3-Way Isolating Amplifier
MCR-C- ... -DC

1. Short Description

The MCR 3-way isolating amplifiers are used for electrical isolation and conversion of analog signals. The components guarantee electrical isolation of analog standard signals. Module input and output are supplied with power electrically isolated from the network via an integrated DC/DC converter (3-way isolation, fig. 2).
The MCR modules ensure reliable decoupling of a sensor circuit from the processing circuit and thus also avoid cross-coupling of several sensor circuits. The 3-way isolation means that the modules can be used universally, both on site or in the vicinity of the controller for the conversion of signals and as galvanic isolation, and along the transmission path to bridge apparent ohmic resistance.



Fig. 1

2. Method of operation

The analog signal is first modulated and then galvanically decoupled using a transformer???.
The isolated signal is then available at the output, demodulated, filtered and amplified.

Notes:

• The space-saving ME housing, a slim 12.5 mm, with pluggable connection technology, enables the 20...30 V DC power supply to be quickly looped through, using preassembled wire bridges.
• The MCR 3-way modules can be snapped onto symmetrical mounting rails in acc. with EN 50 022.

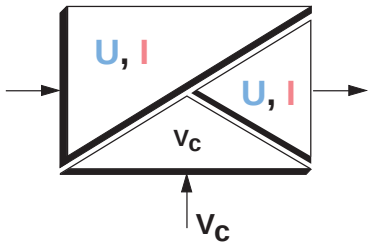


Fig. 2

Headquarters: © Phoenix Contact GmbH & Co. KG • Flachsmarktstraße 8-28 • 32825 Blomberg • Germany
Phone +49-(0) 52 35-3-00 • Fax +49-(0) 52 35-3-4 1200 • http://www.phoenixcontact.com

3-Way Isolating Amplifier MCR-C- ... -DC



3. Technical Data MCR-C-...-DC	...U/I-50	...U/I-0	...I/I-00	...I/U-0	...U/U	...I/U-4	...U/I-4	...I/I-04	...I/I-40
Order No.:	2814485	2814472	2814508	2814498	2814469	2814511	2814537	2814540	2814524
Input (measuring input)									
Input signal	0...5 V	0…10 V	0(4) ...20 mA	0…20 mA	0…10 V ±10 V	4…20 mA	0…10 V	0…20 mA	4…20 mA
Input resistance	200 kΩ	200 kΩ	50 Ω	50 Ω	200 kΩ	50 Ω	200 kΩ	50 Ω	50 Ω
Output (measuring output)									
Output signal	0...20 mA,	0…20 mA	0(4)…20 mA	0…10 V	0…10 V ±10 V	0…10 V	4…20 mA	4…20 mA	0…20 mA
Load	< 500 Ω	< 500 Ω	< 500 Ω	> 10 kΩ	> 10 kΩ	> 10 kΩ	< 500 Ω	< 500 Ω	< 500 Ω
Linear transmission range (in relation to the end value	-5…105 %	-5…105 %	-5…105 %	-110...110 %	-110...110 %	-110...110 %	-5…105 %	-5…105 %	-5…105 %
4. General Data									
Supply voltage	20 … 30 V DC			20 ... 30 V DC		20 ... 30 V DC		20 … 30 V DC	
Operating current (without load current)	< 15 mA			< 15 mA		< 15 mA		< 15 mA	
Transmission error	< 0.2 % of end value typ. 0.1 %			< 0.2 % of end value typ. 0.1 %		< 0.3 % of end value typ. 0.2 %		< 0.3 % of end value typ. 0.2 %	
Temp. coefficient	< 0.015 %/K			< 0.015 %/K		< 0.015 %/K		< 0.015 %/K	
Cut-off freq. (3dB)	approx. 30 Hz			approx. 30 Hz		approx. 30 Hz		approx. 30 Hz	
Test voltage									
Input/Output	1 kV AC / 50 Hz / 1 min.			1 kV AC/ 50 Hz / 1 min.		1 kV AC/ 50 Hz / 1 min.		1 kV AC/ 50 Hz / 1 min.	
Input/Power supply	1 kV AC / 50 Hz / 1 min.			1 kV AC/ 50 Hz / 1 min.		1 kV AC/ 50 Hz / 1 min.		1 kV AC/ 50 Hz / 1 min.	
Output/Power supply	1 kV AC / 50 Hz / 1 min.			1 kV AC/ 50 Hz / 1 min.		1 kV AC/ 50 Hz / 1 min.		1 kV AC/ 50 Hz / 1 min.	
Ambient temperature range	-25 °C to 60 °C (-13 … 140 °F)			-25 °C to 60 °C (-13 … 140 °F)		-25 °C to 60 °C (-13 … 140 °F)		-25 °C to 60 °C (-13 … 140 °F)	
Approval									
Type of connection	Screw/Plug connection			Screw/Plug connection		Screw/Plug connection		Screw/Plug connection	
Installation position	any			any		any		any	
Mounting	any			any		any		any	

Modules with other cut-off frequencies or test voltages are available on request.

Complies with EMC guideline 89/336/EEC and low voltage directive 73/23/EEC

Immunity to interference in acc. with EN 50082-2		
• Electrostatic discharge (ESD)	EN 61000-4-2	Criterion B: 8 kV discharge in air
• Electromagnetic HF field: Amplitude modulation Pulse modulation	EN 61000-4-3	Criterion A 10 V/m 10 V/m
• Fast transients (Burst)	EN 61000-4-4	Criterion B: I/O/S[1]:2 kV/5 kHz
• Surge voltage capacities (Surge)	EN 61000-4-5	Criterion B: V[1]:0.5 kV/2 Ω
• Conducted disturbance	EN 61000-4-6	Criterion A I/O/S[1]: 10 V
Noise emission in acc. with EN 50081-1		
	EN 55011	Class A

EN 61000 corresponds to IEC 1000
EN 55011 corresponds to CISPR11

[1] I≙ Input / O≙Output / S≙Supply
Criterion A: Normal operating behavior within the defined limits.
Criterion B: Temporary impairment to operational behavior that is corrected by the device itself.

Class A: Area of application: industry, without special installation measures.

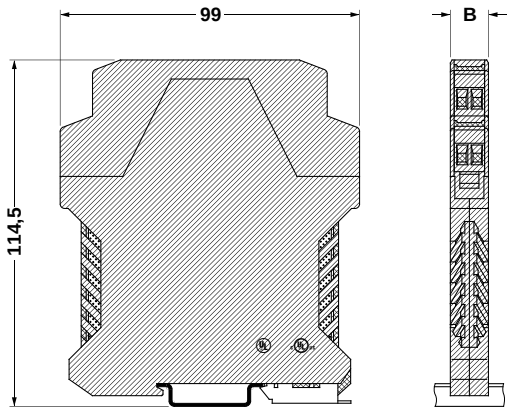


Fig. 3

6. Connection Scheme

3-Way Isolating Amplifier, single-channel

① Supply voltage

② Signal output

③ Signal input

④ Metal latch for fixing to the mounting rail

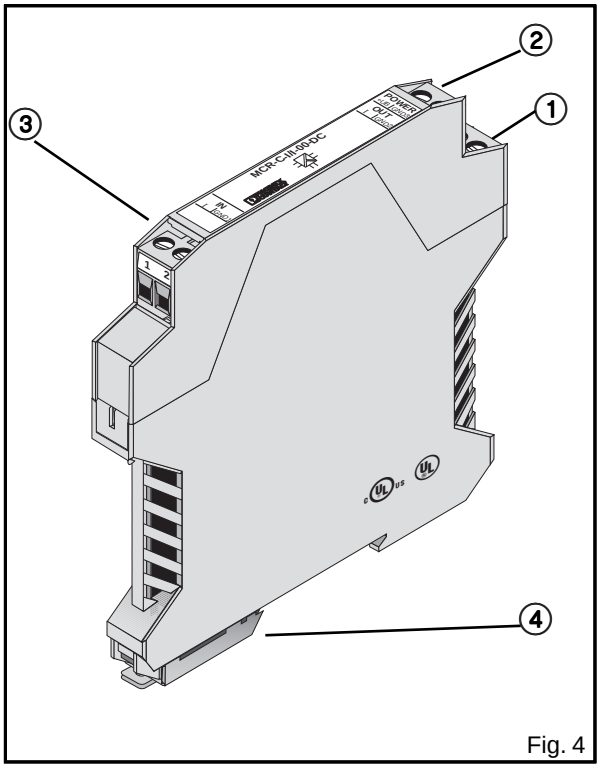


Fig. 4

7. Transfer Characteristic

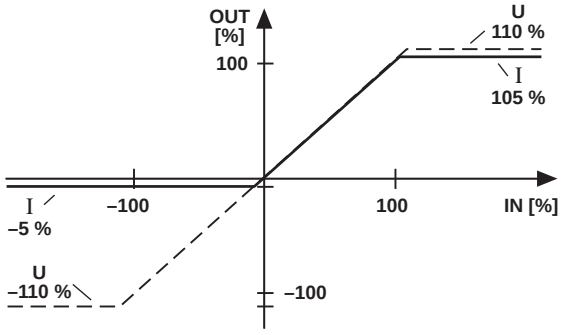


Fig. 5

8. Block Diagram

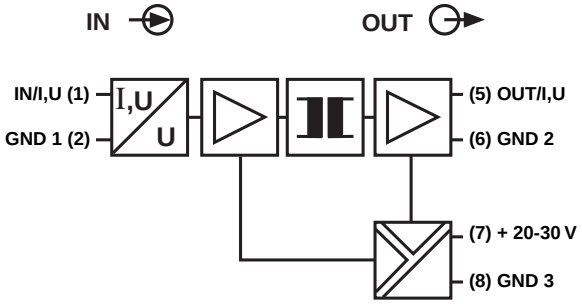


Fig.6

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