IsoTrans 36/37

For hazardous/safe area separation of 0 … 20 mA standard signals without power supply.

The Task
Hazardous area normally means systems in continuous operation that require highly reliable components. Signal transmission to the controller outside the hazardous area must be very accurate to ensure optimal process control.

The Problems
Often, complex systems with power supplies are used for reliable hazardous/safe area separation combined with electrical isolation to prevent measurement errors.

The Solution
Knick loop-powered isolators for 0 ... 20 mA signal transmission. These modules are available as hazardous-area input and hazardous-area output isolators. Due to their patented design (German patent 3526997), they are considered to be the most reliable solution for isolating standard signals without an external power supply.

The Advantages
The IsoTrans 36 and 37 isolators are not only suitable as highly reliable isolators for normal applications, they also meet the most stringent requirements that can be set for electrical isolation. There is no need for power supply wiring.

The Technology
The pioneering TransShield technology allows specifications that were previously considered to be unattainable:

– Extremely high accuracy
– Protective separation, transient protection
– 10 kV test voltage (optional)
– High electromagnetic compatibility
– Extremely low residual ripple and common-mode interference
– Excellent pulse formation
– High transmission accuracy
– SMART transmission
– Hazardous/safe area separation

In addition to the analog signals, they also transmit data protocols for SMART transmitters (HART). They allow for bidirectional communication from every point of the wiring.

Special model available!
Measure voltage without a power supply.
Voltages in the range from 250 to 1200 V DC can be converted into current signals up to 5 mA using a special loop-powered version of this isolator. As an example, this allows for easy checking of the contact wire voltage. Please contact us if you need detailed information on this special model.

The Facts

- **Galvanic isolation between input and output signal**
  Protection against measuring errors caused by grounding problems and parasitic interference voltages
- **No power supply required**
  Cost savings due to lower wiring effort, no mains interference
- **Very low residual ripple**
  No interference of the connected measuring or control system
- **Explosion protection according to ATEX**
- **High transmission accuracy**
  Excellent pulse formation due to exact transmission of the measured values
- **Very low common-mode interference**
  Prevention of incorrect measurements or failures caused by interference
- **Maximum reliability**
  No repair or failure costs
- **10 kV test voltage**
  (optional)
- **Protective separation according to EN 61140**
  Protection of the maintenance staff and subsequent devices against excessively high voltages
- **SMART transmission**
  Bi-directional point-to-point transmission of digital data according to the HART specification
- **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).

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Product Line

Devices		Order no.
IsoTrans 36	Input intrinsically safe	**36 A7**
IsoTrans 37	Output intrinsically safe	**37 A7**
IsoTrans 36 A9, special model	Passive voltage measurement, details upon request	**36 A9-xxx**

Power supply

None, supply from input signal

Options	Order No.
Increased test voltage 10 kV AC	**471**

Specifications

Input data	36 A7	37 A7
Input[1)]	0 … 20 mA, intrinsically safe	0 … 20 mA
Operating current	≤ 20 µA	
Overload capacity	50 mA	
Voltage drop	approx. 4.5 V at 20 mA[2)]	approx. 4 V at 20 mA
Output data		
Output	0 … 20 mA, max. 10 V corresponds to a 500 ohm load)	0 … 20 mA, max. 20 V, intrinsically safe (corresponds to a 1000 ohm load)
Load error	< 0.15 % meas. val. per 100 ohm load	
Offset	< 20 µA	
Residual ripple V_{rms}	< 10 mV at 20 mA and 500 ohm load	
Transmission behavior		
Transmission error	0.2 % meas. val.	
Rise or fall time	≤ 400 µs at 500 ohm load (10 … 90 %, jump from 0 … 20 mA or 20 … 0 mA)	
HART attenuation	< 10 dB	

Specifications (continued)

Isolation

Test voltage	4.4 kV AC 10 kV AC with option 471
Working voltages (basic insulation)	3600 V AC/DC, 2500 V AC[3] at overvoltage category II and pollution degree 2 according to EN 61010-1. For applications with high working voltages, ensure there is sufficient spacing or isolation from neighboring devices and protection against electric shocks. Permissible working voltages for other overvoltage categories and pollution degrees on request. When used in hazardous areas, the max. working voltage is 250 V.
Protection against electric shock	Protective separation according to EN 61140 by reinforced insulation according to EN 61010-1. Working voltages with overvoltage category II and pollution degree 2: 600 V AC/DC For applications with high working voltages, ensure there is sufficient spacing or isolation from neighboring devices and protection against electric shocks. When used in hazardous areas, the max. working voltage is 250 V.

Standards and approvals	**36 A7**	**37 A7**
Explosion protection	II (1) G [EEx ia] IIC, intrinsically safe input PTB 02 ATEX 2134 see the type examination certificate for further information	II (2) G [EEx ib] IIC, intrinsically safe output PTB 02 ATEX 2063
EMC[4]	89/536/EEC NAMUR NE 21, EN 61326	

Further data

Ambient temperature	Operation: -10 … +50 °C Transport and storage: -30 … +80 °C
Design	Modular housing, 22.5 mm wide, screw terminals See dimension drawings for further measurements
Ingress protection	Housing: IP 20, terminals: IP 20
Mounting	Snap-on mounting for 35 mm mounting rail according to EN 50022 See dimension drawing for conductor cross-section
Weight	Approx. 120 g

[1] linear transmission of IsoTrans 36 to 50 mA, IsoTrans 37 to 22 mA
[2] approx. 8.5 V at 50 mA
[3] for circuits according to table 6 from EN 61010-1 (fast transients 2600 V)
[4] over the range of 1 mA to 20 mA

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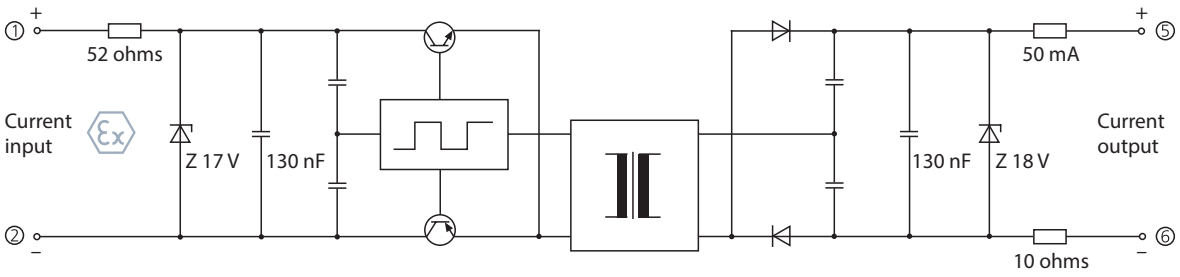
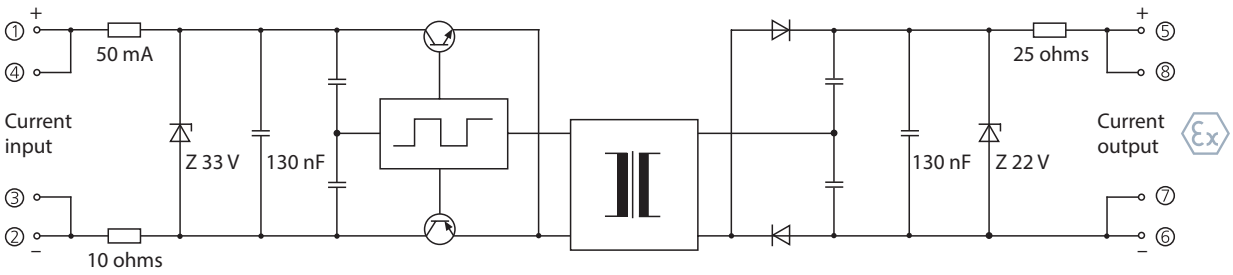
Block Diagrams

IsoTrans 36 A7

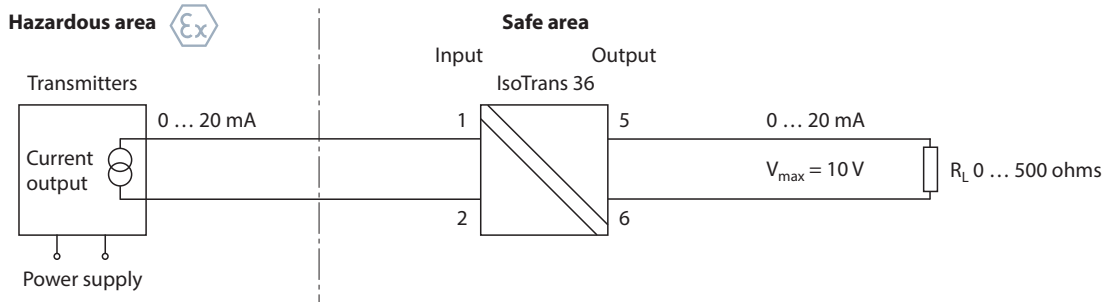


IsoTrans 37 A7



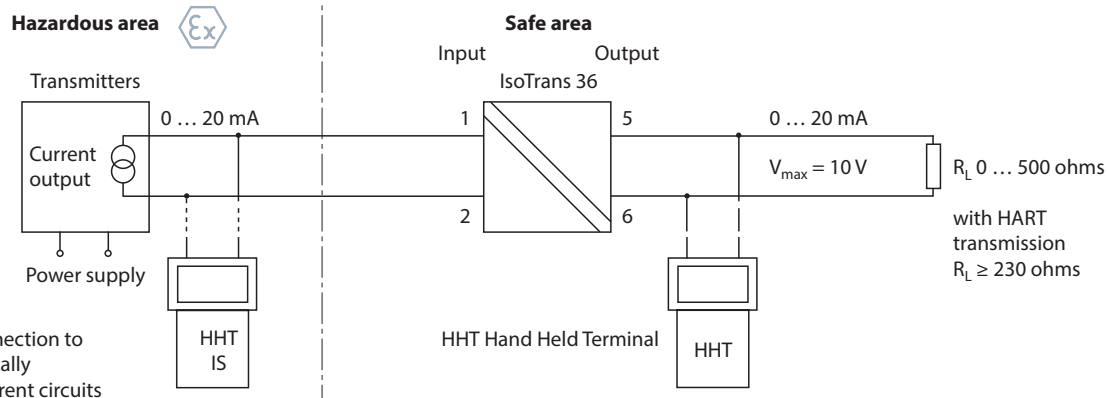
Typical Applications IsoTrans 36 A7

Without HART communication



for connection to intrinsically safe current circuits with the following maximum values:
I ≤ 100 mAP ≤ 1.1 W
C_I ineffective L_I ineffective

With HART communication



for connection to intrinsically safe current circuits with the following maximum values:
I ≤ 100 mA P ≤ 1.1 W
C_I ineffective L_I ineffective

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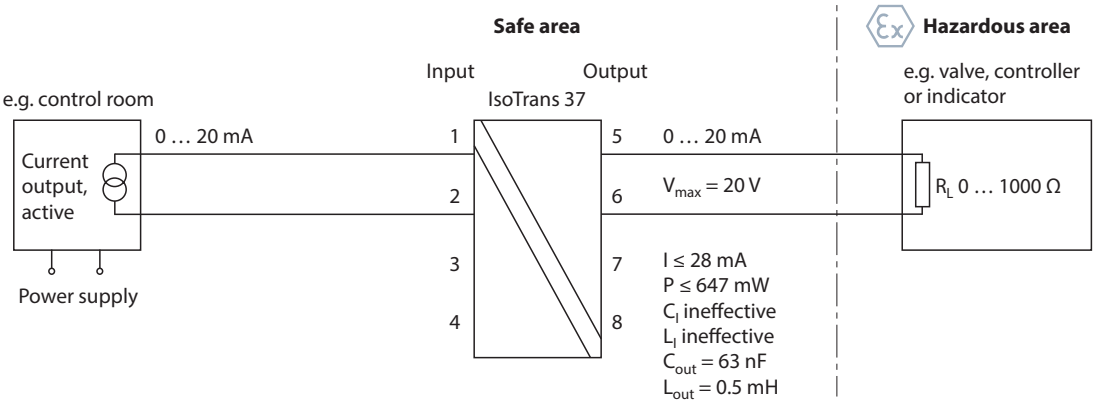
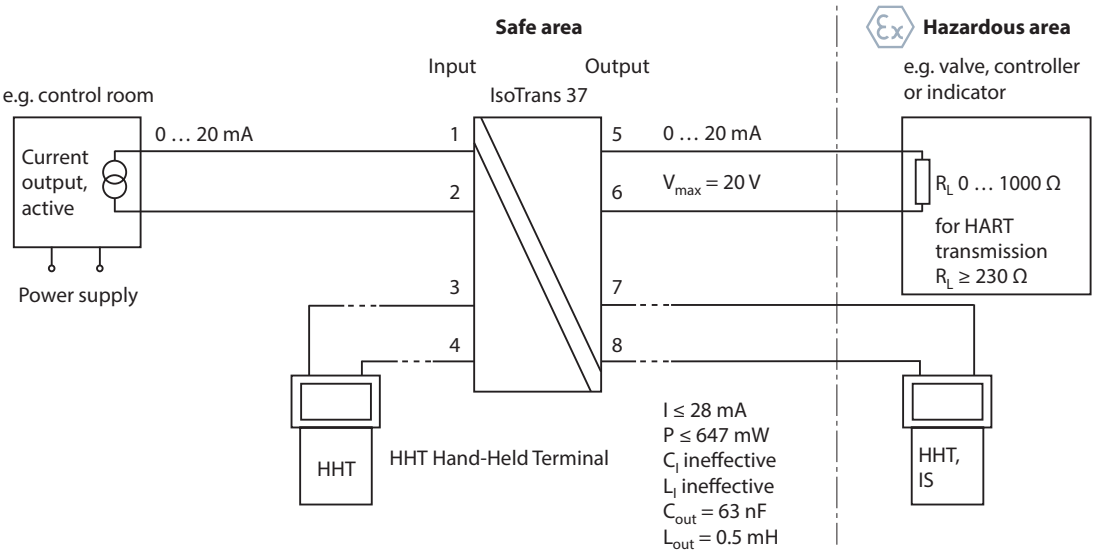
Typical Applications IsoTrans 37 A7 (continued)

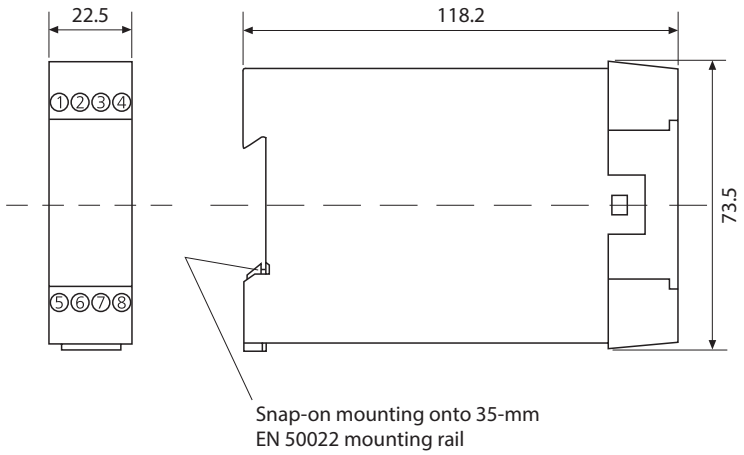
Without HART communication



With HART communication



Dimension Drawings and Terminal Assignments



All dimensions in mm

IsoTrans 36 A7

1 Input +
2 Input –

5 Output +
6 Output –

IsoTrans 37 A7

1 Input +
2 Input –

3 HHT not intrinsically safe
4 HHT not intrinsically safe

5 Output +
6 Output –

7 HHT intrinsically safe
8 HHT intrinsically safe

HHT = Hand-Held Terminal

Captive terminal screws M 3 x 8
Box-type terminals with self-raising wire protection, max. conductor cross section
1 x 4 mm² solid;
1 x 2.5 mm² stranded with ferrule;
2 x 1.5 mm² stranded with ferrule

Only trained personnel should perform installation, commissioning and maintenance!