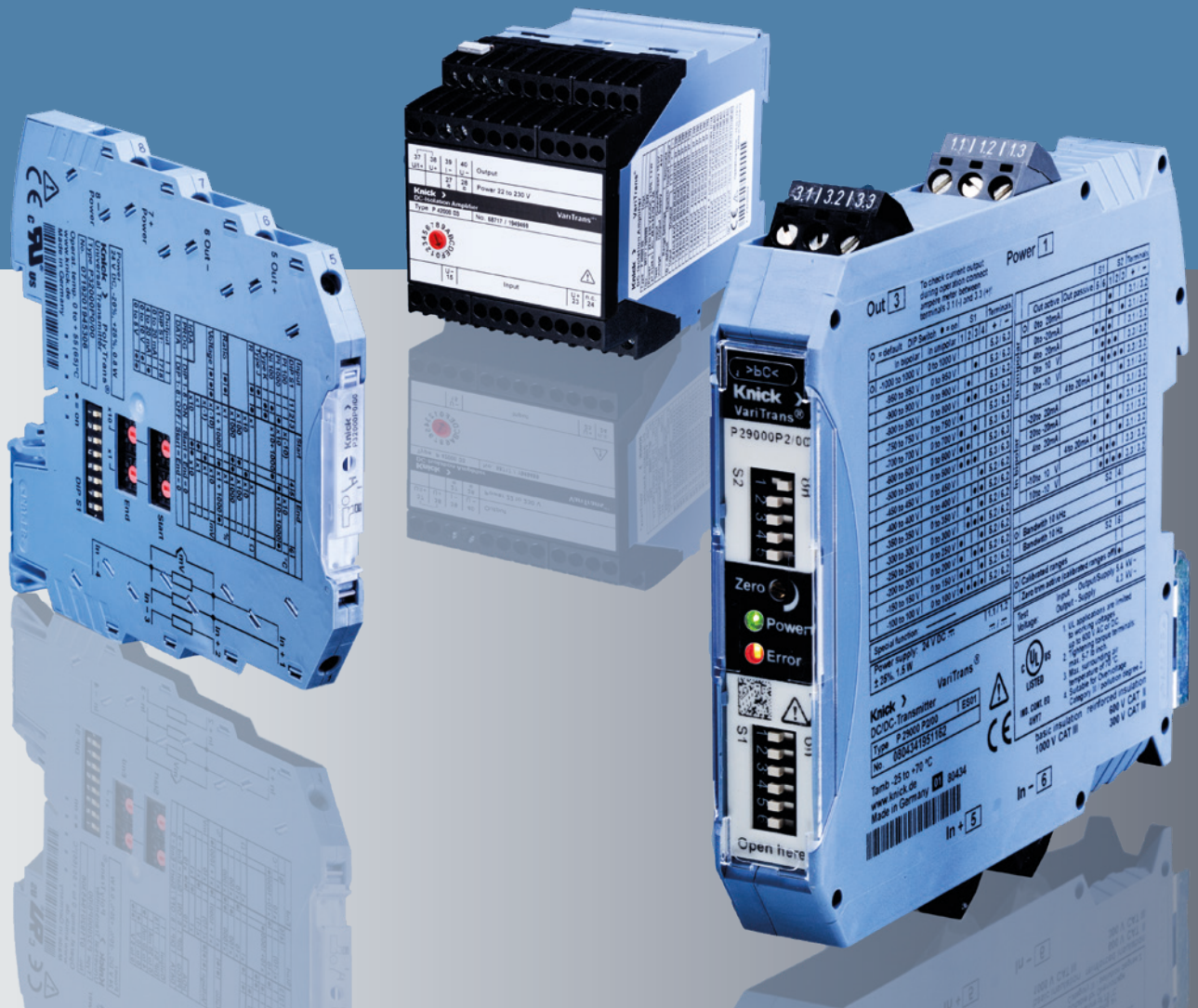
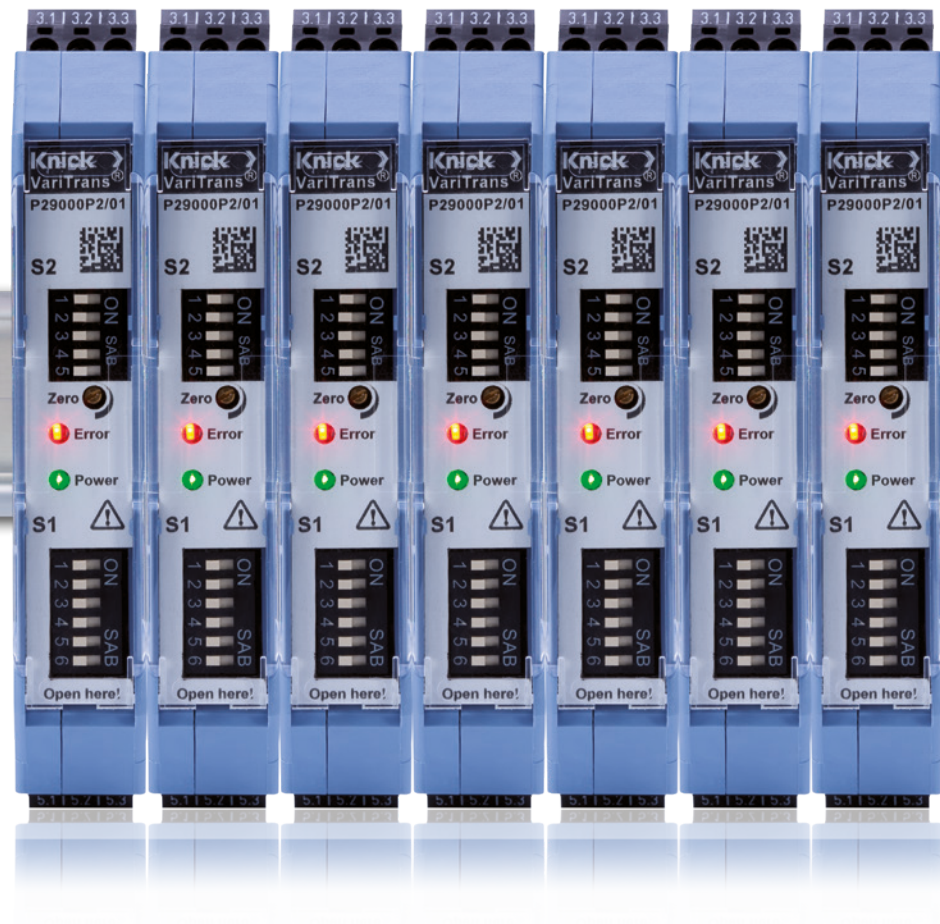


ProLine

Product Overview: Interface Technology

Signal Conditioners and Transmitters





High-Precision Signal Conditioners and Transmitters for Sophisticated Applications

Flexible

Switchable calibrated input ranges and flexibly selectable standard signals on the output allow for a broad range of applications. Inventory costs are reduced and operation is simplified.

Depending on the model, the relevant measurement signals are amplified or converted to the standard values of 10 V or 20 mA. Voltages of a few mV up to 4800 V and currents of a few μA up to kA can be transmitted or converted with a high level of precision.

International

International certification including UL, CSA, CE, DNV GL, SIL, KTA, ATEX, GOST allows the devices to be used worldwide. This applies particularly to the models with broad-range power supply (20 ... 253 V AC/DC).

Signal conditioners and transmitters of the ProLine series provide crucial benefits for applications with high demands on isolation, signal transmission speed and long-term stability.

Reliable

Intelligent circuit design and integrated safety margins between the normal load and the possible maximum load in the event of an error are basic design principles employed by Knick. They also include the use of high-quality parts and eliminating components with high failure rates. The result: MTBF (mean time between failure) is up to 1030 years.

 www.knick.de/proline



ProLine signal conditioners for precise measurements at high working voltages of up to 4800 V

In industrial applications, measuring and control signals must be isolated when being transmitted – for safety reasons and in order to achieve optimal signal quality. The products used must safely master dangerously high voltage levels, a variety of ground potentials and high common-mode voltages.

Our ProLine products provide solutions for a range of industrial applications, including

- Protection and monitoring equipment in electric drives
- Power current switchgear
- Power plants
- Trains and traction power supply
- Photovoltaics
- Measuring and testing technology

Product Lines

- Universal signal conditioners for voltage and current measurement with galvanic isolation
- Transducers for high DC and AC voltages and precise current measurement via shunt resistor
- Active and passive isolators for standard signals
- Repeater power supplies for 2-wire sensors
- Temperature transmitters, also with high isolation

 DNV·GL KTA



5-year
warranty

If shipped to our factory, deficient products will be repaired free of charge there if the deficiency was not visible upon delivery and was reported to us within 5 years of receipt.





The original warranty period after first delivery applies to repaired products.

Further claims for direct damages or consequential damages are excluded from the warranty.

Transducers for High Voltage / Shunt Applications / DC and AC

For reliable current and voltage measurements with extremely high isolation requirements.

High Voltage Transducers	High Voltage Transducers	High Voltage Transducers	High Voltage Transducers	High Voltage Transducers	High Voltage Transducers	Universal Isolated Signal Conditioners	Universal Isolated Signal Conditioners
VariTrans P41000	VariTrans P42000	VariTrans P43000	ProLine P51000	ProLine P52000	VariTrans P29000	VariTrans P27000	VariTrans A26000
							
Input	±60 mV to ±100 V unipolar/bipolar	±100 V to ±3600 V unipolar/bipolar	±0.1 A to ±5 A unipolar/bipolar	±30 mV to ±125 V unipolar/bipolar	±100 V to ±4200 V (max. 4200 V) unipolar/bipolar	±30 mV to ±1000 V unipolar/bipolar	0 ... ±0.1 mA to 0 ... ±100 mA 0 ... ±20 mV to 0 ... ±200 V 0/4 ... 20 mA, ±20 mA 0 ... 10 V, ±10 V unipolar/bipolar
Output	0/4 ... 20 mA, ±20 mA 0 ... (±)10 V	0/4 ... 20 mA, ±20 mA 0 ... (±)10 V	0/4 ... 20 mA, ±20 mA 0 ... (±)10 V	0/4 ... 20 mA, ±20 mA, ±40 mA 0 ... (±)10 V, 0 ... (±)5 V	0/4 ... 20 mA, ±20 mA, ±40 mA 0 ... (±)10 V, 0 ... (±)5 V	0/4 ... 20 mA, ±20 mA 0 ... (±)10 V, 4 ... 20 mA passive	0 ... ±20 mA 0 ... ±10 V bipolar
Accuracy class	0.1 %	0.3 %	0.3 %	0.1 % (0.5 R)	0.1 % (0.5 R)	0.2 %	0.08 %
Test voltage	15 kV AC	15 kV AC	15 kV AC	18 kV AC	18 kV AC	5.4 kV AC	4 kV AC
Basic insulation	3600 V AC/DC	3600 V AC/DC	3600 V AC/DC	4800 V AC/DC	4800 V AC/DC	1000 V AC/DC	1000 V AC/DC
Reinforced insulation	1800 V AC/DC	1800 V AC/DC	1800 V AC/DC	3600 V AC/DC	3600 V AC/DC	600 V AC/DC	300 V AC/DC
Power supply	20 ... 253 V AC/DC broad-range power supply	20 ... 253 V AC/DC broad-range power supply	20 ... 253 V AC/DC broad-range power supply	20 ... 253 V AC/DC, 24 V ± 30% broad-range power supply	20 ... 253 V AC/DC, 24 V ± 30% broad-range power supply	20 ... 253 V AC/DC broad-range power supply	20 ... 253 V AC/DC broad-range power supply
Certification	cULus, EAC	cULus, EAC	cULus, EAC	cULus, EAC, EN50155	cULus, EAC, EN50155	cULus, EAC	ATEX Zone II; cULus CL I, Div 2; GL; EAC
Width	22.5 mm	67.5 mm	45 mm	72.5 mm x 182 mm x 116 mm	72.5 mm x 182 mm x 116 mm	17.5 mm	12.5 mm
Special features	<ul style="list-style-type: none">• High current measurement via high-potential shunt resistor• Precise signal conversion and high cutoff frequency of 5 kHz (-3 dB)• Calibrated, switchable, and custom-adjustable versions• High immunity to transient common-mode interference: T-CMR >115 dB• Extended ambient temperature range from -40 °C to +80 °C on request	<ul style="list-style-type: none">• Direct measurement of high voltages• Up to 3600 V AC/DC working voltage• Calibrated, switchable, and custom-adjustable versions• High measurement accuracy without long-term drift• Precise signal conversion and high cutoff frequency of 5 kHz (-3 dB)• Extended ambient temperature range from -40 °C to +80 °C on request	<ul style="list-style-type: none">• Direct measurement of currents up to 5 A• Up to 3600 V AC/DC working voltage• Calibrated, switchable, and custom-adjustable versions• High measurement accuracy without long-term drift• Precise signal conversion and high cutoff frequency of 5 kHz (-3 dB)• Extended ambient temperature range from -40 °C to +80 °C on request	<ul style="list-style-type: none">• Measurement of high currents via shunt resistor up to 20 kA or universal measurement of high-potential currents and voltages• Use on rolling stock (EN 50155)• Fire protection HL3 according to EN 45545-2• Contact protection according to EN 50153, housing: IP54/IP51• Safety via diagnostics for input circuit, output circuit, and device function• Ambient temperature range: -40 ... +85 °C	<ul style="list-style-type: none">• Direct measurement of high voltages• Use on rolling stock (EN 50155)• Fire protection HL3 according to EN 45545-2• Contact protection according to EN 50153, housing: IP54/IP51• Safety via diagnostics for input circuit, output circuit, and device function• Ambient temperature range: -40 ... +85 °C	<ul style="list-style-type: none">• Universal voltage measurement up to 1000 V and current measurement via shunt resistor (mV ranges)• Calibrated range selection via DIP switches behind the front cover• Precise signal conversion and high cutoff frequency of 10 kHz (-3 dB)• Test jacks for measuring output current and voltage without disconnecting wires	<ul style="list-style-type: none">• Flexible and precise: 480 calibrated ranges• Rapid response for rapid control: 10 kHz cutoff frequency• Customized measuring ranges on request• For measuring DC currents via shunt resistor, battery voltages, and many other currents and voltages• Specifically for precise conversion and galvanic isolation of bipolar signals• Convenient configuration via DIP switches• Even after range switching, the transmission ranges remain calibrated and there is no need for re-adjustment• Precise signal conversion and high cutoff frequency of 5 kHz (-3 dB)





VariTrans P 41000 TRMS	VariTrans P 42000 TRMS	VariTrans P 43000 TRMS	Maconic shunt resistors
			
As P 41000, but with true root-mean-square value conversion (true RMS)	As P 42000, but with true root-mean-square value conversion (true RMS)	As P 43000, but with true root-mean-square value conversion (true RMS)	For measurement of currents up to 20 kA in conjunction with shunt isolators P41000, P51000, P29001, and P27000.

Universal Isolated Signal Conditioners

Easy isolation and conversion of almost any input voltages and currents into selectable, standardized output signals.

Isolated Standard Signal Conditioners/ Repeater Power Supplies




Robust galvanic isolation and conversion of standard signals, even with high voltages and strict requirements for the quality of signal conversion.

Isolated Standard Signal Conditioners	Isolated Standard Signal Conditioners	Signal Doublers	Repeater Power Supplies
VariTrans P15000	VariTrans A 21000	VariTrans A 20300	IsoAmp PWR A 20100
			
0 ... 20 mA 4 ... 20 mA 0 ... 10 V	0 ... 20 mA 4 ... 20 mA 0 ... 10 V	0 ... 20 mA 4 ... 20 mA 0 ... 10 V	4 ... 20 mA
4 ... 20 mA, 0 ... 20 mA, 0 ... 10 V	4 ... 20 mA, 0 ... 20 mA	4 ... 20 mA, 0 ... 20 mA	4 ... 20 mA, 0 ... 20 mA, 0 ... 10 V
0.08 %	0.2 %	0.2 %	0.1 %
4 kV AC	2.5 kV AC	2.5 kV AC	2.5 kV AC
1000 V AC/DC	300 V AC/DC	300 V AC/DC	600 V AC/DC
300 V AC/DC	300 V AC/DC	300 V AC/DC	300 V AC/DC
20 ... 253 V AC/DC broad-range power supply	24 ... 110 V DC / 110 ... 230 V AC	24 V DC	24 V DC
cULus, GL, EAC, KTA	EAC	cULus, GL, EAC, KTA	ATEX Zone II; cULus CL I, Div 2; GL; EAC
12.5 mm	6 mm	6 mm	6 mm

The standard-signal pro with high isolation	The first standard-signal conditioner with protective separation and broad-range power supply in the 6 mm class.	Signal doubler with calibrated, switchable inputs and outputs	Repeater power supply for 2-wire transmitters in a compact 6 mm housing – with calibrated range selection of output signals and HART transmission
<ul style="list-style-type: none">• Almost perfect signal conversion with analog signal processing and transmission• Calibrated, digitally controlled range selection without adjustment after switching• With broad-range power supply for universal, global use	<ul style="list-style-type: none">• Extraordinary operating time and reliability with specially adapted design. MTBF (mean time between failures): 280 years	<ul style="list-style-type: none">• 2 electrically isolated outputs, each with full load of 500 ohms• All channels galvanically decoupled (four-port isolation)	

Loop-Powered Isolators for Standard Signals

Galvanic isolation of current signals to prevent measurement errors. Product design for extreme reliability.




Loop-Powered Isolators for Standard Signals	Loop-Powered Isolators for Standard Signals	Loop-Powered Isolators for Standard Signals
IsoTrans 41	ProLine P 22400	IsoTrans A 20400
		
0 ... 20 mA 4 ... 20 mA 0 ... 50 mA	0 ... 20 mA 4 ... 20 mA	0 ... 20 mA 4 ... 20 mA
Like input 1:1 transmission	Like input 1:1 transmission	Like input 1:1 transmission
0.02 %	0.08 %	0.1 %
2.5 kV AC	5.4 kV AC	2.5 kV AC
500 V AC/DC	600 V AC/DC	600 V AC/DC
300 V AC/DC	600 V AC/DC	300 V AC/DC
24 V DC	24 V DC	24 V DC
Loop-powered	Loop-powered	Loop-powered
EAC	ATEX Zone II; cULus CL I, Div 2; GL; EAC	cULus; GL; EAC
17.5/22.5 mm	12.5 mm	6 mm




Transformer-based isolation of 0(4) ... 20 mA standard current signals on up to 3 channels	Transformer-based isolation of 0(4) ... 20 mA standard current signals	The first decoupled passive isolator with load stop function (option)
<ul style="list-style-type: none">• Extreme precision: 0.02 % meas. val. transmission error• Extreme efficiency: Low voltage drop of 1.2 V	<ul style="list-style-type: none">• One or two channels per device• Up to SIL 3 / EN 61508 and PL c / e / EN 13849-1 for isolation of safety-related circuits• High reliability: MTBF of 1106 years• Also available as a signal splitter with 2 electrically isolated outputs	<ul style="list-style-type: none">• Extremely reliable: MTBF (mean time between failures) 1031 years• Extremely high component density of 320 channels per meter of mounting rail• Excellent price-performance ratio

Transmitters for Temperature, Strain Gauges, Resistance

Reliable detection of sensor signals for physical parameters such as temperature, path, angle, pressure or force, flexible and easy to adjust, for safety-related circuits up to SIL 3 and for general measuring tasks.



Pt100 transmitter for high-voltage applications

Universal Transmitters	Temperature Transmitters	Strain Gauge Transmitters	Resistance Transmitters	Pt100 Transmitters	Pt100 Transmitters
PolyTrans P 32000	ThermoTrans P 32100	SensoTrans DMS P 32200	SensoTrans R P 32300	ProLine P 44000 D3	ProLine P 44000 D1
					
Resistance thermometers, strain gauges, thermocouples, potentiometers, resistors, shunt voltages up to ±1000 mV	Resistance thermometers, thermocouples, resistors, shunt voltages up to ±1000 mV	Strain gauges, load cells	Potentiometers and resistors, shunt voltages up to ±1000 mV	Pt100 resistance thermometers 0 ... 100 °C 0 ... 200 °C 0 ... 300 °C	Pt100 resistance thermometers 0 ... 100 °C 0 ... 200 °C 0 ... 300 °C
4 ... 20 mA, 0 ... 20 mA, 0 ... 5 V, 0 ... 10 V	4 ... 20 mA, 0 ... 20 mA, 0 ... 5 V, 0 ... 10 V	4 ... 20 mA, 0 ... 20 mA, 0 ... 5 V, 0 ... 10 V	4 ... 20 mA, 0 ... 20 mA, 0 ... 5 V, 0 ... 10 V	4 ... 20 mA	4 ... 20 mA
0.1 %	0.1 %	0.1 %	0.1 %	1 K (typically 0.5 K)	1 K (typically 0.5 K)
2.5 kV AC	2.5 kV AC	2.5 kV AC	2.5 kV AC	15 kV AC	10 kV AC
300 V AC/DC	300 V AC/DC	300 V AC/DC	300 V AC/DC	6.6 kV AC/DC	2 kV AC/DC
300 V AC/DC	300 V AC/DC	300 V AC/DC	300 V AC/DC	2500 V AC/DC	1000 V AC/DC
24 V DC	24 V DC	24 V DC	24 V DC	20 ... 253 V AC/DC broad-range power supply	20 ... 253 V AC/DC broad-range power supply
cURus, EAC, KTA	cURus, EAC, KTA	cURus, EAC, KTA	cURus, EAC, KTA	cURus, EAC	cURus, EAC
6 mm	6 mm	6 mm	6 mm	67.5 mm	22.5 mm
Universal transmitter for temperature, strain gauges, and potentiometers in a 6 mm housing	Transmitter for platinum temperature sensors and thermocouples or for measuring mV shunt voltages, in a 6 mm housing	Transmitter for load cells and strain gauges (full bridges) in a 6 mm housing	Transmitter for resistors and potentiometers in a 6 mm housing	Transmitter for monitoring the winding temperature of high-voltage motors	Transmitter for monitoring the winding temperature of high-voltage motors
<ul style="list-style-type: none">• Interface for configuration via PC• Rotary and DIP switches for easy, intuitive configuration• SIL approval for safety circuits up to SIL 3	<ul style="list-style-type: none">• Interface for configuration via PC• Rotary and DIP switches for easy, intuitive configuration• SIL approval for safety circuits up to SIL 3	<ul style="list-style-type: none">• Interface for configuration via PC• Rotary and DIP switches for easy, intuitive configuration• SIL approval for safety circuits up to SIL 3	<ul style="list-style-type: none">• Interface for configuration via PC• Rotary and DIP switches for easy, intuitive configuration• SIL approval for safety circuits up to SIL 3	<ul style="list-style-type: none">• 6.6 kV basic insulation for slot thermometers in high-voltage motors up to 11 kV.• 2-, 3-, or 4-wire connection	<ul style="list-style-type: none">• 2 kV basic insulation for slot thermometers in high-voltage motors up to 3 kV.• 2-, 3-, or 4-wire connection

ThermoTrans A 20210	SensoTrans DMS A 20220	SensoTrans R A 20230
		
As ThermoTrans P 32100, without PC interface	As ThermoTrans P 32200, without PC interface	As ThermoTrans P 32300, without PC interface

Isolators for Standard Signals / Repeater Power Supplies

Hazardous/safe area isolation of process signals and supply to 2-wire sensors in ATEX zone 1.

Loop-Powered Isolators for Standard Signals	Repeater Power Supplies
IsoTrans 36/37	WG 21
	
0 ... 20 mA 4 ... 20 mA	4 ... 20 mA
Like input 1:1 transmission	4 ... 20 mA
0.2 %	0.1 %
10 kV AC	4 kV AC
3600 V AC/DC	1000 V AC/DC
600 V AC/DC	600 V AC/DC
Loop-powered	24 V AC, 110/115 V AC, 220/230 V AC
ATEX: II (1) G [EEx ia] IIC; EAC	ATEX: II (1) G [EEx ia] IIC; EAC
22.5 mm	22.5 mm



Input and output isolators for hazardous/safe area isolation of 20 mA signals in process applications	Repeater power supply for 2-wire sensors in hazardous areas via the 4...20 mA signal
<ul style="list-style-type: none">• Precise signal transmission with outstanding pulse formation• Extremely high isolation, test voltage up to 10 kV• Transmission of HART signals• Maximum reliability: no repair and failure costs	<ul style="list-style-type: none">• High-quality galvanic isolation between current loop and output signal to controller• Transmission of HART signals• Maximum reliability: no repair and failure costs

WG 25

As WG 21, but as loop-powered repeater power supply

Temperature Transmitters

Temperature measurement with sensors in ATEX zone 1/0 with high isolation.

Temperature Transmitters	Temperature Transmitters
ThermoTrans 205/206	ThermoTrans 210/211
	
Resistance thermometers	Thermocouples
4 ... 20 mA, 0 ... 20 mA, 0 ... 10 V	4 ... 20 mA, 0 ... 20 mA, 0 ... 10 V
0.1 %	0.1 %
4 kV AC	4 kV AC
1000 V AC/DC	1000 V AC/DC
600 V AC/DC	600 V AC/DC
24 V AC, 24 V DC, 110/115 V AC, 220/230 V AC	24 V AC, 24 V DC, 110/115 V AC, 220/230 V AC
ATEX: II (1) G [EEx ia] IIC; EAC	ATEX: II (1) G [EEx ia] IIC; EAC
22.5 mm	22.5 mm

Temperature transmitter for platinum and nickel temperature sensors and for detecting resistors and potentiometers	Temperature transmitter for commercial thermocouples and mV voltage measurement
<ul style="list-style-type: none">• Protective separation and high disruptive strength between input, output, and power supply• Maximum reliability: no repair and failure costs	<ul style="list-style-type: none">• Protective separation and high disruptive strength between input, output, and power supply• Maximum reliability: no repair and failure costs

Interface Technology

- Universal Isolated Signal Conditioners
- Isolated Standard Signal Conditioners
- High Voltage Transducers
- Repeater Power Supplies
- Temperature Transmitters
- Resistance Transmitters
- Strain Gauge Transmitters
- AC/DC Transducers

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