



# Temperature measurements

Sensor • Heater • Controller

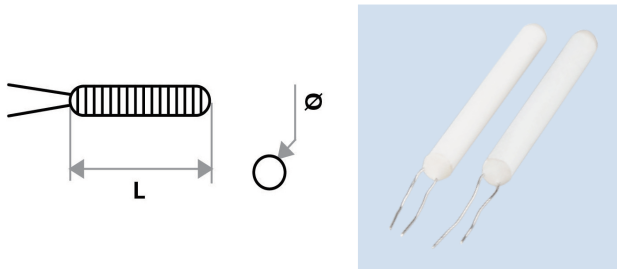
[www.vantsu.com](http://www.vantsu.com)

# RTD TEMPERATURE SENSOR ELEMENT

## WZP series Ceramic platinum RTD sensor element

Platinum resistance is an accurate, sensitive and stable temperature sensor. The ceramic platinum RTD element is a temperature sensing element made of a miniature ceramic tube with a well-wound platinum resistance wire detached coil in the hole.

Because this series has the advantages of small size, wide application range, good reliability, short thermal response time, long service life, etc., it can form a series of products with multiple varieties and specifications, which are widely used in petroleum, chemical, power plants, metallurgy, and light industry food, textile, medical, sanitation, defense industry and machinery and equipment industries.



### Feature of WZP ceramic platinum RTD sensor element

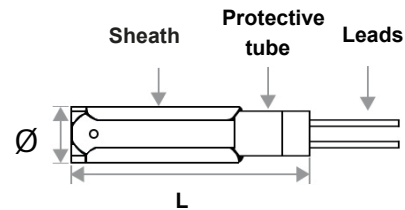
Over the temperature range -200 to +650°C, response time ≤ 15S

Model	Nominal resistance	Specification (Ø x L)	Grade
WZP-1210	Pt10	Ø 1.2x10	1/3B, A, B
WZP-1215		Ø 1.2x15	1/3B, A, B
WZP-1610		Ø 1.6x10	1/3B, A, B
WZP-1615		Ø 1.6x15	1/3B, A, B
WZP-1620		Ø 1.6x20	1/3B, A, B
WZP-2215		Ø 2.2x15	1/3B, A, B
WZP-2220		Ø 2.2x20	1/3B, A, B
WZP-2225		Ø 2.2x25	1/3B, A, B
WZP-2230		Ø 2.2x30	1/3B, A, B
WZP-2515		Ø 2.5x15	1/3B, A, B
WZP-2520		Ø 2.5x20	1/3B, A, B
WZP-2530		Ø 2.5x30	1/3B, A, B
WZP-2820		Ø 2.8x20	1/3B, A, B
WZP-3020		Ø 3.0x20	1/3B, A, B
WZP-3025		Ø 3.0x25	1/3B, A, B
WZP-3035		Ø 3.0x35	1/3B, A, B
WZP-3225	Pt200	Ø 3.2x25	1/3B, A, B
WZP-3230		Ø 3.2x30	1/3B, A, B
WZP-4010		Ø 4.0x10	1/3B, A, B
WZP-4530		Ø 4.5x30	1/3B, A, B
WZP-4830		Ø 4.8x30	1/3B, A, B

## WZP series Mica platinum RTD sensor element

The original mica platinum resistors are made of pure platinum wire bolts wound on a sheet-shaped support formed by mica sheets, and the two sides of the winding are covered with mica sheets for insulation, and then on both sides of them are tied with them with petal-shaped clamps made of thin metal sheets. combine together. The lead end of the platinum wire winding is welded with the lead wire made of silver wire, and a porcelain sleeve is worn for protection and insulation.

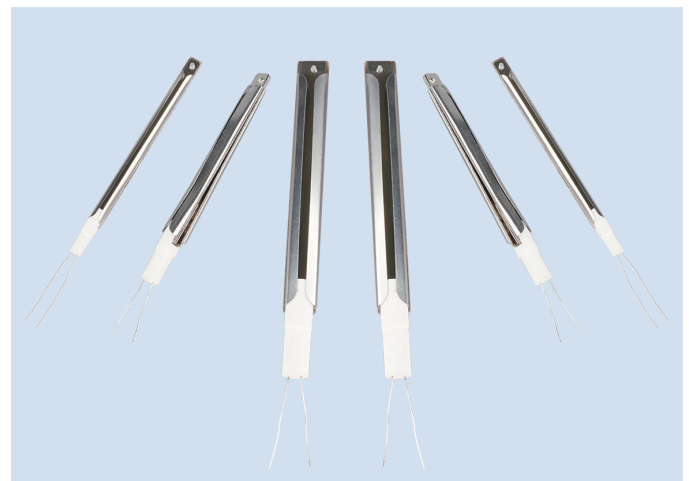
It has the characteristics of high insulation strength, wide application range, convenient installation and long service life.



### Feature of WZP series Mica platinum RTD sensor element

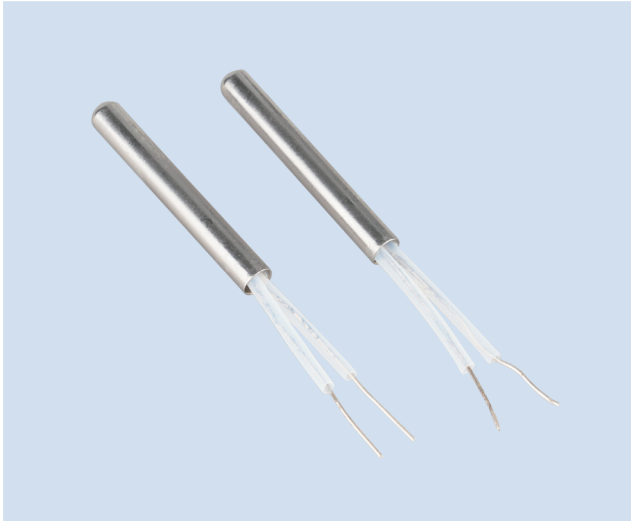
Over the temperature range -200 to +420°C, response time ≤ 15S

Model	Nominal resistance	Specification (Ø x L)	Grade
WZP-010	Pt10 Pt50 Pt100	Ø 10 x100	A, B
WZP2-010		Ø 10 x100	A, B
WZP-011		Ø 8 x70	A, B
WZP2-011		Ø 8 x70	A, B
WZP-012		Ø 6 x60	A, B
WZP2-012		Ø 6 x60	A, B



# RTD TEMPERATURE SENSOR ELEMENT

## WZC series Copper RTD sensor element



The WZC type copper resistor is wound on a rod-shaped plastic or bakelite frame with a high-strength polyester insulated copper wire bolt. To prevent loose copper wires and improve insulation and mechanical strength, the entire component is impregnated with phenolic resin.

### TEMPERATURE RANGE AND TOLERANCE DEVIATION

Series	Nominal resistance	Operating Temperature Range	Tolerance deviation
WZC	Cu10, Cu100	-50 to +150°C	$\pm(0.30+0.006t)$

### THERMAL RESPONSE TIME

When there is a step change in temperature, the resistance value of the thermal resistance changes to 50% of the step change. The time required is called the thermal response time, which is represented by  $t_{0.5}$ .

### TOLERANCE AND TCR (Alpha)

The TCR (Alpha) is  $0.004280 \pm 0.00002$  ohm/ohm/°C

### INSULATION RESISTANCE

When the ambient air temperature is 15-35 °C and the relative humidity is less than 80%, the thermal resistance insulation resistance is not less than 100M $\Omega$

## CRZ series Platinum Thin Film RTD sensor elements

CRZ series thin-film platinum thermal resistance elements are made of metal platinum into a slurry, and are attached to a ceramic substrate to form a film using advanced laser spraying thin film technology, photolithography and dry etching.

### FEATURE

- The thin-film platinum thermal resistance element is made of ceramic and platinum, so it can maintain excellent stability at high temperatures, and is suitable for use at temperatures of -50-450°C.
- The platinum film is sprayed on the ceramic surface by laser, so it has good shock and impact resistance.
- The surface of the film is covered with ceramic, so the components can withstand high voltage and have good insulation.
- High precision, Low drift, high signal resolution, chemical resistant, long-term stability, high degree of signal repeatability
- Lead materials are nickel-plated gold and pure palladium.

### SPECIFICATION

Over the temperature range -50 to +450°C, response time  $\leq 0.3S$

Model	Dimension,mm LxWxH	Resistance	Measuring current	Class	Measuring temperature
CRZ-222-1000	2.3x2.0x0.9	PT1000	$\leq 1mA$	B	-70...500°C
CRZ-222-1000	2.3x2.0x0.9	PT1000	$\leq 1mA$	A	-50...300°C
CRZ-222-100	2.3x2.0x0.9	PT100	$\leq 1mA$	A	-50...300°C
CRZ-222-100	2.3x2.0x0.9	PT100	$\leq 1mA$	B	-70...500°C
CRZ-213-100	2.0x1.3x0.9	PT100	$\leq 1mA$	A	-50...300°C
CRZ-213-100	2.0x1.3x0.9	PT100	$\leq 1mA$	B	-70...500°C

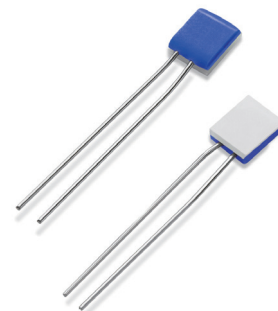
### CRZ-222 - 1000 - B

#### How to Order

Model Resistance value Class

### TOLERANCE AND TCR (Alpha)

Class	Alpha	Resistance value at 0°C ( $\Omega$ )	Tolerance deviation ( $\Omega$ )
A	0.003851	100	$\pm 0.015+0.002t$
B	0.003851	100	$\pm 0.30+0.005t$



# RTD'S SENSORS & THERMOCOUPLES WITH PROCESS FITTING

## Armored Bayonet RTD's and Thermocouple

### Clamp adaptor type for measuring Bearing



Suitable for measurement temperature of bearing, oil, water and general purpose applications. Recognition of rising temperature can provide a warning of the breakdown of the lubricating oil film; thus allowing machine shutdown and maintenance to take place - avoiding the probable catastrophic failure of the bearing and possible damage to its mounting.

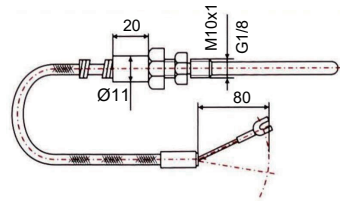
#### FEATURE

- Fast response, high accuracy, small dimension
- Anti-vibration, easy to setting, low cost
- Time constant less 5 s
- Tolerance pressure  $\leq 2.5\text{MPa}$ , armored material is 1Cr18Ni9Ti
- High temperature resistance Leadwire 300-2000mm

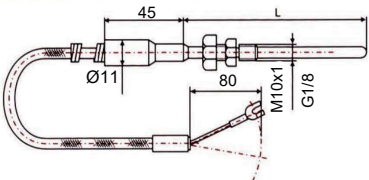
#### TECHNICAL FEATURES

Sensor	Model	Type	Measure range	OD of Armored, mm
Thermocouple Single	WRKK-901M	K	0...800°C	Ø3, Ø4, Ø5, Ø6
	WRKK-901M	E	0...800°C	Ø3, Ø4, Ø5, Ø6
	WRKK-901M	J	0...750°C	Ø3, Ø4, Ø5, Ø6
Thermocouple Dual	WRKK-901M	K	0...800°C	Ø3, Ø4, Ø5, Ø6
	WRKK-901M	E	0...800°C	Ø3, Ø4, Ø5, Ø6
	WRKK-901M	J	0...750°C	Ø3, Ø4, Ø5, Ø6
RTD Bayonet	WRKK-901M	PT100	0...400°C	Ø3, Ø4, Ø5, Ø6
	WRKK-901M	PT100	0...400°C	Ø3, Ø4, Ø5, Ø6

#### DIMENSIONS

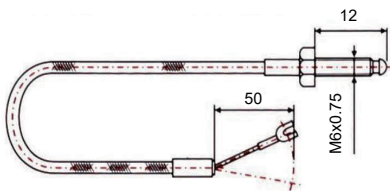


WR □ □ -901M Armored RTD, Thermocouple



WR □ □ -909M Armored RTD, Thermocouple

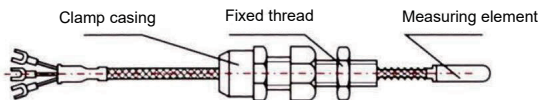
## Small Thermocouple Type "T"



WR □ K-902 Small Thermocouple "T"

Type	Measure range
K	0...800°C
E	0...800°C
J	0...750°C

## Small Thermocouple Type "T"

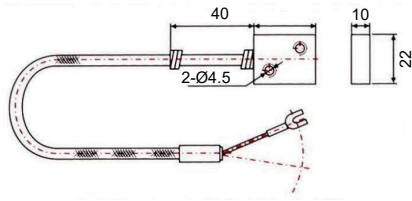


WZPK-904M Spring Loaded RTD

Type	Measure range
PT100	0...400°C

# RTD' & THERMOCOUPLES WITH PROCESS FITTING

## Compression fittings type RTD and Thermocouple



W□□ K-905M Compression fittings RTD and Thermocouple

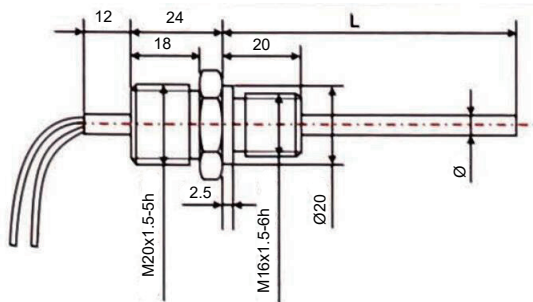
## FEATURE

- Time constant less 15 s
- Tolerance pressure is normal, armored material is 1Cr18Ni9Ti
- High temperature resistance Leadwire 300-2000mm

## TECHNICAL FEATURES

Model	Type	Measure range	OD of Armored, mm
WRKK-905M	K	0...800°C	Ø3, Ø4, Ø5, Ø6
WREK-905M	E	0...800°C	Ø3, Ø4, Ø5, Ø6
WRJK-905M	J	0...750°C	Ø3, Ø4, Ø5, Ø6
WZPK-905M	PT100	0...400°C	Ø3, Ø4, Ø5, Ø6

## Fixed thread-leadwire armored RTD and thermocouple

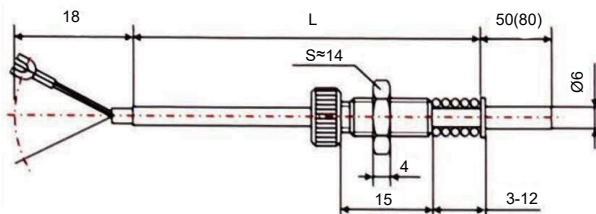


W□□ K-906M Fixed thread armored RTD and Thermocouple

- Fast response, high accuracy, small dimension
- Anti-vibration, easy to setting, low cost
- Time constant less 5 s
- Tolerance pressure  $\leq 2.5\text{MPa}$ , armored material is 1Cr18Ni9Ti
- High temperature resistance Leadwire 300-2000mm

Model	Type	Measure range	OD of Armored, mm
WRKK-906M	K	0...800°C	Ø3, Ø4, Ø5, Ø6
WREK-906M	E	0...800°C	Ø3, Ø4, Ø5, Ø6
WRJK-906M	J	0...750°C	Ø3, Ø4, Ø5, Ø6
WZPK-906M	PT100	0...400°C	Ø3, Ø4, Ø5, Ø6

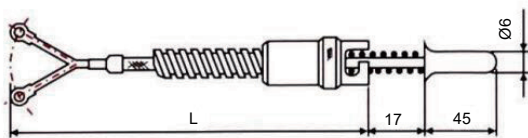
## Compression spring armored RTD and thermocouple



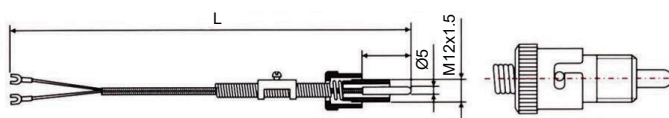
W□□ K-907M Compression spring armored RTD and Thermocouple

Model	Type	Measure range	OD of Armored, mm
WRKK-907M	K	0...800°C	Ø3, Ø4, Ø5, Ø6
WREK-907M	E	0...800°C	Ø3, Ø4, Ø5, Ø6
WRJK-907M	J	0...750°C	Ø3, Ø4, Ø5, Ø6
WZPK-907M	PT100	0...400°C	Ø3, Ø4, Ø5, Ø6

## Fixed bayonet surface RTD and thermocouple



W□□ K-911M Fixed bayonet surface RTD and Thermocouple

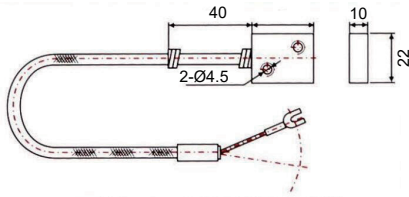


W□□ K-912M Fixed bayonet surface RTD and Thermocouple

Model	Type	Measure range	OD of Armored, mm
WRKK-911M	K	0...800°C	Ø3, Ø4, Ø5, Ø6
WREK-911M	E	0...800°C	Ø3, Ø4, Ø5, Ø6
WRJK-911M	J	0...750°C	Ø3, Ø4, Ø5, Ø6
WZPK-911M	PT100	0...400°C	Ø3, Ø4, Ø5, Ø6

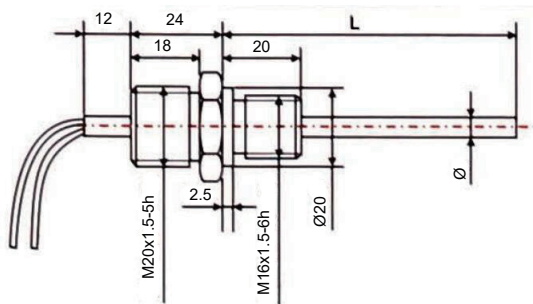
# ASSEMBLY RTD's AND THERMOCOUPLE

## Compression fittings type RTD and Thermocouple



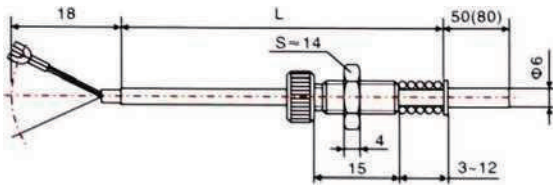
W□□ K-905M Compression fittings RTD and Thermocouple

## Fixed thread-leadwire armored RTD and thermocouple



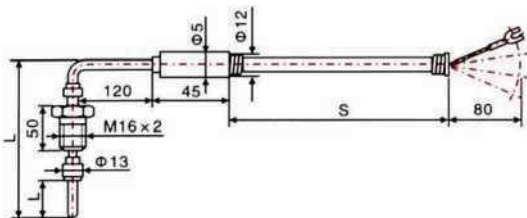
W□□ K-906M Fixed thread armored RTD and Thermocouple

## Compression spring armored RTD and thermocouple



W□□ K-907M Compression spring armored RTD and Thermocouple

## Right Angle Surface armored RTD and thermocouple



WR□ K-916M Right Angle Surface armored RTD and thermocouple

## FEATURE

- Time constant less 15 s
- Tolerance pressure is normal, armored material is 1Cr18Ni9Ti
- High temperature resistance Leadwire 300-2000mm

## TECHNICAL FEATURES

Model	Type	Measure range	OD of Armored, mm
WRKK-905M	K	0...800°C	Ø3, Ø4, Ø5, Ø6
WREK-905M	E	0...800°C	Ø3, Ø4, Ø5, Ø6
WRJK-905M	J	0...750°C	Ø3, Ø4, Ø5, Ø6
WZPK-905M	PT100	0...400°C	Ø3, Ø4, Ø5, Ø6

- Fast response, high accuracy, small dimension
- Anti-vibration, easy to setting, low cost
- Time constant less 5 s
- Tolerance pressure  $\leq 2.5$ MPa, armored material is 1Cr18Ni9Ti
- High temperature resistance Leadwire 300-2000mm

Model	Type	Measure range	OD of Armored, mm
WRKK-906M	K	0...800°C	Ø3, Ø4, Ø5, Ø6
WREK-906M	E	0...800°C	Ø3, Ø4, Ø5, Ø6
WRJK-906M	J	0...750°C	Ø3, Ø4, Ø5, Ø6
WZPK-906M	PT100	0...400°C	Ø3, Ø4, Ø5, Ø6

- Time constant less than 15s.
- Normal pressure
- Armored material is 1Cr18Ni9Ti
- High temperature resistance Leadwire 300-2000mm

Model	Type	Measure range	OD of Armored, mm
WRKK-907M	K	0...800°C	Ø3, Ø4, Ø5, Ø6
WREK-907M	E	0...800°C	Ø3, Ø4, Ø5, Ø6
WRJK-907M	J	0...750°C	Ø3, Ø4, Ø5, Ø6
WZPK-907M	PT100	0...400°C	Ø3, Ø4, Ø5, Ø6

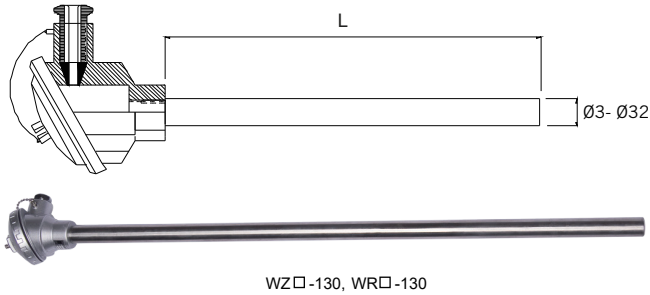
- Time constant less than 15 s.
- Tolerance pressure  $\leq 16$ MPa, armored material is 1Cr18Ni9Ti
- Mostly using measuring bearing. Fast reaction, anti-vibration and etc.
- High temperature resistance Leadwire 2000-5000mm

Model	Type	Measure range	OD of Armored, mm
WRKK-916M	K	0...800°C	Ø3, Ø4, Ø5, Ø6
WREK-916M	E	0...800°C	Ø3, Ø4, Ø5, Ø6
WRJK-916M	J	0...750°C	Ø3, Ø4, Ø5, Ø6
WZPK-916M	PT100	0...400°C	Ø4, Ø5, Ø6



# ASSEMBLY RTD's AND THERMOCOUPLE WITH COVERHEAD

## Assembly type non-fixed device RTD and thermocouple



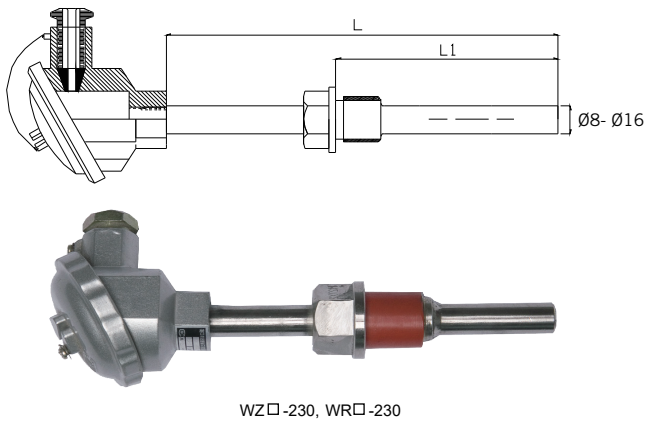
### FEATURE

WZ□-130, WR□-130 series assembled non-fixed device thermal resistance and thermocouple have excellent characteristics such as ultra-high temperature resistance, good stability, strong mechanical strength, and fast response time. Temperature range: RTD 0...450°C; thermocouple 0...1600°C, used in chemical industry, mechanical equipment, power plant and other professional fields.

### TECHNICAL FEATURES

Index number: B, S, K, E, J, T, PT100, CU50  
 Inner element OD/length: Ø4-Ø10 / L: 150-3000mm  
 Protection tube material: NCF800(600), GH3030, S316L, 1Cr18Ni9Ti  
 Temperature range: 0...1600°C  
 Connection method: Welding fixed  
 Other connection methods: ZG1/2, M27x2, G3/4, M33x2, ZG1, G1

## Assembly type straight RTD, thermocouple



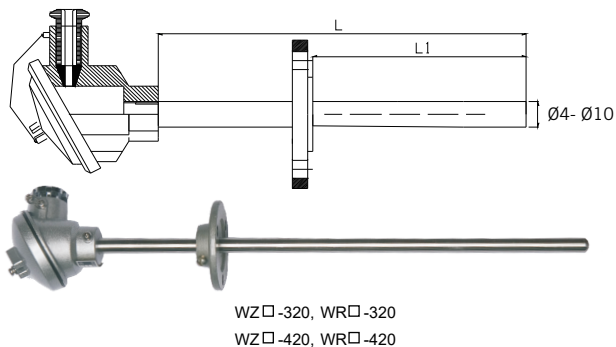
### FEATURE

WZ□-230, WR□-230 series assembled straight thermal resistance and thermocouple have excellent characteristics such as easy installation, good stability, and strong mechanical strength. Temperature range: RTD 0...450°C; thermocouple 0...1000°C, used in chemical industry, mechanical equipment, power plant and other professional fields.

### TECHNICAL FEATURES

Index number: B, S, K, E, J, T, PT100, CU50  
 Inner element OD/length: Ø4-Ø10 / L: 150-3000mm  
 Protection tube material: NCF800(600), GH3030, S316L, 1Cr18Ni9Ti  
 Temperature range: 0...1000°C  
 Connection method: Thread fixed  
 Other connection methods: ZG1/2, M27x2, G3/4, M33x2, ZG1, G1

## Assembly type fixed (moving) flange RTD and thermocouple



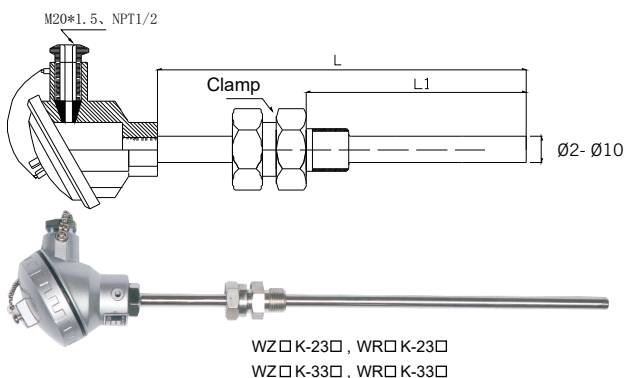
### FEATURE

WZ□-□30, WR□-□30 series assembled straight thermal resistance and thermocouple have excellent characteristics such as easy installation, good stability, and strong mechanical strength. Temperature range: RTD 0...450°C; thermocouple 0...1000°C, used in chemical industry, mechanical equipment, power plant and other professional fields.

### TECHNICAL FEATURES

Index number: B, S, K, E, J, T, PT100, CU50  
 Inner element OD/length: Ø4-Ø10 / L: 150-3000mm  
 Protection tube material: NCF800(600), GH3030, S316L, 1Cr18Ni9Ti  
 Temperature range: 0...1000°C  
 Connection method: Thread fixed  
 Other connection methods: SH, JIS, GB, HG, ANSI and etc flange

## Assembly type fixed (moving) clamp RTD and thermocouple

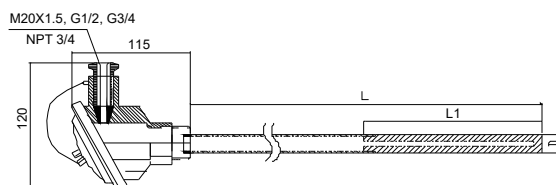


### TECHNICAL FEATURES

Index number: B, S, K, E, J, T, PT100, CU50  
 Inner element OD/length: Ø4-Ø10 / L: 150-3000mm  
 Protection tube material: NCF800(600), GH3030, S316L, 1Cr18Ni9Ti  
 Temperature range: 0...1000°C  
 Connection method: Thread fixed  
 Other connection methods: ZG1/2, M27x2, G3/4, M33x2, ZG1, G1

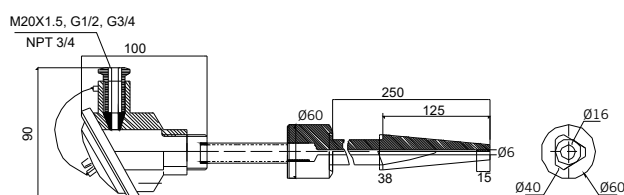
# WZ, WR SERIES RTD, THERMOCOUPLE - POWER PLANTS, CHEMICAL INDUSTRY

## Combustion chamber wear-resistant thermocouple



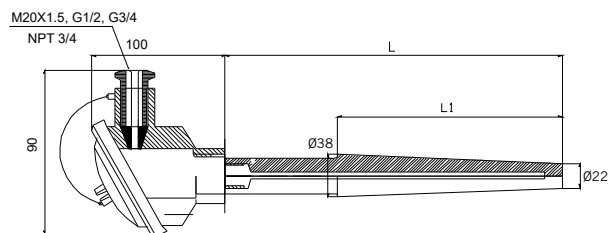
WRNK-130-M, WRNK2-130-M

## Hot-jacket thermocouple



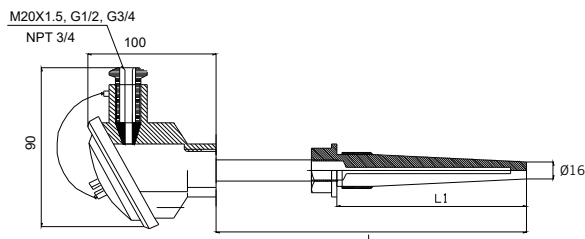
WRNK-130-M, WRNK2-130-M

## High temperature and high pressure thermocouple



WRNK-13

## Medium temperature and medium pressure thermocouple



WRNK-14

## FEATURE

WRNK-130-M wear-resistant thermocouple is mainly used for the upper, middle and lower boiling chambers of the combustion chamber; the furnace outlet; the cyclone outlet. This product adopts special wear-resistant and high-temperature resistant alloy materials and is manufactured through a special process. It has excellent characteristics such as ultra-high temperature resistance (0...1000°C), abrasion resistance, and high pressure resistance, which provides guarantee for the normal operation of high temperature, high pressure and high wear equipment in the power station. The service life is greater than or equal to 1 year, and the estimated service life can reach 20 months.

## TECHNICAL FEATURES

Index number: K, N, E

Inner element OD/length: Ø3-Ø8 / L: 600-1500mm

Protection tube material: Cobalt-molybdenum alloy, cobalt-chromium alloy, NCF800, GH3030

Temperature range: 0...1000°C

Connection method: Welding fixed

## FEATURE

WRNK-01 hot-jacket thermocouple (anti-scouring thermocouple) is mainly used for steam pipe and boiler temperature. The protective tube is made of integral blind holes and high-pressure pipe, which improves the service life and increases the mechanical strength. The special material is resistant to erosion by special media. The measuring range is 0...600°C.

## TECHNICAL FEATURES

Index number: K, N, E

Inner element OD/length: Ø3-Ø8 / L: 600-1500mm

Protection tube material: Cobalt-molybdenum alloy, cobalt-chromium alloy, NCF800, GH3030

Temperature range: 0...1000°C

Connection method: Welding fixed

## FEATURE

WRNK-13 high temperature and high pressure thermocouple is mainly used to measure the temperature of steam pipes and boilers. It is suitable for temperature measurement and high pressure places in the production process of petroleum and chemical industries. It is an indispensable temperature device for oil refineries and high-pressure polyethylene.

The protection tube adopts special processes such as integral blind holes and high-pressure pipe production, which improves the service life and strength. The measuring range is 0...600°C, the pressure is less than 30MPa, and the special material is resistant to erosion by special media.

## TECHNICAL FEATURES

Index number: K, E

Inner element OD/length: Ø3-Ø8 / L: 600-1500mm

Protection tube material: Cobalt-molybdenum alloy, cobalt-chromium alloy, NCF800, GH3030, 316L, 1Cr18Ni9Ti

Temperature range: 0...600°C

Connection method: Welding fixed

## FEATURE

WRNK-14 high temperature and high pressure thermocouple is mainly used to measure the temperature of steam pipes and boilers. It is suitable for temperature measurement and high pressure places in the production process of petroleum and chemical industries. It is an indispensable temperature device for oil refineries and high-pressure polyethylene.

The protection tube adopts special processes such as integral blind holes and high-pressure pipe production, which improves the service life and strength. The measuring range is 0...500°C, the pressure is less than 15MPa, and the special material is resistant to erosion by special media.

## TECHNICAL FEATURES

Index number: K, E, J, T

Inner element OD/length: Ø3-Ø8 / L: 600-1500mm

Protection tube material: Cobalt-molybdenum alloy, cobalt-chromium alloy, NCF800, GH3030, 316L, 1Cr18Ni9Ti

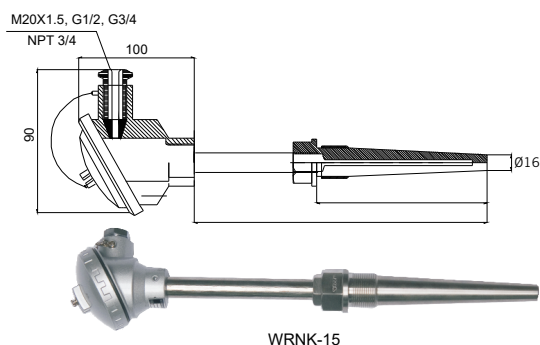
Temperature range: 0...500°C

Connection method: Welding fixed



# WZ, WR SERIES RTD, THERMOCOUPLE - POWER PLANTS, CHEMICAL INDUSTRY

## Low temperature and low pressure thermocouple



## FEATURE

WRNK-15 low temperature and low pressure thermocouple is mainly used to measure the temperature of steam pipes and boilers. It is suitable for temperature measurement and control in high temperature and high pressure places in the production process of petroleum and chemical industries. It is an indispensable temperature device for oil refineries and high-pressure polyethylene. The protection tube adopts special processes such as integral blind holes and high-pressure pipe production, which improves the service life and strength. The measuring range is 0...300°C, the pressure is less than 2MPa, and the special material is resistant to erosion by special media.

## TECHNICAL FEATURES

Index number: K, E, J, T

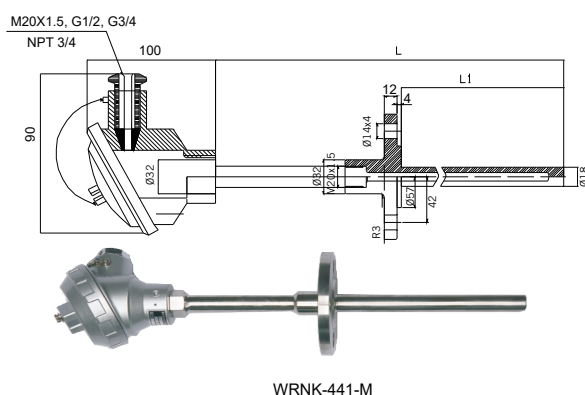
Inner element OD/length: Ø3-Ø8 / L: 600-1500mm

Protection tube material: Cobalt-molybdenum alloy, cobalt-chromium alloy, NCF800, GH3030 316L, 1Cr18Ni9Ti

Temperature range: 0...300°C

Connection method: Thread fixed

## Furnace, combustion chamber flange type wear-resistant thermocouple



## FEATURE

WRNK-441-M Furnace, combustion chamber flange type wear-resistant thermocouple is suitable for the temperature measurement of Furnace, combustion chamber, it has the advantages of good stability, high safety, sensitive response and long service life. Measuring range 0...950°C.

## TECHNICAL FEATURES

Index number: K, S, R

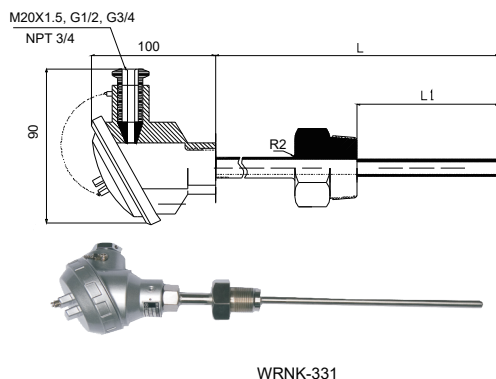
Inner element OD/length: Ø3-Ø8 / L: 600-1500mm

Protection tube material: Cobalt-molybdenum alloy, cobalt-chromium alloy, NCF800, GH3030 316L, 1Cr18Ni9Ti

Temperature range: 0...950°C

Connection method: Thread fixed

## Bearing dedicated thermal resistance, thermocouple



## FEATURE

WRNK-331, WZPK-331 series Bearing dedicated thermal resistance, thermocouple is mainly used for measure the temperature of various bearings with bearing, equipment in power plants. The thermometer is equipped with a shock-absorbing structure and closely adheres to the surface of the bearing to be tested, thereby improving the stability and accuracy of the product.

## TECHNICAL FEATURES

Index number: K, E, J, T, N, PT100, CU50

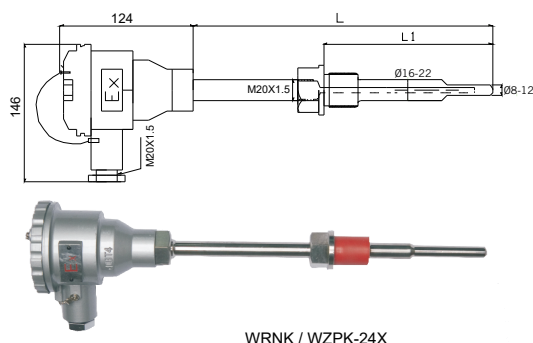
Inner element OD/length: Ø3-Ø8 / L: 600-1500mm

Protection tube material: Cobalt-molybdenum alloy, cobalt-chromium alloy, NCF800, GH3030 316L, 1Cr18Ni9Ti

Temperature range: 0...850°C

Connection method: Thread fixed

## Bearing dedicated thermal resistance, thermocouple



## FEATURE

WZPK-24X, SX-WRNK-24X series explosion-proof thermocouple, thermal resistance has excellent characteristics such as fast response, high sensitivity, good stability, and strong mechanical strength. It is suitable for occasions where the pressure is less than or equal to 2.4MPa and the temperature is less than or equal to 800°C

## TECHNICAL FEATURES

Index number: K, E, J, T, N, PT100, CU50

Inner element OD/length: Ø3-Ø8 / L: 600-1500mm

Protection tube material: NCF800(600), GH3030, 316L, 1Cr18Ni9Ti

Temperature range: 0...850°C

Connection method: Thread fixed

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