

### Resistance Thermometers Model Series TR7X0, Sheathed Design

WIKA Data Sheet TE 60.40



#### Applications

- Suitable for all industrial and laboratory applications

#### Special Features

- Application ranges from -200 °C to +600 °C
- Flexible stainless steel sheath, mineral insulated wire
- High mechanical strength, vibration proof
- Intrinsically safe versions (ATEX)

#### Description

With sheathed resistance thermometers, the flexible part of the probe is a mineral insulated cable, often called the sheathed cable. This cable consists of a stainless steel outer sheath, in which the inner conductors are encased for insulation and compressed into a highly compacted ceramic mass.

The measuring resistance is connected to the inner conductors at the measuring end of the sheathed cable. Connector wires are connected to the other end of the sheathed cable, and the sheathed cable is hermetically sealed with a sealing compound. The connector wires form the basis of the electrical interface, with cable, a connector or a terminal block then attached to these connector wires.

Due to their flexibility and the small diameters in which they are available, sheathed resistance thermometers can be used in locations that are not easily accessible.



Sheathed Resistance Thermometers, Model Series TR7X0

Intrinsically safe designs are also available for applications in hazardous areas. The models in the TR7X0 series are provided with a type-examination certificate for "intrinsically safe" protection according to directive 94/9/EC (ATEX). Manufacturer's Declarations in accordance with EN 50 020 are also available.

Optionally analogue or digital transmitters from the WIKA range can be fitted into the connection head of the TR750 or TR760.

## Sensor

The sensor is located in the tip of the sheathed resistance thermometer.

### Sensor method of connection

- 2 wire
- 3 wire
- 4 wire

With 2-wire connection the lead resistance of the measuring insert compounds the error.

### Sensor limiting error

- class B to DIN EN 60 751
- class A to DIN EN 60 751 (-50 °C ... +450 °C)
- 1/3 DIN B at 0 °C

It makes no sense to combine 2-wire connection with class A or 2-wire connection with 1/3 DIN B, because the lead resistance error of the measuring insert over-rides the higher sensor accuracy.

### Basic values and limiting errors

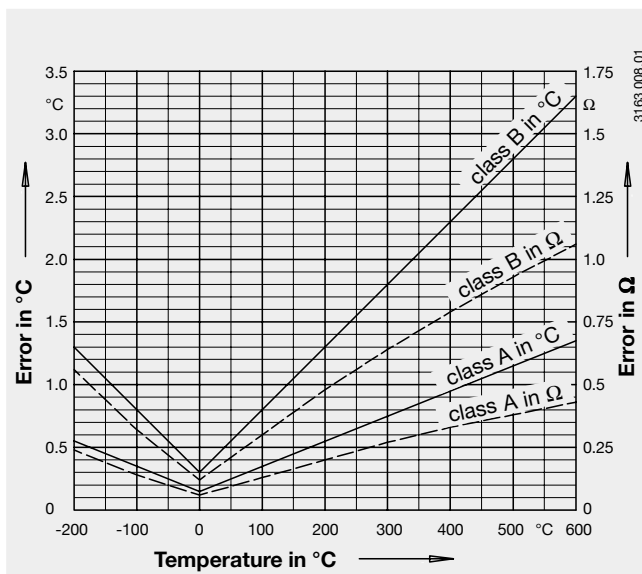
Basic values and limiting errors for the platinum measurement resistances are laid down in DIN EN 60 751. The nominal value of Pt 100 sensors is 100 Ω at 0 °C. The temperature coefficient α can be stated simply to be between 0 °C and 100 °C with:

$$\alpha = 3.85 \cdot 10^{-3} \text{ } ^\circ\text{C}^{-1}$$

The relationship between the temperature and the electrical resistance is characterised by polynomials which are defined in DIN EN 60 751. Furthermore, this standard lays down the basic values in °C stages.

Class	Limiting error in °C
A	$0.15 + 0.002 \cdot  t $ <sup>1)</sup>
B	$0.3 + 0.005 \cdot  t $

1) |t| is the value of the temperature in °C without consideration of the sign



Temperature (ITS 90) °C	Basic value Ω	Limiting error DIN EN 60 751			
		Class A		Class B	
°C	Ω	°C	Ω	°C	Ω
-200	18.52	± 0.55	± 0.24	± 1.3	± 0.56
-100	60.26	± 0.35	± 0.14	± 0.8	± 0.32
-50	80.31	± 0.25	± 0.10	± 0.55	± 0.22
0	100	± 0.15	± 0.06	± 0.3	± 0.12
50	119.40	± 0.25	± 0.10	± 0.55	± 0.21
100	138.51	± 0.35	± 0.13	± 0.8	± 0.30
200	175.86	± 0.55	± 0.2	± 1.3	± 0.48
300	212.05	± 0.75	± 0.27	± 1.8	± 0.64
400	247.09	± 0.95	± 0.33	± 2.3	± 0.79
500	280.98	± 1.15	± 0.38	± 2.8	± 0.93
600	313.71	± 1.35	± 0.43	± 3.3	± 1.06

In addition to the limiting errors defined in DIN EN 60 751 historical data defines further limits, for example: 1/3 DIN B at 0 °C.

It should be noted that the limiting error restriction to 1/3 does not refer to the entire application range but only to the 0 °C value. If the restriction in limiting error refers to a temperature range, this range must be stated.

## Designs

Depending on their type of electrical connection, sheathed resistance thermometers are subdivided into the following designs:

- Model TR720 with conductor wires
- Model TR730 with cable
- Model TR740 with connector
- Model TR750 with connection head
- Model TR760 with connection head and fixed process connection

Upon request custom designs for special requirements are also available.

## Sheath

The sheath is flexible, with the exception of the probe tip, which is a 60 mm long rigid tube containing the measurement resistance. The admissible bending radius is three or five times the value of the sheath diameter. These sheathed probes can be subjected to up to approx. 600 °C.

### Please note:

The flexibility of the sheathed resistance thermometer has to be taken into account, especially when the flow rates are relatively high. Versions in which the process connection is not located directly at the connection head - where a transmitter might be built-in - are to be considered critical in applications where vibratory stresses occur.

### Sheath diameter

2.0 mm, 3.0 mm, 6.0 mm or 8.0 mm (with mounted tube), other on request

### Sheath material

Stainless steel (other on request)

### Nominal length

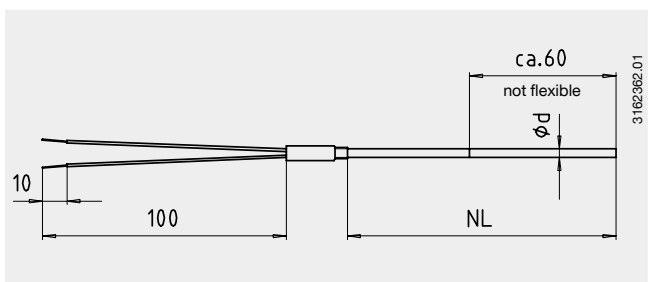
The nominal length should not be less than 150 mm. Shorter probes with cable are available in a rigid design, e.g.: model TR 101, see data sheet TE 60.05.

**Product summary and dimensions in mm**

**TR720 with conductor wires**

These models with conductor wires are intended for the installation into existing housings. The flexible sheath is inserted into the housing to the actual measuring point.

Lead length 100 mm, other length on request,  
 Cu braid 0.22 mm<sup>2</sup>, PTFE insulated,  
 max. temperature at the conductor connection 180 °C  
 (250 °C on request),  
 Number of conductor wires according to number  
 of sensors and method of sensor connection, bare wire  
 ends, other versions on request



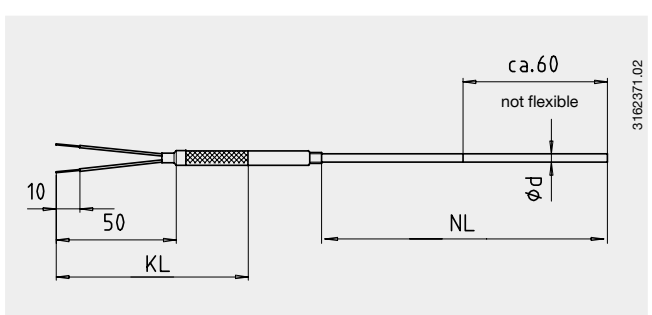
**TR730 with cable**

Cable and sheath are firmly connected to each other. Cable probes are easily replaceable and can be inserted or screwed into holes in machine parts without thermowells, for example. Usually these probes have no process connection as they are inserted into a hole. Retention is by means of threads, union nuts etc. which are available from WIKA.

Cable length to customer specification  
 Cu braid 0.22 mm<sup>2</sup>, number of cores according to number  
 of sensors and method of sensor connection, bare wire  
 ends, insulation (material / max. ambient temperature):

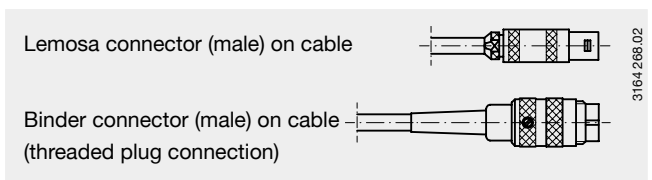
PVC	105 °C
Silicon	200 °C
PTFE	250 °C

other versions on request



**Optional: connector (male) fitted to cable end**

- Lemosa size 1 S for cable diameters up to 5.5 mm
  - Lemosa size 2 S for cable diameters up to 8 mm
  - Binder connector
- max. temperature at connector 85 °C,  
 mating connectors are available,  
 other versions on request



**TR740 with connector (female) fitted on probe**

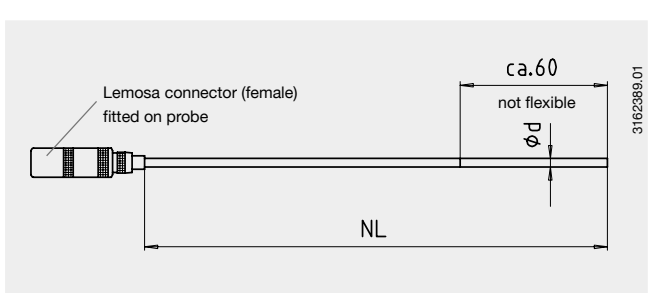
Designs with connector are used in cases where the electrical connection to the probe has to be easily made and unmade via a plug.

Connector:

- Lemosa size 1 S for sheath diameters 2, 3 and 6 mm
- Lemosa size 2 S for sheath diameters 3 and 6 mm

max. temperature at connector 85 °C,  
 mating connectors are available,  
 other versions on request

Otherwise same as model TR730.



Legend:

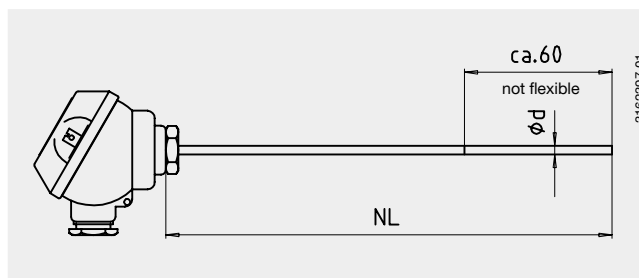
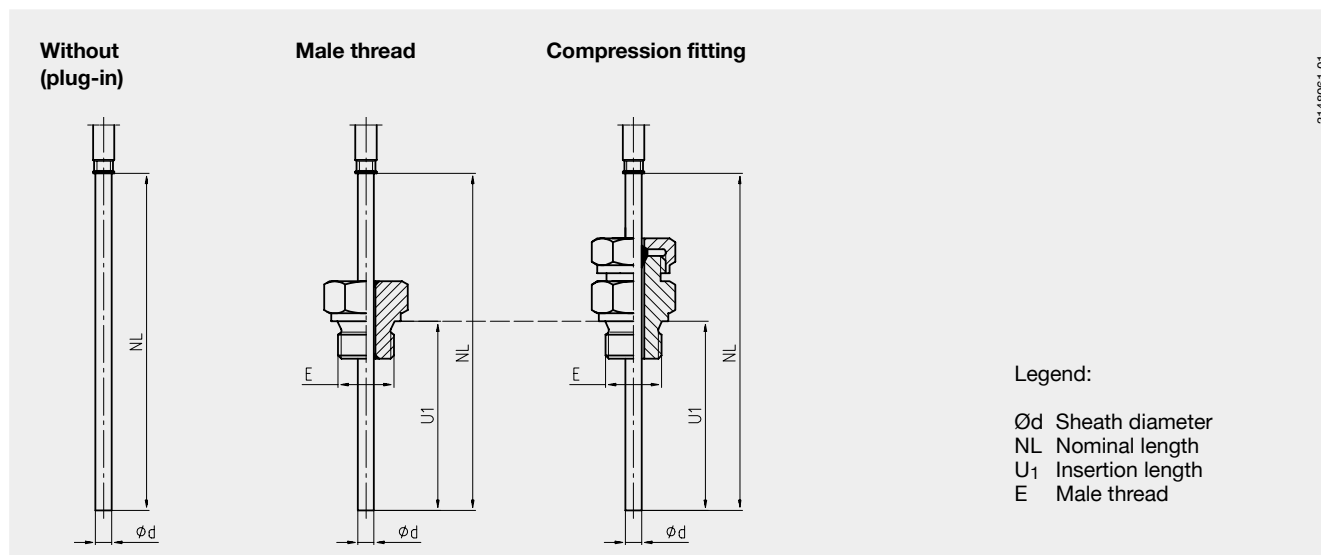
- NL Nominal length
- KL Cable length
- Ød Sheath diameter

**TR750 with connection head**

The electrical connection is provided by a connection head.

Connection head: Model JS, JVA or BS

Description of connection heads see page 6, top

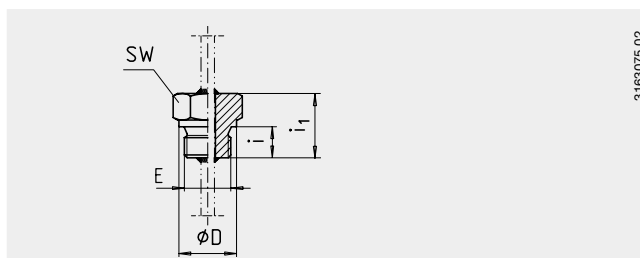
**Process connections of Models TR720, TR730, TR740 and TR750****Male thread**

Firmly connected to the sheath

Insertion length  $U_1$ : to customer specification

Max. insertion length: nominal length minus approx. 20 mm  
(Model TR750: nominal length minus approx. 25 mm)

Material: stainless steel,  
other on request

**Compression fitting**

Allows simple adaptation to the required insertion length at the installation point

Max. insertion length: nominal length minus approx. 25 mm  
(Model TR750: nominal length minus approx. 30 mm)

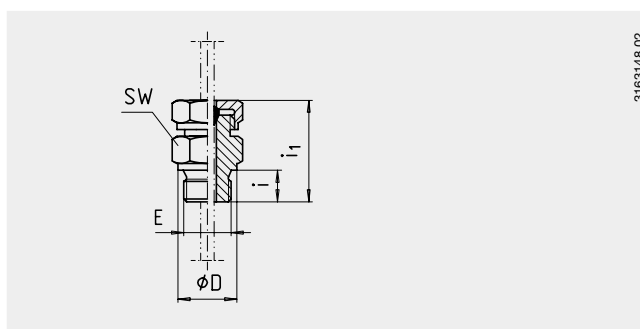
Material: stainless steel  
Sealing ring material: stainless steel or PTFE

Sealing rings of stainless steel can be adjusted once, after unscrewing, sliding along the sheath is no longer possible.

- Max. temperature at process connection 500 °C

Sealing rings of PTFE can be adjusted several times, after unscrewing, repeated sliding along the sheath is still possible.

- Max. temperature at process connection 150 °C



For sheathed resistance thermometers with  $\varnothing$  2 mm only PTFE sealing rings are permissible.

## Dimensions of process connections Model TR720, TR730, TR740 and TR750

Process connection	Male thread E	Sheath in mm Ød	Dimensions in mm			
			i	i <sub>1</sub>	ØD	SW (flats)
<b>Male thread</b>	G ½ B	2, 3 or 6	14	29	26	27
	G ¼ B	2, 3 or 6	12	24	18	19
	M 8 x 1.0	2 or 3	8	14	12	12
<b>Compression fitting</b>	G ½ B	2, 3 or 6	14	34	26	27
	G ¼ B	2, 3 or 6	12	32	18	19
	M 8 x 1.0	2 or 3	8	27	12	12

### TR760 with connection head and fixed process connection

This design is characterised by a fixed process connection (male thread) with a welded-in sheathed probe. Therefore, in this case the insertion length is of importance in lieu of the nominal length for variable insertion dimensions. The male thread is usually positioned directly at the connection head.

Insertion length: to customer specification

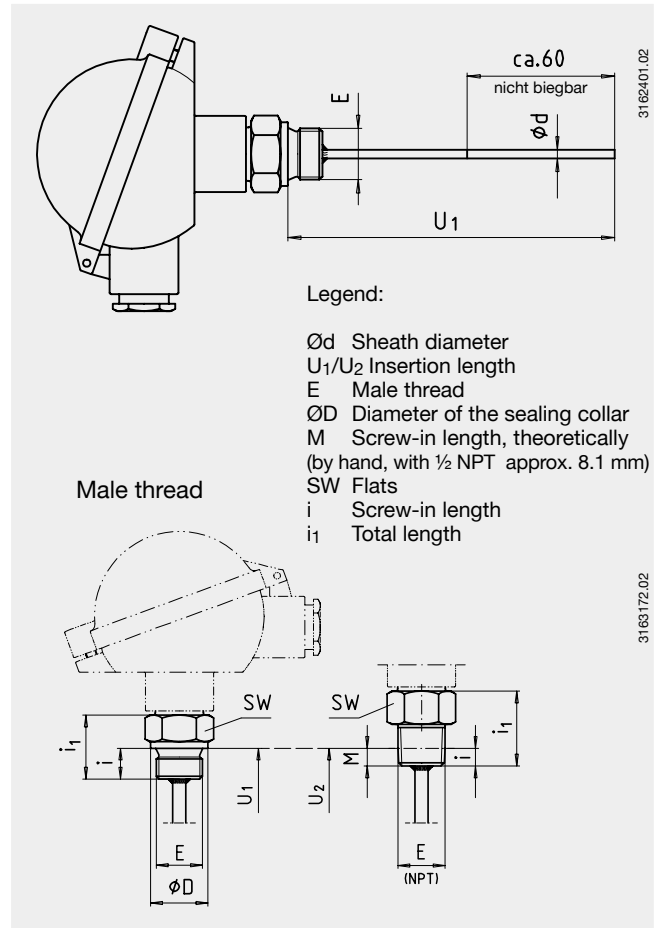
Material: stainless steel,  
other on request

Permissible ambient temperature at the connection head:  
120 °C for designs without transmitter,  
85 °C for designs with transmitter

Description of connection heads see page 6, top

#### Option

Built-in transmitter, see page 6



## Dimensions of process connections Model TR760

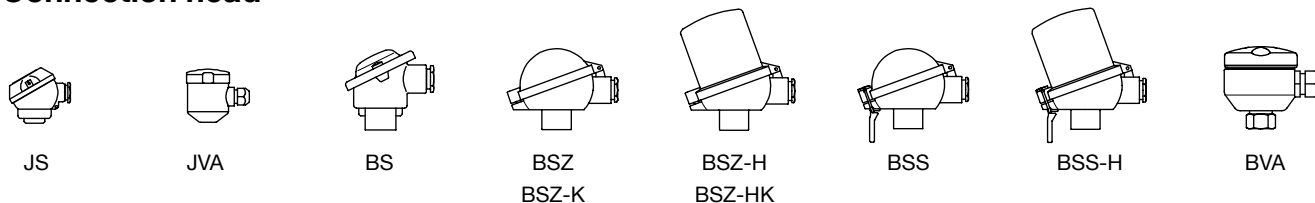
Process connection	Male thread E	Sheath in mm Ød	Dimensions in mm			
			i	i <sub>1</sub>	ØD	SW (flats)
<b>Male thread</b>	G ¼ B	2, 3 or 6 (8)	12	24	18	19
	G ½ B	2, 3 or 6 (8)	14	29	26	27
	½ NPT	3 or 6 (8)	ca. 8.1	34	-	22
	M 20 x 1.5	3 or 6 (8)	14	29	25	27

## Possible combinations of sheath diameter, number of sensors and sensor method of connection

Model	Sheath Ø in mm	Sensor / sensor method of connection 1 x Pt100			Sensor / sensor method of connection 2 x Pt100		
		2 wire	3 wire	4 wire	2 wire	3 wire	4 wire
<b>TR720 ... TR750</b>	2,0 <sup>1)</sup>	x	x	x	-	-	-
	3,0	x	x	x	x	x	-
	6,0	x	x	x	x	x	-
<b>TR760</b>	2,0	x	x	x	-	-	-
	3,0	x	x	x	x	x	-
	6,0	x	x	x	x	x	-
	8,0	x	x	x	x	x	x

1) Not with Model TR750

**Connection head**



Model	Material	Cable entry	Ingress protection	Cap	Surface finish
<b>JS</b>	aluminium	M16 x 1.5	IP 65	cap with 2 screws	silver bronze, painted
<b>JVA</b>	stainless steel	M12 x 1.5 <sup>1)</sup>	IP 65	screw cover	blank
<b>BS</b>	aluminium	M20 x 1.5	IP 65	cap with 2 screws	silver bronze, painted
<b>BSZ</b>	aluminium	M20 x 1.5	IP 65	flap cap with screw	silver bronze, painted
<b>BSZ-K</b>	plastic	M20 x 1.5	IP 65	flap cap with screw	blank
<b>BSZ-H</b>	aluminium	M20 x 1.5	IP 65	flap cap with screw	silver bronze, painted
<b>BSZ-HK</b>	plastic	M20 x 1.5	IP 65	flap cap with screw	blank
<b>BSS</b>	aluminium	M20 x 1.5	IP 65	flap cap with clip	silver bronze, painted
<b>BSS-H</b>	aluminium	M20 x 1.5	IP 65	flap cap with clip	silver bronze, painted
<b>BVA</b>	stainless steel	M20 x 1.5 <sup>1)</sup>	IP 65	screw cover	blank

1) Cable gland, metal

**Connection head with digital indicator (option)**

(only Model TR760)

As an optional alternative to the standard connection head the thermometer may be equipped with the digital indicator DIH10. The connection head used in this case is similar to the head model BSZ-H. For operation a 4 ... 20 mA transmitter is necessary, which is mounted to the measuring insert. The scale range of the indicator is configured to the same measuring range as the transmitter. Intrinsically safe versions, explosion protection type EEx (i), are also available.



**Fig. Connection head with digital indicator, Model DIH10**

**Transmitter (option)**

(not possible with connection head Model JS and JVA)

With model TR750 and model TR760 a transmitter can be mounted directly into the connection head form B.

Generally two mounting variants are possible:

- mounted instead of terminal block
- mounted within the cap of the connection head
- mounting not possible

Mounting of two transmitters on request.

Connection head	Transmitter					
	T12	T19	T24	T32	T42	T5350
<b>BS</b>	–	○	○	–	–	○
<b>BSZ / BSZ-K</b>	○	○	○	○	○	○
<b>BSZ-H / BSZ-HK</b>	●	●	●	●	●	●
<b>BSS</b>	○	○	○	○	○	○
<b>BSS-H</b>	●	●	●	●	●	●
<b>BVA</b>	○	○	○	○	○	○

Model	Description	Explosion protection	Data sheet
<b>T19</b>	Analogue transmitter, configurable	without	TE 19.01
<b>T24</b>	Analogue transmitter, PC configurable	optional	TE 24.01
<b>T12</b>	Digital transmitter, PC configurable	optional	TE 12.01
<b>T32</b>	Digital transmitter, HART protocol	optional	TE 32.01
<b>T42</b>	Digital transmitter, PROFIBUS PA	optional	TE 42.01
<b>T5350</b>	Digital transmitter FOUNDATION Fieldbus and PROFIBUS PA	standard	TE 53.01

## Explosion protection (option)

Resistance thermometers of the Model series TR7X0 are available with a type-examination certificate for "intrinsically safe" ignition protection (TÜV 02 ATEX 1793 X).

These thermometers comply with the requirements of directive 94/9/EC (ATEX), EEx-i, for gases and dust.

Manufacturer's Declarations in accordance with EN 50 020 are also available.

The classification / suitability of the instrument (permissible power  $P_{max.}$ , minimum neck length and permissible ambient temperature) for the respective category can be seen on the type-examination certificate and in the operating instructions.

The responsibility for using suitable thermowells rests with the user.

The permissible ambient temperature ranges of the built-in transmitters can be taken from the corresponding transmitter approval.

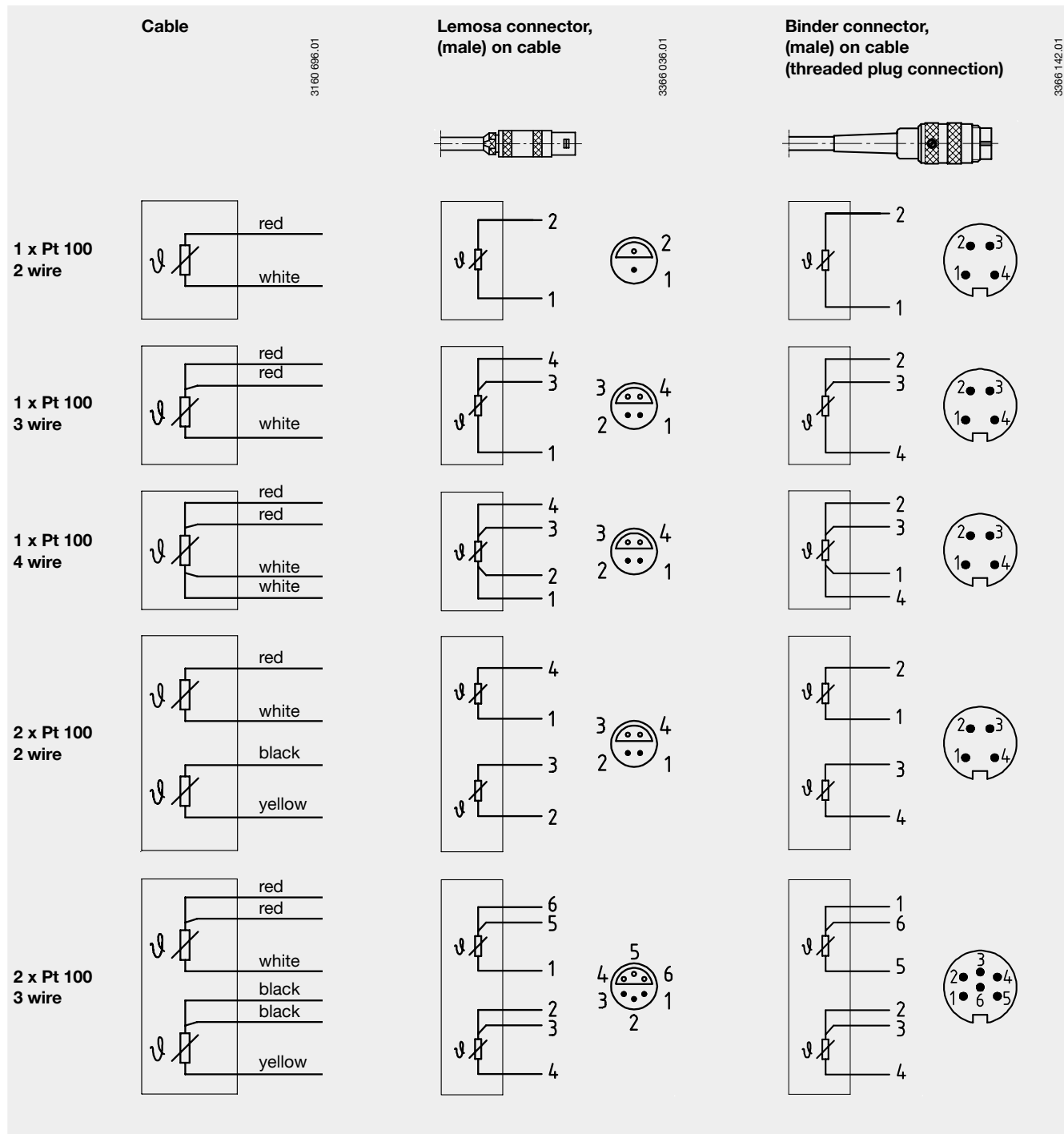
### **Note:**

When mounting thermometers with flying leads, the mounting personnel must ensure that the connection is carried out properly and in compliance with the appropriate regulations.

When the flying leads of the thermometer are within the hazardous area, suitable adapters / connectors are to be used.

Flying leads are to be connected outside of the hazardous area or, when operated in explosive atmospheres caused by dust, within a case which is certified according to the 94/9/EC and EN 50 281-1-1 directives and provides an ingress protection of at least IP 65. A minimum air and creepage distance of 2 mm has to be ensured.

**Electrical connection Models TR720, TR730 and TR740**

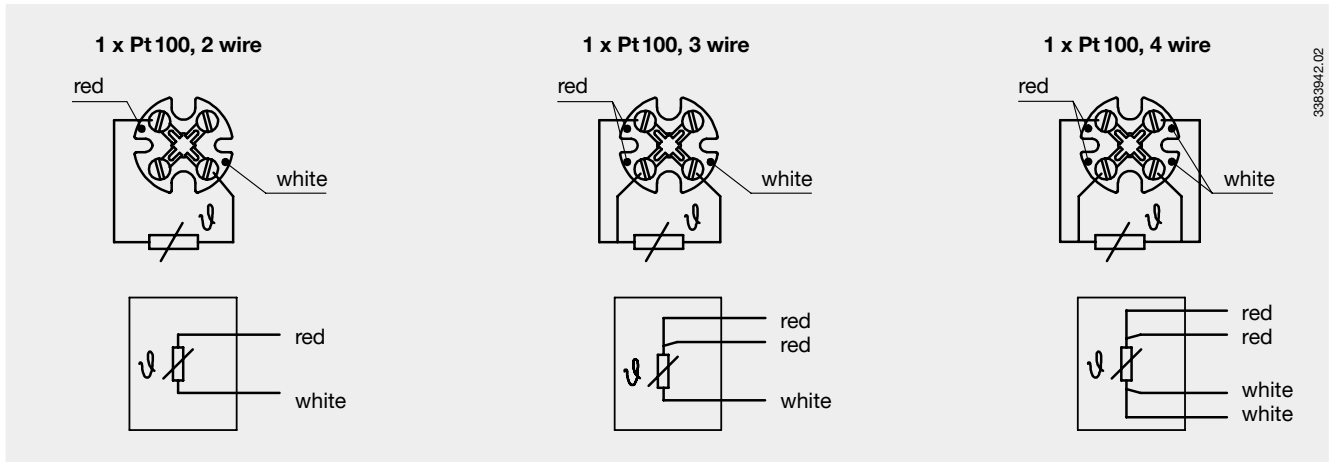


Other connector plugs and other PIN assignments on request

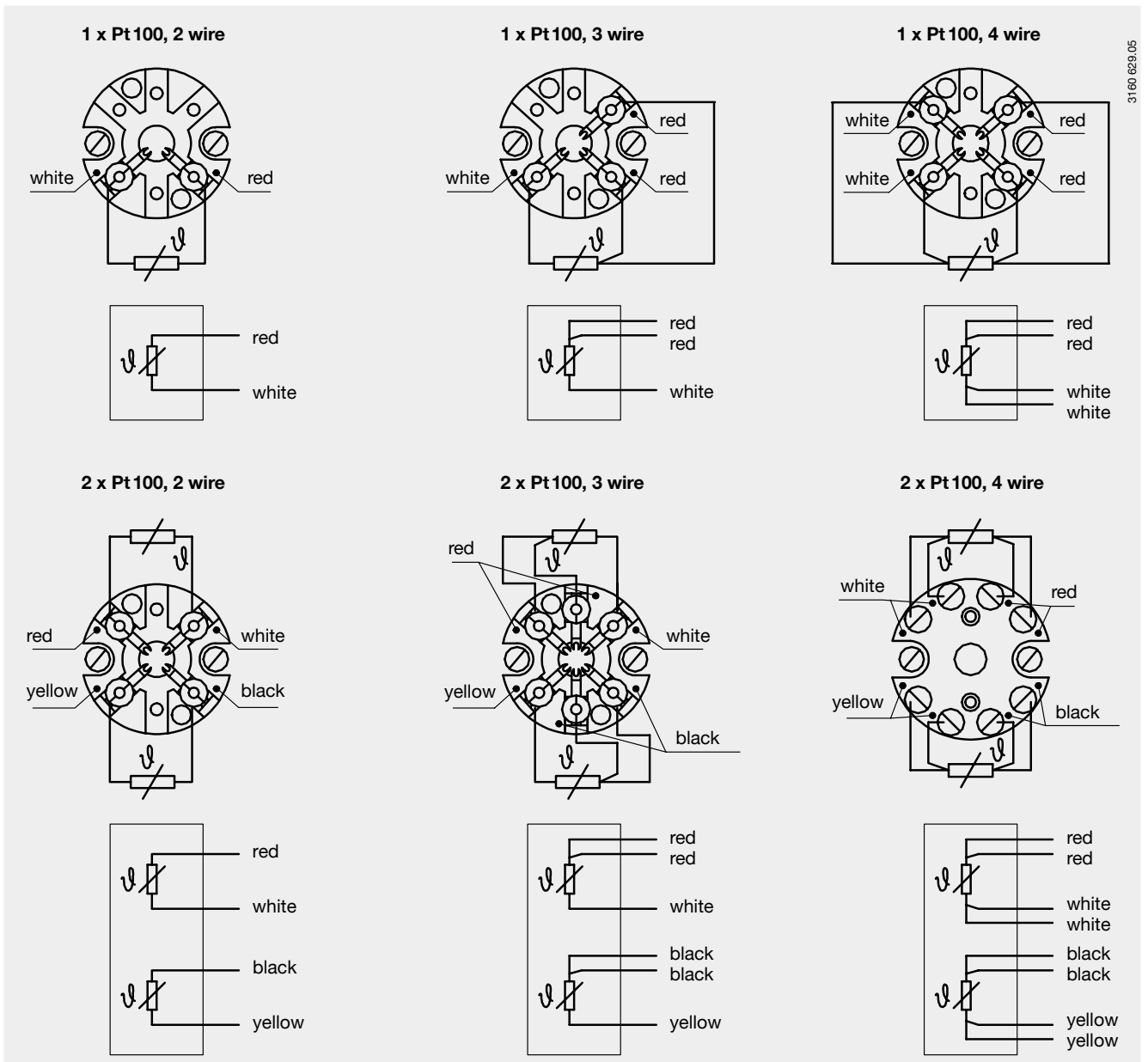


## Electrical connection Models TR750 and TR760

### Connection heads JS and JVA



### Connection heads form B



**Ordering information, Model TR720**

Field No.	Code	Features	
		<b>Explosion protection</b>	
	Z	without	
	Y	according to directive 94/9/EC (ATEX) EEx-i G for gases <sup>1)</sup>	
1	H	according to directive 94/9/EC (ATEX) EEx-i GD for gases and dusts <sup>1)</sup>	
		<b>Type and number of sensors</b>	
	1	1 x Pt100 application range -50 °C ... +250 °C	
	2	2 x Pt100 application range -50 °C ... +250 °C	
	R	1 x Pt100 application range -50 °C ... +450 °C	
	S	2 x Pt100 application range -50 °C ... +450 °C	
	5	1 x Pt100 application range -200 °C ... +450 °C	
	6	2 x Pt100 application range -200 °C ... +450 °C	
	3	1 x Pt100 application range -200 °C ... +600 °C	
	4	2 x Pt100 application range -200 °C ... +600 °C	
2	?	other <i>please state as additional text</i>	
		<b>Sensor method of connection</b>	
	2	2 wire	
	3	3 wire	
3	4	4 wire	
		<b>Sensor limiting error</b>	
	B	class B per DIN EN 60751	
	A	class A per DIN EN 60751 (-50 °C ... +450 °C) <i>not with 2 wire connection</i>	
	C	1/3 DIN B at 0 °C <i>not with 2 wire connection</i>	
4	?	other <i>please state as additional text</i>	
		<b>Process connection</b>	
	ZZ	without	
	GD	G ½ B	
	GB	G ¼ B	
	MA	M 8 x 1.0	
5	??	other <i>please state as additional text</i>	
		<b>Design of process connection</b>	
	Z	without	
	1	compression fitting stainless steel, sealing ring PTFE	
	2	compression fitting stainless steel, sealing ring stainless steel <i>not with sheath diameter 2 mm</i>	
	G	male thread	
6	?	other <i>please state as additional text</i>	
		<b>Sheath material</b>	
	T	stainless steel	
7	?	other <i>please state as additional text</i>	
		<b>Sheath diameter</b>	
	8	2.0 mm <i>only without explosion protection and not with sensor 2 x Pt100</i>	
	4	3.0 mm <i>not with sensor 2 x Pt100 with method of connection 3 or 4 wire</i>	
	6	6.0 mm	
8	?	other <i>please state as additional text</i>	
		<b>Nominal length</b>	
		length in mm, e.g. 0850 for 850 mm	
9	????	longer than 9999 mm <i>please state as additional text</i>	
		<b>Conductor</b>	
	5	Cu braid, 0.22 mm <sup>2</sup> , max. temperature at the conductor connection 180 °C	
10	?	other conductor wire <i>please state as additional text</i>	
		<b>Lead length</b>	
	100	100 mm	
		length in mm, e.g. 080 for 80 mm	
11	???	longer than 999 mm <i>please state as additional text</i>	
		<b>Additional order info</b>	
	YES	NO	
12	T	Z	quality certificates <i>see price list</i>
13	T	Z	additional text <i>Please state as clearly understandable text!</i>

1) Please observe the operating instructions and the type-examination certificate.

**Order code:**

	1	2	3	4	5	6	7	8	9	10	11	12	13
TR720 -	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

**Additional text:**

\_\_\_\_\_

\_\_\_\_\_

**Ordering information, Model TR730**

Field No.	Code	Features	
1		<b>Explosion protection</b>	
	Z	without	
	Y	according to directive 94/9/EC (ATEX) EEx-i G for gases <sup>1)</sup>	
	H	according to directive 94/9/EC (ATEX) EEx-i GD for gases and dusts <sup>1)</sup>	
2		<b>Type and number of sensors</b>	
	1	1 x Pt100 application range -50 °C ... +250 °C	
	2	2 x Pt100 application range -50 °C ... +250 °C	
	R	1 x Pt100 application range -50 °C ... +450 °C	
	S	2 x Pt100 application range -50 °C ... +450 °C	
	5	1 x Pt100 application range -200 °C ... +450 °C	
	6	2 x Pt100 application range -200 °C ... +450 °C	
	3	1 x Pt100 application range -200 °C ... +600 °C	
2	4	2 x Pt100 application range -200 °C ... +600 °C	
	?	other <i>please state as additional text</i>	
3		<b>Sensor method of connection</b>	
	2	2 wire	
	3	3 wire	
	4	4 wire	
4		<b>Sensor limiting error</b>	
	B	class B per DIN EN 60751	
	A	class A per DIN EN 60751 (-50 °C ... +450 °C) <i>not with 2 wire connection</i>	
	C	1/3 DIN B at 0 °C <i>not with 2 wire connection</i>	
4	?	other <i>please state as additional text</i>	
		<b>Process connection</b>	
5	ZZ	without	
	GD	G 1/2 B	
	GB	G 1/4 B	
	MA	M 8 x 1.0	
	??	other <i>please state as additional text</i>	
6		<b>Design of process connection</b>	
	Z	without	
	1	compression fitting stainless steel, sealing ring PTFE	
	2	compression fitting stainless steel, sealing ring stainless steel <i>not with sheath diameter 2 mm</i>	
	G	male thread	
6	?	other <i>please state as additional text</i>	
		<b>Sheath material</b>	
7	T	stainless steel	
	?	other <i>please state as additional text</i>	
8		<b>Sheath diameter</b>	
	8	2.0 mm <i>only without explosion protection and not with sensor 2 x Pt100</i>	
	4	3.0 mm <i>not with sensor 2 x Pt100 with method of connection 3 or 4 wire</i>	
	6	6.0 mm	
	?	other <i>please state as additional text</i>	
9		<b>Nominal length</b>	
		length in mm, e.g. 0850 for 850 mm	
	????	longer than 9999 mm <i>please state as additional text</i>	
10		<b>Cable</b>	
	P	PVC, application range -20 °C ... +100 °C	
	S	Silicon, application range -50 °C ... +200 °C	
	T	PTFE, application range -50 °C ... +250 °C	
	C	PVC, application range 0 °C ... +100 °C, cable transition watertight	
	D	Silicon, application range 0 °C ... +100 °C, cable transition watertight	
	?	other <i>please state as additional text</i>	
11		<b>Cable length</b>	
		length in mm, e.g. 0850 for 850 mm	
	????	longer than 9999 mm <i>please state as additional text</i>	
12		<b>Connector, fitted on cable</b>	
	Z	without	
	6	Lemosa size 1 S (male), max. temperature at connector 85 °C	
	7	Lemosa size 2 S (male), max. temperature at connector 85 °C	
	8	Binder connector (male, threaded plug connection), max. temperature at connector 85 °C	
	?	other <i>please state as additional text</i>	
13		<b>Additional order info</b>	
	YES	NO	
14	T	Z	quality certificates <i>see price list</i>
	T	Z	additional text <i>Please state as clearly understandable text!</i>

1) Please observe the operating instructions and the type-examination certificate.

**Order code:**

TR730	-	1	-	2	3	4	-	5	-	6	7	8	9	10	11	12	-	13	14
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**Additional text:** \_\_\_\_\_

## Ordering information, Model TR740

Field No.	Code	Features	
<b>Explosion protection</b>			
1	Z	without	
	Y	according to directive 94/9/EC (ATEX) EEx-i G for gases <sup>1)</sup>	
	H	according to directive 94/9/EC (ATEX) EEx-i GD for gases and dusts <sup>1)</sup>	
<b>Type and number of sensors</b>			
2	1	1 x Pt100 application range -50 °C ... +250 °C	
	2	2 x Pt100 application range -50 °C ... +250 °C	
	R	1 x Pt100 application range -50 °C ... +450 °C	
	S	2 x Pt100 application range -50 °C ... +450 °C	
	5	1 x Pt100 application range -200 °C ... +450 °C	
	6	2 x Pt100 application range -200 °C ... +450 °C	
	3	1 x Pt100 application range -200 °C ... +600 °C	
	4	2 x Pt100 application range -200 °C ... +600 °C	
2	?	other <span style="float: right;"><i>please state as additional text</i></span>	
<b>Sensor method of connection</b>			
3	2	2 wire	
	3	3 wire	
	4	4 wire	
<b>Sensor limiting error</b>			
4	B	class B per DIN EN 60751	
	A	class A per DIN EN 60751 (-50 °C ... +450 °C) <span style="float: right;"><i>not with 2 wire connection</i></span>	
	C	1/3 DIN B at 0 °C <span style="float: right;"><i>not with 2 wire connection</i></span>	
	?	other <span style="float: right;"><i>please state as additional text</i></span>	
<b>Process connection</b>			
5	ZZ	without	
	GD	G 1/2 B	
	GB	G 1/4 B	
	MA	M 8 x 1.0	
	??	other <span style="float: right;"><i>please state as additional text</i></span>	
<b>Design of process connection</b>			
6	Z	without	
	1	compression fitting stainless steel, sealing ring PTFE	
	2	compression fitting stainless steel, sealing ring stainless steel <span style="float: right;"><i>not with sheath diameter 2 mm</i></span>	
	G	male thread	
	?	other <span style="float: right;"><i>please state as additional text</i></span>	
<b>Sheath material</b>			
7	T	stainless steel	
	?	other <span style="float: right;"><i>please state as additional text</i></span>	
<b>Sheath diameter</b>			
8	8	2.0 mm <span style="float: right;"><i>only without explosion protection and not with sensor 2 x Pt100</i></span>	
	4	3.0 mm <span style="float: right;"><i>not with sensor 2 x Pt100 with method of connection 3 or 4 wire</i></span>	
	6	6.0 mm	
	?	other <span style="float: right;"><i>please state as additional text</i></span>	
<b>Nominal length</b>			
9		length in mm, e.g. 0850 for 850 mm	
	????	longer than 9999 mm <span style="float: right;"><i>please state as additional text</i></span>	
<b>Connector</b>			
10	1	Lemosa size 1 S (female), max. temperature at connector 85 °C	
	2	Lemosa size 2 S (female), max. temperature at connector 85 °C	
	?	other <span style="float: right;"><i>please state as additional text</i></span>	
<b>Additional order info</b>			
11	YES	NO	
	T	Z	quality certificates <span style="float: right;"><i>see price list</i></span>
12	T	Z	additional text <span style="float: right;"><i>Please state as clearly understandable text!</i></span>

1) Please observe the operating instructions and the type-examination certificate.

### Order code:

	1	2	3	4	5	6	7	8	9	10	11	12		
TR740	-	<input type="text"/>	-	<input type="text"/>	<input type="text"/>	<input type="text"/>	-	<input type="text"/>	-	<input type="text"/>	<input type="text"/>	-	<input type="text"/>	<input type="text"/>

### Additional text:

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**Ordering information, Model TR750**

Field No.	Code	Features	
		<b>Explosion protection</b>	
	Z	without	
	Y	according to directive 94/9/EC (ATEX) EEx-i G for gases <sup>1)</sup>	
1	H	according to directive 94/9/EC (ATEX) EEx-i GD for gases and dusts <sup>1)</sup>	
		<b>Type and number of sensors</b>	
	1	1 x Pt100 application range -50 °C ... +250 °C	
	2	2 x Pt100 application range -50 °C ... +250 °C	
	R	1 x Pt100 application range -50 °C ... +450 °C	
	S	2 x Pt100 application range -50 °C ... +450 °C	
	5	1 x Pt100 application range -200 °C ... +450 °C	
	6	2 x Pt100 application range -200 °C ... +450 °C	
	3	1 x Pt100 application range -200 °C ... +600 °C	
	4	2 x Pt100 application range -200 °C ... +600 °C	
2	?	other <i>please state as additional text</i>	
		<b>Sensor method of connection</b>	
	2	2 wire	
	3	3 wire	
3	4	4 wire	
		<b>Sensor limiting error</b>	
	B	class B per DIN EN 60751	
	A	class A per DIN EN 60751 (-50 °C ... +450 °C) <i>not with 2 wire connection</i>	
	C	1/3 DIN B at 0 °C <i>not with 2 wire connection</i>	
4	?	other <i>please state as additional text</i>	
		<b>Process connection</b>	
	ZZ	without	
	GD	G 1/2 B	
	GB	G 1/4 B	
	MA	M 8 x 1.0	
5	??	other <i>please state as additional text</i>	
		<b>Design of process connection</b>	
	Z	without	
	1	compression fitting stainless steel, sealing ring PTFE	
	2	compression fitting stainless steel, sealing ring stainless steel <i>not with sheath diameter 2 mm</i>	
	G	male thread	
6	?	other <i>please state as additional text</i>	
		<b>Sheath material</b>	
	T	stainless steel	
7	?	other <i>please state as additional text</i>	
		<b>Sheath diameter</b>	
	4	3.0 mm <i>not with sensor 2 x Pt100 with method of connection 3 or 4 wire</i>	
	6	6.0 mm	
8	?	other <i>please state as additional text</i>	
		<b>Nominal length</b>	
		length in mm, e.g. 0850 for 850 mm	
9	????	longer than 9999 mm <i>please state as additional text</i>	
		<b>Connection head</b>	
	9	JS (aluminium) <i>only without explosion protection for dusts, transmitter installation not possible</i>	
	1	BS (aluminium)	
	V	JVA (stainless steel) <i>transmitter installation not possible</i>	
10	?	other <i>please state as additional text</i>	
		<b>Cable entry to connection head</b>	
	5	M16 x 1.5 <i>connection head JS</i>	
	4	M20 x 1.5 <i>connection head BS</i>	
	7	M12 x 1.5 <i>connection head JVA</i>	
11	?	other <i>please state as additional text</i>	
		<b>Transmitter</b>	
	ZZ	without	
12	TA	mounted on the measuring insert	
		<b>Additional order info</b>	
	YES	NO	
13	T	Z	quality certificates <i>see price list</i>
14	T	Z	additional text <i>Please state as clearly understandable text!</i>

1) Please observe the operating instructions and the type-examination certificate.

**OBSOLETE**

Order code:

	1	2	3	4	5	6	7	8	9	10	11	12		13	14		
TR750 -	<input type="text"/>	-	<input type="text"/>	<input type="text"/>	<input type="text"/>	-	<input type="text"/>	-	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<b>Z Z</b>	-	<input type="text"/>	<input type="text"/>

Additional text:

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**Ordering information, Model TR760**

Field No.	Code	Features
		<b>Explosion protection</b>
	Z	without
	Y	according to directive 94/9/EC (ATEX) EEx-i G for gases <sup>1)</sup>
1	H	according to directive 94/9/EC (ATEX) EEx-i GD for gases and dusts <sup>1)</sup>
		<b>Type and number of sensors</b>
	1	1 x Pt100 application range -50 °C ... +250 °C
	2	2 x Pt100 application range -50 °C ... +250 °C <sup>2)</sup>
	R	1 x Pt100 application range -50 °C ... +450 °C
	S	2 x Pt100 application range -50 °C ... +450 °C <sup>2)</sup>
	5	1 x Pt100 application range -200 °C ... +450 °C
	6	2 x Pt100 application range -200 °C ... +450 °C <sup>2)</sup>
	3	1 x Pt100 application range -200 °C ... +600 °C
	4	2 x Pt100 application range -200 °C ... +600 °C <sup>2)</sup>
2	?	other <i>please state as additional text</i>
		<b>Sensor method of connection</b>
	2	2 wire
	3	3 wire
3	4	4 wire
		<b>Sensor limiting error</b>
	B	class B per DIN EN 60751
	A	class A per DIN EN 60751 (-50 °C ... +450 °C) <i>not with 2 wire connection</i>
	C	1/3 DIN B at 0 °C <i>not with 2 wire connection</i>
4	?	other <i>please state as additional text</i>
		<b>Process connection</b>
	GD	G 1/2 B
	GB	G 1/4 B
	ND	1/2 NPT
	MI	M 20 x 1.5
5	??	other <i>please state as additional text</i>
		<b>Sheath material</b>
	T	stainless steel
6	?	other <i>please state as additional text</i>
		<b>Sheath diameter</b>
	8	2.0 mm <i>only without explosion protection and not with sensor 2 x Pt100</i>
	4	3.0 mm <i>not with sensor 2 x Pt100 with method of connection 3 or 4 wire</i>
	6	6.0 mm
	7	8.0 mm <i>tubing</i>
7	?	other <i>please state as additional text</i>
		<b>Nominal length</b>
		length in mm, e.g. 0850 for 850 mm
8	????	longer than 9999 mm <i>please state as additional text</i>
		<b>Connection head</b>
	1	BS (aluminium) <i>only transmitter T19/T24/T31 as option possible</i>
	2	BSZ (aluminium)
	3	BSZ-H (aluminium) <i>mounting of an optional transmitter in the cap possible</i>
	T	BSZ-K (plastic)
	S	BSZ-HK (plastic) <i>mounting of an optional transmitter in the cap possible</i>
	4	BSS (aluminium)
	5	BSS-H (aluminium) <i>mounting of an optional transmitter in the cap possible</i>
	H	BSZ-H with digital temperature indicator DIH10 (set to transmitter range) <i>only without explosion protection for use a transmitter (4...20 mA) is required</i>
	J	BSZ-H with digital temperature indicator DIH10-Ex (set to transmitter range) <i>an Ex-certified transmitter (4...20 mA) is required</i>
	9	JS (aluminium) <i>only without explosion protection for dusts, transmitter installation not possible</i>
	V	JVA (stainless steel) <i>transmitter installation not possible</i>
9	?	other <i>please state as additional text</i>
		<b>Cable entry to connection head</b>
	4	M20 x 1.5 <i>connection heads form B</i>
	5	M16 x 1.5 <i>connection head JS</i>
	7	M12 x 1.5 <i>connection head JVA</i>
10	?	other <i>please state as additional text</i>
		<b>Transmitter</b>
	ZZ	without
	TA	mounted on the measuring insert
11	TB	mounted in the cup of the connection head

**Field No. Code Features**

		Additional order info		
		YES	NO	
12		T	Z	quality certificates <span style="float: right;"><i>see price list</i></span>
13		T	Z	additional text <span style="float: right;"><i>Please state as clearly understandable text!</i></span>

- 1) Please observe the operating instructions and the type-examination certificate.
- 2) 2xPt100 in combination with 2 transmitters on request.

**Order code:**

	1	2	3	4	5	6	7	8	9	10	11	12	13		
TR760 -	□	-	□	□	-	□	-	G	□	□	□	□	□		
												ZZ	-	□	□

**Additional text:** \_\_\_\_\_  
 \_\_\_\_\_

Specifications and dimensions given in this leaflet represent the state of engineering at the time of printing. Modifications may take place and materials specified may be replaced by others without prior notice.



**WIKAI Alexander Wiegand GmbH & Co. KG**  
 Alexander-Wiegand-Straße 30  
 63911 Klingenberg/Germany  
 Phone (+49) 93 72/132-0  
 Fax (+49) 93 72/132-406  
 E-Mail info@wika.de  
 www.wika.de