

Portable energy measurement devices



COMPACT – FLEXIBLE – PRECISE

Portable energy measurement devices

# COMPACT – FLEXIBLE – PRECISE

The portable energy measurement devices from Janitza

Stay flexible with the portable energy measurement devices from Janitza. Depending on the variant, the portable energy measurement devices are equipped with a UMG 96RM-E or UMG 512-PRO. This enables residual current and power quality (harmonics, short term interruptions, unbalances, etc.), for example, to be measured anywhere. The portable energy measurement devices are simple to use and integrate. They are the right choice for any application, thanks to a highly flexible measurement range from 100-4000 A.

The **MRG 512-PRO PQ Flex** measures harmonics up to the 63rd. harmonic, as well as flicker and short term interruptions. The MRG 512-PRO PQ Flex can be used for high-quality network analysis at class A level (IEC 61000-4-30), validation of

the device accuracy, for example, and much more besides. The GridVis® visualisation software GridVis®-Basic is available for free download. There are no gaps in the measurement in the event of power outages thanks to three-hour UPS buffering. The device also has PLC functionality.

The **MRG 96RM-E RCM Flex** measures harmonics up to the 40th. harmonic. Possible uses include the analysis of electrical disturbances in the event of network problems, high quality comparative measurement of energy measurement devices and meters or the acquisition of residual currents via external current transformers. The GridVis®-Basic software is also available for free here too.



## Portable energy measurement devices

### The advantages

- Flexible measurement of the power quality and the residual current
- Cost-effective, robust and compact network analysers
- Simple use and rapid integration of the measuring case
- Large measurement range of 100–4000 A through Rogowski current transformer with measurement range changeover
- Acquisition of all power quality parameters (harmonics, short term interruptions, unbalances, etc.) – depending on the model
- Remote access via Ethernet and embedded web server
- GridVis® PQ analysis software
- Standard PQ reports, depending on model: EN 50160, IEEE519, ITIC, IEC 61000-2-4
- Cost centre report
- Large 256 MB internal memory for recording measurement data
- Avoidance of measurement gaps in the event of power outages thanks to the three-hour UPS buffering (only with MRG 512-PRO PQ Flex)
- Measurement up to 63rd. harmonic (MRG 512-PRO PQ Flex)

## MRG 512-PRO PQ Flex



**Complete package – portable power quality analyser incl. accessories:**

- 1 MRG 512-PRO PQ Flex
- 4 Voltage pickoffs with fuses, black (gripping probes)
- 1 Voltage pickoff with fuse, blue (gripping probe)
- 1 Voltage measurement set (brown, black, grey, red, blue)
- 4 Rogowski coils with connection cables and plugs
- 1 Cross patch cable, CAT 5e
- 2 Connection cables with plugs for residual current monitoring, 3 m (residual current transformer not included in the scope of deliverables)

MRG 512-PRO PQ Flex

# MRG 512-PRO PQ FLEX

Portable class A power quality analyser for monitoring the power quality

**Communication**

- ModbusTCP
- TCP/IP
- BACnet (optional)
- HTTP
- FTP (file transfer)
- TFTP
- NTP (time synchronisation)
- SMTP (email function)
- DHCP
- SNMP

**Interfaces**

- Ethernet

**RCM – Residual Current Monitoring**

- 2 residual current inputs

**Power quality**

- Harmonics up to the 63rd. harmonic
- Interharmonics for U and I
- Distortion factor THD-U / THD-I / TDD
- Measurement of positive, negative and zero sequence component
- Rotary field direction detection
- Voltage crest factor
- Acquisition of short term interruptions (from 20 ms)
- Transient recorder (> 50 µs)
- Start-up currents (from 20 ms)
- Unbalance
- Flicker measurement per EN 61000-4-15
- Display of waveforms

**Buffered UPS**

- Up to 3 hrs

**PLC functionality**

- Graphical programming
- Jasic® programming language

**Networks**

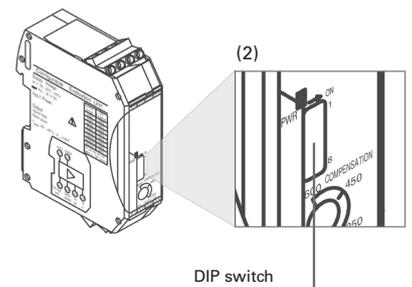
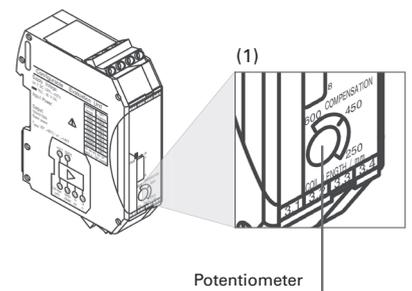
- TN, TT networks
- 3 and 4-phase networks
- Up to 4 single-phase networks

**Network visualisation software**

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

**Rogowski coil (Ø 190 mm)**

- 100 – 4,000 A
- Measurement ranges 100 A, 250 A, 400 A, 630 A, 1000 A, 1500 A, 2000 A, 4000 A



## MRG 512-PRO PQ Flex

The portable MRG 512-PRO PQ Flex power quality analyser with the integrated UMG 512-PRO class A measurement device can be used in a variety of applications. This device can be used to measure harmonics up to the 63rd. harmonic and detect short term interruptions. The device records residual currents, is buffered with a UPS for up to 3 hours and has an Ethernet interface for communication via various protocols.

### Rogowski current transformer included in the scope of supply

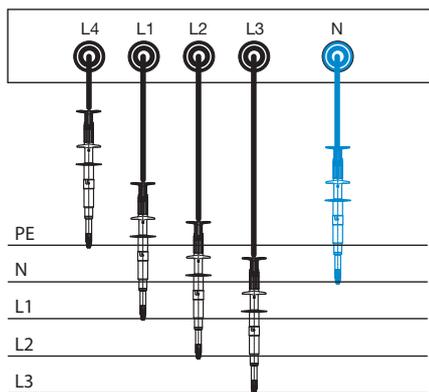
The flexible Rogowski coils offer a great advantage, particularly in

applications with large conductor cross-sections. The Rogowski current transformers are also preferable to ferrite core current transformers with regard to higher frequencies (harmonics).

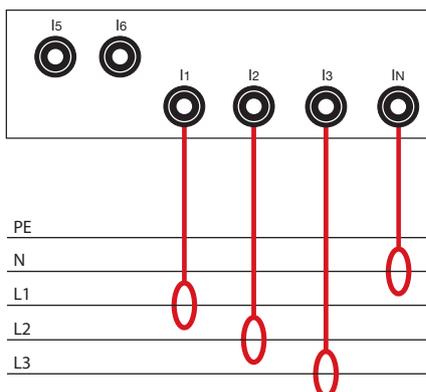
### Large measurement data memory

The large measurement data memory also enables long-term recordings, such as are required for the one-week power quality analysis per EN 50160, for example.

Example connection – voltage measurement



Example connection – current measurement



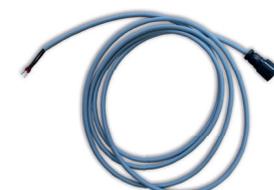
Rogowski coil



Voltage measurement terms connections



RCM measurement cable



MRG 96RM-E RCM Flex

# MRG 96RM-E RCM FLEX

Cost efficient and multifunctional network analyser  
(incl. residual current monitoring)

### Communication

- ModbusTCP
- TCP/IP
- BACnet (optional)
- HTTP
- FTP (file transfer)
- TFTP
- NTP (time synchronisation)
- SMTP (email function)
- DHCP
- SNMP

### Interfaces

- Ethernet

### RCM – Residual Current Monitoring

- 2 residual current inputs

### Power quality

- Harmonics up to the 40th harmonic
- Interharmonics for U and I
- Distortion factor THD-U / THD-I / TDD
- Measurement of positive, negative and zero sequence component
- Rotary field direction detection
- Voltage crest factor
- Recording of short term interruptions
- Start-up currents (from 20 ms)
- Unbalance

### Networks

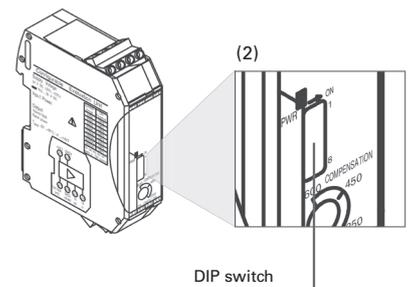
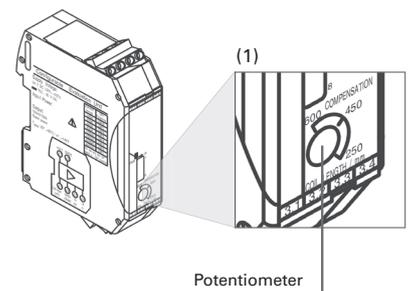
- TN, TT networks
- 3 and 4-phase networks
- Up to 4 single-phase networks

### Network visualisation software

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

### Rogowski coil (Ø 190 mm)

- 100 – 4,000 A
- Measurement ranges 100 A, 250 A, 400 A, 630 A, 1000 A, 1500 A, 2000 A, 4000 A



## MRG 96RM-E RCM Flex



**Complete package – portable energy measurement device incl. accessories:**

- 1 MRG 96RM-E RCM Flex
- 4 Voltage pickoffs with fuses, black (gripping probes)
- 1 Voltage pickoff with fuse, blue (gripping probe)
- 1 Voltage measurement set (brown, black, grey, red, blue)
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**Janitza**® Made in Germany

Meßbereich Messbereich / Volt rated voltage	230	Volt	Beginn year of manuf.	2016
Meßbereich Messbereich / Volt rated frequency	50	Hz	Identifizierungs- IDNO Seriennummer	1716/4398
Produkt- nr. / Product No.	8658-2		16-13535	CE
Serviceartikel- Seriennummer	8658-2_03			
Typ- Name	MRG 96 RM-E Flex RCM Artnr.:5216906			
	Janitza electronics GmbH - Vor dem Polstück 6 - 35633 Lahnau			

**Einstellungen / Settings**

Meßbereich	DIP-Schalter
Measuring range	DIP switch
100A	8
250A	7
400A	6
630A	5
1000A	4
1500A	3
2000A	2
4000A	1

® Spulenlänge / Coil length (mm)  
Länge der angeschlossenen Rogowskispule  
am Potentiometer einstellen!  
Adjust the length of the Rogowski coil  
at the potentiometer!

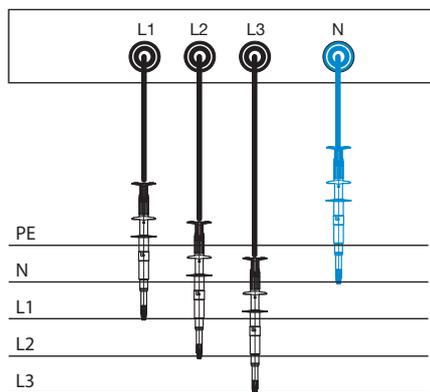
## MRG 96RM-E RCM Flex

The compact MRG 96RM-E RCM FLEX is suitable for energy audits, for recording the residual current and measuring power quality parameters – anywhere it is required! It has 256 MB memory and can save minimum and maximum values. Furthermore, it is also equipped with an Ethernet interface.

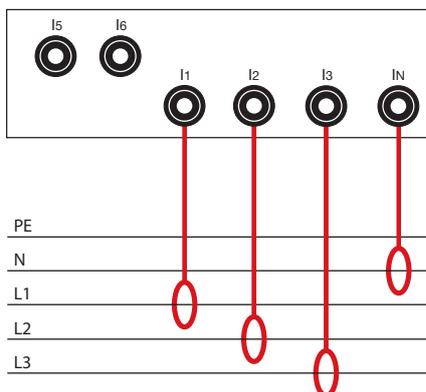
### Rogowski current transformer included in the scope of supply

The flexible Rogowski coils offer a great advantage, particularly in applications with large conductor cross-sections. The Rogowski current transformers are also preferable to ferrite core current transformers with regard to higher frequencies (harmonics).

Example connection - voltage measurement



Example connection - current measurement



Rogowski coil



Voltage measurement terms connections



RCM measurement cable



	MRG 96RM-E RCM Flex	MRG 512-PRO PQ Flex
<b>Item number</b>	<b>52.16.906</b>	<b>52.16.905</b>
<b>Interfaces</b>		
Ethernet 10/100 Base-TX (RJ-45 socket)	•	•
<b>Measurement of the power quality</b>		
Harmonics per order / current and voltage	1. – 40.	1. – 63.
Harmonics per order / active and reactive power	1. – 40.	1. – 63.
Interharmonics - current / voltage	-	•
Flicker: Short term, long term, present	-	•
<b>Measured data recording</b>		
Memory (Flash)	256 MB	256 MB
<b>Measured voltage input</b>		
Overvoltage category	300 V CAT III	600 V CAT III
<b>Displays and inputs / outputs</b>		
LCD display	LCD display with backlight, 2 buttons	Colour graphical display 320 x 240, 256 colours, 6 buttons
<b>General</b>		
Use in low and medium voltage networks	•	•
Accuracy of measurement with voltage	0.2 % <sup>*1</sup>	0.1 % <sup>*1</sup>
Accuracy of measurement with current	0.2 % <sup>*1</sup>	0.1 % <sup>*1</sup>
Accuracy of measurement with active energy (kWh, .../5 A)	Class 0.5S	Class 0.2S
Number of measurement points per period	426	512
Uninterrupted measurement	•	•
<b>RMS - momentary value</b>		
Current, voltage, frequency	•	•
Active, reactive and apparent power / total and per phase	•	•
Power factor / total and per phase	•	•
<b>Energy measurement</b>		
Active, reactive and apparent energy [L1, L2, L3, L4, $\Sigma$ L1-3, $\Sigma$ L1-4]	•	•
<b>Recording of the mean values</b>		
Voltage, current / actual and maximum	•	•
Active, reactive and apparent power / actual and maximum	•	•
Frequency / actual and maximum	•	•
Requirement calculation mode (bi-metallic function) / thermal	•	•
<b>Other measurements</b>		
Operating hours measurement	•	•
Clock	•	•
<b>Measurement of the power quality</b>		
Distortion factor THD-U in %	•	•
Distortion factor THD-I in %	•	•
Current and voltage, positive, zero and negative sequence component	•	•
Transients	-	> 39 $\mu$ s
Error / event plotter function	•	•
Short term interruptions	•	•
Oscillogram function (wave form U and I)	-	•
Under and overvoltage recording	•	•
<b>Measured data recording</b>		
Mean, minimum, maximum values	•	•
Alarm messages	•	•
Time stamp	•	•
Time basis mean value	freely user-defined	freely user-defined
RMS averaging, arithmetic	•	•

Displays and inputs / outputs	MRG 96RM-E RCM Flex	MRG 512-PRO PQ Flex
Analogue inputs (RCM, analogue)	•	•
Voltage and current inputs	L1, L2, L3 + N	every 4
Password protection	•	•

**Communication**

**Protocols**

Modbus TCP, Ethernet	•	•
HTTP (homepage configurable)	•	•
SMTP (email)	•	•
NTP (time synchronisation)	•	•
TFTP (automatic configuration)	•	•
FTP (file transfer)	•	•
SNMP	•	•
DHCP	•	•
TCP/IP	•	•
BACnet (optional)	•	•
ICMP (Ping)	•	•

**GridVis®-Basic software included in the scope of supply\*2**

**Programming / threshold values / alarm management**

Application programs freely programmable	-	7
Graphical programming	-	•
Programming via source code Jasic®	-	•
Comparator (5 Groups with 10 comparators each)	•	-

Technical data	MRG 96RM-E RCM	MRG 512-PRO PQ Flex
Nominal voltage, three-phase, 4-conductor (L-N, L-L)	277 / 480 V AC	417 / 720 V AC
Nominal voltage, three-phase, 3-conductor (L-L)	480 V AC	600 V AC
Measurement in which quadrants	4	4
Networks	TN, TT, IT	TN, TT
Measurement in single-phase/multi-phase networks	1 ph, 2 ph, 3 ph, 4 ph	1 ph, 2 ph, 3 ph, 4 ph and up to 4 times 1 ph

**Measured voltage input**

Measurement range, voltage L-N, AC (without transformer)	0 <sup>3</sup> to 300 Vrms	0 <sup>4</sup> to 600 Vrms
Measurement range, voltage L-L, AC (without transformer)	0 <sup>3</sup> to 520 Vrms	0 <sup>4</sup> to 1000 Vrms
Resolution	0.01 V	0.01 V
Impedance	4 MOhm / phase	4 MOhm / phase
Frequency measuring range	45 to 65 Hz	15 to 440 Hz
Power consumption	Approx. 0.1 VA	Approx. 0.1 VA

**Measured current input**

Rated current	1 A	1 A
Resolution	0.1 mA	0.1 mA
Metering range	0.005 - 6 Amps	0.005 - 7 Amps
Overvoltage category	300 V CAT III	300 V CAT III
Measurement surge voltage	2 kV	6 kV
Power consumption	Approx. 0.2 VA (Ri = 5 mOhm)	Approx. 0.1 VA (Ri = 5 MOhm)
Overload for 1 sec.	120 A (sinusoidal)	120 A (sinusoidal)
Sampling rate	20 kHz	25.6 kHz

**Mechanical properties**

Weight	Approx. 3.4 kg	Approx. 14.2 kg
Device dimensions in mm (L x W x H)	350 x 295 x 150	approx. 500 x 390 x 230
Protection class per EN 60529	Front: IP40; Back: IP20	Front: IP40; Back: IP20

**Security**

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

• = included  
- = not included

\*1 Accuracy of the portable energy measurement device may deviate

\*2 Optional additional functions with the packages GridVis®-Professional, GridVis®-Service and GridVis®-Ultimate.

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

\*4 The UMG 512-PRO can only determine measured values, if an L-N voltage of greater than 10 Veff or an L-L voltage of greater than 18 Veff is applied to at least one voltage measurement input.

Janitza electronics GmbH  
Vor dem Polstück 6 | 35633 Lahnau  
Germany

Phone: +49 6441 9642-0  
Fax: +49 6441 9642-30  
info@janitza.com | www.janitza.com

Sales partner

Item no.: 33.03.761 • Doc. no.: 2.500.1273 • Version 05/2018 • Subject to technical alterations.  
The current version of the brochure is available at [www.janitza.com](http://www.janitza.com)