

益源



- 温度仪表
- Temperature Instrument

典型型号示例

W 温度仪表	SBW 温度变送器			
i 本安型				
R 热电偶	Z 热电阻			
感温元件材料				
K 镍铬-镍硅	T 铜-铜镍	S 铂铑10-铂		
E 镍铬-铜镍	J 铁-镍镍	R 铂铑13-铂		
B 铂铑30-铂铑6	P Pt100	C Cu50、Cu100		
K 普通铠装式	N 耐磨式	G 高压式	L 流体式	H 高温式
M 表面式	D 多点式	F 防腐式	HF 高温防腐式	T 裂解炉式
1--单支	2--双支	n--多点一体式		
铠丝直径	1--Φ1	2--Φ2	3--Φ3	
4--Φ4	5--Φ5	6--Φ6	8--Φ8	
过程连接形式				
1--无固定	2--固定螺纹	3G--活动卡套螺纹		
4G--固定法兰	5--焊接式			
接线盒/接线形式				
1--引线型	2--防溅型	3--防水型		
4--隔爆型	5--接插件型			
测量端形式				
0--绝缘型	1--露端型	2--接壳型		
附加装置				
FL--阻漏卡套	HS--高压密封			
DR--焊接片	G--拥箍	YH--压簧		
P--感温片	C--切断阀	CH--吹气式		
W i R K K 2 · 6 - 4G 4 0 A 4 2 F 8 500 FL				
法兰标准				
A--美标				
H--化工部				
G--国标				
J--机械行业标准				
S--石油化工部标准				
螺纹连接 M33×2、G 1"、M27×2				
法兰公称通径				
1--DN10 (1/4")	2--DN15 (1/2")			
3--DN20 (3/4")	4--DN25 (1")			
5--DN32 (1 1/4")	6--DN40 (1 1/2")			
7--DN50 (2")	8--DN60 (2 1/2")			
法兰公称压力				
1--CLASS 150 (PN2.0 MPa)	2--CLASS 300 (PN5.0 MPa)			
3--CLASS 600 (PN11.0 MPa)	4--CLASS 900 (PN15.0 MPa)			
5--CLASS 1500 (PN26.0 MPa)	6--CLASS 2500 (PN42.0 MPa)			
法兰密封面形式				
R--RF	M--凸面			
F--FF	T--T			
	W--凹面			
	G--G			
	J--RJ			
套管直径				
0--无套管	1--Φ10			
5--Φ18	6--Φ20			
	2--Φ12			
	7--Φ23			
	3--Φ14			
	8--Φ25			
	4--Φ16			
	9--Φ28			

Nomenclature

W	Temperature Instrument	SBW	Integrated Temperature Transmitter		
i Self safty					
R	Thermocouple	Z	RTD		
Thermo-sensor Type					
K	Chromel/Alumel	T	Copper/Constantan		
E	Chromel/Constantan	J	Iron/Constantan		
B	PtRh 70/30 - PtRh 94/6	P	Pt100		
S	PtRh 90/10 - Pt	R	PtRh 87/13 - Pt		
C	Cu50, Cu100				
K-General N-Abrasion-Proof G-High Pressure L-Liquid H-High Temp. M-Surface					
D-Multi-Point F-Anticorrosive HF-High Temp.&Anticorrosive T-Ethylene-Furnace					
1--Single	2--Double	n--Number of Multi-points sensor			
Sensor diameter	1--φ 1	2--φ 2	3--φ 3		
4--φ 4	5--φ 5	6--φ 6	8--φ 8		
Process Connection	0 --Special type				
1 --None	2 --Fixing Thread	3G--Socket Thread			
4G--Fixing Flange	5 --Welded				
Head Type/Electric Connection	0--None Head				
1--Lead Wire	2--Splash Proof	3--Water Proof			
4--Explosion-Proof	5--Socketed Connector				
Sensing Element					
0--Insulated	1--Exposed	2--Grounded			
Accessory					
FL--Leakage-Proof Socket	G--Hoop				
HS--High Pressure Seal					
DR--Edge	YH--Pressure Spring				
P--Fixed Block	C--Shut-Off Valve				
W i R K K 2 · 6 - 4G 4 0 A 4 2 F 8 500 FL					
Flange Standard					
A --U.S.A Standard					
H --Chinese Chemical Department Standard					
G --Chinese National Standard					
J --Chinese Engineering Industry Standard					
S --Chinese Petroleum & Chemical Department Standard					
Thread M33×2, G 1", M27×2					
Flange Nominal Bore					
1--DN10 (1/4")	2--DN15 (1/2")				
3--DN20 (3/4")	4--DN25 (1")				
5--DN32 (1 1/4")	6--DN40 (1 1/2")				
7--DN50 (2")	8--DN60 (2 1/2")				
Flange Pressure Rating Class					
1--CLASS 150 (PN2.0 MPa)	2--CLASS 300 (PN5.0 MPa)				
3--CLASS 600 (PN11.0 MPa)	4--CLASS 900 (PN15.0 MPa)				
5--CLASS 1500 (PN26.0 MPa)	6--CLASS 2500 (PN42.0 MPa)				
Flange Sealing Surface	R--RF F--FF	M--Male Face T--T	W--Female Face G--G J--RJ		
Thermowell Diameter	- 0--none 5--φ 18	1--φ 10 6--φ 20	2--φ 12 7--φ 23	3--φ 14 8--φ 25	4--φ 16 9--φ 28
Thermowell Length					

产品应用

通常和显示仪表、记录仪表、电子计算机等配套使用，直接测量各种生产过程中的流体介质以及固体表面的温度。热电偶的测温范围0~1600℃，热电阻 -200~550℃。由于它结构简单，价格低廉，维修方便广泛用于石油、化工、冶金、电力、机械、食品、塑料、热处理等工业部门，是最简单且可靠的常用接触式测温传感器。

工作原理

铠装热电偶的电极由两根不同材质的导线组成当测量端与参考端存在温差时就会产生热电势，工作仪表便显示出所对应的温度值。

铠装热电阻是利用物质在温度变化时，其电阻值也随着发生变化的特征来测量温度。当阻值发生变化时，工作仪表便显示出阻值所对应的温度值。

特点

热电偶

- 价格低廉
- 测量精度高，测量范围大
- 热响应时间短
- 直径小，长度不受限制，热电偶丝可弯曲
- 机械强度高，耐压性能好

热电阻

- 精度高
- 稳定性佳、重复性强
- 抗腐蚀能力强
- 线性好

Application

Thermo-sensors are usually used with display instruments, record instruments and (or) computers and so on to measure the fluid medium in production process and the solid surface temperature directly. The measurement range of TC is 0~1600℃ and that of RTD is -200~550℃. They are of simple structure, lower cost and easily fixed and thus are widely applied in industries such as petroleum, chemical, metallurgy, electric power, engineering, food, plastic, thermal treatment and etc. They are the most common touched thermal sensors

Principle

Thermocouple consists of two different metal joined to form an electrical circuit. One junction is exposed to the temperature to be measured, the other is at room temperature. A voltage is generated and varies with changes of the temperature difference between the two junctions.

RTD is a resistance temperature Detector. temperature measurement is given by the electrical resistance variation of a metal wire, in general of platinum.

Characters

Thermocouple

- lower price
- high accuracy, wider measurement range
- fast response time
- small dimensions, no length limitation
- rugged

Platinum RTD

- high accuracy
- best stability & repeatability
- good corrosion resistance
- good linearity

热电偶与热电阻的比较

评测标准	热电偶	热电阻	Criteria	TC	RTD
可替换性	良好	优秀	Interchangeability	good	excellent
重复性	一般至中等	优秀	Repeatability	poor to fair	excellent
精度	中等, ± 1.5...5℃	高, ± 0.01...5℃	Accuracy	medium ± 1.5...5℃	high ± 0.1...1.5℃
稳定性	误差0.5℃/年	小于0.1℃/5年	Stability (typical)	0.5℃ error/ year	<0.1℃ error/ 5year
灵敏度	低, 10...100 μV/℃	中等, ~0.4 Ω/℃ Pt100	Sensitivity	10...100 μV/℃	~0.4 Ω/℃ for Pt100
响应时间	中等..快速	中等..快速		lower	moderate
自发热	N/A	非常低	Response time	medium to very fast	medium... Fast
测量元件最小插入深度	根据铠套直径 0.5...12mm	15...30mm	Self heating	N/A	very low ... low
线性度	一般	非常好	min. insertion length of sensing element	dimension: ~Φ sheath 0.5 mm to 12 mm	15...30mm
测量范围	0...+1600℃	-200...+550℃	Linearity	poor	very good
铠装式最小直径	0.5mm	3mm	Temperature range	0...+1600℃	-200...+550℃
			min. diameter for sheathed execution	0.5mm	3mm

主要技术参数

廉金属热电偶分度表 Thermocouples industrial grades

J-type	K-type	T-type	E-type
铁-铜镍 价格低 电势高(低于E型) 线性良好	镍铬-镍硅 应用广, 标准传感 比E、J、T型便宜 抗还原性较差	铜-铜镍 耐腐蚀性好, 精密度高 稳定性好, 灵敏、价格低, 常 用于氧化和还原环境, 抗潮性 好。0°C以下线性好, 适用于低 温测量。	镍铬-铜镍 电势高 导热性低 极佳的抗腐蚀性, 可用于氧化 环境, 输出信号强。
测温范围:-130...+750°C 推荐使用:0...+600°C	测温范围:-50...+1300°C 推荐使用:0...+1200°C	测温范围:-190...+400°C 推荐使用:-100...+350°C	测温范围:-100...+850°C 推荐使用:-40...+750°C
Iron/Constantan Fe-CuNi low cost High EMF(lower than "E") good linearity	Chromel/Alumel NiCr-Ni Mostly used, std. Sensor Less expensive than E,J,T Low resistance to reducing (low oxygen) environment	Copper/Constantan Cu-CuNi High resistance to corrosion High precision & good stability Sensitive & inexpensive used in oxidizing & reducing environment, resistant against moisture, good linearity below 0°C, good for cryogenic meas.	Chromel/Constantan NiCr-CuNi Highest EMF Low thermal conductivity Excell.corrosion resistance can be used in oxidizing environment, high signal output.
Range:-130...+750°C Recom:0...+600°C	Range:-50...+1300°C Recom:0...+1200°C	Range:-190...+400°C Recom:-100...+350°C	Range:-100...+850°C Recom:-40...+750°C

廉金属热电偶精度——执行标准 IEC 584

Precision according to IEC 584

J-type	K-type	T-type	E-type
I 级: $\pm 1.5^\circ\text{C}$ 或 $0.4\% t $	I 级: $\pm 1.5^\circ\text{C}$ 或 $0.4\% t $	I 级: $\pm 0.5^\circ\text{C}$ 或 $0.4\% t $	I 级: $\pm 1.5^\circ\text{C}$ 或 $0.4\% t $
II 级: $\pm 2.5^\circ\text{C}$ 或 $0.75\% t $	II 级: $\pm 2.5^\circ\text{C}$ 或 $0.75\% t $	II 级: $\pm 1.0^\circ\text{C}$ 或 $0.75\% t $	II 级: $\pm 2.5^\circ\text{C}$ 或 $0.75\% t $
Class 1: $\pm 1.5^\circ\text{C}$ or $0.4\% t $	Class 1: $\pm 1.5^\circ\text{C}$ or $0.4\% t $	Class 1: $\pm 0.5^\circ\text{C}$ or $0.4\% t $	Class 1: $\pm 1.5^\circ\text{C}$ or $0.4\% t $
Class 2: $\pm 2.5^\circ\text{C}$ or $0.75\% t $	Class 2: $\pm 2.5^\circ\text{C}$ or $0.75\% t $	Class 2: $\pm 1.0^\circ\text{C}$ or $0.75\% t $	Class 2: $\pm 2.5^\circ\text{C}$ or $0.75\% t $

贵金属热电偶分度表 Thermocouples noble metal B,R,S

S-type	B-type	R-type
铂铑 90/10 - 铂 在高温及氧化环境下呈化学惰性 不用于+18°C 以下温度测量 最高适用温度1500°C(长期), 1760°C(间歇)	铂铑 70/30 - 铂铑 94/6 当操作条件与S型和R型相同时偏差较小 价格最高 最高适用温度达1800°C	铂铑 87/13 - 铂 略好于S型 价格高于S型 最高适用温度1500°C(长期), 1760°C(间歇)
PtRh 90/10 - Pt Chemically inert at high temp. In oxidizing environment Not to use below +18°C Max. Temp. 1500°C cont. Or 1760°C intermittent	PtRh 70/30 - PtRh 94/6 Less drift when operating under same conditions as S- and R-type Highest price Max. Temp. 1800°C	PtRh 87/13 - Pt Slightly better than S-type Higher price than S-type Max. Temp. 1500°C cont. Or 1760°C intermittent

贵金属热电偶精度——执行标准 IEC 584 Precision according to IEC 584

S-type	B-type	R-type
II 级: $\pm 1.5^\circ\text{C}$ 或 $0.25\% t $	II 级: $\pm 1.5^\circ\text{C}$ 或 $0.25\% t $	II 级: $\pm 1.5^\circ\text{C}$ 或 $0.25\% t $
Class 2: $\pm 1.5^\circ\text{C}$ or $0.25\% t $	Class 2: $\pm 1.5^\circ\text{C}$ or $0.25\% t $	Class 2: $\pm 1.5^\circ\text{C}$ or $0.25\% t $

*测温范围°C, 仅对热电偶传感器元件而言, 不同的套管材质, 结构和使用场合, 实际使用温度各有不同。
Range(°C), just for the element of thermo sensor, in different thermowell material, construction,
working area, the range of temperature will be different.

铠装热电偶元件测量端形式 Sheathed thermocouple sensing element type

代号 NO	形式 Type	结 构 Construction	特 点 Functions and Features	铠套直径(Diameter)	
				单支 Single	双支 Double
0	绝缘型 Insulated		1. 反应速度比接壳形慢。 2. 使用寿命长。 3. 防电干扰。 1. Response slower than the grounded 2. Longer working life 3. Electronic interference resistance	$\phi 0.5 \sim \phi 8.0$	$\phi 3.0 \sim \phi 8.0$
1	接壳型 Grounded		1. 反应速度较快。 2. 不适合有电干扰的场合。 1. Response faster than the insulated 2. Not in elec. interference environment	$\phi 0.5 \sim \phi 8.0$	$\phi 3.0 \sim \phi 8.0$
0	露端型 Exposed		1. 反应速度快 2. 适合测量发动机的排气等气体温度。 3. 与其它测量结构相比机械强度差。 1. Response the fastest 2. Good at engine exhaust gas measurement 3. Poorer mechanical strength	$\phi 0.5 \sim \phi 8.0$	$\phi 3.0 \sim \phi 8.0$

工业铂电阻分度表 Industry Platinum Resistance Grade

Pt1000	Pt100	Cu100	Cu50
测温范围: -200...+550°C A 级: $\pm (1.5 \pm 0.2\% t)$ B 级: $\pm (3.0 \pm 0.5\% t)$	测温范围: -200...+550°C A 级: $\pm (1.5 \pm 0.2\% t)$ B 级: $\pm (3.0 \pm 0.5\% t)$	测温范围: -50...+150°C B 级: $\pm (3.0 \pm 0.6\% t)$	测温范围: -50...+150°C B 级: $\pm (3.0 \pm 0.6\% t)$
Range: -200...+550°C Class A: $\pm (1.5 \pm 0.2\% t)$ Class B: $\pm (3.0 \pm 0.5\% t)$	Range: -200...+550°C Class A: $\pm (1.5 \pm 0.2\% t)$ Class B: $\pm (3.0 \pm 0.5\% t)$	Range: -50...+150°C Class B: $\pm (3.0 \pm 0.6\% t)$	Range: -50...+150°C Class B: $\pm (3.0 \pm 0.6\% t)$

铠装热电阻元件测量端形式 Sheathed temperature resistance sensing element type

结 构 Construction	特 点 Functions and Features	铠套直径 Diameter	附 注 Remark
	1. 温度波动及长期应用时稳定性高。 2. 温度线性输出信号。 3. 抗氧化，高精度，对导线电阻进行内部补偿。 1.Highly stable resistance on temp. Cycling & overtime 2.Temperature linear output signal 3.Resisting oxidizing environment High accuracy Internal compensation of lead wire resistance	$\phi 2 \sim \phi 8mm$	测量端80mm内不得弯曲 80mm of the end of sensing element can not be bended

应 用

- 1.适用于一般生产过程，介质温度的测量与控制。
- 2.适用介质范围广：气态、液态及非磨损介质。

Application

1. Use for the medium temperature measurement and control in general production process
2. For a wide range of media :vapours , gases, liquids, non-abrasive substances.



技术参数

1. 测量元件

热电偶

分度号: K、E、T、J (可选)

精 度: I, II

热电阻

分度号: Pt100、Pt500

精 度: A, B

测量端型式: 绝缘型、接壳型和露端型

固定方式: 用户指定

铠套外径 Φ : 0.5...10mm (热电偶)

2.0...10mm (热电阻)

2. 接线盒

型 式: 防溅型、防水型、防爆型

材 质: 不锈钢(304)、铝合金、全塑

防护等级: IP65...IP68

防爆等级: d II CT4/CT5/BT4

本安型防爆等级: ia II CT4/CT5

电气接口: M20×1.5, 1/2" NPT或按用户要求配置

3. 过程连接型式:

固定法兰式、活动法兰式、固定螺纹式、活动螺纹式、卡套活动螺纹、法兰卡套螺纹、无固定装置等可选。

4. 外保护套管型式

根据设计规范、工况条件选用或由用户指定。

5. 法兰、套管材质:

常用材质: 304、321、316SS、316L、317SS、310SS、347。

6. 附 件: 根据用户要求配置。

7. 一体化温度变送器可选。

Technical Data

1. Sensing Element

Thermocouple-----Grade: K, E, T, J

Accuracy: Class 1, 2

RTD-----Grade: Pt100, Pt500

Accuracy: Class A, B

Type of Sensing Element: Insulated, Grounded, Exposed.

Mounting Type: As customer request.

Diameter of sheathed sensing element:

Thermocouple: 0.5...10mm

RTD: 2.0...10mm

2. Terminal Head:

Type: Splash-proof, Water-proof, Explosion-proof

Material: Stainless Steel 304, Aluminum, Full Plastic.

Degree of Protection: IP65...IP68

Degree of Explosion Proof: d II CT4/CT5/BT4

Self-safety Type: ia II CT4/CT5

Cable Entry: M20×1.5, 1/2" NPT or as customer request.

3. Process Connection Type:

Fixed Flanged, Moveable Flanged, Fixed Thread, Moveable Thread, Moveable Socket Thread, Flanged Socket Thread, No Process Connection and so on.

4. Thermowell Type:

Choice of thermowell chosen based relative to the design specifications and working conditions or as customer request.

5. Materials of Flange and Thermowell:

Materials in common use : 304, 321, 316SS, 316L, 317SS, 347, 310SS.

6. Accessory: As customer request.

7. Integrated temperature transmitter can be optional.

应 用

- 1.适用于高压、高温生产过程中的温度测量与控制。
- 3.过程连接：法兰式和焊接式。

Application

- 1.used in high pressure and high temperature environment for temperature measurement and control
- 2.Process Connection: Flanged and welded.



法兰式高压热电偶(阻)
Flanged Type

焊接式高压热电偶(阻)
Welded Type

技术参数

1. 工作压力: >600Lb(约11MPa), <2500Lb(约42MPa)
根据工艺介质的压力、温度、流速，综合选用压力等级标准。

2. 测温范围：
热电偶 0~1000°C, 热电阻 -200~550°C。

3. 接线盒
型 式：防水型、防爆型
材 质：不锈钢(304)、铝合金
防 护 等 级：IP65...IP68
防 爆 等 级：d II CT4/CT5/BT4
本 安 型 防 爆 等 级：ia II CT4/CT5
电 气 接 口：M20×1.5, 1/2" NPT或按用户要求配置

4. 法兰套管的选用
根据设计标准、工艺要求，测量介质的压力、温度、流速及相关参数进行振动频率计算选用相应的法兰标准和保护套管结构形式、材质。法兰套管采用锻件整体钻孔，并进行相应的工艺处理

常用材质：304、321、316、316L、317、347、310SS。

5. 一体化温度变送器可选。

规格型号 SPECIFICATION

型 号 Model	分 度 号 Graduation	过程连接 Process Conn.	精度等级 Precision
WRKG	K	固定法兰/ 焊接式 Flanged/ Welded	I, II
WREG	E		
WZPG	Pt100,Pt500 Pt1000		A, B

Technical Data

1. Pressure Range: >600Lb (about 11MPa),
<2500Lb(about 42MPa).

Pressure grade and standard

Choice of pressure ratings relative to pressure, temperature, velocity of the medium.

2. Temperature Range:
TC 0~1000°C, RTD -200~550°C.

3. Terminal Head:

Type: Water-proof, Explosion-proof.

Material: Stainless Steel 304, Aluminum.

Degree of Protection: IP65...IP68

Degree of Explosion Proof: d II CT4/CT5/BT4

Self-safety Type: ia II CT4/CT5

Cable Entry: M20×1.5, 1/2" NPT or as customer request.

4. Thermowell & Flange

Choosing appropriate flange and thermowell according to the design standards and production requirements and the vibration frequency calculation of the pressure, temperature, velocity and other relevant data of the medium. Using vollbohren drilling to manufacture flange and thermowell.

Materials in common use : 304,321,316,316L,317,347,310SS.

5. Integrated temperature transmitter can be optional.

应 用

1.适用于各种腐蚀性介质中的温度测控。

Application

1. Use in a variety of corrosive environment for temperature measurement and control.

规格型号 Model Type

型 号 Model	分 度 号 Graduation	过程连接 Process Conn.	精度等级 Precision
WZPF□-130	Pt100, Pt500, Pt1000	无 no process conn.	A, B
WZCF□-130	Cu50, Cu100	固定法兰 fixed flange	
WZPF□-4G30	Pt100, Pt500, Pt1000	固定法兰 fixed flange	
WZCF□-4G30	Cu50, Cu100	固定法兰 fixed flange	
WRKF□-130	K	无 no process conn.	I, II
WREF□-130	E		
WRJF□-130	J		
WRTF□-130	T		
WRKF□-4G30	K	固定法兰 fixed flange	I, II
WREF□-4G30	E		
WRJF□-4G30	J		
WRTF□-4G30	T		



技术参数

1. 接线盒

型 式: 防水型、防爆型
材 质: 不锈钢(304)、铝合金
防护等级: IP65...IP68
防爆等级: dⅡ CT4/CT5/BT4
本安型防爆等级: iaⅡ CT4/CT5
电气接口: M20×1.5, ½" NPT或按用户要求配置

2. 法兰套管的选用

根据介质的腐蚀特性、温度、压力、流速等综合参数，选用相应的法兰标准、材质和套管的结构形式和材质。

常用金属类材质：

Ni、Ti、Ta、哈氏合金B、哈氏合金C等。

选用非金属类材质：

PTFE、衬氟PFA、F46等。(使用温度 <120℃)

3. 一体化温度变送器可选。

Technical Data

1. Terminal Head:

Type: Water-proof, Explosion-proof.
Material: Stainless Steel 304, Aluminum.
Degree of Protection: IP65...IP68
Degree of Explosion Proof: dⅡ CT4/CT5/BT4
Self-safety Type: iaⅡ CT4/CT5
Cable Entry: M20×1.5, ½" NPT or as customer request.

2. Thermowell & Flange

According to the corrosion condition, temperature, pressure, flow velocity of the medium, choosing appropriate flange standard, thermowell type and materials.

Corrosive proof metal materials in common use: Ni, Ti, Ta, Hastelloy-B, Hastelloy-C and so on.

Corrosive proof non-metal materials in common use for thermowell covering: PTFE, PFA, F46 and so on.(working temperature <120℃)

3. Integrated temperature transmitter can be optional.

应用

1. 用于各种高温生产过程的测量与控制。
2. 适用于焚烧炉、加热炉等低压、低腐蚀性介质的工况环境。

Application

1. Use in high temperature environment for temperature measurement and control.
2. For a wide range of media :vapours , gases, liquids, non-abrasive substances.



规格型号 Model Type

型 号 Model	分 度 号 Graduation	测温范围 Temp. Range	过程连接 Process Conn.	精度等级 Precision
WRSH□-4G30	S	0~1600℃	固定法兰 fixed flange	I , II
WRRH□-4G30	R	0~1600℃		
WRBH□-4G30	B	0~1700℃		
WRSH□-4G40	S	0~1600℃		
WRRH□-4G40	R	0~1600℃		
WRBH□-4G40	B	0~1700℃		

技术参数

1. 测温范围: 0~1600℃。

2. 接线盒

型 式: 防水型、防爆型

材 质: 不锈钢(304)、铝合金

防 护 等 级: IP65...IP68

防 爆 等 级: d II CT4/CT5/BT4

本 安 型 防 爆 等 级: ia II CT4/CT5

电 气 接 口: M20×1.5, ½" NPT或按用户要求配置

3. 根据设计标准、工艺要求选用相应的法兰标准和外保护套管材质、形式。

800℃<使用温度<1150℃，金属类材质: 310SS、GH3030、GH3039、Inconel600、Inconel800、Inconel800H和3YC52。

900℃<使用温度<1600℃，陶瓷类套管: 高铝管、刚玉管、MoSi₂、SiC。

4. 一体化温度变送器可选。

Technical Data

1. Temperature Range: 0~1600℃.

2. Terminal Head:

Type: Water-proof, Explosion-proof.

Material: Stainless Steel 304, Aluminum.

Degree of Protection: IP65...IP68

Degree of Explosion Proof: d II CT4/CT5/BT4

Self-safety Type: ia II CT4/CT5

Cable Entry: M20×1.5, ½" NPT or as customer request.

3. Thermowell & Flange

Choice of flange and thermowell relative to different design standards and requirements.

800 ℃<Working temperature<1150℃, Metal materials : 310SS, GH3030, GH3039, Inconel600, Inconel800, Inconel800H and 3YC52.

800℃<Working temperature<1600℃, Ceramic materials : Alumina tube, Alundum tube, MoSi₂, SiC.

4. Integrated temperature transmitter can be optional.

应 用

1. 用于各种高温、高压、腐蚀性介质的工况环境。

Application

1. Used in high pressure, high temperature and corrosive environment.

技术参数

1. 接线盒

型 式: 防水型、防爆型
材 质: 不锈钢(304)、铝合金
防护等级: IP65...IP68
防爆等级: d II CT4/CT5/BT4
本安型防爆等级: ia II CT4/CT5
电气接口: M20×1.5, 1/2" NPT或按用户要求配置

Terminal Head

Type: Water-proof, Explosion-proof.
Material: Stainless Steel 304, Aluminum.
Degree of Protection: IP65...IP68
Degree of Explosion Proof: d II CT4/CT5/BT4
Self-safety Type: ia II CT4/CT5
Cable Entry: M20×1.5, 1/2" NPT or as customer request.

2. 法兰套管的选用 Thermowell & Flange

根据设计标准和工况环境选用相应的法兰标准和保护套管的材质及结构形式。

800℃ < 使用温度 < 1100℃, 金属类材质: GH3039、Inconel600、Inconel800、Inconel800H和3YC52。

1100℃ < 使用温度 < 1600℃, 选用陶瓷类套管。

Choice of flange and the thermowell relative to design standards and production requirements.

800℃ < Working Temp. < 1100℃, Metal materials: GH3039, Inconel600, Inconel800, Inconel800H and 3YC52.

1100℃ < Working Temp. < 1600℃, Ceramic thermowell.

3. 一体化温度变送器可选。

Integrated temperature transmitter can be optional.



应用典型 Example of Application

1. 高温、防腐蚀热电偶 :

适用于高温、强腐蚀的工况环境,

如炼油厂硫磺回收装置, 天然气净化装置, 长期工作温度1200~1300℃, 峰值可达1600℃, 强硫化氢腐蚀。

1.High temperature, corrosive proof Thermocouple

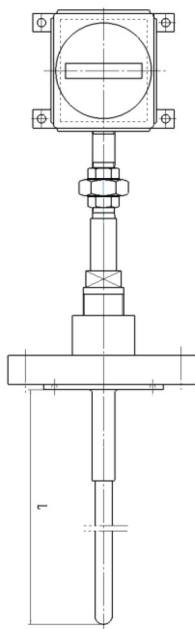
Used in high temperature, strong corrosive environment.

Exp. petroleum refinery sulfur recovery facility and natural gas conditioning facility, whose normal working temperature is 1200~1300℃ and peak temperature is 1600℃, are in strong hydrogen sulfide corrosion condition.

规格型号 Model Type

型 号 Model	分 度 号 Graduation	测温范围 Temp. Range	过程连接 Process Conn.	精度等级 Precision
WRSHF□	S	0~1600℃	固定法兰 fixed flange	I, II
WRRHF□	R	0~1600℃		
WRBHF□	B	0~1700℃		

2. 高温、高压热电偶：



适用于高温高压，有一定腐蚀的工况环境，如气化炉用热电偶，工作温度1200~1500℃，工作压力6~10MPa，工艺介质为硫化氢混合性腐蚀气体。采用先进的高压密封技术，确保在外保护套管损坏的情况下工艺介质不泄露。

2. High temperature, high pressure thermocouple

Used in high temperature, high pressure and corrosive environment.

Exp. Gasification Furnace, normal working temperature is 1200~1500℃, working pressure is 6~10MPa, medium is mixed sulfureted hydrogen gas. Advanced high duty seal technology is applied to ensure that the medium will not leak when thermowell is broken.

规格型号 Model Type

型 号 Model	分 度 号 Graduation	测温范围 Temp. Range	过程连接 Process Conn.	精度等级 Precision
WRSHF□-HS	S	0~1600℃	固定法兰 fixed flange	I, II
WRRHF□-HS	R	0~1600℃		
WRBHF□-HS	B	0~1700℃		

3. 气体保护式高温防腐热电偶

适用于高温腐蚀性工况环境，氮气在一定压力下隔离排放腐蚀性介质，保护测温元件的正常工作。

3. High temperature, corrosive proof , gas shield typed Thermocouple

Used in high temperature, strong corrosive environment.

Exp. Under certain pressure, Nitrogen gas discharges corrosive medium to ensure the normal working of sensing element .

规格型号 Model Type

型 号 Model	分 度 号 Graduation	测温范围 Temp. Range	过程连接 Process Conn.	精度等级 Precision
WRSHF□-CH	S	0~1600℃	固定法兰 fixed flange	I, II
WRRHF□-CH	R	0~1600℃		
WRBHF□-CH	B	0~1700℃		



应 用

1. 适用于各种高流速介质和介质中的颗粒状物质冲刷侵蚀的工况环境。

Application

1. Use in high flow velocity medium or medium with granular material environment for temperature measurement and control.

技术参数

1. 测量端形式: 绝缘型和接壳型

2. 耐磨端根据不同介质的工艺状况, 选用不同的耐磨材质和制作工艺。一般采用铸造、锻压、喷焊和堆焊不同材质的耐磨、耐高温、耐腐蚀硬质合金。

3. 接线盒

型 式: 防水型、防爆型

材 质: 不锈钢(304)、铝合金

防护等级: IP65...IP68

防爆等级: d II CT4/CT5/BT4

本安型防爆等级: ia II CT4/CT5

电气接口: M20×1.5, 1/2" NPT或按用户要求配置

4. 一体化温度变送器可选。

Technical Data

1. Sensing element: insulated and grounded

2. According to the different medium ,choosing appropriate abrasion proof materials and manufacturing process to produce the part of abrasion proof of thermowell. Foundry, forging, spray welding, bead welding different abrasion proof, heat resistance and corrosive proof hard alloy are usually in common use.

3. Terminal Head:

Type: Water-proof, Explosion-proof.

Material: Stainless Steel 304, Aluminum.

Degree of Protection: IP65...IP68

Degree of Explosion Proof: d II CT4/CT5/BT4

Self-safety Type: ia II CT4/CT5

Cable Entry: M20×1.5, 1/2" NPT or as customer request.

4. Integrated temperature transmitter can be optional.

应用典型

1. 乙烯裂解炉区高温耐磨热电偶

乙烯裂解炉区正常使用温度800...850°C, 保护套管受到高流速冲刷侵蚀, 耐磨端采用先进技术、材料、工艺制造, 结构符合流体力学原理, 流阻小, 热响应快, 寿命长, 运行安全可靠。

1. Ethylene Cracking Furnace High Temp. and Abrasion-proof Thermocouple.

The normal working temperature of Ethylene Cracking Furnace is 800...950°C, and thermowell is eroded by medium of high flow velocity

Advanced technology and materials are used to produce the part of abrasion proof to ensure low flow resistance, fast response, and long working life .



规格型号 Model Type

型 号 Model	分 度 号 Graduation	测温范围 Temp. Range	精度等级 Precision
WRKT□	K	0~1200°C	I
WRST□	S	0~1600°C	



2. 炼油厂催化裂化专用耐磨热电偶

炼油厂催化裂化装置正常使用温度600...700℃，保护套管受到催化剂冲刷侵蚀，保护套管采用表面喷焊、堆焊耐磨硬质合金，并带有防泄露装置(切断阀或阻漏卡套)。

2. Petroleum Refinery Catalytic Cracking Facility Use Abrasion Proof Thermocouple

The normal working temperature of Petroleum Refinery Catalytic Cracking Facility is 600...700℃. Thermowell is eroded by catalyst, so the thermowell has special leak proof facility (shutoff valve or leak proof socket) can be optional.

规格型号 Model Type

型 号 Model	分 度 号 Graduation	测温范围 Temp. Range	精度等级 Precision
WRKN□-FL	K	0~800℃	I , II
WRKN□-C			
WRKN□-FL	E	0~750℃	
WRKN□-C			

3. 电厂硫化床用热电偶

电厂硫化床区正常使用温度900...1100℃，保护套管受到矿物质颗粒的高速冲刷，耐磨端采用锻材表面堆焊耐高温、耐磨硬质合金。

3. Fluidized-bed Use Thermocouple

The normal working temperature of Fluidized-bed is 900...1100℃. Thermowell is eroded by high flow velocity mineral matter, So the surface of the thermowell is spray welded or bead welded by hard alloy of high temperature resistance and abrasion proof.



规格型号 Model Type

型 号 Model	分 度 号 Graduation	测温范围 Temp. Range	精度等级 Precision
WRKN□	K	0~1200℃	I , II
WRSN□	S	0~1600℃	

应 用

- 1.用于测量工艺管道、反应器、焚烧炉内外表面和大型设备的轴瓦轴承的表面温度。
- 2.根据工作压力、温度、腐蚀等工艺状况，选用不同压力等级、材质、连接方式，测量端形式和固定方式。(详见下图所示)

Application

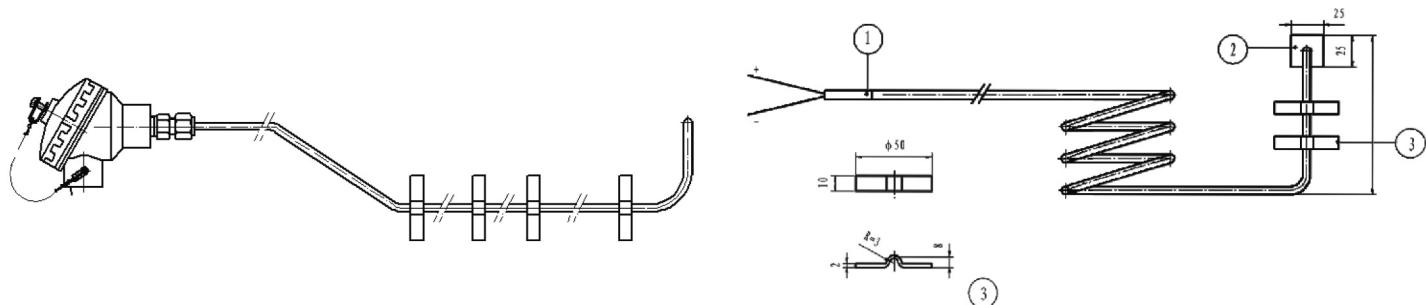
1. Use for the temperature measurement of the inner and outer surface of the process pipe line, reactor, incinerator and the surface temperature measurement of the bearing of large devices.
2. Choice of pressure rating, materials ,process connection, sensing element and mounting type of the surface TC or RTD relative to the working pressure, temperature, corrosive conditions of devices. (See below)A

技术参数

1. 测量元件: 绝缘型和接壳型
2. 精度等级: 热电偶 I, II 热电阻 A, B
3. 测量元件直径: 热电偶 $\phi 0.5\ldots\phi 12.7\text{mm}$
热电阻 $\phi 2.0\ldots\phi 12.7\text{mm}$
4. 一体化温度变送器可选。

Technical Data

1. Sensing Element: Insulated , Grounded
2. Precision: TC--Class1,2 ; RTD--CLASS A, B
3. Dimension: TC $\phi 0.5\ldots\phi 12.7\text{mm}$
RTD $\phi 2.0\ldots\phi 12.7\text{mm}$
4. Integrated temperature transmitter can be optional.

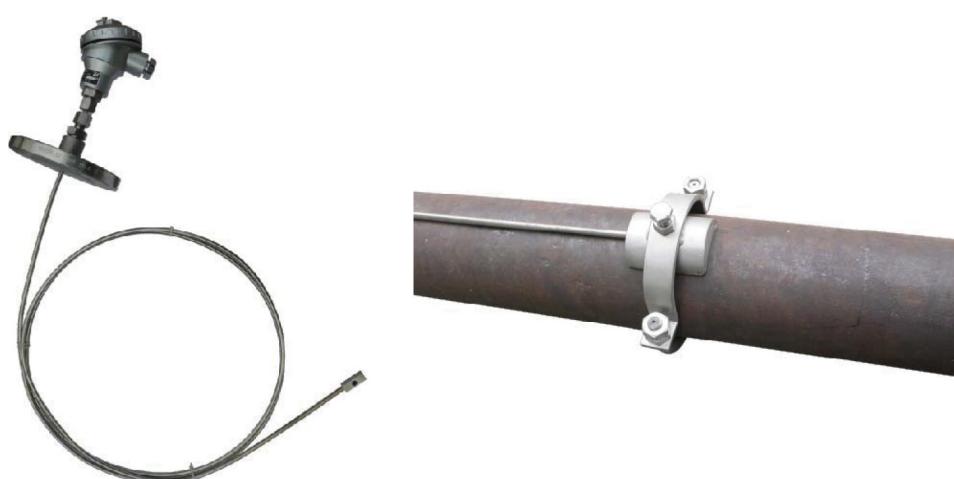


表面热电偶(阻)安装及应用形式 Mounting and Application Type

1. 螺栓固定式表面热电偶(阻)
Screw bolt mounting

2. 抱箍式安装表面热电偶(阻)
Hoop mounting

3. 焊接式安装表面热电偶(阻)
Welded mounting



3. 轴承、轴瓦热电偶(阻)
Bearing surface thermocouple & RTD



4. 微细铠装热电偶
Micro sheathed thermocouple



规格型号 Model Type

仪表名称 Name	型号 Model	分度号 Grade	测温范围℃ Range	精度等级 Precision	安装形式 Mounting	备注 Remark		
螺栓固定式表面热电偶(阻) Bolt Mounting Type Thermocouple & RTD	WRKM-031P	K	0~800	I, II	螺栓固定 Bolt Mounting			
	WREM-031P	E	0~600					
	WRJM-031P	J	0~600					
	WRTM-031P	T	-40~300					
焊接式安装表面热电偶(阻) Welded Mounting Type Thermocouple & RTD	WRKM-4G30DR	K	0~800	I, II	焊接固定 Weld Mounting			
	WREM-4G30DR	E	0~600					
	WZPM-4G30DR	Pt100	-200~550	A, B				
抱箍式安装表面热电偶(阻) Hoop Mounting Type Thermocouple & RTD	WRKM-031G	K	0~400	I, II	抱箍固定 Hoop Mounting			
	WREM-031G	E	0~400					
	WRJM-031G	J	0~400					
	WRTM-031G	T	-40~300					
轴承、轴瓦热电偶(阻) Bearing Surface Thermocouple & RTD	WRKM□-3G30	K	0~300	I, II	卡套螺纹 Socket Thread			
	WRTM□-3G30	E	0~300					
	WZPM□-3G30	Pt100	0~150	A, B	A, B	压簧式 Compression Spring		
	WZPM-210YH	Pt100	-150~200	A, B				
	WZCM-210YH	Cu50,Cu100	-50~150					
	WZPM□-110	Pt100	-150~200					
	WZCM□-110	Cu50,Cu100	-50~150					
	WZPM□-230	Pt100	-150~200					
	WZCM□-230	Cu50,Cu100	-50~150					
微细铠装热电偶 Micro Sheathed Thermocouple	WRKM-112	K	0~600	I, II	公称直径(mm) Diameter Φ 0.25 Φ 0.5 Φ 1.0 Φ 1.5	弯曲半径(mm) bending radius $R \geq \Phi 0.5$		
	WRKM-112	K	0~400					

应 用

用于不同工艺阶层温度的测量与控制。

Application

Use for different levels of vessels temperature measurement and control.

技术参数

1. 测量端形式: 绝缘型和接壳型
2. 测温点数: 2...36点。
3. 测量元件外径: 热电偶 $\phi 0.5\ldots\phi 8.0\text{ mm}$
热电阻 $\phi 2.0\ldots\phi 8.0\text{ mm}$
4. 材质选用: 304, 321, 316, 316L, 310SS, GH3030, GH3039
5. 过程连接: 法兰, 活动螺纹
6. 带保护套管式或无保护套管式
7. 一体化温度变送器可选。

Technical Data

1. Sensing element: insulated and grounded
2. Measure points: 2...36 points
3. Dimension: TC $\phi 0.5\ldots\phi 8.0\text{ mm}$
RTD $\phi 2.0\ldots\phi 8.0\text{ mm}$
4. Material: 304, 321, 316, 316L, 310SS, GH3030, GH3039
5. Process Connection: Flange, Movable Thread
6. Thermowell Type: with or without thermowell
7. Integrated temperature transmitter can be optional.

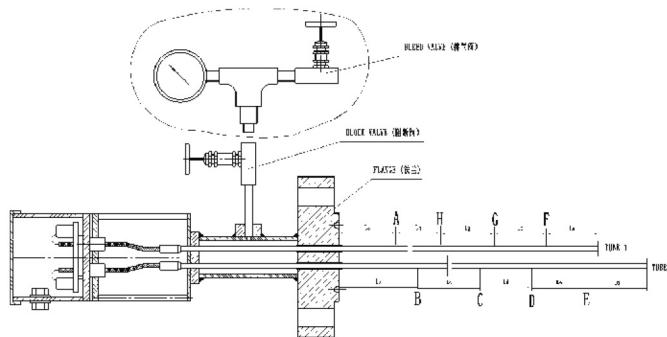


规格型号 Model Type

型 号 Model	分度号 Graduation	过程连接 Process Conn.	精度等级 Precision
WRKD	K	活动螺纹/ 固定法兰	I, II
WRED	E		
WZPD	Pt100, Pt500 Pt1000	Movable Thread/ Fixed Flange	A, B

1. 高压多点式热电偶

High pressure multi points thermocouple



适用于高压反应器多阶层的温度测量，采用先进的高压密封制造工艺，确保在任一测点意外损坏的情况下介质不能泄露，具有热响应快，测量精确等优点。

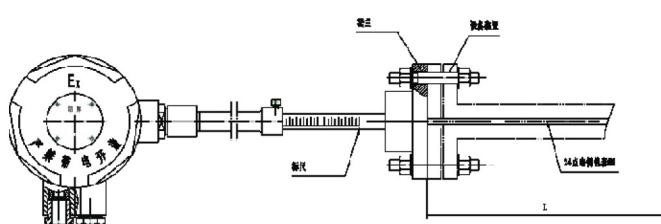
Use for different levels of high pressure reactor temperature measurement and control. High pressure sealing is applied to ensure that medium will not be leak out when any point of the thermocouple accidentally breaks. This type of thermocouple characterized by fast response and good precision and so on.

规格型号 Model Type

型 号 Model	分 度 号 Graduation	过程连接 Process Conn.	精度等级 Precision
WRKGD	K	活动螺纹/ 固定法兰	I, II
WREGD	E	Movable Thread/ Fixed Flange	
WZPGD	Pt100, Pt500 Pt1000	Pt100, Pt500 Pt1000	A, B

2. 苯酐装置用24点式热点偶(带插深调节)

Phthalic Anhydride use 24 points thermocouple



3. 保护套管式多点式热电偶(阻)

Multi points thermocouple(RTD) with Thermowell

