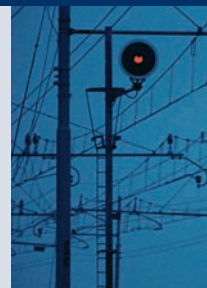


Modular Housings for Hazardous Areas

Knick >

**The practical solution for
temperature measurement
with thermocouples.**

ThermoTrans® 210/211



The Advantages

The ThermoTrans® 210/211 temperature transmitters provide you with just the flexibility you need:

- Configuration effort where it is only really necessary, instead of complicated parameter tables.
- High level of reliability and compact design due to digital signal processing specially developed for the measuring task instead of unnecessary reduction in reliability due to overburdening with complicated technology.

The Models

For the majority of standard applications with fixed preset parameters, you simply select one of the numerous preconfigured standard models.

You can solve special measuring tasks with a transmitter that we configure according to your specifications.

The Technology

The ThermoTrans® 210/211 temperature transmitters provide Safe Isolation and high insulation resistance between the input, output, and power supply. They meet the strict NAMUR EMC requirements and can easily be used for measurements in hazardous areas.

Vacuum encapsulation protects the devices against aggressive environmental influences, shock, and vibrations.

ThermoTrans® 210/211 for Thermocouples

Thermocouples have very low resistance which makes them fail-safe. They are preferably used for high temperatures, for example, for measurements in ovens, smelting plants, and plastic machines.

The range of standard thermocouples is very wide.

The ThermoTrans® 210/211 transmitters therefore provide consistent connection possibilities for all common thermocouples.

To avoid long compensating cables, an external reference junction can also be used in addition to the internal one. For reference junctions with thermostat, the reference temperature can be fixed or measured with a Pt 100.

The ThermoTrans® 210/211 transmitters can also be used to measure voltages in the range of $-20 \dots +100$ mV at a transmission rate of 1/sec. Due to the transfer curve freely configured using functions or sampling points, they are ideal for difficult measuring tasks, such as level measurement in spherical tanks.

**Warranty
5 years!**

*Defects occurring within 5 years
from delivery are remedied free of
charge at our works (carriage and
insurance paid by sender).*

Temperature Transmitters

Isolation Amplifiers
Transmitters

Indicators

Process Analytics

Portable Meters

Laboratory Meters

Sensors

Fittings

Knick ➤

■ The Facts

Explosion protection [Ex ia] IIC

according to ATEX, trouble-free use in hazardous areas

Extensive range of standard models

Configuration not necessary for standard applications

Adjustable via optical interface

Universal for a wide range of measuring tasks, can also be configured on site

EMC tested

Reliable operation even with electromagnetic interference in the mains or in the environment

Safe Isolation according to EN 61140

Protection of maintenance staff and the subsequent devices against non-permitted high voltages

Modular housing, 22.5 mm wide with 73.5 mm standard height

Compact design means easy installation, also easy to fit in standard cabinets

5-year warranty



Modular Housings for Hazardous Areas

ThermoTrans® 210/211

■ Product Line

		ThermoTrans® 210 with current output	ThermoTrans® 211 with voltage output
Adjustable models Adjustable via interface, communication kit on request. See Configuration Schedule for factory setting.	Order No.	210 A7 000 000 Opt. 444	211 A7 000 000 Opt. 444
Fixed range standard models	Order No.	210 A7 x xx xx x Opt.444	211 A7 x xx xx V Opt.444
Sensors	J K S	J K S	J K S
Span	700 K 1000 K 1700 K	60 75 97	60 75 97
Start of scale	0 °C	00	00
Output	0 ... 20 mA 4 ... 20 mA 0 ... 10 V	D L	V

Output curve rising, without filter constant, internal reference junction

ThermoTrans® 210: open circuit recognition 22 mA; ThermoTrans® 211: open circuit recognition 11 V

Power supply	Order No.
230 V AC	
24 V AC/DC	336
115 V AC	363

Temperature Transmitters

Isolation Amplifiers Transmitters	Indicators	Process Analytics	Portable Meters	Laboratory Meters	Sensors	Fittings
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Product Line (continued)

Customer-specific models	Order No.	ThermoTrans® 210 with current output	ThermoTrans® 211 with voltage output
		210 A7 999 999 Opt. 444	211 A7 999 999 Opt. 444

■ Configuration Schedule

Important! Please fill in the configuration schedule completely and enclose it with your order. If entries are missing, the value entered in square brackets or the red-colored setting ■ will be set.

ThermoTrans® 210/211

Sensor	Thermocouple: <input type="checkbox"/> Type B <input type="checkbox"/> Type R <input type="checkbox"/> Type E <input type="checkbox"/> Type S <input type="checkbox"/> Type J <input type="checkbox"/> Type T <input checked="" type="checkbox"/> Type K <input type="checkbox"/> Type U <input type="checkbox"/> Type L <input type="checkbox"/> Voltage <input type="checkbox"/> Type N	
Range	Start of scale ¹⁾ ____ °C [0 °C] or ____ mV Span ¹⁾ ____ K [1000 K] or ____ mV	
Reference junction	<input checked="" type="checkbox"/> Internal <input type="checkbox"/> Internal/external, selectable (via jumper) <input type="checkbox"/> External Pt 100 <input type="checkbox"/> Permanently set temperature ²⁾ or ____ , ____ °C [25 °C]	
Output ³⁾	<input checked="" type="checkbox"/> 0 ... 20 mA <input type="checkbox"/> 0 ... 10 V <input type="checkbox"/> 4 ... 20 mA	
Curve	<input checked="" type="checkbox"/> Rising <input type="checkbox"/> Falling	
Error messages	Message: <input checked="" type="checkbox"/> only with open circuit <input type="checkbox"/> with open circuit and overrange Signal: <input checked="" type="checkbox"/> 22 mA or 11 V <input type="checkbox"/> -1 mA or -0.5 V	
Filter constant T ₉₉	____ s ¹⁾ (1st order filter) [0 s]	
Tag number	_____ [none]	

1) See the specifications for the possible parameter range

2) Compensation range -10 ... 80 °C

3) Other values on request

Modular Housings for Hazardous Areas

ThermoTrans® 210/211

■ Specifications

Input data	Sensor type	Range
Intrinsically safe	Type B IEC 584-1 Type E IEC 584-1 Type J IEC 584-1 Type K IEC 584-1 Type L DIN 43710 Type N ASTM E 230-87 Type R IEC 584-1 Type S IEC 584-1 Type T IEC 584-1 Type U DIN 43710	0 ... +1820 °C -270 ... +1000 °C -210 ... +1200 °C -270 ... +1372 °C -200 ... +900 °C -270 ... +1300 °C -50 ... +1767 °C -50 ... +1767 °C -270 ... +400 °C -200 ... +600 °C
Voltage input	-20 ... +100 mV	
Input resistance	> 10 Mohms	
Span (configurable)	Min.: ≥ 2 mV, max.: end of scale – start of scale	
Sensor failure monitoring	all inputs for open circuit (not with voltage measurement)	
Input error limits	± 10 µV + 0.05 % meas.val.	
Temperature coefficient at input	0.01 % / K full scale (average TC in permitted operating temperature range, reference temperature 23°C)	
Reference junction input (user-defined)	Internal Pt 100 External Pt 100	< ±1.0 K < ±0.3 K + error of Pt 100 used
Output data		
Output signal (0 ... 100 %)	Model 210: 0/4 ... 20 mA, impressed current, load voltage ≤ 10 V Model 211: 0 ... 10 V, impressed voltage, load current ≤ 10 mA	
Resolution	Approx. 8000 steps (for 0 ... 100 %)	
Control range	-2.5 ... 102.5 % span	
Overload range with error message	Model 210: -1.0 mA or 22 mA Model 211: -0.5 V or 11 V	
Output error limits	0.1 % full scale	
Temperature coefficient at output	0.01 % / K full scale (average TC in permitted operating temperature range, reference temperature 23°C)	
Residual ripple at output	< 10 mV _{pp} + digitalization error of input	

Temperature Transmitters

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Specifications (continued)

Transmission behavior

Characteristic	Resistance or temperature linear rising or falling
Meas. rate	Approx. 1 / s
Response time T_{99}	≤ 900 ms
Digital output filter	$T_{99} = 0 \dots 100$ s (1st order filter)

Power supply

Power supply	230 V AC – 15 % + 10 %, 48 ... 62 Hz, approx. 2 VA
Option 336:	24 V AC/DC AC: – 15 % + 10 %, 48 ... 500 Hz, approx. 1.5 VA DC: – 15 % + 20 %, approx. 1.2 W
Option 363:	115 V AC – 15 % + 10 %, 48 ... 62 Hz, approx. 2 VA

Isolation

Galvanic isolation	3-port isolation between input, output and power supply
Test voltage	4 kV AC (input against output and power supply) 3 kV AC (output against power supply)
Working voltage (basic insulation)	1000 V AC/DC input against output and power supply with overvoltage category II and pollution degree 2, 330 V AC/DC output against power supply with overvoltage category II and pollution degree 1, 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. For hazardous area applications the maximum working voltage is 250 V.
Protection against electric shock	Safe Isolation according to EN 61140 by reinforced insulation in accordance with EN 61010-1. Working voltages with overvoltage category II and pollution degree 2: 600 V AC/DC for input against output and power supply, 300 V AC / DC for output against power supply. For applications with high working voltages, you should ensure there is sufficient spacing or isolation from neighboring devices and protection against electric shocks. For hazardous area applications the maximum working voltage is 250 V.

Modular Housings for Hazardous Areas

ThermoTrans® 210/211

Specifications (continued)

Standards and approvals

Explosion protection
(Opt. 444)

II (1) G [Ex ia] II C

PTB 02 ATEX 2107

For further details see certificates of conformity at our website: www.knick.de

Surge withstand

5 kV 1.2 / 50 μ s according to IEC 255-4

EMC¹⁾

89/336/EEC directive, EN 61326, NAMUR NE 21

Other data

Interface
(adjustable models only)

Optical, interface adapter on RS 232 interface (PC) is included in the communications kit (ZU 0254)

Ambient temperature

Operation: -10 ... +60 °C

Transport and storage: -30 ... +80 °C

Design

A7 modular housing, width 22.5 mm, screw terminals

See dimension drawings for further measurements

Ingress protection

Housing IP 40, terminals IP 20

Mounting

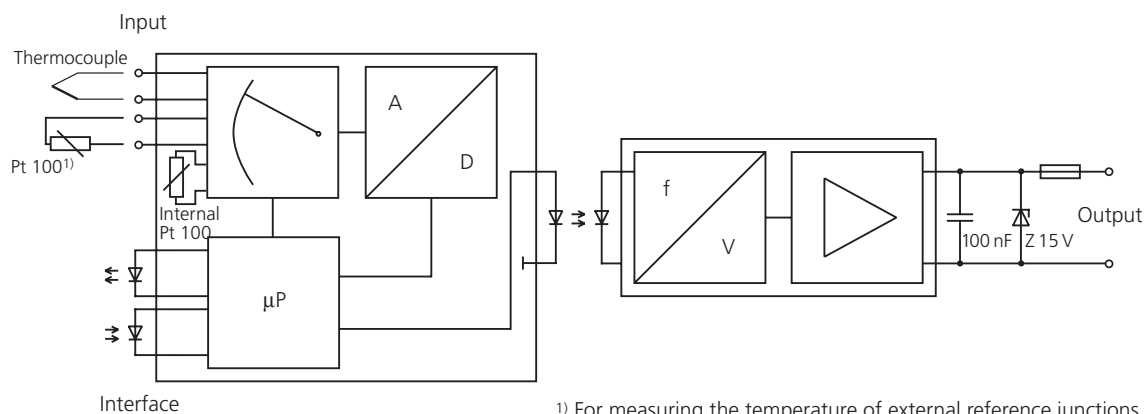
With snap-on mounting for 35 mm top hat rail according to EN 50022-35, width 22.5 mm, see dimension drawings for conductor cross section

Weight

Approx. 300 g

1) Slight deviations are possible while there is interference from RF radiation

■ Block Diagram

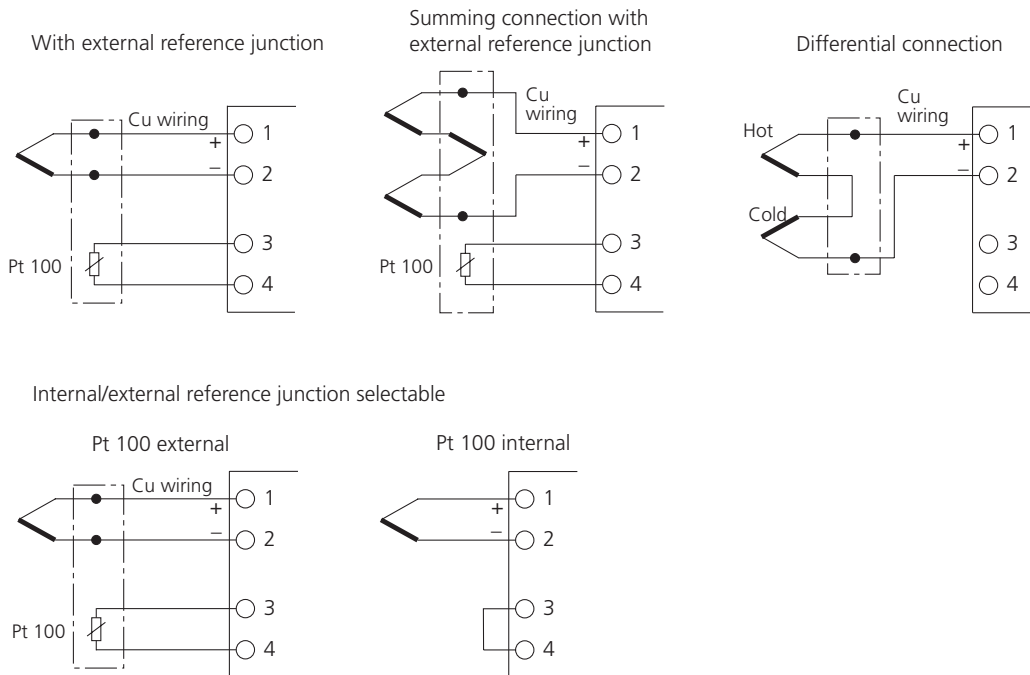


Temperature Transmitters

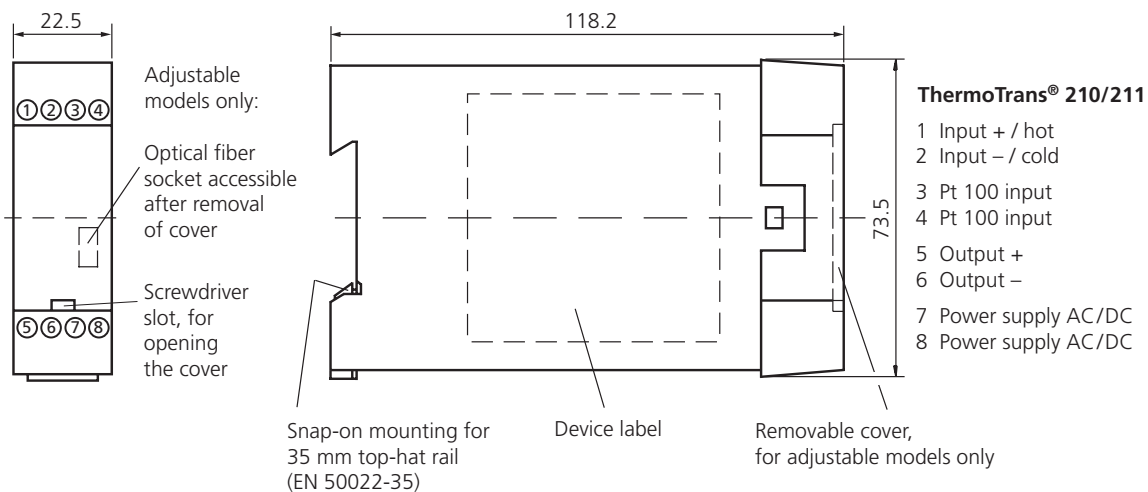
Isolation Amplifiers Transmitters	Indicators	Process Analytics	Portable Meters	Laboratory Meters	Sensors	Fittings
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■ Application Examples



■ Dimension Drawings and Terminal Assignments



Captive M3x8 clamping screws, box terminals with self-releasing wire protection

Max. conductor cross-section

1 x 4 mm² solid

1 x 2.5 mm² stranded wire with ferrule

2 x 1.5 mm² stranded wire with ferrule

All dimensions in mm!