

Modules

Knick >

IsoTrans® 41

**For isolation of
0 ... 20 mA standard signals.**

The Task

Galvanic isolation of measurement signals on circuit boards, cost cutting by means of minimum effort in series production.

The Problems

The application possibilities for loop-powered isolators are mainly defined by the following critical data:

- Voltage drop
- Operating current
- Accuracy
- Load voltage
- Signal delay
- Isolation voltage
- Dimensions

The Solution

Knick's IsoTrans® 41 isolator has unmatched technical specifications. The isolator draws its power as voltage drop from the measured signal without influencing it noticeably. This saves on supply units and cabling and increases the reliability accordingly.

The Housing

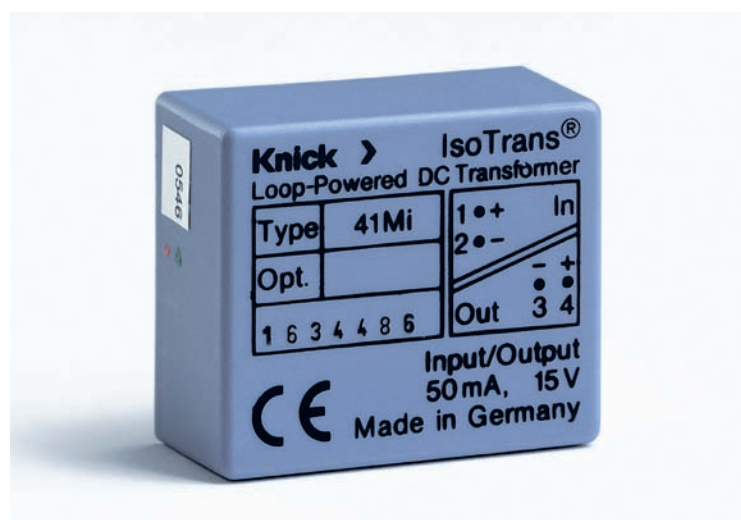
The full encapsulation guarantees maximum reliability even in extreme conditions.

The Advantages

The IsoTrans® 41 with a voltage drop of 1.2 V is the 1:1 isolator for all applications where loop-powered isolators are not suitable because of technical problems such as excessive voltage drop.

The Application

- Galvanic isolation
- of input and output circuits
 - of the supply voltage for 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



Loop-Powered Isolators for Standard Signals

Isolation Amplifiers
Transmitters

Indicators

Process Analytics

Portable Meters

Laboratory Meters

Sensors

Fittings



Knick >

The Technology

Knick's IsoTrans® 41 isolators with transformer isolation have specifications well beyond any other loop-powered isolators. They feature a chopper generator connected in series in the current path and current conversion which gradually changes from sine to square wave over the measuring range. 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 Facts

Minimum loading

Voltage drop from 1.2 V, current transmission from 2 µA to 50 mA

Good signal transmission

Low signal delay

No power supply required

Cost saving due to lower wiring effort, no mains influences

Maximum reliability

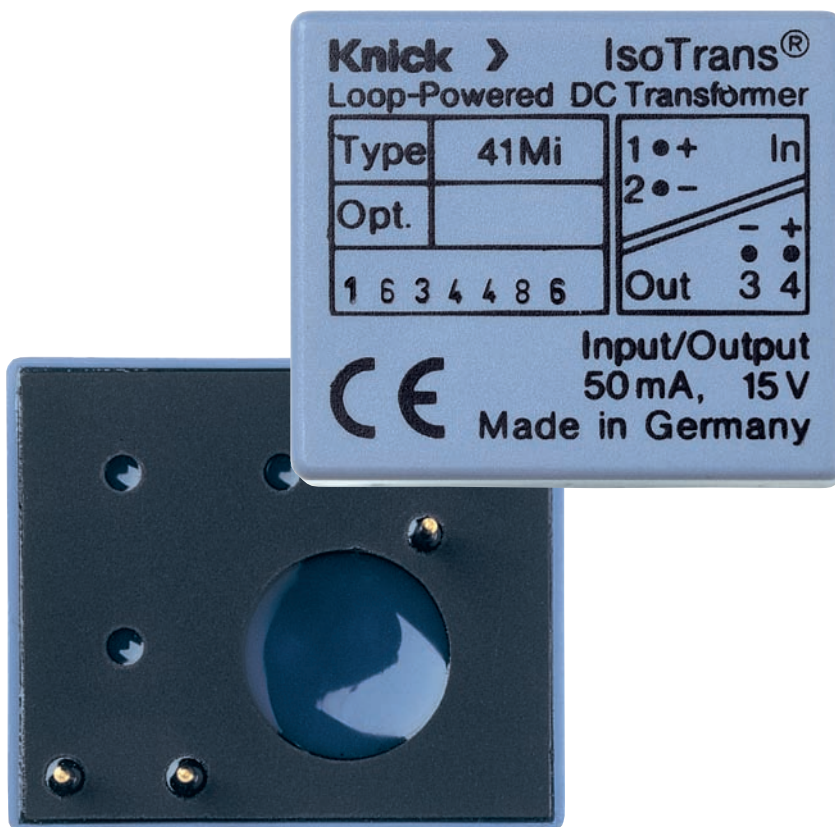
No repair and failure costs

Extremely high accuracy

5-year warranty

Warranty
5 years!

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



IsoTrans® 41

■ Product Line

Devices	Order No.
IsoTrans® 41	41 Mi
Power supply	
None, supply from input signal	

■ Specifications

Input data

Input	0 ... 20 mA 0 ... 50 mA
Operating current	< 2 µA
Overload	100 mA, 20 V
Voltage drop	Approx. 1.2 V (20 mA) Approx. 1.6 V (50 mA)

Output data

Output	0 ... 20 mA/max. 15 V (corresponds to 750 ohms load) 0 ... 50 mA/max. 15 V (corresponds to 300 ohms load)
Load error	< 0.02 % meas. val. per 100 ohms
Offset	< 5 µA
Residual ripple ¹⁾	< 1.5 mV _{pp} /mA

Transmission behavior

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

Isolation

Test voltage	2.5 kV AC
Working voltages (basic insulation)	500 V DC with overvoltage category II and pollution degree 4 according to EN 61010-1. For applications with high working voltages, you should ensure there is sufficient spacing or isolation from neighboring devices and protection against electric shocks.

1) Slightly increased residual ripple can occur with 5 ohms load

2) Temperature range -10 ... +70 °C

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Specifications (continued)

Standards and approvals

Surge withstand 5 kV, 1.2/50 μ s according to IEC 255-4

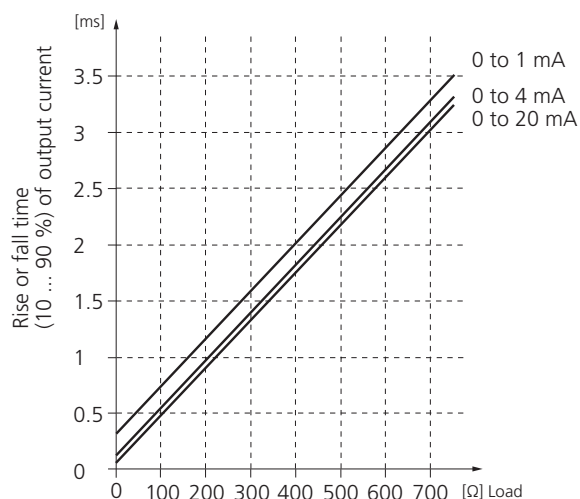
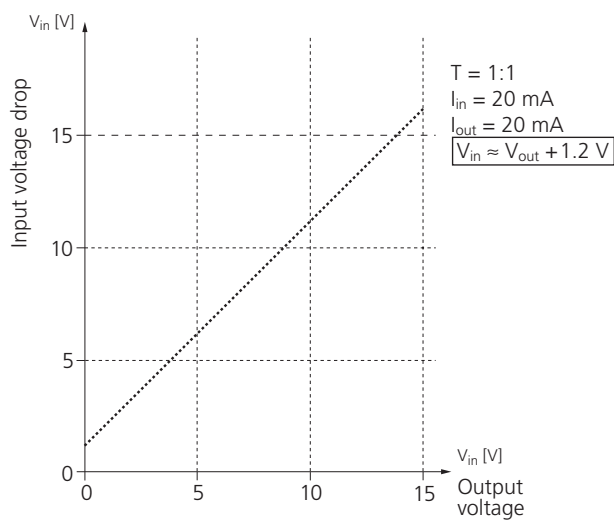
Immunity to interference 8 kV according to IEC 801-2

Other data

Ambient temperature -25 ... +80 °C

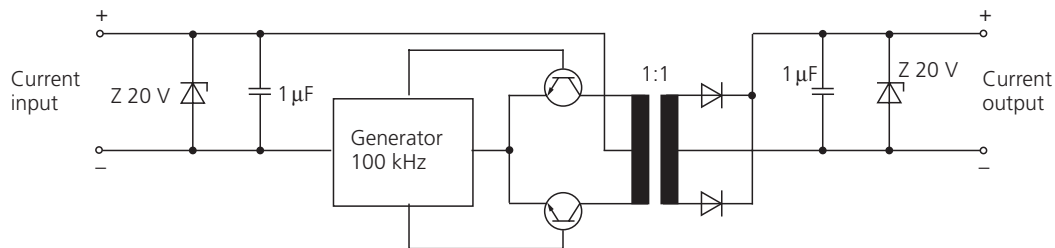
Design Mi module, height 16 mm, see also dimension drawings

Transfer Functions



IsoTrans® 41

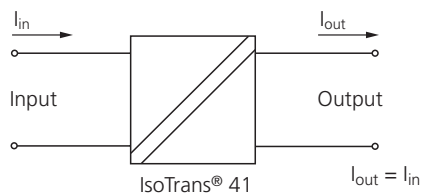
■ Block Diagram



■ Application Examples

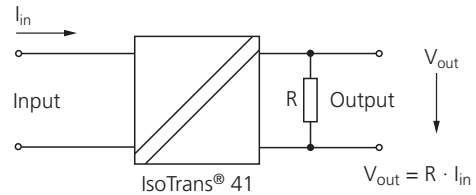
Electrical isolation

with impressed current, current output



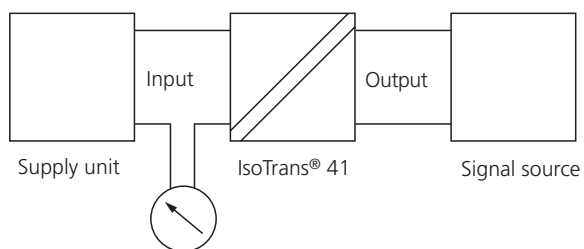
Electrical isolation

with impressed input current, voltage output



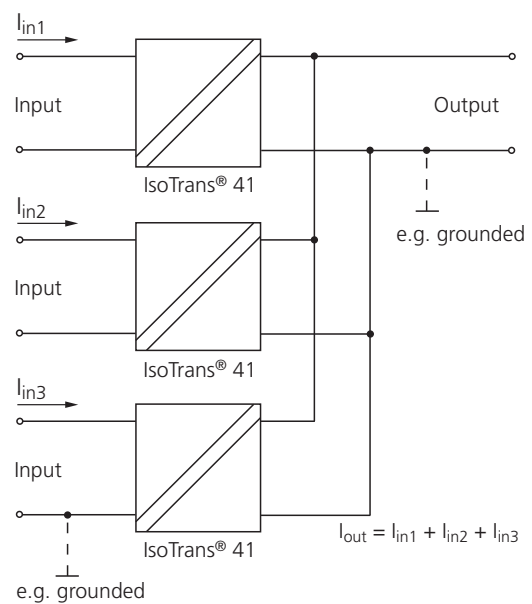
Electrical isolation

in two-wire connection



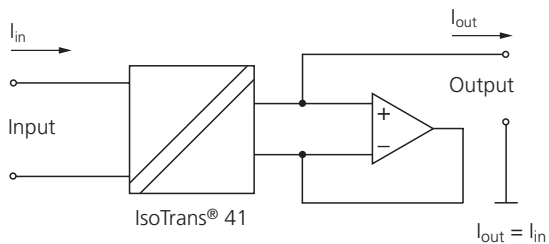
Electrical isolation

for current addition with impressed currents



Electrical isolation

in short-circuit operation, current output with respect to ground



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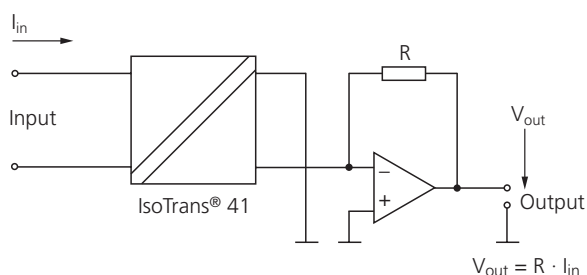
Fittings

Knick 

Application Examples (continued)

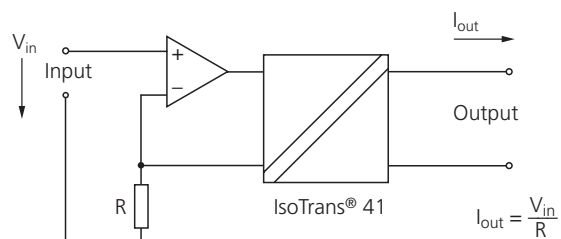
Electrical isolation

with impressed input current
and low-resistance voltage output



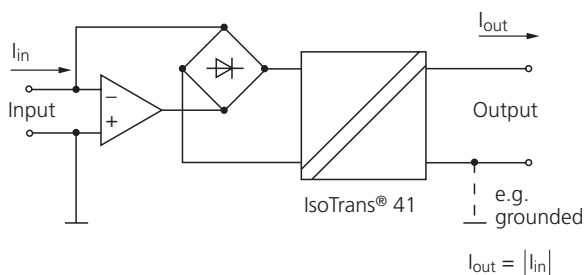
Electrical isolation

with high-resistance voltage input and
impressed output current



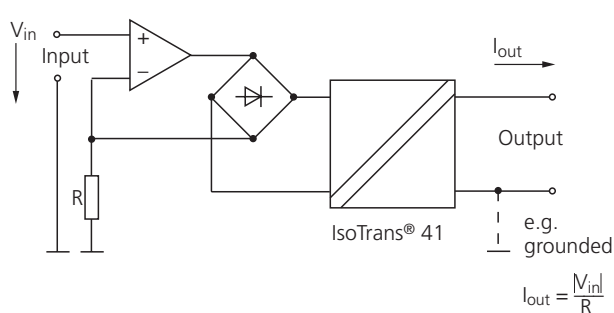
Electrical isolation

with precision full-wave rectification,
impressed input and output current

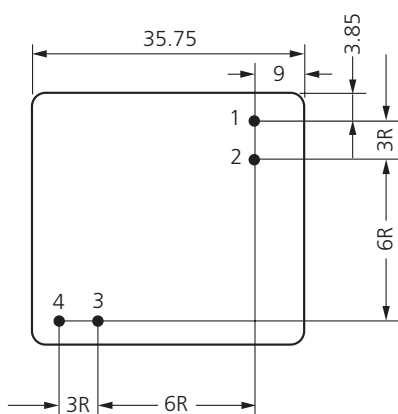


Electrical isolation

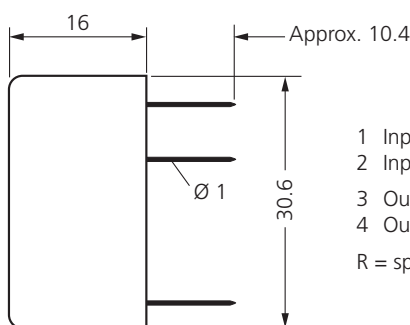
with precision rectification, high-resistance
voltage input, impressed output current



Dimension Drawings and Pin Assignments



Pin View



- 1 Input +
 - 2 Input -
 - 3 Output -
 - 4 Output +
- R = spacing = 2.54

All dimensions in mm!