RESIDUAL CURRENT MONITORING

More safety, more system availability, reduced risk of fire
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14 UMG 512-PRO and UMG 509-PRO
GridVis® network visualization software

Overview of residual current transformer – Compatibility list for residual current transformer

UMG 96-PA

Smart Energy Panel JPC 70

UMG 96RM-E

UMG 20CM and 20CM-CT6 module
The residual current monitoring (RCM) plays an increasingly important role for applications with a demand for highly available power supplies. With a continuous residual current monitoring, you have control over your low voltage network. Dangerous residual currents, which can lead to system faults or increase the risk of fire are detected immediately so that a production losses can be avoided.

Further information and the detailed RCM white paper can be found at: https://www.janitza.com/whitepaper-about-rcm.html

**BENEFITS OF A RESIDUAL CURRENT MONITORING**

The residual current monitoring (RCM) plays an increasingly important role for applications with a demand for highly available power supplies. With a continuous residual current monitoring, you have control over your low voltage network. Dangerous residual currents, which can lead to system faults or increase the risk of fire are detected immediately so that a production losses can be avoided.

RCM measurement devices from Janitza, such as the UMG 512-PRO / UMG 509-PRO / UMG 96RM-E / UMG 96-PA / UMG 96RM-PN, UMG 20CM, are suitable for monitoring alternating currents and pulsating direct currents according to IEC/TR 60755 (2008-01) (type A and type B), and can be used for constant review of residual currents in TN-S systems.

Application possibilities can be found in nearly all market segments, particularly when continuous processes and especially sensitive applications are involved. This is how e.g. data centers, hospitals or semiconductor factories rely on RCM monitoring. Wherever insulation resistance measurements and residual current circuit breakers cannot be implemented due to local or operating conditions, RCM measurement provides a good alternative.
Residual current monitoring

ADDED VALUE AND SAVING POTENTIALS

- Early detection and notification of residual currents by continuous monitoring
- Constant review of the intactness of TN-S systems
- Compliance with EMC and minimization of faults on grounded electrical equipment and thus an increase in the system availability
- Reduced inspection effort on stationary electrical facilities in the context of DGUV regulation 3 for electrical operational safety, IEC 60364-6:2016
- Insulation measurements on stationary electrical facilities and the related shutdown can be omitted

PREVENT SYSTEM FAILURES

- No danger to sensitive loads which could be damaged by a high test voltage
- No high personnel and administrative effort due to shutdowns and thus a reduction of costs
- Maximum alternative safety in areas in which no RCDs can be used due to operational reasons
- Early warning system for RCDs and ground fault switch
- High connectivity and retrofitting capability in new and existing systems
- Essential for TN-S systems with a demand for a high availability!

REDUCE ENERGY CONSUMPTION (ISO 50001/50006)

OPTIMIZE MAINTENANCE COSTS

IMPROVE FIRE PROTECTION

PREVENT PRODUCTION INTERRUPTIONS

MONITOR HIGHLY AVAILABLE ENERGY DISTRIBUTION BOARDS
Residual and operating current monitoring: Implementable with network analyzers 512-PRO / UMG 509-PRO / UMG 98RM-E / UMG 96-PA (with RCM module). The RCM device used should be easy to operate, automatically point out problems and simultaneously provide service technicians with a valuable tool.

THE MONITORED TN-S SYSTEM

EMC-COMPATIBLE AND HIGHLY AVAILABLE POWER SUPPLY WITHOUT FORCED SHUTDOWNS

Central ground point (CGP)

| L3 | Energy, electrical safety, power quality |
| L2 | |
| L1 | |
| N  | |

Σ = calculated neutral conductor current

Measurement of the central ground point / PE current
Total current measurement (RCM) of residual current
RESIDUAL CURRENT MONITORING

TN-S systems are mandatory for new systems. Even for older TN-C-S systems, retrofitting to TN-S systems is recommended. The functionality of TN-S systems can be permanently monitored and recorded with Janitza RCM solutions.

This requirement represents a key function for the safety and economic success of a company in many industries and application areas.

In practice, all three phases and the neutral conductor run through the summation current transformer. For systems without a neutral conductor, for example with controlled drives, only the three phases of the summation current transformer are used. When the system is in an error-free state, the total current is zero or almost zero (in the tolerable range) so that the induced current in the secondary circuit is also zero or almost zero. Conversely if, in the event of an error, a residual current flows to ground, the current difference in the secondary circuit causes a current that is detected, reported and evaluated by the RCM measurement device.

Notification before shutdown – a goal of the residual current monitoring

It is essential to detect faults that arise early on, before fuses or residual current circuit breakers (RCD) of affected systems or socket circuits shut down. The usually gradual increases in residual currents (e.g. triggered due to insulation faults and too high operating currents of system parts or consumers) must be monitored, evaluated and reported for this, before failures arise!
**Residual current monitoring**

**ALL IN ALL ENERGY & RESIDUAL CURRENT MONITORING**

- **Transformer 1**
  - The PEN must be laid insulated over its entire length.
- **Transformer 2**
  - There may always be only ONE connection between the neutral conductor (N) and the grounding system (PA) or protective conductor (PE) → CGP

**Control modules**
- UMG 512-PRO
- UMG 96RM-E

**Main supply, CGP and important hubs**
- UMG 96-PA with RCM module or UMG 96RM-E
- IT rack
- Busbar outlet boxes
- Office & lighting

**Secondary distribution**
- UMG 96RM-E supply
- Sub-distribution/busbar

**End consumer & end power circuits**
- 20CM CT6 for individual circuits 16–63 A up to 96 RCM channels

**Protective ground**
- CGP Central ground point

**Main grounding bar**

**Emergency power supply**
Residual current monitoring

OVER ALL LEVELS FROM THE SUPPLY DOWN TO THE END POWER CIRCUIT

A comprehensive RCM monitoring of the power supply occurs on all levels – from the CGP and the outlets requiring monitoring in the low-voltage main distributor and sub-distributions, up to the individual critical loads.

6-channel operating current, residual current and power quality

**UMG 509-PRO & UMG 512-PRO**
- Legally sound monitoring of the power quality according to class A (only UMG 512-PRO)
- Detection of operating and residual currents
- Ideal for mains supply
- Monitoring mode for fluctuating and constant loads

6-channel operating and residual current

**UMG 96RM-E**
- Detection of operating and residual currents
- Ideal for larger power outlets and sub-distributions
- Monitoring mode for fluctuating and constant loads

**UMG 96-PA & RCM module**
Modular retrofitting capability

Multi-channel operating and residual current monitoring

**UMG 20CM**
- Detection of operating and residual currents
- Ideal for many outlets and circuits
- Monitoring mode for constant loads
- Head unit for the 20CM-CT6

**20CM-CT6**
- Expandable up to 96 current channels
- Parallel recording of measurement values via six integrated current transformers
- Automatic switching between the RCM and operating current metering ranges

20 + 96 RCM channels = 116 channels

The strategic system software for energy data, power quality and RCM in one system
DESIGN OF A RESIDUAL CURRENT MONITORING WITH JANITZA

The Janitza network analyzers allow a modular and flexible system design over the entire power supply. All measurement devices have at least one Modbus RTU interface. Though, depending on the type, also TCP/IP, SNMP, BACnet IP, Proﬁbus, Proﬁnet via Modbus. This allows an integration without complicated diversions via proprietary protocols in already existing BMS. Comprehensive RCM diagnostic variables are available in order to implement an optimal monitoring solution.

Additionally, all devices can be managed and visualized with the GridVis® network visualization software. Automated RCM test reports facilitate the evaluation and documentation requirements.

The Smart Energy Panel JPC 70 can fully manage and display up to 200 RCM monitoring points. It is the tailored solution for a system-related status monitoring.

MAIN DISTRIBUTION AND IMPORTANT HUBS

Transformer supply
L1 L2 L3 N

GridVis® network visualization software

Ethernet (TCP/IP)

The Smart Energy Panel JPC 70 – up to 200 RCM monitoring points are handled in one display

Residual current
Operating current
Residual current monitoring

The planning can be structured into the following steps:

- Risk assessment
- Define measuring points (in case of residual currents, sources of error have to be located quickly)
- Set up distributions with a measurable design
- Clearly label CGP and test points
- Define, document and set threshold values
- Establish two self-sufficient reporting channels (notification on-site, notification in permanently manned control center)
- Test reporting channels through memorization of errors (functional test)
- Train personnel on-site (actions in the event of errors)

| Threshold value per measuring channel |
| Residual current status per channel |
| E-mail alarms |
| Comprehensive Modbus RCM diagnostic variables for higher-order systems |
| Fixed threshold value |
| Dynamic threshold value |
| Step function for threshold values |
| CT connection check per channel |
| Digital alarm outputs |

**JANITZA NETWORK ANALYZERS**

OUTLETS, SUB-DISTRIBUTIONS AND END CONSUMER

Secondary distribution supply

L1 L2 L3 N

Modbus RTU

UMG 20CM

UMG 96-PA with RCM module

UMG 20CM

UMG 2CM 1 ... 20 channels

Residual currents type A according to IEC 60755

Critical loads and single circuits
### Modular energy measurement device

**UMG 96-PA**
- **without MID**
  - 52.32.001

  - 417 / 720 V AC
  - 90 – 277 V AC; 90 – 250 V DC
  - 8.33 kHz (8,330)
  - 10 / 12
  - up to 2 kHz
  - 1st – 40th
  - 0.2% / 0.2%
  - 0.25 (.../5 A)
  - 3
  - 3°
  - Comparator
  - 4 MB
  - GridVis®-Basic

**UMG 96-PA modules**
- **96-PA-RCM-EL**
  - 52.32.010
- **96-PA-RCM**
  - 52.32.011

  - 277 / 480 V AC
  - 90 – 276 V AC; 90 – 276 V DC
  - 20 kHz (20,000)
  - 10 / 12
  - up to 3.125 kHz
  - 1st – 63rd
  - 1%; 1%
  - 1
  - 2
  - 20
  - Current treshold values per channel
  - 768 KB

**UMG 20CM**
- **14.01.625**

  - only current measurement

**20CM-CT6 module**
- **14.01.626**

  - only via UMG 20CM

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**Expansion modules for the UMG 96-PA (additional functions)**

**UMG 96-PA modules**
- **96-PA-RCM-EL**
  - 52.32.010
- **96-PA-RCM**
  - 52.32.011

**UMG 20CM**
- **14.01.625**

**20CM-CT6 module**
- **14.01.626**

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**UMG 96-PA**
- 52.32.001

**UMG 96-PA modules**
- **96-PA-RCM-EL**
  - 52.32.010
- **96-PA-RCM**
  - 52.32.011

**UMG 20CM**
- **14.01.625**

**20CM-CT6 module**
- **14.01.626**

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**Compartment UMG 20CM RCM and energy measurement device with 20 current measuring channels & 20CM-CT6 expansion module**

**Modular expansion for the UMG 20CM measurement device**
- **GridVis®-Basic**

**Modular expansion for the UMG 20CM measurement device**
- **GridVis®-Basic**

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* Combined function: Optionally analog / temperature / residual current input
*² SNMP only for internal Profinet communication
*³ UMG 20CM absolutely necessary
*⁴ With module + 1 current measuring channel
*⁵ No SNMP
*⁶ 2 pulse outputs
UMG PRO SERIES

PERMANENT OPERATING & RESIDUAL CURRENT MONITORING

Main supply, CGP and important hubs
The UMG 512-PRO and UMG 509-PRO power quality analyzers are used on important hubs of TN-S networks for monitoring the power quality and for energy data management. The Ethernet-capable devices have different IP protocols and interfaces and can be easily integrated into superordinate systems (such as PLC, SCADA solutions, etc.) via diverse communication structures.

The UMG 509-PRO network analyzer is a multi-talent for continuous monitoring of the power quality as well as for analysis of electric disturbances during network problems. The UMG 512-PRO is a class A-certified power quality analyzer according to IEC 61000-4-30. Power quality parameters, such as harmonics up to the 63rd, flicker, short term interruptions, etc., are measured according to class A.

- Class A certified according to IEC 61000-4-30 (UMG 512-PRO) and EN50160*/61000-2-4
- Network compatibility level, total residual currents and energy for a higher system availability
- Testing of the electrical Uptime
- Detection of residual currents and monitoring of the total residual currents in a TN-S system
- RCM threshold values can be optimized for each application – fixed and dynamic threshold value
- RCM diagnostic variables
- Historical data – long-term monitoring of measured values
- Dynamic CGP threshold values based on the total energy
- Alarm outputs
- Harmonics up to the 63rd

* UMG 509-PRO only in style
MODULAR ENERGY MEASUREMENT DEVICE
CERTIFIED AND TAMPER-PROOF MID MEASUREMENT

Secondary distribution
The UMG 96-PA combines four solutions in one device (4-in-1): Energy management, MID compliant energy measurement, power quality monitoring and RCM monitoring. The UMG 96-PA measures, monitors, notifies and documents. The RCM module can be quickly and easily retrofitted. Residual currents and leakage currents are detected and recorded to ground according to IEC 60755 type A and B. An additional 1/5 A power input is available for the neutral conductor monitoring. An Ethernet port simplifies the connection to superordinate systems.

- MID measurement: Tamper-proof and legally compliant recording of energy data
- Historical data – long-term monitoring of measured values
- RCM threshold values can be optimized for each application – fixed and dynamic threshold value
- Ethernet connection
- RCM diagnostic variables
- Fourth current transformer input (e.g. N-conductor)
- The UMG 96-PA module has an integrated thermistor input for thermocouples
- Two analog inputs: Optionally as 0 – 20 mA analog inputs or as RCM measuring inputs with cable break detection and additional temperature measurement
- Alarm outputs
Secondary distribution
The UMG 96RM-E has 6 current inputs (4 inputs for 1 or 5 A and 2 analog inputs 0...30 mA), wherein the 2 analog inputs can be used for temperature or residual current monitoring. It combines five functions in one compact device: Universal measurement device, energy monitoring, harmonics analysis and power quality and residual current monitoring.

A continuous monitoring of the residual currents in power distribution systems is thereby possible in addition to the normal measurement of the operating currents. A special method was implemented for the RCM measurement, in which the RCM threshold values are dynamically set according to the total power. With the dynamic threshold value creation, a customized residual current threshold value is created in all load areas and thus unnecessary error alarms are prevented. Unlike conventional RCM monitoring devices, an optimal residual current threshold value is also ensured in the low load range.

Residual currents and leakage currents are detected and recorded to ground according to IEC 60755 type A and B.
With the Smart Energy Panel JPC 70, Janitza is expanding its product portfolio with a display device for optimal presentation of the most important parameters for the power supply. Channel-related measured values of the Janitza current monitoring device UMG 20CM, such as e.g. alarms, can be presented directly on the switchgear on site. The Smart Energy Panel JPC 70 is ideally suited for front panel mounting and can be set via Ethernet per remote access. An additional advantage is the flexible configuration. Thus the USB interface enables, for example, bringing in existing configurations. The clear ‘7-inch’ touchscreen display for the Smart Energy Panel JPC 70 distinguishes itself through the easy and user-friendly menu navigation. Setting up the device is easily possible without any programming knowledge. Warning or fault messages can be displayed over multiple levels in the topology view and therefore be quickly identified. Time synchronization occurs via NTP.

- Presentation of all current and energy values
- Monitoring of up to 200 current channels
- Display and storage of the last maximum value
- Dynamic topology configuration of up to 10 devices
- Plug & Play configuration via USB: Import and export of device configurations
- Topology view of the circuits
- Labeling of the individual circuits, threshold values can be set per channel, and much more
- Visualization of the main and auxiliary measurement
- Integrated alarm management
- E-mail alarms
- Password-protected presentation
**End consumer and end power circuits**

The operating and residual current measurement device UMG 20CM with connectable current transformers is used for acquiring operating current or alternatively for RCM measurement. It is used particularly in applications with many outlets, such as in PDUs for data centers. 20 current measuring channels (inputs) are available for the connection of current transformers for acquiring operating current of 0 – 600 A and for residual current monitoring from 10 mA up to 15 A. RS485 (Modbus RTU) is implemented as a communication interface. The threshold value programming and alarm message option inform you immediately in the event of an overloading of your energy distribution system.

**BASIC DEVICE WITH 20 CURRENT MEASURING CHANNELS**

- RCM and energy measurement device in one
- 20 current measuring channels: 20 LEDs – one LED for each current channel
- Compactness of the system: Retrofitting capability in existing systems
- Analysis of the harmonic residual current proportion
- RCM diagnostic variables
- Alarm outputs
EXPANSION FOR THE RESIDUAL CURRENT MEASUREMENT DEVICE UMG 20CM

End consumer and end power circuits
The current and consumption monitoring device 20CM-CT6 is designed for use in the industrial and residential sector. It is suitable for the measurement and calculation of electric values such as operating and residual current, power, energy, harmonics etc. in the building installation, on distributors, circuit breakers and busbar trunking systems. The 20CM-CT6 is an expansion module for the residual current measurement device UMG 20CM with 20 current measuring channels. The two devices form a complete current and consumption monitoring system with display devices or devices for data coupling on third-party systems. This monitoring system increases the system and operational safety, and the energy up to the end power circuit becomes transparent. Faults or an increase of residual currents (usually creeping) are detected early on, for example, thus allowing preventative maintenance.

- Expandable to up to 96 current channels
- Parallel measurement value recording via six integrated current transformers
- Automatic switching between the metering ranges
- Frequency analysis
- High resolution: 2 mA – 63 A
- Historical memory
- Communication and power supply via internal bus, e.g. receipt of the measured voltages from the 20CM-CT6
- Parameterization via GridVis®
- RCM diagnostic variables
- Evaluation of fault currents (residual currents) type A according to IEC 62020
- Generation of warning and response messages when threshold values are exceeded
- Display of the threshold value monitoring status with 6 LEDs
NETWORK VISUALIZATION SOFTWARE

A FUNDAMENTAL COMPONENT FOR RCM MONITORING AND ANALYSIS

GridVis® RCM Report

- Meaningful statistics on exceedances of limit values for residual currents and operational interruptions
- Support for system testing and the obligation to provide verification
- Verification of a “clean” TN-S system
- Optimal for large systems with many RCM measurement points
- Support of devices with dynamic limit value monitoring or static limit values
- Status overview with signal colors for a general overview
With GridVis®, technicians and business managers are given the data necessary to:

- Receive early alerts before a failure
- Identify failures and vulnerabilities
- Evaluate uptime as a whole
- Create a basis for predictive maintenance
- Calculate key performance indicators
- Depict cost centers
- Monitor status messages

GridVis®—Convenient and versatile

- Convenient programming and parameter configuration
- Link measurement points & create dashboards
- Web-based alarm manager with escalation management
- Versatile presentations
- Automated reports and exports
- Histories and topologies
- Analysis of the effects of nonlinear loads and filter currents
- Integration of RCM systems from other manufacturers via OPC UA or Modbus
Measurement of the CGP (central grounding point)
OVERVIEW

PLUG-ON RESIDUAL CURRENT TRANSFORMER TYPE A

Detection of very small currents
- In connection with the UMG measurement devices, the residual current to
the ground of machines or systems can be determined
- Compact design
- Suitable for the UMG 96RM-E, UMG 96RM-PN, UMG 20CM,
UMG 509-PRO, UMG 512-PRO

<table>
<thead>
<tr>
<th>Type</th>
<th>Transformation ratio</th>
<th>Max. primary residual current in mA*</th>
<th>Item no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTAC RCM 35N</td>
<td>700/1</td>
<td>21000</td>
<td>15.03.458</td>
</tr>
<tr>
<td>CTAC RCM 80N</td>
<td>700/1</td>
<td>21000</td>
<td>15.03.459</td>
</tr>
<tr>
<td>CTAC RCM 110N</td>
<td>700/1</td>
<td>21000</td>
<td>15.03.463</td>
</tr>
<tr>
<td>CTAC RCM 140N</td>
<td>700/1</td>
<td>21000</td>
<td>15.03.460</td>
</tr>
<tr>
<td>CTAC RCM 210N</td>
<td>700/1</td>
<td>21000</td>
<td>15.03.464</td>
</tr>
</tbody>
</table>

* When using the analog inputs of the UMG 96RM-E, UMG 96RM-PN, UMG 509-PRO and UMG 512-PRO

Note:
If the residual current transformers of series CTAC are used in connection with the UMG
20CM, the metering range of the UMG 20CM can be raised from 900 mA or 1 A to 14 A or
15 A through interposition of the loads, item no. 15.03.086.

SPLIT CORE RESIDUAL CURRENT TRANSFORMER

TYPE A

Safe to handle and compact
- Easy and cost-effective assembly
- Practical locking system: Separation and disconnection
  of the primary conductor omitted
- Available in various dimensions
- No operational interruption
- Suitable for the UMG 96RM-E, UMG 96RM-PN, UMG 20CM,
UMG 509-PRO, UMG 512-PRO

<table>
<thead>
<tr>
<th>Type</th>
<th>Transformation ratio</th>
<th>Max. primary residual current in mA*</th>
<th>Weight (kg)</th>
<th>Item no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>KBU 23D*2</td>
<td>600/1</td>
<td>18000</td>
<td>0.7</td>
<td>15.03.400</td>
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<tr>
<td>KBU 58D*2</td>
<td>600/1</td>
<td>18000</td>
<td>1.1</td>
<td>15.03.401</td>
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<tr>
<td>KBU 812D*2</td>
<td>600/1</td>
<td>18000</td>
<td>1.5</td>
<td>15.03.402</td>
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</table>

<table>
<thead>
<tr>
<th>Accessories</th>
<th></th>
<th></th>
<th></th>
<th>Item no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burden (3.9 Ω) with 1.5 m connection cable and spring terminal</td>
<td></td>
<td></td>
<td>15.03.086</td>
<td></td>
</tr>
</tbody>
</table>

*2 When using the analog inputs of the UMG 96RM-E, UMG 96RM-PN, UMG 509-PRO and UMG 512-PRO
*2 If the residual current transformers of series KBU are used in connection with the UMG 20CM, the metering range of the UMG 20CM can be raised from 900 mA or 1 A to 14 A or 15 A through interposition of the loads, item no. 15.03.086.
SPLIT CORE RESIDUAL CURRENT TRANSFORMER TYPE A

Safe to handle and retrofittable
- In connection with the UMG measurement devices, the residual current to the ground of machines or systems (e.g. insulation fault) can be determined
- Compact design
- Detection of very small currents
- Suitable for the UMG 96RM-E, UMG 96RM-PN, UMG 20CM, UMG 509-PRO, UMG 512-PRO

<table>
<thead>
<tr>
<th>Type</th>
<th>Transformation ratio</th>
<th>Max. primary residual current in mA*</th>
<th>Item no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT-AC RCM A110N</td>
<td>700/1</td>
<td>21000</td>
<td>15.03.462</td>
</tr>
<tr>
<td>CT-AC RCM A150N</td>
<td>700/1</td>
<td>21000</td>
<td>15.03.465</td>
</tr>
<tr>
<td>CT-AC RCM A310N</td>
<td>700/1</td>
<td>21000</td>
<td>15.03.461</td>
</tr>
</tbody>
</table>

* When using the analog inputs of the UMG 96RM-E, UMG 96RM-PN, UMG 509-PRO and UMG 512-PRO

Note:
If the residual current transformers of series CT-AC are used in connection with the UMG 20CM, the metering range of the UMG 20CM can be raised from 900 mA or 1 A to 14 A or 15 A by connecting a burden, item no. 15.03.086.

RESIDUAL CURRENT TRANSFORMER TYPE B+

Always alert - intelligent transformer
- Detection of residual currents of the type B+ (up to 300 mA)
- Pre-alarm in the event of errors
- Standard interface 4–20 mA
- Permanent monitoring of residual currents
- 24 V DC supply voltage
- Compact, robust plastic housing
- Reduction of DGUV V3 (replacement for insulation measurement in fixed electrical systems)
- Easy implementation of fire and system protection
- Decentralized, direct shutdown of system parts
- Suitable for the UMG 96RM-E

<table>
<thead>
<tr>
<th>Type</th>
<th>DC supply voltage</th>
<th>Max. primary residual current in mA</th>
<th>Internal consumption</th>
<th>Item no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT-AC/DC type B+ 35 RCM</td>
<td>24 V (21.6 … 26.4 V)</td>
<td>0.3 A</td>
<td>max. 1.5 W</td>
<td>15.03.469</td>
</tr>
<tr>
<td>CT-AC/DC type B+ 70 RCM</td>
<td>24 V (21.6 … 26.4 V)</td>
<td>0.3 A</td>
<td>max. 1.5 W</td>
<td>15.03.468</td>
</tr>
</tbody>
</table>

Accessories
1-phase switch power pack in the installation housing
prim. 115 – 230 V 50/60 Hz, sec. 24 V DC, 1 A
Dimensions in mm (H x W x D): 90.5 x 52 x 62.5; weight: ca. 169 g

16.05.002
OPERATING OR RESIDUAL CURRENT TRANSFORMER, TYPE A

Precise and efficient
- Can be used for operating currents up to max. 63 A and for residual currents of 1 mA to 1000 mA according to type A
- Compact design
- Ratio 700/1
- Primary window applicable for Ø 7.5 mm (max.) insulated cable
- For use on a 3-phase disconnector with a phase distance of 17.5 mm
- DIN top hat rail assembly (35 mm) via rail clamps (optional)
- Custom-made device for the UMG 20CM
- Suitable for the UMG 96RM-E, UMG 96RM-PN, UMG 20CM, UMG 509-PRO, UMG 512-PRO

<table>
<thead>
<tr>
<th>Item no.</th>
<th>Type</th>
<th>Max. operating current in A</th>
<th>Residual current in mA</th>
<th>Transformation ratio</th>
<th>Max. diameter of primary conductor in mm</th>
<th>Class</th>
<th>Dimensions in mm (H x W x D)</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.03.082</td>
<td>CT-20</td>
<td>63 (with load*)</td>
<td>10 ... 1000</td>
<td>700/1</td>
<td>7.5</td>
<td>1</td>
<td>approx. 46 x 27 x 23</td>
<td>0.05</td>
</tr>
</tbody>
</table>

Accessories
- Snap-on mounting: For DIN rail EN 50022-35, suitable for type CT-20

<table>
<thead>
<tr>
<th>Item no.</th>
<th>Accessories</th>
<th>Dimensions in mm (H x W x D)</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>09.09.010</td>
<td>Snap-on mounting</td>
<td>approx. 14 x 41 x 27</td>
<td>approx. 0.1</td>
</tr>
<tr>
<td>15.03.085</td>
<td>Pre-assembled connection cable*</td>
<td>1.5 m with burden (0.8 Ω) and spring terminal for operating current measurement</td>
<td></td>
</tr>
</tbody>
</table>

* Not included in the scope of delivery

SPLIT CORE TRANSFORMER FOR RESIDUAL CURRENT, TYPE A

Microfine and highly precise
- Compact, split core transformer
- Suitable for residual current monitoring (10 ... 1000 mA)
- High accuracy of measurement
- Easy installation by means of clip technology
- UL and EN 61010-1 certified
- Especially for use with the UMG 20CM
- Suitable for the UMG 96RM-E, UMG 96RM-PN, UMG 20CM, UMG 509-PRO, UMG 512-PRO

<table>
<thead>
<tr>
<th>Item no.</th>
<th>Type</th>
<th>Residual current in mA</th>
<th>Transformation ratio</th>
<th>Max. diameter of primary conductor in mm</th>
<th>Class</th>
<th>Accuracy (%)</th>
<th>Dimensions in mm (H x W x D)</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.03.084</td>
<td>SC-CT-21</td>
<td>10 ... 1000</td>
<td>700/1</td>
<td>8</td>
<td>1</td>
<td>1</td>
<td>approx. 35 x 35 x 16</td>
<td>0.06</td>
</tr>
</tbody>
</table>
Residual current transformer

6-FOLD DIN RAIL CURRENT TRANSFORMER, OPERATING OR RESIDUAL CURRENT, TYPE A

Monitor, detect and take action
- Residual current detection with integrated current transformer (residual currents according to IEC 60755 type A)
- 6 measuring channels
- Compact construction
- Parallel measurement value recording and processing
- Use in distribution outlets for consumers and systems
- Tailored device for the UMG 20CM

<table>
<thead>
<tr>
<th>Type</th>
<th>Operating mode*</th>
<th>Operating current with load in A</th>
<th>Residual current in mA</th>
<th>Number of measuring channels**</th>
<th>Transformation ratio</th>
<th>Measurement accuracy</th>
<th>Inner diameter Transformer in mm</th>
<th>Dimensions in mm (H x W x D)</th>
<th>Weight (kg)</th>
<th>Item no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT-6-20</td>
<td>Residual or operating currents</td>
<td>0 ... 63</td>
<td>10 ... 1000</td>
<td>6</td>
<td>700/1</td>
<td>1</td>
<td>11</td>
<td>56 x 174 x 45</td>
<td>0.30</td>
<td>14.01.630</td>
</tr>
</tbody>
</table>

** Accessory
- Pre-assembled connection cable 1.5 m, twisted, shielded with plug 08.02.440

*1 Optionally preconfigurable via Dip switch.  
*2 Measurement transformer integrated.
# Residual current monitoring

## COMPATIBILITY LIST FOR RESIDUAL CURRENT TRANSFORMERS

<table>
<thead>
<tr>
<th>RCM transformer types</th>
<th>Inner window</th>
<th>Separable</th>
<th>Residual current type</th>
<th>Transformer ratio</th>
<th>Primary current with evaluation unit</th>
<th>Primary current with evaluation unit</th>
<th>Compatibility of evaluation unit¹</th>
<th>Compatibility²</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT-AC RCM 35N</td>
<td>35 mm round</td>
<td>No</td>
<td>Type A</td>
<td>700/1</td>
<td>1000 mA without load, 15000 with load</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>CT-AC RCM 80N</td>
<td>80 mm round</td>
<td>No</td>
<td>Type A</td>
<td>700/1</td>
<td>1000 mA without load, 15000 with load</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>CT-AC RCM 110N</td>
<td>110 mm round</td>
<td>No</td>
<td>Type A</td>
<td>700/1</td>
<td>1000 mA without load, 15000 with load</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>CT-AC RCM 140N</td>
<td>140 mm round</td>
<td>No</td>
<td>Type A</td>
<td>700/1</td>
<td>1000 mA without load, 15000 with load</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>CT-AC RCM 210N</td>
<td>210 mm round</td>
<td>No</td>
<td>Type A</td>
<td>700/1</td>
<td>1000 mA without load, 15000 with load</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>CT-20</td>
<td>75 mm round</td>
<td>No</td>
<td>Type A</td>
<td>700/1</td>
<td>1000 mA without load, 15000 with load</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>SC-CT21</td>
<td>8.5 mm round</td>
<td>Yes</td>
<td>Type A</td>
<td>700/1</td>
<td>1000 mA without load, 15000 with load</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>CT-AC RCM A110N</td>
<td>110 mm round</td>
<td>Yes</td>
<td>Type A</td>
<td>700/1</td>
<td>1000 mA without load, 15000 with load</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>CT-AC RCM A150N</td>
<td>150 mm round</td>
<td>Yes</td>
<td>Type A</td>
<td>700/1</td>
<td>1000 mA without load, 15000 with load</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>CT-AC RCM A310N</td>
<td>310 mm round</td>
<td>Yes</td>
<td>Type A</td>
<td>700/1</td>
<td>1000 mA without load, 15000 with load</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>KBU 23D</td>
<td>20 x 30 mm</td>
<td>Yes</td>
<td>Type A</td>
<td>600/1</td>
<td>18000 mA without load, 15000 with load</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>KBU 58D</td>
<td>50 x 80 mm</td>
<td>Yes</td>
<td>Type A</td>
<td>600/1</td>
<td>18000 mA without load, 15000 with load</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>KBU 812D</td>
<td>80 x 120 mm</td>
<td>Yes</td>
<td>Type A</td>
<td>600/1</td>
<td>18000 mA without load, 15000 with load</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>CT-AC/DC type B+ 35 RCM</td>
<td>35 mm round</td>
<td>No</td>
<td>Type B+ (AC and DC)</td>
<td>4-20 mA (300 mA/5 A)</td>
<td>300 mA</td>
<td>not compatible</td>
<td>Only UMG 96RM-E UMG 96-PA</td>
<td>No</td>
</tr>
<tr>
<td>CT-AC/DC type B+ 70 RCM</td>
<td>70 mm round</td>
<td>No</td>
<td>Type B+ (AC and DC)</td>
<td>4-20 mA (300 mA/5 A)</td>
<td>300 mA</td>
<td>not compatible</td>
<td>Only UMG 96RM-E UMG 96-PA</td>
<td>No</td>
</tr>
</tbody>
</table>

¹ UMG 96RM-E, UMG 509-PRO, UMG 512-PRO, UMG 96-PN, UMG 96-PA (module required)
² UMG 20CM

Further information and the detailed RCM white paper can be found at: https://www.janitza.com/whitepaper-about-rcm.html