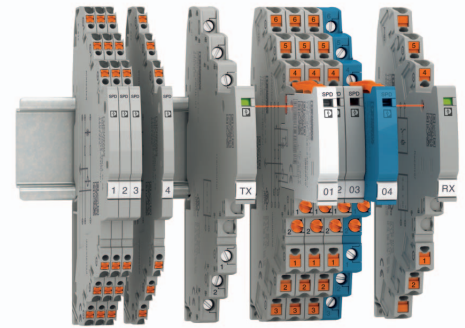


# TERMITRAB complete

## Surge protection for signal circuits of the MCR technology



Technical Note  
107820\_en\_00

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### 1 Description

The TERMITRAB complete product range offers surge protection solutions for signal circuits in measurement and control technology. The protective elements are characterized by their narrow design.

In the event of an overload, a mechanical status indicator indicates the disconnection of a protective element. The status indicator operates without additional auxiliary power.

The protective elements can be integrated into existing remote signaling concepts. Remote signaling modules are available for this. The protective elements are monitored visually. If a protective element is disconnected in the event of an overload, the disconnect device closes the monitoring channel. Group remote signaling is triggered. The status is indicated on the faulty device.

Pluggable protective devices and products with disconnect knives enable easy testing.

The CHECKMASTER 2 from Phoenix Contact performs a test sequence for the protective plugs and documents the results.

TERMITRAB complete is available with screw connection and Push-in connection technology. Further product features round off the surge protection system.



Make sure you always use the latest documentation.

For the technical data, please refer to the relevant product at [phoenixcontact.net/products](https://www.phoenixcontact.net/products).

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### 3 Ordering data

Description	Type	Order No.	Pcs./Pkt.
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The current ordering data for the relevant products can be found at [phoenixcontact.net/products](http://phoenixcontact.net/products).

Accessories	Type	Order No.	Pcs./Pkt.
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Marker pen without ink cartridge, for manual labeling of markers, labeling extremely wipe-proof, line thickness 0.35 mm (Marking)

X-PEN 0,35

0811228

1

Zack Marker strip, flat, Strip, can be ordered: Strip, white, labeled according to customer specifications, Mounting type: Snap into flat marker groove, for terminal block width: 6.2 mm, Lettering field: 5.15 x 6.15 mm (Marking)

ZBF 6 CUS

0825027

1

Zack Marker strip, flat, Strip, white, unlabeled, can be labeled with: CMS-P1-PLOTTER, PLOTMARK, Mounting type: Snap into flat marker groove, for terminal block width: 6.2 mm, Lettering field: 5.15 x 6.15 mm (Marking)

ZBF 6:UNBEDRUCKT

0808710

10

Zack Marker strip, flat, Strip, white, unlabeled, can be labeled with: CMS-P1-PLOTTER, PLOTMARK, Mounting type: Snap into flat marker groove, for terminal block width: 6.2 mm, Lettering field: 5.15 x 6.15 mm (Marking)

ZBF 6/WH-  
100:UNBEDRUCKT

0808736

100

Zack Marker strip, flat, Strip, white, labeled, Printed vertically: Consecutive numbers 1 - 10, 11 - 20, etc. up to 91 - 100, Mounting type: Snap into flat marker groove, for terminal block width: 6.2 mm, Lettering field: 5.15 x 6.15 mm (Marking)

ZBF 6,QR:FORTL.ZAHLEN

0808765

10

Zack Marker strip, flat, Strip, white, unlabeled, can be labeled with: CMS-P1-PLOTTER, PLOTMARK, Mounting type: Snap into flat marker groove, for terminal block width: 3.5 mm, Lettering field: 3.5 x 5.2 mm (Marking)

ZBF 3,5:UNBEDRUCKT

0829392

10

Zack Marker strip, flat, Strip, white, labeled, Printed horizontally: Consecutive numbers 1 - 10, 11 - 20, etc. up to 91 - 100, Mounting type: Snap into flat marker groove, for terminal block width: 3.5 mm, Lettering field: 5.15 x 3.5 mm (Marking)

ZBF  
3,5,LGS:FORTL.ZAHLEN

0801406

10



The corresponding end cover and the appropriate end brackets can be found in the accessories area for the relevant product at [phoenixcontact.net/products](http://phoenixcontact.net/products).

The current range of accessories can be found in the accessories area for the relevant product at [phoenixcontact.net/products](http://phoenixcontact.net/products).

## 4 Order key

Order key - with example:

<b>TTC</b>	-	<b>6</b>	-	<b>P</b>	-	<b>1x2</b>	-	<b>F</b>	-	<b>M</b>	-	<b>24DC</b>	-	<b>PT</b>	-	<b>I</b>
1		2	3		4		5		6		7		8		9	

### Versions:

- 1 = Product family  
**TTC** = TERMITRAB complete
- 2 = Housing width  
3 = 3.5 mm  
6 = 6 mm
- 3 = Pluggability  
**P** = Pluggable  
= Not pluggable
- 4 = Protective circuit type  
**1x2** = Two signal wires, floating  
**2x1** = Two signal wires, common reference potential  
**2** = Two signal wires, without decoupling  
**2-HC** = Two signal wires, without decoupling, for high nominal current  
**3-HF** = Two signal wires with reference conductor for high-frequency applications  
**TVSD** = Suppressor diode  
**MOV** = Varistor  
**GDT** = Gas-filled surge arrester  
**C** = One component in core-ground mode  
**D** = One component in core-core mode
- 5 = Grounding  
**F** = Floating (via GDT)  
= Direct grounding
- 6 = Features  
**M** = Knife disconnection  
**EX** = For explosive areas
- 7 = Nominal voltage  
Example:  
**24DC** = 24 V DC
- 8 = Connection method  
**PT** = Push-in Technology  
**UT** = Screw connection
- 9 = Signaling  
**I** = Status indicator  
= Without status display



The latest versions are listed in the product area at [phoenixcontact.net/products](https://phoenixcontact.net/products).

## 5 Versions

Combine various circuits and features according to the relevant requirements.

### 5.1 Pluggability and testing

Pluggable and testable products are indicated with the letter "P" in the order key.

Surge protection products are designed for use over a long period of time. When used as intended within the specified parameter ranges, the service life of the products can run into many years. During this time, the surge protection processes a large number of transient overvoltages. The end device is protected effectively.

However, in the event of intensive overload the quality of protection may decrease. By testing, you can determine whether protection is sufficiently effective, or whether protective devices are already impaired. These tests and their documentation are a mandatory requirement in some areas of industry.

TERMITRAB complete offers two-piece, pluggable protective devices. They enable protective plugs to be easily removed from the base element.

The plug can be tested with the CHECKMASTER 2 from Phoenix Contact. To this end, a barcode is printed on the plug. The scanner on the CHECKMASTER 2 automatically identifies the corresponding product when the data is read in. The corresponding template is loaded so that the CHECKMASTER 2 can compare the target and actual parameter ranges of the protective elements.

If the tested plug is no longer within the intended range, replacement is recommended. Replacement plugs are available from Phoenix Contact for such a case.

The order number on the base element is valid for the complete item comprising the base element and plug. The order number for the plug is intended for reordering replacement items.

When plugged in, a snap-in lever prevents the plug from moving even in the event of strong vibrations. A mechanical coding system ensures that only matching plugs and base elements can be connected together.

Insertion and removal is impedance-neutral, which means that signals are not interrupted during maintenance work and testing. The cables connected to the base element remain fixed in the installation.

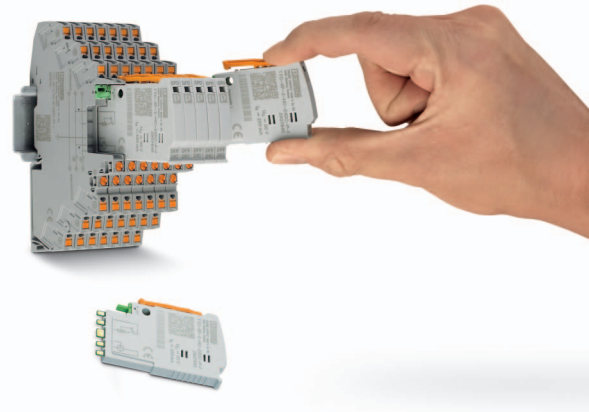


Figure 1 TERMITRAB complete, pluggable

### 5.2 Indirect grounding (floating)

Products with indirect grounding are indicated with the letter "F" in the order key.

In scenarios where direct grounding of the third terminal level (terminal blocks 3 - 6) is not desirable, versions with an additional gas discharge tube for the DIN rail are used.

Example: a common reference potential (common return conductor) is led via the third terminal level, however this must not have a ground connection to the surge protection. An additional gas discharge tube is useful in such a case

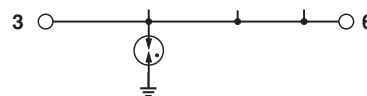


Figure 2 Indirect grounding

### 5.3 Knife disconnection

Products with knife disconnection are indicated with the letter "M" in the order key.

Disconnect terminal blocks are frequently used in sensor/ actuator cabling. These disconnect terminal blocks are installed between the modules for measurement and control technology and the cables led into the field. The disconnect terminal blocks can be used to interrupt signal circuits in order to conduct measurements in the field.

The disconnection option can be used on the top two terminal levels. Isolator 1 opens and closes the signal on the field side directly at terminal point 1. Isolator 2 opens and closes accordingly directly at terminal point 2.

For example, insulation measurements can be carried out on the cables without the surge protection components distorting the test results.

The dielectric strength of the knife disconnection is 2.5 kV (1.2/50  $\mu$ s).

When open (unscrewed), the function screw of the knife disconnection is 7 mm above the upper edge of the housing. In order to minimize contamination of the switching contacts in harsh and dusty ambient conditions, the knife disconnection has an encapsulated design.

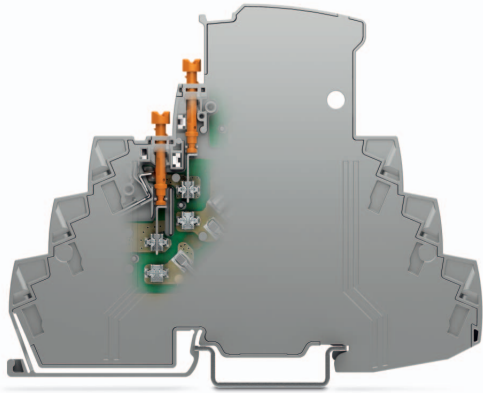


Figure 3 Knife disconnection opened

#### 5.4 Status indicator and remote signaling set

Products with status indicator are indicated with the letter “I” in the order key.

Status indicators and remote signaling are playing an increasingly important role in large technical systems.

As soon as a fine protection element becomes thermally overloaded, the overload protection disconnects the affected component. A mechanical indicator on the device clearly indicates that it has been disconnected. The signal remains unaffected by the disconnection. The dielectric strength of the system is still protected by the coarse protection in the device. Replace the device.

Fault indication in the respective surge protective device does not require a supply voltage.

If you also need the state to be signaled remotely, use the remote signaling set (FMRS) in addition. The set consists of a visual transmission module and receiver module.

Connect each of these modules to a 10 V DC ... 36 V DC supply voltage.

The transmission module is designed to be placed to the left of the block. At the opposite end, the receiver module detects a visual signal that passes through all the surge protective devices. In the event that a fault indicator is triggered, this visual signal is interrupted. It activates the signal contact (normally closed) after a delay time of 5 seconds has elapsed. This means that brief interruptions in the optical beam do not cause the signaling relay to switch.

The function signaling modules independently return to “OK” mode when the faulty surge protection module is replaced.

The receiver module includes a relay contact. This opens as soon as a faulty surge protective device is detected. The relay contact is floating. It is suitable for connection in a higher-level alarm system.

Monitor up to 40 neighboring surge protection products with one remote signaling set.



Figure 4 TERMITRAB complete remote signal set (Push-in version)

## 6 Connection and operation

### 6.1 Safety instructions

The installation and startup of this device may only be performed by an authorized (electrically) skilled person. The relevant country-specific regulations must be observed.



**WARNING: Risk of electric shock and fire**

Check the device for external damage. If the device is defective, it must not be used.



Ensure that the system's maximum operating voltage does not exceed the highest continuous  $U_c$  voltage.

Ensure that the maximum nominal current  $I_N$  of the overvoltage protection device is not exceeded during operation or in the event of a fault.

### 6.2 Installation and connection



Observe the necessary safety precautions when handling components that are vulnerable to electrostatic discharge (EN 61340-5-1 and IEC 61340-5-1).

TERMITRAB complete is designed for mounting on NS 35 DIN rails according to EN 60715.

To protect the device against mechanical or electrical damage, install it in a suitable housing with appropriate degree of protection as per IEC 60529.

#### Connecting cables

"Unprotected" and "protected" indicate the direction for installation of the protection modules.

- Connect the device upstream of the signal input to be protected. The imprint "unprotected" must point in the direction of the expected surge voltage. This is the direction of the incoming field cable.
- Connect the cables from the direction of the equipment to be protected to the terminal blocks marked "protected".
- Do not lay protected and unprotected cables directly next to each other over longer distances. This prevents surge voltages from being coupled into protected cables. Equipotential bonding lines are also considered unprotected cables.

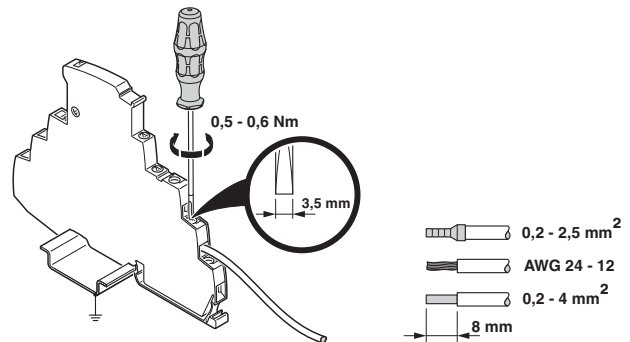


Figure 5 Version with screw connection

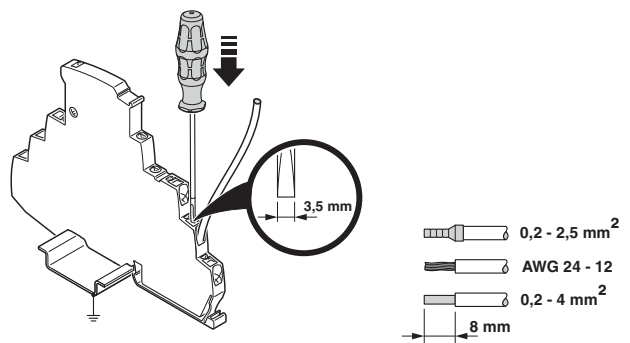


Figure 6 Version with Push-in connection



The corresponding circuit diagrams can be found in the data sheet in the product area at [phoenixcontact.net/products](http://phoenixcontact.net/products).

#### Grounding

The device shows a current carrying capacity connection to the DIN rail.

Establish an electrical connection between DIN rail and ground potential. In this way transient overvoltage between signal wires and the ground are limited.

Products in core-core mode do not have a conductive connection to the DIN rail. These products are indicated with the letter "D" in the order key.

#### Knife disconnection

Only for products with knife disconnection, which are indicated with the letter "M" in the order key.

To operate the disconnect knife, use a suitable bladed screwdriver of the size 0.6 x 3.5 mm.

- To open the contacts, turn the function screw 360° anti-clockwise. When open (unscrewed), the function screw of the knife disconnection is 7 mm above the upper edge of the housing. The function screw remains in the item socket.
- To close the contacts, turn the function screw 360° clockwise. In the end position, the function screw is flush with the upper edge of the housing.

### End cover

Products with an overall width of 3.5 mm and some versions with an overall width of 6 mm have an open housing side.

- Align these products side by side on the DIN rail.
- Use an end cover and suitable end bracket on the open side of the arranged products.



The corresponding end cover and the appropriate end brackets can be found in the accessories area for the relevant product at [phoenixcontact.net/products](http://phoenixcontact.net/products).

### 6.3 Insulation testing

#### For products with knife disconnection

- Open the disconnect knife of the device before an isolation measurement. Otherwise, inaccurate measurements may occur.

#### For products without knife disconnection

- Disconnect the field cabling of the surge protective device before conducting insulation testing. Otherwise, inaccurate measurements may occur.
- Reconnect the cabling after insulation testing has been completed.

### 6.4 Testing option

#### For products with screw connection technology

- Take measurements directly at the screw heads.

#### For products with Push-in connection technology

- Take measurements at the additional test opening. These test openings can accommodate a probe tip that is 2 mm in diameter.

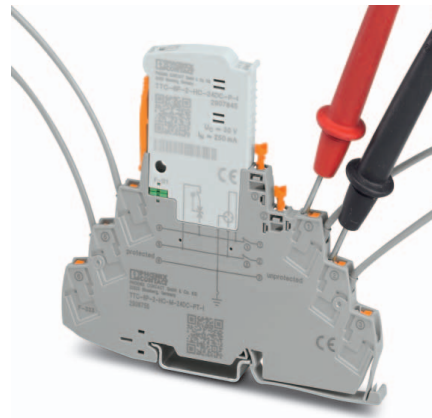


Figure 7 Measurement for Push-in connection technology

### 6.5 Marking

TERMITRAB complete offers the option of marking products for quick localization.

All TERMITRAB complete variants have zack marker strip grooves. Phoenix Contact offers marked and unmarked “ZBF” zack marker strips, which are suitable for series marking, for example.

Products with an overall width of 6 mm have a 6 x 15 mm area free on the visible side. This can be marked individually with a pen or label.