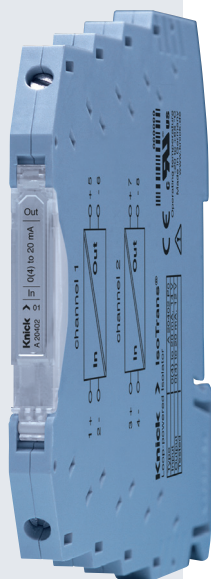


# Loop-Powered Isolators for Standard Signals



## IsoTrans A 20400

The first decoupled passive isolator with load stop function to provide protective separation of 0(4) ... 20 mA.

### The Task

Measurement signals between sensor and controller should be galvanically isolated to ensure reliable and safe operation of the installation. Here, loop-powered standard signal isolators are a low-cost solution. There is no expenditure for power supply units and the associated wiring.

### The Problems

are often, particularly in large plants, the lack of space for mounting the isolators and the increasing operating temperatures in distributors and switch cabinets.

### The Solution

from Knick are the advanced series loop-powered isolators IsoTrans A 20400. Thanks to an extremely high packing density of up to 320 channels per meter of mounting rail and outstanding technical properties such as protective separation, these isolators leave the competition in the dust - even when it comes to the price-performance ratio!

### The Housing

The ultra-slim 6 mm wide modular housing for one or two channels allows for simple and fast installation.

### The Functional Principle

The IsoTrans A 20400 draws its power as a voltage drop directly from the measurement signal without falsifying it. There are no costs for a power supply and wiring. The IsoTrans A 20400 has virtually no self-heating that would cause the electronic components to age faster. Together with a patented circuit design, this means maximum reliability.

The consequence of this extraordinary long service life: 5 years warranty!

### The Technology

A transmission error of just 0.1%, excellent square-wave response and very low residual ripple guarantee perfect signal transmission. The low internal voltage drop of approx. 1.7 V only loads the signal slightly.

The high test voltage up to 2.5 kV and protective separation up to 300 V according to EN 61140 protect the operating personnel against, for example, the mains voltage.

### Interference-Free Functionality

Now, Knick has considerably expanded the application possibilities of passive isolators by implementing a load stop function. Here, the current supplied at the primary side is maintained independently from the output load. Thus, for the first time any excessive load increase at the output, such as caused by line breakage or inconstant loads including complex impedances, can be compensated for.

For up-to-date information, please visit [www.knick.de](http://www.knick.de)

**Knick** >

**The Facts**

- **Extremely compact design**  
Up to 320 channels per meter
- **1- and 2-channel versions**  
Low-cost and flexible for a wide range of applications
- **Galvanic isolation** between input and output protects against incorrect measurements or damage to the equipment due to parasitic voltages
- **Protective separation up to 300 V AC/DC according to EN 61140** to protect personnel and equipment
- **Load stop function prevents feedback**  
e.g. in the case of an open output circuit
- **No power supply required**  
Cost savings due to lower wiring requirements, no mains interference, no unnecessary heating and therefore maximum service life of components
- **High accuracy**  
No distortion of the measurement signal
- **Maximum reliability**  
No repair or failure costs
- **International use**  
UL / CSA approvals
- **5-year warranty**

**Warranty**  
**5 years!**

Warranty  
*Defects occurring within 5 years from delivery date shall be remedied free of charge at our plant (carriage and insurance paid by sender).*



# Loop-Powered Isolators for Standard Signals

## IsoTrans A 20400

### Product Line

Device		Order No.
IsoTrans A 20400	1-channel, P0 modular housing (width: 6 mm)	A 20401 P0
	2-channel, P0 modular housing (width: 6 mm)	A 20402 P0
	1-channel, P0 modular housing (width: 6 mm), with load stop	A 20411 P0
	2-channel, P0 modular housing (width: 6 mm), with load stop	A 20412 P0

### Power supply

None, supply from input signal

### Specifications

Input data	A 20401 and A 20402 (without load stop)	A 20411 and A 20412 (with load stop)
Input	0(4) ... 20 mA / max. 18 V	0(4) ... 20 mA / max. 3 V
Operating current	approx. 150 $\mu$ A	approx. 150 $\mu$ A
Voltage drop	approx. 1.7 V at 20 mA	approx. 1.5 V at 20 mA
Overload capacity	40 mA, 18 V	50 mA, 3 V
Output data		
Output	0(4) ... 20 mA / max. 12 V (600 ohms load at 20 mA)	0(4) ... 20 mA / max. 1.2 V (60 ohms load at 20 mA)
Residual ripple	< 10 mV <sub>rms</sub>	
Transmission behavior		
Transmission error	< 0.1 % full scale	
Load error	< 0.05 % meas. val. per 100 ohms	negligible
Response time (T <sub>99</sub> )	approx. 5 ms at 500 ohm load	approx. 5 ms at 60 ohm load
Temperature coefficient <sup>1)</sup>	< 0.002 %/K of meas. val. per 100 ohm load (reference temperature 23 °C)	< 0.002 %/K full scale (reference temp. 23 °C)

**Specifications** (continued)

**Isolation**

Test voltage	2.5 kV AC
Working voltage (basic insulation)	up to 600 V AC/DC at overvoltage category II and pollution degree 2, between input and output of the same channel and channels against one another
Protection against electric shock	Protective separation according to EN 61140 by reinforced insulation according to EN 61010-1. Working voltage up to 300 V AC/DC at overvoltage category II and pollution degree 2 between input and output of the same channel and channels against one another. For applications with high working voltages, ensure there is sufficient spacing or isolation from neighboring devices and protection against electric shocks.

**Standards and approvals**

EMC <sup>2)</sup>	Product family standard: EN 61326 Emitted interference: Class B Immunity to interference: Industry
Approvals	cUL: Standards: UL 508 and CAN/CSA 22.2 No. 14-95 GL: No. 32650-06 HH

**Further data**

MTBF <sup>3)</sup>	Approx. 1031 years/channel
Chopper frequency	Approx. 100 kHz
Ambient temperature	Operation: -20 ... +65 °C Transport and storage: -25 ... +85 °C
Design	Modular housing with screw terminals, 6.2 mm wide See dimension drawings for further measurements
Ingress protection	IP 20
Mounting	For 35-mm top-hat rail (EN 50022)
Weight	Approx. 50 g

<sup>1)</sup> Average TC in the specified operating temperature range -20 ... +65 °C

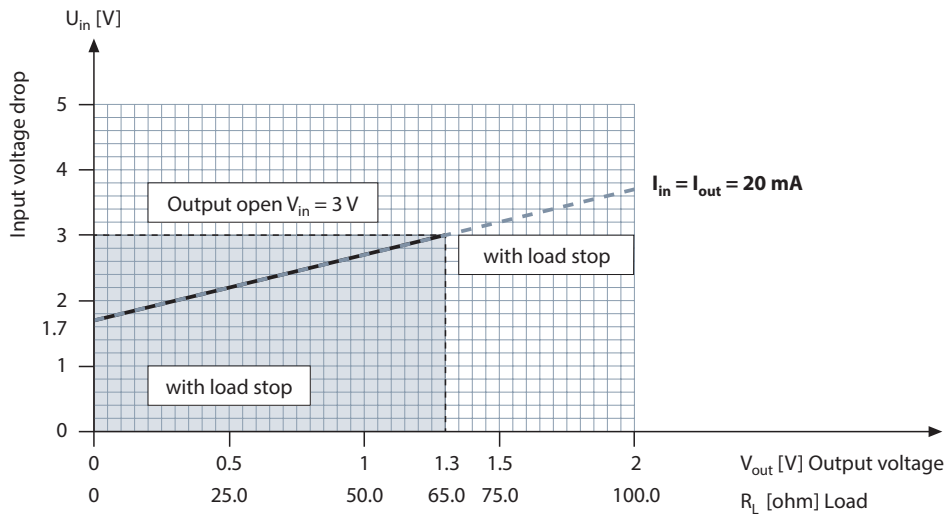
<sup>2)</sup> Applies to 4 ... 20 mA, slight deviations are possible while there is interference

<sup>3)</sup> Mean Time Between Failures – MTBF – according to EN 61709 (SN 29500). Conditions: stationary operation in well-kept rooms, average ambient temperature 40 °C, no ventilation, continuous operation

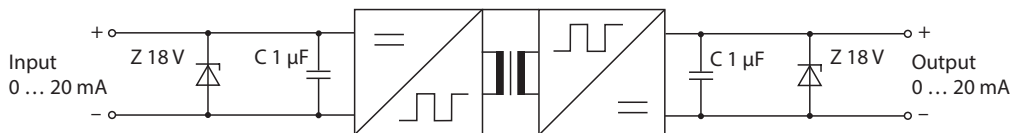
# Loop-Powered Isolators for Standard Signals

## IsoTrans A 20400

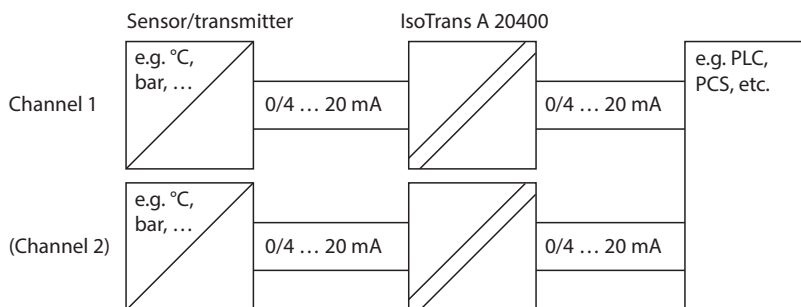
### Transfer Function with Load Stop



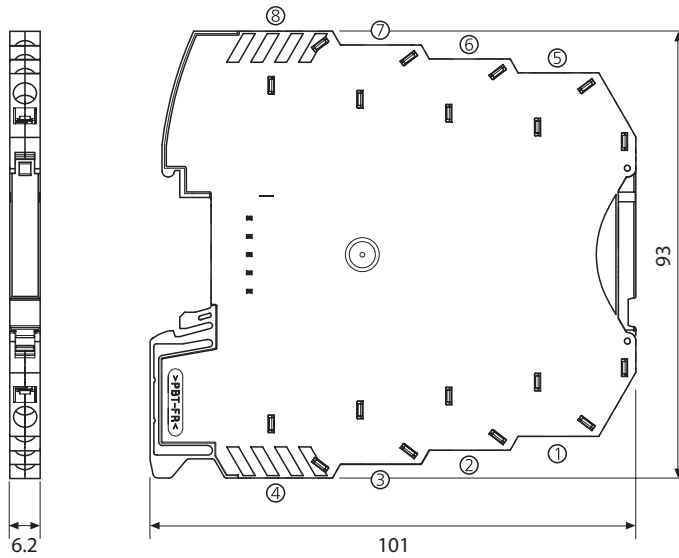
### Block Diagram



### Typical Application



## Dimension Drawings and Terminal Assignments



### Terminal assignments

- |   |          |   |
|---|----------|---|
| 1 | Input 1  | + |
| 2 | Input 1  | - |
| 3 | Input 2  | + |
| 4 | Input 2  | - |
| 5 | Output 1 | + |
| 6 | Output 1 | - |
| 7 | Output 2 | + |
| 8 | Output 2 | - |

### Conductor cross-sections:

- |               |                             |
|---------------|-----------------------------|
| single wire   | 0.2 ... 2.5 mm <sup>2</sup> |
| stranded wire | 0.2 ... 2.5 mm <sup>2</sup> |
|               | 24-14 AWG                   |

All dimensions in mm