Doepke

DE EN

Installation and operating instructions

DCTR B-X Hz-PoE residual current monitors

These installation and operating instructions describe the installation and commissioning of the DCTR B-X Hz-PoE residual current monitors. They are intended for use by electrically skilled persons. Electrical laypersons must not install and connect devices of this type due to the considerable potential dangers. The instructions must be kept so that they can be referred to at a later stage.

Scope of delivery

Operating instructions, drilling templates, ten-pin terminal strip, device, optional: DCTR Manager software

Warning notes

1. Devices with visible damage must not be installed or used.
2. Residual current monitors of this type are not suitable as additional protection through switch-off in combination with a circuit-breaker, for example, as per VDE 0100 Part 410 (residual current protection).
3. There is no distinction between operation-related leakage currents and residual currents.

Intended use and installation

The compact residual current monitors from the DCTR range as per DIN EN 62020 are used to detect and report residual currents in electrical installations, especially those in TN-S, TN-CS and TT networks. Use in IT networks is possible, but may be limited by installation regulations. DCTR B-X Hz-PoE devices are AC-DC sensitive and detect type B residual currents from DC to 100 kHz. They also meet the requirement for increased preventative fire safety in the detection of type B+ residual currents. DCTR B-X Hz-PoE devices are suitable for monitoring both AC and DC networks.

According to VDE 0100 Part 420, residual current monitors may be used in connection with a circuit-breaker for installation switch-off in order to prevent electrical fires caused by insulation faults, insofar as residual current circuit-breakers are rejected for technical reasons.

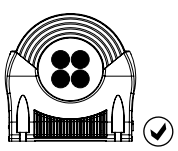
The devices are designed for installation in any position in power distributors or systems in dry indoor conditions. The devices are mounted on stable surfaces or a mounting plate using the supplied screw points.

The following information must be observed to ensure correct operation.

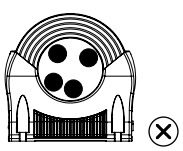
Technical properties

For correct function, the DCTR B-X Hz-PoE devices require the following:

a) There must be a supply voltage of 24 V DC to terminals 7 and 9 or via the Ethernet interface with PoE. The connection of 24 V DC and PoE (48 V DC) is also possible at the same time in order to achieve redundancy.
b) The active conductors to be monitored must be fed through the inner hole of the sensor as symmetrically as possible. Energy may flow in either direction. The protective conductor must not be fed through this point.



▲ *symmetrical*



▲ *asymmetrical*

Alternatively to b), the protective conductor can be monitored; it would then be the only conductor to be fed through the inner hole of the transformer.

The DCTR Manager software provides an overview of all transformers on the network and also makes it easy to manage and check residual currents. Other transformers on the network can easily be added via IP address assignment.

Residual current is reported via two integrated relays. The threshold values for these can be set in the DCTR Manager. The contacts of the relay can activate an external acoustic or visual signal. If the installation regulations allow, the relays can also effect the switch-off of a circuit-breaker. Furthermore, the DCTR Manager can be used to output and monitor the residual current via the integrated Ethernet interface.

The transformer can also be operated without software.

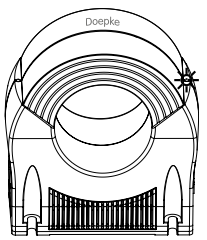
The following parameters are preset when the device is delivered:

	Main analysis		Frequency-selective analysis					
	DC	AC total	50 Hz	< 100 Hz	150 Hz	100 Hz – 1 kHz	> 1 kHz	> 10 kHz
Alarm 1	300 mA	300 mA	300 mA	300 mA	300 mA	300 mA	300 mA	300 mA
Alarm 2	150 mA	150 mA	150 mA	150 mA	150 mA	150 mA	150 mA	150 mA

▲ *Thresholds when delivered*
Note: Only the alarm thresholds of the main analysis are activated.

The LED integrated in the arc of the housing flashes, indicating that the device is functioning correctly and can show the following colours:

» Flashing green: IP address was successfully obtained
» Orange (during commissioning): IP is being obtained via DHCP or being switched to the standard IP 192.168.100.100.
⚠ The switch to the standard IP is done for networks with no DHCP server and can last up to three minutes.
» Orange: Threshold of alarm 2 exceeded
» Red: Threshold of alarm 1 exceeded (takes priority over alarm 2)



Pressing the test key located on the side of the device results in an internal residual current being generated by the transformer. It is also possible to connect an external test key with an NO contact in parallel to the terminal strip if the transformer is not mounted to accessible parts of an installation. Its detection corresponds to a function test of the analysis unit including the signal contacts.

Function of the transformer's test button:

» Press briefly: The transformer generates an internal residual current. ⚠ The potential-free contacts of the transformer also switch in this case. Its detection therefore corresponds to a function test of the analysis unit including the signal contacts.
» Press and hold down (10 s): DHCP will switch back on automatically if it was previously deactivated.

It is also possible to connect an external test button with a NO contact to the terminal strip if the transformer is mounted in an inaccessible part of the installation.

The rated current specified in the data sheet is the current with which the DCTR B-X Hz-PoE can be permanently operated. However, different consumers, such as motors, can mean that the flowing load current is temporarily several times higher than the rated current. As a result of physical effects in the material of the transformer, these inrush currents – depending on size and line structure – may incorrectly result in residual currents being indicated. This effect can be minimised by centred installation of lines routed through the transformer. If this is not possible, the maximum preload can be taken from the table. With the default settings of the DCTR B-X Hz-PoE, a current flow of six times the rated current does not lead to activation of alarm 1 (setting: 300 mA).

Maximum preload with different load currents at 50 Hz

	100 A	200 A	300 A	400 A
Symmetrical line structure	3 mA	6 mA	9 mA	12 mA
Asymmetrical line structure	9 mA	18 mA	27 mA	36 mA

Note: In addition, the measuring accuracy of ± 5 % of the current measuring range end value should be taken into account.
Example: A load current of 400 A in an asymmetrical line structure and a residual current of 100 MA is displayed as a maximum of 151 mA (100 mA + 36 mA + 15 mA).

Detection ranges (automatic range switching)

Frequency	Residual current
DC	0.3 A, 3 A
50 Hz	0.3 A, 1 A, 3 A, 10 A, 30 A
< 100 Hz	
150 Hz	
100 Hz – 1 kHz	
> 1 kHz	
> 10 kHz	

Frequency responses

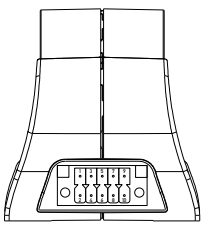
The device has a detection range of up to 100 kHz. This is divided into seven frequency bands that can be analysed using the DCTR Manager software. Further details can be found in the technical information.

It should be emphasised once again that the DCTR B-X Hz-PoE is not a measuring device, but a residual current monitor (RCM) as per DIN EN 62020.

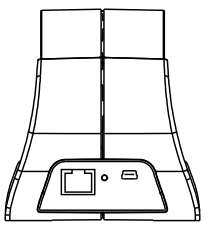
Relay response times

A response delay can be set for each relay in the DCTR Manager (factory default: 0 ms). This prevents excessive switching in the case of a heavily fluctuating residual current.

Wiring diagram

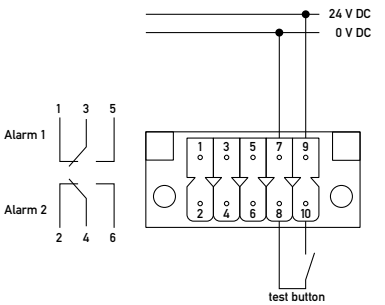


▲ *ten-pin female connector*

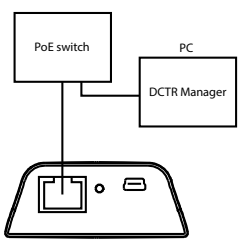


▲ *test key, Ethernet and service interface*

⚠ The service interface is for service purposes only and cannot be used by the user. Both the residual current monitor and any peripheral equipment connected to it can be damaged by incorrect use.



▲ *Pin assignment for ten-pin female connector (de-energised)*



▲ *Wiring diagram for PoE switch and PC with DCTR Manager*

Warranty

All professionally installed, unaltered devices are covered by warranty for the duration of the statutory warranty period from the day of purchase by the end user. The warranty does not apply to damage incurred during transport or caused by short-circuit, overloading or improper use. Should any defects in workmanship or material be discovered within the warranty period, the company will provide repair or replacement free of charge.

DCTR Manager software

The DCTR Manager allows you to manage your transformer easily and centrally. The software also displays and documents the recorded residual currents.

Download now free of charge from the following link
www.doepke.de/dctr-manager