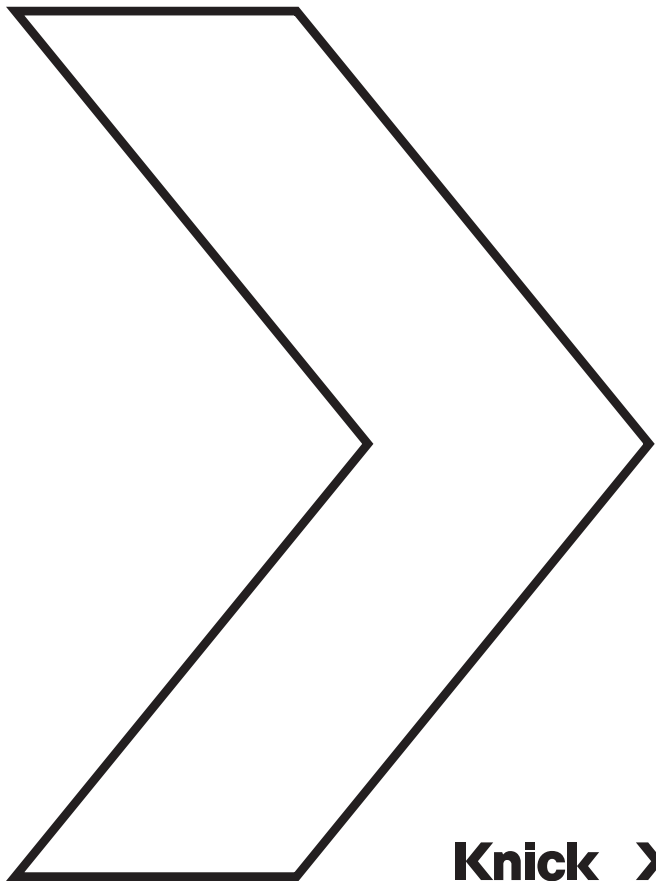


Temperature Transmitters 

ThermoTrans® 205, 206 / ThermoTrans® 210, 211



Knick 



Warranty

Defects occurring within 5 years from delivery date shall be remedied free of charge at our plant (carriage and insurance paid by sender).

EC Declarations of Conformity

09.10.2002	EG-Konformitätserklärung EC Declaration of Conformity Déclaration de Conformité CE	Knick > Knick Elektronische Meßgeräte GmbH & Co. Beuckestraße 22 D-14163 Berlin
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Dokument-Nr. / Document No. / No. document	EG21009A Temperatur-Meßumformer ThermoTrans® 205/206 A7
Produktbezeichnung / Product identification / Désignation du produit	

Das bezeichnete Produkt stimmt mit den Vorschriften folgender Europäischer Richtlinie(n) oder Normen überein:
 The designated product is in compliance with the provisions of the following EC directive(s) or standards:
 Le produit désigné est conforme aux dispositions de la / des directive(s) CE ou du / des standard(s) suivant(s):

Explosionsschutzrichtlinie / Explosion protection / Protection contre les explosions Norm Standard Standard	94/9/EG EN 50014: 1997 + A1 + A2 EN 50020: 1994
Niederspannungs-Richtlinie / Low-voltage directive / Directive basse tension Norm Standard Standard	73/23/EWG EN 60529 / 10.91 / VDE 0470 Teil 1: 1992-11 EN 61010 Teil 1 / 03.93 / VDE 0411 Teil 1: 1994-03 EN 61010-1/A2 / 07.95 / VDE 0411 Teil 1 / A1: 1996-05

EMV-Richtlinie / EMC directive / Directive CEM Norm Standard Standard	89/336/EWG DIN EN 61326 / VDE 0843 Teil 20: 1998-01 DIN EN 61326/A1 / VDE 0843 Teil 20/A1: 1999-05
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Außerdem entspricht es den Vorschriften des Gesetzes über die elektromagnetische Verträglichkeit von Geräten (EMVG) vom 18.09.1998.
 Furthermore it complies with the provisions of the German law on electromagnetic compatibility of devices (EMVG) of September 18, 1998.
 En outre, il correspond aux dispositions de la loi allemande sur la compatibilité électromagnétique des appareils (EMVG) du 18.09.1998.

Knick Elektronische Meßgeräte GmbH & Co.

ppa. 
 Wolfgang Feucht

ppa. 
 Bernhard Kusig

09.10.2002

**EG-Konformitätserklärung
EC Declaration of Conformity
Déclaration de Conformité CE**

Knick >

Knick
Elektronische Meßgeräte
GmbH & Co.
Beuckestraße 22
D-14163 Berlin

Dokument-Nr. /
Document No. /
No. document

EG21009B

Produktbezeichnung /
Product identification /
Désignation du produit

Temperatur-Meßumformer ThermoTrans® 210/211 A7

Das bezeichnete Produkt stimmt mit den Vorschriften folgender Europäischer Richtlinie(n) oder Normen überein:
The designated product is in compliance with the provisions of the following EC directive(s) or standards:
Le produit désigné est conforme aux dispositions de la / des directive(s) CE ou du / des standard(s) suivant(s):

Explosionsschutzrichtlinie /
Explosion protection /
Protection contre les explosions

94/9/EG

Norm
Standard
Standard

EN 50014: 1997 + A1 + A2
EN 50020: 1994

Niederspannungs-Richtlinie /
Low-voltage directive /
Directive basse tension

73/23/EWG

Norm
Standard
Standard

EN 60529 / 10.91 / VDE 0470 Teil 1: 1992-11
EN 61010 Teil 1 / 03.93 / VDE 0411 Teil 1: 1994-03
EN 61010-1/A2 / 07.95 / VDE 0411 Teil 1 / A1: 1996-05

EMV-Richtlinie /
EMC directive /
Directive CEM

89/336/EWG

Norm
Standard
Standard

DIN EN 61326 / VDE 0843 Teil 20: 1998-01
DIN EN 61326/A1 / VDE 0843 Teil 20/A1: 1999-05

Außerdem entspricht es den Vorschriften des Gesetzes über die elektromagnetische Verträglichkeit von Geräten (EMVG) vom 18.09.1998.
Furthermore it complies with the provisions of the German law on electromagnetic compatibility of devices (EMVG) of September 18, 1998.
En outre, il correspond aux dispositions de la loi allemande sur la compatibilité électromagnétique des appareils (EMVG) du 18.09.1998.

Knick Elektronische Meßgeräte GmbH & Co.

ppa.
Wolfgang Feucht

ppa.
Bernhard Kusig

ThermoTrans® 2xx

Safety and installation information

Installation and commissioning

The ThermoTrans® 2xx temperature transmitter is an associated apparatus for application outside hazardous locations. The current loop in type of protection “Intrinsic Safety” may be connected into hazardous locations. Only certified intrinsically safe circuits may be connected to the current loop. Before commissioning it must be proved that the intrinsic safety is maintained when connecting the current loop to other equipment including cables and lines. Be sure to observe the EC-Type-Examination Certificate and the stipulations of EN 50014:1997+A1+A2 and EN 50020:1994.

Assembly/dismantling, installation, operation and maintenance may only be carried out by qualified personnel as defined by the automation industry in compliance with the applicable regulations and this instruction manual. Be sure to observe the technical specifications and input ratings during installation.

Intended use

The ThermoTrans® 2xx temperature transmitters are used to detect resistance-proportional signals or thermo-electric voltages and to convert them into impressed current or voltage signals in the output loop. The ThermoTrans® 2xx transmitters provide safe isolation and high insulation strength between the input, output, and power supply.

The ThermoTrans® 205 / 206 transmitters allow connection of all common resistance thermometers either in 2, 3 or 4-wire configuration.

The ThermoTrans® 210/21 transmitters allow connection of thermocouples. They can also be used to measure voltages in the range of -20 ... +100 mV at a transfer rate of 1/sec.

ThermoTrans® 2xx

- Broad range supply – just 2 versions for all mains voltages
- Reinforced insulation according to EN 61010-1,
Safe Isolation according to EN 61140
- Protection against incorrect measurements due to parasitic voltages
- High transmission accuracy
- Explosion protection II (1) G [Ex ia] IIC
- 22.5 mm modular housing

Product line

Fixed range standard models

ThermoTrans® 205 with current output

Order No.		205 A7	x	xx	xx	x
Sensors	Pt 100 (−200 ... +850 °C)	A				
	Pt 1000 (−200 ... +850 °C)	B				
	Ni 100 (−60 ... +180 °C)	C				
	1000 ohms	D				
	5000 ohms	E				
Span	50 K		05			
	100 K		10			
	150 K		15			
	200 K		20			
	300 K		30			
	400 K		40			
	1000 ohms		70			
	5000 ohms		88			
Start of scale	−100°C		02			
	−50°C		01			
	0 °C		00			
	50 °C		11			
	100 °C		12			
	200 °C		14			
	0 ohm		30			
Output	0 ... 20 mA					D
	4 ... 20 mA					L

Sensor with 4-wire connection (3-wire connection Opt. 494), rising output curve, without filter constant, open circuit recognition 22 mA

Product line

Fixed range standard models (continued)

ThermoTrans® 206 with voltage output

Order No.		206 A7	x	xx	xx	V
Sensors	Pt 100 (–200 ... +850 °C)	A				
	Pt 1000 (–200 ... +850 °C)	B				
	Ni 100 (–60 ... +180 °C)	C				
	1000 ohms	D				
	5000 ohms	E				
Span	50 K		05			
	100 K		10			
	150 K		15			
	200 K		20			
	300 K		30			
	400 K		40			
	1000 ohms		70			
	5000 ohms		88			
Start of scale	–100°C		02			
	–50°C		01			
	0 °C		00			
	50 °C		11			
	100 °C		12			
	200 °C		14			
	0 ohm		30			
Output	0 ... 10 V					V

Sensor with 4-wire connection (3-wire connection Opt. 494), rising output curve, without filter constant, open circuit recognition 11 V

Product line

Fixed range standard models (continued)

ThermoTrans® 210 with current output

Order No.	210 A7	x	xx	xx	x
Sensors	J K S	J K S			
Span	700 K 1000 K 1700 K	60 75 97			
Start of scale	0 °C		00		
Output	0 ... 20 mA 4 ... 20 mA				D L

Output curve rising, without filter constant, internal reference junction, open circuit recognition 22 mA

ThermoTrans® 211 with voltage output

Order No.	211 A7	x	xx	xx	V
Sensors	J K S	J K S			
Span	700 K 1000 K 1700 K	60 75 97			
Start of scale	0 °C		00		
Output	0 ... 10 V				V

Output curve rising, without filter constant, internal reference junction, open circuit recognition 11 V

Product line

Models with customer specific settings

ThermoTrans® 205 with current output

Order No.	205 A7 999 999
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ThermoTrans® 206 with voltage output

Order No.	205 A7 999 999
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ThermoTrans® 210 with current output

Order No.	210 A7 999 999
-----------	----------------

ThermoTrans® 211 with voltage output

Order No.	211 A7 999 999
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Adjustable models

Adjustable via interface. See Configuration Schedule for factory setting.

ThermoTrans® 205 with current output

Order No.	205 A7 000 000
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ThermoTrans® 206 with voltage output

Order No.	206 A7 000 000
-----------	----------------

ThermoTrans® 210 with current output

Order No.	210 A7 000 000
-----------	----------------

ThermoTrans® 211 with voltage output

Order No.	211 A7 000 000
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Options

Order No.

Power supply 24 V AC/DC	336
Power supply 115 V AC	363
Input intrinsically safe, EEx ia IIC	444
ThermoTrans® 205 / 206 standard model with 3-wire connection	494

Accessories

Communications kit ZU 0254

for configuration of the temperature transmitter, with tag database according to VDI / VDE 2187, consisting of:

- optical fiber connecting cable, 3 m
- optical interface adapter – RS 232
- adapter D-Sub 9-pin – D-Sub 25-pin,
- Paraly® configuration software and tag database

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 dark-colored setting ☐ will be set.

Configuration schedule

ThermoTrans® 205/206

Sensor ¹⁾	Temperature probe: <input checked="" type="checkbox"/> Pt 100 according to IEC 751 <input type="checkbox"/> Pt 500 <input type="checkbox"/> Pt 1000 <input type="checkbox"/> Ni 100 according to DIN 43 760 <input type="checkbox"/> Ni 120 <input type="checkbox"/> Ni 500 <input type="checkbox"/> Ni 1000 <hr/> Resistance sensor or potentiometer: <input type="checkbox"/> ≤ 500 ohms <input type="checkbox"/> ≤ 5000 ohms
Connection	<input type="checkbox"/> 2-wire connection Line resistance ²⁾ ___ . ___ ohms <input type="checkbox"/> 3-wire connection <input checked="" type="checkbox"/> 4-wire connection
Range	Start of scale ²⁾ ___ °C [0 °C] or ___ ohms Span ²⁾ ___ K [100 K] or ___ ohms
Output ³⁾	<input checked="" type="checkbox"/> 0 ... 20 mA <input type="checkbox"/> 4 ... 20 mA <input type="checkbox"/> 0 ... 10 V
Characteristic	<input checked="" type="checkbox"/> Rising <input type="checkbox"/> Falling
Error messages	Message: <input checked="" type="checkbox"/> With open circuit only <input type="checkbox"/> With open circuit or out-of-range conditions <hr/> Signal: <input checked="" type="checkbox"/> 22 mA or 11 V <input type="checkbox"/> -1 mA or -0.5 V
Filter constant T ₉₉	___ s ²⁾ (1st order filter) [0 s]
Tag number	_____ [none]

1) Other types on request, 2) See specifications for possible parameter range,
 3) Other values on request

Configuration schedule

ThermoTrans® 210/211

Sensors	Thermocouples: <input type="checkbox"/> Type B <input type="checkbox"/> Type S <input type="checkbox"/> Type E <input type="checkbox"/> Type T <input type="checkbox"/> Type J <input type="checkbox"/> Type U <input checked="" type="checkbox"/> Type K <input type="checkbox"/> Voltage <input type="checkbox"/> Type L <input type="checkbox"/> Type N <input type="checkbox"/> Type R	
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"/> External Pt 100 <input type="checkbox"/> Internal / external switching (via jumper) <input type="checkbox"/> Permanently set temperature ²⁾ ____ . ____ °C [25 °C]	
Output ³⁾	<input checked="" type="checkbox"/> 0 ... 20 mA <input type="checkbox"/> 4 ... 20 mA <input type="checkbox"/> 0 ... 10 V	
Characteristic	<input checked="" type="checkbox"/> Rising <input type="checkbox"/> Falling	
Error messages	Message: <input checked="" type="checkbox"/> With open circuit only <input type="checkbox"/> With open circuit or out-of-range conditions <hr/> 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]

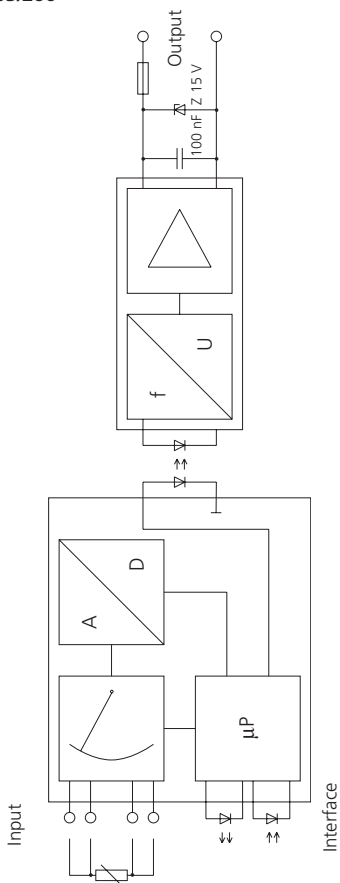
1) See specifications for possible parameter range

2) Compensation range -10 ... 80 °C

3) Other values on request

Block diagram

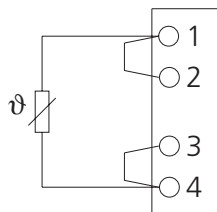
ThermoTrans® 205/206



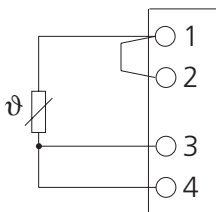
Wiring examples

ThermoTrans® 205/206

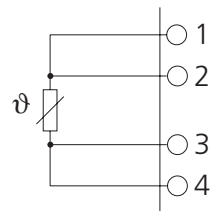
2-wire connection



3-wire connection



4-wire connection



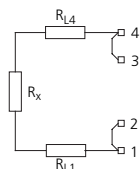
Specifications

ThermoTrans® 205/206

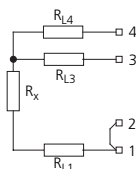
Input data

	Sensor type	Range	Span (user-defined)
Intrinsically safe	Pt 100 to IEC 751	-200 ... +850 °C	25 ... 1050 K
	Pt 500		
	Pt 1000		
	Ni 100 to DIN 43760	-60 ... +180 °C	25 ... 240 K
	Ni 120		
	Ni 500		
	Ni 1000		
	Resistance remote sensor and potentiometer	0 ... 500 ohms or 0 ... 5000 ohms	9 ... 500 ohms or 90 ... 5000 ohms

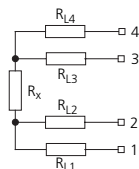
Connection	2-wire connection:	Configured line resistance is calculated in the measured value
	3-wire connection:	$R_{L1} = R_{L4}$
	4-wire connection	



2-wire connection



3-wire connection



4-wire connection

Max. line resistance	$R_{L1} + R_{L4} = 100 \text{ ohms}$
Sensor current	Approx. 1 mA or 0.1 mA depending on measuring range
Open-circuit voltage	< 5 V
Sensor monitoring	All inputs for open circuit

Specifications

ThermoTrans® 205/206 (continued)

Input error limits	Resistance:	Range 0 ... 500 ohms	± 0.05 ohm
		Range 0 to 5 kohm	± 0.5 ohm
	with Pt:	Range -200 ... +850 °C	± 0.2 K
	with Ni:	Range -60 ... +180 °C	± 0.2 K
Temp coefficient at the input	25 ppm / K full scale (average TC in permitted operating temperature range, reference temperature 23 °C)		

Output data

Output signal (0 ... 100 %)	Model 205: 0 / 4 ... 20 mA, impressed current, load voltage ≤ 10 V Model 206: 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 205: -1.0 mA or 22 mA Model 206: -0.5 V or 11 V		
Output error limits	0.1 % full scale		
Temp coefficient at the output	100 ppm / 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		

Transmission behavior

Characteristic	Resistance or temperature linear rising or falling		
Meas. rate	Approx. 1/sec		
Response time T ₉₉	≤ 900 ms		
Digital output filter	T ₉₉ = 0 ... 100 s (1st order filter)		

Specifications

ThermoTrans® 205/206 (continued)

Power supply

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

Opt. 363:	115 V AC – 15 % + 10 %, 48 ... 62 Hz, approx. 2 VA
-----------	--

Isolation

Galvanic isolation	3-port isolation between input, output, and power supply
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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 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 electrical shocks. When used in hazardous areas, the max. working voltage is 250 V.
---------------------------------------	---

Protection against electrical 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 With overvoltage category II and pollution degree 1: 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 electrical shocks. When used in hazardous areas, the max. working voltage is 250 V.
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Specifications

ThermoTrans® 205/206 (continued)

Standards and approvals

Explosion protection (Opt. 444)	II (1) G [EEx ia] II C PTB 02 ATEX 2107 for further details see certificates of conformity
Surge withstand	5 kV 1.2 / 50 µs according to IEC 255-4
EMC ¹⁾	89/336/EEC, EN 61326, NAMUR NE 21 recommendation

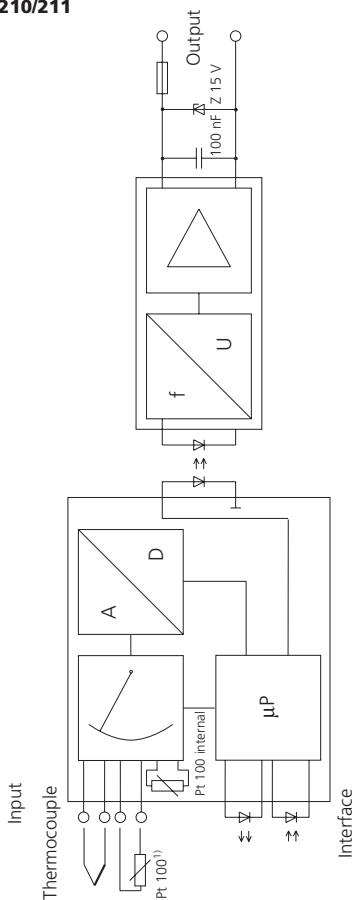
1) Slight deviations are possible while there is interference from RF radiation

Other data

Interface (adjustable models only)	Optical, interface adapter on RS 232 interface (PC) is included in the ZU 0254 communications kit
Ambient temperature	Operation: -10 ... +60 °C Transport and storage: -30 ... +80 °C
Design	Modular housing A7, width 22.5 mm, screw terminals see dimension drawing for further measurements
Ingress protection	Housing IP 40, terminals IP 20
Mounting	With snap-on mounting for 35 mm top hat rail accord- ing to EN 60715, width 22.5 mm, see dimension drawing for conductor cross section
Weight	Approx. 300 g

Block diagram

ThermoTrans® 210/211

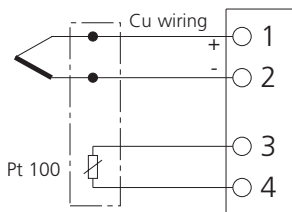


1) For temperature measurement of external reference junctions

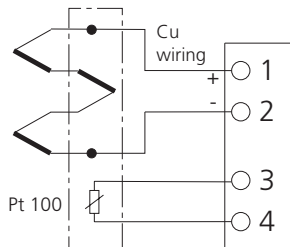
Wiring examples

ThermoTrans® 210/211

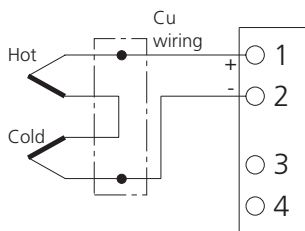
With external reference junction



Summing circuit with external reference junction

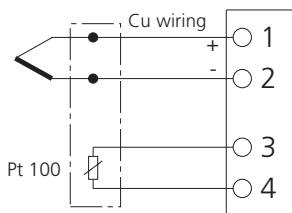


Differential circuit

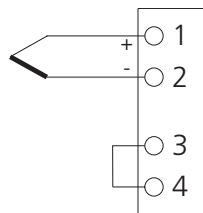


Connection at reference junction internally / externally switchable

Pt 100 external



Pt 100 internal



Specifications

ThermoTrans® 210/211

Input data

	Sensor type		Range
Intrinsically safe	Type B	DIN / IEC 584-1	0 ... +1820 °C
	Type E	DIN / IEC 584-1	-270 ... +1000 °C
	Type J	DIN / IEC 584-1	-210 ... +1200 °C
	Type K	DIN / IEC 584-1	-270 ... +1372 °C
	Type L	DIN 43710	-200 ... + 900 °C
	Type N	ASTM E 230-87	-270 ... +1300 °C
	Type R	DIN / IEC 584-1	-50 ... +1767 °C
	Type S	DIN / IEC 584-1	-50 ... +1767 °C
	Type T	DIN / IEC 584-1	-270 ... + 400 °C
	Type U	DIN 43710	-200 ... + 600 °C
Voltage input	-20 ... +100 mV		
Input resistance	> 10 Mohms		
Span (user-defined)	Min. ≥ 2 mV, max. end of scale – start of scale		
Sensor monitoring	All inputs for open circuit (not with voltage measurement)		
Input error limits	$\pm 10 \mu\text{V} + 0.05 \% \text{ meas.val.}$		
Temp coefficient at input	100 ppm / K full scale (average TC in permitted operating temperature range, reference temperature 23 °C)		
Reference junction input (user defined)	Internal Pt 100	< ± 1.0 K	
	External Pt 100	< ± 0.3 K + error of Pt 100 used	

Specifications

ThermoTrans® 210/211 (continued)

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
Temp coefficient at output	100 ppm / 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

Transmission behavior

Characteristic	Temperature or voltage linear or customer specific rising or falling
Meas. rate	Approx. 1/sec
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
Opt. 336:	24 V AC / DC AC: - 15 % + 10 %, 48 ... 500 Hz, approx. 1.5 VA DC: - 15 % + 20 %, approx. 1.2 W
Opt. 363:	115 V AC - 15 % + 10 %, 48 ... 62 Hz, approx. 2 VA

Specifications

ThermoTrans® 210/211 (continued)

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 electrical shocks. When used in hazardous areas, the max. working voltage is 250 V.
Protection against electrical 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 With overvoltage category II and pollution degree 1: 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 electrical shocks. When used in hazardous areas, the max. working voltage is 250 V.

Specifications

ThermoTrans® 210/211 (continued)

Standards and approvals

Explosion protection (Opt. 444)	II (1) G [EEx ia] II C PTB 02 ATEX 2107 for further details see EC-Type-Examination Certificate
Surge withstand	5 kV 1.2 / 50 µs according to IEC 255-4
EMC ¹⁾	89/336/EEC, EN 61326, NAMUR NE 21 recommendation

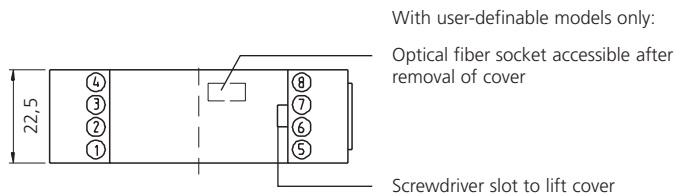
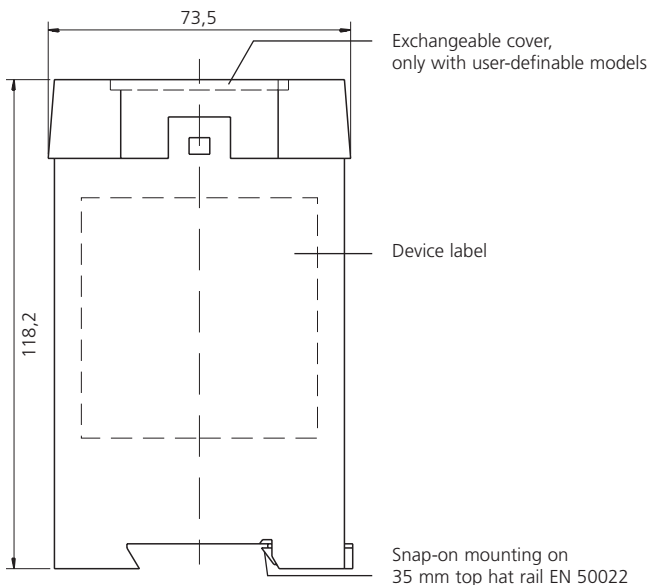
1) Slight deviations are possible while there is interference from RF radiation

Other data

Interface (adjustable models only)	Optical, interface adapter on RS 232 interface (PC) is included in the ZU 0254 communications kit
Ambient temperature	Operation: – 10 ... +60 °C Transport and storage: – 30 ... +80 °C
Design	Modular housing A7, width 22.5 mm, screw terminals see dimension drawing 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 60715, width 22.5 mm, see dimension drawing for conductor cross section
Weight	Approx. 300 g

Dimension drawings

and terminal assignment







Dimension drawings

and terminal assignment (continued)

Terminal assignment

ThermoTrans® 205/206

- 1  Input
- 2  Sense line
- 3  Sense line
- 4  Input

- 5 Output +
- 6 Output –
- 7 Power supply AC/DC
- 8 Power supply AC/DC

ThermoTrans® 210/211

- 1 Input +/-hot
- 2 Input -/cold
- 3 Pt 100 input
- 4 Pt 100 input

- 5 Output +
- 6 Output –
- 7 Power supply AC/DC
- 8 Power supply AC/DC

Design of screw clamp connection

Captive M3x8 clamp screws, box terminals with self-releasing wire protection,
max. conductor cross section

1 x 4 mm² solid

1 x 2.5 mm² stranded with sleeve or

2 x 1.5 mm² stranded with sleeve

Installation, commissioning, and maintenance must only be carried out by trained personnel.

EC-Type-Examination Certificate

Physikalisch-Technische Bundesanstalt
Braunschweig und Berlin



(1) **EC-TYPE-EXAMINATION CERTIFICATE**
(Translation)

- (2) Equipment and Protective Systems Intended for Use in
Potentially Explosive Atmospheres - **Directive 94/9/EC**

- (3) EC-type-examination Certificate Number:



PTB 02 ATEX 2107

- (4) Equipment: Temperature Transmitter ThermoTrans
Model Z** A7 Opt. ...
- (5) Manufacturer: Knick Elektronische Messgeräte GmbH & Co.
- (6) Address: Beuckestr. 22, 14163 Berlin, Germany
- (7) This equipment and any acceptable variation thereto are specified in the schedule to this certificate and the documents therein referred to.
- (8) The Physikalisch-Technische Bundesanstalt, notified body No. 0102 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.

The examination and test results are recorded in the confidential report PTB Ex 02-22171.

- (9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:
EN 50014:1997 + A1 + A2 **EN 50020:1994**
- (10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.
- (11) This EC-type-examination Certificate relates only to the design, examination and tests of the specified equipment in accordance to the Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.
- (12) The marking of the equipment shall include the following:



II (1) G [EEx ia] IIC

Zertifizierungsstelle Explosionsschutz
By order:

Braunschweig, August 27, 2002

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor



sheet 1/4

EC-type-examination Certificates without signature and official stamp shall not be valid. The certificates may be circulated only without alteration. Extracts or alterations are subject to approval by the Physikalisch-Technische Bundesanstalt. In case of dispute, the German text shall prevail.

Physikalisch-Technische Bundesanstalt • Bundesallee 100 • D-38116 Braunschweig

Physikalisch-Technische Bundesanstalt

Braunschweig und Berlin



SCHEDULE

(13)

 (14) **EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2107**

 (15) Description of equipment

The temperature transmitter ThermoTrans Model 2** A7 Opt. ... with it's different variants is used for the detection of resistance-proportional measuring signals and of thermo-electromotive forces and their conversion to injected current and voltage signals into the output circuit.

The apparatus is installed outside hazardous areas.

The permissible range of the ambient temperature is -10 °C ... 60 °C.

Electrical data

Auxiliary power circuit..... 230 V AC -15 % +10 %, approx. 2 VA
 (terminals 7, 8) 115 V AC -15 % +10 %, approx. 2 VA
 24 V AC -15 % +10 %, approx. 1.5 VA
 24 V DC -15 % +20 %, approx. 1.2 W

Output circuit..... I = 0 ... 20 mA
 (terminals 5, 6) U = 10 V
 U_m = 253 V

Types 20* ...

Resistance measuring circuit type of protection Intrinsic Safety EEx ia IIC
 (terminals 1, 2, 3, 4)

Maximum values:

U₀ = 6 V
 I₀ = 13 mA
 P₀ = 20 mW
 R_i = 480 Ω
 linear characteristic
 L₀ = 3 mH
 C₀ = 2200 nF
 L_i negligibly low
 C_i negligibly low

The resistance measuring circuit is safely electrically isolated from the auxiliary power circuit and from the output circuit up to a peak value of the nominal voltage of 375 V.

sheet 2/4

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SCHEDULE TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2107

Types 21* ...

Thermocouple measuring circuit type of protection Intrinsic Safety EEx ia IIC
(terminals 1, 2)

Maximum values:

$U_0 = 6 \text{ V}$
 $I_0 = 2.3 \text{ mA}$
 $P_0 = 3.5 \text{ mW}$
 $R_0 = 2600 \text{ } \Omega$
linear characteristic
 $L_0 = 3 \text{ mH}$
 $C_0 = 2300 \text{ nF}$
 L_i negligibly low
 $C_i = 1100 \text{ nF}$

resp.

for connection to a certified intrinsically safe
circuit

Maximum values:

$U_i = 12 \text{ V}$
 $I_i = 100 \text{ mA}$
 $P_i = 250 \text{ mW}$
 L_i negligibly low
 $C_i = 1100 \text{ nF}$

Pt 100-measuring circuit type of protection Intrinsic Safety EEx ia IIC
(terminals 3, 4)

Maximum values:

$U_0 = 6 \text{ V}$
 $I_0 = 5.5 \text{ mA}$
 $P_0 = 8.5 \text{ mW}$
 $R_0 = 1090 \text{ } \Omega$
linear characteristic
 $L_0 = 3 \text{ mH}$
 $C_0 = 2300 \text{ nF}$
 L_i negligibly low
 $C_i = 1100 \text{ nF}$

The thermocouple measuring circuit and the Pt 100-measuring circuit are electrically interconnected and safely electrically isolated from the auxiliary power circuit and the output circuit up to a peak value of the nominal voltage of 375 V.

sheet 3/4

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SCHEDULE TO EC-TYPE-EXAMINATION CERTIFICATE PTB 02 ATEX 2107

(16) Test report PTB Ex 02-22171

(17) Special conditions for safe use

none

(18) Essential health and safety requirements

met by the standards quoted

Zertifizierungsstelle Explosionsschutz
By order

Braunschweig, August 27, 2002

Dr.-Ing. U. Johannsmeyer
Regierungsdirektor



sheet 4/4

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