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MINI MCR-SL-...CP-I-I...

One- and two-channel passive isolators

INTERFACE

Data sheet
101948_en_01

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1 Description

MINI MCR-SL-...CP-I-I(-SP) passive isolators are used for electrical isolation and filtering of analog 0(4)...20 mA standard current signals without additional supply voltage.

Features

- One- or two-channel passive isolators
- Input and output signal range 0...20 mA or 4...20 mA
- Approval for Ex-zone 2 (nA)
- Screw or spring-cage connection can be provided



Attention: Correct usage in potentially explosive areas

The module is a category 3 item of electrical equipment. It is absolutely vital to follow the instructions provided here during installation and observe the information in the "Safety regulations and installation notes".



Make sure you always use the latest documentation.

It can be downloaded from the product at www.phoenixcontact.net/catalog.



This data sheet is valid for all products listed on the following page:

2	Table of contents	
1	Description	1
2	Table of contents	2
3	Ordering data	3
4	Technical data	3
5	Safety regulations and installation notes.....	5
	5.1 Installation notes	5
	5.2 Installation in the Ex area (zone 2).....	5
6	Installation	6
	6.1 Connection notes	6
	6.2 Structure	6
	6.3 Block diagram.....	6
	6.4 Power supply.....	6
	6.5 Assembly.....	7
	6.6 Connecting the wires	7
7	Connection/application example	8

3 Ordering data

Description	Type	Order No.	Pcs. / Pkt.
MCR loop-powered isolator, 1-channel, for the electrical isolation of current signals without auxiliary power, with screw connection	MINI MCR-SL-1CP-I-I	2864419	1
MCR passive isolator, 1-channel, for the electrical isolation of current signals without auxiliary power, with spring-cage connection	MINI MCR-SL-1CP-I-I-SP	2864749	1
MCR passive isolator, 2-channel, for the electrical isolation of current signals without auxiliary power, with screw connection	MINI MCR-SL-2CP-I-I	2864655	1
MCR passive isolator, 2-channel, for the electrical isolation of current signals without auxiliary power, with spring-cage connection	MINI MCR-SL-2CP-I-I-SP	2864781	1
Accessories	Type	Order No.	Pcs. / Pkt.
DIN rail connector (TBUS), 5-pos., for bridging the supply voltage, can be snapped onto NS 35/... DIN rails according to EN 60715	ME 6,2 TBUS-2 1,5/5-ST-3,81 GN	2869728	10
Eight MINI analog signal converters with screw connection method can be connected to a control system using a system adapter and system cabling with a minimum of wiring and very low error risk.	MINI MCR-SL-V8-FLK 16-A	2811268	1
Label for extended marking of MINI MCR modules in connection with the MINI MCR-DKL	MINI MCR-DKL-LABEL	2810272	10
Fold up transparent cover for MINI MCR modules with additional labeling option using insert strips and flat Zack marker strip 6.2 mm	MINI MCR DKL	2308111	10

4 Technical data

Input	
Description of the input	Current input
Configurable/programmable	No
Max. voltage input signal	18 V
Current input signal	0 mA ... 20 mA 4 mA ... 20 mA
Max. current input signal	40 mA
Response current	Approx. 190 μ A
Input voltage limitation	18 V
Voltage dissipation	1.7 V (at I = 20 mA)
Output	
Output description	Current output
Current output signal	0 mA ... 20 mA 4 mA ... 20 mA
Configurable/programmable	No
Ripple	< 10 mV _{rms} (at 600 Ω)
Load/output load current output	< 600 Ω (at I = 20 mA output signal)
Supply	
Supply voltage range	(no separate supply voltage necessary)

General data

Limit frequency (3 dB)	75 Hz
Maximum transmission error	≤ 0.1 % (of final value)
Maximum temperature coefficient	≤ 0.002 %/K (of measured value / 100 Ω load)
Step response (10-90%)	5 ms (At 600 Ω load)
Electrical isolation	Basic insulation according to EN 61010
Surge voltage category	II
Mounting position	Any
Degree of protection	IP20
Pollution degree	2
Rated insulation voltage	50 V AC/DC
Dimensions W / H / D	6.2 mm / 93.1 mm / 102.5 mm
Type of housing	PBT green

Connection data

	Screw connection	Spring-cage conn.
Conductor cross section, solid	0.14 mm ² ... 2.5 mm ²	0.2 mm ² ... 2.5 mm ²
Conductor cross section, stranded	0.2 mm ² ... 2.5 mm ²	0.2 mm ² ... 2.5 mm ²
Stripping length	12 mm	8 mm


Ambient conditions

Ambient temperature (operation)	-20 °C ... 65 °C
Ambient temperature (storage/transport)	-40 °C ... 85 °C

Conformance with EMC Directive 2004/108/EC

Noise immunity according to EN 61000-6-2
Noise emission according to EN 61000-6-4

Conformance / approvals

Conformance	CE-compliant
ATEX	 II 3 G Ex nA II T6 X
UL, USA / Canada	UL 508 Recognized
Shipbuilding	GL EMC 2 D

5 Safety regulations and installation notes

5.1 Installation notes

- The device is designed for installation in zone 2 potentially explosive areas.
- Installation, operation, and maintenance may only be carried out by qualified electricians. Follow the installation instructions described. When installing and operating the device, the applicable regulations and safety directives (including national safety directives), as well as general technical regulations, must be observed. The technical data is provided in this package slip and on the certificates (conformity assessment, additional approvals where applicable).
- It is not permissible to open or modify the device. Do not repair the device yourself but replace it with an equivalent device. Repairs may only be carried out by the manufacturer. The manufacturer is not liable for damage resulting from violation.
- The IP20 degree of protection (EN 60529) of the device is intended for use in a clean and dry environment. Do not subject the device to any load that exceeds the described limits.
- The device is not designed for use in atmospheres with a danger of dust explosions.

5.2 Installation in the Ex area (zone 2)

- Observe the specified conditions for use in potentially explosive areas.
- The device must be installed in a housing (control or distributor box) which meets the requirements of EN 60079-15 and provides at least IP54 (EN 60529) degree of protection.
- During installation and when connecting the supply and signal circuits, observe the requirements of EN 60079-14. Devices may only be connected to circuits in zone 2 if they are suitable for operation in Ex zone 2 and for the prevailing conditions at the place of use.
- In potentially explosive areas, terminals may only be snapped onto or off the DIN rail connector and wires may only be connected or disconnected when the power is switched off.
- The device must be stopped and immediately removed from the Ex area if it is damaged, has been subjected to an impermissible load, has been stored incorrectly, or if it malfunctions.
- You can download the latest documents for these devices from www.phoenixcontact.net/catalog.

6 Installation

6.1 Connection notes



Attention: Electrostatic discharge!

The device contains components that can be damaged or destroyed by electrostatic discharge. When handling the device, observe the necessary safety precautions against electrostatic discharge (ESD) according to EN 61340-5-1 and EN 61340-5-2.

6.2 Structure

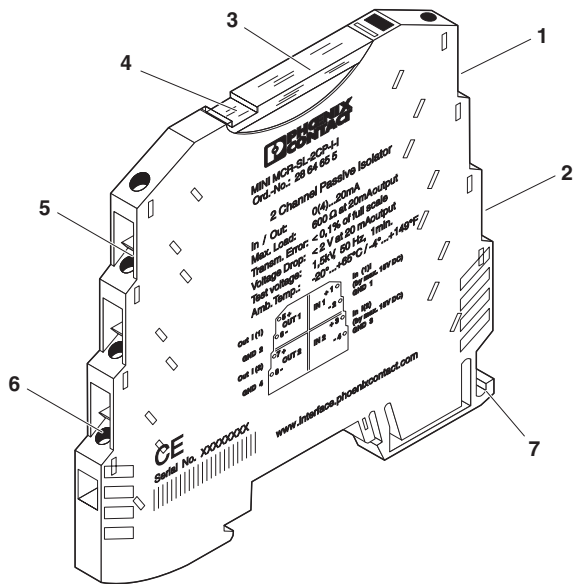


Figure 1 Structure

1. Input: Standard signals (channel 1)
2. Input: Standard signals (channel 2)
3. Cover
4. Groove for ZBF 6 zack marker strip
5. Output: Standard signals (channel 1)
6. Output: Standard signals (channel 2)
7. Universal snap-on foot for EN DIN rails

6.3 Block diagram

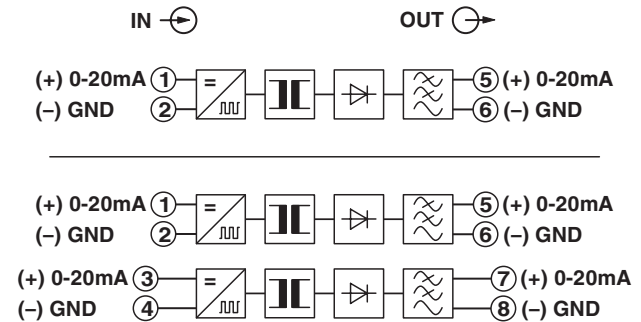


Figure 2 Block diagram

6.4 Power supply



ATTENTION:

Never connect the supply voltage directly to the DIN rail connector. It is not permitted to draw power from the DIN rail connector or from individual modules.

Supply via the module

The MINI passive isolators do not need a separate power supply. The necessary power is supplied by a current loop on the input side, e.g. in the form of a transmitter (see the section titled "Connection/Application example").



However, MINI passive isolators can be snapped onto a DIN rail connector – no electrically conductive connection is established. This means that it is not necessary to disconnect an existing connection involving DIN rail connector elements.

6.5 Assembly

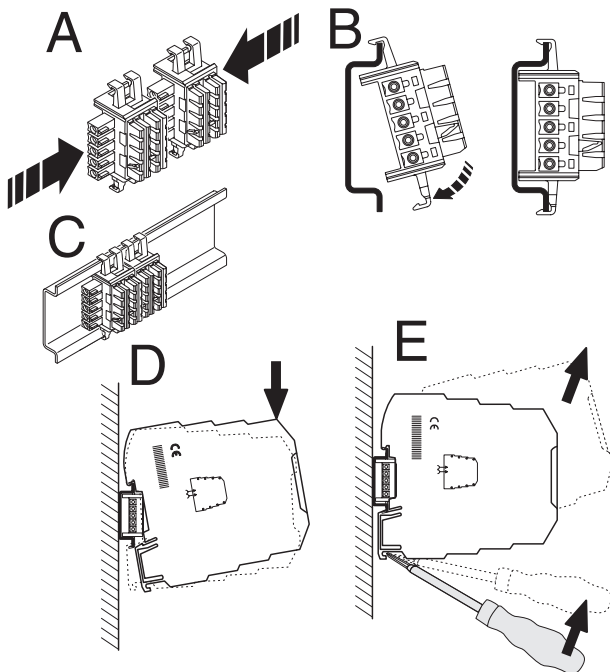


Figure 3 Mounting and removing

- Mount the module on a 35 mm DIN rail according to EN 60715.
- When using the DIN rail connector, first place it into the DIN rail (see A – C). It is used to bridge the power supply. It is also absolutely vital that you snap the module and the DIN rail connector into position in the correct direction: the snap-on foot should be at the bottom and the connector on the left.

6.6 Connecting the wires

The MINI MCR-SL-1CP-I-I... is available with two types of connection:

- Screw terminal blocks (MINI MCR-SL-1CP-I-I)
- Spring-cage terminal blocks (MINI MCR-SL-1CP-I-I-SP)

Screw connection:

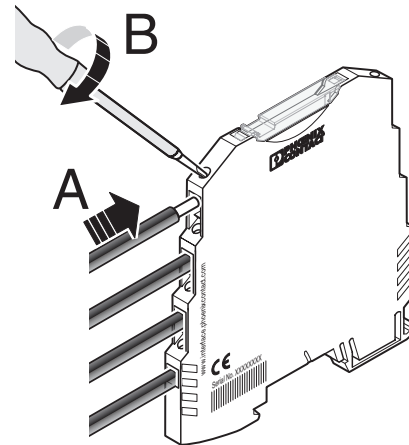


Figure 4 Screw connection

- Insert the wire into the corresponding connection terminal block.
- Use a screwdriver to tighten the screw in the opening above the connection terminal block.

Spring-cage connection:

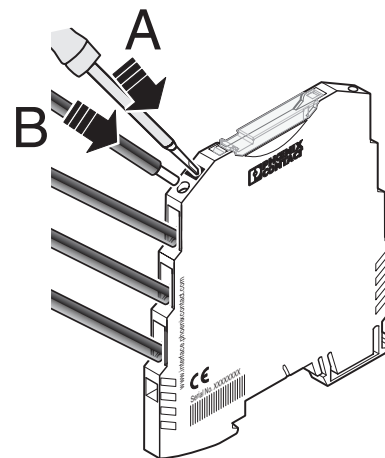


Figure 5 Spring-cage connection

- Insert a screwdriver into the opening above the connection terminal block.
- Insert the wire into the corresponding connection terminal block.

7 Connection/application example

When using passive isolators, you must make sure that the current sourcing voltage of the measuring transducer U_B is sufficient to drive the maximum current of 20 mA via the passive isolator with a voltage drop $U_V = 1.7\text{ V}$ and load R_B .

This means:

$$U_B \geq U_E = 1.7\text{ V} + 20\text{ mA} \times R_B$$

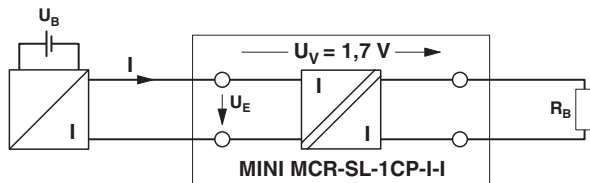


Figure 6 Power supply