

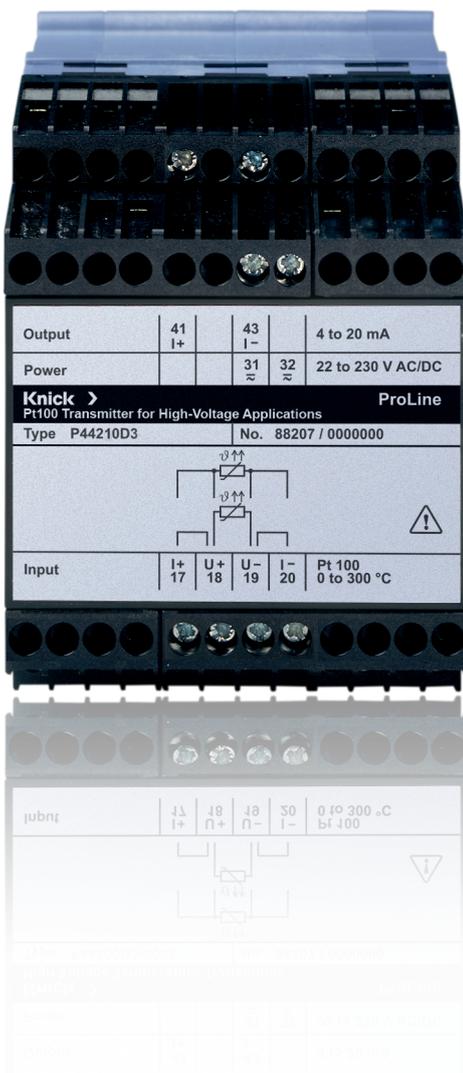
Precise Temperature Measurement at High Voltage Potentials up to 6.6 kV

When temperatures are to be measured using Pt100 resistance thermometers in high-voltage environments, standard temperature transmitters are often unsuitable due to their insufficient insulation.

Resistance thermometers can be insulated against high voltage. In practice, however, the available installation space is often too small. Moreover, the insulation is weakened by thermal and mechanical aging.

For temperature measurement on power electronics components, maximum safety is therefore provided by high-voltage resistant galvanic isolation.

A typical application is the monitoring of the winding temperature of electric motors, generators or transformers.



The Solution:

Pt100 Transmitter with up to 6.6 kV AC/DC Basic Insulation

The new ProLine P 44000 transmitters for high-voltage applications convert the resistance of a 2-, 3- or 4-wire Pt100 resistance thermometer into a 4 to 20 mA signal with high accuracy and short delay times.

The output signal is galvanically isolated from the input signal and the voltage supply. The isolation is designed for working voltages of up to 6.6 kV AC/DC. During routine testing, the test voltage is 15 kV AC. Vacuum encapsulation protects the circuit against environmental influences and ensures that the extraordinary isolation properties are maintained.

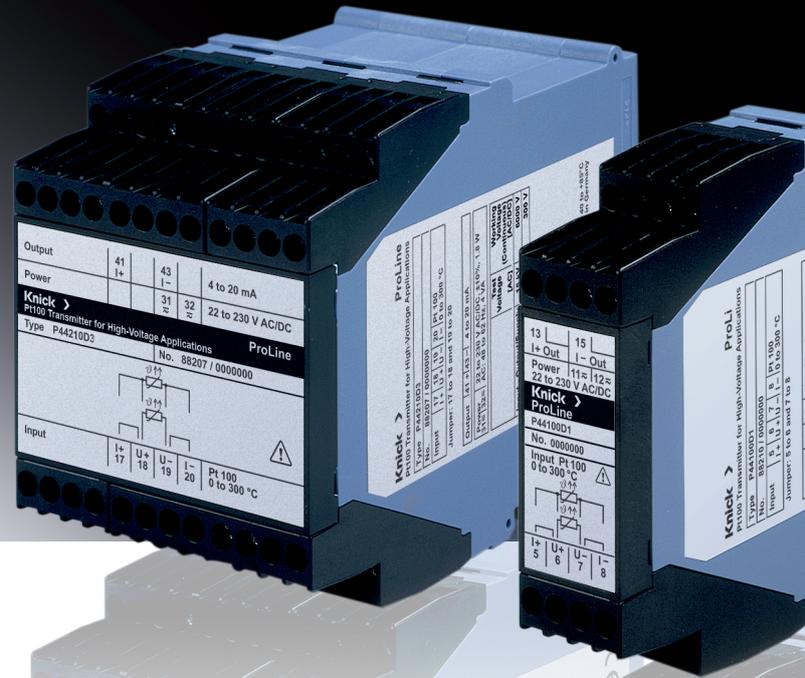
The product line covers the standard ranges of 0 to 150 °C, 0 to 200 °C and 0 to 300 °C. The transmitters are available in 67.5 and 22.5 mm modular housings to suit different requirements.

ProLine P 44000 – At One Glance

- Transmitters for Pt100 temperature sensors, 2-, 3- or 4-wire connection
- Fixed range models for 0 to 150 °C, 0 to 200 °C and 0 to 300 °C input ranges
- Impressed output current of 4 to 20 mA
- Compact 67.5 and 22.5 mm modular housings based on proven VariTrans technology
- High isolation up to 6.6 kV AC/DC basic insulation and up to 2.5 kV AC/DC reinforced insulation with overvoltage category III and pollution degree 2 (input against output and power supply)
- 22.5 mm housing for less demanding isolation requirements up to 2 kV AC/DC (basic insulation)
- Measurement error of just ± 1 K (typically ± 0.5 K) and short T90 delay time of 100 ms
- VariPower broad-range power supply for 22 ... 230 V AC/DC ensures safe operation even with unstable power grids
- Resistant to environmental influences through vacuum encapsulation
- Suitable for extreme environments: ambient temperature during operation $-40 \dots +85$ °C

Pt100 Transmitters for High Voltage Applications

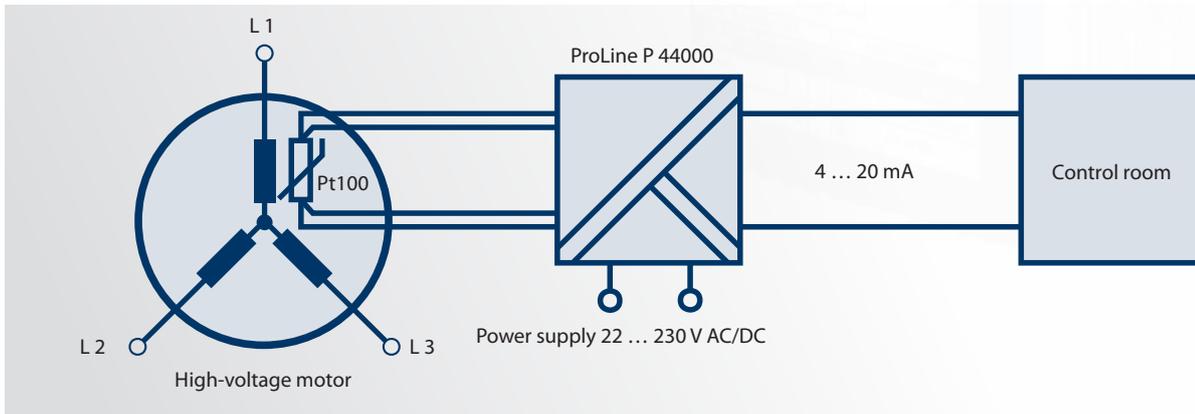
5 Year
Warranty!



Typical Application:

Monitoring the winding temperature of high-voltage motors
Galvanic isolation of the slot RTD using ProLine P 44000:

- Protects the operators
- Prevents damage to the equipment
- Interference-free transmission of 4 to 20 mA signals to the control room – even with long cables



ProLine: You won't find anything better

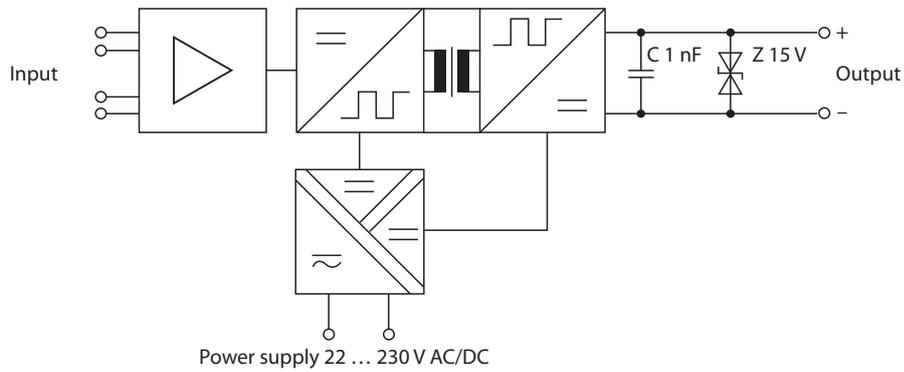
ProLine stands for top-of-the-range signal conditioners and transmitters. Each component will stand up to any competition: regarding conditioning, conversion or amplification of signals, as well as transmission characteristics, versatility, usability and energy efficiency.

Due to their well-established reliability, ProLine products are used in industrial measurement and control systems around the world. Requiring few components, their intelligent circuits enable excellent reliability ratings. A five-year warranty is therefore a matter of course for all ProLine products.



ProLine P 44000

Block Diagram



Product Line

Device	Input	Output	Test voltage	Order No.
ProLine P 44000	0 ... 150 °C	4 ... 20 mA	15 kV	P44210D3-0007
	0 ... 200 °C	4 ... 20 mA	15 kV	P44210D3-0008
	0 ... 300 °C	4 ... 20 mA	15 kV	P44210D3-0009
ProLine P 44000 D1	0 ... 150 °C	4 ... 20 mA	7.5 kV	P44100D1-0004
	0 ... 200 °C	4 ... 20 mA	7.5 kV	P44100D1-0005
	0 ... 300 °C	4 ... 20 mA	7.5 kV	P44100D1-0006

Pt100 Transmitters for High Voltage Applications

Specifications

Input

Resistive sensor	Pt100 acc. to DIN 60751	
Measuring ranges	P44210D3-0007	0 ... 150 °C
	P44210D3-0008	0 ... 200 °C
	P44210D3-0009	0 ... 300 °C
	P44100D1-0004	0 ... 150 °C
	P44100D1-0005	0 ... 200 °C
	P44100D1-0006	0 ... 300 °C

Connection	2-, 3- or 4-wire	
	Note: With 3-wire connection, the sensor cable resistance is not completely compensated for.	

Max. line resistance	100 ohms	
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Supply current	Approx. 1 mA	
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Output

Output	4 ... 20 mA (linear up to 21 mA)	
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Maximum load	550 ohms	
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Residual ripple	< 10 mV _{rms}	
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Input unconnected or measuring range exceeded	> 21 mA (max. 38 mA)	
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Transmission behavior

Transmission error	± 1 K (typ. ± 0.5 K) at 23 °C ambient temperature	
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Temperature influence	< 150 ppm/K of full scale (average TC in permitted operating temp range, reference temp 23 °C)	
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Time response	T90 time max. 100 ms	
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Power supply

Power supply	22 ... 230 V AC/DC ± 10 %; AC 48 ... 62 Hz, < 1.8 W, < 4 VA	
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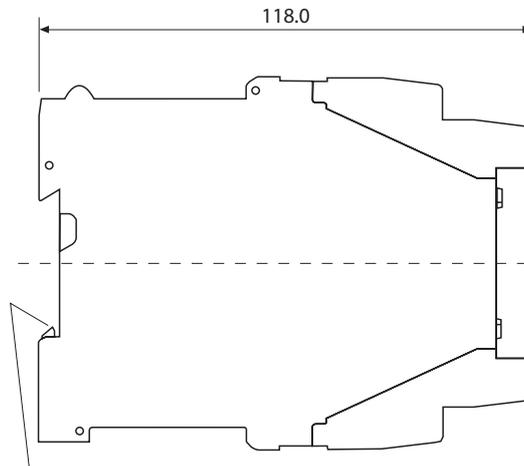
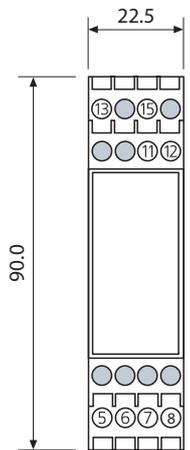
Isolation

Galvanic isolation	3-port isolation between input, output, and power supply	
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Test voltage	P44210D3-xxxx	15 kV AC across input and output / power supply 4 kV AC across output and power supply
	P44100D1-xxxx	7.5 kV AC across input and output / power supply 4 kV AC across output and power supply

Pt100 Transmitters for High Voltage Applications

Dimension Drawing and Terminal Assignments, Type D1



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

Terminal assignments

- 5 Input + Current
- 6 Input + Voltage
- 7 Input - Voltage
- 8 Input - Current

- 11 Power supply AC/DC
- 12 Power supply AC/DC

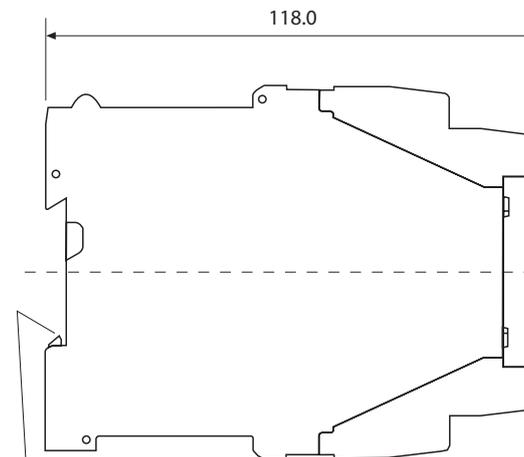
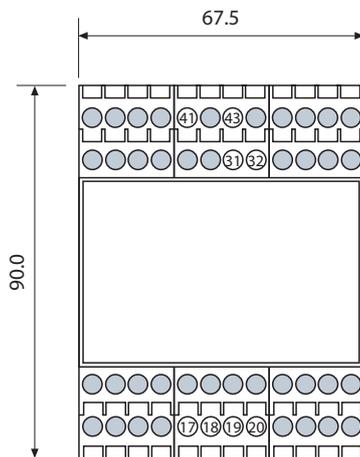
- 13 Output + Current
- 15 Output - Current

For 2-wire-connection to Pt100, place jumpers from 5 to 6 and from 7 to 8, for 3-wire connection from 7 to 8 only.

M 3.5 connecting screws with self-releasing terminal housing.

Conductor cross-section max. 1 x 4 mm² solid or 1 x 2.5 mm² stranded with sleeve, min. 1 x 0.5 mm² solid or stranded with sleeve

Dimension Drawing and Terminal Assignments, Type D3



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

Terminal assignments

- 17 Input + Current
- 18 Input + Voltage
- 19 Input - Voltage
- 20 Input - Current

- 31 Power supply AC/DC
- 32 Power supply AC/DC

- 41 Output + Current
- 43 Output - Current

For 2-wire-connection to Pt100, place jumpers from 17 to 18 and from 19 to 20, for 3-wire connection from 19 to 20 only.

M 3.5 connecting screws with self-releasing terminal housing.

Conductor cross-section max. 1 x 4 mm² solid or 1 x 2.5 mm² stranded with sleeve, min. 1 x 0.5 mm² solid or stranded with sleeve