

Modular Housings

Knick >

The professional standard-signal isolator. With calibrated range selection and broad-range power supply.

VariTrans® P 15000



The Task

Industrial applications require the transmission and conversion of different standard signals (0 ... 20 mA, 4 ... 20 mA and 0 ... 10 V) with maximum accuracy.

The Problems

Long transmission paths can cause potential differences that lead to errors in the measuring result. Furthermore different products would be required for different signals and supply voltages.

The Solution

The VariTrans® P 15000 isolation amplifier from Knick features excellent transmission quality combined with the calibrated standard signal switching using DIP switches and a broad-range power supply.

The Housing

At just 12.5 mm wide, the modular housing with pluggable screw terminals allows simple and fast assembly and prewiring of enclosures. Housings with fixed screw terminals are also available for extremely high mechanical loads.

The easy-to-open housing allows simple configuration of the input and output ranges and provides good protection against contact and unintentional adjustment.

The Advantages

The analog transmission of the measurement signal with transformer isolation and the new digitally controlled range selection guarantee almost perfect signal transmission:

- Gain error only 0.08 %
- Excellent pulse formation
- Extremely low residual ripple
- Maximum long-term stability and reliability

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.

Thanks to the VariPower® power supply, the devices can be used all over the world for all common supply voltages from 20 to 253 V AC/DC with almost any power supply. 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

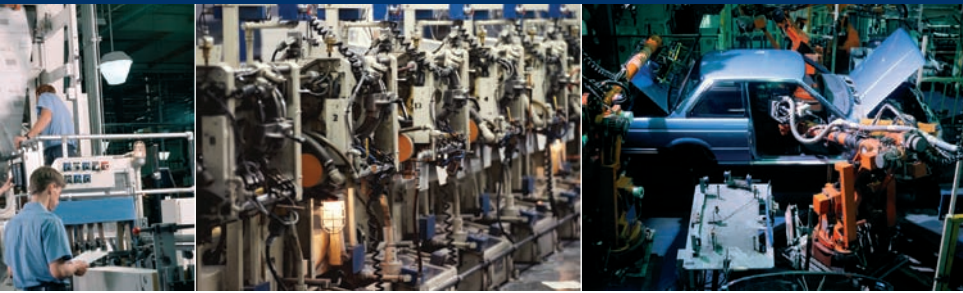
Process Analytics

Portable Meters

Laboratory Meters

Sensors

Fittings



Knick ➤

■ The Facts

Flexible and highly accurate

Calibrated range selection without complicated readjustment

VariPower®

broad-range power supply,
20 ... 253 V AC/DC

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

Pluggable screw terminals

Simple, time-saving assembly and
prewiring of enclosures

3-port isolation

Protection against incorrect
measurements or damage

Maximum accuracy

Specific test report

following EN 10204 2.3

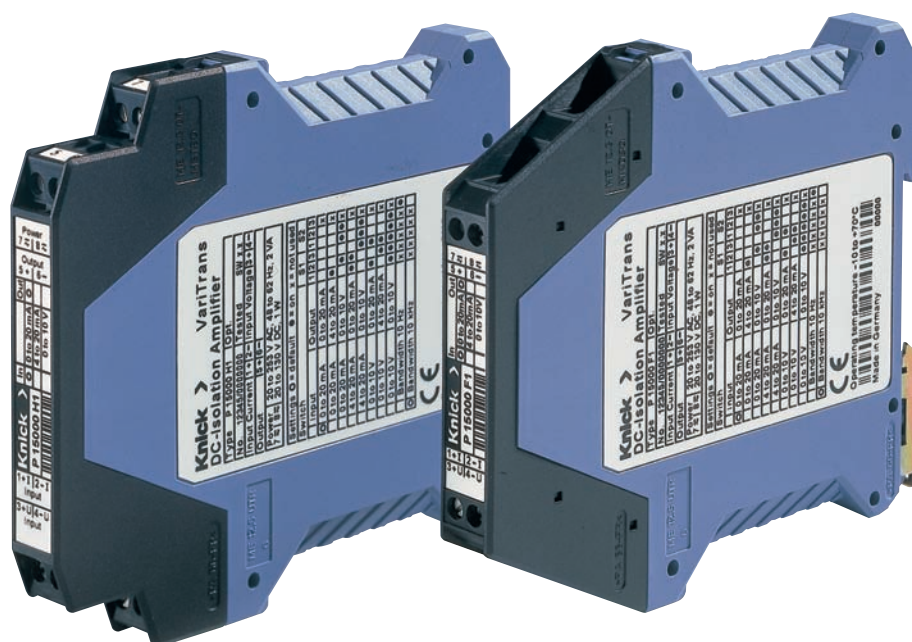
Safe Isolation

according to EN 61140 protects
against unpermitted high
voltages

Maximum reliability

No repair and failure costs

5-year warranty



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VariTrans® P 15000

■ Product Line

Devices	Order No.	
	With pluggable screw terminal	With fixed screw terminal
VariTrans® P 15000 Input and output calibrated switchable	P 15000 H1	P 15000 F1
VariTrans® P 15000 with fixed settings	P 15016 H1 P 15017 H1 P 15018 H1 P 15026 H1 P 15016 H1 P 15028 H1 P 15036 H1 P 15037 H1 P 15038 H1	P 15016 F1 P 15017 F1 P 15018 F1 P 15026 F1 P 15016 F1 P 15028 F1 P 15036 F1 P 15037 F1 P 15038 F1

Power supply

20 ... 253 V AC/DC

■ Specifications

Input data

Inputs	0 ... 20 mA 4 ... 20 mA 0 ... 10 V	Terminal selectable/switchable (factory setting 0 ... 20 mA) or fixed settings (see Product Line)
Input resistance	Current input Voltage input	Voltage drop approx. 250 mV at 20 mA Approx. 1 Mohm
Overload	Current input Voltage input	≤ 300 mA Voltage limitation with suppressor diode 30 V, max. permitted continuous current 30 mA

Output data

Outputs	0 ... 20 mA 4 ... 20 mA 0 ... 10 V (Transmission of negative measurement signals up to approx. -5 % full scale)	Switchable (factory setting 0 ... 20 mA) or fixed settings (see Product line)
Load	With output current With output voltage	≤ 12 V (600 ohms at 20 mA) ≤ 10 mA (1 kohm at 10 V) ¹⁾

1) Higher voltage output load on request

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Specifications (continued)

Output data (continued)

Offset 20 μ A or 10 mV

Residual ripple < 10 mV_{rms}

Transmission behavior

Gain error < 0.08 % meas.val. (DC)

Cut-off frequency > 10 kHz, -3 dB, P 15000 F1/H1 switchable to < 10 Hz, -3 dB

Temperature coefficient²⁾ 0.005 %/K full scale (reference temperature 23 °C)

Power supply

Power supply 20 ... 253 V AC/DC AC 48 ... 62 Hz, approx. 2 VA
DC approx. 0.9 W

Isolation

Galvanic isolation 3-port isolation between input, output and power supply

Test voltage 4 kV AC input against output against power supply

Working voltage (basic insulation) 1000 V AC/DC with overvoltage category II and pollution degree 2 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.

Protection against electric shock Safe Isolation according to EN 61140 by reinforced insulation in accordance with EN 61010-1.
Working voltages up to 300 V AC/DC across input and output and power supply with overvoltage category II and pollution degree 2.
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 μ s, according to IEC 255-4

EMC³⁾ European EMC regulations; EN 61326

Approvals CUL: File No. E 216767, Standards UL 3101-1, CSA-C22.2-95, No. 10101-1
GL: No. 14593-99 HH
KTA 3503/3507

3) Slight deviations are possible while there is interference

2) Average TC in specified operating temperature range -10 °C ... +70 °C

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Specifications (continued)

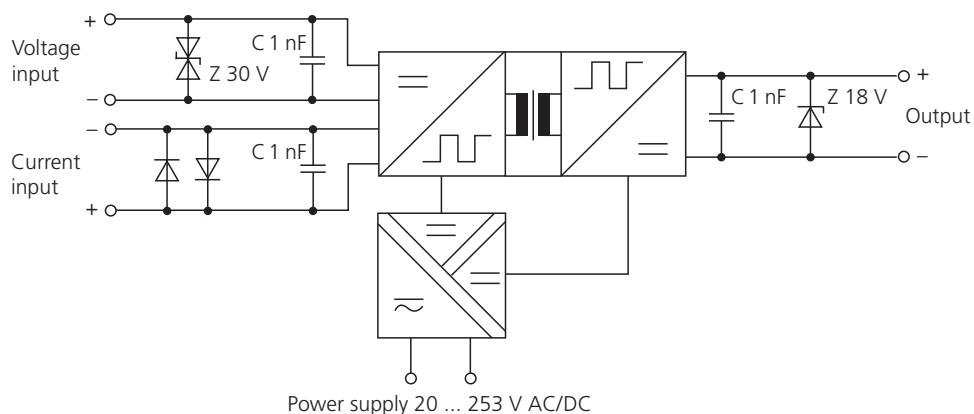
Other data

MTBF ⁴⁾	Approx. 91 years
Ambient temperature	Operation: -10 ... +70 °C Transport and storage: -40 ... +85 °C
Design	Modular housing, width 12.5 mm, see dimension drawing for other measurements Pluggable screw terminals: Type H1 Fixed screw terminals: Type F1
Ingress protection	IP 20
Mounting	Metal lock for mounting on 35 mm top hat rail according to EN 50022 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



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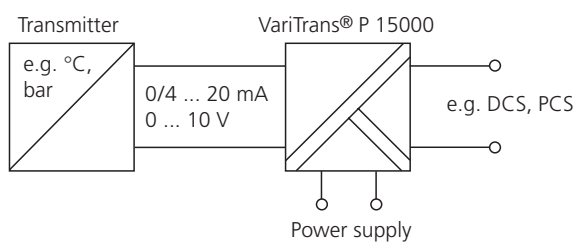
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■ Application Examples

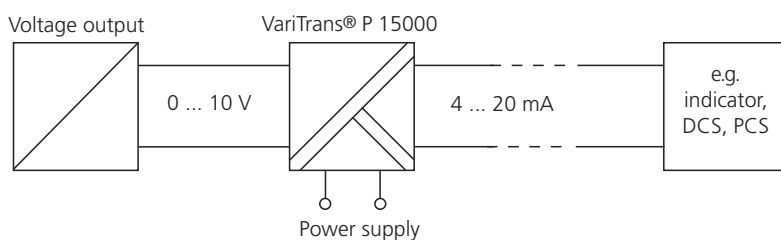
Electrical isolation

for safe coupling of the measurement signals to the evaluation electronics



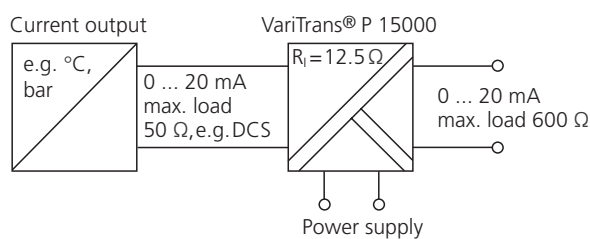
Signal conversion

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



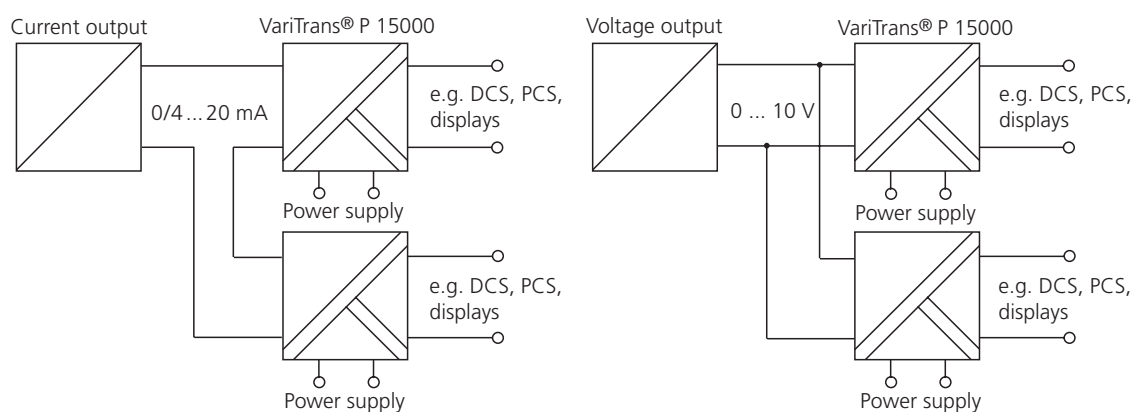
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Application Examples (continued)

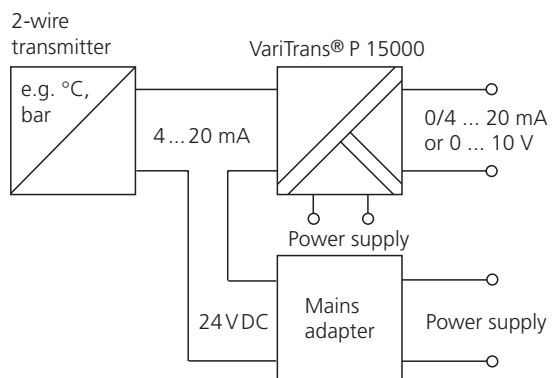
Signal multiplication

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



2-wire application

for simple set-up of 2-wire measuring circuits



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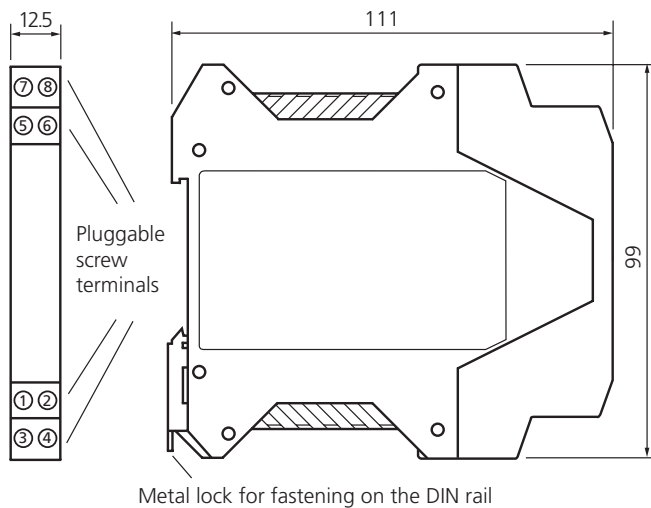
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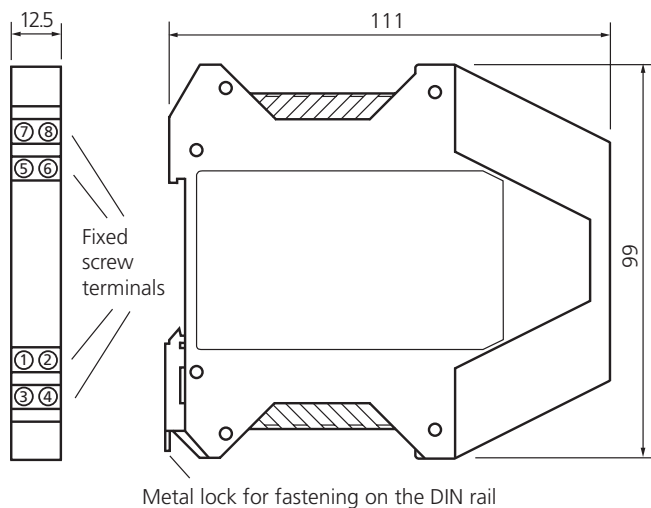
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■ Dimension Drawings and Terminal Assignments

Housing with pluggable screw terminals



Housing with fixed screw terminals



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 mm²

Multi-wire connection max. 1 mm² (two wires with same cross-section)

All dimensions in mm!