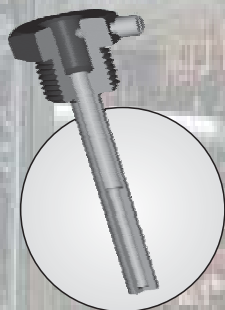
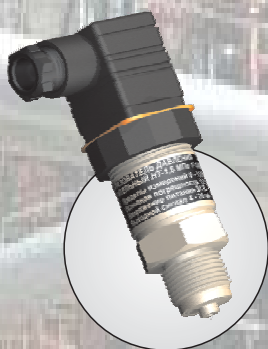
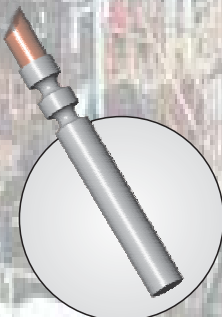
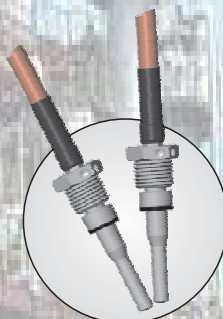




Ltd. "INTEP"



PRODUCTS CATALOGUE

RELIABLE MEASURING MEANS

INTEP KOMPLEKT Ltd
Official representative
in the Russian Federation



2016
Novopolotsk



“INTEP” Ltd was found in 1992 and one of its principal activities is development and manufacture of measuring means: converters and secondary electronic device intended for usage in measurement systems, temperature and pressure control systems.

The enterprise has a well equipped production base with up-to date test equipment enabling testing and checking products manufactured on-site. High quality of products is ensured by highly skilled personnel and the quality control system is certified to Quality Management System ISO 9001.

The products of the enterprise are widely used in many different branches of the economy and industry of the Republic of Belarus, the Russian Federation, Kazakhstan, Moldova, Ukraine, Uzbekistan.

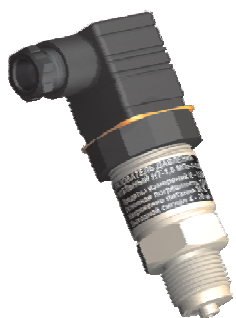
The products represented in this catalogue have been listed in state register of measuring means.

In 2009, the enterprise product item “Resistive Temperature Transducer Sets KTSP-N” became the winner of the contest “The Best Goods of the Republic of Belarus” and also of the contest “The Best Belarusian Goods of the Russian Market” in 2010.

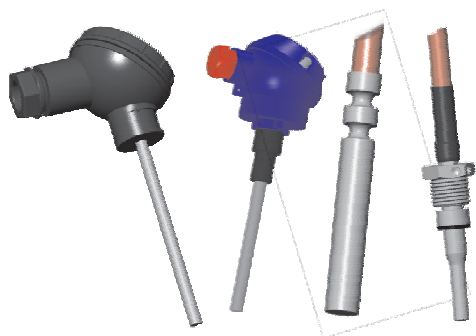
Our enterprise always widens the line of goods, improves the construction and operational characteristics of the manufactured products. Our compact industry allows manufacturing not only serial products but also developing experienced parcel of products to order on your request in the shortest possible time.

We hope that our devices satisfy all your most exacting requirements!

Collective of “INTEP” Ltd



Pressure Converters HT



Platinum Resistive Temperature Transducer ТСП-Н
Resistive Temperature Transducer Set КТСН-Н
Copper Resistive Temperature Transducer ТСМ-Н



Weldolets



Protective Sleeves

Pressure Converters NT

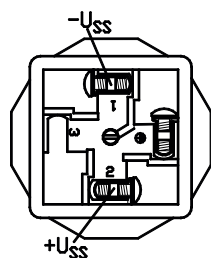
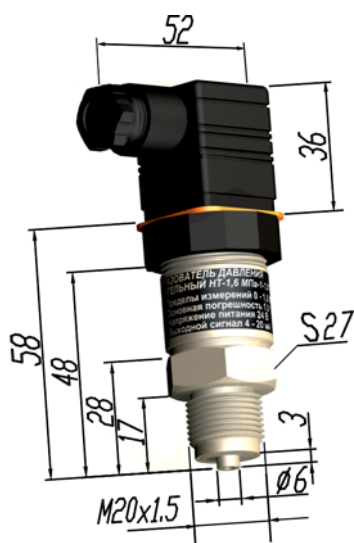
Description

This measuring pressure converter represents a single-channel, single-unit device for measuring overpressure of media in relation to which fitting material is corrosion-resistant.

The device is inappropriate for usage in the explosive hazardous zones according to the Electric Installation Code (PUE).

Usage

The measuring pressure converter is applied for continuous, proportional transformation of measured overpressure into the unified output current signal in systems of automatic control, regulation and management of technological processes.



Technical Features

Upper-range value, MPa	0.1; 0.16; 0.25; 0.4; 0.6; 0.63; 1.0; 1.6; 2.5
Lower-range value, MPa	0
Maximum permissible basic error, %	± 0.25 ; ± 0.5 ; ± 1.0
Additional error caused by temperature change for every 10°C, no more than %	$\pm 0.25^*$ (from 0 to plus 70°C) $\pm 0.45^*$ (from minus 40 to plus 85°C) $\pm 0.25^{**}$
Additional error caused by supply voltage change in the range of 20.6 - 26.4 V, no more than %	± 0.25
Output signal response time, MS	≤ 5
Operating supply voltage, V	24 ± 0.48
Output signal, mA	4-20
Power intake, W	≤ 0.8
Stability to mechanical influences	group N2 (GOST12997)
Degree of protection	Ip65 (GOST14254)
Atmospheric pressure operative range, kPa	84.0 - 106.7
environment temperature operative range, °C	minus 40 - plus 85
Fitting material	steel 12X18N10T; brass L63
Recalibration interval, years	1 (4 for basic error $\pm 1.0\%$)
Average service life, years	8
Mean time between failures, hours	65 000

* For the measuring pressure converters with permissible basic error $\pm 0.5\%$ and $\pm 1.0\%$.

** For the measuring pressure converters with permissible basic error $\pm 0.25\%$.

*** Load resistance should be $\leq 500 \Omega$.

Design Examples

Design	Upper-range value, MPa	Fitting Material	Maximum permissible basic error, %
NT- 0.1 MPa - 1 -0,5%	0.1	steel 12X18N10T	± 0.5
NT- 0.25 MPa - 1 -0,5%	0.25	steel 12X18N10T	± 0.5
NT- 0.4 MPa - 2 -1,0%	0.4	steel 20X13	± 1.0
NT- 1.0 MPa - 1 -0,5%	1.0	steel 12X18N10T	± 0.5
NT- 1.0 MPa - 2 -0,5%	1.0	steel 20X13	± 0.5
NT- 1.6 MPa - 1 -0,5%	1.6	steel 12X18N10T	± 0.5
NT- 1.6 MPa - 2 -1,0%	1.6	steel 20X13	± 1.0

If you want to order not mentioned design, you should follow technical features of the measuring pressure converter NT.



Certificate № 5123. Listed in state register of measuring means at № P5 03 04 1992 13.



Certificate № 53157. Listed in state register of measuring means at № 26817-13



Certificate № 4784. Listed in state register of measuring means at № KZ.02.03.05344-2013/P5 03 04 1992 13.

Usage

This resistive temperature transducer is applied for temperature control and measurement of liquid, firm, loose and gaseous media.

Fields of usage: ensure the functioning of recording devices, systems of control and automatic regulation in industry, laboratory researches, agriculture.

Stability to Influences

The temperature transducers correspond to climatic design group - D3, according to GOST 12997, are situated outside and are subjected to the influence of atmospheric factors (immediate heating by the sun-rays, wind, rain, frozen rain, icing over).

The temperature transducers are firm and stable to vibration influence and correspond to design group - N2 (according to GOST 12997). They are situated in some places suffered from vibration from working mechanisms of industrial objects.

Protection degree - IP65 according to GOST 12254 (dust-proof and is protected from water jets.)

Immersion Depth

The minimal immersion depth when the temperature transducer still preserves its metrological features:

$$L_{\min} = 5 \cdot \varnothing D_3 + L_{\text{сз}}$$

where:

$\varnothing D_3$ - diameter of protection tube, mm;

$L_{\text{сз}}$ - length of sensing elements, mm.

The usage of small-sized sensing elements and protection fitting allows creating the temperature transducers with a small immersion depth and shorter response time.

Metrological Features

The temperature transducers have the standardized statistic feature (NSH - the unique sensor curve) Pt50, Pt100, Pt500, Pt1000.

NSH (the unique sensor curve), nominal value of measured current and ratio W_{100} are represented in the following table:

Values of Measuring Current and W_{100}

	Nominal measuring current, mA	α, C^{-1}
Pt 50	2,0	0,00385
Pt 100	1,0	0,00385
Pt 500	0,2	0,00385
Pt 1000	0,1	0,00385
100П	1,0	0,00391

Self heating effect doesn't exceed $0,3^\circ\text{C}$ (acc. to СТБ EN 60751) when nominal measuring current value is chosen.

Thermoelectric Effect

The usage of the best sensing elements of some foreign producers helps to reduce the thermoelectric power effect practically to zero.

Accuracy Classes

The limits of acceptable departure from NSH depending on a class correspond to:

-for class AA: $\pm(0,1+0,0017 \cdot |t|)$

-for class A: $\pm(0,15+0,002 \cdot |t|)$

-for class B: $\pm(0,3+0,005 \cdot |t|)$

RECALIBRATION INTERVAL IS 4 YEARS

Response Time

Thanks to the unique construction of the temperature transducer, tight protection fitting diameters limits and location of protective sleeve these temperature transducers have a short response time on temperature step change.

The regulated parameters of the temperature transducers and stability of the parameters during a long period of exploitation are guaranteed by the correct installation, usage of the protective sleeves and component parts produced by the manufacturer.

Resistance Pt100 - Temperature Relationship Values (acc. to GOST EN 60751)

°C	Ω	°C	Ω	°C	Ω	°C	Ω	°C	Ω
-50	80,31	0	100,00	50	119,40	100	138,51	150	157,33
-48	81,10	2	100,78	52	120,17	102	139,26	152	158,07
-46	81,89	4	101,56	54	120,94	104	140,02	154	158,82
-44	82,69	6	102,34	56	121,71	106	140,78	156	159,56
-42	83,48	8	103,12	58	122,47	108	141,54	158	160,31
-40	84,27	10	103,90	60	123,24	110	142,29	160	161,05
-38	85,06	12	104,68	62	124,01	112	143,05	162	161,80
-36	85,85	14	105,46	64	124,78	114	143,80	164	162,54
-34	86,64	16	106,24	66	125,54	116	144,56	166	163,29
-32	87,43	18	107,02	68	126,31	118	145,31	168	164,03
-30	88,22	20	107,79	70	127,08	120	146,07	170	164,77
-28	89,01	22	108,57	72	127,84	122	146,82	172	165,51
-26	89,80	24	109,35	74	128,61	124	147,57	174	166,26
-24	90,59	26	110,12	76	129,37	126	148,33	176	167,00
-22	91,37	28	110,90	78	130,13	128	149,08	178	167,74
-20	92,16	30	111,67	80	130,90	130	149,83	180	168,48
-18	92,95	32	112,45	82	131,66	132	150,58	182	169,22
-16	93,73	34	113,22	84	132,42	134	151,33	184	169,96
-14	94,52	36	114,00	86	133,18	136	152,08	186	170,70
-12	95,30	38	114,77	88	133,95	138	152,83	188	171,43
-10	96,09	40	115,54	90	134,71	140	153,58	190	172,17
-8	96,87	42	116,31	92	135,47	142	154,33	192	172,91
-6	97,65	44	117,08	94	136,23	144	155,08	194	173,65
-4	98,44	46	117,86	96	136,99	146	155,83	196	174,38
-2	99,22	48	118,63	98	137,75	148	156,58	198	175,12

The values are given without taking into consideration the resistance of the temperature transducer cable with the wire always switched on.

Certificates

These temperature transducers are produced due to TY BY 300044107.001-2006.

The temperature transducers have been certified and now have current certificates.

Belarus - certificate №7451 (State register of the measuring means № PE 03 10 0494 11)

Russia - certificate №BY.C.999.A №47829 (state register of the measuring means № 38959-12)

Ukraine - certificate № UA-MI/3p-63-99

(State register of the measuring means № PE 03 10 0494 97)

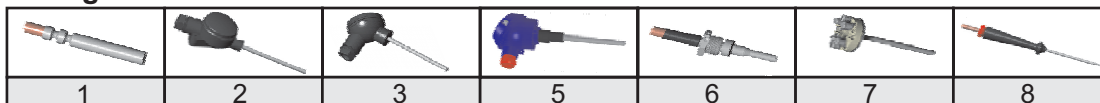
Kazakhstan - certificate №8126 (State register of measuring means № KZ. 02. 03. 04506-2012 PE 03 10 0494 11)

OTHER VERSIONS CAN BE SUPPLIED ON YOUR REQUEST

Diagram Symbols of the Resistive Temperature Transducer TСП-Н

ТСП-Н	a	b	c	d	e	f	g	/	h
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a — Design



b – Mounting Part Diameter




Ø4 MM	Ø6 MM	Ø8 MM	Ø10 MM	Ø3 MM	Ø5 MM	Ø7 MM
0	1	2	3	4	5	6

c — Mounting Part Length

60 MM	80 MM	100 MM	120 MM	160 MM	180 MM	200 MM	250 MM	320 MM	400 MM	500 MM
00	01	02	03	04	05	06	07	08	09	10

630 MM	800 MM	1000 MM	1250 MM	1600 MM	2000 MM	2500 MM	3150 MM	27,5 MM	50 MM	45 MM
11	12	13	14	15	16	17	18	19	20	21

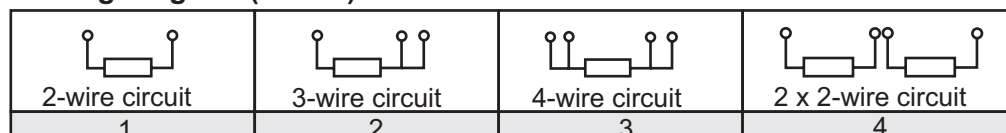
d — Fastening

In-Situ	 Mobile fitting			 Nut			 Fixed Fitting		
	M10x1	M16x1,5	M20x1,5	M10x1	M16x1,5	M20x1,5	M10x1	M16x1,5	M20x1,5
00	11	01	02	12	06	07	13	14	15








e – NSH(the unique sensor curve)and Accuracy Class

Out of class	Pt 50		Pt 100		Pt 500		Pt 1000		Pt 50	Pt 100	Pt 500	Pt 1000	100П	100П	100П
	A	B	A	B		B	A	B	AA	AA	AA	AA	AA	A	B
12	0	1	3	4	6	7	9	10	11	13	16	19	20	21	22

f — Wiring Diagram (circuit)



g – Measuring Temperature Range

 +160 °C 0 °C	 +180 °C -50 °C	 +400 °C -50 °C	 +550 °C -50 °C	 +650 °C -200 °C	 +850 °C -200 °C	 +600 °C -50 °C
0	1	2	3	4	5	6

h — Cable Length (it is mentioned for designs 1, 6, 8)

It should mentioned when you make order

Example of ordering notes:

ТСП-Н 5.0.01.00.3.3.0



- Design 5
- Mounting pert diameter 4 mm
- Mounting part length 80 mm
- Fastening in-situ
- Pt 100 A
- 4-wire circuit
- Temperature range 0...+160°C

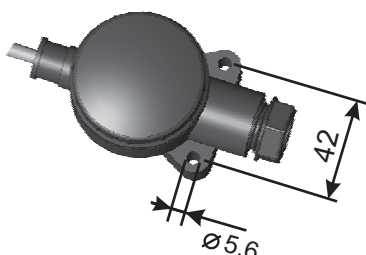
Usage

This temperature transducer is applied for outdoor temperature measurement in systems of control and automation regulation of different purpose.

Installation

The construction of the temperature transducer casing makes it possible to mount it immediately to the wall or other surface with screws, woodscrews and fastening meanings.

A leaden seal is fixed through a lid opening.



Connecting

Connecting with external devices is made with the help of the appropriate section cable and the amount of wires recommended in the circuit.

The cable connects to the circuit with screws and nuts.

Construction

The resistive temperature transducer represents a phenoplastic casing with an unscrewing lid, a protection tube of stainless steel and a gland entry for a cable. A sensing element is settled in a protection sleeve.

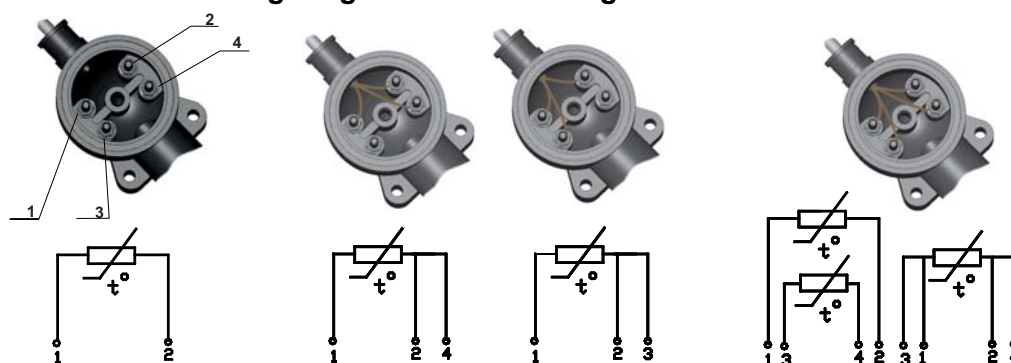
Electrical connection of the sensing element with screws for an external cable connection is made corresponding to 2-wire, 3-wire or 4-wire circuit (the temperature transducers corresponding to class A with 2-wire circuit are not made).



Technical Features

Measuring temperature range, °C	from minus 50 to plus 180
Mounting part length, mm	60; 80
Wiring diagram (circuit)	2-wire; 3-wire; 4-wire; 2-x 2-wire
Class	A and B (CT5 EN 60751), AA
Thermal response time, no more than s	30
Fastening	in-situ
Protective fitting	Ø6; Ø8
Recalibration interval, years	4

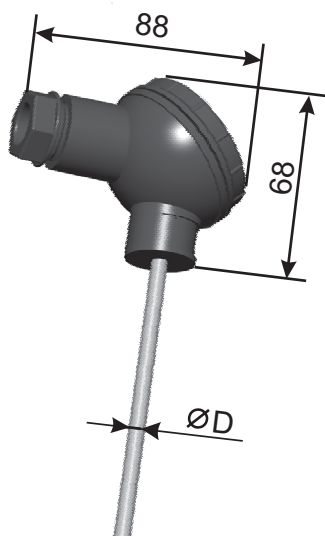
Connecting Diagram of the sensing Elements



The Temperature Transducer Design Examples

Design	ØD, mm	L pa6, mm	Fastening	NSH	Class	Circuit	t pa6, °C
ТСП-Н 2.1.00.00.4.1.1	6	60	in-situ	Pt100	B	2-wire	-50...+180
ТСП-Н 2.1.01.00.3.3.1	6	80	in-situ	Pt100	A	4-wire	-50...+180
ТСП-Н 2.2.01.00.7.1.1	8	80	in-situ	Pt500	B	2-wire	-50...+180
ТСП-Н 2.2.00.00.7.2.1	8	60	in-situ	Pt500	B	3-wire	-50...+180
ТСП-Н 2.2.01.00.6.3.1	8	80	in-situ	Pt500	A	4-wire	-50...+180

If you want to order not mentioned designs you should follow technical features of resistive temperature transducer ТСП-Н.



Usage

This temperature transducer is applied for temperature measurement in systems of control and automatic regulation of different purpose.

Construction

The temperature transducer represents a phenoplastic casing with an unscrewing lid, a protection tube of stainless steel and a gland entry for a cable. A sensing element is settled in a protection sleeve.

Electrical connection of the sensing element with screw for an external cable connection is made corresponding to 2-wire, 3-wire or 4-wire circuit.

Technical Features

Measuring temperature range, °C	from 0 to plus 160 from minus 50 to plus 180
Mounting part length, mm	60...3150
Wiring diagram (circuit)	2-wire; 3-wire 4-wire; 2-x 2-wire
Class	A or B (CTB EN 60751) , AA
Thermal response time	30
Fastening	in-situ
Protective fitting	Ø6; Ø8

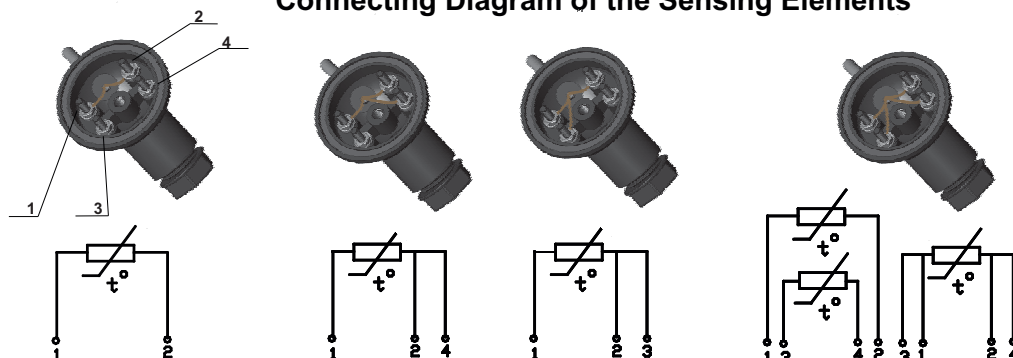
For measuring temperature range 0-160°C recalibration interval - 4 years;
minus 50-180°C recalibration interval - 4 years.
for other - recalibration interval 2 years.

Connecting

Connection with external devices is made with the help of the appropriate section cable and the amount of wires recommended in the circuit.

The cable connects to the circuit with the help of screws and nuts.

Connecting Diagram of the Sensing Elements



Installation

The temperature transducer is mounted to a pipeline with the help of protective sleeves and weldolets or immediately with the help of the appropriated fastening elements of the temperature transducer dependently on a performance of fastening elements.

The leaden seal is fixed through a lid opening, or through a seal opening in a fitting.

Fastening Elements Design Examples

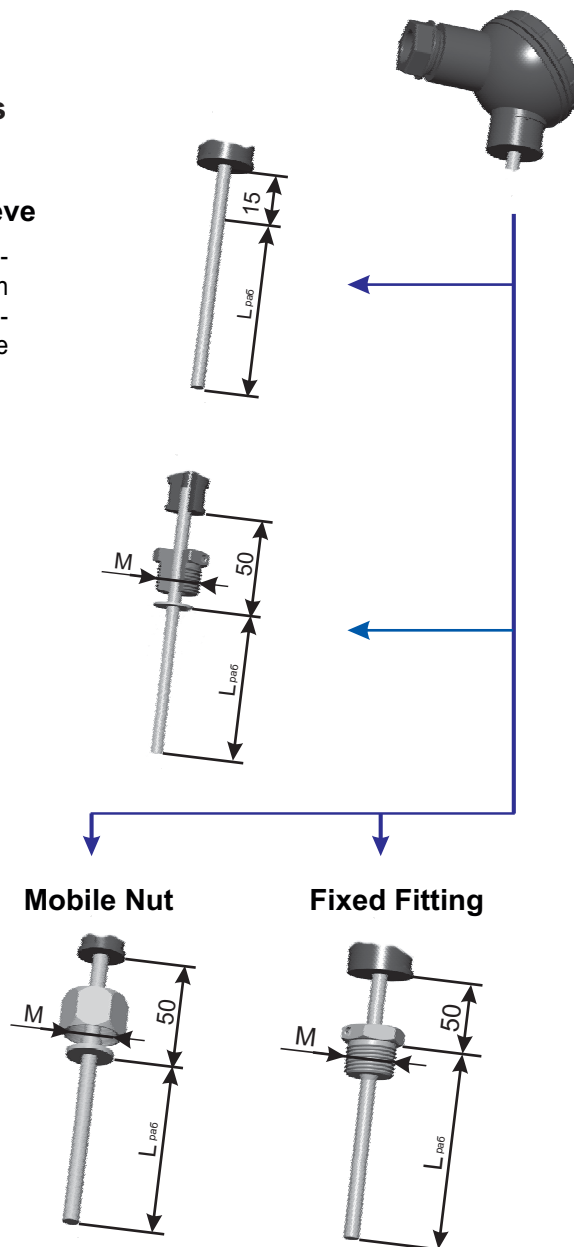
Installation in a protective sleeve

It's recommended to mount the temperature transducer without any installation elements to a pipeline with the help of protective sleeve of design 2 and with the help of weldolet BP1 (or BP2).

Mobile Fitting

It's recommended to mount the temperature transducer with a mobile fitting to a pipeline with the help of protective sleeve of design 1 and weldolet BP1 or BP2 or it's also possible with the help of protective sleeve of design 4 for immediate installation at a pipeline.

The temperature transducer with mobile nut and fixed fitting are applied for immediate mounting to a pipeline with a client's fastening element.

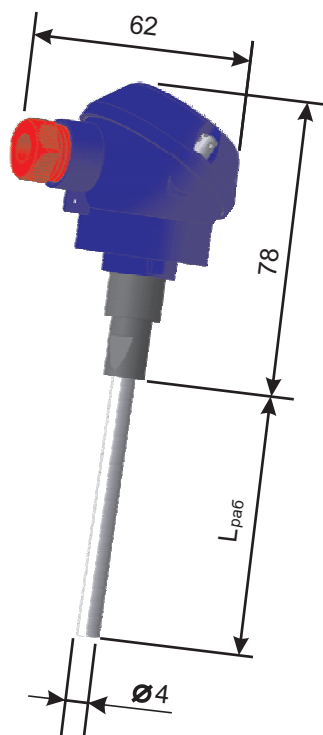


Design Examples

Design	ØD, mm	L _{паб} , mm	Fastening	NSH	Class	Circuit	t _{паб} , °C
ТСП-Н 3.1.00.02.4.1.0	6	60	Mobile fitting M20x1,5	Pt100	B	2-wire	0...+160
ТСП-Н 3.1.01.00.3.3.1	6	80	Protective sleeve	Pt100	A	4-wire	-50...+180
ТСП-Н 3.2.02.15.7.1.0	8	100	Fixed fitting M20x1,5	Pt500	B	2-wire	0...+160
ТСП-Н 3.2.03.15.6.3.1	8	120	Fixed fitting M20x1,5	Pt500	A	4-wire	-50...+180
ТСП-Н 3.2.04.00.7.3.1	8	160	Protective sleeve	Pt500	B	4-wire	-50...+180

If you want to order not mentioned designs you should follow technical features of the resistive temperature transducer.

Platinum Resistive Temperature Transducer Type PL-head



Usage

This temperature transducer is applied for temperature measurement in systems of control and automatic regulation of different purpose with a short response time.

The temperature transducer should be used with a protective sleeve.

Construction

The temperature transducer consists of a sensing element, which is located in a protection tube, also of a threaded bushing, terminal block, corps of aluminum and a lid.

A lid is mounted to the corps through a rubber washer and is fixed with two screws. Thus pressure tight joint is achieved.

A threaded bushing has an oblique cut to fix a temperature transducer in a protection sleeve to prevent access to the circuit without any sanction without breaking the leaden seal.

Installation

The temperature transducer is mounted to a pipeline with the help of protective sleeves of design 3 and weldolets BP1 or BP2.

WARNING!

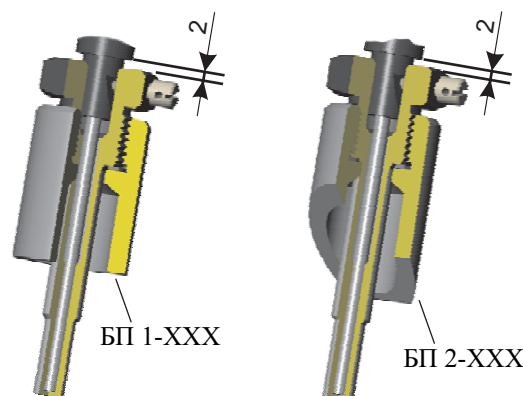
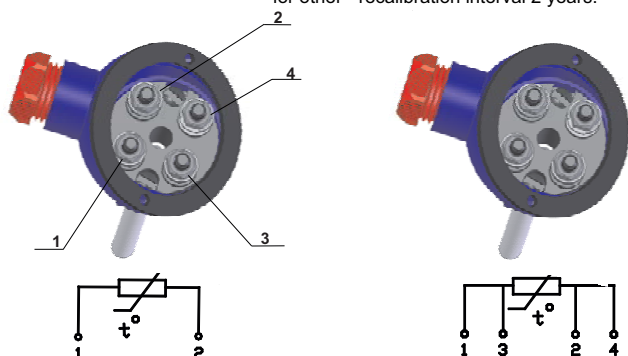
The gap clearance between a protective sleeve and a threaded bushing slot is 2mm.

A leaden seal is fixed through a sleeve screw, a corps opening and an opening of two screws which tighten a lid of the temperature transducer.

Technical Features

Measuring temperature range, °C	from 0 to plus 160 from minus 50 to plus 180
Mounting part length, mm	60; 80; 100; 120; 160; 200; 250
Wiring diagram (circuit)	2-wire; 4-wire;
Class	A or B (CTB EN 60751) , AA
Thermal response time, no more than s	6
Fastening	Mounting to a protective sleeve
Protective fitting, mm	Ø4

For measuring temperature range 0-160°C recalibration interval is 4 years;
minus 50-180°C recalibration interval - 4 года.
for other - recalibration interval 2 years.



Connecting

Connecting with an external device is made with the help of the proper section cable and the amount of wires corresponding to the temperature transducer circuit.

The cable is connected with the circuit through a terminal block with the help of nuts and pucks.

Design Examples

Design	ØD, mm	L _{pa6} , mm	Fastening	HGX	Class	Circuit	t _{pa6} , °C
ТСП-Н 5.0.00.00.4.1.0	4	60	in a sleeve	Pt100	B	2-wire	0...+160
ТСП-Н 5.0.01.00.3.3.1	4	80	in a sleeve	Pt100	A	4-wire	-50...+180
ТСП-Н 5.0.02.00.7.1.0	4	100	in a sleeve	Pt500	B	2-wire	0...+160
ТСП-Н 5.0.03.00.6.3.1	4	120	in a sleeve	Pt500	A	4-wire	-50...+180
ТСП-Н 5.0.04.00.6.3.0	4	160	in a sleeve	Pt500	A	4-wire	0...+160

If you want to order not mentioned designs, you should follow technical features of this temperature transducer.

Platinum Resistive Temperature Transducer Type PL-head

Usage

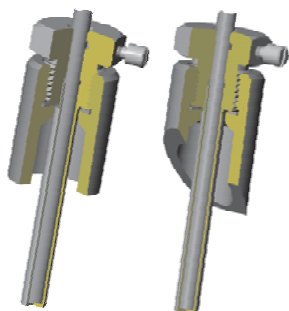
This temperature transducer is applied for temperature measurement in control systems of automatic regulations of different purpose.

The temperature transducer should be used with a protective sleeve.

Installation

The temperature transducer is mounted to a pipeline with the help of protective sleeve of design 3 and weldolets BP1 or BP2.

The leaden seal is fixed through a sleeve, a corps opening and an opening of two screws which tighten a temperature transducer lid.

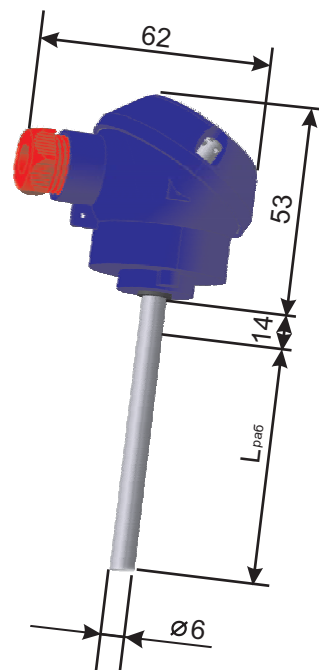


Construction

This temperature transducer consists of a sensing element, which is located in a protection tube $\varnothing 6$, also of a threaded bushing, terminal block, corps of aluminum and a lid.

A lid is mounted to the corps through a rubber washer and is fixed with two screws. Thus pressure tight joint is achieved.

A protection tube is fixed in a sleeve by a screw to prevent access to the circuit without any sanction without breaking the leaden seal.



Technical Features

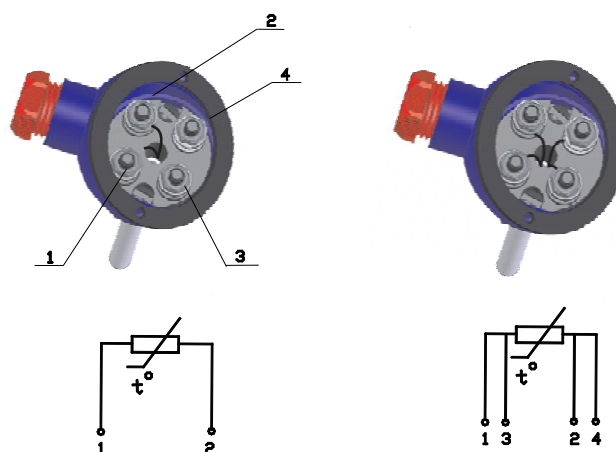
Measuring temperature range, °C	from 0 to plus 160; from minus 50 to plus 180
Mounting part length, mm	60; 80; 100; 120; 160; 200; 250
Wiring diagram (circuit)	2-wire; 4-wire;
Class	A or B (CTB EN 60751), AA
Fastening	Mounting to a protection sleeve
Protective fitting	$\varnothing 6$

For measuring temperature range 0 - plus 160°C recalibration interval - 4 years;
minus 50 - plus 180°C recalibration interval - 4 years.
for other - recalibration interval 2 years.

Connecting

Connecting with an external device is made with the help of the proper section cable and the amount of wires corresponding to the temperature transducer circuit.

The cable is connected with the circuit through a terminal block with the help of nuts and pucks.

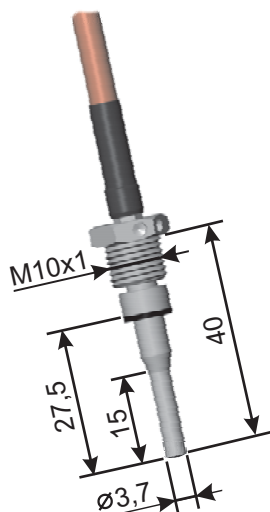


Design Examples

Design	$\varnothing D$, mm	L_{pa6} , mm	Fastening	NSH	Class	Circuit	t_{pa6} , °C
ТСП-Н 5.1.00.00.4.1.0	6	60	In a sleeve	Pt100	B	2-wire	0...+160
ТСП-Н 5.1.01.00.3.3.1	6	80	In a sleeve	Pt100	A	4-wire	-50...+180
ТСП-Н 5.1.02.00.7.1.0	6	100	In a sleeve	Pt500	B	2-wire	0...+160
ТСП-Н 5.1.03.00.6.3.1	6	120	In a sleeve	Pt500	A	4-wire	-50...+180
ТСП-Н 5.1.04.00.6.3.0	6	160	In a sleeve	Pt500	A	4-wire	0...+160

If you want to order not mentioned design you should follow technical features of this resistive temperature transducer type PL-head.

Platinum Resistive Temperature Transducer Type DS-cable



Usage

This resistive temperature transducer is applied for temperature measurement in systems of control and automatic regulation of different purpose.

It's used for mounting to pipelines DN25.

Construction

This temperature transducer consists of a sensing element, which is located in a protection tube, a cable with tips with the proper amount of wires and a fastening elements (a mobile fitting and CAF gasket).

Technical Features

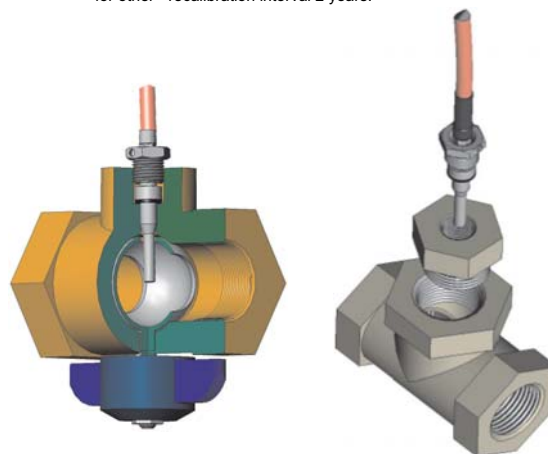
Measuring temperature range, °C	from 0 to plus 160; from minus 50 to plus 180
Mounting part length, mm	27,5
Wiring diagram(circuit)	2-wire; 4-wire;
Class	A or B (CT5 EN 60751), AA
Fastening	Mobile fitting M10x1,0
Protective fitting, mm	Ø4

For measuring temperature range 0-160°C recalibration interval - 4 years;
minus 50-180°C recalibration interval - 4 years.
for other - recalibration interval 2 years.

Installation

The temperature transducer are installed immediately in valves, T-couplers, etc. through a transitive nut.

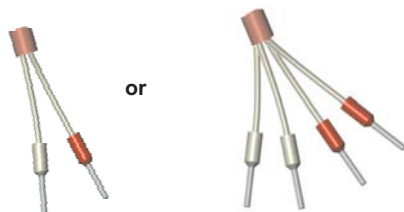
When installing in a ball valve, it's became unnecessary to lighten the systems while mounting and to change a temperature transducer after the recalibration interval has been finished.



Connecting

Connecting with an external device is made with the help of the proper section of a cable and the amount of wires corresponding to the temperature transducer circuit.

Connecting wires tips are pressed out by the cable tips of two colors: white and red. When the circuit is 4-wire, wires with inner connections are depicted in the same color.



Design Exmples

Design	ØD, mm	L _{паб} , mm	Mobile fastening	NSH	Class	Circuit	t _{паб} , °C	Cable, m
ТСП-Н 6.0.19.11.4.3.1/1,5	4	27,5	Fitting M10x1,0	Pt100	B	4-wire	-50...+180	1,5
ТСП-Н 6.0.19.11.4.1.1/1	4	27,5	Fitting M10x1,0	Pt100	B	2-wire	-50...+180	1
ТСП-Н 6.0.19.11.7.1.0/2	4	27,5	Fitting M10x1,0	Pt500	B	2-wire	0...+160	2

If you want to order not mentioned designs you should follow the technical features and ordering diagram of resistive temperature transducers ТСП-Н and КТСП-Н.

Usage

These temperature transducer are intended for temperature measurement of firm, loose, liquid and gaseous media and ensure the functioning of recording devices, systems of control and automatic regulation of different purpose.

The temperature transducer should be used with a protective sleeve.

Construction

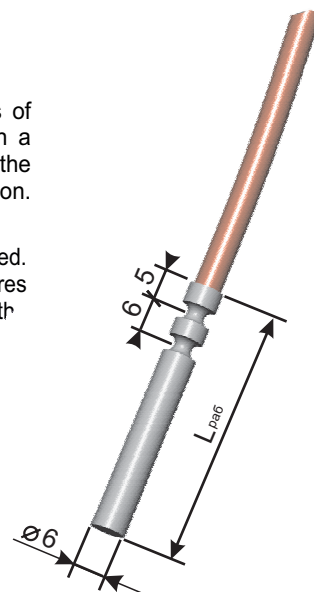
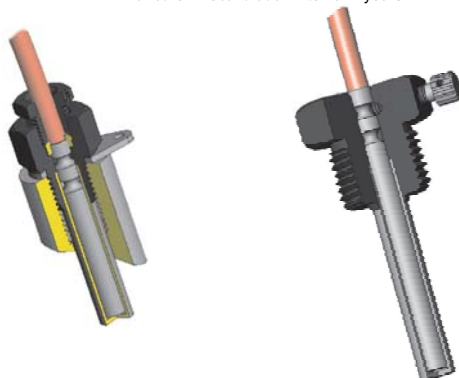
The temperature transducer consists of a sensing element, which is located in a protection tube, and of a cable with the proper amount of wires and proper section.

The isolation of joining wire tips is removed. Dealing with 4-wire circuit, pairs of wires have different length in accordance with the inner connection.

Technical Features

Measuring temperature range, °C	from 0 to plus 160 from minus 50 to plus 180
Mounting part length, mm	45; 60; 80; 100; 120; 160; 200; 250
Wiring diagram (circuit)	2-wire; 4-wire;
Class	A or B (CTB EN 60751), AA
Fastening	Mounting to a protection tube
Protective fitting, mm	Ø6

For measuring temperature range 0-160°C recalibration interval - 4 years;
minus 50-180°C recalibration interval - 4 years.
for other - recalibration interval 2 years.



Installation

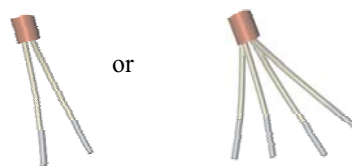
The temperature transducer is mounted to a pipeline with the help of protection sleeve and weldolets.

Protective sleeve GZ5/8-xx-G1/4 and weldolets BP3 are used for mounting of the temperature transducer with length 45 and 60 mm.

Protective sleeve GZ2/8 and weldolets BP1(or BP2) are used for mounting of temperature transducer with length 45 and 60 mm.

Connecting

Connecting with an external device is made with the help of the proper section of a flexible cable and the amount of wires corresponding to the temperature transducer circuit.

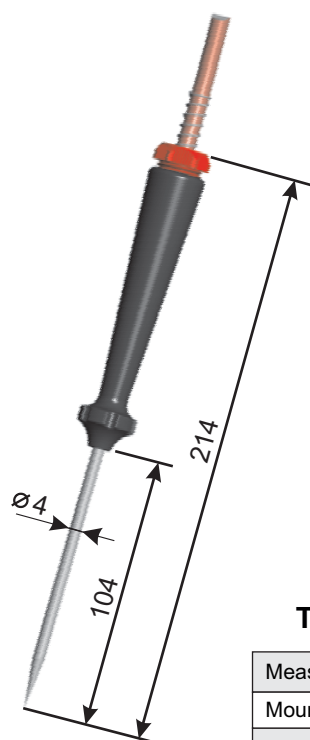


Design Examples

Design	ØD, mm	L _{пab} , mm	Fastening	NSH	Class	Circuit	t _{пab} , °C	Cable, m
ТСП-Н 1.1.21.00.3.3.0/1.5	6	45	In a sleeve	Pt100	A	4-wire	0...+160	1,5
ТСП-Н 1.1.02.00.4.1.1/0.5	6	100	In a sleeve	Pt100	B	2-wire	-50...+180	0.5
ТСП-Н 1.1.00.00.7.1.0/2	6	60	In a sleeve	Pt500	B	2-wire	0...+160	2
ТСП-Н 1.1.01.00.3.2.1/1	6	80	In a sleeve	Pt100	A	3-wire	-50...+180	1
ТСП-Н 1.1.21.00.3.3.1/1	6	45	In a sleeve	Pt100	A	4-wire	-50...+180	1

If you want to order not mentioned design you should follow the technical features and ordering diagrams of the concrete type of the resistive temperature transducer ТСП-Н.

Platinum Resistive Temperature Transducer “Needle”



Usage

The temperature transducer is intended for temperature measurement of loose liquid and soft media in stationary and mobile control systems of different purpose.

Construction

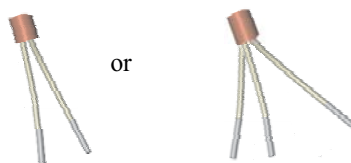
This temperature transducer consists of a sensing element, which is located in a sharp-ended protection tube, an accessible shaft for temperature transducer manipulation and a flexible cable for a connection with an external device.

Technical Features

Measuring temperature range, °C	from minus 50 to plus 180
Mounting part length, mm	100
Wiring diagram (circuit)	2-wire; 3-wire;
Class	B (СТБ EN 60751)
Fastening	-
Protective fitting	Ø4
Recalibration interval, years	4

Connecting

Connecting with an external device is made with the help of the proper section of a flexible cable and the amount of wires.



Design Examples

Design	ØD, mm	L _{раб} , mm	Fastening	NSH	Class	Circuit	t _{раб} , °C
ТСП-Н 8.0.02.00.4.2.1	4	100	In-situ	Pt100	B	3-wire	-50...+180
ТСП-Н 8.0.02.00.4.1.1	4	100	In-situ	Pt100	B	2-wire	-50...+180
ТСП-Н 8.0.02.00.7.2.1	4	100	In-situ	Pt500	B	3-wire	-50...+180
ТСП-Н 8.0.02.00.7.1.1	4	100	In-situ	Pt500	B	2-wire	-50...+180

If you want to order not mentioned designs you should follow the technical features and ordering diagrams of some concrete resistive temperature transducer ТСП-Н.

Resistive Temperature Transducer Type PI-head

Usage

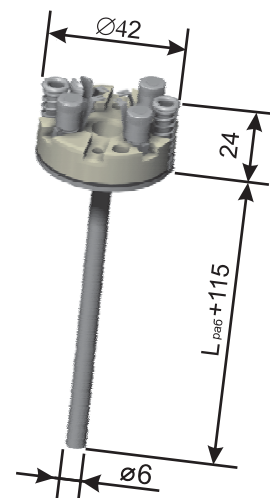
The resistive temperature transducer is intended for temperature measurement of loose, liquid and gaseous media in stationary and mobile control systems of different purpose.

This temperature transducer should be used with a protection sleeve.

Construction

The temperature transducer consists of a sensing element in a protection tube c6 and a terminal block.

Constructively this temperature transducer is intended for usage in a protective sleeve with a hermetic corps of aluminum. fastening is made with the help of spring-loaded screws, which tightly pressthe temperature transducer to a protective sleeve base.



Technical Features

Measuring temperature range, °C	from 0 to plus 160 from minus 50 to plus 180
Mounting part length, mm	160; 200; 250; 320; 400
Wiring diagram (circuit)	2-wire; 4-wire;
Class	A or B (CTB EN 60751), AA
Fastening	Mounting to a protection sleeve
Protective fitting	Ø6

For measuring temperature range 0 - plus 160°C recalibration interval - 4 years;
minus 50 - plus 180°C recalibration interval - 4 years
for other - recalibration interval 2 years.

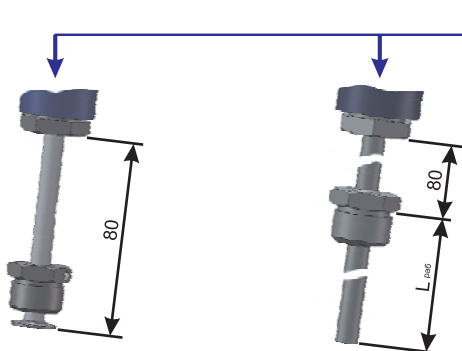
Installation

The temperature transducer is mounted to a pipeline with the help of protective sleeve GZ8-X and weldolets BP1(or BP2) or without it.



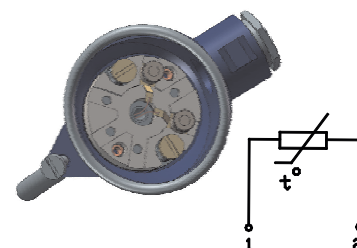
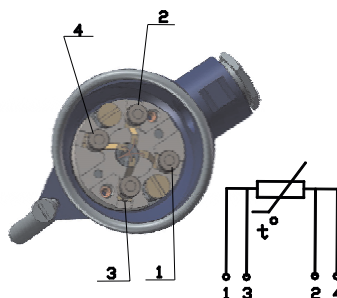
The temperature transducer should be installed in a protective sleeve, then the connection with an external device and covering a lid and fixing it with a screw should be made, creating tight joint.

A leaden seal is fixed through a fixing lid screw and it helps to prevent from an access to the circuit.



Connecting

Connection with an external device is made with the help of the proper section cable with the amount of wires and corresponding to the temperature transducer circuit.



Design Examples

Design	ØD, mm	L _{pa6} , mm	Fastening	NSH	Class	Circuit	t _{pa6} , °C
ТСП-Н 7.1.04.00.3.3.1	6	160	In-situ	Pt100	A	4-wire	-50...+180
ТСП-Н 7.1.06.00.4.1.1	6	200	In-situ	Pt100	B	2-wire	-50...+180
ТСП-Н 7.1.07.00.6.3.1	6	250	In-situ	Pt500	A	4-wire	-50...+180
ТСП-Н 7.1.08.00.7.1.0	6	320	In-situ	Pt500	B	2-wire	0...+160
ТСП-Н 7.1.09.00.3.3.0	6	400	In-situ	Pt100	A	4-wire	0...+160

If you want to order not mentioned design you should follow the technical features and ordering diagrams of the concrete type of the resistive temperature transducer ТСП-Н.

Usage

This resistive temperature transducer is applied for temperature control and measurement of liquid, firm, loose and gaseous media.

Fields of usage: ensure the functioning of recording devices, systems of control and automatic regulation in industry, laboratory researches, agriculture.

Stability to Influences

The temperature transducers correspond to climatic design group - D3, according to GOST 12997, are situated outside and are subjected to the influence of atmospheric factors (immediate heating by the sun-rays, wind, rain, frozen rain, icing over).

The temperature transducers are firm and stable to vibration influence and correspond to design group - N2 (according to GOST 12997). They are situated in some places suffered from vibration from working mechanisms of industrial objects.

Protection degree - IP65 according to GOST 12254 (dust-proof and is protected from water jets.)

Immersion Depth

The minimal immersion depth when the temperature transducer still preserves its metrological features:

$$L_{\min} = 5 \cdot \varnothing D_3 + L_{\text{сз}}$$

where:

$\varnothing D_3$ - diameter of protection tube, mm;

$L_{\text{сз}}$ - length of sensing elements, mm.

The usage of small-sized sensing elements and protection fitting allows creating the temperature transducers with a small immersion depth and shorter response time.

Metrological Features

The temperature transducers have the standardized statistic feature (NSH - the unique sensor curve) Pt50, Pt100, Pt500, Pt1000.

NSH (the unique sensor curve), nominal value of measured current and ratio W_{100} are represented in the following table:

Values of Measuring Current and W_{100}

	Nominal measuring current, mA	Ratio $W_{100} (R_{100}/R_0)$
Pt 50	2,0	1,385
Pt 100	1,0	1,385
Pt 500	0,2	1,385
Pt 1000	0,1	1,385

Self heating effect doesn't exceed 0,3°C (acc. to СТБ EN 60751) when nominal measuring current value is chosen.

Thermoelectric Effect

The usage of the best sensing elements of some foreign producers helps to reduce the thermoelectric power effect practically to zero.

Accuracy Classes

The limits of acceptable departure from NSH depending on a class correspond to:

-for class AA: $\pm(0,1+0,0017 \cdot |t|)$

-for class A: $\pm(0,15+0,002 \cdot |t|)$

-for class B: $\pm(0,3+0,005 \cdot |t|)$

The Limits of Acceptable Departure from NSH for Pt100

°C	Acceptable Departure			
	Class A		Class B	
	°C	Ω	°C	Ω
-200	$\pm 0,55$	$\pm 0,24$	$\pm 1,3$	$\pm 0,56$
-100	$\pm 0,35$	$\pm 0,14$	$\pm 0,8$	$\pm 0,32$
0	$\pm 0,15$	$\pm 0,06$	$\pm 0,3$	$\pm 0,12$
100	$\pm 0,35$	$\pm 0,13$	$\pm 0,8$	$\pm 0,30$
200	$\pm 0,55$	$\pm 0,20$	$\pm 1,3$	$\pm 0,48$
300	$\pm 0,75$	$\pm 0,27$	$\pm 1,8$	$\pm 0,64$
400	$\pm 0,95$	$\pm 0,33$	$\pm 2,3$	$\pm 0,79$
500	$\pm 1,15$	$\pm 0,38$	$\pm 2,8$	$\pm 0,93$
600	$\pm 1,55$	$\pm 0,43$	$\pm 3,3$	$\pm 1,06$
650	$\pm 1,45$	$\pm 0,46$	$\pm 3,6$	$\pm 1,13$
700	-	-	$\pm 3,8$	$\pm 1,17$
800	-	-	$\pm 4,3$	$\pm 1,28$
850	-	-	$\pm 4,6$	$\pm 1,34$

RECALIBRATION INTERVAL IS 4 YEARS

Response Time

Thanks to the unique construction of the temperature transducer, tight protection fitting diameters limits and location of protective sleeve these temperature transducers have a short response time on temperature step change.

The regulated parameters of the temperature transducers and stability of the parameters during a long period of exploitation are guaranteed by the correct installation, usage of the protective sleeves and component parts produced by the manufacturer.

Resistance Pt100 - Temperature Relationship Values (acc. to GOST EN 60751)

°C	Ω	°C	Ω	°C	Ω	°C	Ω	°C	Ω
-50	80,31	0	100,00	50	119,40	100	138,51	150	157,33
-48	81,10	2	100,78	52	120,17	102	139,26	152	158,07
-46	81,89	4	101,56	54	120,94	104	140,02	154	158,82
-44	82,69	6	102,34	56	121,71	106	140,78	156	159,56
-42	83,48	8	103,12	58	122,47	108	141,54	158	160,31
-40	84,27	10	103,90	60	123,24	110	142,29	160	161,05
-38	85,06	12	104,68	62	124,01	112	143,05	162	161,80
-36	85,85	14	105,46	64	124,78	114	143,80	164	162,54
-34	86,64	16	106,24	66	125,54	116	144,56	166	163,29
-32	87,43	18	107,02	68	126,31	118	145,31	168	164,03
-30	88,22	20	107,79	70	127,08	120	146,07	170	164,77
-28	89,01	22	108,57	72	127,84	122	146,82	172	165,51
-26	89,80	24	109,35	74	128,61	124	147,57	174	166,26
-24	90,59	26	110,12	76	129,37	126	148,33	176	167,00
-22	91,37	28	110,90	78	130,13	128	149,08	178	167,74
-20	92,16	30	111,67	80	130,90	130	149,83	180	168,48
-18	92,95	32	112,45	82	131,66	132	150,58	182	169,22
-16	93,73	34	113,22	84	132,42	134	151,33	184	169,96
-14	94,52	36	114,00	86	133,18	136	152,08	186	170,70
-12	95,30	38	114,77	88	133,95	138	152,83	188	171,43
-10	96,09	40	115,54	90	134,71	140	153,58	190	172,17
-8	96,87	42	116,31	92	135,47	142	154,33	192	172,91
-6	97,65	44	117,08	94	136,23	144	155,08	194	173,65
-4	98,44	46	117,86	96	136,99	146	155,83	196	174,38
-2	99,22	48	118,63	98	137,75	148	156,58	198	175,12

The values are given without taking into consideration the resistance of the temperature transducer cable with the wire always switched on.

Certificates

These temperature transducers are produced due to TY BY 300044107.001-2006.

The temperature transducers have been certified and now have current certificates.

Belarus - certificate №5121 (State register of the measuring means № P5 03 10 0494 08)

Russia - certificate №33125 (state register of the measuring means № 38959-08)

Ukraine - certificate № UA-MI/3p-63-99

(State register of the measuring means № P5 03 10 0494 97)

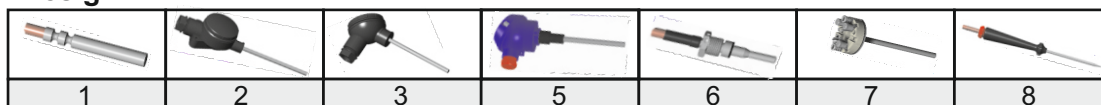
Kazakhstan - certificate №4786 (State register of measuring means № KZ. 02. 03. 02621-2008/ P5 03 10 0494 08)

OTHER VERSIONS CAN BE SUPPLIED ON YOUR REQUEST

Diagram Symbols of the Resistive Temperature Transducer TСП-H

ТСП-H **a** **b** **c** **d** **e** **f** **g** / **h**

a – Design



b – Mounting Part Diameter

Ø4 MM	Ø6 MM	Ø8 MM	Ø10 MM	Ø3 MM	Ø5 MM	Ø7 MM
0	1	2	3	4	5	6

c – Mounting Part Length

60 MM	80 MM	100 MM	120 MM	160 MM	180 MM	200 MM	250 MM	320 MM	400 MM	500 MM
00	01	02	03	04	05	06	07	08	09	10

630 MM	800 MM	1000 MM	1250 MM	1600 MM	2000 MM	2500 MM	3150 MM	27,5 MM	50 MM	45 MM
11	12	13	14	15	16	17	18	19	20	21

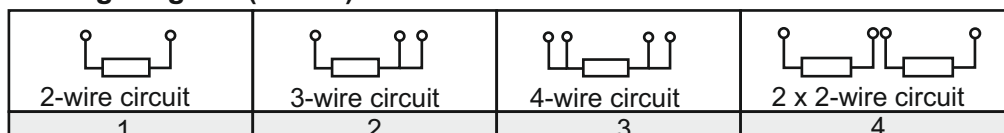
d – Fastening

In-Situ	Mobile fitting			Nut			Fixed Fitting		
	M10x1	M16x1,5	M20x1,5	M10x1	M16x1,5	M20x1,5	M10x1	M16x1,5	M20x1,5
00	11	01	02	12	06	07	13	14	15

e – NSH(the unique sensor curve)and Accuracy Class

Out of Class	Pt 50		Pt 100		Pt 500		Pt 1000		Pt 50	Pt 100	Pt 500	Pt 1000
	A	B	A	B	A	B	A	B	AA	AA	AA	AA
12	0	1	3	4	6	7	9	10	11	13	16	19

f – Wiring Diagram (circuit)



g – Measuring Temperature Range

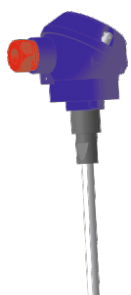
+160 °C	+180 °C	+400 °C	+550 °C	+650 °C	+850 °C	+600 °C
0 °C	-50 °C	-50 °C	-50 °C	-200 °C	-200 °C	-50 °C
0	1	2	3	4	5	6

h – Cable Length (it is mentioned for designs 1, 6, 8)

It should mentioned when you make order

Example of ordering notes:

ТСП-H 5.0.01.00.3.3.0



- Design 5
- Mounting part diameter 4 mm
- Mounting part length 80 mm
- Fastening in-situ
- Pt 100 A
- 4-wire circuit
- Temperature range 0...+160°C

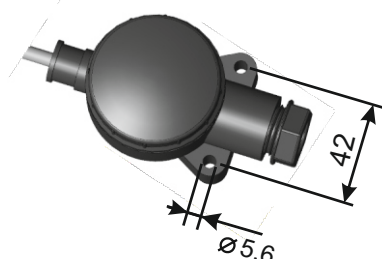
Usage

This temperature transducer is applied for outdoor temperature measurement in systems of control and automation regulation of different purpose.

Installation

The construction of the temperature transducer casing makes it possible to mount it immediately to the wall or other surface with screws, woodscrews and fastening meanings.

A leaden seal is fixed through a lid opening.



Connecting

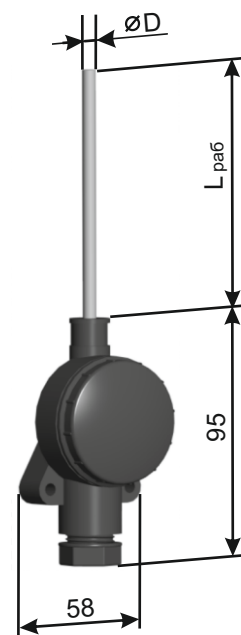
Connecting with external devices is made with the help of the appropriate section cable and the amount of wires recommended in the circuit.

The cable connects to the circuit with screws and nuts.

Construction

The resistive temperature transducer represents a phenoplastic casing with an unscrewing lid, a protection tube of stainless steel and a gland entry for a cable. A sensing element is settled in a protection sleeve.

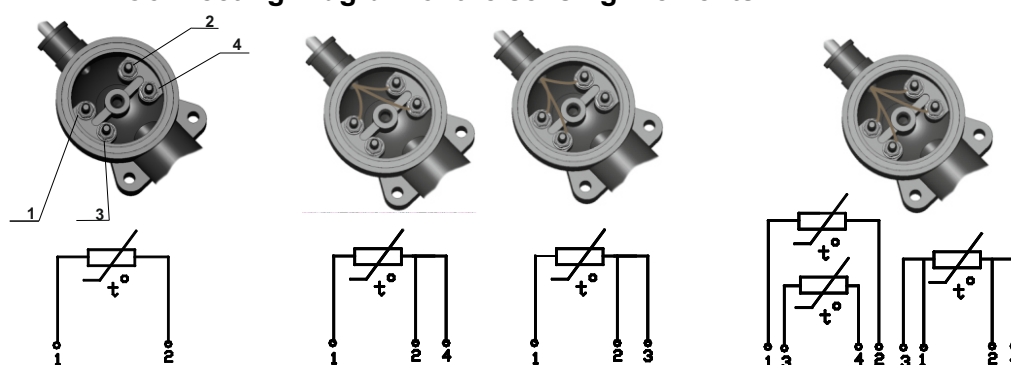
Electrical connection of the sensing element with screws for an external cable connection is made corresponding to 2-wire, 3-wire or 4-wire circuit (the temperature transducers corresponding to class A with 2-wire circuit are not made).



Technical Features

Measuring temperature range, °C	from minus 50 to plus 180
Mounting part length, mm	60; 80
Wiring diagram (circuit)	2-wire; 3-wire; 4-wire; 2-x 2-wire
Class	A and B (CT5 EN 60751), AA
Thermal response time, no more than s	30
Fastening	in-situ
Protective fitting	Ø6; Ø8
Recalibration interval, years	2

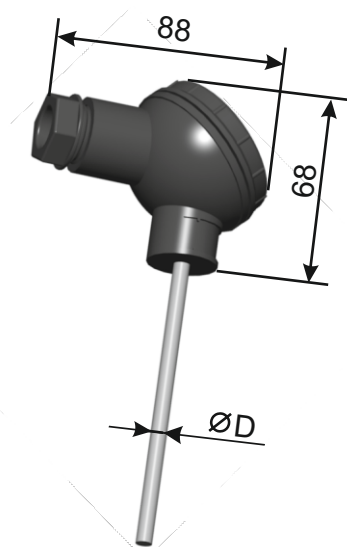
Connecting Diagram of the sensing Elements



The Temperature Transducer Design Examples

Design	ØD, mm	L pa6, mm	Fastening	NSH	Class	Circuit	t pa6, °C
ТСП-Н 2.1.00.00.4.1.1	6	60	in-situ	Pt100	B	2-wire	-50...+180
ТСП-Н 2.1.01.00.3.3.1	6	80	in-situ	Pt100	A	4-wire	-50...+180
ТСП-Н 2.2.01.00.7.1.1	8	80	in-situ	Pt500	B	2-wire	-50...+180
ТСП-Н 2.2.00.00.7.2.1	8	60	in-situ	Pt500	B	3-wire	-50...+180
ТСП-Н 2.2.01.00.6.3.1	8	80	in-situ	Pt500	A	4-wire	-50...+180

If you want to order not mentioned designs you should follow technical features of resistive temperature transducer ТСП-Н.



Usage

This temperature transducer is applied for temperature measurement in systems of control and automatic regulation of different purpose.

Construction

The temperature transducer represents a phenoplastic casing with an unscrewing lid, a protection tube of stainless steel and a gland entry for a cable. A sensing element is settled in a protection sleeve.

Electrical connection of the sensing element with screw for an external cable connection is made corresponding to 2-wire, 3-wire or 4-wire circuit.

Technical Features

Measuring temperature range, °C	from 0 to plus 160 from minus 50 to plus 180
Mounting part length, mm	60...3150
Wiring diagram (circuit)	2-wire; 3-wire 4-wire; 2-x 2-wire
Class	A or B (CTB EN 60751) , AA
Thermal response time	30
Fastening	in-situ
Protective fitting	Ø6; Ø8

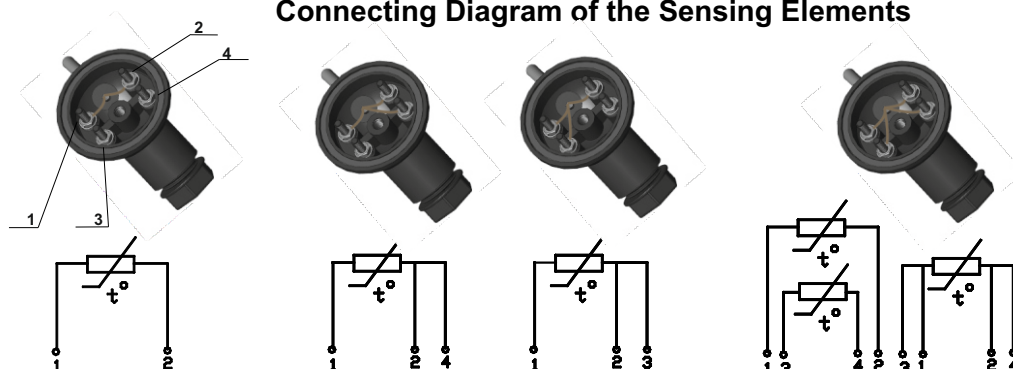
For measuring temperature range 0-160°C recalibration interval - 4 years;
minus 50-180°C recalibration interval - 2 years.

Connecting

Connection with external devices is made with the help of the appropriate section cable and the amount of wires recommended in the circuit.

The cable connects to the circuit with the help of screws and nuts.

Connecting Diagram of the Sensing Elements



Installation

The temperature transducer is mounted to a pipeline with the help of protective sleeves and weldolets or immediately with the help of the appropriated fastening elements of the temperature transducer dependently on a performance of fastening elements.

The leaden seal is fixed through a lid opening, or through a seal opening in a fitting.

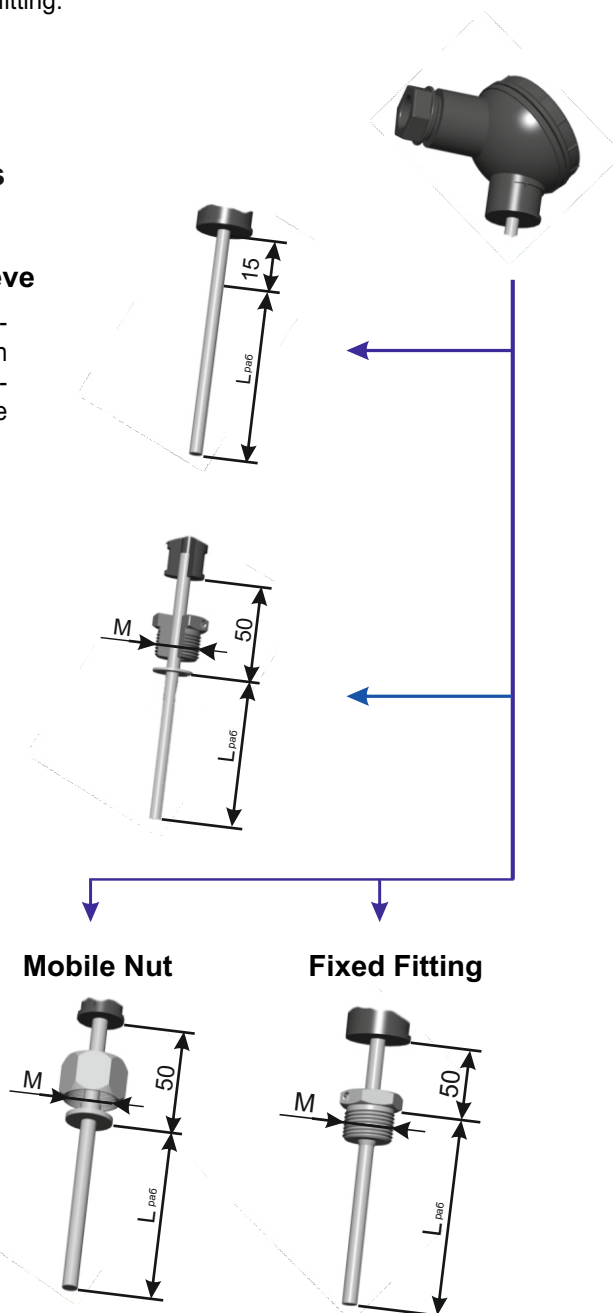
Fastening Elements Design Examples

Installation in a protective sleeve

It's recommended to mount the temperature transducer without any installation elements to a pipeline with the help of protective sleeve of design 2 and with the help of weldolet BP1 (or BP2).

Mobile Fitting

It's recommended to mount the temperature transducer with a mobile fitting to a pipeline with the help of protective sleeve of design 1 and weldolet BP1 or BP2 or it's also possible with the help of protective sleeve of design 4 for immediate installation at a pipeline.



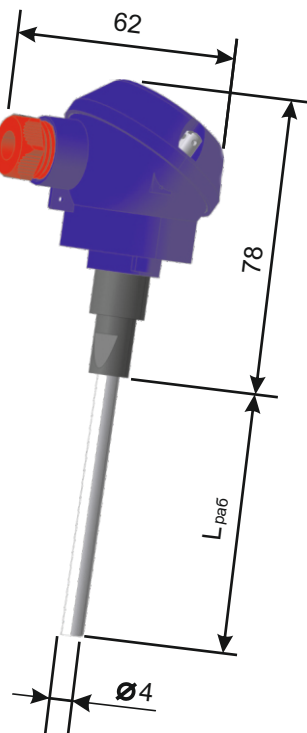
The temperature transducer with mobile nut and fixed fitting are applied for immediate mounting to a pipeline with a client's fastening element.

Design Examples

Design	ØD, mm	L _{паб} , mm	Fastening	NSH	Class	Circuit	t _{паб} , °C
ТСП-Н 3.1.00.02.4.1.0	6	60	Mobile fitting M20x1,5	Pt100	B	2-wire	0...+160
ТСП-Н 3.1.01.00.3.3.1	6	80	Protective sleeve	Pt100	A	4-wire	-50...+180
ТСП-Н 3.2.02.15.7.1.0	8	100	Fixed fitting M20x1,5	Pt500	B	2-wire	0...+160
ТСП-Н 3.2.03.15.6.3.1	8	120	Fixed fitting M20x1,5	Pt500	A	4-wire	-50...+180
ТСП-Н 3.2.04.00.7.3.1	8	160	Protective sleeve	Pt500	B	4-wire	-50...+180

If you want to order not mentioned designs you should follow technical features of the resistive temperature transducer.

Platinum Resistive Temperature Transducer Type PL-head



Usage

This temperature transducer is applied for temperature measurement in systems of control and automatic regulation of different purpose with a short response time.

The temperature transducer should be used with a protective sleeve.

Construction

The temperature transducer consists of a sensing element, which is located in a protection tube, also of a threaded bushing, terminal block, corps of aluminum and a lid.

A lid is mounted to the corps through a rubber washer and is fixed with two screws. Thus pressure tight joint is achieved.

A threaded bushing has an oblique cut to fix a temperature transducer in a protection sleeve to prevent access to the circuit without any sanction without breaking the leaden seal.

Installation

The temperature transducer is mounted to a pipeline with the help of protective sleeves of design 3 and weldolets BP1 or BP2.

WARNING!

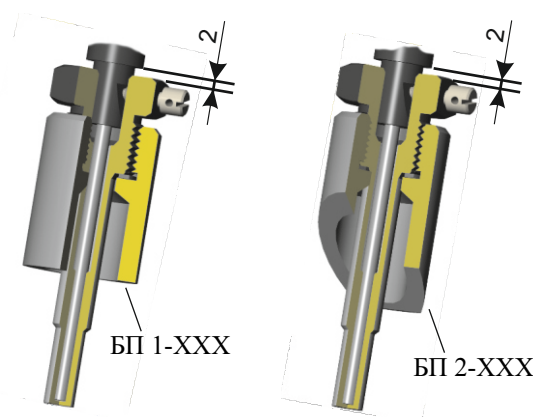
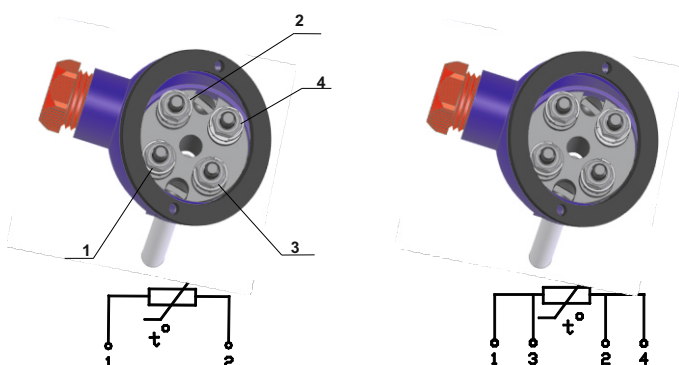
The gap clearance between a protective sleeve and a threaded bushing slot is 2mm.

A leaden seal is fixed through a sleeve screw, a corps opening and an opening of two screws which tighten a lid of the temperature transducer.

Technical Features

Measuring temperature range, °C	from 0 to plus 160 from minus 50 to plus 180
Mounting part length, mm	60; 80; 100; 120; 160; 200; 250
Wiring diagram (circuit)	2-wire; 4-wire;
Class	A or B (CTB EN 60751) , AA
Thermal response time, no more than s	6
Fastening	Mounting to a protective sleeve
Protective fitting, mm	Ø4

For measuring temperature range 0-160°C recalibration interval is 4 years;
minus 50-180°C recalibration interval - 2 года.



Connecting

Connecting with an external device is made with the help of the proper section cable and the amount of wires corresponding to the temperature transducer circuit.

The cable is connected with the circuit through a terminal block with the help of nuts and pucks.

Design Examples

Design	ØD, mm	L _{pa6} , mm	Fastening	HGX	Class	Circuit	t _{pa6} , °C
ТСП-Н 5.0.00.00.4.1.0	4	60	in a sleeve	Pt100	B	2-wire	0...+160
ТСП-Н 5.0.01.00.3.3.1	4	80	in a sleeve	Pt100	A	4-wire	-50...+180
ТСП-Н 5.0.02.00.7.1.0	4	100	in a sleeve	Pt500	B	2-wire	0...+160
ТСП-Н 5.0.03.00.6.3.1	4	120	in a sleeve	Pt500	A	4-wire	-50...+180
ТСП-Н 5.0.04.00.6.3.0	4	160	in a sleeve	Pt500	A	4-wire	0...+160

If you want to order not mentioned designs, you should follow technical features of this temperature transducer.

Platinum Resistive Temperature Transducer Type PL-head

Usage

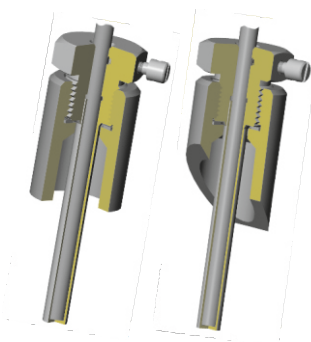
This temperature transducer is applied for temperature measurement in control systems of automatic regulations of different purpose.

The temperature transducer should be used with a protective sleeve.

Installation

The temperature transducer is mounted to a pipeline with the help of protective sleeve of design 3 and weldolets BP1 or BP2.

The leaden seal is fixed through a sleeve, a corps opening and an opening of two screws which tighten a temperature transducer lid.

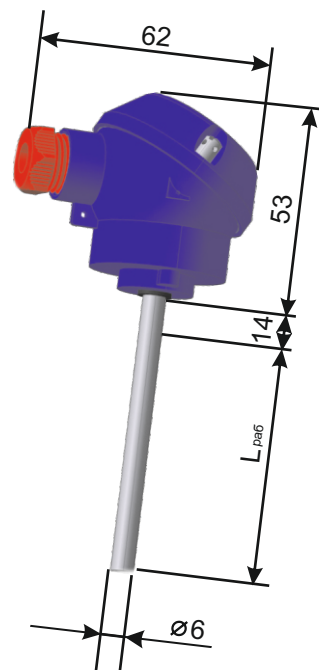


Construction

This temperature transducer consists of a sensing element, which is located in a protection tube $\varnothing 6$, also of a threaded bushing, terminal block, corps of aluminum and a lid.

A lid is mounted to the corps through a rubber washer and is fixed with two screws. Thus pressure tight joint is achieved.

A protection tube is fixed in a sleeve by a screw to prevent access to the circuit without any sanction without breaking the leaden seal.



Technical Features

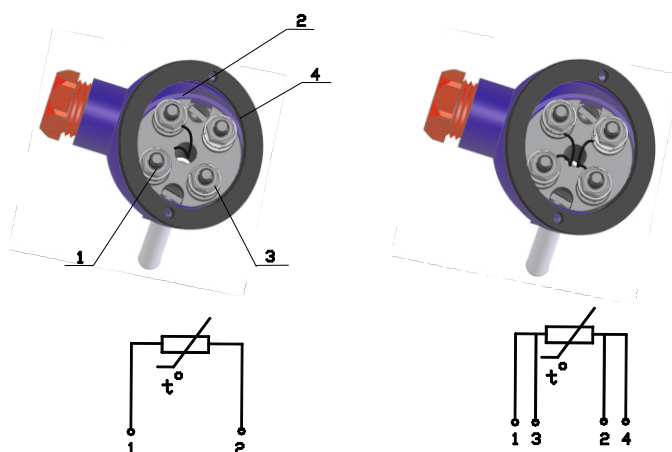
Measuring temperature range, °C	from 0 to plus 160; from minus 50 to plus 180
Mounting part length, mm	60; 80; 100; 120; 160; 200; 250
Wiring diagram (circuit)	2-wire; 4-wire;
Class	A or B (CTB EN 60751), AA
Fastening	Mounting to a protection sleeve
Protective fitting	$\varnothing 6$

For measuring temperature range 0 - plus 160°C recalibration interval - 4 years;
minus 50 - plus 180°C recalibration interval - 2 years.

Connecting

Connecting with an external device is made with the help of the proper section cable and the amount of wires corresponding to the temperature transducer circuit.

The cable is connected with the circuit through a terminal block with the help of nuts and pucks.

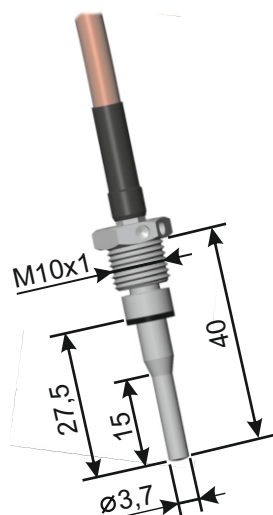


Design Examples

Design	$\varnothing D$, mm	L_{pa6} , mm	Fastening	NSH	Class	Circuit	t_{pa6} , °C
ТСП-Н 5.1.00.00.4.1.0	6	60	In a sleeve	Pt100	B	2-wire	0...+160
ТСП-Н 5.1.01.00.3.3.1	6	80	In a sleeve	Pt100	A	4-wire	-50...+180
ТСП-Н 5.1.02.00.7.1.0	6	100	In a sleeve	Pt500	B	2-wire	0...+160
ТСП-Н 5.1.03.00.6.3.1	6	120	In a sleeve	Pt500	A	4-wire	-50...+180
ТСП-Н 5.1.04.00.6.3.0	6	160	In a sleeve	Pt500	A	4-wire	0...+160

If you want to order not mentioned design you should follow technical features of this resistive temperature transducer type PL-head.

Platinum Resistive Temperature Transducer Type DS-cable



Usage

This resistive temperature transducer is applied for temperature measurement in systems of control and automatic regulation of different purpose.

It's used for mounting to pipelines DN25.

Construction

This temperature transducer consists of a sensing element, which is located in a protection tube, a cable with tips with the proper amount of wires and a fastening elements (a mobile fitting and CAF gasket).

Technical Features

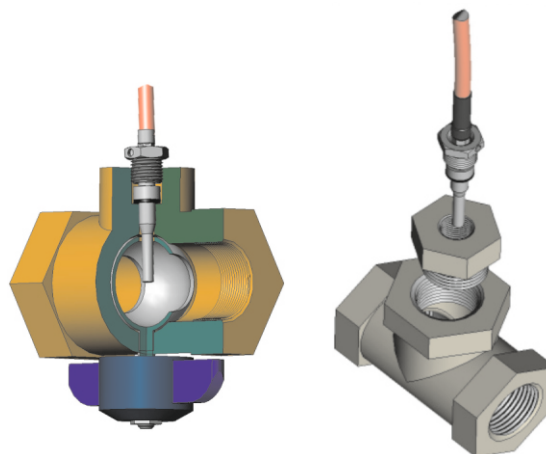
Measuring temperature range, °C	from 0 to plus 160; from minus 50 to plus 180
Mounting part length, mm	27,5
Wiring diagram(circuit)	2-wire; 4-wire;
Class	A or B (CT5 EN 60751), AA
Fastening	Mobile fitting M10x1,0
Protective fitting, mm	Ø4

For measuring temperature range 0-160°C recalibration interval - 4 years;
minus 50-180°C recalibration interval - 2 years.

Installation

The temperature transducer are installed immediately in valves, T-couplers, etc. through a transitive nut.

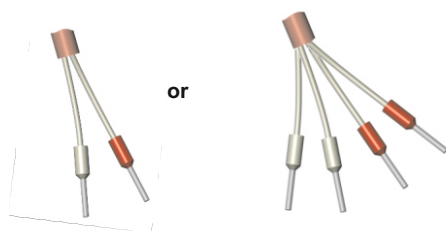
When installing in a ball valve, it's became unnecessary to lighten the systems while mounting and to change a temperature transducer after the recalibration interval has been finished.



Connecting

Connecting with an external device is made with the help of the proper section of a cable and the amount of wires corresponding to the temperature transducer circuit.

Connecting wires tips are pressed out by the cable tips of two colors: white and red. When the circuit is 4-wire, wires with inner connections are depicted in the same color.



Design Exmples

Design	ØD, mm	L _{паб} , mm	Mobile fastening	NSH	Class	Circuit	t _{паб} , °C	Cable, m
ТСП-Н 6.0.19.11.4.3.1/1,5	4	27,5	Fitting M10x1,0	Pt100	B	4-wire	-50...+180	1,5
ТСП-Н 6.0.19.11.4.1.1/1	4	27,5	Fitting M10x1,0	Pt100	B	2-wire	-50...+180	1
ТСП-Н 6.0.19.11.7.1.0/2	4	27,5	Fitting M10x1,0	Pt500	B	2-wire	0...+160	2

If you want to order not mentioned designs you should follow the technical features and ordering diagram of resistive temperature transducers ТСП-Н and КТСП-Н.

Usage

These temperature transducer are intended for temperature measurement of firm, loose, liquid and gaseous media and ensure the functioning of recording devices, systems of control and automatic regulation of different purpose.

The temperature transducer should be used with a protective sleeve.

Construction

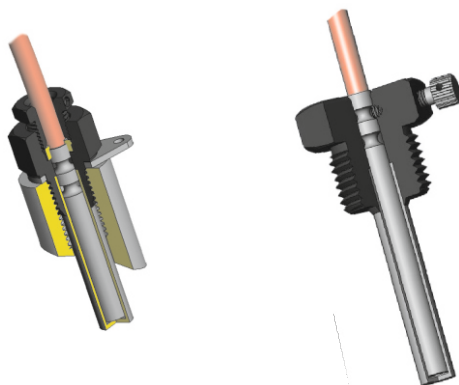
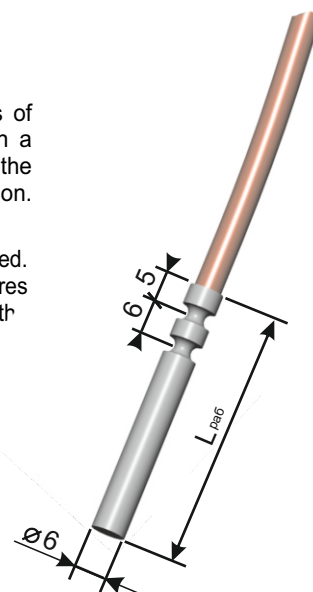
The temperature transducer consists of a sensing element, which is located in a protection tube, and of a cable with the proper amount of wires and proper section.

The isolation of joining wire tips is removed. Dealing with 4-wire circuit, pairs of wires have different length in accordance with the inner connection.

Technical Features

Measuring temperature range, °C	from 0 to plus 160 from minus 50 to plus 180
Mounting part length, mm	45; 60; 80; 100; 120; 160; 200; 250
Wiring diagram (circuit)	2-wire; 4-wire;
Class	A or B (CTB EN 60751), AA
Fastening	Mounting to a protection tube
Protective fitting, mm	Ø6

For measuring temperature range 0-160°C recalibration interval - 4 years;
minus 50-180°C recalibration interval - 2 years.



Installation

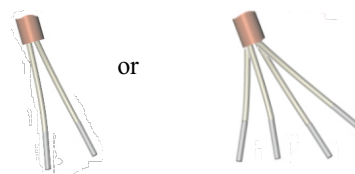
The temperature transducer is mounted to a pipeline with the help of protection sleeve and weldolets.

Protective sleeve GZ5/8-xx-G1/4 and weldolets BP3 are used for mounting of the temperature transducer with length 45 and 60 mm.

Protective sleeve GZ2/8 and weldolets BP1(or BP2) are used for mounting of temperature transducer with length 45 and 60 mm.

Connecting

Connecting with an external device is made with the help of the proper section of a flexible cable and the amount of wires corresponding to the temperature transducer circuit.

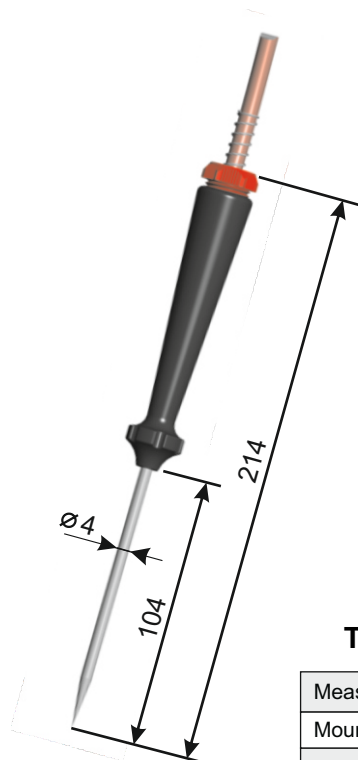


Design Examples

Design	ØD, mm	L _{паб} , mm	Fastening	NSH	Class	Circuit	t _{паб} , °C	Cable, m
ТСП-Н 1.1.21.00.3.3.0/1.5	6	45	In a sleeve	Pt100	A	4-wire	0...+160	1,5
ТСП-Н 1.1.02.00.4.1.1/0.5	6	100	In a sleeve	Pt100	B	2-wire	-50...+180	0.5
ТСП-Н 1.1.00.00.7.1.0/2	6	60	In a sleeve	Pt500	B	2-wire	0...+160	2
ТСП-Н 1.1.01.00.3.2.1/1	6	80	In a sleeve	Pt100	A	3-wire	-50...+180	1
ТСП-Н 1.1.21.00.3.3.1/1	6	45	In a sleeve	Pt100	A	4-wire	-50...+180	1

If you want to order not mentioned design you should follow the technical features and ordering diagrams of the concrete type of the resistive temperature transducer ТСП-Н.

Platinum Resistive Temperature Transducer “Needle”



Usage

The temperature transducer is intended for temperature measurement of loose liquid and soft media in stationary and mobile control systems of different purpose.

Construction

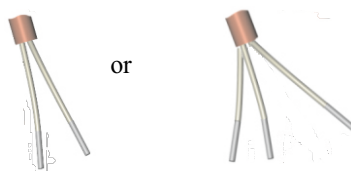
This temperature transducer consists of a sensing element, which is located in a sharp-ended protection tube, an accessible shaft for temperature transducer manipulation and a flexible cable for a connection with an external device.

Technical Features

Measuring temperature range, °C	from minus 50 to plus 180
Mounting part length, mm	100
Wiring diagram (circuit)	2-wire; 3-wire;
Class	B (СТБ EN 60751)
Fastening	-
Protective fitting	Ø4
Recalibration interval, years	2

Connecting

Connecting with an external device is made with the help of the proper section of a flexible cable and the amount of wires.



Design Examples

Design	ØD, mm	L _{раб} , mm	Fastening	NSH	Class	Circuit	t _{раб} , °C
ТСП-Н 8.0.02.00.4.2.1	4	100	In-situ	Pt100	B	3-wire	-50...+180
ТСП-Н 8.0.02.00.4.1.1	4	100	In-situ	Pt100	B	2-wire	-50...+180
ТСП-Н 8.0.02.00.7.2.1	4	100	In-situ	Pt500	B	3-wire	-50...+180
ТСП-Н 8.0.02.00.7.1.1	4	100	In-situ	Pt500	B	2-wire	-50...+180

If you want to order not mentioned designs you should follow the technical features and ordering diagrams of some concrete resistive temperature transducer ТСП-Н.

Resistive Temperature Transducer Type PI-head

Usage

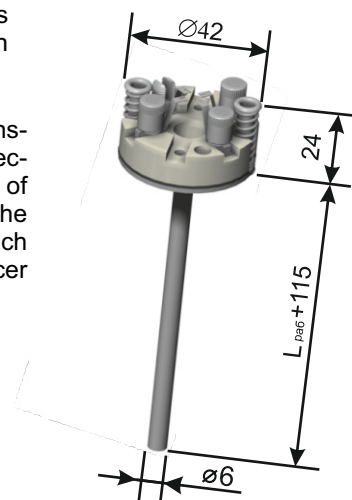
The resistive temperature transducer is intended for temperature measurement of loose, liquid and gaseous media in stationary and mobile control systems of different purpose.

This temperature transducer should be used with a protection sleeve.

Construction

The temperature transducer consists of a sensing element in a protection tube c6 and a terminal block.

Constructively this temperature transducer is intended for usage in a protective sleeve with a hermetic corps of aluminum. fastening is made with the help of spring-loaded screws, which tightly press the temperature transducer to a protective sleeve base.



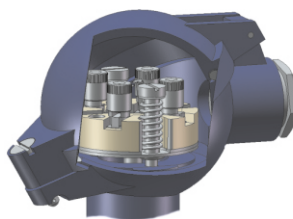
Technical Features

Measuring temperature range, °C	from 0 to plus 160 from minus 50 to plus 180
Mounting part length, mm	160; 200; 250; 320; 400
Wiring diagram (circuit)	2-wire; 4-wire;
Class	A or B (CTB EN 60751), AA
Fastening	Mounting to a protection sleeve
Protective fitting	Ø6

For measuring temperature range 0 - plus 160°C recalibration interval - 4 years;
minus 50 - plus 180°C recalibration interval - 2 years

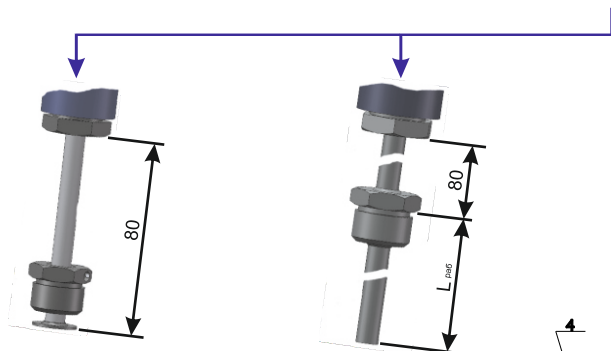
Installation

The temperature transducer is mounted to a pipeline with the help of protective sleeve GZ8-X and weldolets BP1(or BP2) or without it.



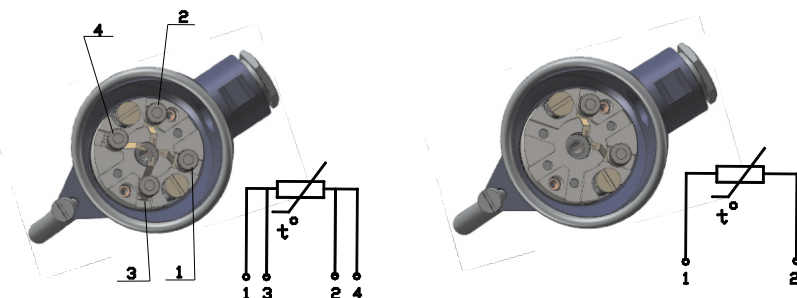
The temperature transducer should be installed in a protective sleeve, then the connection with an external device and covering a lid and fixing it with a screw should be made, creating tight joint.

A leaden seal is fixed through a fixing lid screw and it helps to prevent from an access to the circuit.



Connecting

Connection with an external device is made with the help of the proper section cable with the amount of wires and corresponding to the temperature transducer circuit.



Design Examples

Design	ØD, mm	L _{паб} , mm	Fastening	NSH	Class	Circuit	t _{паб} , °C
ТСП-Н 7.1.04.00.3.3.1	6	160	In-situ	Pt100	A	4-wire	-50...+180
ТСП-Н 7.1.06.00.4.1.1	6	200	In-situ	Pt100	B	2-wire	-50...+180
ТСП-Н 7.1.07.00.6.3.1	6	250	In-situ	Pt500	A	4-wire	-50...+180
ТСП-Н 7.1.08.00.7.1.0	6	320	In-situ	Pt500	B	2-wire	0...+160
ТСП-Н 7.1.09.00.3.3.0	6	400	In-situ	Pt100	A	4-wire	0...+160

If you want to order not mentioned design you should follow the technical features and ordering diagrams of the concrete type of the resistive temperature transducer ТСП-Н.

Usage

The sets are intended for measurement of temperature and temperature difference of heat carrier in systems of control and automatic regulations in power engineering and heating systems.

The sets are produced according to TY of RB 300044107.008-2002 in accordance with CTE EN 60751 and CTE EN 1434 as recited in claims on a resistive temperature transducer.

Selection of the Temperature Transducers

The sets should be selected at the automation-equipped working places according to the methods worked out at the enterprise, which have been metrologically certified and were introduced into production in 2000.

To select a correct set one should calculate the errors of the effective range temperatures and temperature difference using the primary calibration results of measurement in three calibration points.

The KTCP-H resistive temperature transducer sets consist of the platinum resistive temperature transducers TСП-H adjusted to each other by the identity of individual statistic features and the level of absolute error minimization during the measurement of temperature differences within the entire measuring range.

Maximum permissible relative error of measuring temperature difference:

$$\text{Class 1: } \pm(0,25 + \frac{1,5\Delta t_{\min}}{\Delta t})$$

$$\text{Class 2: } \pm(0,5 + \frac{3\Delta t_{\min}}{\Delta t})$$

The usage of the selection method in three calibration points is stipulated by getting the real information about absolute error distribution of all measuring range when temperature measuring difference has different values.

This method allows finding out error output value of the set more accurately in comparison with the selection method in two calibration points (picture1).

The refuse to use zero-point and steam thermostats with temperature pattern dissimilarity no more than 0,005 makes it possible to select temperature transducers in sets with high accuracy and minimal measuring temperature difference by the means of calibration with metrological reservoir of accuracy to MOZM R75 recommendations.

Measuring Temperature Difference

The KTCP-H sets are used to measure temperature difference within the range from 2(3)°C to 150°C.

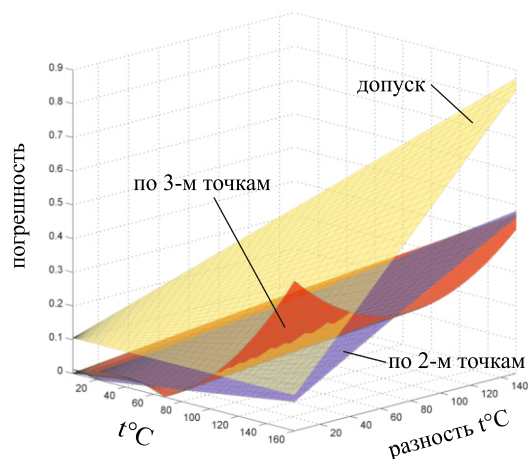
Measuring Temperature Range

The KTCP-H sets are used to measure temperature ranging from 0°C to 160°C.

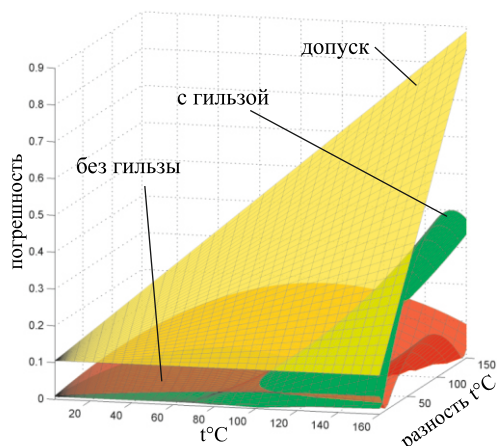
List of Equipment

The KTCP-H sets mounted to the protective sleeve are stocked with weldolets and sleeves ensuring minimal influence on the set measurement error (picture 2).

The protective sleeves influence on measuring temperature difference results is always controlled.



Picture 1. The Set Error out of the Accepted Values



Picture 2. The Protection Sleeve Influence on the Set Error.

Certificates

The KTCP-H sets are produced acc. to TY ПБ 300044107.008-2002.

The sets have been certificated and have current certificates:

Belarus - certificate №5122

(State Registers of Measuring Means № ПБ 03 10 1762 08)

Russia - certificate №33052

(State Registers of Measuring Means № 38878-08)

Kazakhstan - certificate № 4785 (State Registers of Measuring Means № KZ.02.03.02620-2008/ПБ 03 10 1762 08)

RECALIBRATION INTERVAL IS 4 YEARS

Diagram Symbols of Resistive Temperature Transducers Set KTCP-H

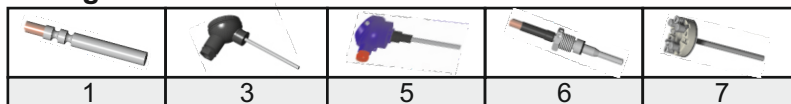
KTCP-H

a	b	c	d	e	f	g
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 /

h

a – Design



b – Mounting Part Diameter

Ø4 mm	Ø6 mm	Ø8 mm	Ø10 mm	Ø3 mm	Ø5 mm	Ø7 mm
0	1	2	3	4	5	6

c – Mounting Part Length

27,5 mm	50 mm	60 mm	80 mm	100 mm	120 mm	160 mm	200 mm	250 mm	45 mm
00	01	02	03	04	05	06	07	08	09

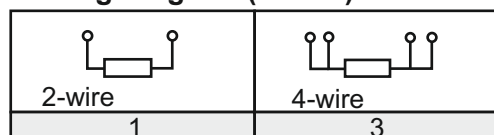
d – Fastening

In-situ	Mobile Fitting			Nut			Fixed Fitting		
00	11	01	02	12	06	07	13	14	15

e – NSH (the unique sensor curve) and tolerance class

Out of Class	Pt 100		Pt 500		Pt 1000		100П	
	A	B	A	B	A	B	A	B
12	3	4	6	7	9	10	21	22

f – Wiring Diagram (circuit)



g – Lower Value of a Measuring Temperature Range and Tolerance Class

2 °C	3 °C	2 °C	3 °C
2	3	22	32
Class 2		Class 1	

h – Cable Length (it's mentioned for designs 1,6)

It should be mentioned when you make order

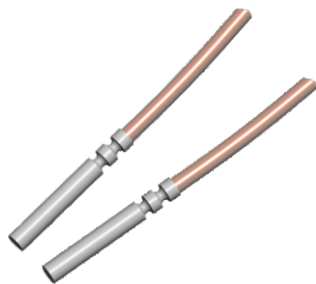
Example of Ordering

Notes : KTCP-H 5.0.03.00.3.3.3



- Design 5
- Mounting part diameter 4 mm
- Mounting part length 80 mm
- Fastening in-situ
- Pt 100 A
- 4-wire circuit
- Temperature difference 3°C

Resistive Temperature Transducer Set Type PL-cable



Usage

The set is intended for measurement of temperature and temperature difference in systems of control and automatic regulation of heat quantity.

The temperature transducer from the set should be used with protective sleeves.

Description

The set is selected in accordance with method MP VT 047-2002 in three points of the resistive temperature transducer ТСП-Н.

The temperature transducer mounting to a delivery pipeline is signed by letter "Г", mounting to a return pipeline by letter "Х".

Installation

The temperature transducer is mounted to a pipeline with the help of protective sleeve of design 5 and weldolets БПЗ - G 1/4.

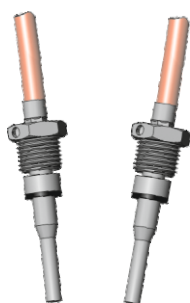
Measuring temperature range, °C	from 0 to plus 160
Mounting part length, mm	45; 60; 80; 100; 120; 160; 200; 250
Wiring diagram (circuit)	2-wire; 4-wire;
Class	A or B (СТБ EN 60751)
Fastening	Mounting to a protection sleeve
Protective fitting, mm	Ø6

Design Examples

Design	ØD, mm	L _{пaб} , mm	Fastening	NSH	Class	Circuit	Δt, °C	Cable, m
КТСП-Н 1.1.09.00.3.3/1	6	45	in a sleeve	Pt100	A	4-wire	3...150	1
КТСП-Н 1.1.09.00.4.1.3/2	6	45	In a sleeve	Pt100	B	2-wire	3...150	2
КТСП-Н 1.1.00.00.7.1.3/2	6	60	In a sleeve	Pt500	B	2-wire	3...150	2
КТСП-Н 1.1.01.00.4.3.3/2	6	80	In a sleeve	Pt100	B	4-wire	3...150	2
КТСП-Н 1.1.04.00.4.1.3/3	6	100	In a sleeve	Pt100	B	2-wire	3...150	3

If you want to order not mentioned design you should follow technical features and ordering diagrams of the КТСП-Н set.

Resistive Temperature Transducer Set Type DS-cable



Usage

The set is intended for measurement of temperature and temperature difference in systems of control and automatic regulation of heat quantity.

The set is used for an installation at pipelines to the point of DN 25.

Description

The set is selected according to the method MP VT 047-2002 in three points of the resistive temperature transducer ТСП-Н.

The temperature transducer mounted to a delivery pipeline is signed by letter "Г", and mounted to a return pipeline by letter "Х".

Installation

They are installed immediately in valves, T-couplers, etc. through a transitive nut.

When they are installed immediately in a ball valve, it's became unnecessary to lighten the systems while mounting and to change a temperature transducer after the recalibration interval has been finished.

Measuring temperature range, °C	from 0 to plus 160
Mounting part length, mm	27,5
Wiring diagram (circuit)	2-wire; 4-wire;
Class	B (СТБ EN 60751)
Fastening	Mounting to a protection sleeve
Protective fitting, mm	Ø3,7

Design Examples

Design	ØD, mm	L _{пaб} , mm	Mobile fastening	NSH	Class	Circuit	Δt, °C	Cable, m
КТСП-Н 6.0.00.11.4.1.3/1.5	4	27,5	Fitting M10x1,0	Pt100	B	2-wire	3...150	1,5
КТСП-Н 6.0.00.11.7.1.3/1	4	27,5	Fitting M10x1,0	Pt500	B	2-wire	3...150	1

If you want to order not mentioned design you should follow the technical features and ordering diagram of the КТСП-Н set.

Resistive Temperature Transducer Set Type PI-head

Usage

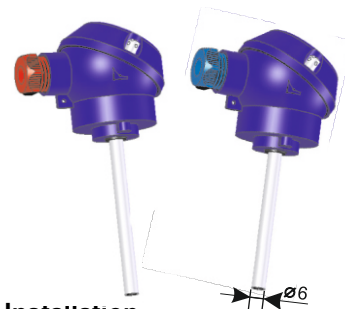
The set is intended for measurement of temperature and temperature difference in systems of control and automatic regulation of heat quantity.

The temperature transducers from the set should be used with protective sleeves.

Description

The set is selected according to the method MP VT 047-2002 in three points of the resistive temperature transducer ТСП-Н.

The temperature transducer installed at a delivery pipeline is signed by a red screw of a gland entry and installed at a return pipeline by a blue screw.



Installation

The temperature transducer is mounted to a pipeline with the help of protective sleeves of design 2 and weldolets БП1 (or БП2).

The cable is connected with the circuit through a terminal block with the help of nuts and pucks.

Measuring temperature range, °C	from 0 to plus 160
Mounting part length, mm	60; 80; 100; 120; 160; 200; 250
Wiring diagram (circuit)	2-wire; 4-wire;
Class	A or B (СТБ EN 60751)
Fastening	Mounting to a sleeve
Protective fitting, mm	Ø6

Design Examples

Design	ØD, mm	L _{паб} , mm	Fastening	NSH	Class	Circuit	Δt, °C
КТСП-Н 5.1.02.00.3.3.3	6	60	In a sleeve	Pt100	A	4-wire	3...150
КТСП-Н 5.1.03.00.4.1.2	6	80	In a sleeve	Pt100	B	2-wire	2...150
КТСП-Н 5.1.04.00.3.3.3	6	100	In a sleeve	Pt100	A	4-wire	3...150
КТСП-Н 5.1.04.00.7.1.2	6	100	In a sleeve	Pt500	B	2-wire	2...150
КТСП-Н 5.1.05.00.6.1.3	6	120	In a sleeve	Pt500	A	2-wire	3...150

If you want to order not mentioned variant you should follow the technical features and ordering diagram of the КТСП-Н set.

Usage

The set is intended for measurement of temperature and temperature difference in systems of control and automatic regulation of heat quantity, including systems which take into account all the dynamic elements of a metering error.

The temperature transducers from the set should be used with protective sleeves.

Description

The set is selected in accordance with method MP VT 047-2002 in three points of the resistive temperature transducer ТСП-Н.

The temperature transducer installed at a delivery pipeline is signed by a red screw of a gland entry and installed at a return pipeline by a blue screw.



Installation

The temperature transducer is mounted to a pipeline with the help of protective sleeves of design 2 and weldolets БП1 (or БП2).

The cable is connected with the circuit through a terminal block with the help of nuts and pucks.

Measuring temperature range, °C	from 0 to plus 160
Mounting part length, mm	60; 80; 100; 120; 160; 200; 250
Wiring diagram (circuit)	2-wire; 4-wire;
Class	A or B (СТБ EN 60751)
Thermal response time, no more than s	6
Fastening	Mounting to a sleeve
Protective fitting, mm	Ø4

Design Examples

Design	ØD, mm	L _{паб} , mm	Fastening	NSH	Class	Circuit	Δt, C
КТСП-Н 5.0.02.00.3.3.3	4	60	In a sleeve	Pt100	A	4-wire	3...150
КТСП-Н 5.0.03.00.4.3.2	4	80	In a sleeve	Pt100	B	4-wire	2...150
КТСП-Н 5.0.04.00.7.3.3	4	100	In a sleeve	Pt500	B	4-wire	3...150
КТСП-Н 5.0.05.00.6.1.2	4	120	In a sleeve	Pt500	A	2-wire	2...150

If you want to order not mentioned variant you should follow the technical features and ordering diagram of the КТСП-Н set.

Resistive Temperature Transducer Set Type DL-head

Usage

The set is intended for measurement of temperature and temperature difference in systems of control and automatic regulation of heat quantity.

The temperature transducers from the set should be used with protective sleeves or without them depending on a design.

Description

The set is selected in accordance with method MP VT 047-2002 in three points of the resistive temperature transducer ТСП-Н.

The temperature transducer mounting to a delivery pipeline is signed by letter "Г" and mounting to a return pipeline by letter "Х".

Installation

The temperature transducer is mounted to a pipeline with the help of protective sleeves and the weldolets or immediately with the help of the appropriate fastening elements of the temperature transducer itself.

Fastening Elements Design

Installation in a Protective Sleeve

It's recommended to mount the temperature transducers with the help of protective sleeves of design 2 and weldolets БП 1 (or БП 2).

Mobile Fitting

It's recommended to mount the temperature transducers with the help of a mobile fitting to a pipeline with the help of protective sleeves of design 1 and weldolets БП 1 (БП 2) or with the help of protective sleeves of design 4 for immediate mounting to a pipeline.

The temperature transducers with a mobile nut and fixed fitting are intended for immediate mounting to a pipeline with a client'

Mobile Nut

Fixed Fitting

Design Examples

Design	ØD, mm	L _{паб} , mm	Fastening	NSH	Class	Circuit	Δt, °C
КТСП-Н 3.1.02.02.3.3.3	6	60	Mobile fitting M20x1,5	Pt100	A	4-wire	3...150
КТСП-Н 3.1.03.00.4.1.3	6	80	In a protection sleeve	Pt100	B	2-wire	3...150
КТСП-Н 3.2.04.07.7.1.2	8	100	Mobile nut M20x1,5	Pt500	B	2-wire	2...150
КТСП-Н 3.2.05.15.3.3.3	8	120	Fixed fitting M20x1,5	Pt100	A	4-wire	3...150
КТСП-Н 3.2.06.00.6.3.3	8	160	In a protection sleeve	Pt500	A	4-wire	3...150

If you want to order not mentioned variant, you should follow the technical features and ordering diagram of the КТСП-Н set.

Resistive Temperature Transducer Set Type PL-head

Usage

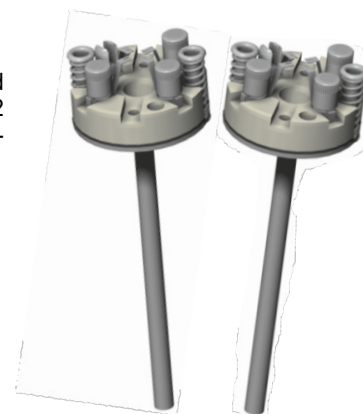
This resistive temperature transducer set is intended for temperature measurement of loose, liquid, gaseous media in stationary and mobile control systems of different purpose.

The temperature transducer set should be used with a protective sleeve.

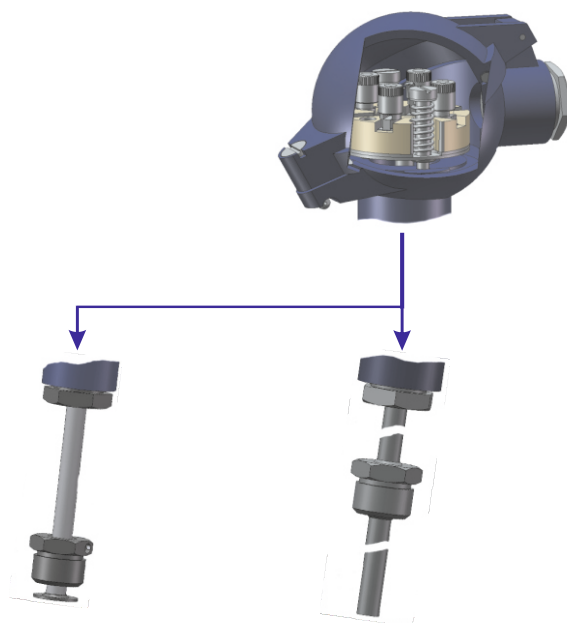
Description

The temperature transducer is selected according to method MP VT 047-2002 in three points of the resistive temperature transducer ТСП-Н.

The temperature transducer mounting to a delivery pipeline is signed by letter "Г" and mounting to a return pipeline by letter "Х".



Measuring temperature range, °C	from 0 to plus 160
Mounting part length, mm	160; 200; 250; 320; 400
Wiring diagram (circuit)	2-wire; 4-wire;
Class	A or B (CT5 EN 60751)
Fastening	Mounting to a protection sleeve
Protective fitting, mm	Ø6



Installation

The temperature transducer is mounted to a pipeline with the help of protection sleeve Г38 and weldolet БП1 (or БП2) or without it.

The temperature transducer should be installed in a protective sleeve, then the connection with an external device and covering a lid and fixing it with the help of a screw should be made, creating tight joint.

The leaden seal is fixed through a fixing lid screw and that helps to prevent from an access to the circuit.

Design Examples

Design	ØD, mm	L _{паб} , mm	Fastening	NSH	Class	Circuit	Δt, °C
КТСП-Н 7.1.06.00.3.3.3	6	160	In a sleeve	Pt100	A	4-wire	3...150
КТСП-Н 7.1.07.00.4.1.3	6	200	In a sleeve	Pt100	B	2-wire	3...150
КТСП-Н 7.1.08.00.6.3.2	6	250	In a sleeve	Pt500	A	4-wire	2...150
КТСП-Н 7.1.07.00.7.1.2	6	200	In a sleeve	Pt500	B	2-wire	2...150
КТСП-Н 7.1.06.00.3.3.3	6	160	In a sleeve	Pt100	A	4-wire	3...150

If you want to order not mentioned variant you should follow the technical features and ordering diagram of this КТСП-Н set.

Usage

This temperature transducer is applied for control and temperature measurement of liquid, firm, loose and gaseous media.

Fields of usage: ensure the functioning of recording devices, systems of control and automatic regulation in industry, laboratory researches, agriculture, etc.

Stability to influences

These temperature transducers correspond to climatic design group - UHL, according to GOST 15150.

The temperature transducer are stable and firm to the influence of vibration and correspond to design group N2 (acc. to GOST 12997). They are situated in areas that are damaged by the vibration from working mechanisms of industrial objects.

Protection degree - IP55 due to GOST 12254 (it's dust-proof and protected from water jets.)

Methrological Features

These temperature transducers have standardized statistic features (NSH - the unique sensor curve) Cu10, Cu50, Cu100.

NSH, temperature coefficient resistive temperature transducer, $\alpha, ^\circ\text{C}^{-1}$ correspond to values: 0,00428.

Accuracy Classes

Acceptable tolerance limits depending to the class correspond to:

-for class B: $\pm(0,3+0,005 \cdot |t|)$

-for class C: $\pm(0,6+0,01 \cdot |t|)$

The temperature transducer regulated parameters and their stability during a long service life are achieved by a correct installation, usage of protective sleeves and component parts produced only by the manufacturer.

Dependence of the resistance values Cu100 of the Temperature (acc. to GOST 6651)

$\alpha=0,004280$	
$^\circ\text{C}$	Ω
-50	78,45
-45	80,62
-40	82,78
-35	84,94
-30	87,10
-25	89,26
-20	91,41
-15	93,56
-10	95,71
-5	97,86
0	100,00
5	102,14
10	104,28
15	106,42
20	108,56
25	110,69
30	112,83
35	114,97
40	117,11
45	119,25
50	121,39
55	123,53
60	125,67
65	127,80
70	129,94
75	132,08
80	134,22
85	136,36
90	138,50
95	140,64
100	142,78
105	144,91
110	147,05
115	149,19
120	151,33
125	153,47
130	155,61
135	157,75
140	159,89
145	162,02
150	164,16
155	166,30
160	168,44

The values are given without taking into consideration a cable resistance of the resistive temperature transducer with a wire always switched on.

Certificates

These resistive temperature transducers are produced acc. to TY P5 300044107.002-2001.

All the temperature transducers have been certified and have now current certificates:

Belarus - certificate №8924 (State Registers of the Measuring Means № P5 03 10 0288 14)

OTHER VERSIONS CAN BE SUPPLIED ON YOUR REQUEST

Diagram Symbols of Resistive Temperature Transducers TCM-H

TCM-H

a	b	c	d	e	f	g
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 /

h

a — Design



b — Mounting Part Diameter

Ø4 mm	Ø6 mm	Ø8 mm	Ø10 mm	Ø12 mm	Ø16 mm
0	1	2	3	4	5

c — Mounting Part Length

50 mm	80 mm	100 mm	120 mm	160 mm	180 mm	200 mm	250 mm	320 mm	400 mm
00	01	02	03	04	05	06	07	08	09

500 mm	630 mm	800 mm	1000 mm	1250 mm	1600 mm	2000 mm	2500 mm	3150 mm	60 mm
10	11	12	13	14	15	16	17	18	19

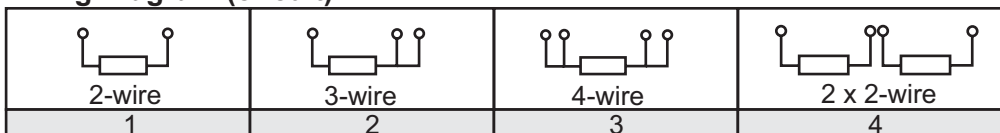
d — Fastening

In-situ	Mobile Fitting		Nut		Fixed Fitting	
	M16x1,5	M20x1,5	M16x1,5	M20x1,5	M16x1,5	M20x1,5
00	01	02	06	07	11	12

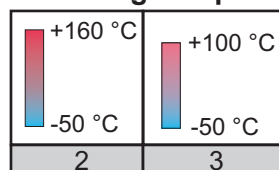
e — NSH and tolerance class

$\alpha=0,00428$			
B		C	
Cu50	Cu100	Cu50	Cu100
7	8	10	11

f — Wiring Diagram (circuit)



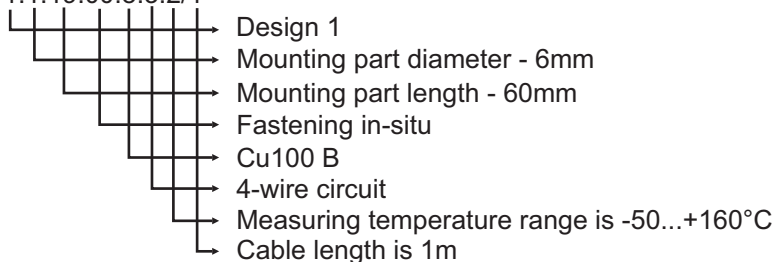
g — Measuring Temperature Range



h — Cable Length (it's mentioned for designs 1,8)

It should be mentioned when you make order

Example of Orderig Notes: TCM-H 1.1.19.00.8.3.2/1





Usage

This temperature transducer is applied for outside air temperature measurement in systems of control and automatic regulation of different purpose.

The temperature transducer is calibrated in accordance with GOST 8.461.

Construction

The temperature transducer represents a phenoplastic casing with an unscrewing lid, a protection tube of stainless steel and a gland entry for a cable. A sensing element is settled in a protection sleeve.

An electrical connection of a sensing element with screws for an external cable connection is made corresponding to 2-wire or 3-wire circuit.

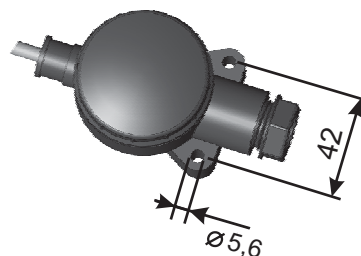
Installation

The construction of a temperature transducer casing makes it possible to mount it immediately to the wall or other surface with the help of screws, woodscrews and other fastening meanings.

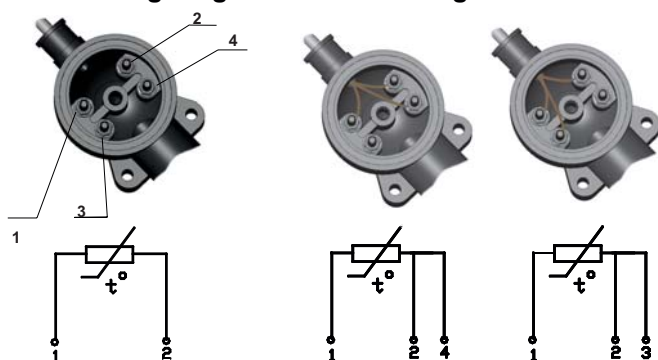
The leaden seal is fixed through a lid opening.

Technical Features

NSH (the unique sensor curve)	Cu10; Cu50; Cu100
Measuring temperature range, °C	minus 50 plus 100 minus 50 plus 160
α , °C-1	0,00428
Mounting part length, mm	60; 80
Wiring diagram (circuit)	2-wire; 3-wire
Class	B or C
Thermal response time, no more than s	60
Fastening	in-situ
Protective fitting, mm	Ø6; Ø8
Recalibration interval, years	2



Connecting Diagram of the Sensing Elements



Connecting

Connecting with external devices is made with the help of the appropriate section cable and the amount of wires recommended in the circuit.

The cable connects to the circuit with the help of screws and nuts.

Design Examples

Design	ØD, mm	L _{pa6} , mm	Fastening	NSH	Class	α , °C-1	Circuit	t _{pa6} , °C
TCM-H 2.1.19.00.8.1.2	6	60	in-situ	Cu100	B	0,00428	2-wire	-50...+160
TCM-H 2.1.01.00.10.2.2	6	80	in-situ	Cu50	C	0,00428	3-wire	-50...+160
TCM-H 2.2.01.00.7.1.3	8	80	in-situ	Cu50	B	0,00428	2-wire	-50...+100
TCM-H 2.2.19.00.11.2.3	8	60	in-situ	Cu'100	C	0,00428	3-wire	-50...+100
TCM-H 2.2.01.00.8.1.2	8	80	in-situ	Cu'100	B	0,00428	2-wire	-50...+160

If you want to order not mentioned design you should follow the technical features and ordering diagram of the resistive temperature transducer TCM-П

Copper Resistive Temperature Transducer Type DL-head

Usage

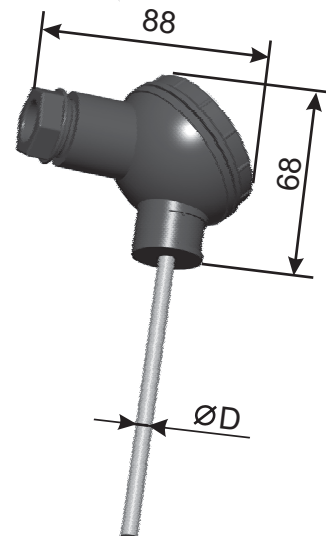
This copper resistive temperature transducer is applied for temperature measurement in systems of control and automatic regulation of different purpose.

The temperature transducer is calibrated according to GOST 8.461.

Construction

The temperature transducer represents a phenoplastic casing with an unscrewing lid, a protection tube of stainless steel and a gland entry for a cable. A sensing element is settled in a protection sleeve.

An electrical connection of a sensing element with screws for an external cable connection is made corresponding to 2-, 3- and 4-wire circuit.



Technical Features

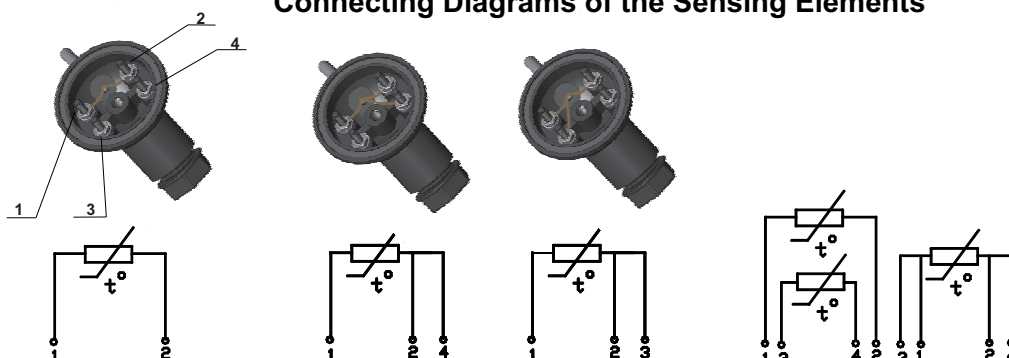
NSH (the unique sensor curve)	Cu10; Cu50; Cu100
Measuring temperature range, °C	minus 50 plus 100 minus 50 plus 160
α , °C ⁻¹	0,00428
Mounting part length, mm	60; 80; 100; 120; 160; 200; 250...3150
Wiring diagram (circuit)	2-wire; 3-wire 4-wire; 2-x 2-wire
Class	B or C
Thermal response time, no more than s	60
Fastening	Mounting to a protection sleeve
Protective fitting, mm	Ø6; Ø8
Recalibration interval, years	2

Connecting

A connection with external devices is made with the help of the appropriate section cable and the amount of wires recommended in the circuit.

The cable connects to the circuit with the help of screws and nuts.

Connecting Diagrams of the Sensing Elements



Copper Resistive Temperature Transducer Type DL-head

Installation

This temperature transducer is mounted to a pipeline with the help of protective sleeve and weldolets or immediately with the help of appropriate fastening elements of temperature transducer dependently on fastening elements design.

The leaden seal is fixed through a lid opening, or through a seal opening in a fitting.

Design Examples of Fastening Elements

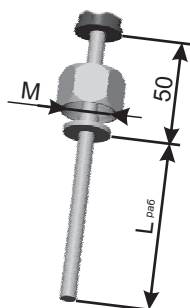
Mounting to a Protection Sleeve

It's recommended mounting this temperature transducer without installation elements to a pipeline with the help of protection sleeve of design 2 and with the help of weldolet БП 1 or БП 2.

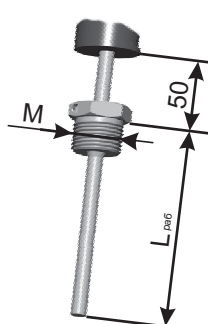
Mobile Fitting

It's recommended mounting the temperature transducer with a mobile fitting to a pipeline with the help of protection sleeve of design 1 and weldolet БП1 (БП2) or also with the help of protection sleeve of design 4 for immediate installation at a pipeline.

Mobile Nut



Fixed Fitting



The temperature transducers with a mobile nut and fixed fitting are applied for immediate mounting to a pipeline with a client's fastening element.

Design examples

Design	ØD, mm	L _{па6} , mm	Fastening	NSH	Class	α, °C-1	Circuit	t _{па6} , °C
TCM-H 3.1.19.02.8.2.0	6	60	Mobile fitting M20x1,5	Cu100	B	0,00428	3-wire	-50...+160
TCM-H 3.1.01.00.7.2.1	6	80	In a sleeve	Cu50	B	0,00428	3-wire	-50...+160
TCM-H 3.2.02.07.10.1.0	8	100	Mobile nut M20x1,5	Cu50	C	0,00428	2-wire	-50...+100
TCM-H 3.2.03.12.11.1.1	8	120	Fixed fitting M20x1,5	Cu'100	C	0,00428	2-wire	-50...+160
TCM-H 3.2.04.00.8.3.1	8	160	In a sleeve	Cu'100	B	0,00428	4-wire	-50...+100

If you want to order not mentioned variant of design you should follow the technical features and ordering diagram of the resistive temperature transducer TCM-H.

Copper Resistive Temperature Transducer Type PL-cable

Usage

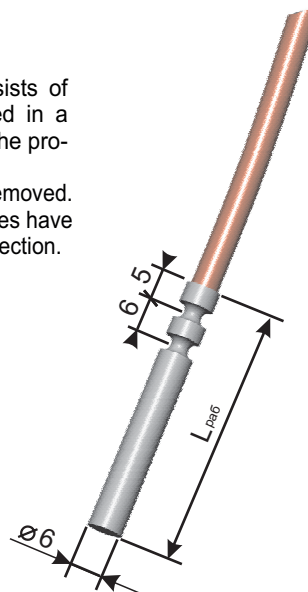
These temperature transducers are intended for temperature measurement of firm, loose, liquid and gaseous media and ensure the functioning of recording devices, systems of control and automatic regulation of different purpose. The temperature transducer is calibrated acc. to GOST 8.461.

The temperature transducer should be used with a protection sleeve.

Construction

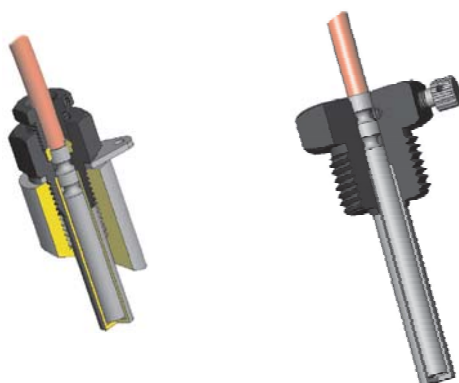
The temperature transducer consists of a sensing element, which is located in a protection tube, and of a cable with the proper section and amount of wires.

The isolation of joining wire tips is removed. Dealing with 4-wire circuit, pairs of wires have different length in acc. with inner connection.



Technical Features

NSH (the unique sensor curve)	Cu10; Cu50; Cu100
Measuring temperature range, °C	minus 50 plus 100 minus 50 plus 160
$\alpha, ^\circ\text{C}^{-1}$	0,00428
Mounting part length, mm	45; 60; 80; 100; 120
Wiring diagram (circuit)	2-wire; 4-wire; 3-wire;
Class	B or C
Thermal response time, no more than s	60
Fastening	Mounting to a protection sleeve
Protective fitting, mm	Ø6
Recalibration interval, years	2



Installation

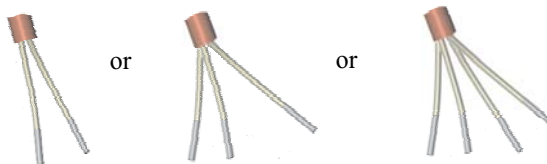
The resistive temperature transducer is mounted to a pipeline with the help of protection sleeves and weldolets.

If the length of a temperature transducer is from 60 to 250 mm it's better to use for mounting protection sleeve of design 2 and weldolet БП1 (or БП2).

The leaden seal is fixed through a sleeve screw.

Connecting

A connecting with external devices is made with the help of the proper section of a flexible cable and the amount of wires corresponding to the temperature transducer circuit.

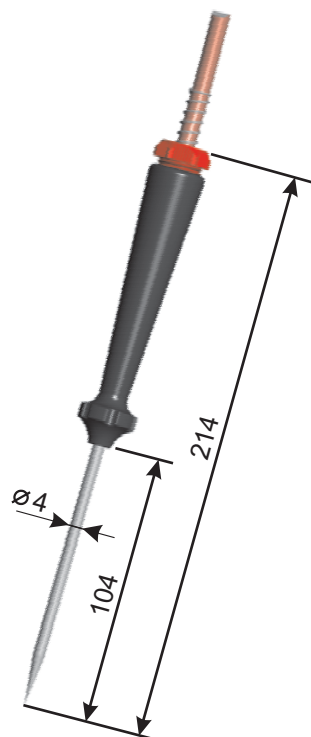


Design Example

Design	ØD, mm	L _{раб} , mm	Fastening	NSH	Class	$\alpha, ^\circ\text{C}^{-1}$	Circuit	t _{раб} , °C	Кабель, м
TCM-H 1.1.19.00.8.3.2/1.5	6	60	In a sleeve	Cu10	B	0,00428	4-wire	-50...+160	1,5
TCM-H 1.1.02.00.7.1.2/2	6	100	In a sleeve	Cu50	B	0,00428	2-wire	-50...+160	2
TCM-H 1.1.19.00.10.3.3/1	6	60	In a sleeve	Cu'50	C	0,00428	4-wire	-50...+100	1
TCM-H 1.1.01.00.2.1.3/2	6	80	In a sleeve	Cu100	B	0,00428	2-wire	-50...+100	2
TCM-H 1.1.03.00.11.3.2/3	6	120	In a sleeve	Cu'100	C	0,00428	4-wire	-50...+160	3

If you want to order not mentioned design you should follow the technical features and ordering diagrams of the resistive temperature transducer TCM-H.

Copper Resistive Temperature Transducer "Needle"



Usage

This temperature transducer is intended for temperature measurement of loose, liquid and soft media in stationary and mobile control systems of different purpose.

The resistive temperature transducer is calibrated acc. to GOST 8.461.

Construction

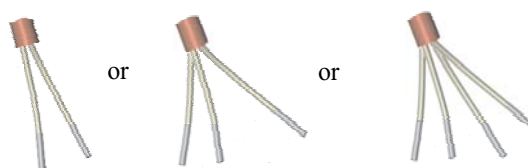
This temperature transducer consists of a sensing element, which is located in a sharp-ended protection tube, an accessible shaft for temperature transducer manipulation and flexible cable for a connection with an external device.

Technical Features

NSH (the unique sensor curve)	Cu10; Cu50; Cu100
Measuring temperature range, °C	minus 50 plus 100 minus 50 plus 160
α , °C-1	0,00428
Mounting part length, mm	100
Wiring diagram (circuit)	2-wire; 3-wire; 4-wire
Class	B or C
Thermal response time, no more than s	60
Fastening	Mounting to a pipeline
Protective fitting, mm	Ø4
Recalibration interval, years	2

Connecting

A connecting with external devices is made with the help of the proper section of a flexible cable and proper amount of wires.



Design Variants

Design	ØD, mm	L _{паб} , mm	NSH	α , °C-1	Class	Circuit	t _{паб} , °C
TCM-H 8.0.02.00.10.2.2	4	100	Cu50	0,00428	C	3-wire	-50...+160
TCM-H 8.0.02.00.11.3.3	4	100	Cu10	0,00428	C	4-wire	-50...+100
TCM-H 8.0.02.00.7.1.2	4	100	Cu50	0,00428	B	2-wire	-50...+160
TCM-H 8.0.02.00.10.3.2	4	100	Cu'50	0,00428	C	4-wire	-50...+160
TCM-H 8.0.02.00.8.1.3	4	100	Cu'100	0,00428	B	2-wire	-50...+100
TCM-H 8.0.02.00.11.3.2	4	100	Cu'100	0,00428	C	4-wire	-50...+160

If you want to order not mentioned design variant you should follow the technical features and ordering diagrams of the resistive temperature transducer TCM-H.

Description



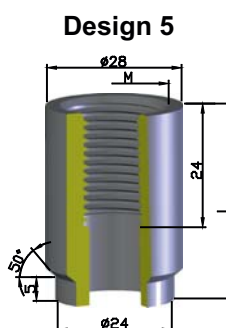
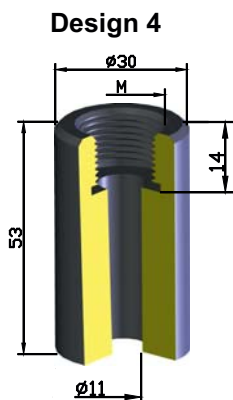
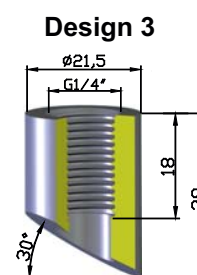
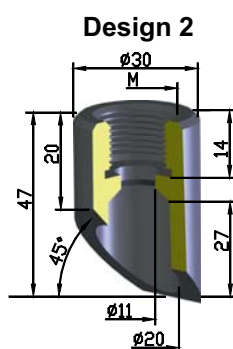
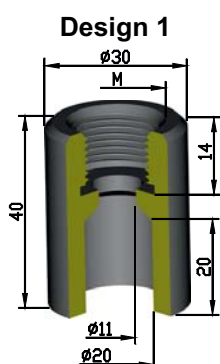
№ РОСС BY.AB24.H05729

The products are intended for mounting resistive temperature transducers for temperature measurement. The device is also used to mount sampling devices and shutoff valves of impulse lines used in technological processes automation systems applied in industry.

Application

The weldolets are intended for usage in conditions of the UHL (areas with frigid and moderate climate) in the second type of atmosphere acc. to GOST 15150. Weldolets connect with a pipeline with the help of mounting. It could have any operative location.

The service life of these products is no less than 6 years.



Size Variants

Thread variants	Metric M20x1,5
	Inch G1/2"
Length L, mm	35; 40; 50
Material	Art.3 GOST 380-71

Design Examples of the Weldolets

Notes	Design	Thread	Length, mm
БП 1- M20x1,5	1	M20x1,5	-
БП 1 - G1/2"	1	G1/2"	-
БП 2 - M20x1,5	2	M20x1,5	-
БП 2 - G1/2"	2	G1/2"	-
БП 3 - G1/4"	3	G1/4"	-
БП 4 - M20x1,5	4	M20x1,5	-
БП 4- G1/2"	4	G1/2"	-

Notes	Design	Thread	Length, mm
БП 5 - M20x1,5 - 35	5	M20x1,5	35
БП 5 - M20x1,5 - 40	5	M20x1,5	40
БП 5 - M20x1,5 - 50	5	M20x1,5	50
БП 5 - G1/2" - 35	5	G1/2"	35
БП 5 - G1/2" - 40	5	M20x1,5	40
БП 5 - G1/2" - 50	5	G1/2"	50

Description

The sleeves represent a fitting of steel 20x13 and a welded tube and a plug of steel 12x18H10T.

The article ensures temperature measurement ranging from - 50°C to + 180°C with maximum operating pressure of process medium 1,6 MPa for general designs (2,5 MPa for reinforced designs), with no impairment of the thermal element accuracy class.

Application

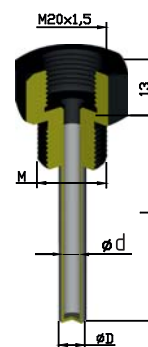
The product is intended for operation as part of a resistive temperature transducer. It's applied to protect a sensor from direct contact with the medium subject to measuring and to mount the thermal element to a pipeline.



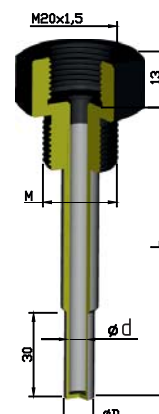
№ РОСС BY.AB24.H05730

Example of Ordering Notes

$\Gamma 3$ 3/4 -160 -G1/2"-4
 $\Gamma 3$ - protective sleeve;
 3 - example of design;
 4 - tube diameter ($\varnothing d$, mm);
 160 - mounting part of temperature transducer length (L, mm);
 G1/2 - process connection (connecting thread);
 4 - design picture;



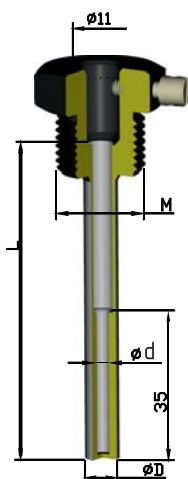
Picture 1



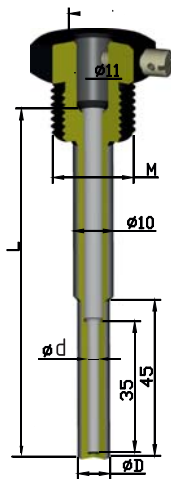
Picture 2

Design 1

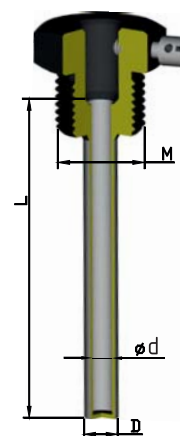
Note	Design	$\varnothing D$, mm	$\varnothing d$, mm	Length L, mm	Thread	Picture	Appendix
$\Gamma 3$ 1/x-xxx-M20x1,5	1	8; 10	6; 8	60; 80; 100; 120	M20x1,5	1	
$\Gamma 3$ 1/x-xxx-M20x1,5	1	8; 10	6; 8	160; 200; 250	M20x1,5	2	intensified



Picture 3



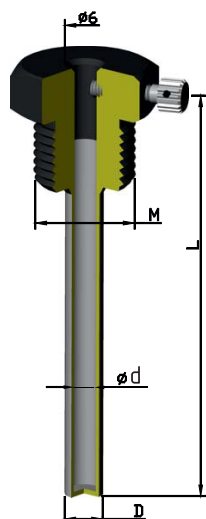
Picture 4



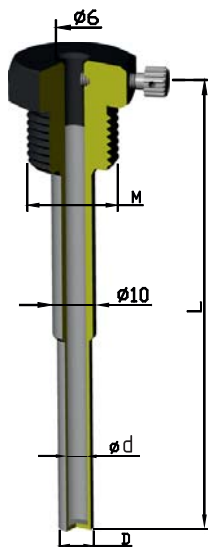
Picture 5

Design 3

Notes	Design	$\varnothing D$, mm	$\varnothing d$, mm	Length L, mm	Thread	Picture	Appendix
$\Gamma 3$ 3/4-xxx-G1/2"	3	8	4	60; 80; 100; 120	G1/2"	3	
$\Gamma 3$ 3/4-xxx-G1/2"	3	8	4	160; 200; 250	G1/2"	4	intensified
$\Gamma 3$ 3/6-xxx-G1/2"	3	8	6	60; 80; 100; 120	G1/2"	5	



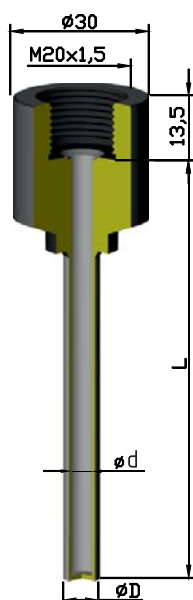
Picture 6



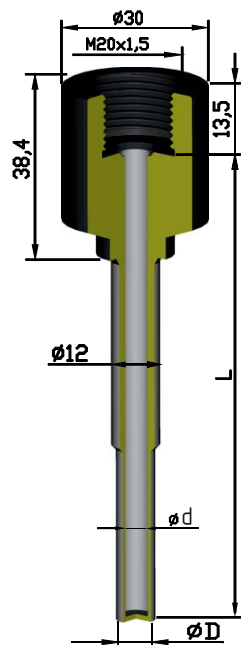
Picture 7

Design 2

Notes	Design	ϕD , mm	ϕd , mm	Length L, mm	Thread	Picture	Appendix
ГЗ 2/х-xxx-G1/2"	2	8	6	60; 80; 100; 120	G1/2"	6	
ГЗ 2/х-xxx-M20x1,5	2	8	6	60; 80; 100; 120	M20x1,5	6	
ГЗ 2/х-xxx-G1/2"	2	8	6	160; 200; 250	G1/2"	7	intensified
ГЗ 2/х-xxx-M20x1,5	2	8	6	160; 200; 250	M20x1,5	7	intensified



Picture 8

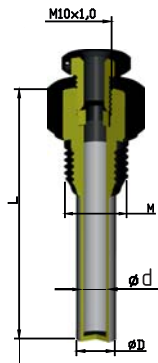


Picture 9

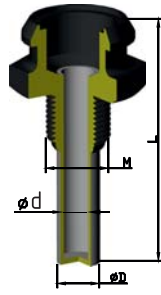
Design 4

Inner diameter = 6 or 8 mm

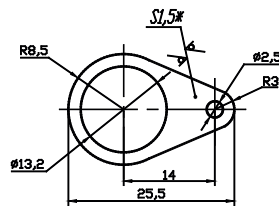
Notes	Design	ϕD , mm	ϕd , mm	Length L, mm	Picture	Appendix
ГЗ 4/х-xxx	4	8; 10	6; 8	50; 60; 80; 100; 120	8	
ГЗ 4/х-xxx	4	8; 10	6; 8	160; 200; 250; 320; 400; 500	9	intensified



Picture 10



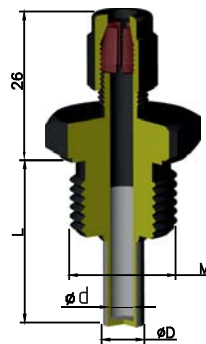
Picture 11



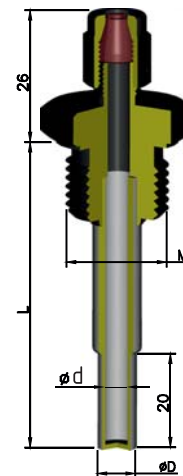
The washer is delivered with sleeves of design 5 and weldolet БП 3 - G1/4".
The material is lead ДПРМ 1,5М1 GOST 495-77.

Design 5 and 6

Notes	Design	ØD, mm	Ød, mm	Length L, mm	Thread	Picture
Г3 5/6-xx-G1/4"	5	8	6	50; 65	G1/4"	10
Г3 6/6-47-G1/2"	6	8	6	47	M12	11



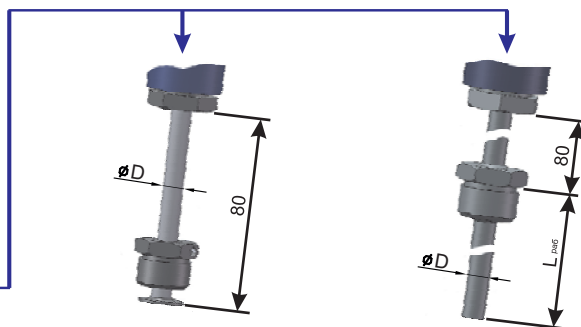
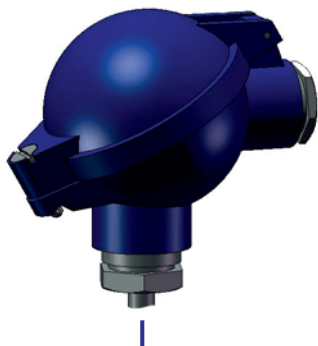
Picture 12



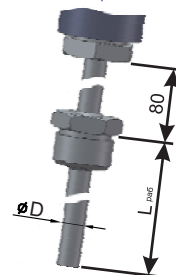
Picture 13

Design 7

Notes	Design	ØD, mm	Ød, mm	Length L, mm	Thread	Picture	Appendix
Г3 7/8-34-G1/2"	7	8	6	34	G1/2"	12	
Г3 7/8-xxx-G1/2"	7	8	6	84; 134; 174	G1/2"	13	intensified



Picture 14



Picture 15

Design 8

Notes	Design	ØD, mm	Длина L, mm	Thread	Picture
Г3 8/8-xxx-xxx	8	8	160; 200; 250; 320; 400	M20x1,5; G1/2"	14
Г3 8/8-80-M20x1,5	8	8	80	M20x1,5	15

FOR NOTES

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