

# WZ Temperature Sensor

## Introduction

Industrial platinum resistance thermometers and thermocouples are used as temperature sensors and are usually used in conjunction with display instruments, recording instruments and electronic regulators. The sensors can directly measure the temperature of liquid, vapor and gaseous media and solid surfaces in the range of -200°C~ 1300°C in various production processes. The design of explosion-proof structure is suitable for explosion-proof occasions. Products have been widely used in petroleum, chemical, pharmaceutical, electric power, metallurgy, paper-making and other industries.

## Specifications

Code	Name	TEMP. Range	Accuracy Class	Allowable Error/°C	Temperature Range of Different Accuracy
PT100	PT100 Thermal Resistance	-200°C~ 500°C	AA	$\pm (0.1+0.0017 t )$	0°C~ 100°C (Thin Film) -50°C~ 200°C (Wire-wound)
			A	$\pm (0.15+0.002 t )$	-50°C~ 300°C
			B	$\pm (0.3+0.005 t )$	-200°C~ 500°C
PT1000	PT1000 Thermocouple	-50°C~ 200°C	A	$\pm (0.15+0.002 t )$	-50°C~ 200°C
			B	$\pm (0.3+0.005 t )$	-50°C~ 200°C
K	K-type Thermocouple (Nickel-chrome - Nickel-silicon)	-40°C~ 1200°C	I	$\pm 1.5^{\circ}\text{C}$	-40°C~ 375°C
				$\pm 0.004  t $	375°C~ 1000°C
			II	$\pm 2.5^{\circ}\text{C}$	-40°C~ 333°C
J	J-type Thermocouple (Iron - Constantan)	-40°C~ 750°C	I	$\pm 1.5^{\circ}\text{C}$	-40°C~ 375°C
				$\pm 0.004  t $	375°C~ 750°C
			II	$\pm 2.5^{\circ}\text{C}$	-40°C~ 333°C
T	T-type Thermocouple (Copper - Constantan)	-196°C~ 350°C	I	$\pm 0.5^{\circ}\text{C}$	-40°C~ 125°C
				$\pm 0.004  t $	125°C~ 350°C
			II	$\pm 1.0^{\circ}\text{C}$	-196°C~ 133°C
E	E-type Thermocouple (Nickel-chrome - Constantan)	-40°C~ 900°C	I	$\pm 1.5^{\circ}\text{C}$	-40°C~ 375°C
				$\pm 0.004  t $	375°C~ 800°C
			II	$\pm 2.5^{\circ}\text{C}$	-40°C~ 333°C
S	S-type Thermocouple (Platinum Rhodium 10 - Platinum)	-40°C~ 1600°C	I	$\pm 1.0^{\circ}\text{C}$	0°C~ 1100°C
				$\pm (1+0.003 t-1100 )$	1100°C~ 1600°C
			II	$\pm 1.5^{\circ}\text{C}$	0°C~ 600°C
				$\pm 0.0025  t $	600°C~ 1600°C

## Recommendation:

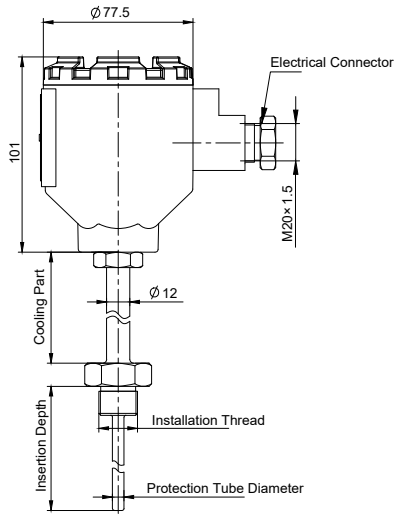
1. PT100 is recommended for application with long-term temperature range less than 300°C .
2. When the measuring range is small, PT1000 can be a good choice.
3. K-type thermocouple is recommended if the long-term temperature is higher than 300°C and lower than 800°C .
4. S-type thermocouple is recommended if the long-term temperature is higher than about 1200°C .



## Features

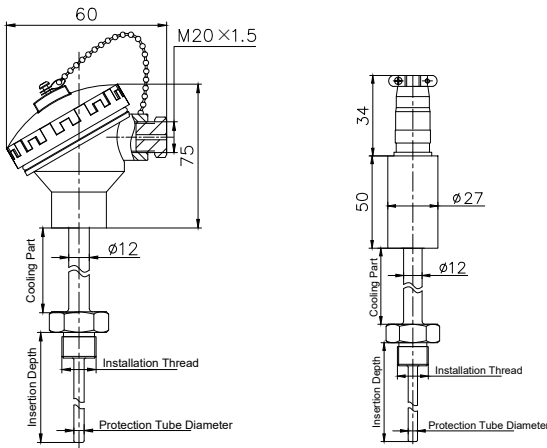
- Small size, easy to install.
- The sensor is in contact with the measured medium, with high reliability.
- The material of the part in contact with the medium is corrosion resistant.
- Diversified products can be provided.
- Explosion-proof certification Exd II C T6 Gb.
- A variety of indexing numbers are optional.

## Outline Structure



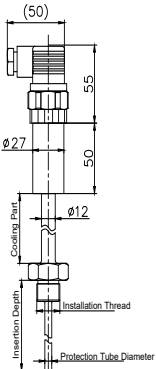
Explosion-proof Junction Box

- Explosion-proof Sign: Exd II C T6 Gb;
- Protection Class of Housing: IP67;
- Housing Material: Cast Aluminum;
- Code: d;



Waterproof Junction Box

- Protection Class of Housing: IP65;
- Housing Material: Cast Aluminum;
- Code: F;

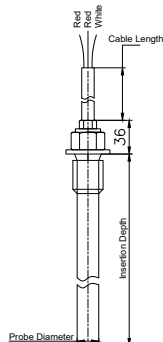


Hirschmann Plug

- Protection Class of Housing: IP65;
- Housing Material: Stainless Steel;
- Code: H

Aviation Plug

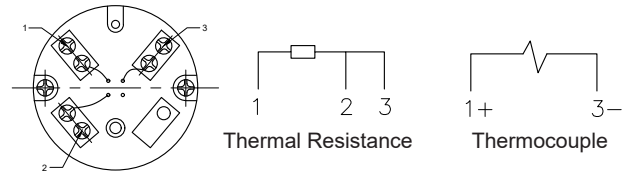
- Protection Class of Housing: IP65;
- Housing Material: Cast Aluminum;
- Code: K;



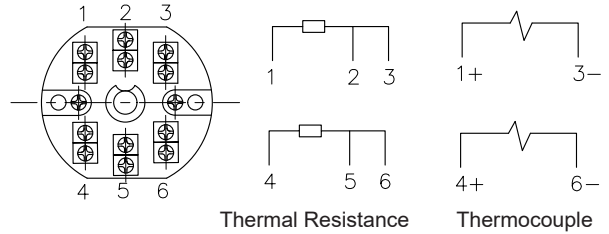
Direct Cable Outlet

- Protection Class of Housing: IP67;
- HCable Material: PTFE Shielded Wire;
- Code: L(XXX)

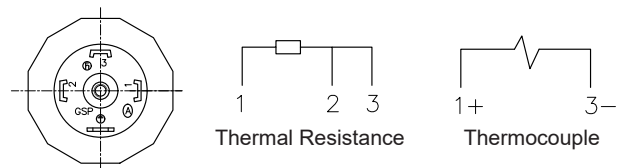
## Electrical Connection



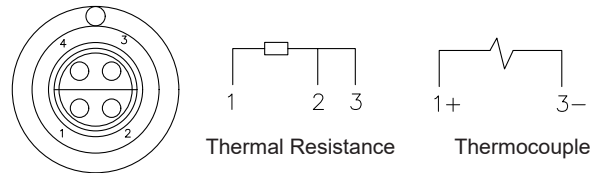
Explosion-proof Junction Box/Waterproof Junction Box(Single)



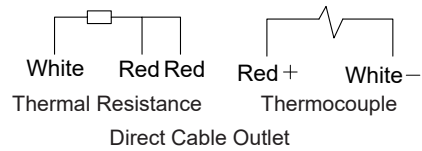
Explosion-proof Junction Box/Waterproof Junction Box(Double)



Hirschmann Plug



Aviation Plug



Direct Cable Outlet

### Instruction:

1. Only explosion-proof junction box and waterproof junction box support dual components.
2. For the wiring definition of the additional transmitter, please refer to the transmitter module.
3. Different batches have slightly differences on thread colors, please refer to the actual label received.

## Diameter of Protection Tube

Type	Diameter (Unit: mm)	Feature
Assembly Type	φ4, φ5, φ6, φ8, φ10, φ12, φ16, φ18, φ22	The response time is relatively slow, the rigidity is good, and a variety of materials are available:
Armored Type	φ2, φ3, φ4, φ5, φ6, φ8	The response time is fast, the cable is flexible, bendable, and the line resistance is larger.

### Instruction:

1. φ2, φ3 do not support dual components.
2. φ4, φ5, φ6, φ8's probe rods are assembled by default, if armored type is required, please note when ordering;
3. If you need other specifications of the protection tube, please contact our company for customization.

## Installation Methods

Code	Installation Form
IV	Fixed Flange Installation (DN10、DN15、DN20、DN32...)
V	Chuck Installation (Clamp $\phi 25.4$ 、 $\phi 50.4$ ...)
VI	Movable flange installation (DN10、DN15、DN20、DN32...)
VII	Fixed Thread Installation, Thread M16 $\times$ 1.5, Thread Length 18mm
VIII	Fixed Thread Installation, Thread G3/8, Thread Length 14mm
X	Fixed Thread Installation, Thread NPT1/4, Thread Length 14mm
XI	Fixed Thread Installation, Thread G1/4, Thread Length 14mm
C10	Fixed Thread Installation, Thread NPT1/2, Thread Length 18mm
C18	Fixed Thread Installation, Thread M14 $\times$ 1.5, Thread Length 14mm
C24	Fixed Thread Installation, Thread M10 $\times$ 1, Thread Length 12mm
IX	Other standard thread sizes, please note with specific specifications.

Instruction:

1. The sealing form of thread mounting method is face seal.
2. The product comes with PTFE washer or copper washer by default.
3. Other installation methods need to be customized.

## Insertion Depth

The insertion depth of the protection tube is selected according to the user's pipe diameter and installation structure. Usually, the probe tip should be placed in the center of the medium to measure more accurately.

Minimum insertion depth that can be accurately tested by a third-party measurement agency:

Thermal resistance: minimum insertion depth  $l_{min} \geq 15D$ .

Thermocouple: minimum insertion depth  $l_{min} \geq 8D$ .

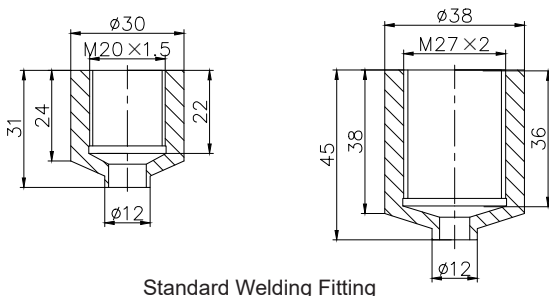
"D" represents the diameter of the protective tube.

If the insertion depth cannot be reached due to the limitation of the on-site installation environment, it is necessary to make an insulation layer on the surface of the pipe to improve the measurement accuracy.

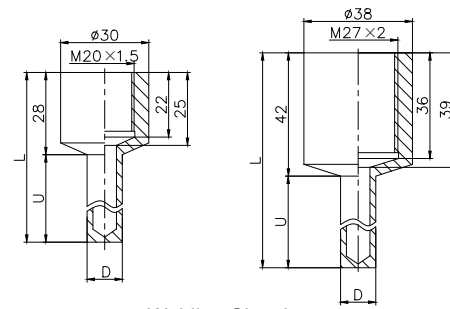
## Protection Tube (Sleeving) Material

Material	Code	Operation Temperature	Features
Stainless Steel 304	1 (Default)	-200°C~ 800°C	Low carbon content, good intergranular corrosion resistance, usually used as general heat-resistant steel.
Stainless Steel 316L	2	-200°C~ 750°C	Ultra-low carbon content, good intergranular corrosion resistance, usually used as general heat-resistant steel.
Hastelloy C-276	4	-100°C~ 700°C	Excellent intergranular corrosion resistance, usually used as corrosion-resistant steel.
GH3030	4	0°C~ 1100°C	Nickel-based high-temperature alloy steel, with excellent oxidation resistance, usually used as heat-resistant steel.
GH3039	4	0°C~ 1300°C	Nickel-based high-temperature alloy steel, with excellent oxidation resistance, usually used as heat-resistant steel.
Corundum	4	0°C~ 1600°C	Industrial ceramic tube, high temperature resistance, excellent oxidation resistance, corrosion resistance, fragile.
PTFE	3	-200°C~ 250°C	Excellent corrosion resistance.

## Installation Accessories

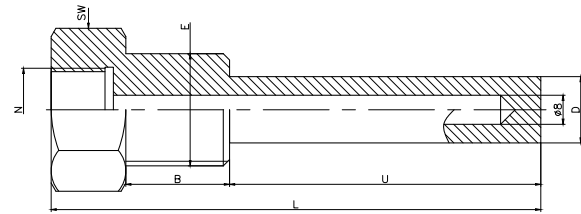


Standard Welding Fitting



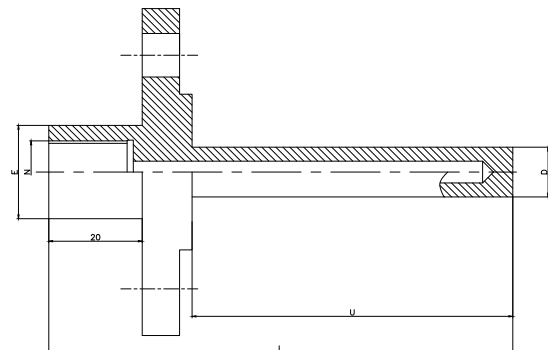
Welding Sleeving

- Sleeving Pressure Rating  $\leq 10$ MPa;
- Sleeving Structure: Assembly type;
- Support welding at the base ONLY;
- The outer diameter of the standard sleeving corresponding to the protection tube  $D=12$ mm, 16mm, U corresponds to the insertion depth in the order guide;
- Non-standard welded sleeving: Please provide  $D=$ \_,  $U=$ \_,  $L=$ \_.



Threaded Installation Sleeving

- Sleeving Pressure Rating  $\leq 10$ MPa;
- Sleeving Structure: Assembly type;
- The internal thread "N" is M20 $\times$ 1.5, if you choose other threads, please contact our company for customization;
- Threaded Installation Sleeving: Please provide  $D=$ \_,  $U=$ \_,  $B=$ \_, sleeving mounting thread specification  $E=$ \_, total sleeving length  $L=$ \_ (optional, if it is not provided, the default  $L=30+B+U$ )



Flange Mounting Sleeving

- Sleeving Pressure Rating  $\leq 10$ MPa;
- Sleeving Structure: Assembly type;
- The internal thread "N" is M20 $\times$ 1.5, if you choose other threads, please contact our company for customization;
- Threaded Installation Sleeving: Please provide  $D=$ \_,  $U=$ \_, flange standard (diameter, pressure rating, sealing type, carried standard), total sleeving length  $L=$ \_ (optional, if it is not provided, the default  $L=20$ +thickness of flange).

Flange Specifications	Instruction
DN20	Diameter
PN16	Pressure Rating
RF	Sealing Surface Structure (Convex Surface)
GB9119-2010	Carried Standard

Note:

- Detailed specifications above for standard flange should be provided.

## Order Guide

WZ	Temperature Sensor										
	Code	Instruction									
	P	Thermal Resistance [Pt100]									
	PT1000	Thermal Resistance [Pt1000]									
	K	K Type Thermocouple(Nickel-chrome - Nickel-silicon)									
	J	J Type Thermocouple(Iron – Constantan)									
	T	T Type Thermocouple(Copper – Constantan)									
	E	E Type Thermocouple(Nickel-chrome – Constantan)									
	S	S Type Thermocouple(Platinum Rhodium 10 – Platinum)									
	Code	Quantity of Sensor									
	Null	Single(Default)									
	2	Double									
	Temperature Range	-200°C~ 0°C ...1300°C									
	(X ~ Y) °C	X and Y represent the value of lower limit and upper limit, unit: °C									
	Code	Outer Diameter of Protection Tube (Default is single sleeving, unit: mm)									
	6	φ6									
	8	φ8									
	10	φ10									
	12	φ12									
	X	ΦX ( Please fill in the specific number, please refer to the table of the Diameter of Protection Tube for options )									
	Code	Installation Methods & Interface									
	C	Fixed Thread Installation, Thread M20×1.5, Thread Length 18mm									
	M	Fixed Thread Installation, Thread M27×2, Thread Length 32mm									
	G	Fixed Thread Installation, Thread G1/2, Thread Length 20mm									
	N	None									
	...	<a href="#">Please refer to Installation for more structure</a>									
	Code	Insertion Depth (default includes thread length, if not included, please note)									
	XXX	Based on actual required length									
	Code	Material of Parts in Contact									
	1	Stainless Steel 304(Default)									
	2	Stainless Steel 316L(Default)									
	3	PTFE Sleeving									
	4	Customized material, please note.									
	Code	Electrical Connection									
	d	Explosion-proof Junction Box[Exd II C T6 Gb]									
	K	4-pin Aviation Plug									
	H	Hirschmann Plug									
	F	Waterproof Junction Box									
	XXX	Cable Length, unit: mm									
	Code	Cooling Part Dimension (please fill in "0" if there is no cooling part, unit: mm)									
	XXX	Cooling Part Dimension ≥0mm, -50°C~ 100°C									
Cooling Part Dimension ≥100mm, -200°C~ 150°C											
Cooling Part Dimension ≥150mm, -200°C~ 1300°C											
	Code	Accessories, multiple options									
	Null	None									
	B	Temperature Transmitter (Only electrical connection: d, F)									
	HJ	Welded Fitting									
	HT	Welded Sleeving									
	LT	Thread Sleeving									
	FT	Flange Sleeving									
WZ	P	2	(0°C~200°C)	6	C	100	1	F	0	HT	Whole Spec.

## Order Note

1. Attached temperature transmitter specifications for reference, please kindly check our company's temperature transmitter specifications for details.
2. If a product with a base or fitting is needed, the length of the probe does not include the size other than the base.
3. For the content not included in the order guide, please consult our company for customization. The code should be replaced by '\*' and explained in the remarks or provided with drawings.
4. The default wiring is three-wire. Please note for two-wire or four-wire. Please refer to the product label for wiring definition.

## Code Example

Example: WZP2[0°C~ 200°C ]6-C-100-1-F-150-BLT

Description: WZ temperature sensor, PT100 platinum resistance, double sensors, temperature range 0°C~ 200°C , probe outer diameter 6mm, fixed thread installation M20×1.5, protection tube insertion depth 100mm, protection tube material stainless steel 304, waterproof junction box type cooling part 150mm, with temperature transmitter, with threaded sleeving (D=\_, U=\_, B=\_, E=\_, L=\_).