Power & Signal Quality TRABTECH

Monitoring

Residual current monitoring and testing of arresters

PHOENIX CONTACT
INSPIRING INNOVATIONS

Interference-free power supply and signal transmission

Permanent power supply and a safe data link are essential for the operational reliability of electrical systems, installations and devices.

Phoenix Contact meets these requirements with the comprehensive TRABTECH product range. Specific solutions from surge protection, monitoring, UPS as well as EMC products offer a constant high power and signal quality for maximum availability.

Surge protection

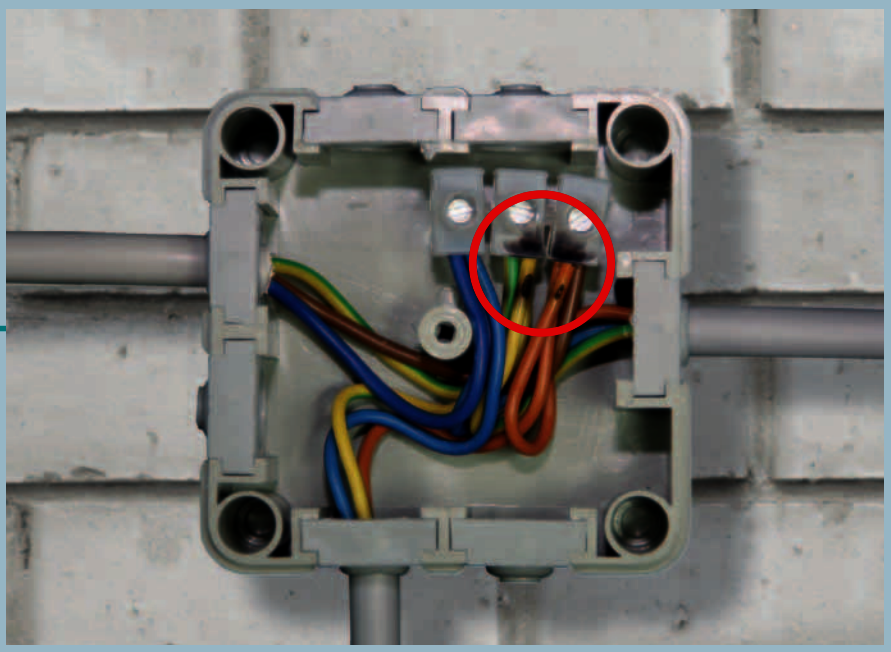
Monitoring

Uninterruptible power supply

EMC solutions

Services

System monitoring and arrester testing with early error detection

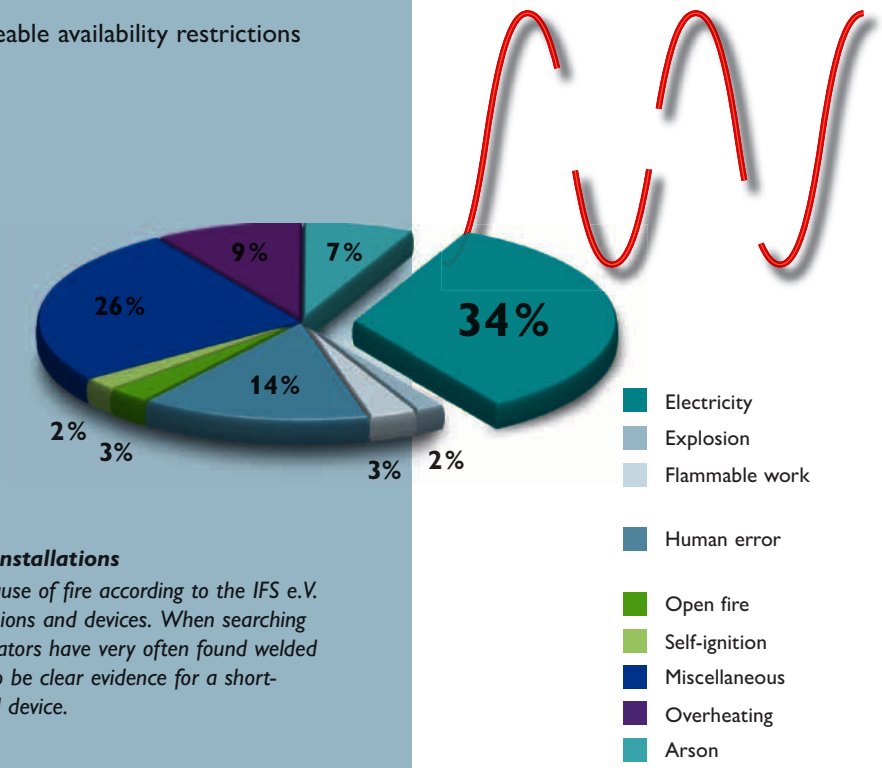


Danger identified – danger eliminated

Unexpected mandatory shutdowns of devices or systems could be avoided in many cases. The cause is often pre-damage which can develop into serious faults or even an acute risk of fire. Constant system monitoring and device tests at regular intervals help prevent unwanted operational interruptions. This also increases system availability.

The monitoring devices identify and report foreseeable availability restrictions in good time.

- Products for differential current monitoring
- CHECKMASTER arrester test system



On-site electrical installations

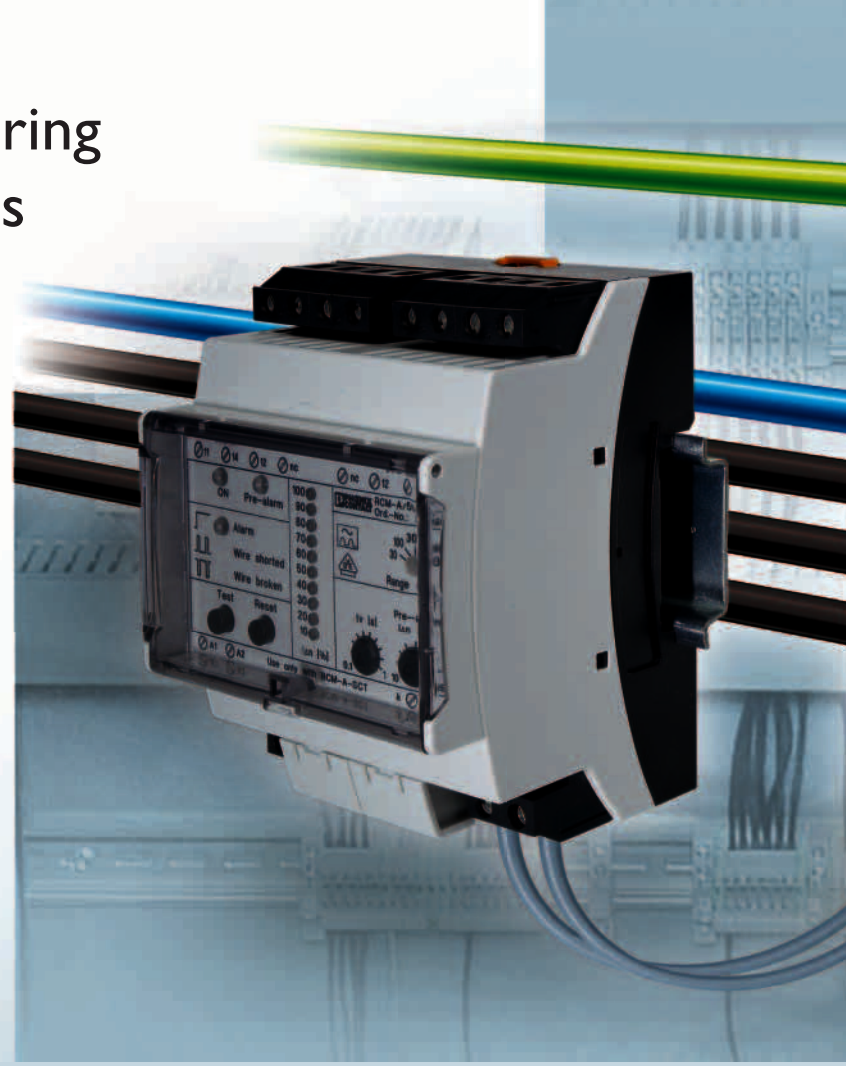
The most frequent cause of fire according to the IFS e.V. are electrical installations and devices. When searching for clues, fire investigators have very often found welded wires which proved to be clear evidence for a short-circuit in an electrical device.

Source: Institut für Schadenverhütung und Schadenforschung der öffentlichen Versicherer e.V. (IFS), 2009
(German institute for prevention and research of damage)

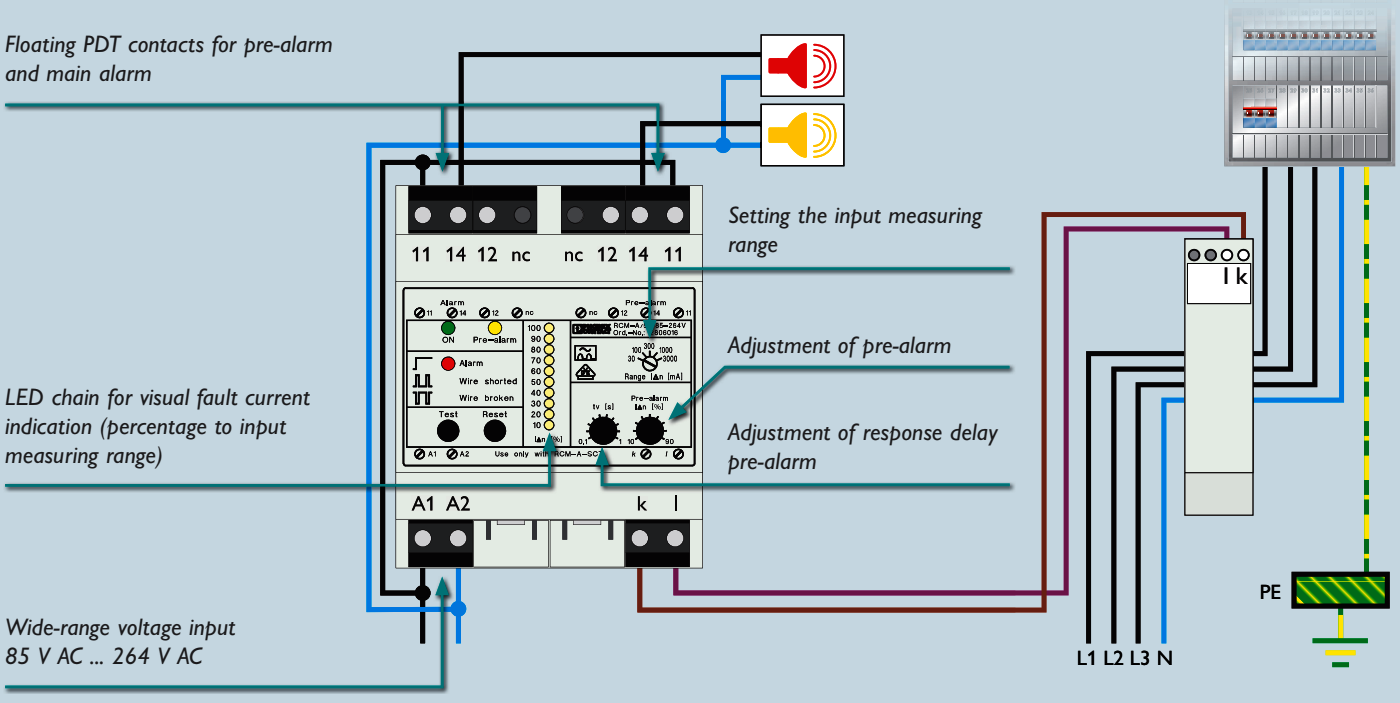
Table of contents

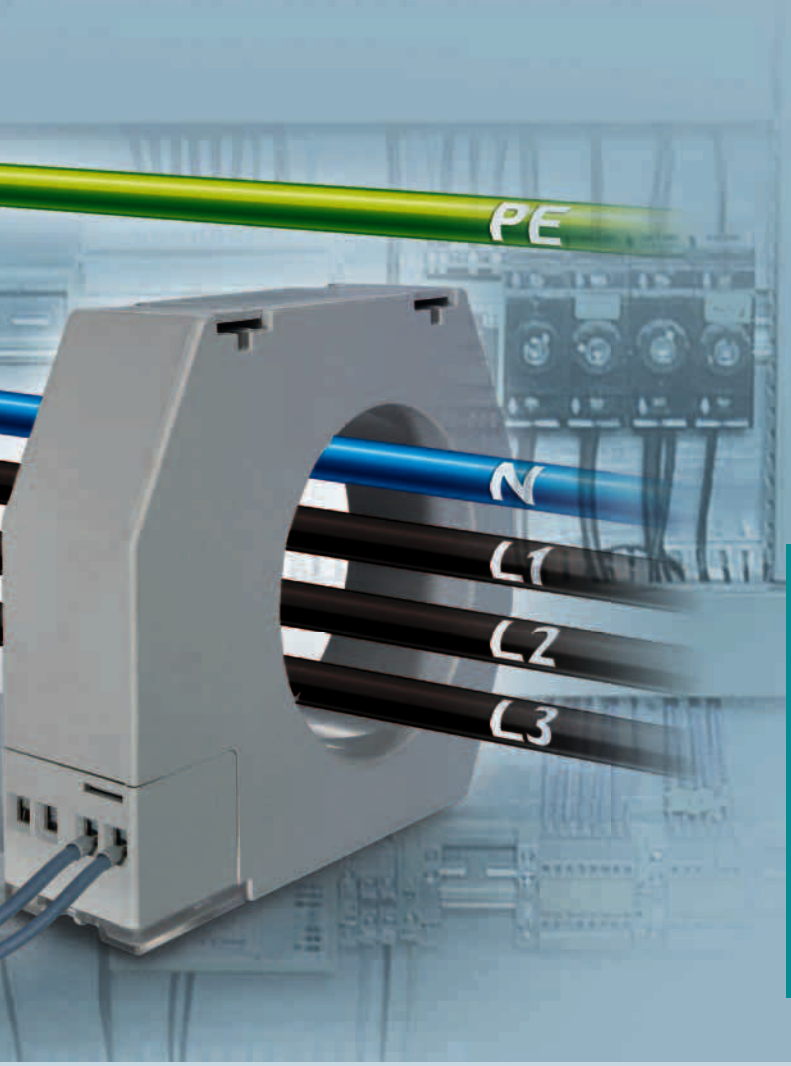
Residual current monitoring for electrical installations

The RCM devices serve for residual current monitoring in grounded power supply systems. They detect fault currents in time which are the result of insulation errors. This helps to prevent the threat of forced system shutdowns, as troubleshooting can be planned outside operating hours. RCM devices are also considered to be preventive measures.



Functional principle of the RCM devices



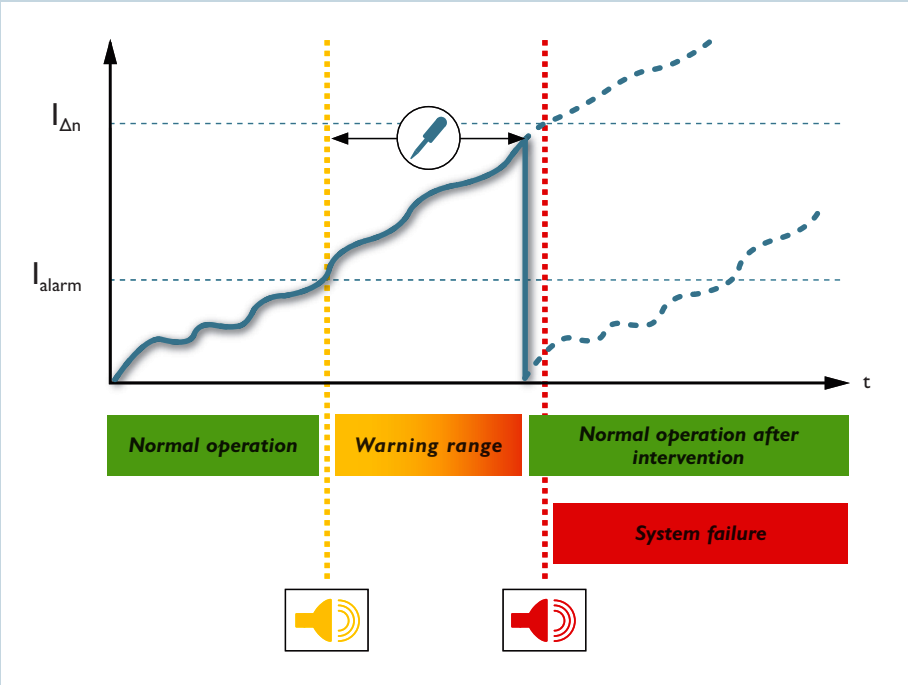


Equipped for the future:
Differential fault currents up to 100 kHz

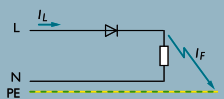
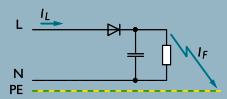
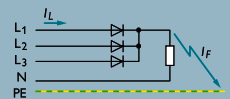
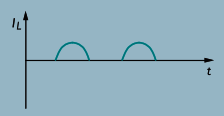
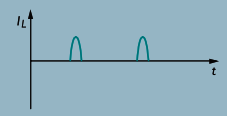
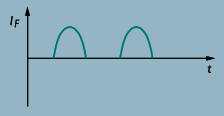
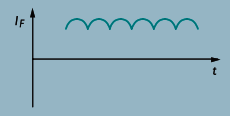
Operating equipment such as frequency converters are increasingly used and they can generate residual currents with a frequency of up to 50 kHz in the case of an error. Today, the RCM devices from Phoenix Contact can already record residual currents of up to 100 kHz. This exceeds the currently applicable 20 kHz requirement for type B+ devices.

Monitoring – Detecting – Handling

Residual currents can constantly increase due to gradual processes. The cause can be penetrating humidity or conductive contamination on live parts. Residual current circuit breakers are triggered at different rated residual currents $I_{\Delta n}$ depending on the type. Additionally installed residual current monitoring devices prevent sudden system downtimes by means of early warnings. Constant information about the gradually increasing residual currents enable intervention in time. Unwanted system failures are efficiently prevented.



Residual current monitoring – Selection guide

	Single-phase	Single-phase with smoothing	Three-phase star circuit
Circuit			
Intended load current			
Fault current against ground potential			
Solution	**TYPE A**	–	–
	TYPE B	**TYPE B**	**TYPE B**

Evaluation unit RCM type A

RCM-A/50/85-264V
Order No. 2806016
RCM Type A

- Nominal voltage range: 85 V AC ... 264 V AC
- Nominal frequency f_N: 50 Hz (60 Hz)
- Required max. back-up fuse: 16 A (B)
- Rated response differential current $I_{\Delta n}$: 3 A
- Response differential current $I_{\Delta n}$: 30, 100, 300, 1000, 3000 mA (adjustable)
- Main alarm response threshold: 80% ... 100% (of the set response differential current $I_{\Delta n}$)
- Pre-alarm response threshold: 10% ... 90% (of the main alarm threshold adjustable)
- Response time at 2 x $I_{\Delta n}$: 0.1 s ... 1 s (adjustable)

Converter for RCM type A

RCM-A-SCT-20 (50 A*)
Order No. 2806045

RCM-A-SCT-30 (100 A*)
Order No. 2806058

RCM-A-SCT-35 (125 A*)
Order No. 2806061

RCM-A-SCT-70 (200 A*)
Order No. 2806074

RCM-A-SCT-105 (250 A*)
Order No. 2806087

RCM-A-SCT-140 (350 A*)
Order No. 2806090

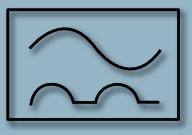
RCM-A-SCT-210 (400 A*)
Order No. 2806100

Note:
Slightly different design depending on the type (example: RCM-A-SCT-70)

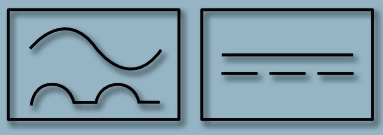
- Rated response differential current $I_{\Delta n}$: 3 A
- Differential current recording characteristic: Type A (50/60 Hz)
- Response differential current $I_{\Delta n}$: 0.03 A ... 3 A

* Rated current I_n

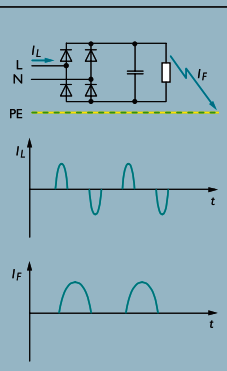
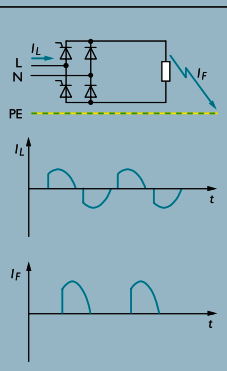
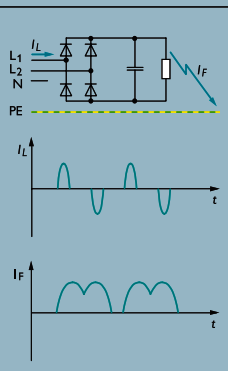
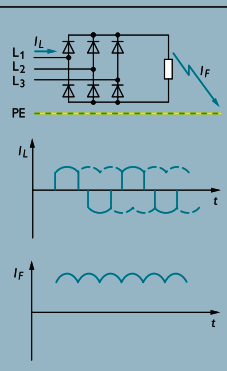
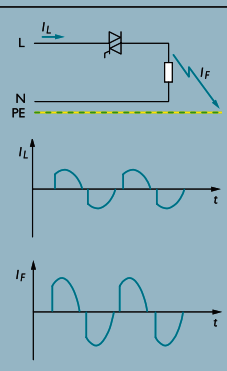
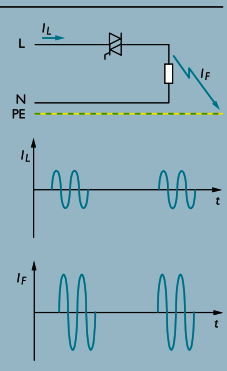
Selection of RCM devices as per the expected fault currents



Type A detected:
- *AC fault currents*
- *Pulsating DC fault currents*



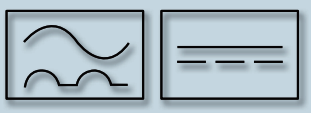
Type B (all-current-sensitive) detected:
- *Pure DC fault currents*
- *AC fault currents*
- *Pulsating DC fault currents*

Full bridge circuit	Full bridge circuit semi-controlled	Full bridge circuit between outer conductors	Current full bridge circuit	Phase-controlled modulator	Burst control
					
TYPE A	**TYPE A**	**–**	**–**	**TYPE A**	**TYPE A**
TYPE B	**TYPE B**	**TYPE B**	**TYPE B**	**TYPE B**	**TYPE B**

Source: As per IEC 60755:2008

Evaluation unit RCM type B

RCM-B/50/85-264V
Order No. 2806210
RCM Type B



- Nominal voltage range: 85 V AC ... 264 V AC
- Nominal frequency f_N: 50 Hz (60 Hz)
- Required max. back-up fuse: 16 A (B)
- Rated response differential current $I_{\Delta n}$: 3 A
- Response differential current $I_{\Delta n}$: 30, 100, 300, 1000, 3000 mA (adjustable)
- Main alarm response threshold: 80% ... 100% (of the set response differential current $I_{\Delta n}$)
- Pre-alarm response threshold: 10% ... 90% (of the main alarm threshold adjustable)
- Response time at 2 x $I_{\Delta n}$: 0.1 s ... 1 s (adjustable)

Converter for RCM type B

RCM-B-SCT-35 (125 A*)
Order No. 2806223

RCM-B-SCT-70 (200 A*)
Order No. 2806236

RCM-B-SCT-105 (300 A*)
Order No. 2806249

RCM-B-SCT-140 (630 A*)
Order No. 2806252

Note:
Slightly different design depending on the type (example: RCM-B-SCT-70)

- Rated response differential current $I_{\Delta n}$: 3 A
- Differential current recording characteristic: Type B (DC up to 100 kHz)
- Response differential current $I_{\Delta n}$: 0.03 A ... 3 A

* Rated current I_n

CHECKMASTER –
The arrester testing system

Lightning protection systems must be tested as per the IEC 62305-3 requirements and official specifications. Simply a visual check is not sufficient here in order to detect pre-damaged surge protection devices. Only an electrical check using the CHECKMASTER produces convincing results. It checks all relevant components of an arrester. The nominal data of the protective elements such as spark gaps, varistors, gas discharge arresters and suppressor diodes are tested in only one test cycle.

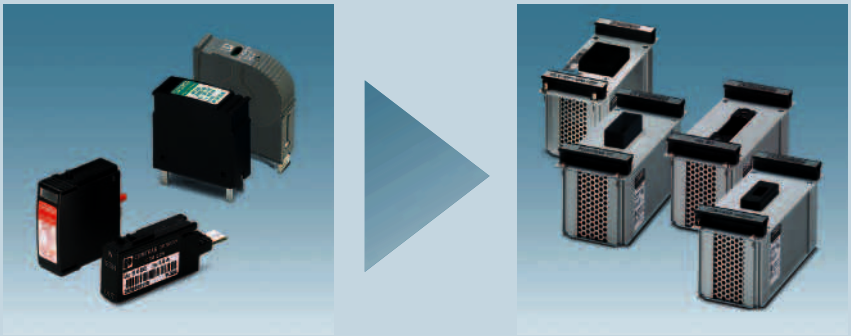
CHECKMASTER has an important plus point when it comes to safety for all fields with high system availability requirements.

Testing pluggable arresters in four easy and reliable steps

1. Easy selection

The CHECKMASTER is modular in design. Take your surge protection devices to decide which test socket * you need.

Further details on selecting the necessary test sockets can be found on the next page.



2. Convenient scanning

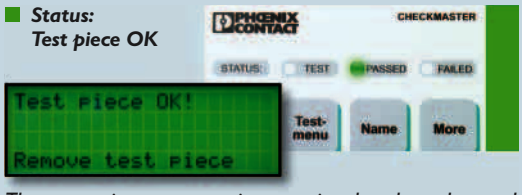
The barcodes on the surge protection devices provide you with a fast and accurate option to enter an item.

System-specific abbreviations or user-defined IDs can be entered on the operator panel or also imported from individually generated barcode labels.

3. Safe testing

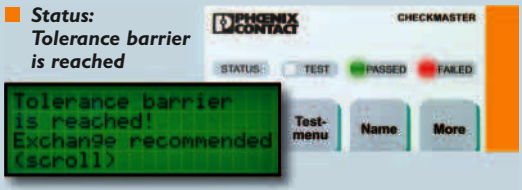
After the test has been started, an automatic test process runs which tests the specific electrical characteristics of the arresters. The results are displayed via the display as well as using two signal lamps.

Status:
Test piece OK



The protective connector is operational and can be used further.

Status:
Tolerance barrier is reached



The protective connector is pre-damaged – an exchange is recommended.

Status:
Defect

The protective connector is defect and must be exchanged.

4. Fast logging

Tests should be documented as per IEC 62305-3. In addition to immediate processing of all test values, the CHECKMASTER also allows you to export the internal memory content directly into an Excel table.

* Other test sockets on request

CHECKMASTER – Selection guide

The CHECKMASTER uses an electrical test procedure to check all obstructed protective elements such as spark gaps, gas discharge arresters, varistors and suppressor diodes in the arrester connectors.

Test sockets and accessories ensure a long service life for the system.

CHECKMASTER
Order No. 2838924
Mobile test laboratory for protective circuits of pluggable surge protection devices.

Test sockets* – flexible and expandable compatibility

CM-PA-FLT/VAL-CP
Order No. 2880392
Test socket for:
• FLASHTRAB compact
• VALVETRAB compact

CM-PA-PT
Order No. 2882844
Test socket for:
• PLUGTRAB PT

(Standard assembly – included in the scope of supply of the CHECKMASTER)

CM-PA-VAL
Order No. 2858454
Test socket for:
• VALVETRAB-MS

CM-PA-CTM
Order No. 2816962
Test socket for:
• COMTRAB modular

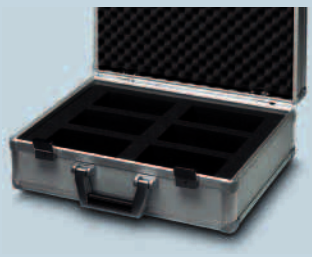
* Other test sockets on request

The top features at a glance

- Comfortable, safe and fast check
- The check status "Tolerance barrier is reached" prevents unnecessary servicing
- Automatic log function of test results
- The internal memory also enables the subsequent processing of test results on a PC
- The update function always keeps the CHECKMASTER up to date with the latest advancements in testing technology
- High investment security owing to variable test sockets
- Increase in system availability thanks to the screening test
- IEC 62305-3-compliant testing
- High quality and safety standard

Be the first to know what's up –
Have a check-up

Accessories



PA-CASE
Order No. 2858988

Transport case to accommodate six CHECKMASTER test sockets CM-PA...

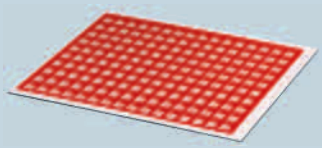
CM-KBL-RS232/USB
Order No. 2881078

Connection cable to connect the CHECKMASTER to the USB port of a PC.

Additional software packages for the CHECKMASTER are available in Phoenix Contact's e-shop.

CM-KBL-PROG
Order No. 2881557

The firmware of the CHECKMASTER can be updated via a PC using this cable and the update tool. The latest version of the update tool is available in Phoenix Contact's e-shop for free download.



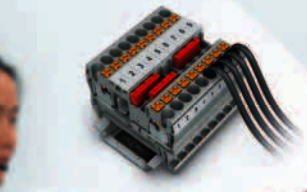
TRABTECH-PPB
Order No. 2783040

Sheet of inspection labels with 190 self-adhesive labels for labeling tested protective devices.

Further information on the products presented here and on the world of solutions from Phoenix Contact can be found at

www.phoenixcontact.net/catalog

Or contact us directly.



Industrial Connection Technology,
Marking Systems and Mounting Material

CLIPLINE

Connection Technology for
Field Devices and Field Cabling

PLUSCON

Device Connection Technology
and Electronic Housings

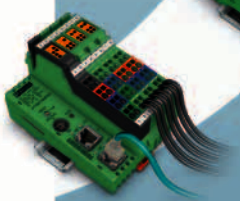
COMBICON

Power and Signal Quality

TRABTECH

Signal Converters, Switching Devices,
Power Supplies

INTERFACE



Components and Systems

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