

IsoTrans 41

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

The Task

If no power supply is available, the galvanic isolation of 0(4) ... 20 mA standard-current signals requires investing in power supplies.

The Problems

Many products only provide loop-powered isolation with an insufficient degree of accuracy. But the need for high measurement accuracy requires an isolator design which meets the highest demands.

The load capability of the 20 mA source is limited and therefore requires efficient use of the load voltage.

The Solution

The Knick IsoTrans 41 with transformer-based isolation offer properties which no other loop-powered DC isolator can even come close to. Thanks to the 0.2 % fault class and an internal voltage requirement of just 1.2 V, this isolator can be used for a broad range of applications.

The Housing

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

The full encapsulation guarantees maximum reliability even in extreme conditions.

The Advantages

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

The Technology

The devices 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 of even the lowest currents.

The Application

Galvanic isolation

- of input and output circuits
- of the supply voltage for 2-wire transmitters
- for the addition or other coupling of signals at different potentials
- to eliminate double-ground compensation currents
- when insulation and test voltage are insufficient
- of high-potential signal sources
- for battery-powered devices with a central battery

IsoTrans 41

Facts and Features

- **No power supply**
No mains influences
- **Extremely high accuracy**
- **Broad range of applications**
Current transmission from 2 μ A to 50 mA
- **Maximum reliability**
No unnecessary heating and therefore maximum service life of components
- **Marginal loading of measured signal**
Voltage drop of only 1.2 V
- **Low signal delay**
- **Space-saving thanks to multi-channel versions**
Modular housing with up to three channels
- **Quality ensured by computer-controlled testing**
- **5-year warranty**



Product Line

Device

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)

Order no.

41 A2 / 1
41 A2 / 2
41 A2 / 3

Power supply

None, supply from input signal

Specifications

Input data

Inputs

0(4) ... 20 mA
0 ... 50 mA

Min. operating current

< 2 μ A

Voltage drop

Approx. 1.2 V (20 mA)
Approx. 1.6 V (50 mA)

Overload capacity

100 mA, 20 V

Output data

Output

0(4) ... 20 mA /max. 15 V (corresponds to a 750 Ω load)
0 ... 50 mA /max. 15 V (corresponds to a 300 Ω load)

Offset

< 5 μ A

Residual ripple¹⁾

< 1.5 mV_{pp} / mA

Transmission behavior

Transformation error²⁾

0.02 % meas. val.

Load error

0.02 % meas. val. per 100 Ω

Rise / Fall time

Approx. 2.5 ms at 500 Ω load resistance

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 (for type 41 A2/3 across neighboring inputs and outputs with pollution degree 2 inside the housing, degree 3 outside).
For applications with high working voltages, take measures to prevent accidental contact and make sure that there is sufficient distance or insulation between adjacent devices.

IsoTrans 41

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

Further data

Ambient conditions	Indoor use ³⁾ ; relative humidity 5 ... 95 %, no condensation; max. altitude 2000 m (air pressure: 790 ... 1060 hPa) ⁴⁾
Ambient temperature	-25 ... +80 °C
Design	Modular housing, 22.5 mm wide, screw terminals See dimension drawings for further measurements
Ingress protection	Protection with terminal covers according to DIN 40050: housing: IP 40, terminals: IP 20
Mounting	Snap-on mounting for 35 mm DIN rail according to EN 60715 or M4 screw mounting
Connection	Connecting screws M 2.5 x 8 with self-lifting clamps, max. conductor cross section 2 x 2.5 mm ² solid or 2 x 1.5 mm ² stranded with ferrule
Weight	41 A2 / 1: approx. 140 g 41 A2 / 2: approx. 190 g 41 A2 / 3: approx. 210 g

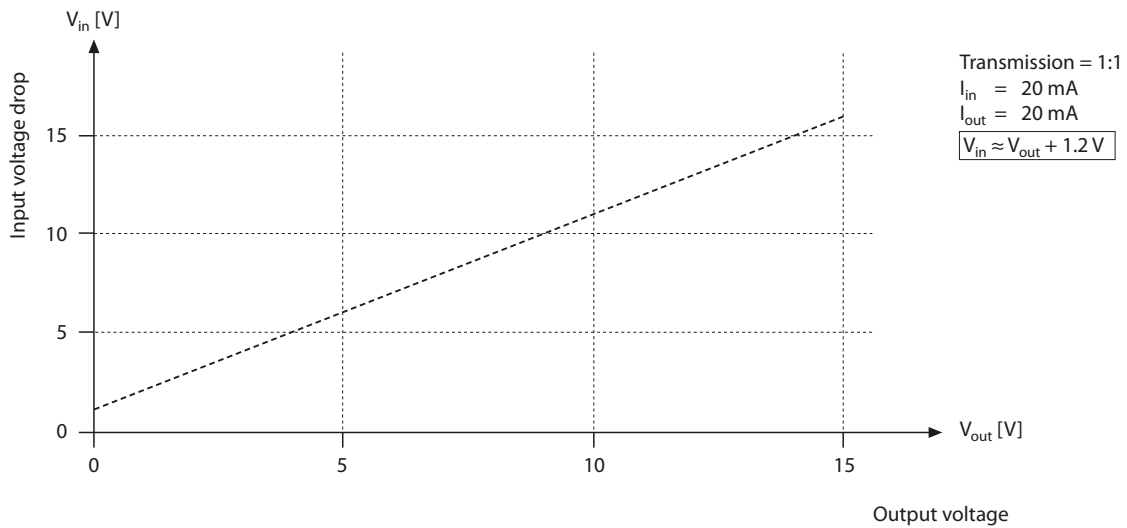
¹⁾ Slightly increased residual ripple can occur with loads < 5 ohms

²⁾ Temperature range -10 ... +70 °C

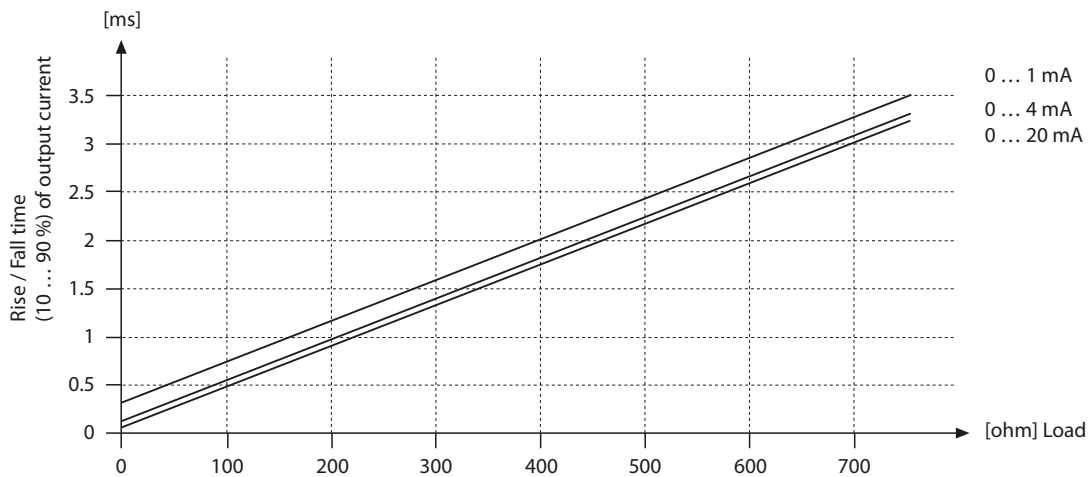
³⁾ Closed, weather-protected operating areas (stationary operation), water or wind-driven precipitation (rain, snow, hail, etc.) excluded

⁴⁾ Lower air pressure reduces the allowable working voltages.

Transfer Function

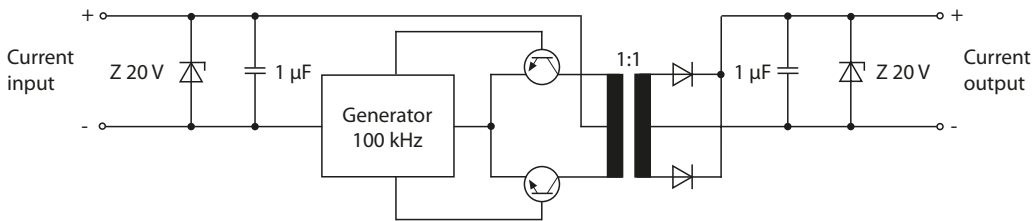


Response to Square Step of Input Current



IsoTrans 41

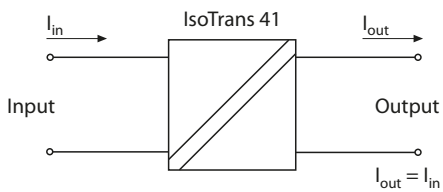
Block Diagram



Typical Applications

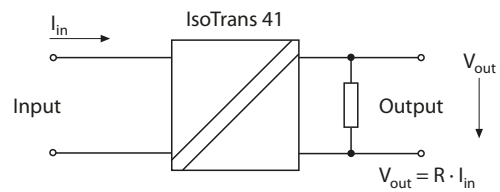
Potential isolation

with impressed current, current output



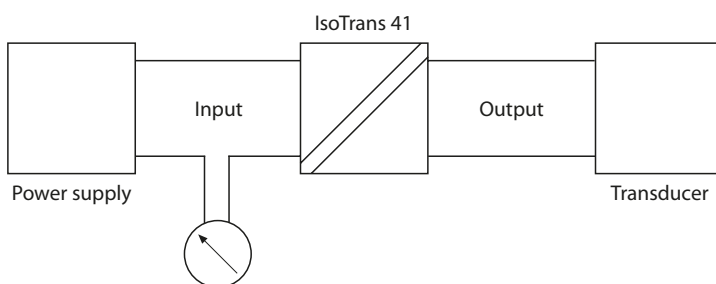
Potential isolation

with impressed input current, voltage output



Potential isolation

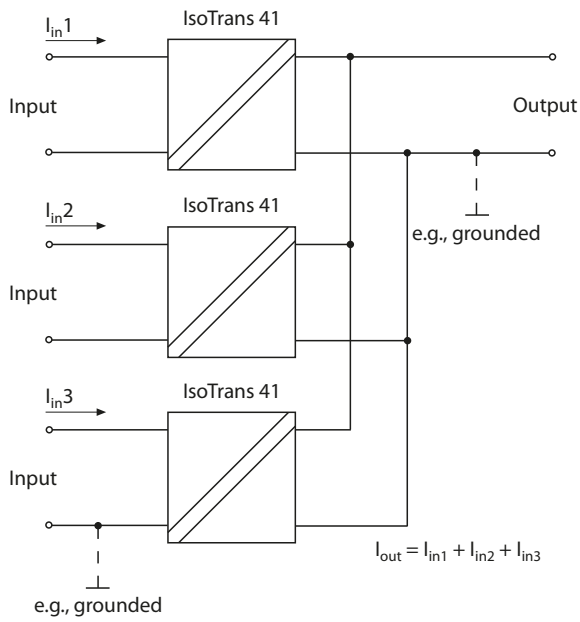
in two-wire systems



Typical Applications (continued)

Potential isolation

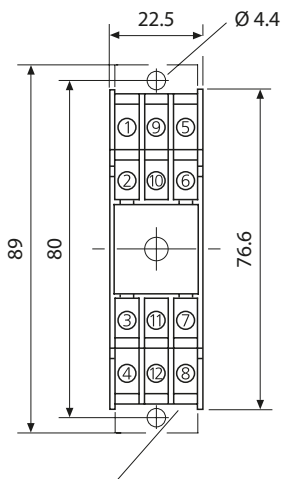
for current addition with impressed currents



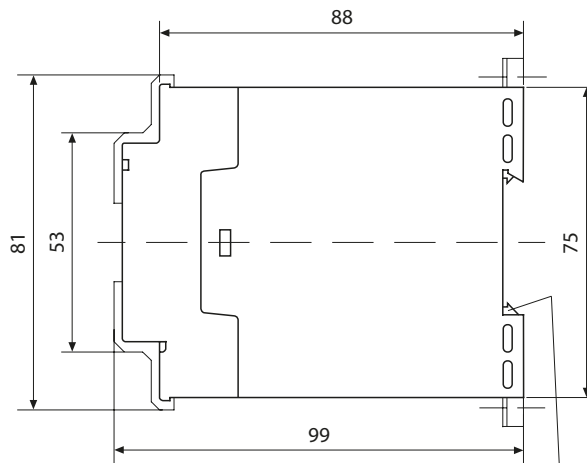
IsoTrans 41

Dimension Drawings and Terminal Assignments

Modular housing type A2



Screw mounting with extendable lugs



Snap-on mounting on 35-mm DIN rail to EN 60715

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 screw terminals with self-lifting clamps, max. conductor cross section 2 x 2.5 mm² solid or 2 x 1.5 mm² stranded with ferrule

All dimensions in mm