

## 电站测温用热电偶、热电阻

## TC and TRD for temperature measurement in power plant

普通结构的热电偶、热电阻，已不能适应电站工作环境中高温、高压、高速蒸汽流的特殊要求。因此，有专供电站用特殊型热电偶、热电阻，由用户根据不同的温度、压力及蒸汽流速来选用。

The TC and TRD of ordinary structure has not met the special requirements of high temperature, high pressure and high-speed steam flow of the power plant. Therefore, there are TCs and RTDs especially special for power plant. Users can select them in accordance with different temperature, pressure and steam flow speed.



### 主要技术指标 Major technical index

#### 热电偶、热电阻类别、测量范围与允差 Class, measuring range and tolerance of TC and RTD

类型 Model	分度号 Graduation mark	代号 Code	测量范围 (°C) Measuring range	精度等级 Accuracy class	允许仪式差 $\Delta t^{\circ}\text{C}$ Tolerance
热电偶 Thermocouple	K	WRNT	0~800	1	$*\pm 1.5^{\circ}\text{C}$ or $\pm 0.004t$
				2	$*\pm 2.5^{\circ}\text{C}$ or $\pm 0.0075t$
热电偶 Thermocouple	E	WRET	0~600	1	$*\pm 1.5^{\circ}\text{C}$ or $\pm 0.004t$
				2	$*\pm 2.5^{\circ}\text{C}$ or $\pm 0.0075t$
热电偶 Thermocouple	T	WRTT	-40~+350	1	$*\pm 1.5^{\circ}\text{C}$ or $\pm 0.004t$
				2	$*\pm 2.5^{\circ}\text{C}$ or $\pm 0.0075t$
铂热电阻 Platinum Thermocouple	Pt100	WZPT	-200~+850	A	-200~+650 $\pm(0.15+0.002 t )$
				B	-200~+850 $\pm(0.30+0.005 t )$

注：(1) 式中“|t|”为感温元件的实测温度。(2) “\*”表示允许偏差两者中取其大者。

Note: (1) “|t|” is the measured temperature of temperature-sensing element. (2) “\*” means to select the bigger between the two tolerances.



## 热套型热电偶、热电阻 Heat shielded thermocouple and shrink thermal resistance

热套型的热套式、焊接式、螺栓式热电偶、热电阻主要用于测量蒸汽管道及锅炉温度。

The thermocouple and thermal resistance of heat-shielded type such as heat-shielded model, welding model and roll-bolt are used to measure the temperature of steam line and boiler.

热套式、焊接式、螺栓式热电偶、热电阻采用保护管与连接管能任意拆装、转向和内芯铠装元件可分离方式，它的优点是便于热电偶、热电阻的维修或更换，而无需停机。保护管安装时，可用焊接或机械方法固定在设备上，然后安装上热电偶、热电阻铠装元件就可工作。

产品参照美国EBASCO公司规范，可替代进口，能满足国产或进口的300MW、600MW、900MW发电机组配套需要。

The thermocouple and thermal resistance of heat-shielded type, welding type roll-bolt type adopt a way which can dismount or mount and turn the protection tube and connecting tube at will and share the inner sheathed elements. In this way, they are easy to maintain and change without shutting down the machine. To install the protection tube can use welding or mechanical methods to fix it on the equipment, and then fit on the sheathed elements of thermocouple and thermal resistance. When such steps finish, it can work.

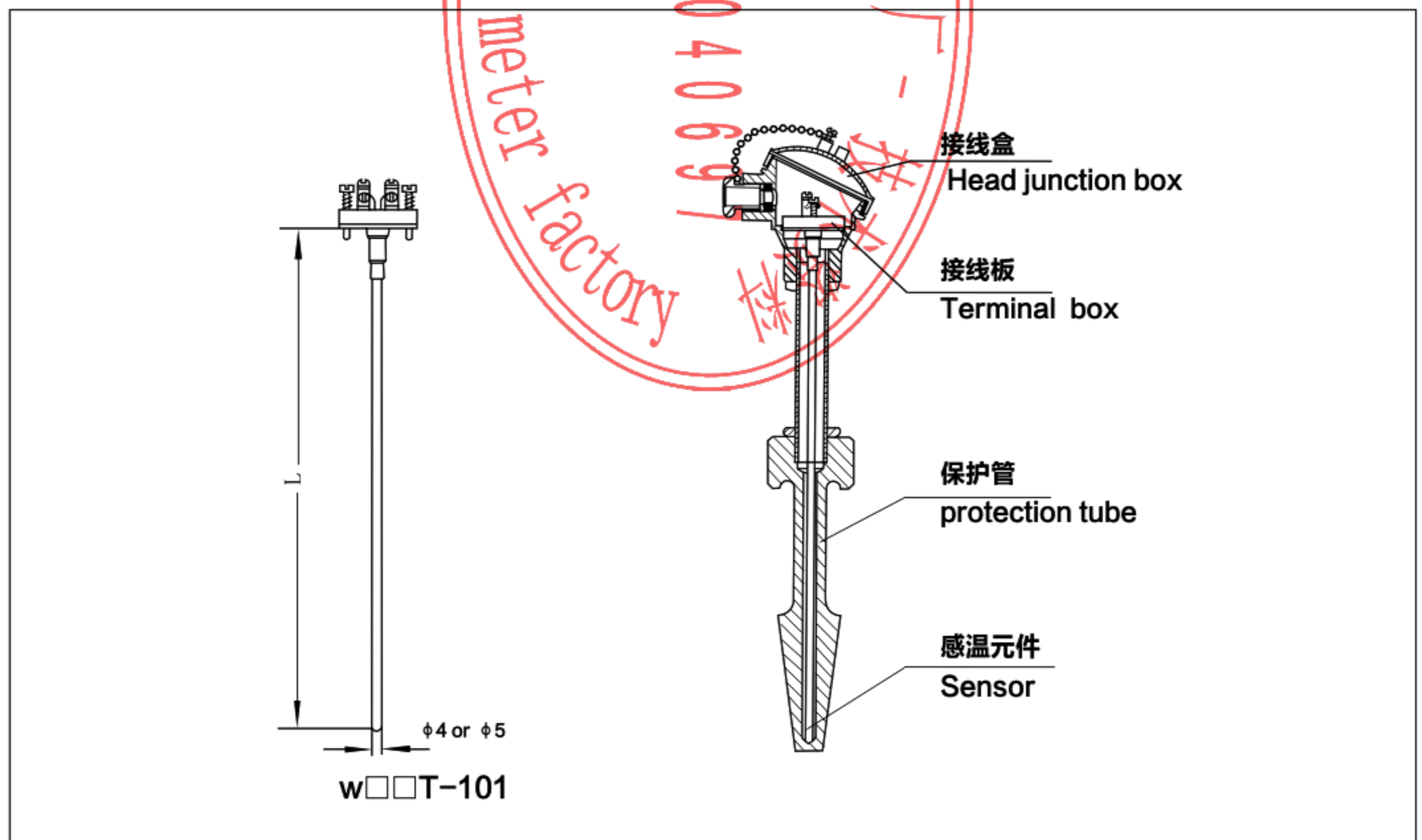
The products, referring to US EBASCO company standard, can substitute imported products, meeting the matching needs of the home-made or imported generating set of 300MW、600MW、900MW.

内芯均采用弹簧压紧式铠装元件，与一般铠装内芯有所不同，它借助弹簧压力使其端部始终与保护管内端面接触，这样既有较小的热惰性，又能消除因振动而引起对使用寿命的影响。

The inner cores, with spring-pressing sheathed elements, resort to spring pressure to make the end contact with the end face in the protection tube, by which, a bit of thermal inertia can be brought into while the influence on the use and life arose from the vibration can be eliminated.

## 热套式热电偶、铂热电阻基本结构

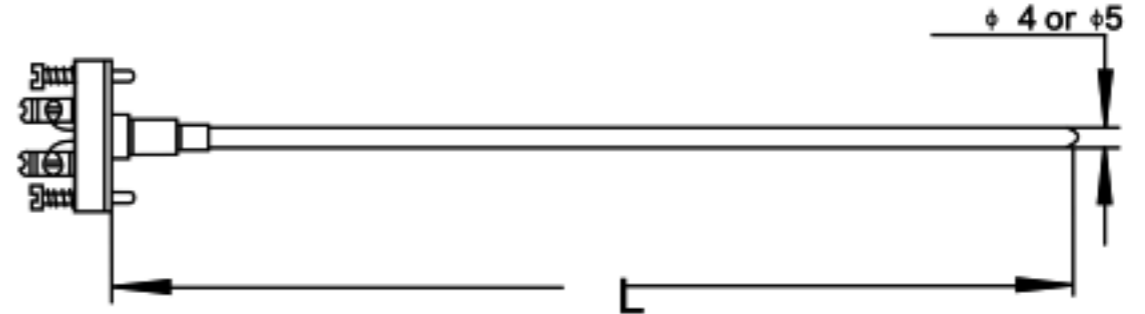
## Heat-shielded TC and TRD structural representation





## 弹性压紧式热电偶、铂热电阻 Spring Compression Type Of TC And Pt-RTD

型号Type	分度号Graduation mark	测量范围Measuring range (°C)	L (mm)			
WRNT-001 WRNT <sub>2</sub> -001	K	0~800	250	375	555	925
WRET-001 WRET <sub>2</sub> -001	E	0~600	275	405	605	1405
WZPT-001 WZPT <sub>2</sub> -001	Pt100	-200~+500	280	425	655	1425
			305	455	675	1525
			325	475	705	1675
			355	505	905	2175



注：(1) 公司产品弹性压紧式热电偶、铂热电阻的内芯更换，其长度正确选用应为保护管的总长度“L”再增加30mm。

例：保护管总长度L=300mm，其内芯长度为330mm。

(2) 保护管材料：1Cr18Ni9Ti。

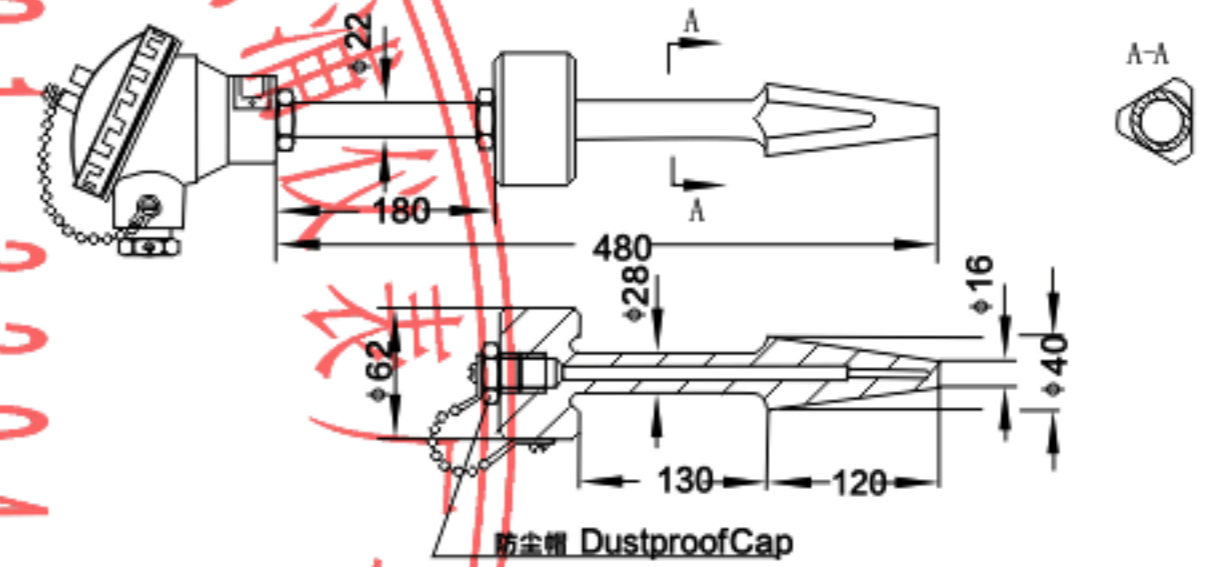
Note: (1) The selected length of the spring compression type of TC and Pt-RTD for changing inner core shall be the overall length of the protection tube “L” plus 30mm.

For example: If the overall length of the protection tube L=300mm, then the length of the inner core is 330mm.

(2) Protection tube material: 1Cr18Ni9Ti.

## 热套式热电偶、铂热电阻 Heat-shielded thermocouple and platinum thermal resistance

型号Type	分度号Graduation mark	测量范围Measuring range (°C)	保护管材料 Protection tube material
WRNR-01 WRNR <sub>2</sub> -01	K	0~600	1Cr18Ni9Ti
WRER-01 WRER <sub>2</sub> -01	E		
WZPR-01 WZPR <sub>2</sub> -01	Pt100	0~500	

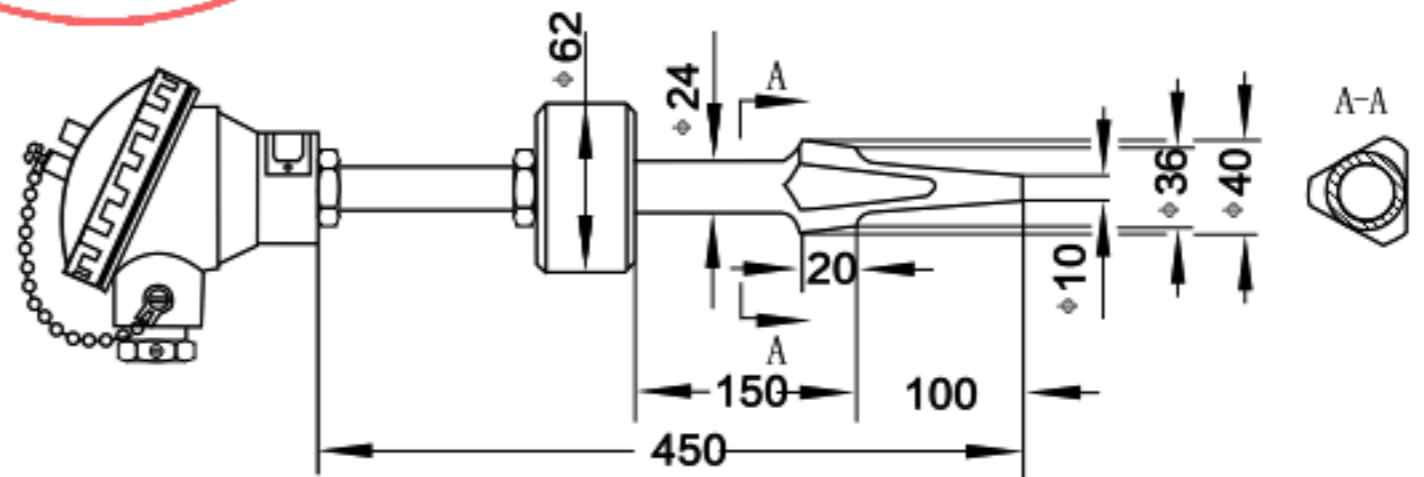


注：(1) 公称压力：30MPa。流速≤80m/s。热响应时间τ 0.5: ≤60s。

Note: (1) Nominal pressure: 30Mpa. Flow rate ≤80m/s. Thermal response time τ 0.5: ≤60s.

## 热套式热电偶 Heat-shielded thermocouple

型号Type	分度号Graduation mark	测量范围Measuring range (°C)	热响应时间τ 0.5 (s) Thermal Response Time t 0.5 (s)	保护管材料 Protection tube material
WRN-634 WRN <sub>2</sub> -634	K	0~600	≤20	1Cr18Ni9Ti
WRN-635 WRN <sub>2</sub> -635			≤30	
WRE-634 WRE <sub>2</sub> -634	E		≤20	
WRE-635 WRE <sub>2</sub> -635			≤30	



注：(1) 公称压力：30MPa。流速≤80m/s。

(2) WR□-634型的铠装内芯测量端型式为接壳式，WR□-635型为绝缘式。

Note: (1) Nominal pressure: 30Mpa. Flow rate ≤80m/s.

(2) The measuring form of the sheathed inner core of WR□-634 type is shell-connecting type, and the WR□-635 type is insulation type.



## 焊接式热电偶、铂热电阻 Welding thermocouple and platinum thermal resistance

型号 Type	分度号 Graduation mark	测量范围 Measuring range (°C)	保护管材料 Protection tube material	l (mm)	
WRNR-13 WRNR <sub>2</sub> -13	K	0-800	1Cr18Ni9Ti	50	
WRER-13 WRER <sub>2</sub> -13	E	0-600		75	
WZPR-13 WZPR <sub>2</sub> -13	Pt100	0-500		100	
				150	

注：(1) 公称压力：30MPa。流速≤80m/s。热响应时间  $\tau_{0.5}$ ：≤75s。

Note: (1) Nominal pressure: 30Mpa. Flow rate ≤80m/s. Thermal response time  $\tau_{0.5}$ ：≤75s.

## 焊接式热电偶、铂热电阻 Welding thermocouple and platinum thermal resistance

型号 Type	分度号 Graduation mark	测量范围 Measuring range (°C)	保护管材料 Protection tube material	l (mm)	
WRNR-14 WRNR <sub>2</sub> -14	K	0-600	1Cr18Ni9Ti	50	
WRER-14 WRER <sub>2</sub> -14	E			75	
				100	
				150	
				200	
				250	
				300	
WZPR-14 WZPR <sub>2</sub> -14	Pt100	0-500			

注：(1) 公称压力：30MPa。流速≤80m/s。热响应时间  $\tau_{0.5}$ ：≤60s。

Note: (1) Nominal pressure: 30Mpa. Flow rate ≤80m/s. Thermal response time  $\tau_{0.5}$ ：≤60s.

## 固定螺栓锥形保护管式热电偶、铂热电阻

## Fixed bolt taper protection tube thermocouple and platinum thermal resistance

型号 Type	分度号 Graduation mark	测量范围 Measuring range (°C)	保护管材料 Protection tube material	l (mm)	
WRNR-15 WRNR <sub>2</sub> -15	K	0-600	1Cr18Ni9Ti	50	
WRNR-15A WRNR <sub>2</sub> -15A				75	
WRNR-15B WRNR <sub>2</sub> -15B	100				
WRER-15 WRER <sub>2</sub> -15	150				
WRER-15A WRER <sub>2</sub> -15A	200				
WRER-15B WRER <sub>2</sub> -15B	E			250	
				300	
				350	
				400	
				450	
				500	
WZPR-15 WZPR <sub>2</sub> -15	Pt100	0-500			
WZPR-15A WZPR <sub>2</sub> -15A					
WZPR-15B WZPR <sub>2</sub> -15B					



注：(1) 公称压力：30MPa。流速 $\leq 80\text{m/s}$ 。热响应时间 $\tau_{0.5} \leq 60\text{s}$ 。

(2) 15型螺栓为M33 $\times$ 2，15A型螺栓为NPT1，15B型螺栓为M33 $\times$ 2齿形垫片规格参见螺纹规格。

(3) 常规产品H=130 mm，当产品的连接管“H”需要加长时，尺寸由用户自定。(4) 防尘帽为可选配件。

Note: (1) Nominla pressure: 30Mpa. Flow rate $\leq 80\text{m/s}$ . Thermal response time  $\tau_{0.5} \leq 60\text{s}$ .

(2) Bolt of 15 type is M33 $\times$ 2, that of 15A type is NPT1, the 15B type is M33 $\times$ 2. Refer to for specification of grooved metal gasket.

(3) For the conventional product, H is equal to 130mm, but when the H need to lengthen, the size can be determined by users.

(4) The dust caps are options

## 烟风道用热电偶、铂热电阻 Thermocouple and platinum thermal resistnce for flue

型号Type	分度号 Graduation mark	测量范围Measuring range (°C)	保护管材料 Protection tube material	规格 (mm) Specification
				L X I
WRNR-12 WRNR <sub>2</sub> -12	K	0~800	1Cr18Ni9Ti	480 $\times$ 230
				680 $\times$ 430
				880 $\times$ 630
WRER-12 WRER <sub>2</sub> -12	E	0~600		1380 $\times$ 1130
				1500 $\times$ 1350
WZPR-12 WZPR <sub>2</sub> -12	Pt100	0~500		1650 $\times$ 1500
				2150 $\times$ 2000

注：(1) 公称压力：10MPa。流速 $\leq 9\text{m/s}$ 。热响应时间 $\tau_{0.5} \leq 45\text{s}$ 。(2) 螺栓M: G2"、M60 $\times$ 3、NPT<sub>2</sub>、R<sub>2</sub>。

Note: (1) Nominla pressure: 10Mpa. Flow rate $\leq 80\text{m/s}$ . Thermal response time  $\tau_{0.5} \leq 45\text{s}$ .

(2) Tread M: G2", M60 $\times$ 3, NPT<sub>2</sub>, R<sub>2</sub>.

## 煤粉仓用耐磨热电偶、铂热电阻

## Abrasion thermocouple and platinum thermal resistance for coal dust storehouse

型号Type	分度号 Graduation mark	测量范围Measuring range (°C)	规格 (mm) Specification
			L X I
WRNN-42HL WRNN <sub>2</sub> -42HL	K	0~800	2150 $\times$ 2000
			2650 $\times$ 2500
			3150 $\times$ 3000
WREN-42HL WREN <sub>2</sub> -42HL	E	0~600	3650 $\times$ 3500
			4150 $\times$ 4000
			5150 $\times$ 5000
WZPN-42 WZPN <sub>2</sub> -42	Pt100	0~500	6150 $\times$ 6000
			7150 $\times$ 7000
			8150 $\times$ 8000
			9150 $\times$ 9000
			10150 $\times$ 10000

注：(1) 煤粉仓用热电偶、铂热电阻，保护管的插入长度凡超出2米，将分段制成以2米为基本长度的联接结构的形式。(2) 保护管首段采用特种耐磨材料。(3) 单支铂热电阻、双支铂热电阻，均为四线制。(4) 直形保护管固定螺栓规格参见螺纹规格。

Note: (1) Of abrasion thermocouple and platinum thermal resistance for coal dust storehouse, these protciton tubes that the inserted length exceeds 2m will be divided to make a form of linkage structure, taking 2m as the basic length. (2) The first section of the protection tube is made of special abrasion resistance materials. (3) Single pt thermal resistance, double pt thermal resistance, both are four-wire system. (4) Refer to for sepecification of fixed bolt of straight protection tube.

## 轴承热电偶、铂热电阻 Bearing thermocouple and thermal resistance

轴承热电偶、铂热电阻，主要用于测量电站各种带有轴承设备的轴承温度。固定装置具有抗震动、防渗油结构，元件的测量端部紧顶被测物表面，从而提高温度测量的准确性。

Bearing thermocouple and thermal resistance are mainly used to measure the temperature of various equipments fitted on bearings. The fixed devices is providee with structure to resist to vibration and oil leakage. The measuring end is tightly touched on the surface of the objects to be measured, improving the accuracy of the measurement.



## 轴承热电偶、铂热电阻 Bearing thermocouple and thermal resistance

型号 Model	分度号 Graduation mark	测量范围(°C) Measuring range	L (mm)	M	d(mm)
WRNT-31 WRNT <sub>2</sub> -31	K	0~200	100 150 200 250 300 350 400 450 500	M16×1.5 M18×1.5 M20×1.5 M27×2 G1/2" G3/4"	φ3 φ4 φ5 φ6 φ8
WRET-31 WRET <sub>2</sub> -31	E				
WRTT-31 WRTT <sub>2</sub> -31	T				
WZPT-31 WZPT <sub>2</sub> -31	Pt100				

## 轴承热电偶、铂热电阻 Bearing thermocouple, platinum thermal resistance

型号 Model	分度号 Graduation mark	测量范围(°C) Measuring range	L (mm)	M	d(mm)
WRNT-393P A WRNT <sub>2</sub> -393P A	K	0~200	100 150 200 250 300 350 400 450 500	M16×1.5 M18×1.5 M20×1.5 M27×2 G1/2" G3/4"	φ3 φ4 φ5 φ6 φ8
WRET-393P A WRET <sub>2</sub> -393P A	E				
WRTT-393 A WRTT <sub>2</sub> -393 A	T				
WZPT-393P A WZPT <sub>2</sub> -393P A	Pt100				

注：(1) 铠装热电偶的响应时间。

(2) 铠装铂热电阻的热响应时间。

(3) 导线延长式长度“S”常规附带500mm, 若需增加请注明长度。

Note: (1) Refer for the thermal response time of sheathed thermocouple.

(2) Refer for the thermal response time of sheathed platinum thermal resistance.

(3) The extension wire type is always attached to 500mm, if the addition is needed, please note the length.

## 泵用铂热电阻 Pump platinum thermal resistance

型号 Model	分度号 Graduation mark	测量范围(°C) Measuring range	热响应时间 Thermal response time $\tau_{0.5}(s)$	规格 Specification (mm)	
				d	$l_1$
WZPT-41	Pt100	-50~+200	Cu	φ3.2 φ4 φ5	15
WZPT <sub>2</sub> -41				φ4 φ5	20 25

注：(1) 总长“L”及前段长度“ $l_2$ ”在订货时同用户自定。

(2) 热响应时间  $\tau_{0.5}$ :  $\leq 5s$ 。

Note: (1) The overall length “L” and the forepart length “ $l_2$ ” can be determined by the users when they place the order.

(2) The thermal response time  $\tau_{0.5}$ :  $\leq 5s$ .



## 轴承用阻漏铂热电阻 Damping leakage platinum thermal resistance for bearing

型号Model	分度号 Graduation mark	测量范围(°C) Measuring range	热响应时间 Thermal response time t0.5(s)	保护管材料 Protection tube material	d (mm)
WZPT-83	Pt100	-50~+200	≤3	1Cr18Ni9Ti	φ3.2
WZPT-84 WZPT <sub>2</sub> -84			≤5		φ4
WZPT-85 WZPT <sub>2</sub> -85			≤8		φ5
WZPT-86 WZPT <sub>2</sub> -86			≤12		φ6

注: φ3.2仅提供单支元件, φ4、φ5、φ6可提供双支元件。

Note: φ3.2 only supply single element. φ4、φ5、φ6 can provide double element.

## 轴承用双测点阻漏铂热电阻 Bearing dual-purpose station damping leakage pt thermal resistance

型号Model	分度号 Graduation mark	测量范围(°C) Measuring range	热响应时间 Thermal response time t0.5(s)	保护管材料 Protection tube material	规格 Specification (mm)	
					L	S
WZPM <sub>2</sub> Y-271	Pt100	-50~+200	≤3	Cu	1500 2000	1500 2000 3000

## 固定法兰锥形保护管式热电偶、铂热电阻

## Fixed flange taper protection tube thermocouple and platinum thermal resistance

型号Model	分度号 Graduation mark	测量范围(°C) Measuring range	热响应时间 Thermal response time t0.5(s)	保护管材料 Protection tube material	规格 Specification (mm)
					L X I
WRNR-46 WRNR <sub>2</sub> -46	K	0~800	≤60	1Cr18Ni9Ti	250×100 300×150 350×200 400×250 450×300 500×350 550×400 600×450 650×500
WRER-46 WRER <sub>2</sub> -46	E	0~600			
WZPR-46 WZPR <sub>2</sub> -46	Pt100	0~500			

注: (1) 公称压力: 10MPa。

(2) 型号后加A, 为ANSI标准法兰。例: WRNR-46A, 选用JB/T标准法兰。

Note: (1) Nominla pressure: 10Mpa

(2) The type with A attached to is the ANSI standard flange, for example WRNR-46A. Refer select JB/T standard flange.



## 锅炉炉壁、管壁热电偶、热电阻 Boiler furnace wall and tube wall thermal resistance and thermocou

锅炉炉壁、管道用热电偶、铂热电阻是采用 $\phi 4$ 或 $\phi 5$ 直径的铠装元件作探头，用铠装电缆引出或用测温补偿导线引出，测量端导热板带有与管道或炉壁相吻合的曲面，用螺钉、焊接或卡箍的方法将导热板固定在管（炉）壁上，通过导热板的传导，可测得炉壁或管道等表面温度。

The furnace wall of boiler, thermocouple of shell of pipe and platinum thermal resistance adopt the sheathed elements with the  $\phi 5$  diameter as probe, leaded out by armored cable or thermometric extension wire, whose heat conduction shield of measuring terminal is equipped with camber suitable for pipes or furnace wall and fixed to the tube (furnace) wall by bolts, welding or holding down clip. The surface temperature of the furnace wall or tubes can be measured by the conduction of the heat conduction shield.

### 集热铠装热电偶、热电阻(带集热块)

### Heat collecting sheathed thermocouple and thermal resistance (with collecting plate)

型号 Model	分度号 Graduation Mark	测量范围(°C) Measuring Range(°C)	插入方向 Placed Direction	固定型式 Fixed Type	L (毫米) L (mm)		
WRNT-11Z WRNT <sub>2</sub> -11Z	K	0~800	沿管道轴向 Along axial direction of pipeline	焊接固 定导热 板式 Welding fixed heat conduction shield	500	<p>11Z型 11Z Type</p> <p>R=29~110 导热块规格: 40×20×12 Specification=40×20×12 导热块材料: 1Cr18Ni9Ti material: 1Cr18Ni9Ti</p>	
WRET-11Z WRET <sub>2</sub> -11Z	E	0~600			600		
WZPT-11Z WZPT <sub>2</sub> -11Z	Pt100	-70~400			1000		
WRNT-11J WRNT <sub>2</sub> -11J	K	0~800	沿管道径向 Along radical direction of pipeline	焊接固 定导热 板式 Welding fixed heat conduction shield	2000		<p>51J型 51J Type</p> <p>R=29~110 导热块规格: 40×20×12 Specification=40×20×12 导热块材料: 1Cr18Ni9Ti material: 1Cr18Ni9Ti</p>
WRET-11J WRET <sub>2</sub> -11J	E	0~600			3000		
WZPT-11J WZPT <sub>2</sub> -11J	Pt100	-70~400			4000		
WRNT-51Z WRNT <sub>2</sub> -51Z	K	0~800	沿管道轴向 Along axial direction of pipeline	焊接固 定导热 板式 Welding fixed heat conduction shield	4000	<p>51J型 51J Type</p> <p>R=29~110 导热块规格: 40×20×12 Specification=40×20×12 导热块材料: 1Cr18Ni9Ti material: 1Cr18Ni9Ti</p>	
WRET-51Z WRET <sub>2</sub> -51Z	E	0~600			5000		
WZPT-51Z WZPT <sub>2</sub> -51Z	Pt100	-70~400			6000		
WRNT-51J WRNT <sub>2</sub> -51J	K	0~800	沿管道径向 Along radical direction of pipeline	焊接固 定导热 板式 Welding fixed heat conduction shield	8000		<p>51J型 51J Type</p> <p>R=29~110 导热块规格: 40×20×12 Specification=40×20×12 导热块材料: 1Cr18Ni9Ti material: 1Cr18Ni9Ti</p>
WRET-51J WRET <sub>2</sub> -51J	E	0~600			10000		
WZPT-51J WZPT <sub>2</sub> -51J	Pt100	-70~400					

注：(1) 集热板曲率半径“R”可根据管道直径供货，并由用户四点焊接或用螺钉固定在被测物体表面。集热板的具体安装尺寸及规格参见安装图。(2) 导线延长式，尾线长度“S”常规附带500mm，若需要增加，请注明尾线长度。(3) 热响应时间 $t_{0.5}(s)$ 热电偶 $\leq 2.5$ 或 $\leq 4$ ；热电阻 $\leq 5$ 或 $\leq 8$ 。

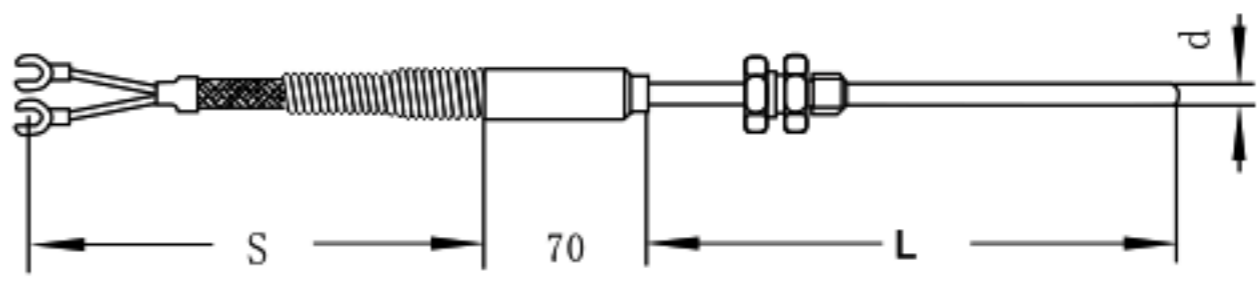
(1) The radius of curvature of the collecting plate “R” shall be provided according to the tube diameter, which shall be fixed on the surface of the measured object through four points welding or screw by customers. for the detailed installation dimension and specification of collecting plate. (2) 500mm buttcock line is usually attached to the extension wire type “S”, if need to add, please indicate the length. (3) The thermal response time is 0.5(s), thermocouple  $\leq 2.5$  or  $\leq 4$ ; the thermal resistance  $\leq 5$  or  $\leq 8$ .



## 铠装热电偶、铂热电阻 (带固定卡套螺栓)

### Sheathed thermocouple and platinum thermal resistance (with fixed ferrule bolt)

型号 Model	分度号 Graduation Mark	测量范围(°C) Measuring Range(°C)	热响应时间 $\tau_{0.5}(s)$ Thermal Response Time $\tau_{0.5}(s)$	d(mm)	L(mm)
WRNT-21 WRNT <sub>2</sub> -21	K	0~800	≤2.5 or ≤4	φ3 φ4 φ5 φ6 φ8	500 1000 5000 8000 10000 15000 20000 25000
WRET-21 WRET <sub>2</sub> -21	E	0~600			
WRTT-21 WRTT <sub>2</sub> -21	T	-40~+350			
WZPT-21 WZPT <sub>2</sub> -21	Pt100	-200~+500	≤5 or ≤8	φ3 φ4 φ5 φ6 φ8	300~5000

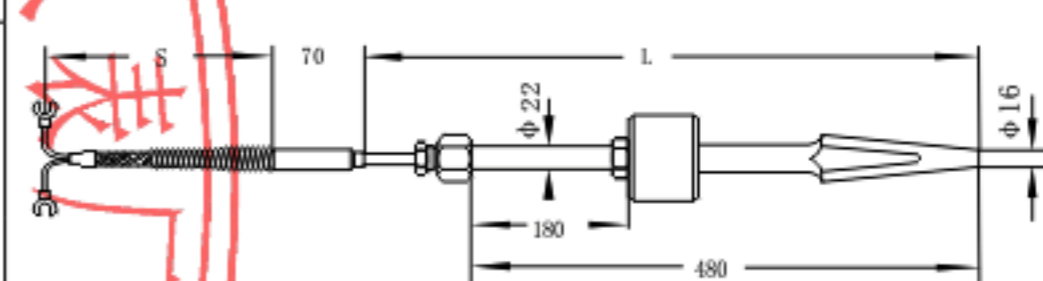


注: (1) 导线延长式, 线长度“S”常规附带500mm, 若需增加, 请注明长度。(2) 卡套螺栓规格参见安装图。

Note: (1) 500mm is usually attached to the wire extension type “S”, if need to add, please indicate the length. (2) See the specification

## 热套式热电偶铠装元件延长型 Heat shielded thermocouple and sheathed elements extension type

型号 Model	分度号 Graduation Mark	测量范围(°C) Measuring Range(°C)	公称压力(Mpa) Nominal pressure (Mpa)	流速 (m/s) Flow rate (m/s)
WRNR-0131 WRNR <sub>2</sub> -0131	K	0~800	≤30	≤80
WRER-0131 WRER <sub>2</sub> -0131	E	0~600		



注: (1) 铠装元件引出长度“L”由用户自定。

(2) 保护管材料1Cr18Ni9Ti。

(3) 补偿导线型式、线长度“S”常规附带500mm, 如需增加注明线长度。

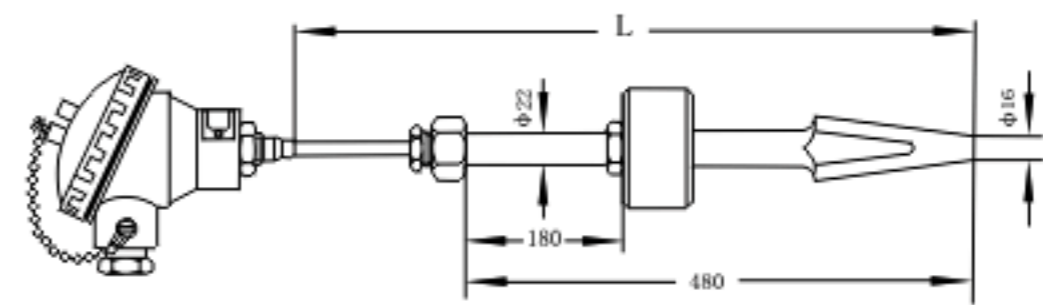
Note: (1) The length “L” leaded out of sheathed elements shall be determined by customers.

(2) Protection tube material 1Cr18Ni9Ti.

(3) 500mm lead wire is usually attached to the extension wiretype “S”, if need to add, please indicate the length.

## 热套式热电偶铠装元件延长型 Heat shielded thermocouple and sheathed elements extension type

型号 Model	分度号 Graduation Mark	测量范围(°C) Measuring Range(°C)	公称压力(Mpa) Nominal Pressure (Mpa)	流速 (m/s) Flow rate (m/s)
WRNR-0133 WRNR <sub>2</sub> -0133	K	0~800	≤30	≤80
WRER-0133 WRER <sub>2</sub> -0133	E	0~600		



注: (1) 铠装元件引出长度“L”由用户自定。

(2) 保护管材1Cr18Ni9Ti。

Note: (1) The length “L” leaded out of sheathed elements shall be determined by customers.

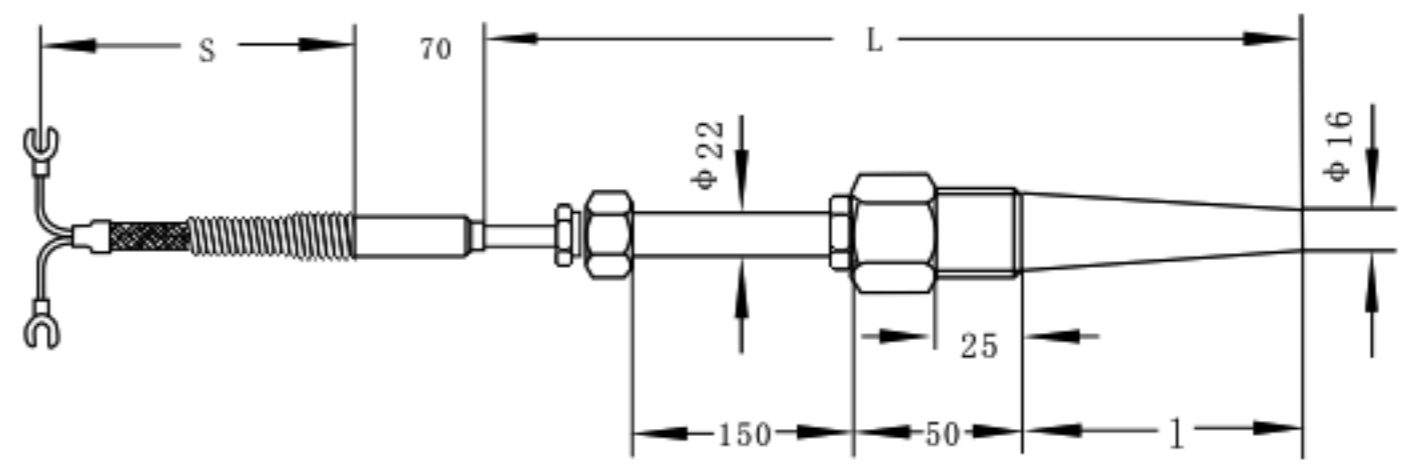
(2) Protection tube material shall be 1Cr18Ni9Ti.



## 固定螺栓锥形保护管式热电偶铠装元件延长型

### Fixed bolt taper tube sheathed thermocouple elements extension type

型号 Model	分度号 Graduation Mark	测量范围(°C) Measuring Range(°C)	公称压力 (MPa) Nominal pressure (MPa)	置入深度 Placed depth	
				L	
WRNR-1531 WRNR <sub>2</sub> -1531	K	0~800	≤30	75	100
				150	200
				250	300
				350	400
				450	500
WRER-1531 WRER <sub>2</sub> -1531	E	0~600			



注：(1) WR□R-1531、WR□R1533不加尾注为M33×2螺栓；加A为NPT1螺栓；加B为M33×2螺栓带齿形垫片规格参见安装规范。

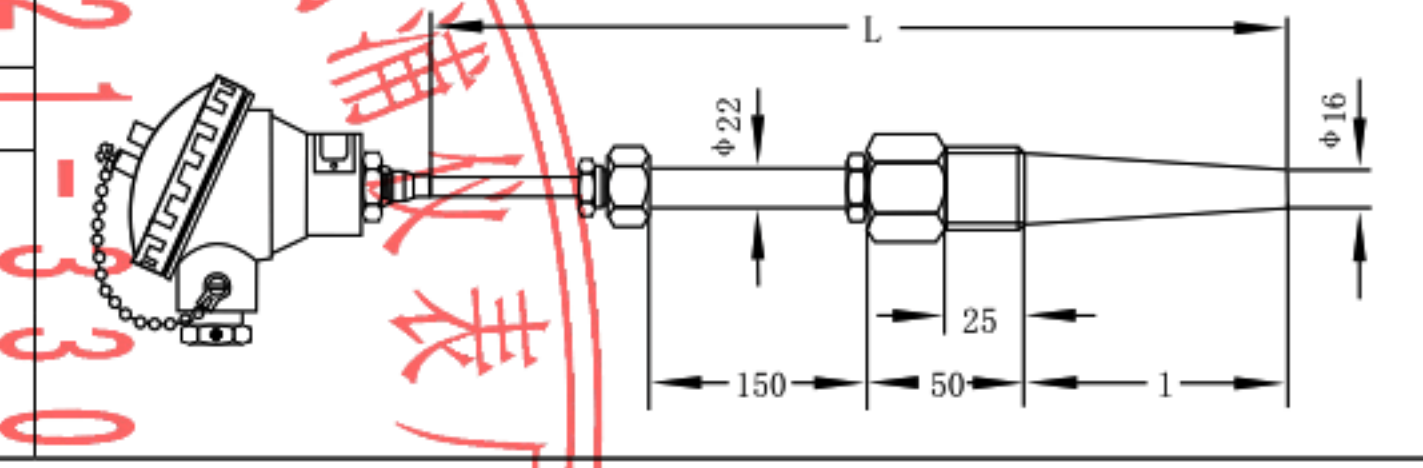
(2) 铠装元件引出长度“L”由用户自定。(3) 保护管材料1Cr18Ni9Ti。(4) 补偿导线式，线长长度“S”常规附带500mm，若须增加注明长度。

Note: (1) WR□R-1531 and WR□R1533 model without endnote are M33×2 bolt and with B is M33×2 bolt with serrated washer. See the specification on (2) The length “L” leaded out of sheathed elements shall be determined by customers. (3) Protection tube material 1Cr18Ni9Ti. (4) 500mm is usually attached to extension wire type “S”, if need to add, please indicate the length.

## 固定螺栓锥形保护管式热电偶铠装元件延长型

### Fixed bolt taper tube sheathed thermocouple elements extension type

型号 Model	分度号 Graduation Mark	测量范围(°C) Measuring Range(°C)	公称压力 (MPa) Nominal pressure (MPa)	置入深度 Placed depth	
				L	
WRNR-1533 WRNR <sub>2</sub> -1533	K	0~800	≤30	75	100
				150	200
				250	300
				350	400
				450	500
WRER-1533 WRER <sub>2</sub> -1533	E	0~600			



注：(1) WR□R-1531、WR□R1533不加尾注为M33×2螺栓；加A为NPT1螺栓；加B为M33×2螺栓带齿形垫片规格参见安装图。

(2) 铠装元件引出长度“L”由用户自定。

(3) 保护管材料1Cr18Ni9Ti。

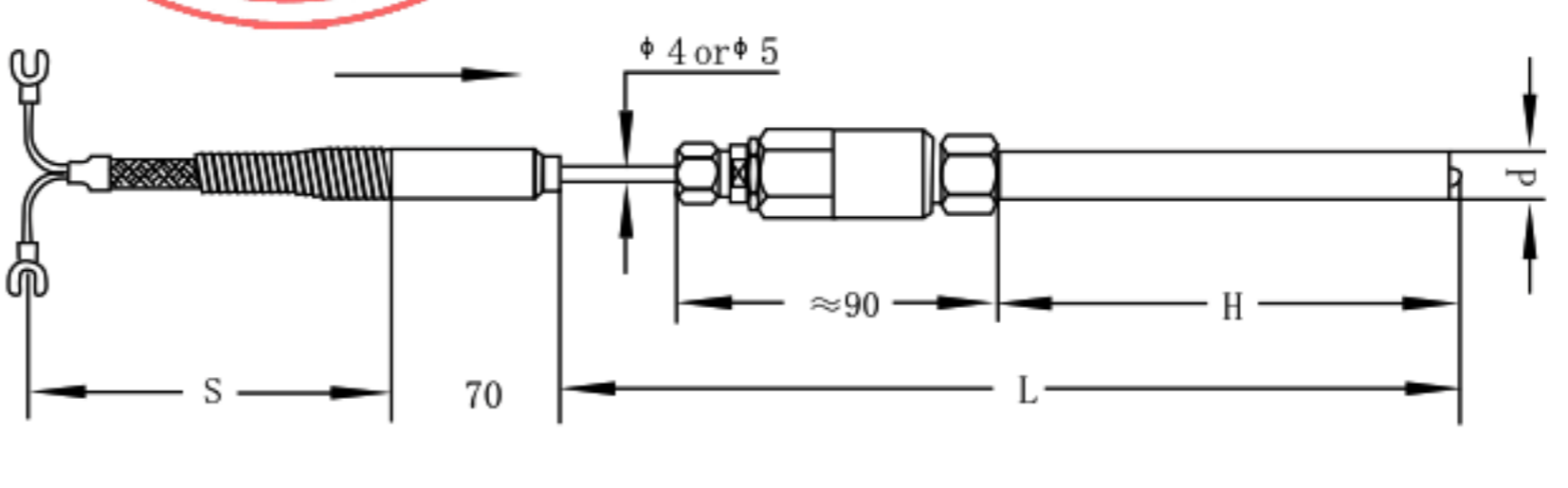
Note: (1) WR□R-1531 and WR□R1533 model without endnote are M33×2 bolt and with B is M33×2 bolt with serrated washer. See the specification on .

(2) The length “L” leaded out of sheathed elements shall be determined by customers.

(3) Protection tube material 1Cr18Ni9Ti.

## 铠装热电偶 (带防震引出管) Sheathed thermocouple (with anti-vibration extraction tube)

型号 Model	分度号 Graduation Mark	测量范围(°C) Measuring Range(°C)	引出管 (mm) Extraction tube (mm)	
			d	H
WRNK-91FZ WRNK <sub>2</sub> -91FZ	K	0~800	φ12 φ16 φ20 φ22	200
				300
				400
				500
				600
WREK-91FZ WREK <sub>2</sub> -91FZ	E	0~600		700
				800



注：(1) 主要用于测量管道金属表面的温度，引出管带有防震紧顶结构。能使元件的测量端部与被测面始终保持紧密的接触。

(2) 引出管的高度“H”，铠装热电偶的长度“L”和延长导线“S”的尺寸由用户根据需要自定。

Note: (1) It is usually used measure the temperature of the metal surface of the pipelines. The extraction tube is equipped with anti-vibration tight-top structure to ensure the elements close contact with the measured face when measuring.

(2) The height “H” of the extraction tube, the length “L” of sheathed thermocouple and the dimension of the extension lead wire “S” shall be determined by users’ need.



## 铠装热电偶 (带防震引出管) Sheathed thermocouple (with anti-vibration extraction tube)

型号 Model	分度号 Graduation Mark	测量范围(°C) Measuring Range(°C)	引出管 (mm) Extraction tube (mm)	
			d	H
WRNK-93FZ WRNK <sub>2</sub> -93FZ	K	0~800	φ12 φ16 φ20 φ22	200 300 400 500 600
WREK-93FZ WREK <sub>2</sub> -93FZ	E	0~600		700 800

注: (1) 主要用于测量管道金属表面的温度, 引出管带有防震紧顶结构。能使元件的测量端部与被测面始终保持紧密的接触。(2) 引出管的高度“H”, 铠装热电偶的长度“L”由用户根据需要自定。

Note: (1) It is usually used measure the temperature of the metal surface of the pipelines. The extraction tube is equipped with anti-vibration tight-top structure to ensure the elements close contact with the measured face when measuring. (2) The height “H” of the extraction tube and the length “L” of sheathed thermocouple shall be determined by users’ need.

## 固定套管式铠装热电偶、铂热电阻

### Fixed extension type sheathed thermocouple and platinum thermal resistance

型号 Model	分度号 Graduation Mark	测量范围(°C) Measuring Range(°C)	规格 Specification	
			M	H(mm)
WRNT-53T WRNT <sub>2</sub> -53T	K	0~800	M20×1 M22×1 G1/2" G3/4"	130 150 180 200
WZPT-53T WZPT <sub>2</sub> -53T	Pt100	-70~500		

注: (1) 安装螺栓“M”能同各种有内螺纹的保护套配接, 能任意方向安装。

(2) 采用铠装元件, 测量端能同保护套内端面有效的紧密接触。

Note: (1) Mounting bolt “M” shall be applicable to all kinds of protecting jacket with internal thread and available in all direction.

(2) It adopts the sheathed elements to ensure the measuring terminal actively close contact with the internal end face of the protecting jacket.

## 活动套管式铠装热电偶、铂热电阻

### Movable extension type sheathed thermocouple and thermal resistance

型号 Model	分度号 Graduation Mark	测量范围(°C) Measuring Range(°C)	规格 Specification	
			d	H
WRNT-33HJT WRNT <sub>2</sub> -33HJT	K	0~800	M16×1 M20×1 M22×1 G1/2" G3/4"	130 150 180 200
WZPT-33HJT WZPT <sub>2</sub> -33HJT	Pt100	-70~500		

注: (1) 安装螺栓“M”能同各种有内螺纹的保护套配接, 能任意方向安装。

(2) 铠装元件的长度“L”和引出管的高度“H”由用户根据需要自定。

Note: (1) Mounting bolt “M” shall be applicable to all kinds of protecting jacket with internal thread and available in all direction.

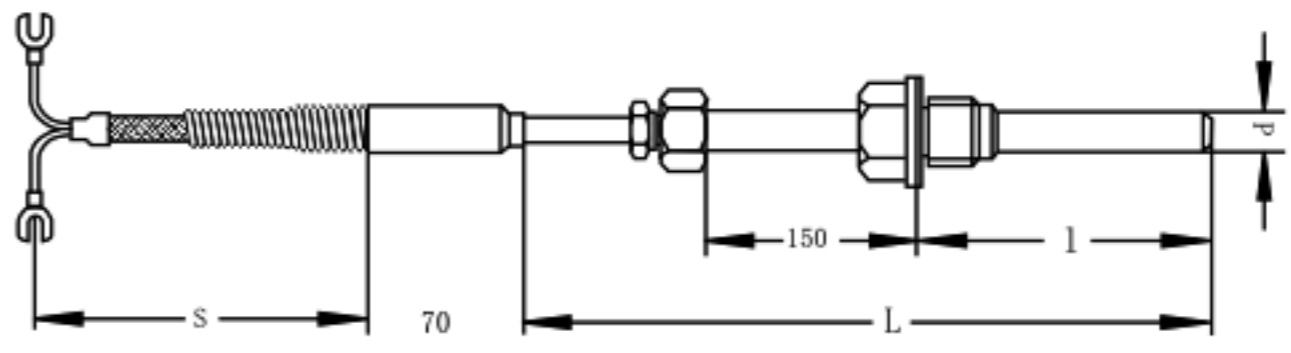
(2) The height “H” of the extraction tube and the length “L” of sheathed thermocouple shall be determined by users’ need.



## 固定螺栓直形保护管式热电偶、铂热电阻、铠装元件延长型

### Fixed Screw In Type TC And RTD With Straight Protection Tube And Extensible MITC And MIRTDT Element

型号 Model	分度号 Graduation Mark	测量范围(°C) Measuring Range(°C)	规格 Specification	
			d	l
WRNR-231631 WRNR <sub>2</sub> -231631	K	0~800	φ16	100 450
WRER-231631 WRER <sub>2</sub> -231631	E	0~600		150 500
				200 750
				250 1000
WZPR-231631 WZPR <sub>2</sub> -231631	Pt100	-200~+500		300 1250
			350 1500	
WZPR-231231 WZPR <sub>2</sub> -231231			φ12	400 2000



注：(1) 公称压力：10Mpa。

(2) 保护管材料：1Cr18Ni9Ti。

(3) 导线延长式，尾线长度“S”常规附带500mm，若需增加请注明尾线长度。

(4) 铠装元件引出长度“L”由用户自定。

(5) 直形保护管固定螺栓规格参阅安装图。

Note: (1) Normal Pressure:10MPa.

(2) Protection Tube Material:1Cr18Ni9Ti.

(3) Extension cable regularly comes with 500mm end cable “S”. Please specify the length of end cable, if different.

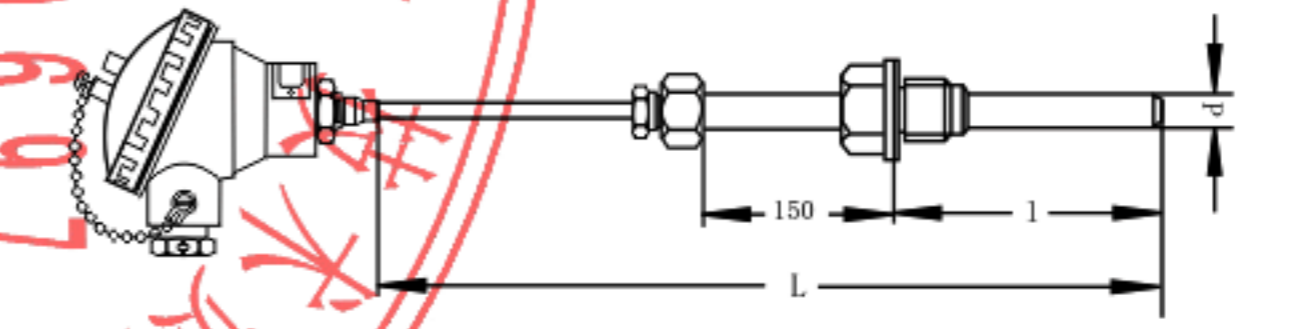
(4) User specifies the extension length of MITC and MIRTDT element.

(5) Refer to page 91, Fig 147 for specification of fixed screw-in straight protection tube.

## 固定螺栓直形保护管式热电偶、铂热电阻、铠装元件延长型

### Fixed Screw-In Type TC And RTD With Straight Protection Tube And Extensible MITC And MIRTDT Element

型号 Model	分度号 Graduation Mark	测量范围(°C) Measuring Range(°C)	规格 Specification	
			d	l
WRNR-231633 WRNR <sub>2</sub> -231633	K	0~800	φ16	100 450
WRER-231633 WRER <sub>2</sub> -231633	E	0~600		150 500
				200 750
				250 1000
WZPR-231633 WZPR <sub>2</sub> -231633	Pt100	-200~+500		300 1250
			350 1500	
WZPR-231233 WZPR <sub>2</sub> -231233			φ12	400 2000



注：(1) 公称压力：10Mpa。

(2) 保护管材料：1Cr18Ni9Ti。

(3) 铠装元件引出长度“L”由用户自定。

(4) 直形保护管固定螺栓规格参阅安装图。

Note: (1) Normal Pressure:10MPa.

(2) Protection Tube Material:1Cr18Ni9Ti.

(3) User specifies the extension length of MITC and MIRTDT element.

(4) Refer to for specification of fixed screw-in straight protection tube.

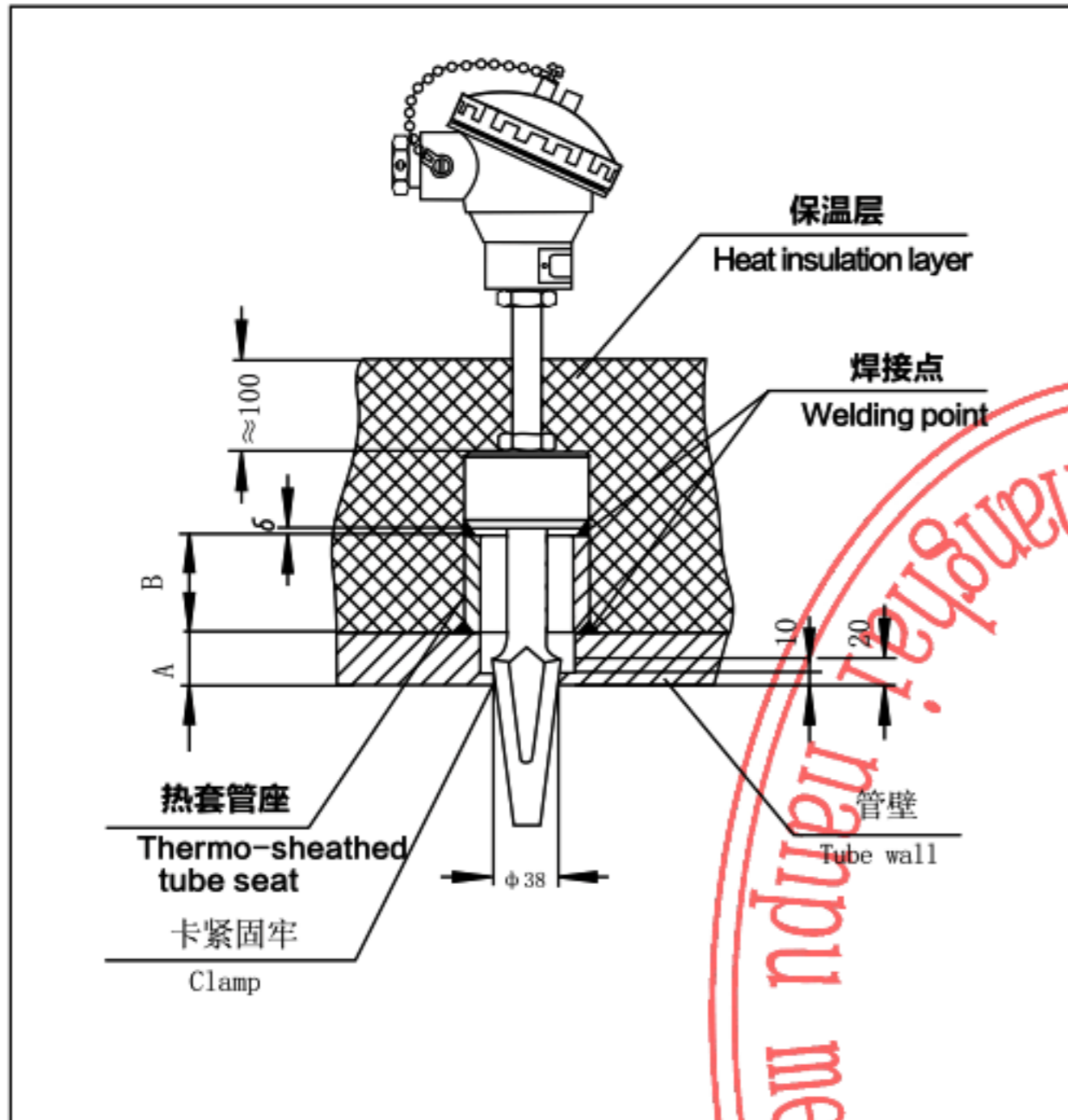


## 电站测温用热电偶、热电阻安装示意图

### INSTALLATION FIGURE OF TC AND RTD USED IN POWER STATION

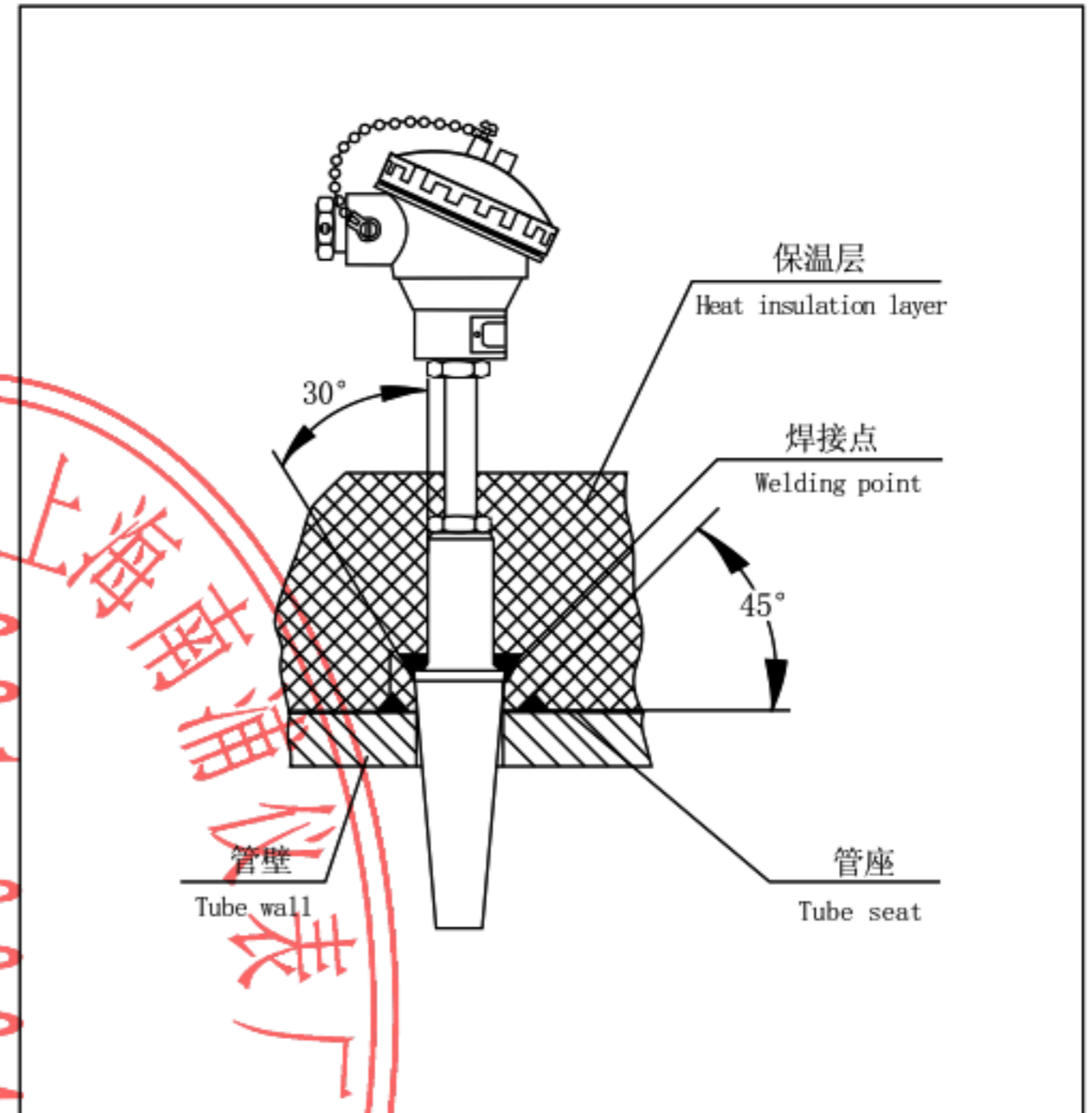
01型热套式热电偶、热电阻安装结构示意图

Installation Figure Of Thermo-Sheated Type 01  
TC And RTD



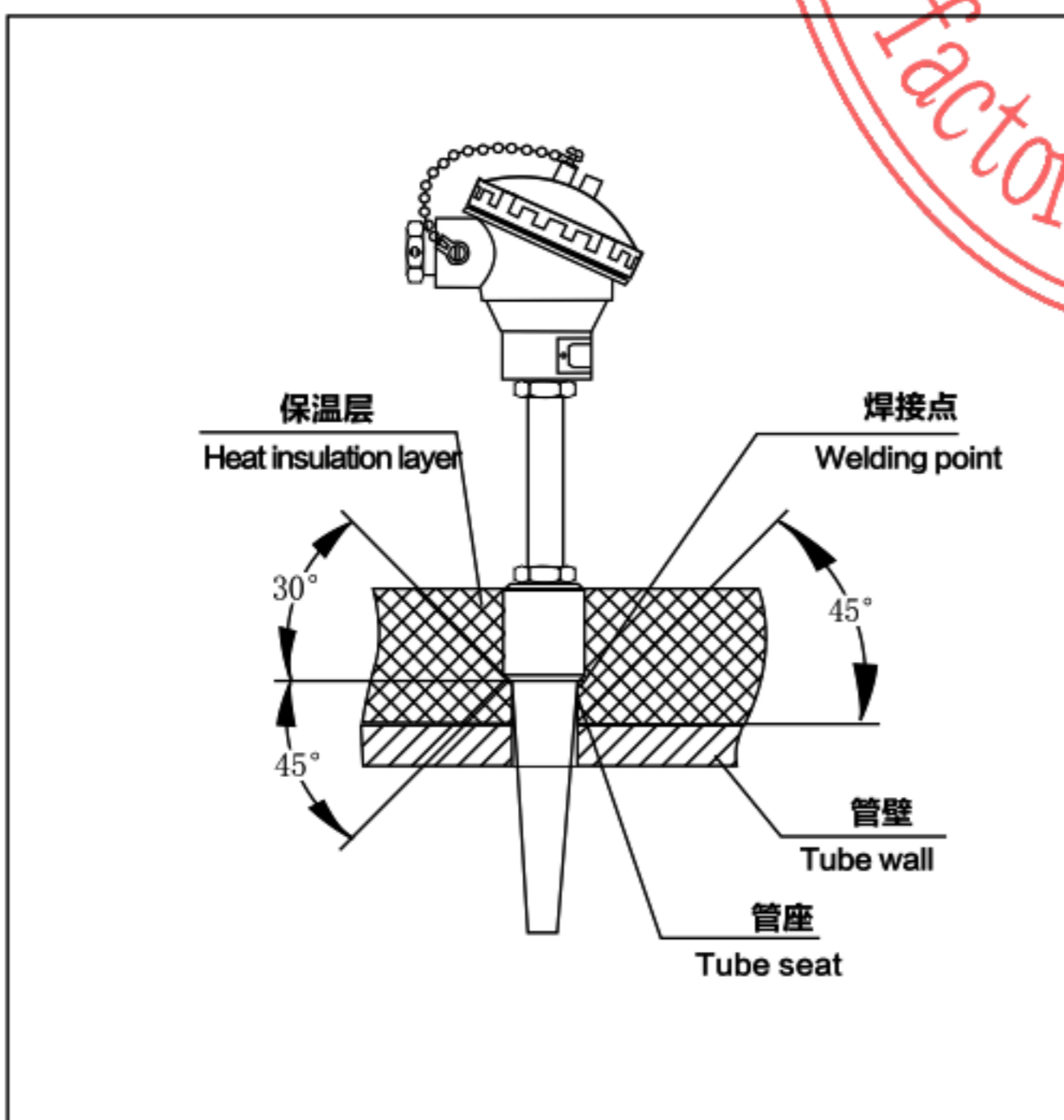
13型热电偶、热电阻安装结构示意图

Installation Figure Of Type 13 TC And RTD



14型热电偶、热电阻安装结构示意图

Installation Figure Of Type 14 TC And RTD



15型热电偶、热电阻安装结构示意图

Installation Figure Of Type 15 TC And RTD

