

# Modular Housings

**Knick** ➤

**The reasonably priced alternative for standard industrial applications. Standard-signal isolators with calibrated range selection.**

## The Task

Guaranteeing reliable and safe system operation requires galvanic isolation between sensors and controller (e.g. PCS, DCS etc.).

## The Problems

In particular with large-scale systems, the difficulties often lie in the financial pressure in addition to the lack of space for mounting the isolators. Up to now, low-cost single-range isolators have, however, caused relatively high purchase, logistics, and storage costs, for example, also for stocking of spare parts.

## The Solution

The calibrated switching of the input and output ranges allows the VariTrans® B 13000 basic low-cost standard-signal isolators to be used universally – without complicated readjustment. The settings are made simply using DIP switches.

## VariTrans® B 13000

## The Housing

The modular housing, just 12.5 mm in width, can also withstand high mechanical loads. The housing is easy to open providing access to the setting elements.

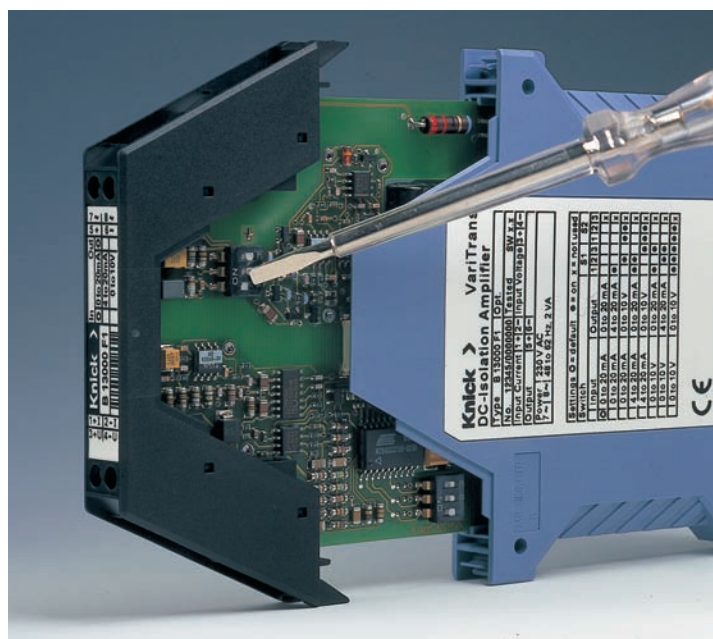
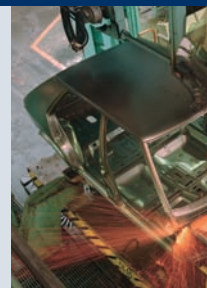
## The Advantages

The analog transmission of the measurement signal with transformer isolation and the new digitally controlled range selection guarantee troublefree use in all standard industrial applications.

## The Technology

A microcontroller monitors the control element settings and controls the calibrated range selection. Interference to the signal transmission – for example, due to contact resistance in the range switch – is thus ruled out.

The integrated power supply is configured for 230 V AC or 24 V AC/DC. The extremely low power consumption and the related minimal self-heating significantly increase reliability. The consequence: a 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).*

# Isolation Amplifiers for Standard Signals

Isolation Amplifiers  
Transmitters

Indicators

Process Analytics

Portable Meters

Laboratory Meters

Sensors

Fittings

**Knick** ➤

## ■ The Facts

### Flexible and accurate

Calibrated range selection without complicated readjustment

### Low-cost

The competitively priced solution for standard applications; considerable reduction in purchasing, logistics, and storage costs, for example for stocking of spare parts.

### Extremely compact design

12.5 mm modular housing; up to 80 active isolators per meter of mounting rail

### Fast and easy configuration

Housing simple to open

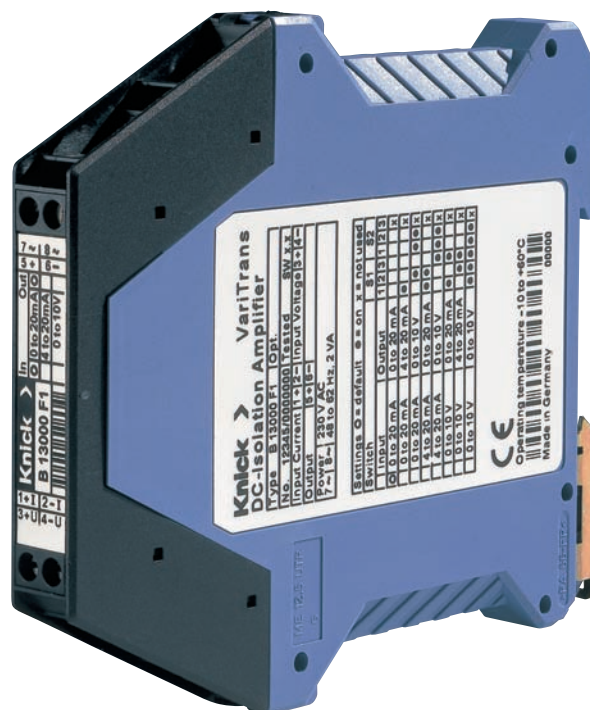
### 3-port isolation

Protection against incorrect measurements or damage

### Maximum reliability

No repair and failure costs

### 5-year warranty



# Modular Housings

## VariTrans® B 13000

### ■ Product Line

| Devices                                                         | Input                                                                                                                            | Output                                                                                                                           | Order No.                                                                                                                  |
|-----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| VariTrans® B 13000<br>Input and output<br>calibrated switchable | 0 ... 20 mA,<br>4 ... 20 mA,<br>0 ... 10 V                                                                                       | 0 ... 20 mA,<br>4 ... 20 mA,<br>0 ... 10 V                                                                                       | B 13000 F1                                                                                                                 |
| VariTrans® B 13000<br>with fixed settings                       | 0 ... 20 mA<br>0 ... 20 mA<br>0 ... 20 mA<br>4 ... 20 mA<br>4 ... 20 mA<br>4 ... 20 mA<br>0 ... 10 V<br>0 ... 10 V<br>0 ... 10 V | 0 ... 20 mA<br>4 ... 20 mA<br>0 ... 10 V<br>0 ... 20 mA<br>4 ... 20 mA<br>0 ... 10 V<br>0 ... 20 mA<br>4 ... 20 mA<br>0 ... 10 V | B 13016 F1<br>B 13017 F1<br>B 13018 F1<br>B 13026 F1<br>B 13016 F1<br>B 13028 F1<br>B 13036 F1<br>B 13037 F1<br>B 13038 F1 |
| Power supply                                                    |                                                                                                                                  |                                                                                                                                  |                                                                                                                            |
| 230 V AC                                                        |                                                                                                                                  |                                                                                                                                  |                                                                                                                            |
| 24 V AC/DC                                                      |                                                                                                                                  |                                                                                                                                  | 336                                                                                                                        |

### ■ Specifications

#### Input data

|                  |                                          |                                                                                                       |
|------------------|------------------------------------------|-------------------------------------------------------------------------------------------------------|
| Inputs           | 0 ... 20 mA<br>4 ... 20 mA<br>0 ... 10 V | Terminal selectable/switchable (factory setting 0 ... 20 mA)<br>or fixed settings (see Product line)  |
| Input resistance | Current input<br>Voltage input           | Voltage drop approx. 500 mV at 20 mA<br>Approx. 1 Mohm                                                |
| Overload         | Current input<br>Voltage input           | ≤ 300 mA<br>Voltage limitation with suppressor diode 30 V,<br>max. permitted continuous current 30 mA |

#### Output data

|                                                                              |                                          |                                                                                  |
|------------------------------------------------------------------------------|------------------------------------------|----------------------------------------------------------------------------------|
| Outputs                                                                      | 0 ... 20 mA<br>4 ... 20 mA<br>0 ... 10 V | Switchable (factory setting 0 ... 20 mA)<br>or fixed settings (see Product line) |
| (Transmission of negative measurement signals up to approx. -5 % full scale) |                                          |                                                                                  |

# Isolation Amplifiers for Standard Signals

Isolation Amplifiers  
Transmitters

Indicators

Process Analytics

Portable Meters

Laboratory Meters

Sensors

Fittings

**Knick** 

## Specifications (continued)

### Output data (continued)

|                 |                                                                                                                                        |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Load            | With output current $\leq 10 \text{ V}$ (500 ohms at 20 mA)<br>With output voltage $\leq 10 \text{ mA}$ (1 kohm at 10 V) <sup>1)</sup> |
| Offset          | 20 $\mu\text{A}$ or 10 mV                                                                                                              |
| Residual ripple | $< 20 \text{ mV}_{\text{rms}}$                                                                                                         |

### Transmission behavior

|                                       |                                                    |
|---------------------------------------|----------------------------------------------------|
| Gain error                            | $< 0.4 \%$ meas.val. (DC)                          |
| Cut-off frequency                     | $> 1 \text{ kHz}$ , $-3 \text{ dB}$                |
| Temperature coefficient <sup>2)</sup> | 0.015 %/K full scale (reference temperature 23 °C) |

### Power supply

|              |                                                                                            |
|--------------|--------------------------------------------------------------------------------------------|
| Power supply | 230 V AC, $-15 \%$ $+10 \%$ , 48 ... 62 Hz, approx. 2 VA                                   |
| Option 336:  | 24 V AC/DC AC: $\pm 15 \%$ , 48 ... 62 Hz, approx. 2 VA<br>DC: $\pm 15 \%$ , approx. 0.9 W |

### Isolation

|                                       |                                                                                                                                                                                                                                                                      |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Galvanic isolation                    | 3-port isolation between input, output and power supply                                                                                                                                                                                                              |
| Test voltage                          | 3.25 kV AC input against output against power supply                                                                                                                                                                                                                 |
| Working voltage<br>(basic insulation) | 600 V AC/DC with overvoltage category II and pollution degree 2 according to EN 61010-1.<br>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 $\mu\text{s}$ , according to IEC 255-4                                           |
| EMC <sup>3)</sup> | 89/336/EEC directive; EN 61326                                                                |
| Approvals         | CUL: File No. E 216767, Standards UL 3101-1, CSA-C22.2-95, No. 10101-1<br>GL: No. 14627-99 HH |

1) Higher voltage output load on request

2) Average TC in specified operating temperature range  $-10 \text{ °C}$  ...  $+60 \text{ °C}$

3) Slight deviations are possible while there is interference

# Modular Housings

## VariTrans® B 13000

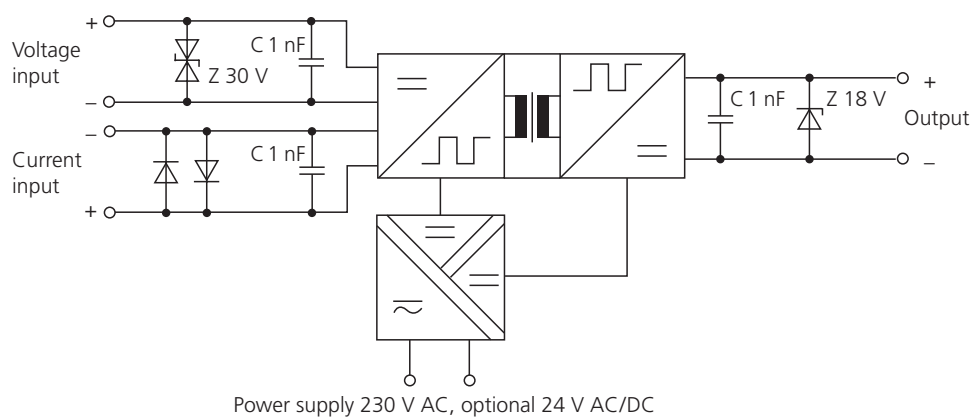
### Specifications (continued)

#### Other data

|                     |                                                                                                               |
|---------------------|---------------------------------------------------------------------------------------------------------------|
| MTBF <sup>4)</sup>  | Approx. 91 years                                                                                              |
| Ambient temperature | Operation: -10 ... +60 °C<br>Transport and storage: -20 ... +85 °C                                            |
| Design              | Modular housing type F1, with screw terminals, width 12.5 mm, see dimension drawings for further measurements |
| Ingress protection  | IP 20                                                                                                         |
| Mounting            | For 35 mm top hat rail to EN 50022<br>See dimension drawings for conductor cross section                      |
| Weight              | Approx. 150 g                                                                                                 |

4) 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

#### ■ Block Diagram



# Isolation Amplifiers for Standard Signals

Isolation Amplifiers  
Transmitters

Indicators

Process Analytics

Portable Meters

Laboratory Meters

Sensors

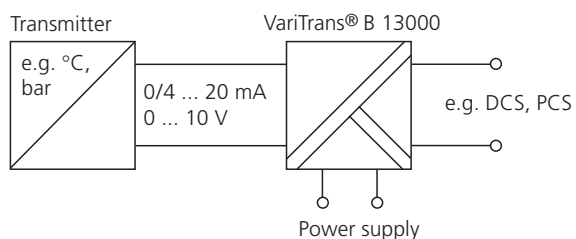
Fittings

**Knick** 

## ■ Application Examples

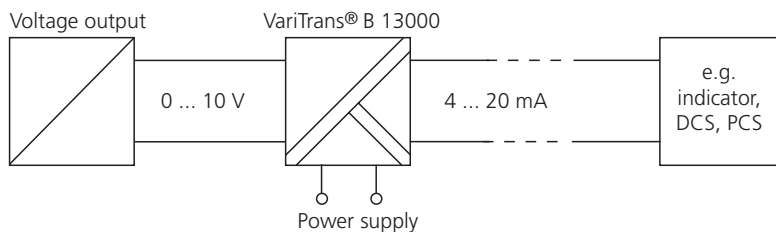
### Electrical isolation

for safe coupling of the measurement signals to the evaluation electronics



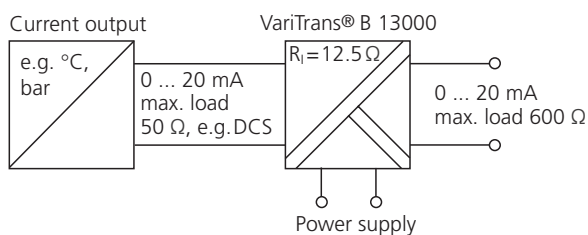
### Signal conversion

e.g. conversion of voltage signals into current signals for interference-free signal transmission over long distances



### Load increase

e. g. for low load capability signals



Modular Housings

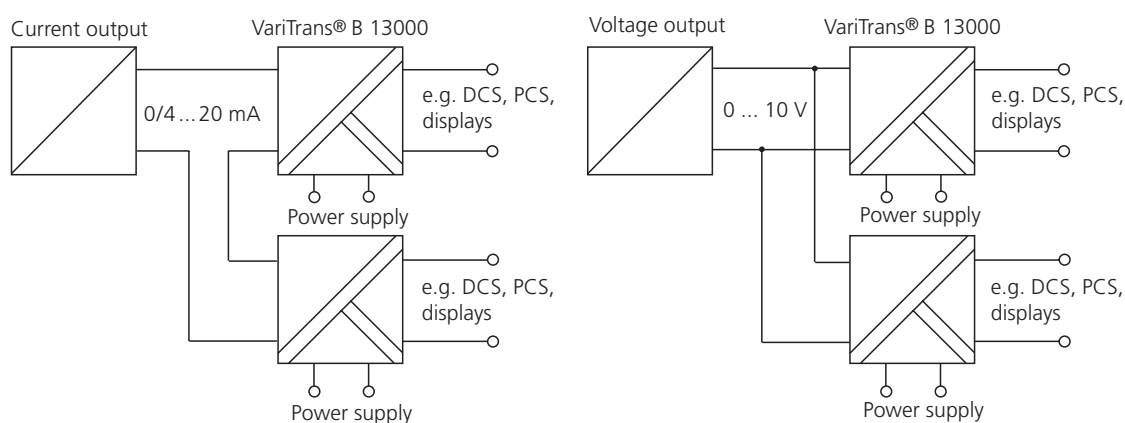
# Modular Housings

## VariTrans® B 13000

### Application Examples (continued)

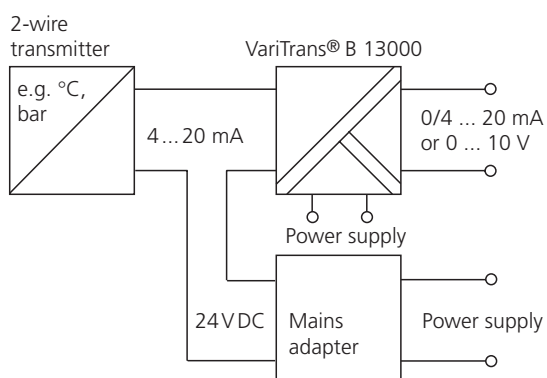
#### Signal Multiplication

e. g. for correct evaluation of measurement signals in different devices



#### 2-wire application

for simple set-up of 2-wire measuring circuits



# Isolation Amplifiers for Standard Signals

Isolation Amplifiers  
Transmitters

Indicators

Process Analytics

Portable Meters

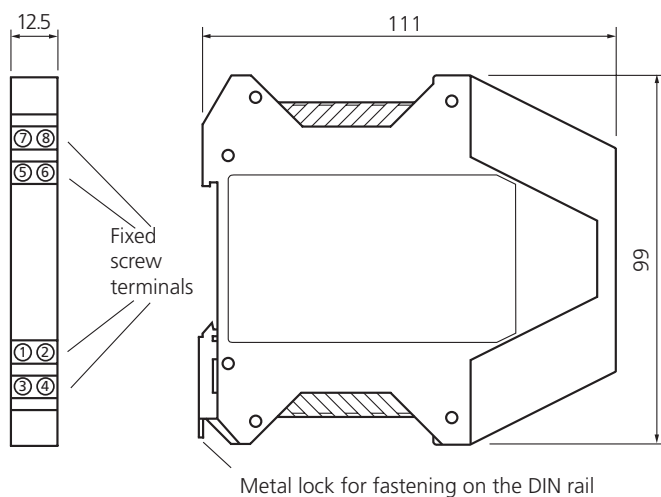
Laboratory Meters

Sensors

Fittings

**Knick** 

## ■ Dimension Drawings and Terminal Assignments



### Terminal Assignments

|   |              |   |         |
|---|--------------|---|---------|
| 1 | Input        | + | Current |
| 2 | Input        | - | Current |
| 3 | Input        | + | Voltage |
| 4 | Input        | - | Voltage |
| 5 | Output       | + |         |
| 6 | Output       | - |         |
| 7 | Power supply | ≈ |         |
| 8 | Power supply | ≈ |         |

Conductor cross-section max. 2.5 mm<sup>2</sup>

Multi-wire connection max. 1 mm<sup>2</sup> (two wires with same cross-section)

All dimensions in mm!