

Modular Housings

Knick >

IsoTrans® 41



**For isolation of
0(4) ... 20 mA standard
current signals;
up to 3 channels.**

The Task

If there is no power supply available, the galvanic isolation of 0(4) ... 20 mA standard current signals requires investment in power supply units.

The Problems

Many products provide loop-powered isolation with insufficient accuracy only. The desire for high accuracy demands an isolator concept that fulfils the highest expectations.

The load capability of the 20-mA source is limited and therefore requires economical handling of the load voltage.

The Solution

Knick IsoTrans® 41 with transformer potential isolation has specifications well beyond other loop-powered DC isolation amplifiers. 0.2 % fault class and just 1.2 V voltage requirement allow diverse uses of this isolator.

The Housing

The A2 modular housing with a width of 22.5 mm for max. 3 isolators offers optimum space usage in multichannel mode. The A3 modular housing for one isolator is just 17.5 mm wide.

The full encapsulation guarantees a high level of reliability even in extreme conditions.

The Advantages

The galvanic isolation in the IsoTrans® 41 is achieved using a passive isolator that obtains its power as a voltage drop from the measurement signal. This saves on supply units and cabling and increases the reliability accordingly.

The Technology

The units work with a serial chopper generator in the current path. This avoids the accuracy-reducing current losses of normal parallel connected generators, considerably reduces the voltage drop, and ensures accurate transmission even of the lowest currents.

The Application

Galvanic isolation

- of input and output circuits
- the supply voltage of 2-wire transmitters
- in the case of addition or another coupling of signals at different potentials
- for removal of double ground compensation currents
- when there is an insufficient insulation and test voltage
- of high-potential signal sources
- for battery-powered devices with a central battery

**Warranty
5 years!**

Defects occurring within 5 years from delivery are remedied free of charge at our works (carriage and insurance paid by sender).

Loop-Powered Isolators for Standard Signals

Isolation Amplifiers
Transmitters

Indicators

Process Analytics

Portable Meters

Laboratory Meters

Sensors

Fittings

Knick ➤



■ The Facts

Loop-powered

No mains influences

Extremely high accuracy

Broad field of application

Current transmission
from 2 μ A to 50 mA

Maximum reliability

No unnecessary heat and
therefore maximum service life of
components

Negligible loading of the measurement signal

Voltage drop just 1.2 V

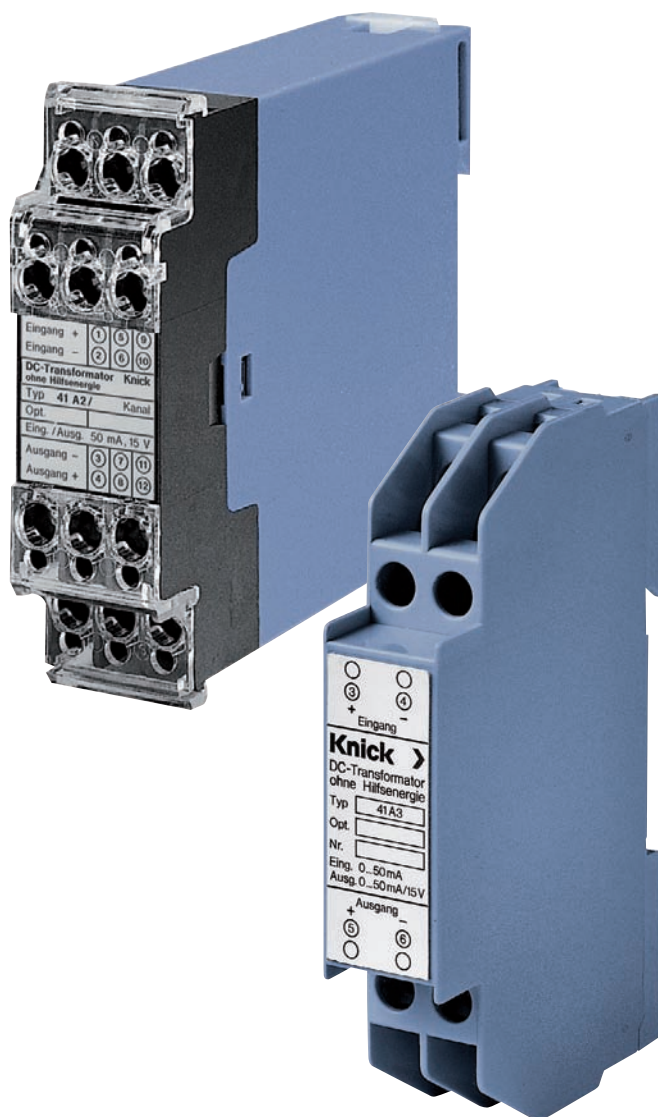
Low signal delay

Space-saving due to multichannel variants

Modular housing with up to
three channels

Computer-controlled testing guarantees quality

5-year warranty



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■ Product Line

Devices		Order No.
IsoTrans® 41	1-channel, A2 modular housing (width: 22.5 mm) 2-channel, A2 modular housing (width: 22.5 mm) 3-channel, A2 modular housing (width: 22.5 mm) 1-channel, A3 modular housing (width: 17.5 mm)	41 A2 / 1 41 A2 / 2 41 A2 / 3 41 A3
Power supply	None, supply from input signal	

■ Specifications

Input data

Inputs	0(4) ... 20 mA 0 ... 50 mA
Operating current	< 2 µA
Voltage drop	Approx. 1.2 V (20 mA) Approx. 1.6 V (50 mA)
Overload	100 mA, 20 V (see also page 84)

Output data

Output	0(4) ... 20 mA/max. 15 V (corresponds to 750 ohms load) 0 ... 50 mA/max. 15 V (corresponds to 300 ohms load)
Offset	< 5 µA
Residual ripple ¹⁾	< 1.5 mV _{pp} /mA

Transmission behavior

Transformation error ²⁾	0.02 % meas. val.
Load error	< 0.02 % meas. val. per 100 ohms
Rise or fall time	Approx. 2.5 ms at 500 ohms load resistance

1) Slightly increased residual ripple can occur when load < 5 ohms

2) Temperature range -10 ... +70 °C

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Specifications (continued)

Isolation

Test voltage	2.5 kV AC
Working voltage (basic insulation)	500 V DC across any inputs and outputs with overvoltage category II and pollution degree 3 according to EN 61010-1 (with model 41 A2/3 across neighboring inputs and outputs, with pollution degree 2 inside the housing, degree 3 outside). For applications with high working voltages, you should ensure there is sufficient spacing or isolation from neighboring devices and protection against electric shocks.

Standards and approvals

Surge withstand	5 kV, 1.2/50 μ s, according to IEC 255-4
Immunity to interference	8 kV according to IEC 801-2

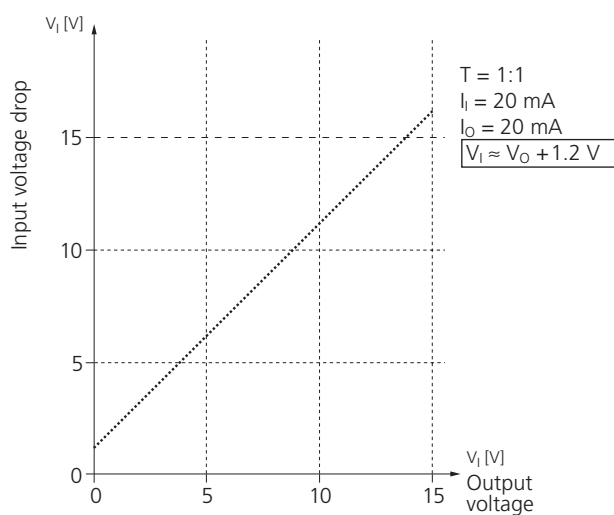
Other data

Ambient temperature	-25 ... +80 °C
Design	A2 modular housing, 22.5 mm wide, A3 modular housing, 17.5 mm wide, see dimension drawings for further measurements
Ingress protection	Protection class with terminal cover according to DIN 40050: Housing IP 40, terminals IP 20
Mounting	Snap-on mounting for 35 mm top hat rail according to EN 50022 or M4 screw mounting See dimension drawings for conductor cross section
Weight	41 A2 / 1: Approx. 140 g 41 A2 / 2: Approx. 190 g 41 A2 / 3: Approx. 210 g 41 A3: Approx. 70 g

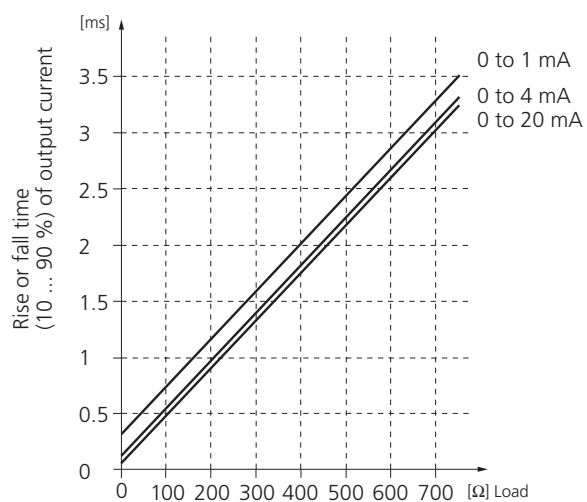
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IsoTrans® 41

■ Transfer Function



■ Reactions to Square Step of Input Current

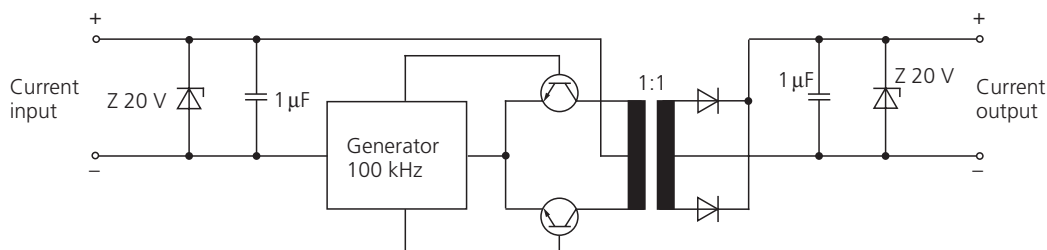


Loop-Powered Isolators for Standard Signals

Isolation Amplifiers Transmitters	Indicators	Process Analytics	Portable Meters	Laboratory Meters	Sensors	Fittings
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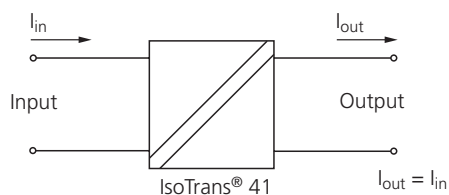
■ Block Diagram



■ Application Examples

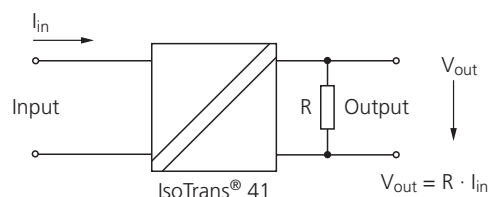
Electrical isolation

with impressed current, current output



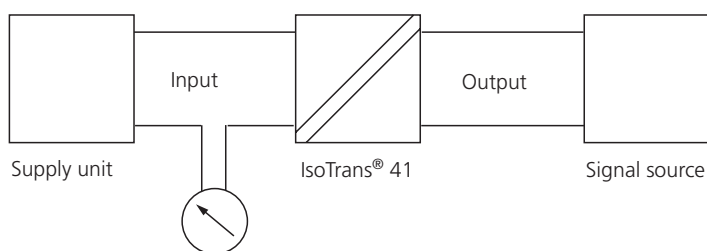
Electrical isolation

with impressed input current, voltage output



Electrical isolation

in two-wire technology



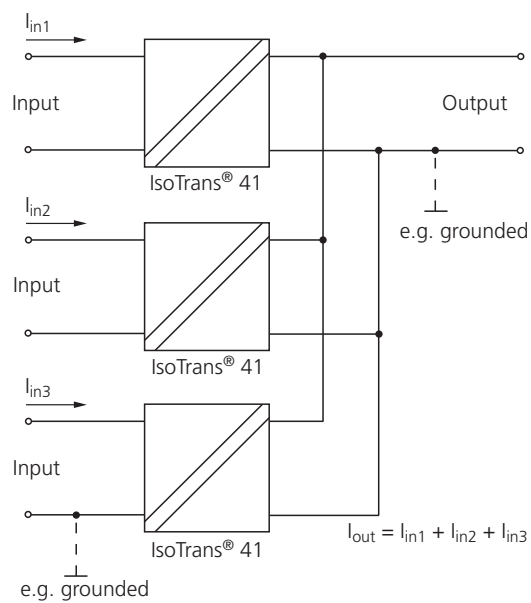
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Application Examples (continued)

Electrical isolation

for current addition with impressed currents



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Portable Meters

Laboratory Meters

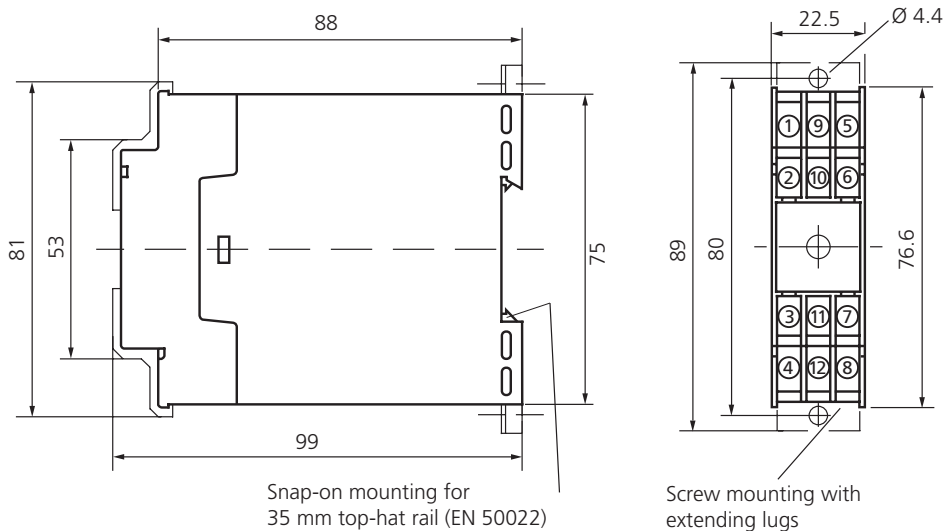
Sensors

Fittings

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■ Dimension Drawings and Terminal Assignments

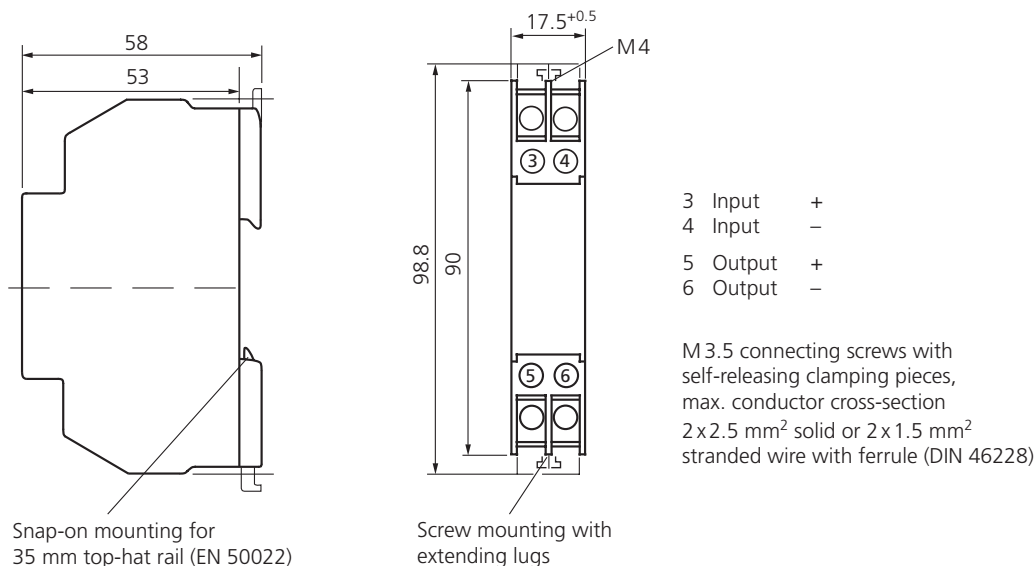
Type A2 Modular Housing



Channel 1	1 Input	+
	2 Input	-
	3 Output	-
	4 Output	+
Channel 2	5 Input	+
	6 Input	-
	7 Output	-
	8 Output	+
Channel 3	9 Input	+
	10 Input	-
	11 Output	-
	12 Output	+

M 2.5 x 8 connecting screws with self-releasing clamping pieces,
max. conductor cross-section 2 x 2.5 mm² solid or 2 x 1.5 mm² stranded wire with ferrule

Type A3 Modular Housing



All dimensions in mm!