	-
Current harmonics	Ih	KI. 1 (IEC61000-4-7)	up to 2.5 kHz	0 A .. 999 kA
THD of the current ³⁾	THDi	1.0 (IEC61557-12)	up to 2.5 kHz	0 % .. 999 %
THD of the current ⁴⁾	THD-Ri	-	-	-
Mains signal voltage	MSV	-	-	-

¹⁾ Referred to amplitude.

²⁾ Referred to phase and amplitude.

³⁾ Referred to mains frequency.

⁴⁾ Referred to root mean square value.

⁵⁾ Accuracy class 0.5/ 0.5S with ..5 A transformer.
Accuracy class 1 with ..1 A transformer.

* The display returns to 0 W when the maximum total energy values are reached.

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