UMG 96RM

UMG 96RM – Universal measurement instrument

The UMG 96RM is a very compact and powerful universal measurement device designed for use in low and medium voltage distribution systems.

In addition to recording a large quantity of electrical parameters, this innovative measurement instrument offers additional functions such as the measurement of harmonics up to the 40th order. Continuous sampling with 426 samples/cycle ensures high resolution for each measured value and provides an effective energy management tool for fault analysis and power quality monitoring.

There are several models within the UMG 96RM range to suit various applications from the basic model to those with 256MB memory and various communication protocols.

Areas of application

- Measuring, monitoring and checking electrical parameters in energy distribution systems
- Recording of load profiles for energy management systems (e. g. ISO50001, EN16001)
- Collection of energy consumption data for cost center analysis
- Measurement value generator for building management systems or PLC (Modbus)
- Monitoring of power quality characteristics, e.g. harmonics up to the 40th order

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UMG 96RM – Compact high performance

The compact and powerful multi-function measurement device for energy measurement.

The UMG 96RM is equipped with a powerful, innovative microprocessor. The sampling rate of all measurement channels at 426 samples/cycle enables continuous acquisition of several hundred measurement values at high resolution.

Main features

- Measurement in solidly grounded, high resistance grounded or ungrounded systems
- LCD-Display with backlight
- True RMS measurement (TRMS)
- Continuous sampling of voltage and current inputs with 426 samples/cycle
- Harmonic analysis up to the 40th order
- 7 Energy meter for L1, L2, L3 and sum
- 8 tariffs
- High measurement accuracy, effective energy class 0.5, accuracy V/I, 0.2%
- RCM (Option)
- High reliability and long lifespan
- Including extensive package of GridVis software
- up to 6 current inputs

The UMG 96RM collects electrical energy consumption, standard electrical parameters such as current, voltage, frequency, power and 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 and economical design make the UMG 96RM stand out as a very competitive offering.

Applications

The UMG 96RM is a latest generation measurement instrument from Janitza®. It is intended for measuring, recording and monitoring electrical parameters (True-RMS) in low and medium voltage systems (1 and 3-phase systems with a neutral conductor).

Among the characteristics of this measurement instrument are the compact construction (96x96 mm), LCD backlight and the measurement of harmonic currents and voltages in each conductor.

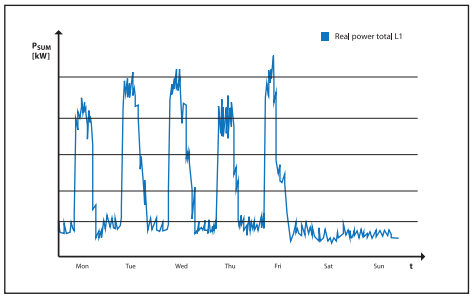
The voltage measurement inputs are designed for direct measurement in low voltage systems in which nominal voltages up to 300V to ground and surge voltages up to over-voltage Category III can occur.

System integration can be readily achieved (energy management system, PLC, SCADA, BMS) through the large choice of interfaces and protocols. The GridVis software, which is included as part of the package, provides the basis for energy management systems and power quality investigations.

Typical applications

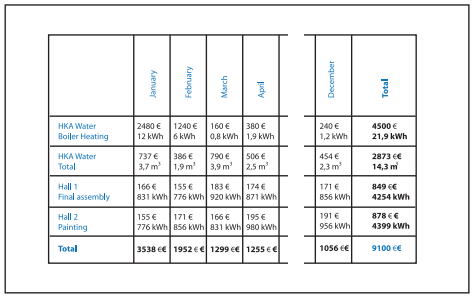
In order to achieve a sustainable reduction in energy costs, an overview of the energy consumption and the energy flow in the electrical system is first required.

The UMG 96RM range of universal measurement devices can be used to create energy management systems (ISO 50001/EN16001), cost center management or to monitor power quality, among other applications.



Energy data acquisition & load profile

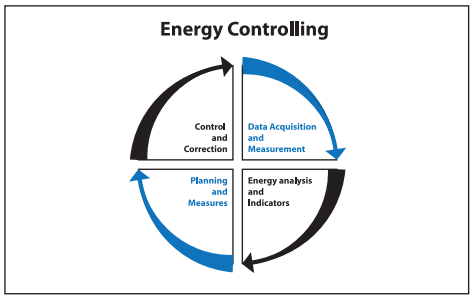
With the help of the UMG 96RM acquisition of detailed energy data and the load profile beomes a simple task. This is essential for tracking energy efficiency and to avoid overloads in the energy distribution system.



	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 €€**

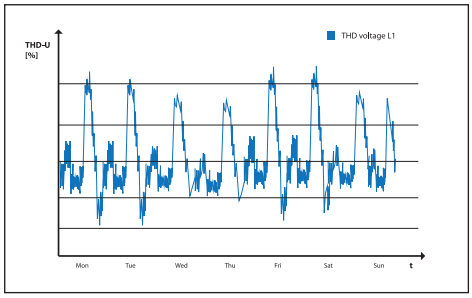
Cost center analysis

It is becoming progressively more important in industry to be able to assign energy costs to particular products. To do this it is desirable to determine energy costs for individual processes and to charge them accordingly. Cost analysis also allows employees to focus on specific cost optimization and conservation of energy.



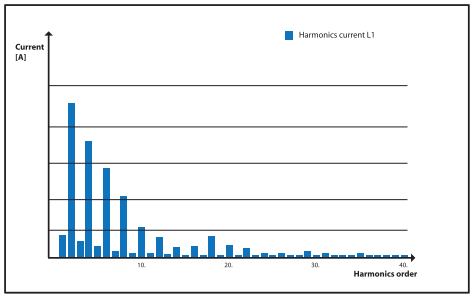
Energy management systems (ISO 50001/EN 16001)

Energy management systems per standard ISO50001/ EN16001 are essential for monitoring continuous improvements in energy efficiency and reduction of costs. The UMG 96RM range of universal measurement devices can play an important role in establishing an effective energy management system.



Transparency of energy supply

A multi-stage and scalable measurement system allows a higher degree of transparency into the energy supply history. Continuous measurement with high resolution meters is the only way that sporadic events can be analyzed and corrective solutions identified.



Power quality monitoring

The UMG 96RM gives indispensable information about inadequate power quality and enables measures to be undertaken to address recurring problems.
This can result in the prevention of production stoppages, significantly longer service life for manufacturing assets leading to improved sustainability and return on investment.

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Versions of UMG 96RM

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

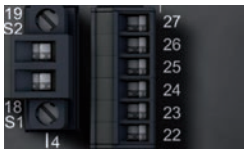
Basic device UMG96RM

The fast RS485 interface with the Modbus protocol and 2 digital outputs allows quick and cost-effective monitoring of the power quality and energy consumption.

Profibus and digital IOs UMG96RM-P

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

Temperature input and analogue output UMG96RM-E



The wide choice of inputs and outputs enables effective integration into upstream systems. The temperature input can be used to send a signal to protect against over temperature in low voltage distribution systems, the transformer or a server cabinet.

M-Bus UMG96RM-M

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

4th current transformer input UMG96RM-CBM/-E/-P

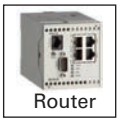
The growth of non-linear loads leads to increasing pollution effects on the electrical supply, in particular overloading of the neutral conductor by harmonic currents. The N-line can be continuously monitored via the 4th current input.

Ethernet (TCP/IP) UMG96RM-E

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

Digital IOs UMG96RM-Various

Along with network transparency Smart Grid programs are promoting the active control of energy flow and power consumption. The UMG 96RM offers a wide choice of I/O configurations for intelligent integration and control tasks.


Router


SPS

Software

Interface
- RS 485
- Profibus (Option)
- M-Bus (Option)
- Ethernet (Option)
- USB (Option)

Systems
- Solidly grounded, high resistance grounded and ungrounded systems
- 3 phase and 4 phase systems
- Up to 4 single phase circuits

4 digital inputs (Option)
- Pulse input
- Logic input
- Status monitoring
- HT/LT conversion

6 digital outputs (Option)
- Pulse output kWh/kvarhv
- Switch output
- Limit value output
- Logic output
- Remote over Modbus / Profibus

3 digital inputs-/outputs (UMG 96RM-E)
- Either inputs or outputs

2 analogue inputs (UMG 96RM-E)
- Analogue, temperature or RCM inputs

Temperature measurement input
- PT 100, PT 1000 (Option)

Memory
(Basic unit: without data memory, energy, min and max values are stored in the EPROM)
- 256 MB Flash

Power quality
- Harmonics up to 40th
- THD-V
- THD-I
- Unbalance

Communication
- Modbus (RTU)
- Profibus DP/V0 (Option)
- TCP/IP (Option)

Measurement accuracy
- Class: 0.5S (.../5A) class
- Current: 0,2 %
- Voltage: 0,2 %

Scope of operation and technical data UMG 96RM

Overview of product models

Three/four phase power analyzers; 50/60Hz; current transformer .../1/5A; including GridVis programming and analysis software														
								Interfaces						
Supply voltage 95...240 V AC, 80...340 V DC ±10% of nominal range	Digital inputs	Digital-/ pulse output	Digital inputs/ outputs (either 3 inputs or 3 outputs)	Analogue inputs Temperature/ residual current, combinable	4th current transformer input	Memory size	Clock and battery	RS 485	Profibus	M-Bus	Ethernet 100baseT	USB	Type	Item number
•	-	2	-	-	-	-	-	•	-	-	-	-	UMG 96RM	52.22.031 ‡
•	4	6	-	-	•	256 MB*	•	•	•	-	-	•	UMG 96RM-P	52.22.034 ‡
•	-	2	-	-	-	-	-	-	-	•	-	-	UMG 96RM-M	52.22.039 **
•	-	2	3	2	•	256 MB*	•	•	-	-	•	-	UMG 96RM-E	52.22.033 ‡
•	4	6	-	-	•	256 MB*	•	•	-	-	-	•	UMG 96RM-CBM	52.22.032 ‡
24-250VAC 20-300VDC	-	-	-	-	-	-	-	-	-	-	•	-	UMG 96RM-EL	52.22.056 **
Accessories														
Fastening clamps for UMG 96 RM (52.22.001), UMG 96 RM-M (52.22.003) and UMG 96RM-EL (52.22.006). Clamps for fastening the measurement instrument - with front panel thickness from 6 mm or with heavy vibrations.														52.22.251

For parameterization of the basic unit (item-no. 52.22.001) an interface converter and GridVis software is recommended.

* 192 MB available for recordings

• = Included – = Not possible ‡ Intertek ** c UL us LISTED

Features

Three wire/Four wire		yes/yes
Sampling frequency		426 samples/cycle
Energy tariffs		4 x kWh / 4xkVArh
Harmonics		1..40th
Distortion factor THD-V /THD-I in %		yes
Unbalance		yes
Clock		+/- 1 min per month
Operating hour meter		yes

Communication

Interfaces	RS 485	9.6, 19.2, 38.4, 57.6, 76.8, 115.2, 921.6 kbps	yes, but NOT Version M and EL
	Profibus DP	Plug, sub D 9-pole up to 12Mbps	yes, Version P
	M-Bus		yes, Version M
	Ethernet	RJ45-sockets	yes, Version E and EL
	USB		yes, Version P and CBM
	Webserver		yes, Version E
Protocols	Modbus RTU		yes, but NOT Version M and EL
	Profibus DP V0		yes, Version P
	Modbus TCP/IP		yes, Version E and EL
	Modbus over TCP		yes, Version E
	Modbus-Gateway		yes, Version E
	HTTP	Homepage (configurable)	yes, Version E
	SMTP	E-Mail	yes, Version E
	SNMP		yes, Version E
	SNTP	Time synchronization	yes, Version E
	TFTP	Automatic configuration	yes, Version E
	FTP	File Transfer	yes, Version E
	DHCP		yes, Version E

General technical data

Nominal voltage	3-phase 4-wire grid (L - N, L - L)	277/480 V AC
	3-phase 3-wire grid (L - L)	480 V AC
Overvoltage category		300 V CAT III
Quadrants		4
Continuous measurement		yes
Scanning rate 50/60 Hz	Per channel	426 samples/cycle
Mounting		Front panel installation
Working temperature range		4°... 131°F (-10°...55°C)
Connectable conductor (U/I)	Single wire, multi-wire, fine-wire	28 AWG-14 AWG (0.08 - 2.5 mm²)
	pin cable lugs, ferrule	16 AWG (1.5 mm²)
Protection class	According to EN 60529	IP 20 (NEMA 1)

Measurement values

Measurement parameter	Display range	Measurement range at scaling factor 1	L1	L2	L3	Sum	Lowest value	Average value	Maximum value	Measurement accuracy
Current	0 .. 9999 kA	0 .. 5 A	•	•	•		•	•	•	+-0.5 %
Current calculated in N	0,03 .. 9999 kA	0.03 .. 25 A				•	•	•	•	+-1.0 %
Voltage L-N	0 .. 9999 kV	10 .. 300 V	•	•	•		•	•	•	+-0.2 %
Voltage L-L	0,0 .. 9999 kV	18 .. 520 V	•	•	•		•	•	•	+-0.2 %
Frequency (U)	45,00 .. 65,00 Hz	45.00 .. 65.00 Hz	•							+-0.05 %
Effective power per phase	0 W .. 9999 GW	0 W .. 1.8 kW	•	•	•			•	•	+-0.5 %
Apparent power per phase	0 VA .. 9999 GVA	0 VA .. 1.8 kVA	•	•	•			•	•	+-0.5 %
Reactive power per phase	0 var .. 9999 Gvar	0 var .. 1.8 kvar	•	•	•			•	ind.	+-1.0 %
Effective power, sum	0 W .. 9999 GW	0 W .. 5.4 kW				•		•	•	+-0.5 %
Apparent power sum	0 VA .. 9999 GVA	0 VA .. 5.4 kVA				•		•	•	+-0.5 %
Reactive power, sum	0 var .. 9999 Gvar	0 var .. 5.4 kvar				•		•	ind.	+-1.0 %
cos-phi	0.00 kap. .. 1.00 .. 0.00 ind.	0.00 kap. .. 1.00 .. 0.00 ind.				•		•		+-1.0 degree
Effective energy, consumed	0 .. 999,999,999 kWh					•				Class 0.5(5A)
Reactive energy, inductive	0 .. 999,999,999 kvarh					•				Class 1(5A)
Operating hour meter	0 .. 999,999,999 h					•				+-2 min per day

Power quality

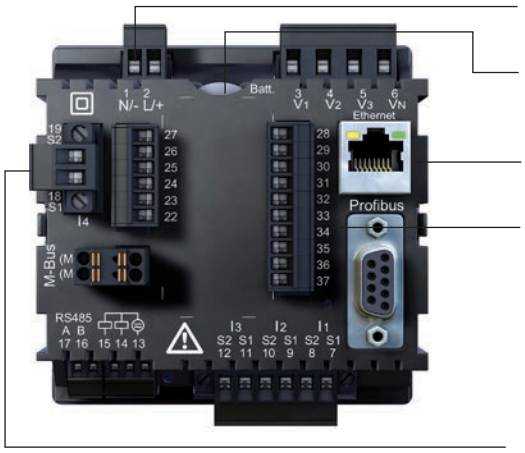
Harmonics, 1-40 harmonic	Current, voltage L1, L2, L3	Accuracy class 1
Distortion factor THD-V in %	L1, L2, L3	Accuracy class 1
Distortion factor THD-I in %	L1, L2, L3	Accuracy class 1
Recorder for threshold events		yes, for units with memory

Periphery

Digital inputs	As a status or pulse input	refer to order details
Digital outputs	As a switch or pulse output	refer to order details
Analogue outputs	4...20mA, Temp. or RCM	refer to order details
Password protection		yes
Software GridVis		**yes**

Side and rear views each show a combination of the various versions just to indicate overall dimensions and the locations of interfaces and connectors. For the specific design of an individual version, please refer to our operation manual.

Combination of the various versions



External power supply with wide voltage range.

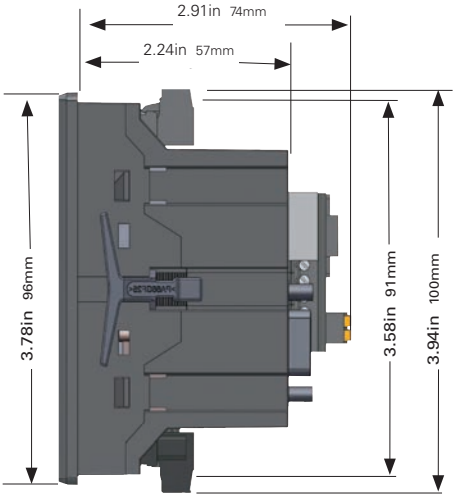
The external battery compartment enables the battery to be replaced whilst the system is running.

Ethernet connection for fast and secure integration into the network, or USB-connector for configuration.

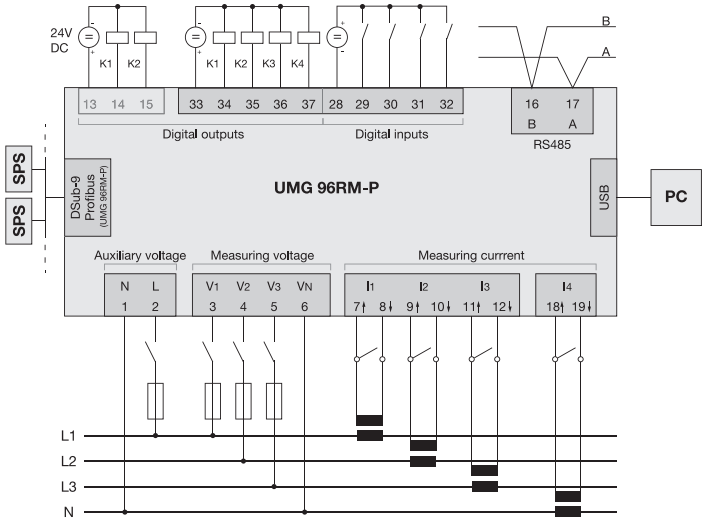
The large number of digital inputs and outputs (up to 4 x IN and 6 x OUT) enables the integration of subordinate measurement points in the same way as the UMG 96RM is integrated into upstream systems.

The 4th current transformer input enables monitoring of the N-line or a 4th single phase load.

Dimensional drawing



Typical connection option (UMG 96RM-P)



The compact design ...

...particularly for applications with tight spaces. The shallow depth allows installation even where space is limited, for example in subdistribution panels.

Panel Cut Out Dimensions

3 5/8 +/- 1/32 in x 3 5/8 +/- 1/32 in
92 +/- 0.8 mm x 92 +/- 0.8 mm

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