



温度仪表选型样本



创新 科技

品质 服务



◇ 热电偶 ◇ 热电阻 ◇ 一体化温度变送器 ◇ 双金属温度计

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公司简介 >>>

杭州和利时自动化有限公司成立于2003年9月,是国内最大的自动化系统制造商-和利时集团子公司,专业从事过程自动化业务。杭州和利时自动化工程有限公司是杭州和利时自动化有限公司的全资子公司,致力于工业自动化仪表产品的研发和制造,是目前国内集成技术领先的自控系统集成商。

杭州和利时公司HOLLIAS工业控制平台下拥有一系列先进、实用、可靠的工业自动化系统以及和利时品牌的自动化仪表产品,系统产品包括MACS-K、MACS-S工业控制系统DCS, DEH、ETS、SIS等专业控制系统,生产企业的全过程信息化软件。仪表产品包括隔离式安装栅、信号隔离器、浪涌保护器、电量变送器、压力变送器、电磁流量计、金属管浮子流量计、磁性液位计、雷达物位计、节流元件、热元件及压力表等。

公司产品已成功应用于重大工程、关键装备中,包括1000MW超临界大型火电机组、120万吨尿素、500万吨炼油主装置。在业界树立了良好的声誉。

公司具有强大的自动化控制系统集成和工程实施能力,能为广大企业的自控系统的新建项目以及技术改造项目提供和利时自主产品、电气仪表成套、自控设计咨询、现场安装与调试等全方位的工程服务。



目录

Contents

铠装热电偶.....	1
Sheathed Thermocouple	
装配热电偶.....	13
Assembly Thermocouple	
铠装热电阻.....	28
Sheathed Thermal Resistance	
装配热电阻.....	35
ASSEMBLY Thermal Resistance	
防爆热电偶/阻.....	49
Explosion-proof Thermocouple/Thermal Resistance	
电站热电偶（阻）.....	59
Power Station Thermocouple/Thermal Resistance	
热套热电偶（阻）.....	61
Thermocouple/Thermal Resistance W/Thermowell	
热套热电偶（阻）.....	62
Thermocouple/Thermal Resistance w/Thermowell	
炉顶热电偶.....	64
Furnace Top Thermocouple	
炉壁热电偶.....	65
Furnace Wall Thermocouple	
轴承热电偶（阻）.....	66
Bearing Thermocouple(Thermal Resistance)	
石油化工热电偶（阻）.....	67
Petroleum & Chemical Industry Thermocouple(Thermal Resistance)	
高温高压热电偶.....	68
High Temperature and Pressure Thermocouple	
耐磨热电偶（阻）.....	71
Wear-resisting Thermocouple(Thermal Resistance)	
耐磨切断热电偶.....	72
Wear-resisting Cutting Thermocouple	
耐磨阻漏热电偶/阻.....	73
Wear-resisting & Leakage-proof Thermocouple/Thermal Resistance	
防腐热电阻.....	74
Corrosion-resistant Thermal Resistance	
高温防腐热电偶.....	75
Corrosion-resistant Thermocouple Under High Temperature	
多点热电偶/阻.....	76
Multi-point Thermocouple/ Thermal Resistance	
多点隔爆热电偶/阻.....	78
Multi Points Explosion-separation Thermocouple/Thermal Resistance	
特殊热电偶（阻）.....	79
Special Thermocouple(Thermal Resistance)	
微型热电偶（阻）.....	81
Mini-thermocouple(Thermal Resistance)	
微细铠装热电偶.....	82
Tiny Sheathed Thermocouple	

压簧固定热电偶.....	83
Spring Fixed Thermocouple	
端面热电阻.....	84
Surface Measuring Thermal Resistance	
给水泵专用端面铂热电阻.....	85
Pt Surface Measuring Thermal Resistance for Water Supply Pump Specially	
插座式热电阻.....	86
Thermal Resistance w/ Socket-shaped	
直角弯头热电偶.....	87
Thermocouple w/Right Angle Elbow	
高温贵金属热电偶.....	88
Thermocouple w/ Precious Metal for High Temperature	
炉管刀刃热电偶.....	89
Thermocouple w/Edge on Furnace Tube	
吹气热电偶.....	90
Blowing Thermocouple	
拱顶热电偶.....	91
Thermocouple for Arch Top of Furnace	
电机热电偶（阻）.....	92
Thermocouple(Thermal Resistance)for Electric	
裂解炉专用热电偶.....	94
Special Thermocouple for Heating Cracker	
WRPG系列高温盐浴炉专用热电偶.....	95
Special Thermocouple for WRPG Series Salt Bath Furnace Under High Temperature	
BXW系列便携式浸入型测温仪.....	97
BXW Series Portable Immersed Temperature Measurement Meter	
WR□ Z系列真空炉专用热电偶.....	99
Special Thermocouple for Vacuum Furnace	
带温度变送器热电偶（阻）.....	101
Thermocouple(Thermal Resistance)with Temperature Transmitter	
带温度变送器管显示防爆热电偶（阻）.....	112
Explosion-proof Thermocouple(Thermal Resistance)with Temperature Transmitter Dispaly Tube	
温度变送器.....	129
Temperature Transmitter	
双金属温度计.....	135
Bimetalli Thermometer	
电接点双金属温度计.....	143
Electric Junction Bimetallic Thermometer	
隔爆双金属温度计.....	146
Explosion-separation Bimetallic Thermometer	
热套式双金属温度计.....	148
Bimetallic Thermometer w/Thermowell	
带热电偶（阻）双金属温度计.....	150
Bimetallic Thermometer with Thermocouple(Thermal Resistance)	
热安装套管.....	152
Thermowell	

WR□K系列 WR□K Series

铠装热电偶

Sheathed Thermocouple

应用 Application

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0~1300℃范围内液体、蒸汽和气体介质以及固体表面温度。
It is usually cooperated with display meter, recording meter and computer etc. to measure the surface temperature of the mediums as liquid, steam and gas ranging from 0 to 1300℃ during various production processes directly.

特点 Features

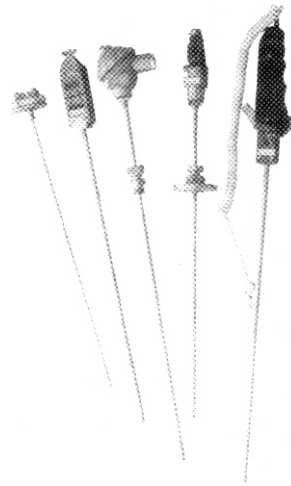
- 热响应时间短，减小动态误差；
With short thermal response time, reducing dynamic error
- 可弯曲安装使用；
Bending installation
- 测量范围大；
Wide measuring range
- 有良好的机械性能，耐压、耐震、耐冲击。
Good mechanical performance, pressure-resistant, shock-resistant, impact-resistant.

工作原理 Working Principle

铠装热电偶的两根电极由不同导体材质组成，当测量端与参比端存在温差时，就会产生热电动势，工作仪表便显示出热电动势所对应的温度值。

铠装热电偶的热电动势将随着测量端温度的升高而增长，热电动势的大小只与铠装偶导体的材质以及两端温差有关，和热电极的长度、直径无关。

The two electrodes of sheathed thermocouple are made of different conductor materials. Where there is temperature difference between measuring end and reference end, there will be hydroelectric potential, then the meter shows the corresponding temperature of the hydroelectric potential. The hydroelectric potential of sheathed thermocouple will raise according to the temperature of measuring end. The size of



hydroelectric potential has relationship with the materials of sheathed thermocouple conductor and temperature difference of two ends only while non-relevant to length, diameter of thermal electrode.

结构原理 Structure Principle

铠装热电偶的结构原理是，由导体、高温绝缘氧化镁外套1Cr18Ni9Ti不锈钢保护管，经多次一体拉制而成。铠装热电偶主要由接线盒、接线端子和铠装偶组成基本结构，并配以各种安装固定装置组成。

The structure sheathed thermocouple is made up of conductor, high temperature insulation oxidized magnesium tube and 1Cr18Ni9Ti stainless steel protection tube, through many integral pullings. The basic structure of sheathed thermocouple is mainly made up of connection box, connection and sheathed thermocouple, connected with various installation fixing devices.

主要技术参数 Main Technical Parameters

● 产品执行标准 Standard:

IEC584

IEC1515

GB/T 16839-1997

JB/T 5582-91

● 测温范围及允差

Measuring Range & Tolerance

型号 Type	分度号 Graduation	允差等级 Tolerance Class			
		I		II	
		允差值 Tolerance Value	测温范围℃ Measuring Range℃	允差值 Tolerance Value	测温范围℃ Measuring Range℃
WRNK	K	±1.5℃	-40 ~ +375	±2.5℃	-40 ~ +333
		±0.004 t	375 ~ 1000	±0.0075 t	333 ~ 1200
WRMK	N	±1.5℃	-40 ~ +375	±2.5℃	-40 ~ +333
		±0.004 t	375 ~ 1000	±0.0075 t	333 ~ 1200
WREK	E	±1.5℃	-40 ~ +375	±2.5℃	-40 ~ +333
		±0.004 t	375 ~ 800	±0.0075 t	333 ~ 900
WRFK	J	±1.5℃	-40 ~ +375	±2.5℃	-40 ~ +333
		±0.004 t	375 ~ 750	±0.0075 t	333 ~ 750
WRCK	T	±0.5℃	-40 ~ +125	±1℃	-40 ~ +133
		±0.004 t	125 ~ 350	±0.0075 t	133 ~ 1000
WRPK	S	±1℃	0 ~ +1100	±1.5℃	0 ~ 600
		±[1+0.003(t-1100)]	1100 ~ 1600	±0.0025 t	600 ~ 1600

注：t为被测电偶的实测温度。

Notice: t is the exact measured temperature for thermocouple

● 常温绝缘电阻

Insulation Resistance at Normal Temperature

铠装偶在环境温度为15~35℃，相对湿度不大于80%，电极与电极之间、电极与外套管之间的绝缘电阻应不小于1000MΩ·m。

即1m长的铠装偶绝缘电阻为1000MΩ；

10m长的铠装偶绝缘电阻为100MΩ。

The insulation resistance between the two electrodes and the electrode and the outer protection tube of sheathed thermocouple is no less than 1000MΩ·m under condition that environment temperature is 15~35℃, relative humidity is no more than 80%. That is to say, the insulation resistance of 1 m long sheathed thermocouple is 1000MΩ, and that of 10 m long sheathed thermocouple is 100MΩ.

● 升高温度下的绝缘电阻

Insulation Resistance at Raised Temperature

● 升高温度下的绝缘电阻

Insulation Resistance at Raised Temperature

分度号 Graduation	置于试验温场中的长度mm Length in Tested Temperature	试验温度℃ Testing Temperature	升高温度下的绝缘电阻MΩ Insulation Resistance at Raised Temperature
K, N, E, J	300	500±15	≥5
T	300	300±10	≥500

常温绝缘电阻试验电压表

Test Voltage of Insulation Resistance at Normal Temperature

套管直径mm Thermowell Diameter mm	试验电压V—DC Testing Voltage V-DC	绝缘电阻MΩ·m Insulation Resistance Ω·m
φ0.5~1.5	50±5	≥1000
> φ1.5	500±50	≥1000

● 热响应时间 τ 0.5

Thermal Response Time t 0.5

在温度出现阶跃变化时，热电偶的输出变化至相当于该跃变化时的50%所需的时间称为热响应时间，用 τ 0.5表示。
When the temperature has step-jumping change, the needed time for output of thermocouple changes to 50% of the step-jumping change, this time is called thermal response time, indicating with τ 0.5.

热响应时间 τ 0.5参考表

Parameter List of τ 0.5

工作端形式 Operation End Form	露端式 End-exposing Type	接壳式 Shell-connecting Type	绝缘式 Insulation-Type
套管直径(mm) Thermowell Diameter			
φ2	0.3	0.4	1
φ3	0.4	0.6	2
φ4	0.5	0.8	2.5
φ5	0.7	1.2	4
φ6	0.8	2	6
φ8	1.0	4	8

● 可挠度 Flexibility:

铠装热电偶的可挠曲率半径不小于其外径的5倍。

The radius of flexible curving ratio of sheathed thermocouple is no less than 5 times of its outer diameter.

● 偶丝直径及材料

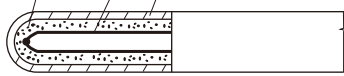
Wire Diameter & Material:

偶丝形式 Wire Type	套管直径 Bushing Diameter	套管材质 Tube Material		
		E, J, T	K, N	S
单支式 Simplex	φ2	1Cr18Ni9Ti	GH3030 1Cr18Ni9Ti	GH3039
	φ3			
	φ4			
	φ5			
	φ6			
	φ8			
双支式 Duplex	φ3	1Cr18Ni9Ti	GH3030 1Cr18Ni9Ti	GH3039
	φ4			
	φ5			
	φ6			

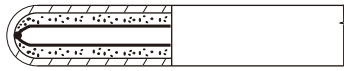
● 测量端结构形式

Measuring End Structure:

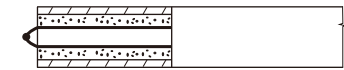
氧化镁粉 电极 Electrode
Magnesia Power 不锈钢金属套管 S.S Metal Tube



绝缘式 Insulation Type



接壳式 Shell-connecting Type



露端式 End-exposing Type

● 露端式特点

End-exposing Type Features:

- 反应速度快;
Quick Response
- 适用于测量发动机的排气等气体的温度;
Applicable for measuring motor gas etc.
- 与其它测量结构相比, 机械强度差。
Low mechanism strength comparing with other measurement structures

● 接壳式特点

Shell-connecting Type Features:

- 反应速度较快;
Quick response
- 耐压可达 $3500\text{Kg}/\text{cm}^2$
Pressure-resistance can reach to $3500\text{kg}/\text{m}^2$;
- 不适合用于有电磁干扰的场合。
Not suitable for fields with electric-magnetic interference

● 绝缘式特点

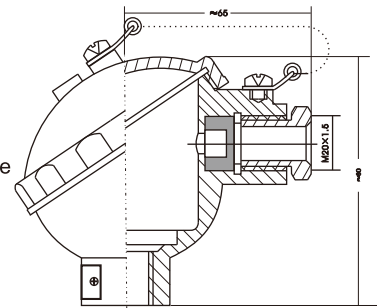
Insulation Type Features:

- 反应速度比接壳式慢, 对于无特别要求快速反应的场合, 一般都大量采用;
Response is slower than shell-connecting, it is widely used in fields without special demands for quick response
- 防电磁干扰;
Eclectic-magnetic interference-proof
- 使用寿命长。
Long life

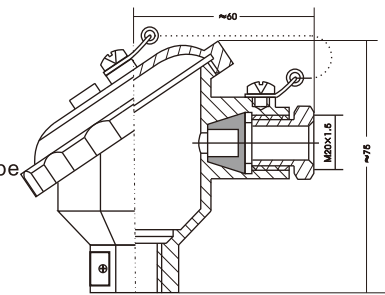
● 接线盒形式

Connection Box Types:

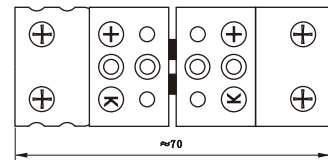
防喷式
Anti-spray Type



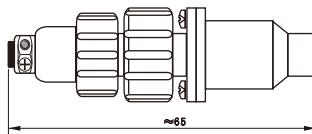
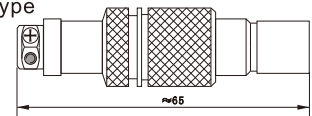
防水式
Water-proof Type



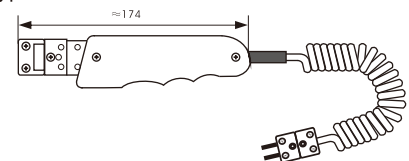
扁接插式
Flat Plug Type



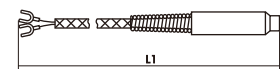
圆接插式
Round Plug Type



手柄式
Handle Type



补偿导线式
Compensation Wire Type

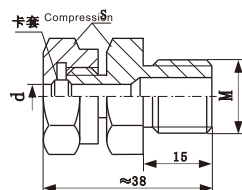


● 安装固定形式

Installation & Fixing Form

● 卡套螺纹式

Compression Thread



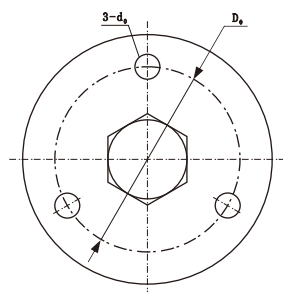
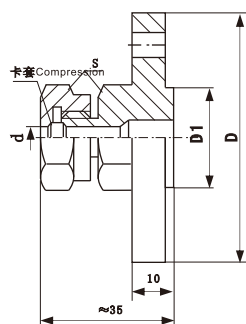
固定卡套 Fixed Compression



可动卡套 Movable Compression

代号和尺寸 Code & Size	铠装偶外径 Outer Diameter of Sheathed Thermocouple					
	Φ8	Φ6	Φ5	Φ4	Φ3	Φ2
M	M16×1.5			M12×1.5		
S	22			19		

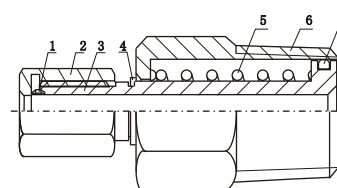
● 卡套法兰式 Compression Flange



代号和尺寸 Code & Size	铠装偶外径 Outer Diameter of Sheathed Thermocouple					
	Φ8	Φ6	Φ5	Φ4	Φ3	Φ2
D	Φ60			Φ50		
D ₀	Φ42			Φ36		
D ₁	Φ24			Φ20		
S	22			19		
d ₀	Φ9			Φ7		

● 防震阻漏卡套螺纹

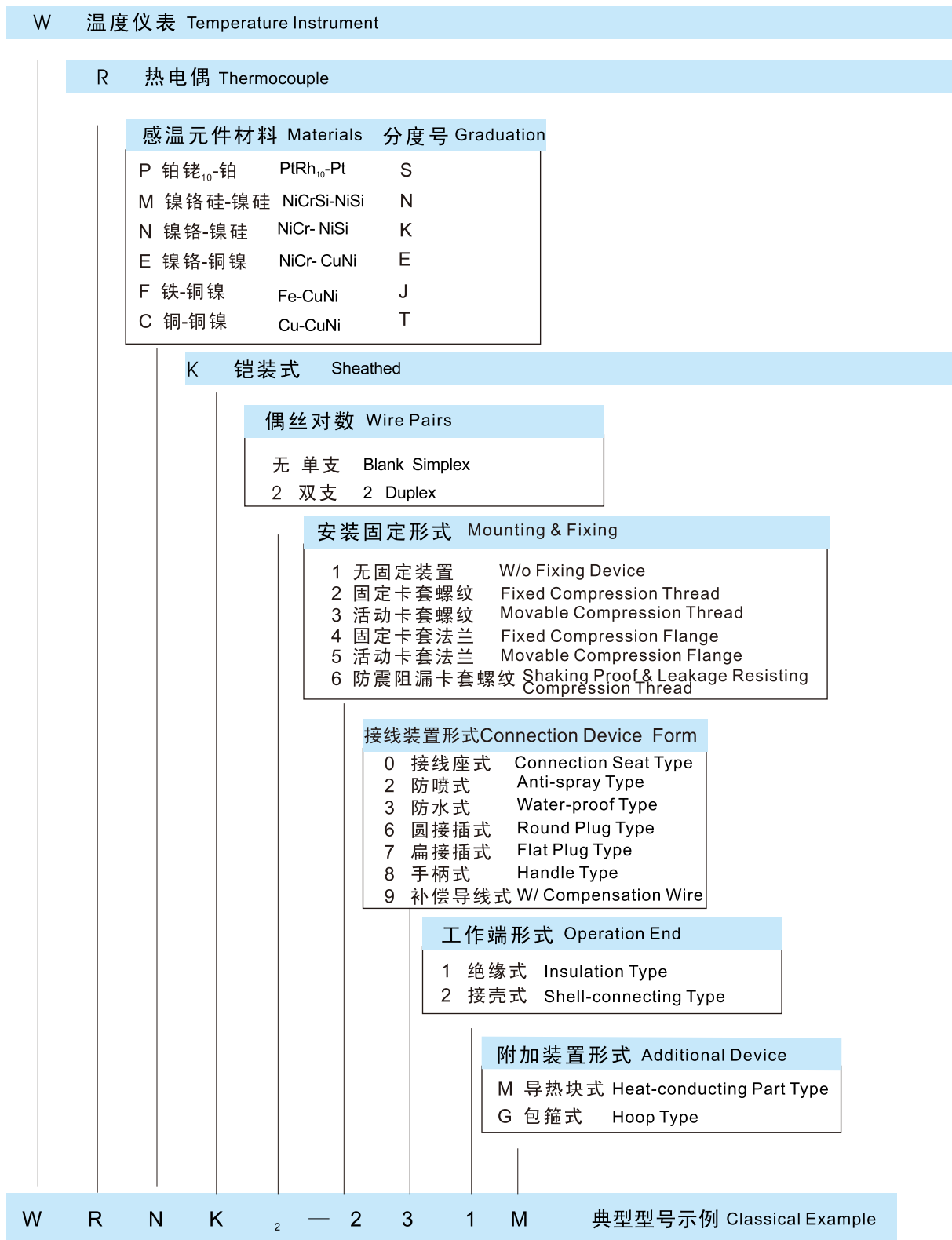
Shock-resistant & Anti-leakage Compression Thread



- 1 卡套 2 锁紧螺母 3 防震芯
4 卡簧 5 弹簧 6 固定螺纹 7 阻漏圈

- 1.Compression 2.Locking Nut 3.Shock-resistance Core
4.Compression Spring 5.Spring 6.Fixing Thread 7.Aanti-leakage Ring

型号命名方法 Naming

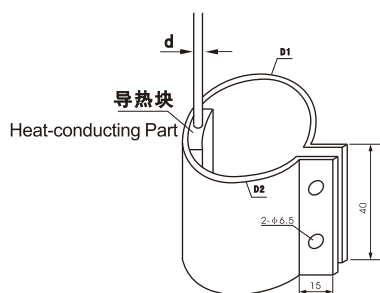


● 铠装热电偶推荐使用温度

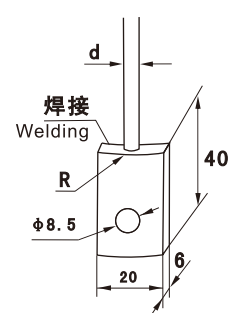
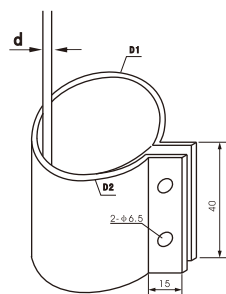
Operation Temperature Recommended of Sheathed Thermocouple

品 种 Category	套管材料 Tube Material	外径 (mm) Outer Diameter	使用温度 (℃) Operation Temperature	
			长期使用温度 Long Time	短期使用温度 Short Time
铠装镍铬-镍硅 Sheathed NiCr-NiSi	1Cr18Ni9Ti	Φ2	550	600
		Φ3 Φ4	600	700
		Φ5 Φ6	700	800
		Φ8	800	850
	GH3030	Φ2 Φ3	800	900
		Φ4 Φ5	900	1000
铠装镍铬硅-镍硅 Sheathed NiCrSi-NiSi	1Cr18Ni9Ti	Φ2	600	700
		Φ3	800	900
		Φ4 Φ5 Φ6	900	1000
		Φ8	1000	1100
	GH3030	Φ2 Φ3	900	1000
		Φ4 Φ5	1000	1100
		Φ6 Φ8	1100	1200
	GH3039	Φ2 Φ3 Φ4	1000	1100
		Φ5 Φ6 Φ8	1100	1200
铠装镍铬-铜镍 Sheathed NiCr-CuNi	1Cr18Ni9Ti	Φ2 Φ3	350	450
		Φ4 Φ5 Φ6 Φ8	450	550
铠装铁-铜镍 Sheathed Fe-CuNi	1Cr18Ni9Ti	Φ2 Φ3	300	400
		Φ4 Φ5 Φ6 Φ8	400	500
铠装铜-铜镍 Sheathed Cu-CuNi	1Cr18Ni9Ti	Φ2	150	200
		Φ3 Φ4 Φ5	200	250
		Φ6 Φ8	250	300
铠装铂铑 ₁₀ -铂 Sheathed PtRh ₁₀ -Pt	GH3039	Φ4	1000	1100
		Φ5 Φ6 Φ8	1100	1200

● 附加装置形式 Additional Device Form



包箍式 (G)
Hoop Type

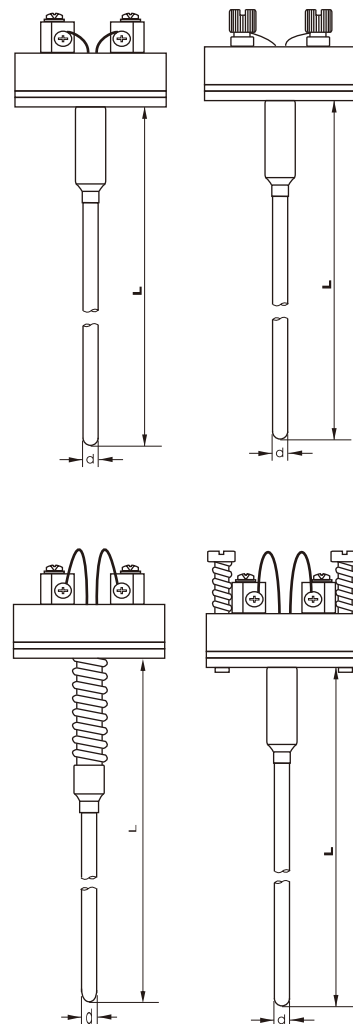


导热块式 (M)
Type W/ Heat-conducting Part

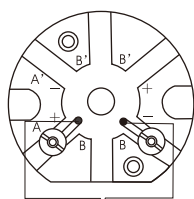
型号及规格 Type & Specification

● 感温元件 Thermal Elements

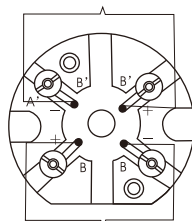
名 称 Description	型 号 TYPE	分度号 Graduation	规 格 Spec.		工作端形式 Measuring End
			d	L ₁	
单支铂铑 ₁₀ --铂 PtRh ₁₀ -Pt(simplex)	WRPK-101	S	φ 5	75 100 150 200	绝缘式 Insulation Type
	WRPK-102		φ 6		接壳式 Shell-connecting Type
双支铂铑 ₁₀ --铂 PtRh ₁₀ -Pt(duplex)	WRPK ₂ -101		φ 8		绝缘式 Insulation Type
	WRPK ₂ -102				接壳式 Shell-connecting Type
单支镍铬硅--镍硅 NiCrSi-NiSi(simplex)	WRMK-101	N		250 300 400 500	绝缘式 Insulation Type
	WRMK-102				接壳式 Shell-connecting Type
双支镍铬硅--镍硅 NiCrSi-NiSi(duplex)	WRMK ₂ -101				绝缘式 Insulation Type
	WRMK ₂ -102				接壳式 Shell-connecting Type
单支镍铬--镍硅 NiCr-NiSi(simplex)	WRNK-101	K	φ 2	750 1000 2000 3000	绝缘式 Insulation Type
	WRNK-102		φ 3		接壳式 Shell-connecting Type
双支镍铬--镍硅 NiCr-NiSi(duplex)	WRNK ₂ -101		φ 4		绝缘式 Insulation Type
	WRNK ₂ -102		φ 5		接壳式 Shell-connecting Type
单支镍铬--铜镍 NiCr-CuNi(simplex)	WREK-101	E	φ 6	4000 5000 7500 10000	绝缘式 Insulation Type
	WREK-102		φ 8		接壳式 Shell-connecting Type
双支镍铬--铜镍 NiCr-CuNi(duplex)	WREK ₂ -101				绝缘式 Insulation Type
	WREK ₂ -102				接壳式 Shell-connecting Type
单支铜--铜镍 Cu-CuNi(simplex)	WRCK-101	T		15000 20000 25000	绝缘式 Insulation Type
	WRCK-102				接壳式 Shell-connecting Type
双支铜--铜镍 Cu-CuNi(duplex)	WRCK ₂ -101				绝缘式 Insulation Type
	WRCK ₂ -102				接壳式 Shell-connecting Type
单支铁--铜镍 Fe-CuNi(simplex)	WRFK-101	J			绝缘式 Insulation Type
	WRFK-102				接壳式 Shell-connecting Type
双支铁--铜镍 Fe-CuNi(duplex)	WRFK ₂ -101				绝缘式 Insulation Type
	WRFK ₂ -102				接壳式 Shell-connecting Type



● 接线方式 Connection Method



单支接线方法
Simplex Connection



双支接线方法
Duplex Connection

选型须知

- 1) 型号
- 2) 分度号
- 3) 精度等级
- 4) 安装固定形式
- 5) 保护管材质
- 6) 长度或插入长度

例A: 铠装热电偶, K型, I 级, 固定卡套螺纹, 保护管 GH3030, 长度450mm, 插入长度300mm, WRNK-231, K, L×I=450×300, I 级, 保护管GH3030。

Selection notice

- 1.Type
- 2.Graduation
- 3.Accuracy Class
- 4.Installation & Fixing Form
- 5.Protection Tube Materials
- 6.Length or Inserting Length

Eg. Sheathed thermocouple, type-K, class I, fixed compression thread, protection tube GH3030, length 450mm, inserting length 300mm, WRNK-231, k, L×I=450×300, class I, protection tube GH 3030.

● 防水式铠装热电偶（绝缘式和接壳式）

Water-proof Type Sheathed Thermocouple (Insulation Type & Shell-connecting Type)

名 称 Description	型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	保护管材质 Thermowell Material	安装固定装置 Mounting & Fixing Device
铠装铂铑 ₁₀ -铂 Sheathed PtRh ₁₀ -Pt	WRPK-131	S	0-1300	GH3039	无固定装置 W/o Fixing Device
铠装镍铬硅-镍硅 Sheathed NiCrSi-NiSi	WRMK-131 WRMK ₂ -131	N	0-1100	GH3030	
			0-800	1Cr18Ni9Ti	
铠装镍铬-镍硅 Sheathed NiCr-NiSi	WRNK-131 WRNK ₂ -131	K	0-1100	GH3030	
			0-800	1Cr18Ni9Ti	
铠装镍铬-铜镍 Sheathed NiCr-CuNi	WREK-131 WREK ₂ -131	E	0-600	1Cr18Ni9Ti	
铠装铜-铜镍 Sheathed Cu-CuNi	WRCK-131 WRCK ₂ -131	T	0-350		
铠装铁-铜镍 Sheathed Fe-CuNi	WRFK-131 WRFK ₂ -131	J	0-500		
铠装镍铬硅-镍硅 Sheathed NiCrSi-NiSi	WRMK-231 WRMK ₂ -231	N	0-1100	GH3030	固定卡套螺纹 Fixed Compression Thread
			0-800	1Cr18Ni9Ti	
铠装镍铬-镍硅 Sheathed NiCr-NiSi	WRNK-231 WRNK ₂ -231	K	0-1100	GH3030	
			0-800	1Cr18Ni9Ti	
铠装镍铬-铜镍 Sheathed NiCr-CuNi	WREK-231 WREK ₂ -231	E	0-600	1Cr18Ni9Ti	
铠装铜-铜镍 Sheathed Cu-CuNi	WRCK-231 WRCK ₂ -231	T	0-350		
铠装铁-铜镍 Sheathed Fe-CuNi	WRFK-231 WRFK ₂ -231	J	0-500		
铠装镍铬硅-镍硅 Sheathed NiCrSi-NiSi	WRMK-331 WRMK ₂ -331	N	0-1100	GH3030	可动卡套螺纹 Movable Compression Thread
			0-800	1Cr18Ni9Ti	
铠装镍铬-镍硅 Sheathed NiCr-NiSi	WRNK-331 WRNK ₂ -331	K	0-1100	GH3030	
			0-800	1Cr18Ni9Ti	
铠装镍铬-铜镍 Sheathed NiCr-CuNi	WREK-331 WREK ₂ -331	E	0-600	1Cr18Ni9Ti	
铠装铜-铜镍 Sheathed Cu-CuNi	WRCK-331 WRCK ₂ -331	T	0-350		
铠装铁-铜镍 Sheathed Fe-CuNi	WRFK-331 WRFK ₂ -331	J	0-500		
铠装镍铬硅-镍硅 Sheathed NiCrSi-NiSi	WRMK-431 WRMK ₂ -431	N	0-1100	GH3030	固定卡套法兰 Fixed Compression Flange
			0-800	1Cr18Ni9Ti	
铠装镍铬-镍硅 Sheathed NiCr-NiSi	WRNK-431 WRNK ₂ -431	K	0-1100	GH3030	
			0-800	1Cr18Ni9Ti	
铠装镍铬-铜镍 Sheathed NiCr-CuNi	WREK-431 WREK ₂ -431	E	0-600	1Cr18Ni9Ti	
铠装铜-铜镍 Sheathed Cu-CuNi	WRCK-431 WRCK ₂ -431	T	0-350		
铠装铁-铜镍 Sheathed Fe-CuNi	WRFK-431 WRFK ₂ -431	J	0-500		
铠装镍铬硅-镍硅 Sheathed NiCrSi-NiSi	WRMK-531 WRMK ₂ -531	N	0-1100	GH3030	可动卡套法兰 Movable Compression Flange
			0-800	1Cr18Ni9Ti	
铠装镍铬-镍硅 Sheathed NiCr-NiSi	WRNK-531 WRNK ₂ -531	K	0-1100	GH3030	
			0-800	1Cr18Ni9Ti	
铠装镍铬-铜镍 Sheathed NiCr-CuNi	WREK-531 WREK ₂ -531	E	0-600	1Cr18Ni9Ti	
铠装铜-铜镍 Sheathed Cu-CuNi	WRCK-531 WRCK ₂ -531	T	0-350		
铠装铁-铜镍 Sheathed Fe-CuNi	WRFK-531 WRFK ₂ -531	J	0-500		

★：1) 防水接线盒防护等级IP55；防喷接线盒防护等级IP65；

The proof class of water-proof connection box is IP65, anti-spray is IP 65

2) 热电偶 I 级按协议订货；未注明一律以 II 提供；

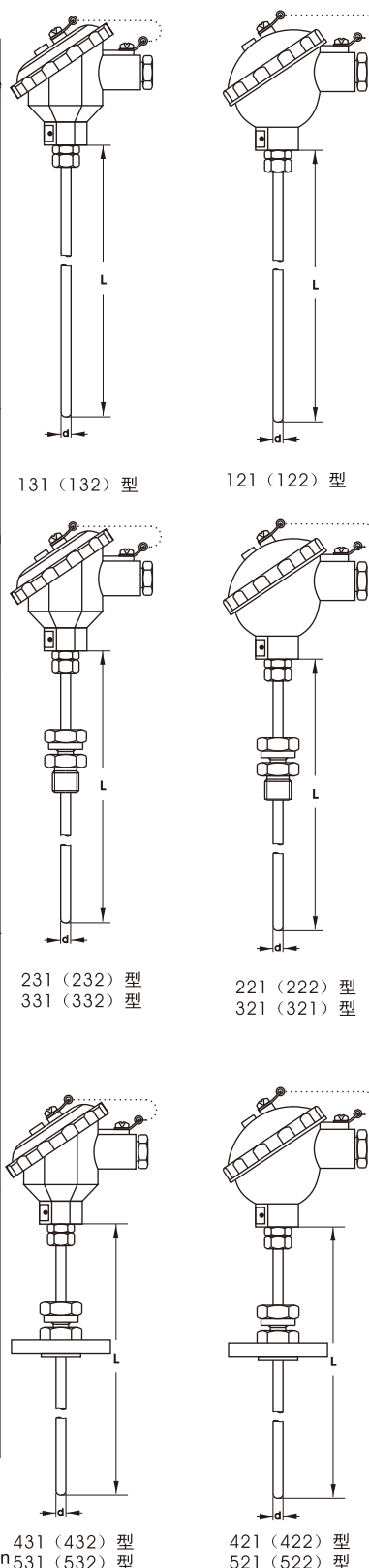
Class-I thermocouple is ordered according to agreement, it shall be considered as class-II if no indication

3) 未注明测量温度范围及保护管材质，保护管材质一律以 1Cr18Ni9Ti 提供；

Protection tube materials shall be considered as 1Cr18Ni9Ti if no indication of measuring range and materials

4) 接壳式同绝缘式产品型号相差末位数字，如：接壳式为 WRNK-132。

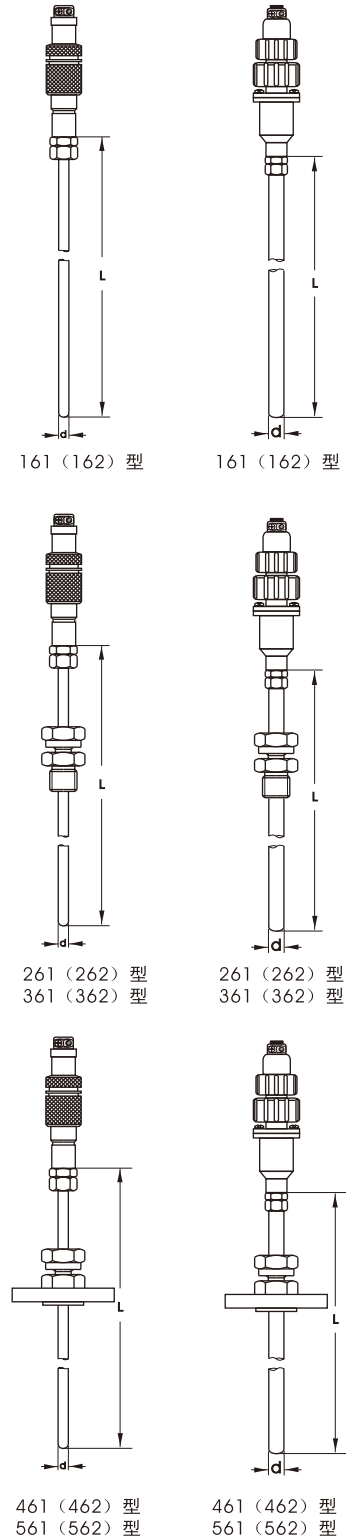
The last digit is different between shell-connection type and insulation-type models. For example: shell-connection is WRNK-132



● 圆接插式铠装热电偶（绝缘式和接壳式）

Round Plug Type Sheathed Thermocouple (Insulation Type, Shell-connecting Type)

名 称 Name/description	型 号 Type	分 度 号 Graduation	测温范围℃ Measuring Range	安装固定装置 Mounting& Fixing Device
铠装铂铑 ₁₀ -铂 Sheathed PtRh ₁₀ -Pt	WRPK-161	S	0-1200	无固定装置 Without Fixing Device
铠装镍铬硅-镍硅 Sheathed NiCrSi-NiSi	WRMK-161 WRMK ₂ -161	N	0-800	
铠装镍铬-镍硅 Sheathed NiCr-NiSi	WRNK-161 WRNK ₂ -161	K		
铠装镍铬-铜镍 Sheathed NiCr-CuNi	WREK-161 WREK ₂ -161	E	0-600	
铠装铜-铜镍 Sheathed Cu-CuNi	WRCK-161 WRCK ₂ -161	T	0-350	
铠装铁-铜镍 Sheathed Fe-CuNi	WRFK-161 WRFK ₂ -161	J	0-500	
铠装镍铬硅-镍硅 Sheathed NiCrsi-NiSi	WRMK-261 WRMK ₂ -261	N	0-800	固定卡套螺纹 Fixed Compression Thread
铠装镍铬-镍硅 Sheathed NiCr-NiSi	WRNK-261 WRNK ₂ -261	K		
铠装镍铬-铜镍 Sheathed NiCr-CuNi	WREK-261 WREK ₂ -261	E	0-600	
铠装铜-铜镍 Sheathed Cu-CuNi	WRCK-261 WRCK ₂ -261	T	0-350	
铠装铁-铜镍 Sheathed Fe-CuNi	WRFK-261 WRFK ₂ -261	J	0-500	
铠装镍铬硅-镍硅 Sheathed NiCrsi-NiSi	WRMK-361 WRMK ₂ -361	N	0-800	
铠装镍铬-镍硅 Sheathed NiCr-NiSi	WRNK-361 WRNK ₂ -361	K		
铠装镍铬-铜镍 Sheathed NiCr-CuNi	WREK-361 WREK ₂ -361	E	0-600	
铠装铜-铜镍 Sheathed Cu-CuNi	WRCK-361 WRCK ₂ -361	T	0-350	
铠装铁-铜镍 Sheathed Fe-CuNi	WRFK-361 WRFK ₂ -361	J	0-500	
铠装镍铬硅-镍硅 Sheathed NiCrsi-NiSi	WRMK-461 WRMK ₂ -461	N	0-800	固定卡套法兰 Fixed Compression Flange
铠装镍铬-镍硅 Sheathed NiCr-NiSi	WRNK-461 WRNK ₂ -461	K		
铠装镍铬-铜镍 Sheathed NiCr-CuNi	WREK-461 WREK ₂ -461	E	0-600	
铠装铜-铜镍 Sheathed Cu-CuNi	WRCK-461 WRCK ₂ -461	T	0-350	
铠装铁-铜镍 Sheathed Fe-CuNi	WRFK-461 WRFK ₂ -461	J	0-500	
铠装镍铬硅-镍硅 Sheathed NiCrsi-NiSi	WRMK-561 WRMK ₂ -561	N	0-800	
铠装镍铬-镍硅 Sheathed NiCr-NiSi	WRNK-561 WRNK ₂ -561	K		
铠装镍铬-铜镍 Sheathed NiCr-CuNi	WREK-561 WREK ₂ -561	E	0-600	
铠装铜-铜镍 Sheathed Cu-CuNi	WRCK-561 WRCK ₂ -561	T	0-350	
铠装铁-铜镍 Sheathed Fe-CuNi	WRFK-561 WRFK ₂ -561	J	0-500	



★：1) 热电偶 I 级按协议订货；未注明一律以 II 提供；

Class-I thermocouple ordered according to agreement, it shall be considered as class-II if no indication

2) 未注明测量温范围及保护管材质，保护管材质一律以 1Cr18Ni9Ti 提供；

Thermowell materials shall be considered as 1Cr18Ni9Ti if no indication of measuring range and materials

3) 接壳式同绝缘式产品型号相差末位数字，如：接壳式为 WRNK-162。

The last digit is different between shell-connection type and insulation-type product. E.g.: shell-connection type is WRNK-162

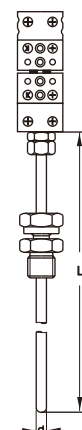
● 扁接插式铠装热电偶（绝缘式和接壳式）

Flat Plug Sheathed Thermocouple (Insulation Type & Shell-connecting Type)

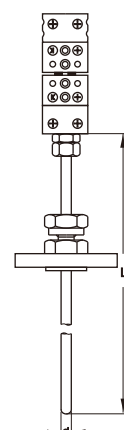
名 称 Description	型 号 Type	分 度 号 Graduation	测温范围℃ Measuring Range	安装固定装置 Mounting& Fixing Device
铠装铂铑 ₁₀ -铂 Sheathed PtRh ₁₀ -Pt	WRPK-171	S	0-1200	无固定装置 W/O Fixing Device
铠装镍铬硅-镍硅 Sheathed NiCrSi-NiSi	WRMK-171 WRMK ₂ -171	N	0-800	
铠装镍铬-镍硅 Sheathed NiCr-NiSi	WRNK-171 WRNK ₂ -171	K		
铠装镍铬-铜镍 Sheathed NiCr-CuNi	WREK-171 WREK ₂ -171	E	0-600	
铠装铜-铜镍 Sheathed Cu-CuNi	WRCK-171 WRCK ₂ -171	T	0-350	
铠装铁-铜镍 Sheathed Fe-CuNi	WRFK-171 WRFK ₂ -171	J	0-500	
铠装镍铬硅-镍硅 Sheathed NiCrsi-NiSi	WRMK-271 WRMK ₂ -271	N	0-800	固定卡套螺纹 Fixed Compression Thread
铠装镍铬-镍硅 Sheathed NiCr-NiSi	WRNK-271 WRNK ₂ -271	K		
铠装镍铬-铜镍 Sheathed NiCr-CuNi	WREK-271 WREK ₂ -271	E	0-600	
铠装铜-铜镍 Sheathed Cu-CuNi	WRCK-271 WRCK ₂ -271	T	0-350	
铠装铁-铜镍 Sheathed Fe-CuNi	WRFK-271 WRFK ₂ -271	J	0-500	
铠装镍铬硅-镍硅 Sheathed NiCrsi-NiSi	WRMK-371 WRMK ₂ -371	N	0-800	可动卡套螺纹 Movable Compression Thread
铠装镍铬-镍硅 Sheathed NiCr-NiSi	WRNK-371 WRNK ₂ -371	K		
铠装镍铬-铜镍 Sheathed NiCr-CuNi	WREK-371 WREK ₂ -371	E	0-600	
铠装铜-铜镍 Sheathed Cu-CuNi	WRCK-371 WRCK ₂ -371	T	0-350	
铠装铁-铜镍 Sheathed Fe-CuNi	WRFK-371 WRFK ₂ -371	J	0-500	
铠装镍铬硅-镍硅 Sheathed NiCrsi-NiSi	WRMK-471 WRMK ₂ -471	N	0-800	固定卡套法兰 Fixed Compression Flange
铠装镍铬-镍硅 Sheathed NiCr-NiSi	WRNK-471 WRNK ₂ -471	K		
铠装镍铬-铜镍 Sheathed NiCr-CuNi	WREK-471 WREK ₂ -471	E	0-600	
铠装铜-铜镍 Sheathed Cu-CuNi	WRCK-471 WRCK ₂ -471	T	0-350	
铠装铁-铜镍 Sheathed Fe-CuNi	WRFK-471 WRFK ₂ -471	J	0-500	
铠装镍铬硅-镍硅 Sheathed NiCrsi-NiSi	WRMK-571 WRMK ₂ -571	N	0-800	可动卡套法兰 Movable Compression Flange
铠装镍铬-镍硅 Sheathed NiCr-NiSi	WRNK-571 WRNK ₂ -571	K		
铠装镍铬-铜镍 Sheathed NiCr-CuNi	WREK-571 WREK ₂ -571	E	0-600	
铠装铜-铜镍 Sheathed Cu-CuNi	WRCK-571 WRCK ₂ -571	T	0-350	
铠装铁-铜镍 Sheathed Fe-CuNi	WRFK-571 WRFK ₂ -571	J	0-500	



171型



271型
371型



471型
571型

★：1) 热电偶 I 级按协议订货；未注明一律以 II 提供；

Class-I thermocouple is ordered according to agreement, it shall be considered as class-II if no indication

2) 未注明测量温范围及保护管材质，保护管材质一律以'1Cr18Ni9Ti'提供；

Thermowell materials shall be considered as 1Cr18Ni9Ti if no indication of measuring range and materials

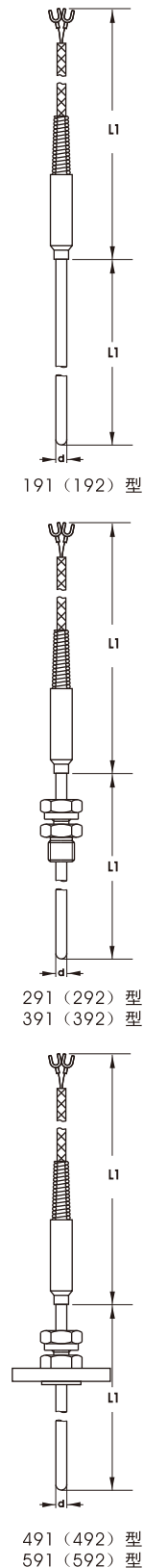
3) 接壳式同绝缘式产品型号相差末位数字，如：接壳式为WRNK-172。

The last digit is different between shell-connection type and insulation-type product. E.g.: shell-connection type is WRNK-172

● 补偿导线式铠装热电偶（绝缘式和接壳式）

Sheathed Thermocouple w/ Compensation Wire (Insulation Type & Shell-connecting Type)

名 称 Description	型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	长 度Length		安 装 固 定 装 置 Mounting& Fixing Device		
				L	L ₁			
铠装镍铬硅—镍硅 Sheathed NiCrSi-NiSi	WRMK-191	N	0-800	50 75 100 150 200 250 300 400 500 750 1000 1500 2000 3000 4000 5000 7500 10000 15000 25000	500	无固定装置 W/O Fixing Device		
铠装镍硅—镍硅 Sheathed NiCr-NiSi	WRNK-191	K						
铠装镍硅—铜镍 Sheathed NiCr-CuNi	WREK-191	E						
铠装铜—铜镍 Sheathed Cu-CuNi	WRCK-191	T						
铠装铁—铜镍 Sheathed Fe-CuNi	WRFK-191	J						
铠装镍铬硅—镍硅 Sheathed NiCrSi-NiSi	WRMK-291	N	0-800			50 75 100 150 200 250 300 400 500 750 1000 1500 2000 3000 4000 5000 7500 10000 15000 25000	500	固定卡套螺纹 Fixed Compression Thread
铠装镍硅—镍硅 Sheathed NiCr-NiSi	WRNK-291	K						
铠装镍硅—铜镍 Sheathed NiCr-CuNi	WREK-291	E						
铠装铜—铜镍 Sheathed Cu-CuNi	WRCK-291	T						
铠装铁—铜镍 Sheathed Fe-CuNi	WRFK-291	J						
铠装镍铬硅—镍硅 Sheathed NiCrSi-NiSi	WRMK-391	N	0-800	400 500 750 1000 1500 2000 3000 4000 5000 7500 10000 15000 25000	1500 2000 3000 4000 5000 7500 10000 15000 25000			可动卡套螺纹 Movable Compression Thread
铠装镍硅—镍硅 Sheathed NiCr-NiSi	WRNK-391	K						
铠装镍硅—铜镍 Sheathed NiCr-CuNi	WREK-391	E						
铠装铜—铜镍 Sheathed Cu-CuNi	WRCK-391	T						
铠装铁—铜镍 Sheathed Fe-CuNi	WRFK-391	J						
铠装镍铬硅—镍硅 Sheathed NiCrSi-NiSi	WRMK-491	N	0-800			4000 5000 7500 10000 15000 25000	15000 25000	固定卡套法兰 Fixed Compression Flange
铠装镍硅—镍硅 Sheathed NiCr-NiSi	WRNK-491	K						
铠装镍硅—铜镍 Sheathed NiCr-CuNi	WREK-491	E						
铠装铜—铜镍 Sheathed Cu-CuNi	WRCK-491	T						
铠装铁—铜镍 Sheathed Fe-CuNi	WRFK-491	J						
铠装镍铬硅—镍硅 Sheathed NiCrSi-NiSi	WRMK-591	N	0-800	25000				可动卡套法兰 Movable Compression Flange
铠装镍硅—镍硅 Sheathed NiCr-NiSi	WRNK-591	K						
铠装镍硅—铜镍 Sheathed NiCr-CuNi	WREK-591	E						
铠装铜—铜镍 Sheathed Cu-CuNi	WRCK-591	T						
铠装铁—铜镍 Sheathed Fe-CuNi	WRFK-591	J						



★：1）热电偶 I 级按协议订货；未注明一律以 II 提供；

Class-I thermocouple is ordered according to agreement, it shall be considered as class-II if no indication

2）未注明测量温范围及保护管材质，保护管材质一律以 1Cr18Ni9Ti 提供；

Thermowell materials shall be considered as 1Cr18Ni9Ti if no indication of measuring range and materials

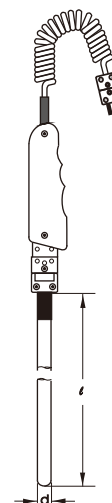
3）接壳式同绝缘式产品型号相差末位数字，如：接壳式为 WRNK-182。

The last digit is different between shell-connection type and insulation-type product. E.g.: shell-connection type is WRNK-182

●手柄式铠装热电偶（绝缘式和接壳式）

Handle Type Sheathed Thermocouple (Insulation-type & Shell-connecting Type)

名 称 Description	型 号 Type	分 度 号 Graduation	测温范围℃ Temperature Range	工作端形式 Operation End Type
铠装镍铬硅—镍硅 Sheathed NiCrSi-NiSi	WRMK-181	N	0-900	绝缘式
铠装镍铬—镍硅 Sheathed NiCr-NiSi	WRNK-181	K	0-800	
铠装镍铬—铜镍 Sheathed NiCr-CuNi	WREK-181	E	0-600	
铠装铜—铜镍 Sheathed Cu-CuNi	WRCK-181	T	0-350	
铠装铁—铜镍 Sheathed Fe-CuNi	WRFK-181	J	0-500	
铠装镍铬硅—镍硅 Sheathed NiCrSi-NiSi	WRMK-182	N	0-900	接壳式
铠装镍铬—镍硅 Sheathed NiCr-NiSi	WRNK-182	K	0-800	
铠装镍铬—铜镍 Sheathed NiCr-CuNi	WREK-182	E	0-600	
铠装铜—铜镍 Sheathed Cu-CuNi	WRCK-182	T	0-350	
铠装铁—铜镍 Sheathed Fe-CuNi	WRFK-182	J	0-500	



★：1）热电偶Ⅰ级按协议订货；未注明一律以Ⅱ提供；

Class-I thermocouple is ordered according to agreement, it shall be considered as class-II if no indication

2）未注明测量温范围及保护管材质，保护管材质一律以`1Cr18Ni9Ti提供；

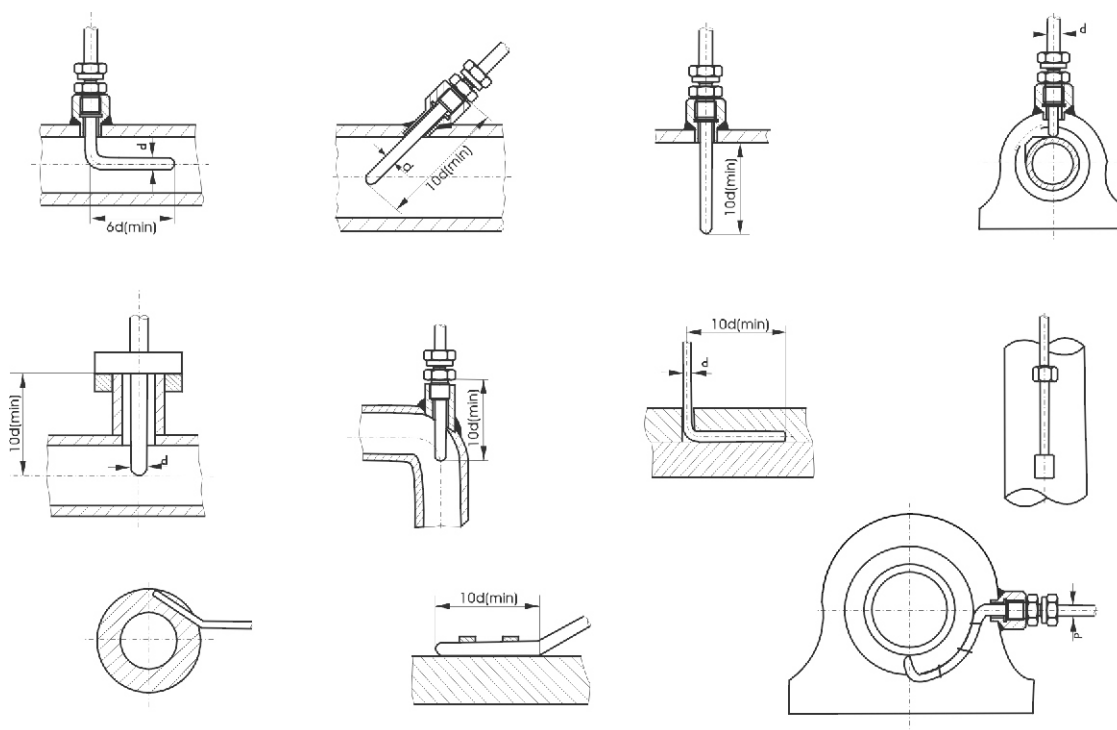
Thermowell materials shall be considered as 1Cr18Ni9Ti if no indication of measuring range and materials

3）接壳式同绝缘式产品型号相差末位数字，如：接壳式为WRNK-182。

The last digit is different between shell-connection type and insulation-type product. E.g.: shell-connection type is WRNK-182

铠装热电偶安装示意图

Installation Sketch Map of Sheathed Thermocouple



WR□系列 WR□系列

装配热电偶

Assembly Thermocouple

应用 Application

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0~1300℃范围内液体、蒸汽和气体介质以及固体表面温度。

It is usually cooperated with display meter, recording meter and computer etc. to measure the surface temperature of the mediums as liquid, steam and gas ranging from 0 to 1300℃ during various production processes directly.

特点 Features

- 装配简单，更换方便；

Easy assembly and convenient for replacement

- 压簧式感温元件，抗振性能好；

Spring thermal element with good shock-proof performance

- 测量范围大；

Wide measuring range

- 机械强度高，耐压性能好；

High mechanical strength and good pressure-resistant performance

工作原理 Working principle

热电偶的电极由两根不同导体材质组成。当测量端与参比端存在温差时，就会产生热电势，工作仪表便显示出热电势所对应的温度值。

热电偶的热电动势将随着测量端温度的升高而增长，热电动势的大小只与铠装偶导体的材质以及两端温差有关，和热电极的长度、直径无关。

The two electrodes of sheathed thermocouple are made of different conductor materials. Where there is temperature difference between measuring end and reference end, there will be hydroelectric potential, then the meter shows the corresponding temperature of the hydroelectric potential. The hydroelectric potential of sheathed thermocouple will raise according to the temperature of measuring end. The size of hydroelectric potential has relationship with the materials of sheathed thermocouple conductor and temperature difference of two ends only while non-relevant to length, diameter of thermal electrode.

结构原理 Structure Principle

装配热电偶主要由接线盒、接线端子、保护管、绝缘套管、热电极组成基本结构，并配以各种安装固定装置组成。

The basic structure of sheathed thermocouple is mainly made up of connection box, connection and sheathed thermocouple, connected with various installation fixing devices.

主要技术参数 Main technical parameters:

● 产品执行标准 Standard

IEC584

IEC1515

GB/T16839-1997

JB/T9238-1999

● 测温范围及允差

Measuring Range & Tolerance

型号 Type	分度号 Graduation	允差等级 Tolerance Class			
		I		II	
		允差值 Tolerance	测温范围℃ Temperature Range	允差值 Tolerance	测温范围℃ Temperature Range
WRN	K	±1.5℃	-40~+375	±2.5℃	-40~+333
		±0.004 t	375-1000	±0.0075 t	333-1200
WRM	N	±1.5℃	-40~+375	±2.5℃	-40~+333
		±0.004 t	375-1000	±0.0075 t	333-1200
WRE	E	±1.5℃	-40~+375	±2.5℃	-40~+333
		±0.004 t	375-800	±0.0075 t	333-900
WRF	J	±1.5℃	-40~+375	±2.5℃	-40~+333
		±0.004 t	375-750	±0.0075 t	333-750
WRC	T	±0.5℃	-40~+125	±1℃	-40~+333
		±0.004 t	125-350	±0.0075 t	133-350

注：t为被测电偶的实测温度。

Notice: t is the exact measured temperature for thermocouple.

● 常温绝缘电阻

Insulation Resistance at Normal Temperature

热电偶在环境温度为15~35℃，相对湿度不大于80%，试验电压为500±50V（直流）电极与外套管之间的绝缘电阻≥100MΩ·m；对于长度等于或不足1米的热电偶，其绝缘电阻应不小于100MΩ。

The insulation resistance between the electrode and the outer protection tube of is no less than 100MΩ.m under condition that environment temperature is 15~35℃, relative humidity is no more than 80%, test voltage is 500±50V (D.C.) The insulation resistance should be no less than 100MΩ for the thermocouple which is not longer than 1m.

注：当测量元件为铠装式元件时，其常温绝缘电阻参数则按铠装热电偶计算。

Note: When the measuring element is sheathed element, the parameter of insulation resistance at normal temperature should be calculated according to sheathed thermocouple.

● 上限温度绝缘电阻

Insulation Resistance at Upper Limit

热电偶上限温度绝缘电阻应不小于下表的规定：

The insulation thermal resistance at upper limit should be no less than the regulation below.

上限温度 t_m (°C) Upper Limit	试验温度 (°C) Testing Temperature	电阻值 (M Ω) Resistance
$100 \leq t_m < 300$	$t = t_m$	10
$300 \leq t_m < 500$	$t = t_m$	2
$500 \leq t_m < 850$	$t = t_m$	0.5
$850 \leq t_m < 1000$	$t = t_m$	0.08
$1000 \leq t_m < 1300$	$t = t_m$	0.02
$t_m > 1300$	$t = 1300$	0.02

注：如果是铠装元件，其上限温度绝缘电阻值则按铠装热电偶计算。

Note: When the measuring element is sheathed element, the parameter of insulation resistance at normal temperature should be calculated according to sheathed thermocouple.

● 热响应时间 $\tau_{0.5}$ Thermal Response Time $t_{0.5}$

在温度出现阶跃变化时，热电偶的输出变化至相当于该跃变化时的50%所需的时间称为热响应时间，用 $\tau_{0.5}$ 表示。

When the temperature has step-jumping change, the needed time for output of thermocouple changes to 50% of the step-jumping change, this time is called thermal response time, indicating with $\tau_{0.5}$.

● 公称压力 Nominal Pressure

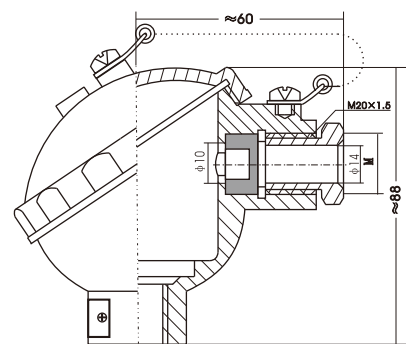
一般是指在工作温度下保护管所能承受的静态外压而不破裂。实际上，工作压力不仅与保护管材料、直径、壁厚有关，还与热电偶结构形式、安装方法、置入深度以及被介质的流速和种类等有关。

It is usually means the static outer pressure which the protection tube can offer and will not be broken under the working temperature. In fact, working pressure not only has relationship with with protection tube material, diameter and thickness of wall, but also the structure form, installation method, inserting depth and the flow speed and type of the medium etc.

● 接线盒形式 Connection Type

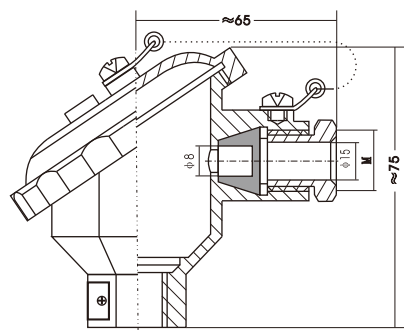
防喷式 Anti-spray Type

防护等级:IP65
Protection Class: IP 65



防水式 Water-proof Type

防护等级:IP55
Protection Class: IP 55

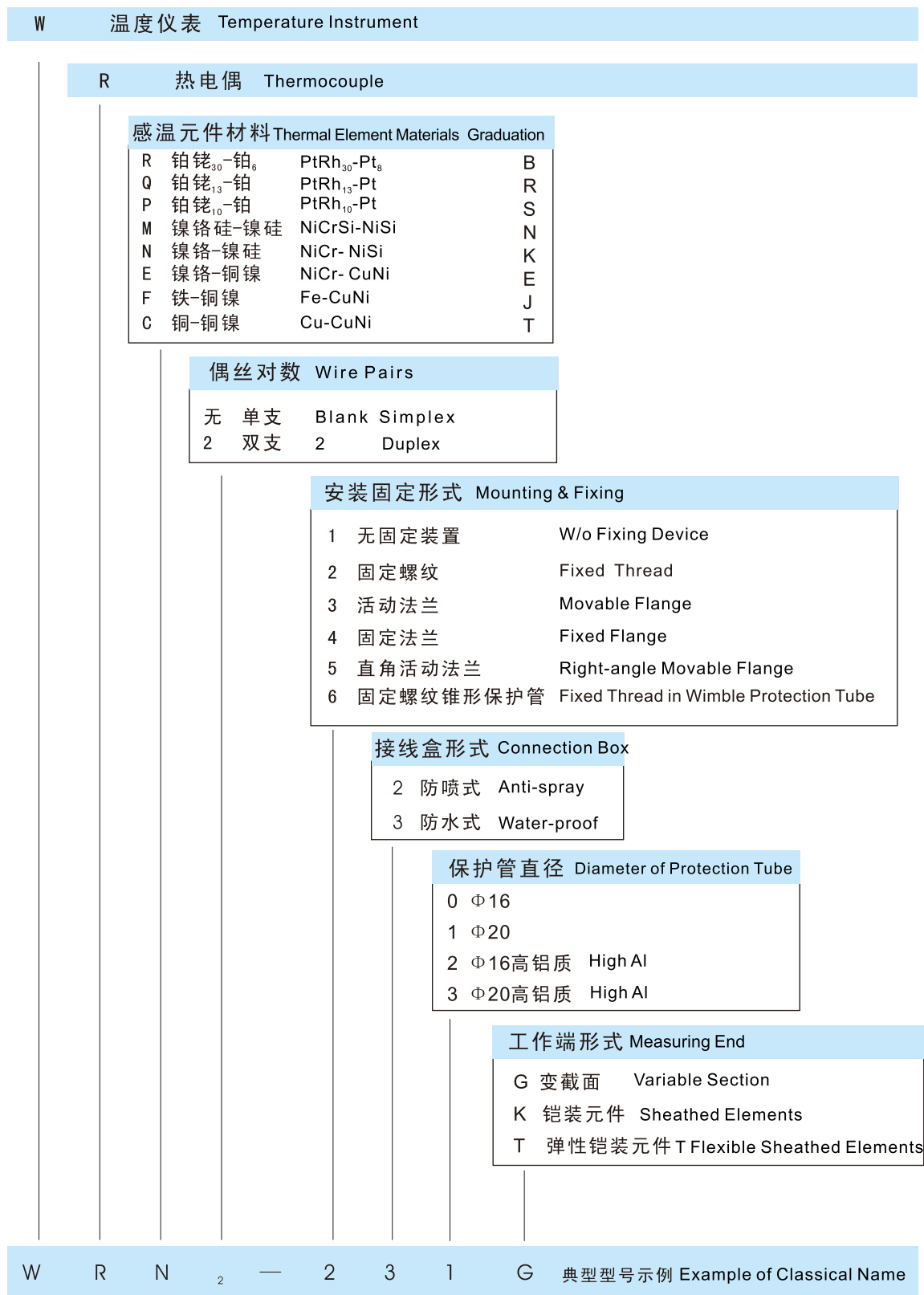


注：电气出口M未特殊指明，一律视为M20×1.5

Notice:

The electric exit shall be considered as 20×1.5 if no indication

型号命名方法 Naming



型号及规格 Type & Specification

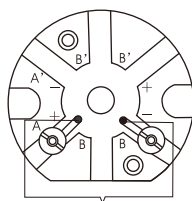
● 感温元件 Thermal Element

型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	规 格 Specification	
WRR-010 WRR ₂ -010	B	0-1600	φ8	300
WRQ-010 WRQ ₂ -010	R	0-1300	φ8	350
WRP-010 WRP ₂ -010	S	0-1300	φ8	450
WRN-010 WRN ₂ -010 WRN-101 WRN ₂ -101	K	0-1000	φ11 φ5 φ6 φ8	550
WRE-010 WRE ₂ -010 WRE-101 WRE ₂ -101	E	0-800	φ11 φ4 φ6 φ5 φ8	650 950 1150
WRF-010 WRF ₂ -010 WRF-101 WRF ₂ -101	J	0-600	φ11 φ4 φ6 φ5 φ8	1650 2150
WRC-010 WRC ₂ -010 WRC-101 WRC ₂ -101	T	0-350	φ11 φ4 φ6 φ5 φ8	

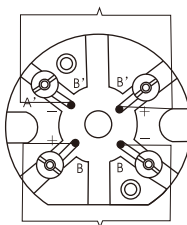
注：“L”可协议订货；“B”分度不推荐使用铠装式

Note: L can be ordered by negotiation, and sheathed type is not recommended for Graduation B

● 接线方式 Wiring Method



单支接线方法
Wiring Method(simplex)



双支接线方法
Wiring Method(duplex)

● 无固定装置热电偶

Thermocouple w/o Fixing Device

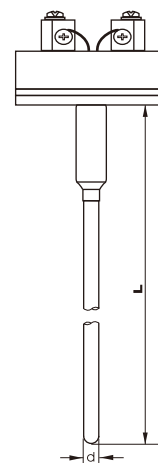
型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	保护管 Thermowell	热响应时间τ _{0.5} S TRT
WRR-130 WRR ₂ -130	B	0-1600	φ16 刚玉管 Corundum Pipe	<150
WRR-131 WRR ₂ -131			φ25 刚玉管 Corundum Pipe	<360
WRP-130 WRP ₂ -130	S	0-1300	φ16 高铝质 High AL content	<150
WRP-131 WRP ₂ -131			φ25 高铝质 High AL content	<360
WRN-132 WRN ₂ -132	K	0-1000	φ16 高铝质 High AL content	<240
WRN-133 WRN ₂ -133			φ20 高铝质 High AL content	<240

★：1) 结构特征：非置入部分为碳钢20#；

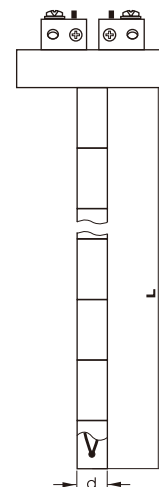
Structure features: non- inserting part is 20 # carbonic-steel

2) φ25mm为双层套管。

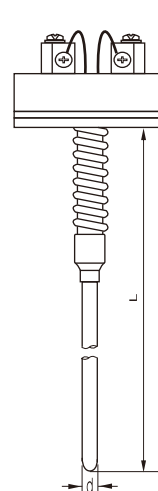
φ25 mm is protection tube with double film



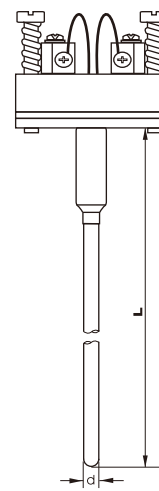
防喷式122 123型
Anti-spray Type



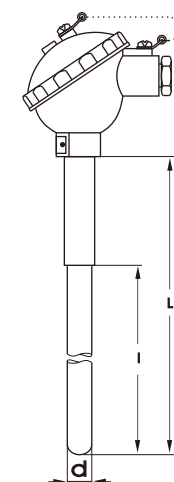
防水式132 133型
Water-proof Type



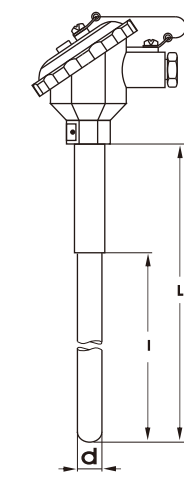
防喷式122 123型
Anti-spray Type



防水式132 133型
Water-proof Type



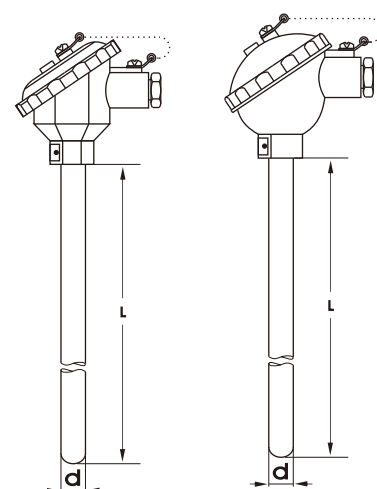
防喷式122 123型
Anti-spray Type



防水式132 133型
Water-proof Type

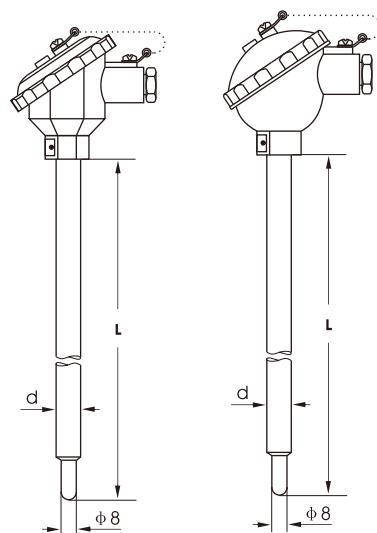
● 无固定装置热电偶 Thermocouple w/o Fixing Device

型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	热响应时间 Thermal Response Time	保护管材料 Thermowell Material	规 格 Specification		
					D	L×I	
WRM-130 WRM ₂ -130	N	0-800	<60S	1Cr18Ni9Ti	φ 16	300×150 350×200 400×250 450×300 500×350 650×500 1150×1000 1650×1500 2150×2000	
		0-1000		0Cr25Ni20			
WRM-130G WRM ₂ -130G		0-800	<24S	1Cr18Ni9Ti			
		0-1000		0Cr25Ni20			
WRN-130 WRN ₂ -130	K	0-800	<60S	1Cr18Ni9Ti			
		0-1000		0Cr25Ni20			
WRN-130G WRN ₂ -130G		0-800	<24S	1Cr18Ni9Ti			
		0-1000		0Cr25Ni20			
WRE-130 WRE ₂ -130	E	0-700	<60S	1Cr18Ni9Ti			
WRE-130G WRE ₂ -130G			<24S				
WRC-130 WRC ₂ -130	T	0-350	<60S	1Cr18Ni9Ti			
WRC-130G WRC ₂ -130G			<24S				
WRF-130 WRF ₂ -130	J	0-600	<60S	1Cr18Ni9Ti			
WRF-130G WRF ₂ -130G			<24S				
WRM-131 WRM ₂ -131	N	0-800	<90S	1Cr18Ni9Ti			φ 20
		0-1000		0Cr25Ni20			
WRM-131G WRM ₂ -131G		0-800	<24S	1Cr18Ni9Ti			
		0-1000		0Cr25Ni20			
WRN-131 WRN ₂ -131	K	0-800	<90S	1Cr18Ni9Ti			
		0-1000		0Cr25Ni20			
WRN-131G WRN ₂ -131G		0-800	<24S	1Cr18Ni9Ti			
		0-1000		0Cr25Ni20			
WRE-131 WRE ₂ -131	E	0-700	<90S	1Cr18Ni9Ti			
WRE-131G WRE ₂ -131G			<24S				
WRC-131 WRC ₂ -131	T	0-350	<90S	1Cr18Ni9Ti			
WRC-131G WRC ₂ -131G			<24S				
WRF-131 WRF ₂ -131	J	0-600	<90S	1Cr18Ni9Ti			
WRF-131G WRF ₂ -131G			<24S				



防水式130 131型
Water-proof Type

防喷式120 121型
Anti-spray Type



防水式130G 131G型
Water-proof Type

防喷式120G 121G型
Anti-spray Type

注：1、如需其余材质的保护管可协议订货。

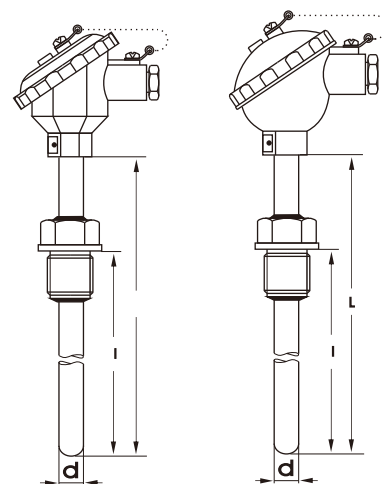
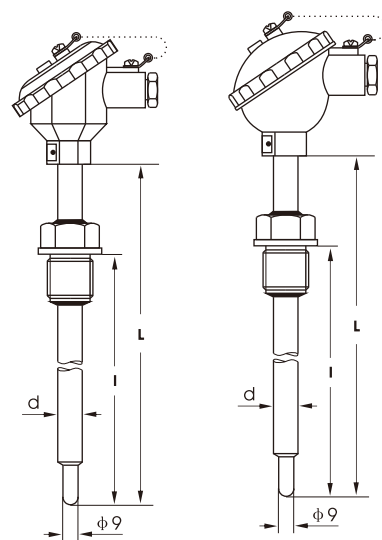
It can be ordered due to agreement for other materials.

2、变截面型式的热电偶内配铠装元件。

The thermocouples with variable section should be cooperated with sheathed element.

● 固定螺纹式热电偶 Fixed Thread Thermocouple

型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	热响应时间 Thermal Response Time	保护管材料 Thermowell Material	规 格 Specification	
					d	L×l
WRM-230 WRM ₂ -230	N	0-800	<60S	1Cr18Ni9Ti	φ 16	300×150 350×200 400×250 450×300 500×350 650×500 1150×1000 1650×1500 2150×2000
		0-1000		0Cr25Ni20		
WRM-230G WRM ₂ -230G		0-800	<24S	1Cr18Ni9Ti		
		0-1000		0Cr25Ni20		
WRN-230 WRN ₂ -230	K	0-800	<60S	1Cr18Ni9Ti		
		0-1000		0Cr25Ni20		
WRN-230G WRN ₂ -230G		0-800	<24S	1Cr18Ni9Ti		
		0-1000		0Cr25Ni20		
WRE-230 WRE ₂ -230	E	0-700	<60S	1Cr18Ni9Ti		
WRE-230G WRE ₂ -230G			<24S			
WRC-230 WRC ₂ -230	T	0-350	<60S	1Cr18Ni9Ti		
WRC-230G WRC ₂ -230G			<24S			
WRF-230 WRF ₂ -230	J	0-600	<60S	1Cr18Ni9Ti		
WRF-230G WRF ₂ -230G			<24S			
WRM-231 WRM ₂ -231	N	0-800	<90S	1Cr18Ni9Ti	φ 20	
		0-1000		0Cr25Ni20		
WRM-231G WRM ₂ -231G		0-800	<24S	1Cr18Ni9Ti		
		0-1000		0Cr25Ni20		
WRN-231 WRN ₂ -231	K	0-800	<90S	1Cr18Ni9Ti		
		0-1000		0Cr25Ni20		
WRN-231G WRN ₂ -231G		0-800	<24S	1Cr18Ni9Ti		
		0-1000		0Cr25Ni20		
WRE-231 WRE ₂ -231	E	0-700	<90S	1Cr18Ni9Ti		
WRE-231G WRE ₂ -231G			<24S			
WRC-231 WRC ₂ -231	T	0-350	<90S	1Cr18Ni9Ti		
WRC-231G WRC ₂ -231G			<24S			
WRF-231 WRF ₂ -231	J	0-600	<90S	1Cr18Ni9Ti		
WRF-231G WRF ₂ -231G			<24S			

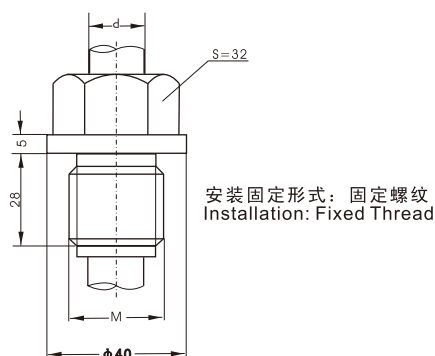
防水式230 231型
Water-proof Type防喷式220 221型
Anti-spray Type防水式230G 231G型
Water-proof Type防喷式220G 221G型
Anti-spray Type

注：1、如需其余材质的保护管可协议订货。

It can be ordered due to agreement for other materials.

2、变截面型式的热电偶内配铠装元件。

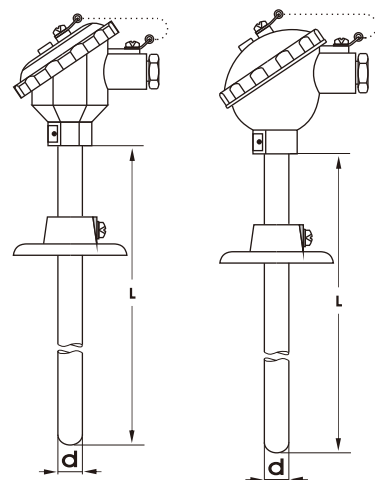
The thermocouples with variable section should be cooperated with sheathed element.



型号示例 Model Type	螺纹规格 Thread Specification		D	公称压力 NP Mpa
	代号 Code	M		
WRN-230		M27×2	φ 16	10
WRN-230A	A	G3/4		
WRN-230C	C	NPT3/4		
WRN-231G		M27×2	φ 20	
WRN-231GA	A	G3/4		
WRN-231GC	C	NPT3/4		

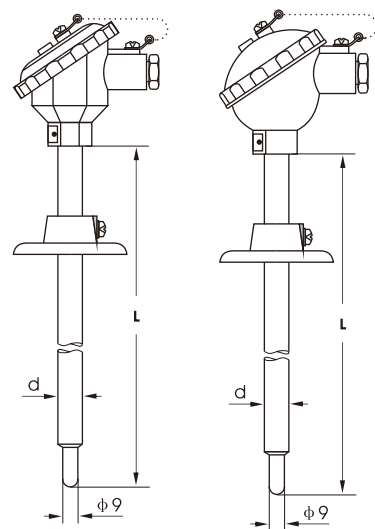
● 活动法兰式热电偶 Thermocouple w/ Moveable Flange

型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	热响应时间 Thermal Response Time	保护管材料 Thermowell Material	规 格 Specification		
					d	L	
WRM-330 WRM ₂ -330	N	0-800	<60S	1Cr18Ni9Ti	φ 16	300 350 400 450 500 650 1150 1650 2150	
		0-1000		0Cr25Ni20			
		WRM-330G WRM ₂ -330G	0-800	<24S			1Cr18Ni9Ti
			0-1000				0Cr25Ni20
WRN-330 WRN ₂ -330	K	0-800	<60S	1Cr18Ni9Ti			
		0-1000		0Cr25Ni20			
		WRN-330G WRN ₂ -330G	0-800	<24S			1Cr18Ni9Ti
			0-1000				0Cr25Ni20
WRE-330 WRE ₂ -330	E	0-700	<60S	1Cr18Ni9Ti			
			<24S				
WRC-330 WRC ₂ -330	T	0-350	<60S	1Cr18Ni9Ti			
			<24S				
WRF-330 WRF ₂ -330	J	0-600	<60S	1Cr18Ni9Ti			
			<24S				
WRM-331 WRM ₂ -331	N	0-800	<60S	1Cr18Ni9Ti	φ 20		
		0-1000		0Cr25Ni20			
		WRM-331G WRM ₂ -331G	0-800	<24S			1Cr18Ni9Ti
			0-1000				0Cr25Ni20
WRN-331 WRN ₂ -331	K	0-800	<60S	1Cr18Ni9Ti			
		0-1000		0Cr25Ni20			
		WRN-331G WRN ₂ -331G	0-800	<24S			1Cr18Ni9Ti
			0-1000				0Cr25Ni20
WRE-331 WRE ₂ -331	E	0-700	<90S	1Cr18Ni9Ti			
			<24S				
WRC-331 WRC ₂ -331	T	0-350	<90S	1Cr18Ni9Ti			
			<24S				
WRF-331 WRF ₂ -331	J	0-600	<90S	1Cr18Ni9Ti			
			<24S				



防水式330 331型
Water-proof Type

防喷式320 321型
Anti-spray Type



防水式330G 331G型
Water-proof Type

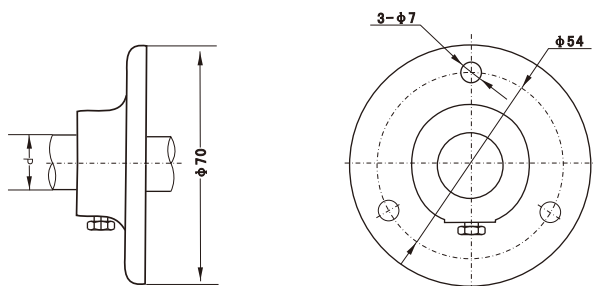
防喷式320G 321G型
Anti-spray Type

注：1、如需其余材质的保护管可协议订货。

It can be ordered due to agreement for other materials.

2、变截面型式的热电偶内配铠装元件。

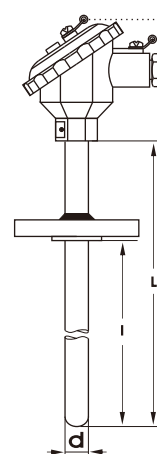
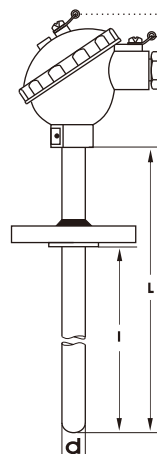
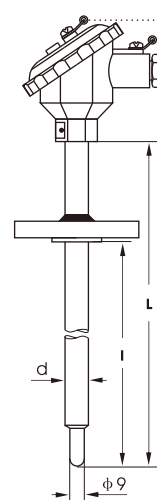
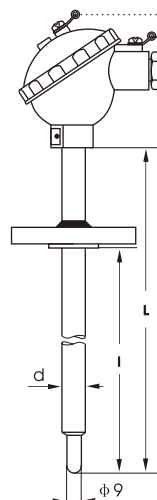
The thermocouples with variable section should be cooperated with sheathed element.



安装固定形式：活动法兰
Installation: Movable Flange

● 固定法兰式热电偶 Thermocouple w/ Fixed Flange

型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	热响应时间 Thermal Response Time	保护管材料 Thermowell Material	规 格 Specification	
					d	L×I
WRM-430 WRM ₂ -430	N	0-800	<60S	1Cr18Ni9Ti	φ 16	300×150 350×200 400×250 450×300 500×350 650×500 1150×1000 1650×1500 2150×2000
		0-1000		0Cr25Ni20		
WRM-430G WRM ₂ -430G		0-800	<24S	1Cr18Ni9Ti		
		0-1000		0Cr25Ni20		
WRN-430 WRN ₂ -430	K	0-800	<60S	1Cr18Ni9Ti		
		0-1000		0Cr25Ni20		
WRN-430G WRN ₂ -430G		0-800	<24S	1Cr18Ni9Ti		
		0-1000		0Cr25Ni20		
WRE-430 WRE ₂ -430	E	0-700	<60S	1Cr18Ni9Ti		
WRE-430G WRE ₂ -430G			<24S			
WRC-430 WRC ₂ -430	T	0-350	<60S	1Cr18Ni9Ti		
WRC-430G WRC ₂ -430G			<24S			
WRF-430 WRF ₂ -430	J	0-600	<60S	1Cr18Ni9Ti		
WRF-430G WRF ₂ -430G			<24S			
WRM-431 WRM ₂ -431	N	0-800	<90S	1Cr18Ni9Ti	φ 20	
		0-1000		0Cr25Ni20		
WRM-431G WRM ₂ -431G		0-800	<24S	1Cr18Ni9Ti		
		0-1000		0Cr25Ni20		
WRN-431 WRN ₂ -431	K	0-800	<90S	1Cr18Ni9Ti		
		0-1000		0Cr25Ni20		
WRN-431G WRN ₂ -431G		0-800	<24S	1Cr18Ni9Ti		
		0-1000		0Cr25Ni20		
WRE-431 WRE ₂ -431	E	0-700	<90S	1Cr18Ni9Ti		
WRE-431G WRE ₂ -431G			<24S			
WRC-431 WRC ₂ -431	T	0-350	<90S	1Cr18Ni9Ti		
WRC-431G WRC ₂ -431G			<24S			
WRF-431 WRF ₂ -431	J	0-600	<90S	1Cr18Ni9Ti		
WRF-431G WRF ₂ -431G			<24S			

防水式430 431型
Water-proof Type防喷式420 421型
Anti-spray Type防水式430G 431G型
Water-proof Type防喷式420G 421G型
Anti-spray Type

注：1、如需其余材质的保护管可协议订货。

It can be ordered due to agreement for other materials.

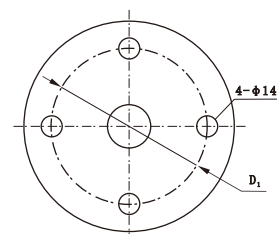
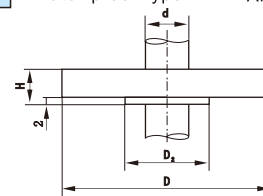
2、变截面型式的热电偶内配铠装元件。

The thermocouples with variable section should be cooperated with sheathed element.

型号示例 Model Examples	法兰规格 Flange Specification				
	D	D ₁	D ₂	H	d
WRN-430	φ95	φ65	φ46	14	φ16
WRN-430G	φ105	φ75	φ56	16	
WRN-431	φ115	φ85	φ65	16	φ20
WRN-431G	φ115	φ85	φ65		

注：其余规格的法兰，可参见“热安装套管”或协议约定。

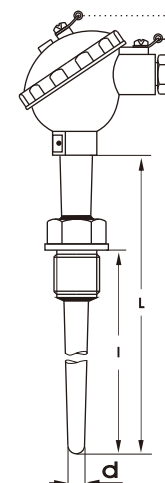
Note: For other specifications of flange, please refer to Thermowell or agreement

安装固定形式：固定法兰
Installation: Fixed Flange

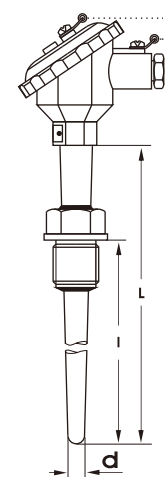
● 固定螺纹锥形保护管热电偶

Thermocouple with Fixed Thread Wimble Protection Tube

型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	热响应时间 Thermal Response Time	保护管材料 Protection Tube Material	规 格 Specification		
					d	L×I	
WRM-620 WRM ₂ -620	N	0-800	<90S	1Cr18Ni9Ti	φ 16	300×150 350×200 400×250 450×300 500×350	
		0-1000		0Cr25Ni20			
WRM-620A WRM ₂ -620A		0-800		1Cr18Ni9Ti			
		0-1000		0Cr25Ni20			
WRN-620 WRN ₂ -620	K	0-800		1Cr18Ni9Ti			
		0-1000		0Cr25Ni20			
WRN-620A WRN ₂ -620A		0-800		1Cr18Ni9Ti			
		0-1000		0Cr25Ni20			
WRE-620 WRE ₂ -620	E	0-700		1Cr18Ni9Ti			
WRE-620A WRE ₂ -620A							
WRC-620 WRC ₂ -620	T	0-350		1Cr18Ni9Ti			
WRC-620A WRC ₂ -620A							
WRF-620 WRF ₂ -620	J	0-600		1Cr18Ni9Ti			
WRF-620A WRF ₂ -620A							
WRM-630 WRM ₂ -630	N	0-800		<90S			1Cr18Ni9Ti
		0-1000					0Cr25Ni20
WRM-630A WRM ₂ -630A		0-800	1Cr18Ni9Ti				
		0-1000	0Cr25Ni20				
WRN-630 WRN ₂ -630	K	0-800	1Cr18Ni9Ti				
		0-1000	0Cr25Ni20				
WRN-630A WRN ₂ -630A		0-800	1Cr18Ni9Ti				
		0-1000	0Cr25Ni20				
WRE-630 WRE ₂ -630	E	0-700					1Cr18Ni9Ti
WRE-630A WRE ₂ -630A							
WRC-630 WRC ₂ -630	T	0-350					1Cr18Ni9Ti
WRC-630A WRC ₂ -630A							
WRF-630 WRF ₂ -630	J	0-600					1Cr18Ni9Ti
WRF-630A WRF ₂ -630A							



防喷式620 620A型
Anti-spray Type

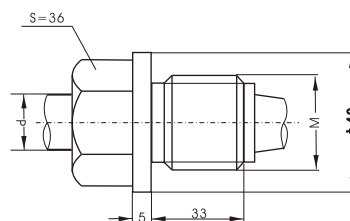


防水式630 630A型
Water-proof Type

如需其它材质的保护管可协议订货。

If need other materials of protection tube, can due to agreement.

型 号 Type	螺纹规格 Thread Specification		公称压力 NP Mpa
	代号 Code	M	
WRN-620		M33×2	30
WRN-620A	A	NPT1	
WRN-630		M33×2	
WRN-630A	A	NPT1	



安装固定形式：固定螺纹锥形保护管

Installation: Fixed Thread Wimble Protection Tube

可拆卸式热电偶 Knock-down Thermocouple

W 温度仪表 Temperature Instrument

R 热电偶 Thermocouple

感温元件材料(铠装式) Thermal Element Material (Sheathed)

M	镍铬硅-镍硅	NiCrSi-NiSi
N	镍铬-镍硅	NiCr-NiSi
E	镍铬-铜镍	NiCr-CuNi
F	铁-铜镍	Fe-CuNi
C	铜-铜镍	Cu-CuNi

偶丝对数 Wire Pairs

无	单支	Blank	Simplex
2	双支	2	Duplex

连接形式 Connection

- 5 活络管接头式 Elbow Tube Connector
- 7 直形管接头式 Straight Tube Connector
- 8 固定螺纹接头式 Fixed Thread Connector
- 9 活动螺纹接头式 Movable Thread Connector

接线装置形式 Connection Device

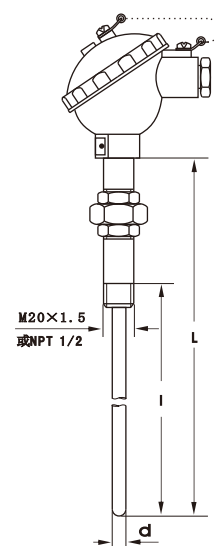
- 2 防喷式 Anti-spray
- 3 防水式 Water-proof

热安装套管见<热套管安装图>
Please refer to Thermowell Table

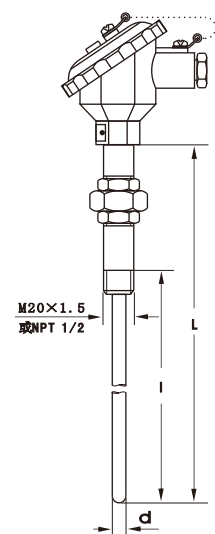
W R N 2 — 5 2 典型型号示例 Example of Classical Name

● 活络管接头式热电偶 Thermocouple w/ Movable Tube Connector

型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	螺纹规格 Thread Spec	保护管材料 Thermowell Material	规 格 Specification						
					d	l					
WRM-52 WRM ₂ -52	N	0-1000	M20×1.5	1Cr18Ni9Ti	φ 3						
WRM-52A WRM ₂ -52A			NPT1/2								
WRN-52 WRN ₂ -52	K		M20×1.5								
WRN-52A WRN ₂ -52A			NPT1/2								
WRE-52 WRE ₂ -52	E	0-700	M20×1.5								
WRE-52A WRE ₂ -52A			NPT1/2								
WRC-52 WRC ₂ -52	T	0-350	M20×1.5				φ 3				
WRC-52A WRC ₂ -52A			NPT1/2								
WRF-52 WRF ₂ -52	J	0-600	M20×1.5						φ 4		
WRF-52A WRF ₂ -52A			NPT1/2								
WRM-53 WRM ₂ -53	N	0-1000	M20×1.5	φ 5							
WRM-53A WRM ₂ -53A			NPT1/2								
WRN-53 WRN ₂ -53	K		M20×1.5								
WRN-53A WRN ₂ -53A			NPT1/2								
WRE-53 WRE ₂ -53	E	0-700	M20×1.5			φ 6					
WRE-53A WRE ₂ -53A			NPT1/2								
WRC-53 WRC ₂ -53	T	0-350	M20×1.5				φ 8				
WRC-53A WRC ₂ -53A			NPT1/2								
WRF-53 WRF ₂ -53	J	0-600	M20×1.5								
WRF-53A WRF ₂ -53A			NPT1/2								



防喷式52 52A型
Anti-spray Type



防水式53 53A型
Water-proof Type

★:1) 型号53、53A为防水式，防护等级IP55； 型号52、52A为防喷式，防护等级IP65；

Type 53,53A for water-proof type, proof class IP 55; Type 52,52A for anti-spray type, proof class IP 65

2) 如无特殊之约定，L仅为参考尺寸，热电偶插入深度应为热安装套管U尺寸；

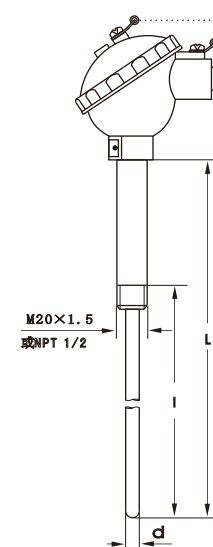
L is for reference only if no special agreement and the insert depth of the thermocouple shall be the size U of thermowell.

3) 热安装套管形式详见《热安装套管图》

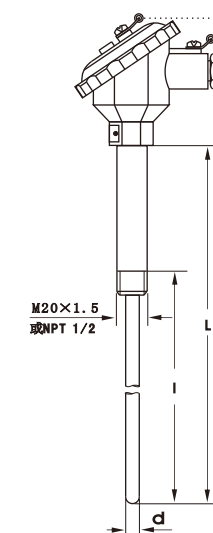
Please see more for thermowell at Thermowell Table at the end of this book

● 直形管接头式热电偶 Thermocouple w/ Straight Tube Connector

型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	螺纹规格 Thread Spec	保护管材料 Thermowell Material	规 格 Specification	
					d	l
WRM-72 WRM ₂ -72	N	0-1000	M20×1.5	1Cr18Ni9Ti	φ 3	250 275 300 350 400 450 550 650 750 900 1150
WRM-72A WRM ₂ -72A			NPT1/2			
WRN-72 WRN ₂ -72	K		M20×1.5			
WRN-72A WRN ₂ -72A			NPT1/2			
WRE-72 WRE ₂ -72	E	0-700	M20×1.5			
WRE-72A WRE ₂ -72A			NPT1/2			
WRC-72 WRC ₂ -72	T	0-350	M20×1.5			
WRC-72A WRC ₂ -72A			NPT1/2			
WRF-72 WRF ₂ -72	J	0-600	M20×1.5			
WRF-72A WRF ₂ -72A			NPT1/2			
WRM-73 WRM ₂ -73	N	0-1000	M20×1.5	1Cr18Ni9Ti	φ 6	
WRM-73A WRM ₂ -73A			NPT1/2			
WRN-73 WRN ₂ -73	K		M20×1.5			
WRN-73A WRN ₂ -73A			NPT1/2			
WRE-73 WRE ₂ -73	E	0-700	M20×1.5			
WRE-73A WRE ₂ -73A			NPT1/2			
WRC-73 WRC ₂ -73	T	0-350	M20×1.5			
WRC-73A WRC ₂ -73A			NPT1/2			
WRF-73 WRF ₂ -73	J	0-600	M20×1.5			
WRF-73A WRF ₂ -73A			NPT1/2			



防喷式72 72A型
Anti-spray Type



防水式73 73A型
Water-proof Type

★:1) 型号73、73A为防水式，防护等级IP55；型号72、72A为防喷式，防护等级IP65；

Type 73,73A for water-proof type, proof class IP 55; Type 72,72A for anti-spray, proof class IP 65

2) 如无特殊之约定，L仅为参考尺寸，热电偶插入深度应为热安装套管U尺寸；

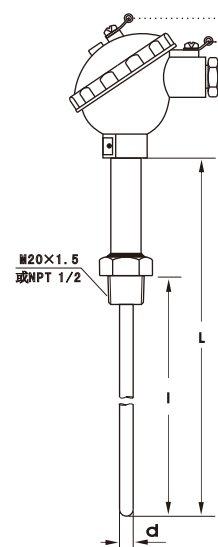
L is for reference only if no special agreement, and the insert depth of the thermocouple shall be size U of thermowell.

3) 热安装套管形式详见《热安装套管图》

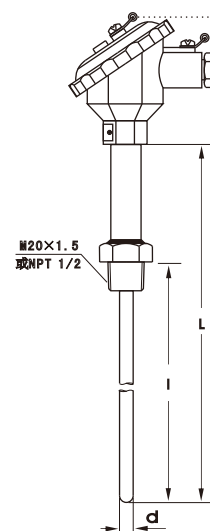
Please see more for thermowell at Thermowell Table at the end of this book

● 固定螺纹管接头式热电偶 Thermocouple w/ Fixed Thread Tube Connector

型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	螺纹规格 Thread Spec	保护管材料 Thermowell Material	规 格 Specification		
					D	I	
WRM-82 WRM ₂ -82	N	0-1000	M20×1.5	1Cr18Ni9Ti	φ 3	250 275 300 350 400 450 550 650 750 900 1150	
WRM-82A WRM ₂ -82A			NPT1/2				
WRN-82 WRN ₂ -82	K		M20×1.5				
WRN-82A WRN ₂ -82A			NPT1/2				
WRE-82 WRE ₂ -82	E	0-700	M20×1.5				
WRE-82A WRE ₂ -82A			NPT1/2				
WRC-82 WRC ₂ -82	T	0-350	M20×1.5				
WRC-82A WRC ₂ -82A			NPT1/2				
WRF-82 WRF ₂ -82	J	0-600	M20×1.5				
WRF-82A WRF ₂ -82A			NPT1/2				
WRM-83 WRM ₂ -83	N	0-1000	M20×1.5	1Cr18Ni9Ti	φ 6		
WRM-83A WRM ₂ -83A			NPT1/2				
WRN-83 WRN ₂ -83	K		M20×1.5				φ 8
WRN-83A WRN ₂ -83A			NPT1/2				
WRE-83 WRE ₂ -83	E	0-700	M20×1.5				
WRE-83A WRE ₂ -83A			NPT1/2				
WRC-83 WRC ₂ -83	T	0-350	M20×1.5				
WRC-83A WRC ₂ -83A			NPT1/2				
WRF-83 WRF ₂ -83	J	0-600	M20×1.5				
WRF-83A WRF ₂ -83A			NPT1/2				



防喷式82 82A型
Anti-spray Type



防水式83 83A型
Water-proof Type

★:1) 型号83、83A为防水式，防护等级IP55；型号82、82A为防喷式，防护等级IP65；

Type 83,83A for water-proof type, protection class IP 55; Type 82,82A for anti-spray, protection class IP 65

2) 如无特殊之约定，L仅为参考尺寸，热电偶插入深度应为热安装套管U尺寸；

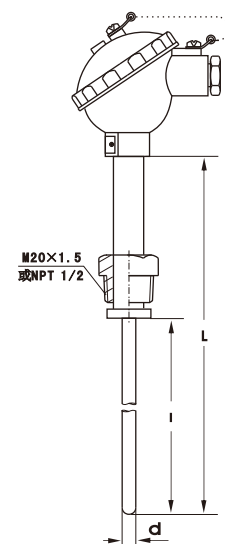
L is for reference only if no special agreement and the insert depth of the thermocouple shall be size U of thermowell.

3) 热安装套管形式详见《热安装套管图》

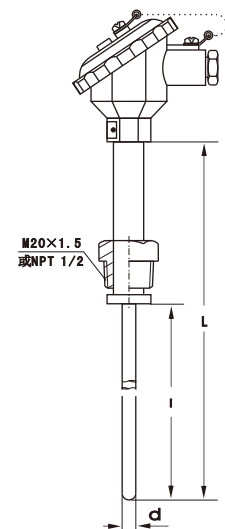
Please see more for thermowell at Thermowell Table at the end of this book

● 活动螺纹接头式热电偶 Thermocouple w/ Moveable Thread Connector

型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	螺纹规格 Thread Spec	保护管材料 Thermowell Material	规 格 Specification								
					d	l							
WRM-92 WRM ₂ -92	N	0-1000	M20×1.5	1Cr18Ni9Ti	φ 3								
WRM-92A WRM ₂ -92A			NPT1/2										
WRN-92 WRN ₂ -92	K		M20×1.5										
WRN-92A WRN ₂ -92A			NPT1/2										
WRE-92 WRE ₂ -92	E	0-700	M20×1.5										
WRE-92A WRE ₂ -92A			NPT1/2										
WRC-92 WRC ₂ -92	T	0-350	M20×1.5				φ 3	245					
WRC-92A WRC ₂ -92A			NPT1/2										
WRF-92 WRF ₂ -92	J	0-600	M20×1.5						φ 4	345			
WRF-92A WRF ₂ -92A			NPT1/2										
WRM-93 WRM ₂ -93	N	0-1000	M20×1.5	φ 5	395								
WRM-93A WRM ₂ -93A			NPT1/2										
WRN-93 WRN ₂ -93	K		M20×1.5			φ 6					445		
WRN-93A WRN ₂ -93A			NPT1/2										
WRE-93 WRE ₂ -93	E	0-700	M20×1.5									φ 8	545
WRE-93A WRE ₂ -93A			NPT1/2										
WRC-93 WRC ₂ -93	T	0-350	M20×1.5				φ 8	645					
WRC-93A WRC ₂ -93A			NPT1/2										
WRF-93 WRF ₂ -93	J	0-600	M20×1.5						φ 8	745			
WRF-93A WRF ₂ -93A			NPT1/2										



防喷式92 92A型
Anti-spray Type



防水式93 93A型
Water-proof Type

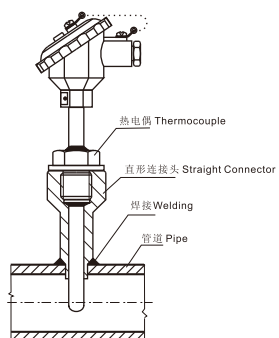
★:1) 型号93、93A为防水式, 防护等级IP55; 型号92、92A为防喷式, 防护等级IP65;
Type 93,93A for water-proof type, protection class IP 55; Type 92,92A for anti-spray, protection class IP 65
2) 如无特殊之约定, L仅为参考尺寸, 热电偶插入深度应为热安装套管U尺寸;
L is for reference only if no special agreement and the insert length of the thermocouple shall be size U of thermowell.
3) 热安装套管形式详见《热安装套管图》
Please see more for thermowell at Thermowell Table at the end of this book

热电偶安装示意图

Thermocouple Installation Diagram

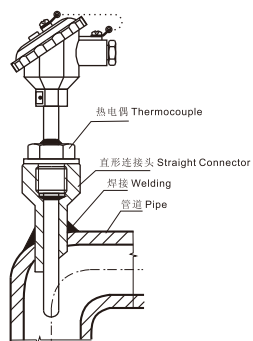
垂直管道安装方法

Installation Method of Vertical Pipe



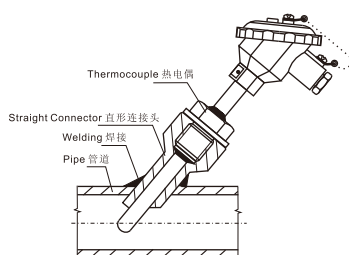
弯曲管道安装方法

Installation Method of Bending Pipe



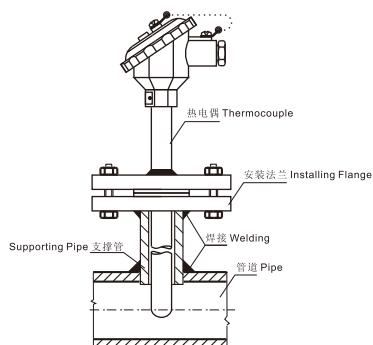
倾斜管道安装方法

Installation Method of Leaning Pipe



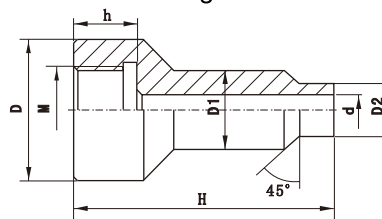
法兰安装方法

Flange Installation Method

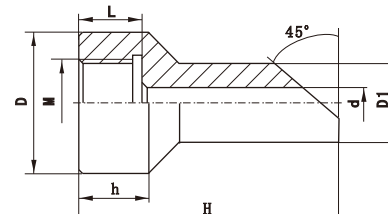
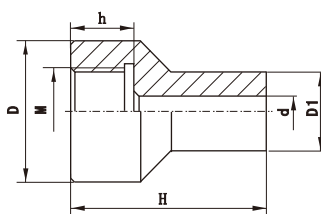


直形接头规格

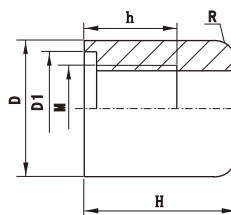
Specification of Straight Connector



代号 Code	M	D	D ₁	D ₂	d	h	H
LD21A	M12×1.5	φ24	φ16	φ12	φ8	20	60
LD21B	M16×1.5	φ24	φ16	φ12	φ8	20	60
LD21C	M20×1.5	φ28	φ16	φ12	φ8	20	60
LD21D	M27×2	φ39	φ28	φ24	φ20	35	60
LD21E	M33×2	φ48	φ38	φ30	φ22	35	90
LD21F	NPT1/2	φ28	φ16	φ12	φ8	20	60
LD21G	NPT3/4	φ39	φ28	φ24	φ20	35	
LD21H	NPT1	φ48	φ38	φ30	φ22	35	90



代号 Code	M	D	D ₁	d	h	H
LD22A	M12×1.5	φ24	φ16	φ8	20	35
LD22B	M16×1.5	φ24	φ16	φ8	20	35
LD22C	M20×1.5	φ28	φ16	φ8	20	45
LD22D	M27×2	φ39	φ28	φ20	35	60
LD22E	M33×2	φ48	φ38	φ22	35	90
LD22F	NPT1/2	φ28	φ16	φ8	20	45
LD22G	NPT3/4	φ39	φ28	φ20	35	60
LD22H	NPT1	φ48	φ38	φ22	35	90



代号 Code	M	D	D ₁	R	h	H
LD23A	M27×2	φ47	φ44	6	32	60
LD23B	M33×2	φ55	φ52	6	38	60

WZPK系列 WZPK Series

铠装热电阻

Sheathed Thermal Resistance

应用 Application

通常和显示仪表、记录仪表、计算机等配套使用。
直接精确测量各种生产过程中的-200~+450℃范围内
液体、蒸汽和气体介质以及固体表面温度。

It is usually cooperated with display meter, recording meter and computer etc., to measure the surface temperature of the mediums as liquid, steam and gas ranging from -200~+450℃ during various production processes directly.

特点 Features

- 热响应时间短，减小动态误差；
With short thermal response time, reducing dynamic error
- 直径小，可弯曲；
Small diameter, flexible
- 测量精确度高；
High measuring accuracy
- 进口薄膜电阻元件，性能可靠稳定；
Imported film resistor with reliability and stability

工作原理 Working Principle

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

It is based on that when temperature of object changes, the resistance will change accordingly, to measure temperature. When the resistance value changes, the working meter will display relevant temperature.

主要技术参数

Main Technical Parameters:

● 产品执行标准

Standard:

IEC751

IEC1515

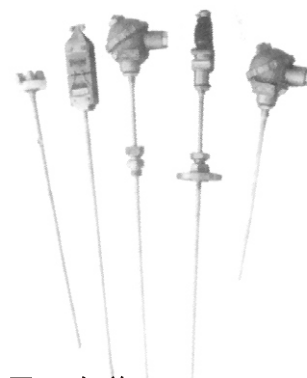
JB / T8623—1997

JB / T8622—1997

● 铠装热电阻保护管直径及材料

Thermowell Diameter & Material of Sheathed Thermal Resistance:

Type	套管直径 Diameter	套管材质Material
单支式 Simplex 	Φ3	1Cr18Ni9Ti
	Φ4	
	Φ5	
	Φ6	
	Φ8	
双支式 Duplex 	Φ3	
	Φ4	
	Φ5	
	Φ6	
	Φ8	



● 测温范围及允差 Measuring Range & Tolerance

型号 Type	分度号 Graduation	测温范围℃ Measuring Range	精度等级 Accuracy Class	允 差 Tolerance
WZPK	Pt100	-200~+450	A级 Class A	$\pm(0.15+0.002 t)$
			B级 Class B	$\pm(0.30+0.005 t)$

注：t为感温元件实测温度绝对值

Notice: t is the absolute value of exact measured temperature

● 常温绝缘电阻

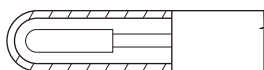
Insulation Resistance at Normal Temperature

热电阻在环境温度为15~35℃，相对湿度不大于80%，试验电压为10~100V（直流）组电极与组电极、电极与外套管之间的绝缘电阻 $\geq 100M\Omega$ 。
The insulation resistance between one electrode group and the other, electrode and outer thermowell is $\geq 100M\Omega$ under condition that environment temperature is 15~35℃, relative humidity is no more than 80%, testing voltage is 10~100V (D.C)

● 热响应时间 Thermal Response Time

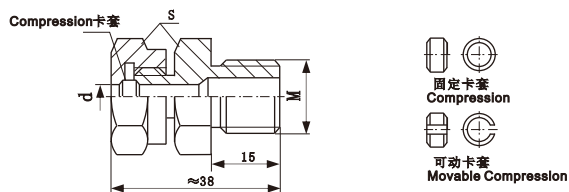
套管直径 Diameter	热响应时间 $\tau_{0.95}$ Thermal Response Time t0.5 S
Φ3	≤ 3
Φ4	≤ 5
Φ5	≤ 6
Φ6	≤ 8
Φ8	≤ 10

● 测量端结构形式 Measuring End Structure



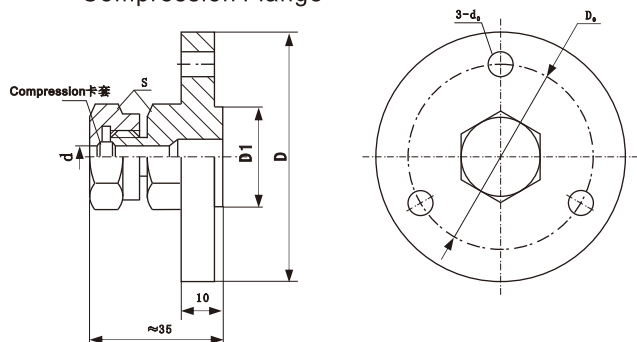
● 安装固定形式 Mounting & Fixing Type

卡套螺纹式 Compression Thread



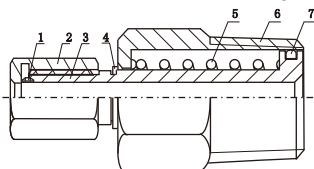
代号和尺寸 Code & Size	铠装阻外径d Outer Diameter				
	Φ8	Φ6	Φ5	Φ4	Φ3
M	M16×1.5			M12×1.5	
S	22			19	

卡套法兰式 Compression Flange



代号和尺寸 Code & Size	铠装电阻外径d Outer Diameter				
	Φ8	Φ6	Φ5	Φ4	Φ3
D	Φ60			Φ50	
D ₀	Φ42			Φ36	
D ₁	Φ24			Φ20	
S	22			19	
d ₀	Φ9			Φ7	

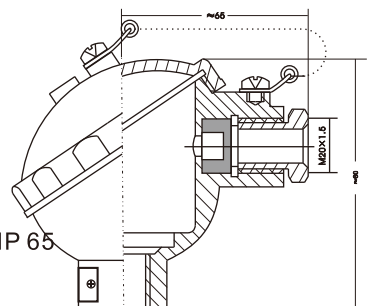
● 防震阻漏卡套螺纹 Shock-resistant & Anti-leakage Compression Thread



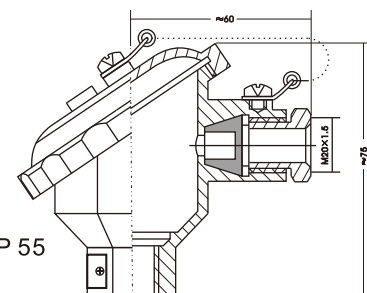
- 1 卡套 2 锁紧螺母 3 防震芯
4 卡簧 5 弹簧 6 固定螺纹 7 阻漏圈
1.Compression 2.Locking Nut 3.Shock-resistance Core
4.Compression Spring 5.Spring 6.Fixing Thread 7.Aanti-leakage Ring

● 接线盒形式 Connection Box Type

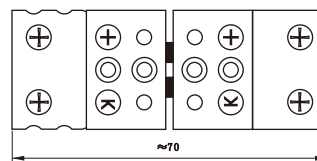
防喷式
Anti-spray type
防护等级: IP65
Protection Class: IP 65



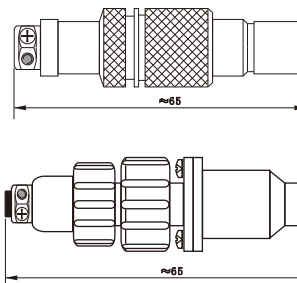
防水式
Water-proof type
防护等级: IP55
Protection Class: IP 55



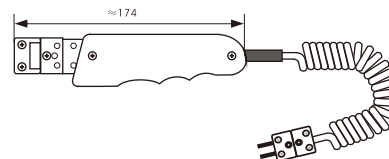
扁接插式 Flat Plug Type



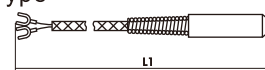
圆接插式 Round Plug Type



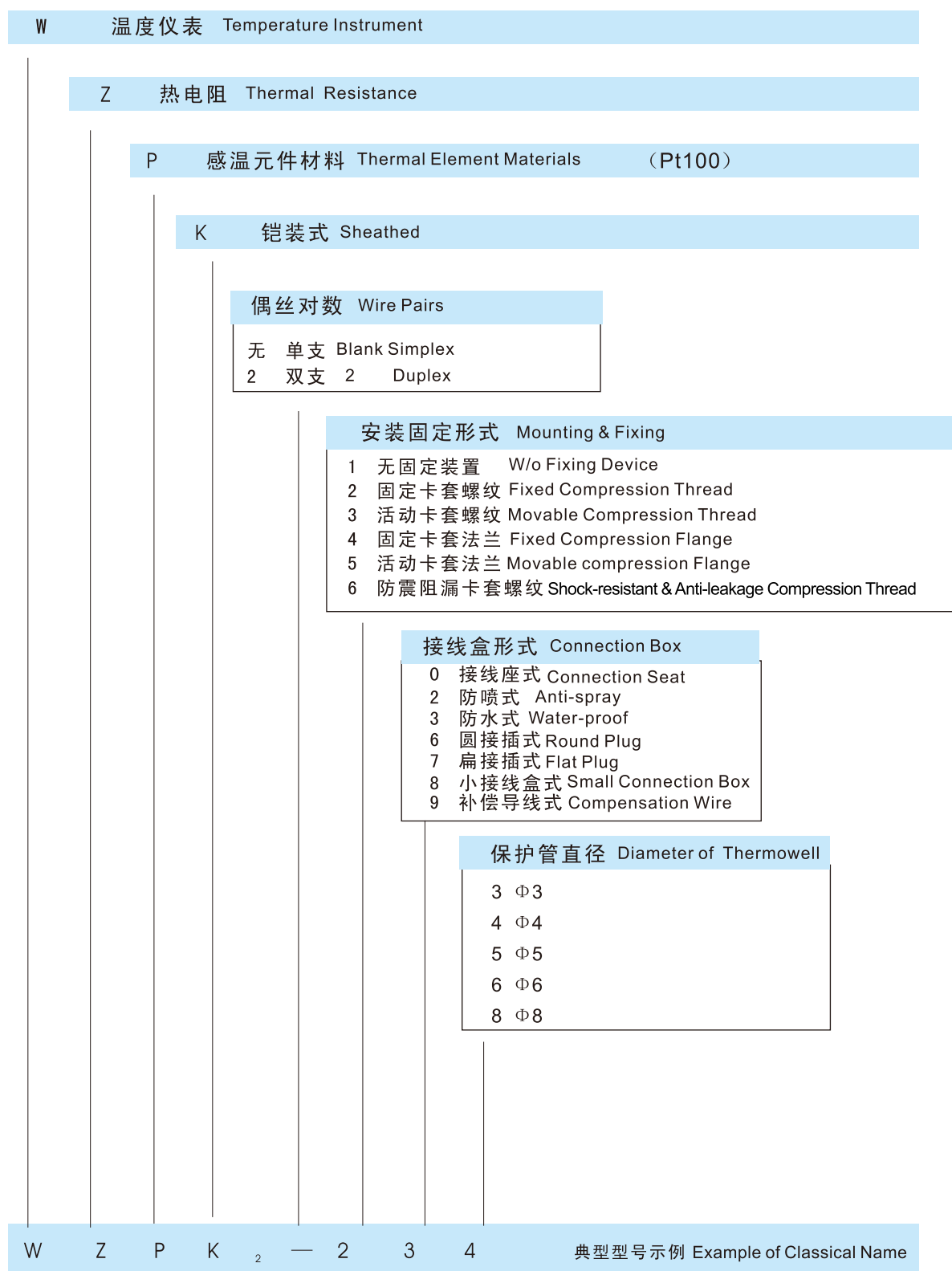
手柄式 Handle type



补偿导线式 Compensation Wire Type



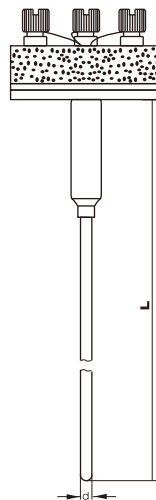
型号命名方法 Naming



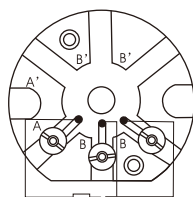
型号及规格 Type & Specification:

● 感温元件 Thermal Elements

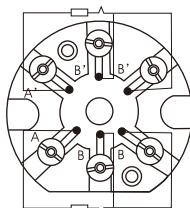
型 号 Type	分度号 Graduation	测量范围℃ Measuring Range	精度等级 Accuracy Class	偶丝对数 Wire Pairs
WZPK-103	Pt100	-200~+450	A级或B级 Class A or Class B	单支 Simplex.
WZPK-104				
WZPK-105				
WZPK-106				
WZPK-108				双支 Duplex.
WZPK ₂ -104				
WZPK ₂ -105				
WZPK ₂ -106				
WZPK ₂ -108				



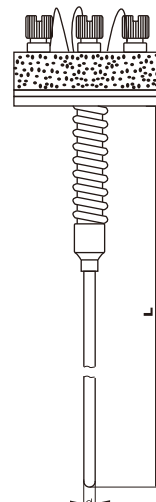
● 接线方式 Wiring Method



单支接线方法
Wiring Method (simplex)



双支接线方法
Wiring Method (duplex)



防震式
Shaking-proof Type

选型须知 Selection Notice

- 1) 型号
Type
- 2) 分度号
Graduation
- 3) 精度等级
Accuracy class
- 4) 安装固定形式
Mounting & Fixing type
- 5) 长度或插入深度
Length or insert depth

例A: 铠装热电阻, Pt100型, A级, 固定螺纹M16×1.5, 长度、防喷式接线盒
450mm, 插入长度300mm。

WZPK-226, Pt100, L=450×300, A级, M16×1.5

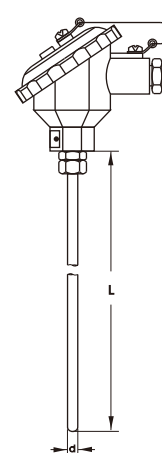
Eg.: Sheathed thermal resistance, type Pt100, Class A, fixed thread M16X1.5, length, anti-spray connection is 400mm, insert depth 300mm

WZPK-226, Pt100, L=450×300, Class A, M16×1.5

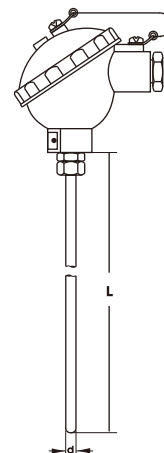
● 防水式铠装热电阻

Water-proof Sheathed Thermal Resistance

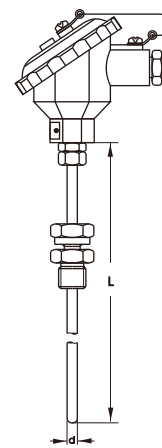
型 号 Type	分 度 号 Graduation	测 量 范 围℃ Measuring Range	精 度 等 级 Accuracy Class	安 装 固 定 装 置 Mounting & Fixing Device
WZPK-133	Pt100	-200~+450	A级或B级 Class A or Class B	无固定装置 W/o Fixing Device
WZPK-134				
WZPK-135				
WZPK-136				
WZPK-138				
WZPK ₂ -134				
WZPK ₂ -135				
WZPK ₂ -136				
WZPK ₂ -138				
WZPK-233				固定卡套螺纹 Fixed Compression Thread
WZPK-234				
WZPK-235				
WZPK-236				
WZPK-238				
WZPK ₂ -234				
WZPK ₂ -235				
WZPK ₂ -236				
WZPK ₂ -238				
WZPK-333				可动卡套螺纹 Movable Compression Thread
WZPK-334				
WZPK-335				
WZPK-336				
WZPK-338				
WZPK ₂ -334				
WZPK ₂ -335				
WZPK ₂ -336				
WZPK ₂ -338				固定卡套法兰 Fixed Compression Flange
WZPK-433				
WZPK-434				
WZPK-435				
WZPK-436				
WZPK-438				
WZPK ₂ -434				
WZPK ₂ -435				
WZPK ₂ -436				可动卡套法兰 Movable Compression Flange
WZPK ₂ -438				
WZPK-533				
WZPK-534				
WZPK-535				
WZPK-536				
WZPK ₂ -534				
WZPK ₂ -535				
WZPK ₂ -536				
WZPK ₂ -538				



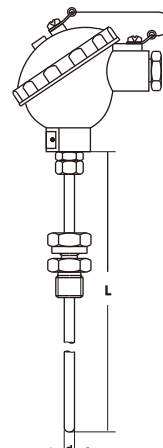
13□型



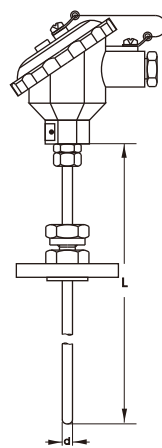
12□型



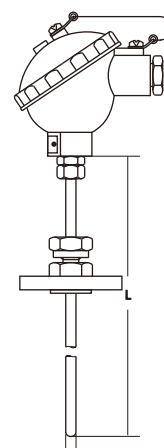
23□型
33□型



22□型
32□型



43□型
53□型

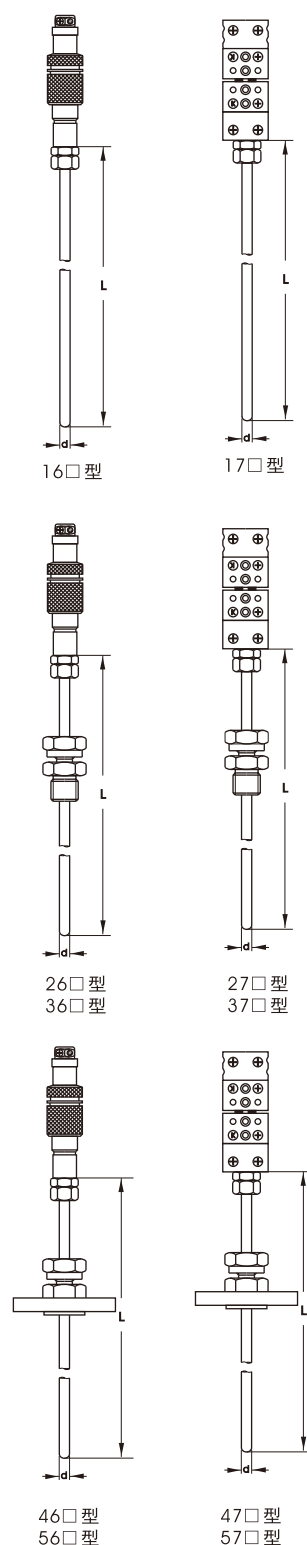


42□型
52□型

● 圆接插式铠装热电阻

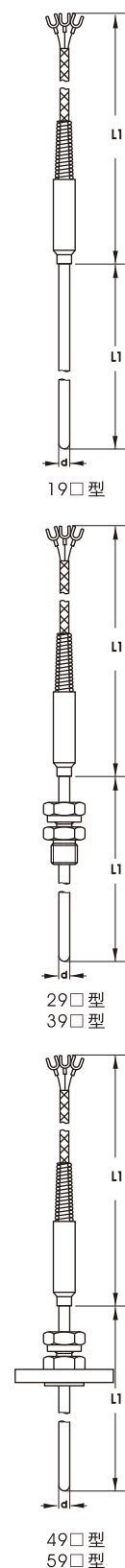
Round Plug Type Sheathed Thermal Resistance

型 号 Type	分 度 号 Graduation	测量范围℃ Measuring Range	精度等级 Accuracy Class	安装固定装置 Mounting & Fixing Device
WZPK-163	Pt100	-200~+450	A级或B级 Class A o r Class B	无固定装置 W/o Fixing Device
WZPK-164				
WZPK-165				
WZPK-166				
WZPK-168				
WZPK ₂ -164				
WZPK ₂ -165				
WZPK ₂ -166				
WZPK ₂ -168				
WZPK-263				固定卡套螺纹 Fixed Compression Thread
WZPK-264				
WZPK-265				
WZPK-266				
WZPK-268				
WZPK ₂ -264				
WZPK ₂ -265				
WZPK ₂ -266				
WZPK ₂ -268				
WZPK-363				可动卡套螺纹 Movable Compression Thread
WZPK-364				
WZPK-365				
WZPK-366				
WZPK-368				
WZPK ₂ -364				
WZPK ₂ -365				
WZPK ₂ -366				
WZPK ₂ -368				
WZPK-463				固定卡套法兰 Fixed Compression Flange
WZPK-464				
WZPK-465				
WZPK-466				
WZPK ₂ -464				
WZPK ₂ -465				
WZPK ₂ -466				
WZPK ₂ -468				
WZPK-563				可动卡套法兰 Movable Compression Flange
WZPK-564				
WZPK-565				
WZPK-566				
WZPK-568				
WZPK ₂ -564				
WZPK ₂ -565				
WZPK ₂ -566				
WZPK ₂ -568				



● 电缆式铠装热电阻 Cable Type Sheathed Thermal Resistance

型 号 Type	分 度 号 Graduation	测 量 范 围 ℃ Measuring Range	精 度 等 级 Accuracy Class	安 装 固 定 装 置 Mounting & Fixing Device
WZPK-193	Pt100	-200~+450	A级或B级 Class A or Class B	无固定装置 W/o Fixing Device
WZPK-194				
WZPK-195				
WZPK-196				
WZPK-198				
WZPK ₂ -194				
WZPK ₂ -195				
WZPK ₂ -196				
WZPK ₂ -198				
WZPK-293				
WZPK-294				固定卡套螺纹 Fixed Compression Thread
WZPK-295				
WZPK-296				
WZPK-298				
WZPK ₂ -294				
WZPK ₂ -295				
WZPK ₂ -296				
WZPK ₂ -298				
WZPK-393				
WZPK-394				
WZPK-395				可动卡套螺纹 Movable Compression Thread
WZPK-396				
WZPK-398				
WZPK ₂ -394				
WZPK ₂ -395				
WZPK ₂ -396				
WZPK ₂ -398				
WZPK-493				
WZPK-494				
WZPK-495				
WZPK-496				固定卡套法兰 Fixed Compression Flange
WZPK-498				
WZPK ₂ -494				
WZPK ₂ -495				
WZPK ₂ -496				
WZPK ₂ -498				
WZPK-593				
WZPK-594				
WZPK-595				
WZPK-596				
WZPK-598				可动卡套法兰 Movable Compression Flange
WZPK ₂ -594				
WZPK ₂ -595				
WZPK ₂ -596				
WZPK ₂ -598				
WZPK ₂ -598				



WZP系列

装配热电阻

Assembly Thermal Resistance

应用 Application

通常和显示仪表、记录仪表、电子计算机等配套使用。直接测量生产过程中的-200~+450℃范围内液体、蒸汽和气体介质以及固体表面温度。

It is usually connected with display meter, recording meter and computer etc. to directly measure the temperature of liquid, vapor, gas and solid surface ranging from -200 to 450℃ during various production processes.

特点 Features

- 结构简单、稳定性好

Simple structure and good stability performance

- 测量精确度高；

High measuring accuracy

- 机械强度高，耐压性能好；

High mechanical strength, good pressure-resisting performance

工作原理 Working Principle

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

It is based on that when temperature of object changes, the resistance will change accordingly, to measure temperature. When the resistance value changes, the working meter will display relevant temperature.

主要技术参数

Main Technical Parameters

- 产品执行标准

Standard:

IEC751

JB/T 8622-1997

JB/T 8623-1997

- 常温绝缘电阻

Insulation Resistance at Normal Temperature

- 在环境温度为15~35℃，相对湿度不大于80%，试验电压为10~100V（直流），铂热电阻的绝缘电阻应不小于100MΩ；铜热电阻的绝缘电阻应不小于50MΩ。

The insulation resistance of Pt thermal resistance shall be no less than 100MΩ, and the insulation resistance of Cu thermal resistance should be no less than 50MΩ under condition that environment temperature is 15~35℃, relative humidity is no more than 80%, testing voltage is 10~100V (D.C).

- 热响应时间 Thermal Response Time

在温度出现阶跃变化时，热电阻的输出变化至相当于该阶跃变化的50%，所需的时间称为热响应时间，用 $\tau_{0.5}$ 表示。

When the temperature has step-jumping change, the needed time for output of thermocouple changes to 50% of the step-jumping change, this time is called thermal response time, indicating with $\tau_{0.5}$.

- 公称压力 Nominal Pressure

一般是指在工作温度下保护管所能承受的静态外压而不破裂。实际上，工作压力不仅与保护管材料、直径、壁厚有关，还与热电偶结构形式、安装方法、置入深度以及被介质的流速和种类等有关。

It is usually means the static outer pressure which the protection tube can offer and will not be broken under the working temperature. In fact, working pressure not only has relationship with protection tube material, diameter and thickness of wall, but also the structure form, installation method, inserting depth and the flow speed and type of the medium etc.

● 测温范围及允差

Measuring Range & Tolerance

型号 Type	分度号 Graduation	测温范围℃ Measuring range	精度等级 Accuracy class	允许偏差 Tolerance allowed
WZP	Pt100	-200~+450	A级 Class	$\pm(0.15+0.002 t)$
			B级 Class	$\pm(0.30+0.005 t)$
WZC	Cu50 Cu100	-50~+150	-	$\pm(0.30+0.006 t)$

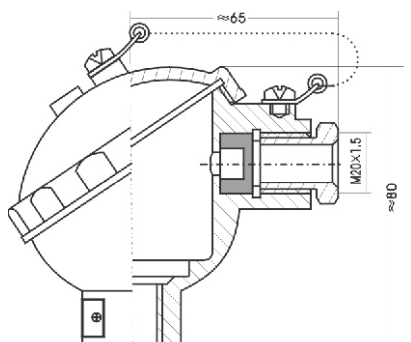
注：t为感温元件实测温度绝对值

Notice: t is the absolute value of exact measured temperature

● 接线盒形式

Connection Box Type

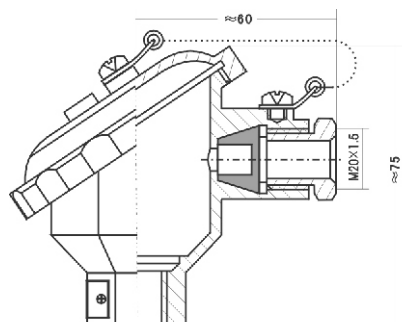
防喷式
Anti-spray Type



防护等级 IP 65
Protection Class: IP 65

防水式

Water-proof Type



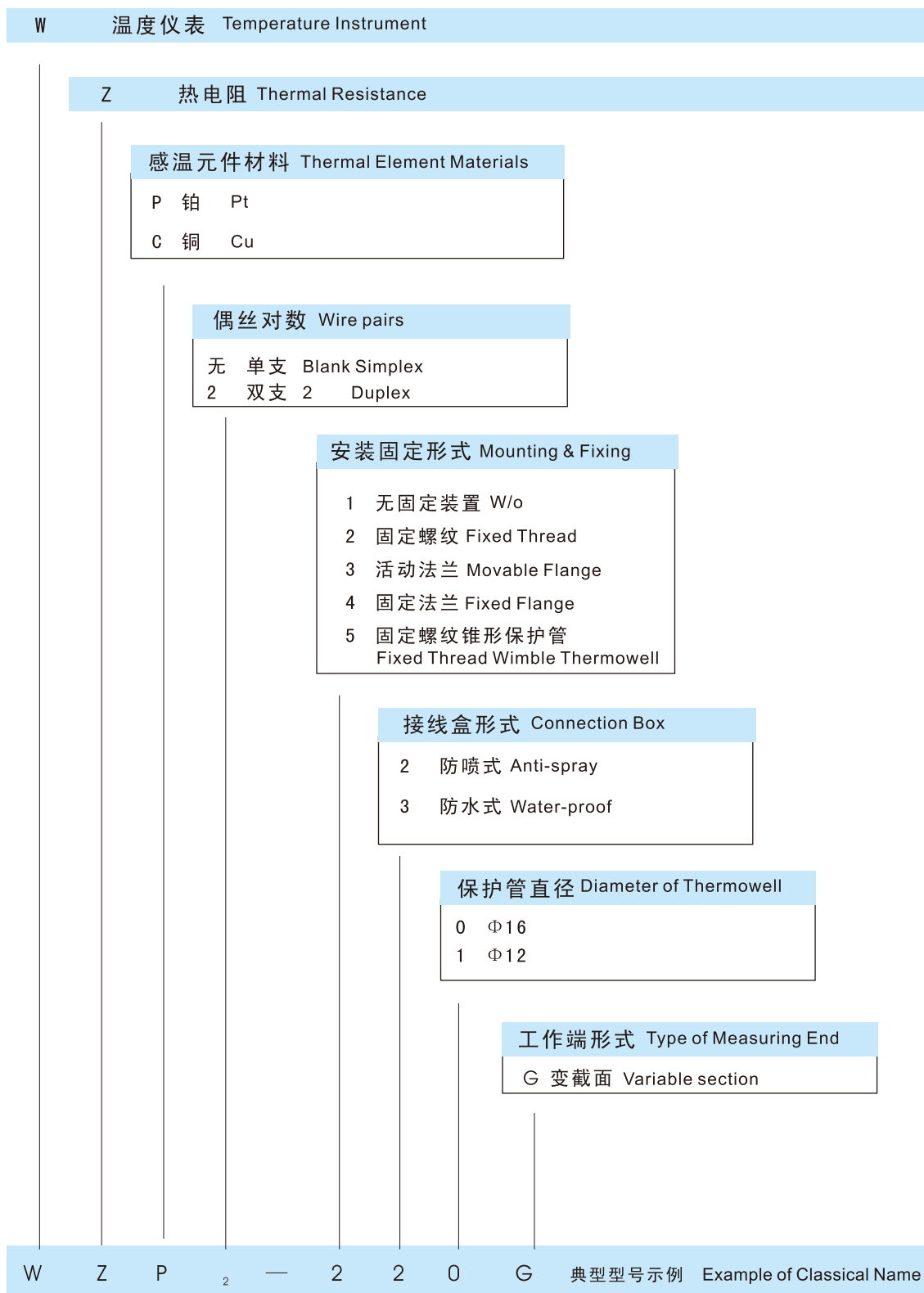
防护等级 IP 55
Protection Class: IP 55

注：电气出口M未特殊指明，一律视为M20×1.5

Notice:

The electric exit shall be considered as M20×1.5 if no indication

型号命名方法 Naming



感温元件 Thermal Elements

热电阻元件是测温仪表的基本结构之一，可分为铜热电阻元件和铂热电阻元件两大类，铜热电阻元件测温范围低，铂热电阻测温范围高，精度灵敏。

热电阻元件是一种温度传感器，其工作原理是：在温度作用下，电阻丝的电阻随之变化而变化。可用于测量-200~+450℃范围内的温度。与热电偶相比，其优点是：电气性能好，温度和电阻关系近于线性，偏差较小，且随着使用时间的增长偏差可忽略。

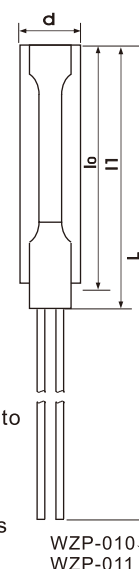
我公司生产的WZP系列铂热电阻元件，具有精确、灵敏、稳定等良好性能，结构小，可靠性好，热响应时间短，可做成多产品多规格的系列产品，为石油、化工、电力、轻工、机械、科研等行业提供新一代优质品。

Thermal resistor is one of basic structures of measuring instrument, including two types as Cu thermal resistor and Pt thermal resistor, Cu thermal resistor has lower measuring range and Pt thermal resistor has higher measuring range and acute accuracy.

Thermal resistor is a temperature sensor, its working principle is:

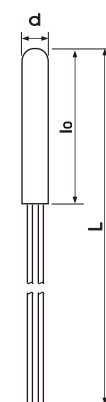
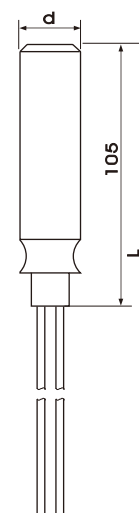
The resistance of resistance filament changes along with temperature under temperature effect. It is applicable for measuring temperature ranging from -200 to +450℃. It has following advantages compared with thermocouple: good electric-gas performance, the relation between temperature and resistance is near to linearity, less tolerance, the tolerance shall be ignorant with operation time increasing.

The WZP series Pt thermal resistor we produced has good accuracy, acute, stable etc. performances, small structure, good stability, short thermal response time. It can be made into series products with multi products and multi specifications, which supply the new generation products with favorable quality to petroleum, chemical industries, power, mechanism, light industry and technology research etc.



● 骨架式热电阻元件 Skeleton Type Thermal Resistor

热电阻类别 Thermal Resistance Type	产品 型号 Model #	分度号 Graduation	测温 范围℃ Measuring Range	保护管材料 Thermowell Material	规 格 Specification				热响应 时 间 t0.5(S) TRT
					直径 d mm Diameter	总长 Lmm Total length	L ₀ mm	L ₁ mm	
单支铂热电阻感温元件 Pt (Simplex)	WZP -010	Pt100 (BA ₁ 、 BA ₂)*	-200 ~450	外保护层为1Cr 18Ni9Ti不锈钢 薄片 Outer protection is 1Cr 18Ni9TiStain- less steel film	φ 12	300 350 450 550 650 900 1150 1400 1650 2150	85	105	<45
双支铂热电阻感温元件 Pt (Duplex)	WZP ₂ -010								
单支铂热电阻感温元件 Pt (Simplex)	WZP -011				φ 8	300 350 450 550	65	80	<15
双支铂热电阻感温元件 Pt (Duplex)	WZP ₂ -011								
铜热电阻感温元件 Cu	WZC- 010A	Cu50 (G) *	-50~ +150	柴铜管 Cu tube	φ 8	300 350 450 550 650 900 1150 1400 1650 2150			<20
铂热电阻感温元件 Pt	WZP- 035S	Pt100	-50~ +450	不锈钢套管 Stainless steel tube	φ 6		35		<5
铜热电阻感温元件 Cu	WZC -011	Cu50 (G) *	-50~ +150	不锈钢套管 Stainless steel Tube	φ 4		25		<3



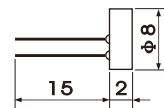
注：①打“*”分度号作特殊规格订货；

It should be ordered as special specification if marked with *

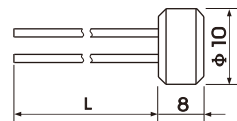
● 薄膜式端面铂热电阻元件

Film Section Pt Thermal Resistor

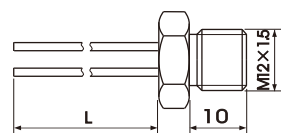
产品型号 Model Number	分度号 Graduation	测温范围℃ Measuring Range	精度等级 Accuracy Class	保护管材料 Thermowell Material	热响应时间 τ 0.5(S) TRT
WZPM-018	Pt100	-200~+450	B	陶瓷 Ceramic	≤ 0.5
WZPM-0110		-50~+150	B	1Cr18Ni9Ti	≤ 5
WZPM-2012		-50~+150	B	1Cr18Ni9Ti	≤ 10



WZPM-018



WZPM-0110

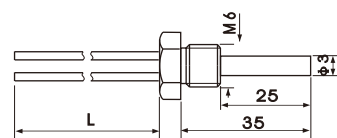


WZPM-2012

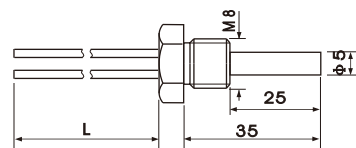
● 内绕式铂热电阻元件

Inner-circling Pt Thermal Resistor

产品型号 Model Number	分度号 Graduation	测温范围℃ Measuring Range	精度等级 Accuracy Class	套管材料 Thermowell Material	热响应时间 τ 0.5(S) TRT
WZP-203S		-50~+150	B	1Cr18Ni9Ti	≤ 5
WZP-205S		-50~+150	B	1Cr18Ni9Ti	≤ 5



WZP-203S



WZPM-205S

● 感温元件 Thermal Element

名称 Name	型号 Type	分度号 Graduation	测温范围℃ Measuring Range	规格Specification	
				D	L
单支铂热电阻 Pt Thermal Resistance (Simplex.)	WZP-105	Pt100	-200~500	φ3	310
				φ4	360
				φ5	410
				φ6	460
				φ6	510
双支铂热电阻 Pt Thermal Resistance (Duplex.)	WZP ₂ -105			φ6	560

● 无固定装置热电阻

Thermal Resistance W/ Fixing Device

型 号 Type	分 度 号 Graduation	测温范围℃ Measuring Range	热响应时间 TRT	规 格Specification	
				D	L
WZP-120 W ZP ₂ - 120	Pt100	-200~+450	<90S	φ 16	300 350 400 450 500 550 650 900 1150 1650 2150
WZP-120G W ZP ₂ - 120G			<24S		
WZP-121 W ZP ₂ - 121			<45S	φ 12	
WZP-121G W ZP ₂ - 121G			<24S		
WZP-130 W ZP ₂ - 130			<90S	φ 16	
WZP-130G W ZP ₂ - 130G			<24S		
WZP-131 W ZP ₂ - 131			<45S	φ 12	
WZP-131G W ZP ₂ - 131G			<24S		
WZC-120 W ZC- 120G	Cu50 CU100	-50~+150	<120S	φ 16	
WZC-120G			<40S		
WZC-130			<120S		
WZC-130G			<40S		
WZC-121			<120S	φ 12	
WZC-121G			<40S		
WZC-131			<120S		
WZC-131G			<40S		

注：1、保护管材质为304S，其余材质可协议订货

The material of thermowell is 304S, other materials can be ordered by agreement.

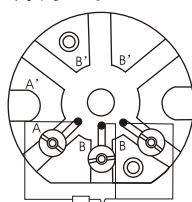
2、变截面型式为铠装元件

The variable section is sheathed elements.

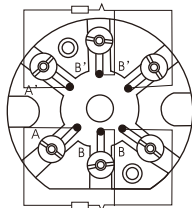
3、其余长度可协议订货

The other length can be ordered by agreement.

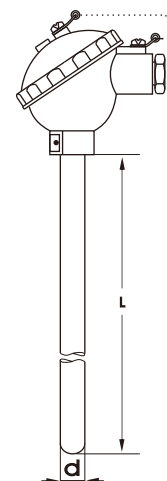
● 接线方式 Wiring Method



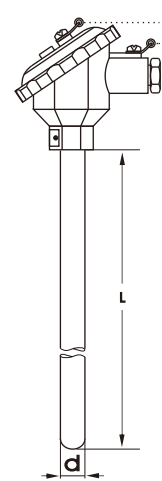
单支接线方法
Wiring Method (Simplex)



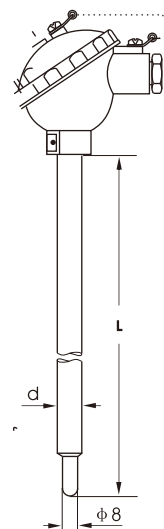
双支接线方法
Wiring Method (Duplex.)



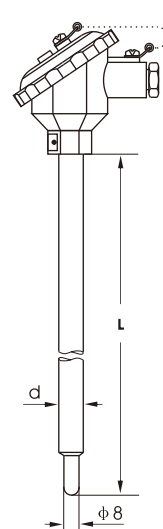
防喷式120 121型
Anti-spray Type



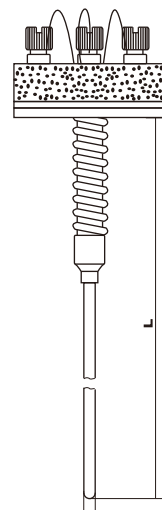
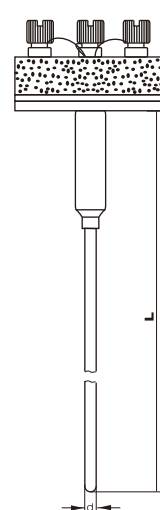
防水式130 131型
Water-proof Type



防喷式120G 121G型
Anti-spray Type



防水式130G 131G型
Water-proof Type



● 固定螺纹式热电阻

Thermal Resistance w/ Fixed Thread

型 号 Type	分 度 号 Graduation	测温范围℃ Measuring Range	热响应时间 TRT	规 格Specification	
				D	L×I
WZP-220 W ZP ₂ -220	Pt100	-200~+450	<60S	φ 16	300×150 350×200 400×250 450×300 500×350 550×400 650×500 900×750 1150×1000 1650×1500 2150×2000
WZP-220G W ZP ₂ -220G			<24S		
WZP-221 W ZP ₂ -221			<45S	φ 12	
WZP-221G W ZP ₂ -221G			<24S		
WZP-230 W ZP ₂ -230			<60S	φ 16	
WZP-230G W ZP ₂ -230G			<24S		
WZP-221 W ZP ₂ -221			<45S	φ 12	
WZP-221G W ZP ₂ -221G			<24S		
WZC-220	Cu50 CU100	-50~150	<90S	φ 16	
W ZC-220G			<24S		
WZC-230			<90S		
W ZC-230G			<24S		
WZC-221			<90S	φ 12	
W ZC-221G			<24S		
WZC-231			<90S		
W ZC-231G			<24S		

注：1、保护管材质为304S，其余材质可协议订货

The material of thermowell is 304S, other materials can due to agreement.

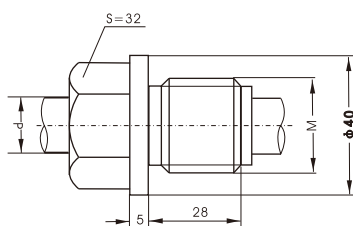
2、变截面型式为铠装元件

The variable section is sheathed elements.

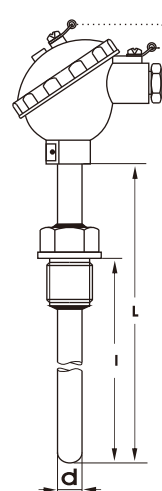
3、其余长度可协议订货

The other length can be ordered by agreement.

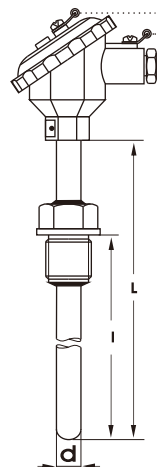
型号系列 Type Name	螺纹规格 Thread Specification		公称压力 NP Mpa
	代号 Code	M	
WZP-230		M27×2	10
WZP-230A	A	G3/4	
WZP-230C	C	NPT3/4	
WZP-231G		M27×2	
WZP-231GA	A	G3/4	
WZP-231GC	C	NPT3/4	



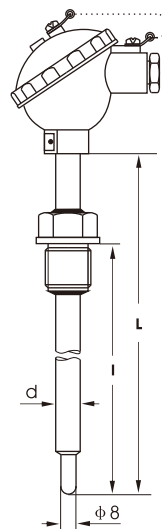
安装固定型式：固定螺纹
Installation: Fixed Thread



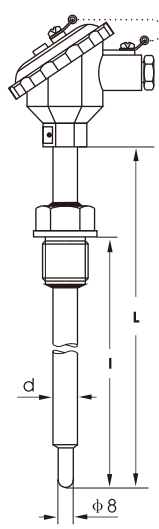
防喷式220 221型
Anti-spray Type



防水式230 231型
Water-proof Type



防喷式220G 221G型
Anti-spray Type



防水式230G 231G型
Water-proof Type

● 活动法兰式热电阻

Thermal Resistance W/ Moveable Flange

型 号 Type	分 度 号 Graduation	测温范围℃ Measuring Range	热响应时间 TRT	规 格 Specification	
				D	L
WZP-320 W ZP ₂ -320	Pt100	-200~+450	<90S	φ 16	300 350 400 450 500 550 650 900 1150 1650 2150
WZP-320G W ZP ₂ -320G			<24S		
WZP-321 W ZP ₂ -321			<45S	φ 12	
WZP-321G W ZP ₂ -321G			<24S		
WZP-330 W ZP ₂ -330			<90S	φ 16	
WZP-330G W ZP ₂ -330G			<24S		
WZP-321 W ZP ₂ -321			<45S	φ 12	
WZP-321G W ZP ₂ -321G			<24S		
WZC-320	Cu50 CU100	-50~150	<120S	φ 16	
W ZC-230G			<40S		
WZC-330			<120S		
W ZC-330G			<40S		
WZC-321			<120S	φ 12	
W ZC-321G			<40S		
WZC-331			<120S		
W ZC-331G			<40S		

注：1、保护管材质为3045S，其余材质可协议订货

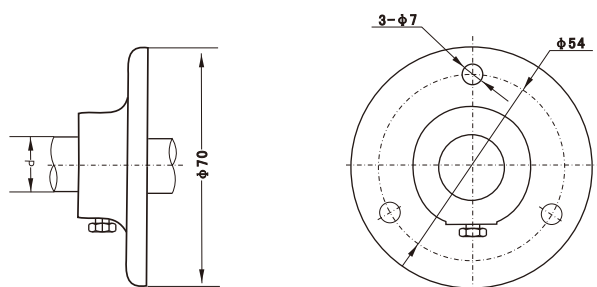
The material of thermowell is 3045S, other materials can due to agreement.

2、变截面型式为铠装元件

The variable section is sheathed elements.

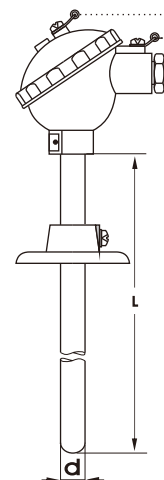
3、其余长度可协议订货

The other length can be ordered by agreement.

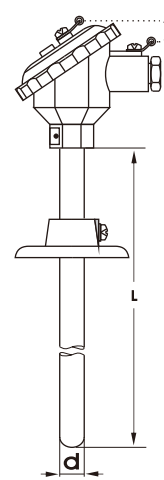


安装固定型式：活动法兰

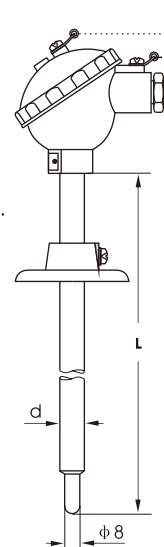
Installation: Movable Flange



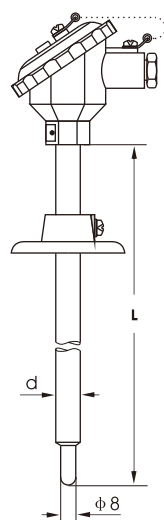
防喷式320 321型
Anti-spray Type



防水式330 331型
Water-proof Type



防喷式320G 321G型
Anti-spray Type



防水式330G 331G型
Water-proof Type

● 固定法兰式热电阻 Thermal Resistance w/ Fixed Flange

型 号 Type	分 度 号 Graduation	测 温 范 围℃ Measuring Range	热 响 应 时 间 TRT	规 格 Specification	
				D	L×I
WZP-420 W ZP ₂ -420	Pt100	-200~+450	<90S	φ 16	300×150 350×200 400×250 450×300 500×350 550×400 650×500 900×750 1150×1000 1650×1500 2150×2000
WZP-420G W ZP ₂ -420G			<24S		
WZP-421 W ZP ₂ -421			<45S	φ 12	
WZP-421G W ZP ₂ -421G			<24S		
WZP-430 W ZP ₂ -430			<90S	φ 16	
WZP-430G W ZP ₂ -430G			<24S		
WZP-421 W ZP ₂ -421			<45S	φ 12	
WZP-421G W ZP ₂ -421G			<24S		
WZC-420	Cu50 CU100	-50~150	<120S	φ 16	
W ZC-420G			<40S		
WZC-430			<120S		
W ZC-430G			<40S		
WZC-421			<120S	φ 12	
W ZC-421G			<40S		
WZC-431			<120S		
W ZC-431G			<40S		

注：1、保护管材质为3045S，其余材质可协议订货

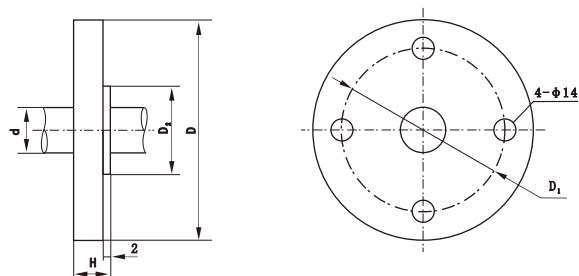
The material of thermowell is 3045S, other materials can due to agreement.

2、变截面型式为铠装元件

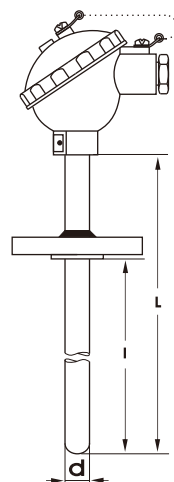
The variable section is sheathed elements.

3、其余长度可协议订货

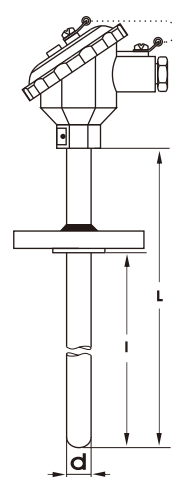
The other length can be ordered by agreement.



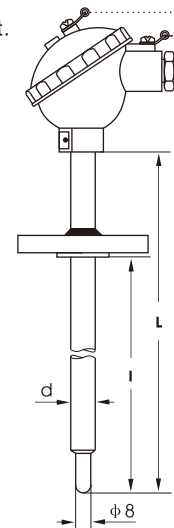
型号示例 Type	法兰规格 Flange Specification					公称压力 NP Mpa
	D	D 1	D 2	H	d	
WZP-420	φ 105	φ 75	φ 55	16	φ 16	2.5
WZP-420G	φ 105	φ 75	φ 55			
WZP-421	φ 105	φ 75	φ 55	16	φ 16	
WZP-421G	φ 105	φ 75	φ 55			



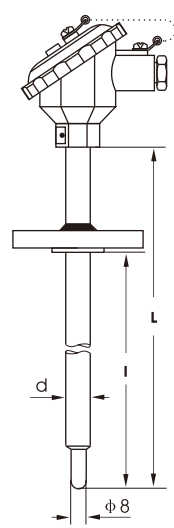
防喷式420 421型
Anti-spray Type



防水式430 431型
Water-proof Type



防喷式420G 421G型
Anti-spray Type



防水式430G 431G型
Water-proof Type

● 固定螺纹锥形保护管热电阻

Thermal Resistance w/ Fixed Thread in Wimble Thermowell

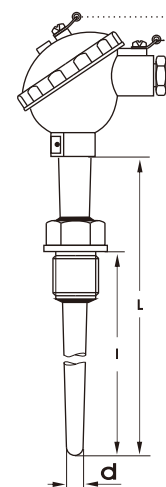
型号 Type	分度号 Graduation	测温范围℃ Measuring Range	热响应时间 TRT	规格 Specification	
				D	L×I
WZP-620 WZP ₂ -620	Pt100	-200~+450	<90S	Φ 15	300×150
WZP-620A WZP ₂ -620A			<90S		350×200
WZP-620 WZP ₂ -620			<90S		400×250
WZP-620A WZP ₂ -620A			<90S		450×300
					500×350
					550×400
					650×500

注：1、保护管材质为1Cr18Ni9Ti，其余协议订货；

The material of thermowell is 1Cr18Ni9Ti, others will be ordered due to agreement.

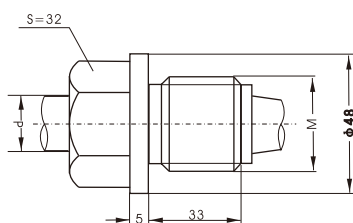
2、元件为铠装式

Element is sheathed.



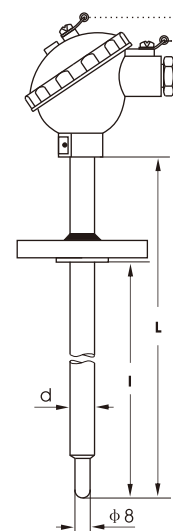
防喷式620 620A型
Anti-spray Type

型号示例 Type Model	螺纹规格 Thread Specification		公称压力 NP Mpa
	代号 Code	M	
WZP-620		M33×2	≤30
WZP-620A	A	NPT1	
WZP-630		M33×2	
WZP-630A	A	NPT1	



安装固定型式：固定螺纹锥形保护管

Installation: Fixed Thread in Wimble Thermowell



防水式630 630A型
Water-proof Type

可拆卸式热电阻 Knock-down Thermocouple

W 温度仪表 Temperature Instrument

Z 热电阻 Thermal Resistance

感温元件材料(铠装式) Thermal Element Material (Sheathed)

P Pt100

Z Cu

偶丝对数 Wire Pairs

无 单支 Blank Simplex

2 双支 2 Duplex

连接形式 Connection

5 活络管接头式 Elbow Tube Connector

7 直形管接头式 Straight Tube Connector

8 固定螺纹接头式 Fixed Thread Connector

9 活动螺纹接头式 Movable Thread Connector

接线装置形式

2 防喷式 Anti-spray

3 防水式 Water-proof

热安装套管形式见<热套管安装图>

Please refer to Thermowell Table

W Z P 2 — 5 2

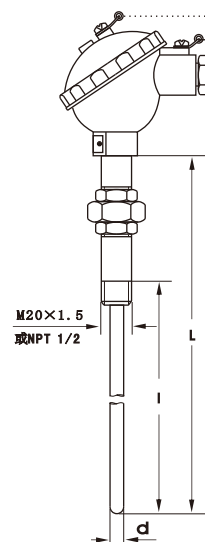
典型型号示例 Example of Classical Name

● 活络管接头式热电阻

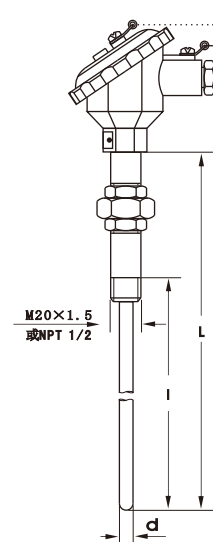
Thermal Resistance w/ Movable Tube Connector

型 号 type	分度号 Graduation	测温范围℃ Measuring Range	螺纹规格 Thread Specification	规格 Specification	
				D	L
WZP-52 W ZP ₂ -52	Pt100	-200~+450	M20×1.5	φ3	245
WZP-52A W ZP ₂ -52A			NPT1/2	φ4	270
WZP-53 W ZP ₂ -53			M20×1.5	φ5	295
WZP-53A W ZP ₂ -53A			NPT1/2	φ6	345
WZC-52			M20×1.5	φ8	395
W ZC-52A			NPT1/2	φ5	445
WZC-53	Cu50 CU100	-50~150	M20×1.5	φ6	545
W ZC-53A			NPT1/2	φ8	645
					745
					899
					1149

- 1) 如无特殊之约定,L仅为参考尺寸,热电偶插入深度应为热安装套管U尺寸计算;
L is for reference only if no special indication, and insert depth of thermocouple should be size U of thermowell.
- 2) 热安装套管形式详见后面热安装套管型式图;
For thermowell type, pls refer to Thermowell Table at the end of this book.
- 3) 元件为弹性铠装式元件
Elements are spring sheathed element.



防喷式52 52A型
Anti-spray Type



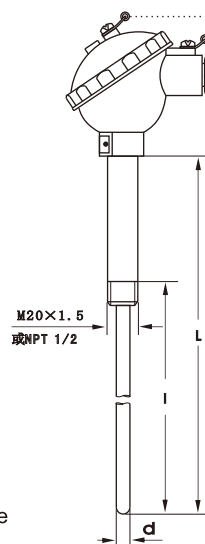
防水式53 53A型
Water-proof Type

● 直形管接头式热电阻

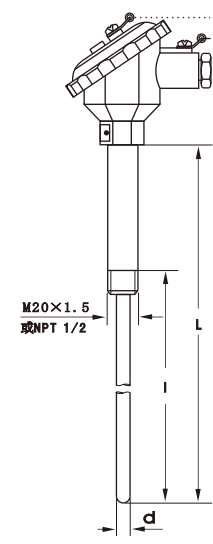
Thermal Resistance w/ Straight Tube Connector

型 号 type	分度号 Graduation	测温范围℃ Measuring Range	螺纹规格 Thread Specification	规格 Specification	
				D	L
WZP-72 W ZP ₂ -72	Pt100	-200~+450	M20×1.5	φ3	245
WZP-72A W ZP ₂ -72A			NPT1/2	φ4	270
WZP-73 W ZP ₂ -73			M20×1.5	φ5	295
WZP-73A W ZP ₂ -73A			NPT1/2	φ6	345
WZC-72			M20×1.5	φ8	395
W ZC-72A			NPT1/2	φ5	445
WZC-73	Cu50 CU100	-50~150	M20×1.5	φ6	545
W ZC-73A			NPT1/2	φ8	645
					745
					899
					1149

- 1) 如无特殊之约定,L仅为参考尺寸,热电偶插入深度应为热安装套管U尺寸计算;
L is for reference only if no special indication, and insert depth of thermocouple should be size U of thermowell.
- 2) 热安装套管形式详见后面热安装套管型式图;
For thermowell type, pls refer to Thermowell Table at the end of this book.
- 3) 元件为弹性铠装式元件
Elements are spring sheathed element.



防喷式72 72A型
Anti-spray Type



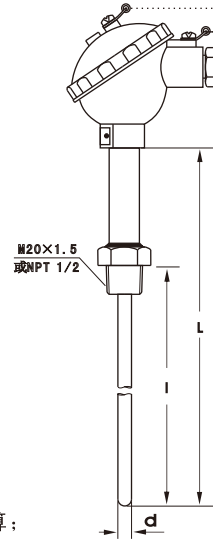
防水式73 73A型
Water-proof Type

● 固定螺纹管接头式热电阻

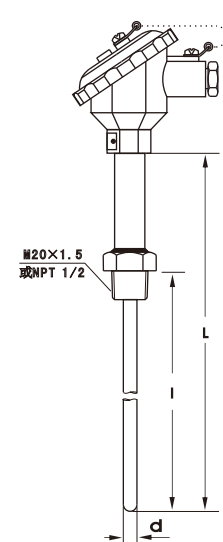
Thermal Resistance w/ Fixed Threaded Tube Connector

型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	螺纹规格 Thread Specification	规 格 Specification	
				D	L
WZP-82 W ZP ₂ -82	Pt100	-200~+450	M20×1.5	φ3 φ4 φ5 φ6 φ8	245
WZP-82A W ZP ₂ -82A			NPT1/2		270
WZP-83 W ZP ₂ -83			M20×1.5		295
WZP-83A W ZP ₂ -83A			NPT1/2		345
WZC-82 W ZC-82A			M20×1.5		395
WZC-83 W ZC-83A	Cu50 CU100	-50~150	NPT1/2	φ5 φ6 φ8	445
WZC-82			M20×1.5		545
WZC-82A			NPT1/2		545
WZC-83			M20×1.5		645
WZC-83A	Cu50 CU100	-50~150	NPT1/2	φ5 φ6 φ8	745
WZC-82			M20×1.5		899
WZC-82A			NPT1/2		899
WZC-83			M20×1.5		1149
WZC-83A	Cu50 CU100	-50~150	NPT1/2	φ5 φ6 φ8	1149

- 1) 如无特殊之约定,L仅为参考尺寸,热电偶插入深度应为热安装套管U尺寸计算;
L is for reference only if no special indication, and insert depth of thermocouple should be size U of thermowell.
- 2) 热安装套管形式详见后面热安装套管型式图;
For thermowell type, pls refer to Thermowell Table at the end of this book.
- 3) 元件为弹性铠装式元件
Elements are spring sheathed element.



防喷式82 82A型
Anti-spray Type



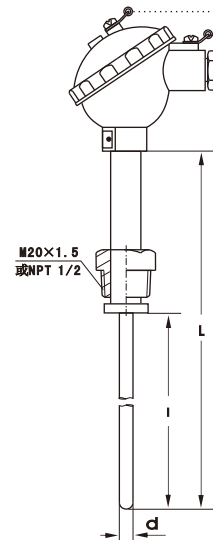
防水式83 83A型
Water-proof Type

● 活动螺纹管接头式热电阻

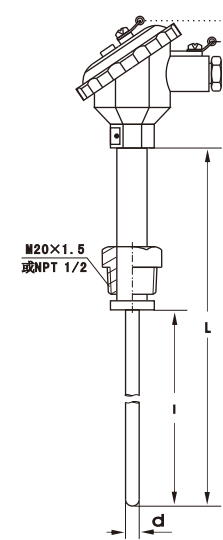
Thermal Resistance w/ Moveable Threaded Connector

型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	螺纹规格 Thread Specification	规 格 Specification	
				D	L
WZP-92 W ZP ₂ -92	Pt100	-200~+450	M20×1.5	φ3 φ4 φ5 φ6 φ8	245
WZP-92A W ZP ₂ -92A			NPT1/2		270
WZP-93 W ZP ₂ -93			M20×1.5		295
WZP-93A W ZP ₂ -93A			NPT1/2		345
WZC-92 W ZC-92A			M20×1.5		395
WZC-93 W ZC-93A	Cu50 CU100	-50~150	NPT1/2	φ5 φ6 φ8	445
WZC-92			M20×1.5		545
WZC-92A			NPT1/2		545
WZC-93			M20×1.5		645
WZC-93A	Cu50 CU100	-50~150	NPT1/2	φ5 φ6 φ8	745
WZC-92			M20×1.5		899
WZC-92A			NPT1/2		899
WZC-93			M20×1.5		1149
WZC-93A	Cu50 CU100	-50~150	NPT1/2	φ5 φ6 φ8	1149

- 1) 如无特殊之约定,L仅为参考尺寸,热电偶插入深度应为热安装套管U尺寸计算;
L is for reference only if no special indication, and insert depth of thermocouple should be size U of thermowell.
- 2) 热安装套管形式详见后面热安装套管型式图;
For thermowell type, pls refer to Thermowell Table at the end of this book.
- 3) 元件为弹性铠装式元件
Elements are spring sheathed element.



防喷式92 92A型
Anti-spray Type

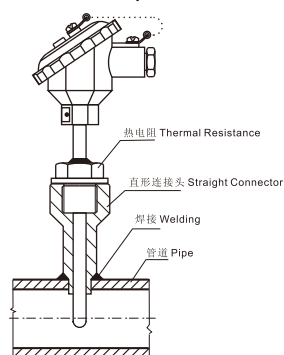


防水式93 93A型
Water-proof Type

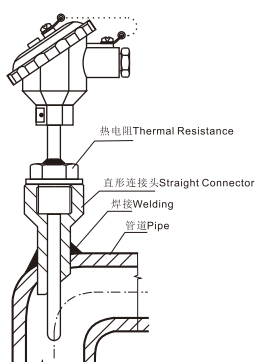
热电阻安装示意图

Installation Sketch Map of Thermal Resistance

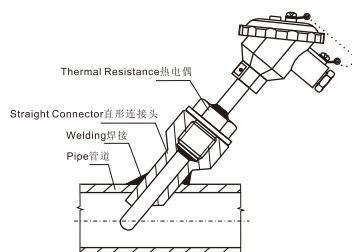
垂直管道安装方法 Vertical Pipe



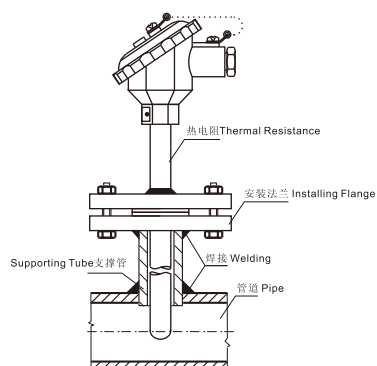
弯曲管道安装方法 Bending Pipe



倾斜管道安装方法 Leaning Pipe

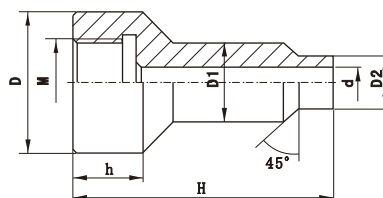


法兰安装方法 Flange Installation method

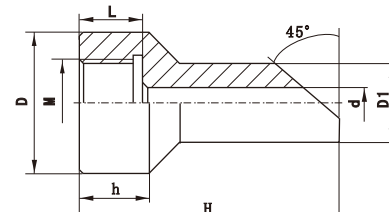
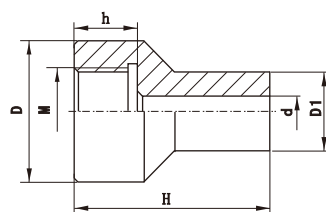


直形接头规格

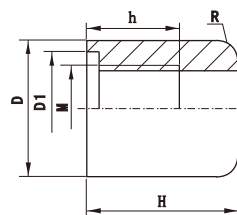
Straight Connector Specification



代号Code	M	D	D ₁	D ₂	d	h	H
LD21A	M12×1.5	φ24	φ16	φ12	φ8	20	60
LD21B	M16×1.5	φ24	φ16	φ12	φ8	20	60
LD21C	M20×1.5	φ28	φ16	φ12	φ8	20	60
LD21D	M27×2	φ39	φ28	φ24	φ20	35	60
LD21E	M33×2	φ48	φ38	φ30	φ22	35	90
LD21F	NPT1/2	φ28	φ16	φ12	φ8	20	60
LD21G	NPT3/4	φ39	φ28	φ24	φ20	35	
LD21H	NPT1	φ48	φ38	φ30	φ22	35	90



代号Code	M	D	D ₁	d	h	H
LD22A	M12×1.5	φ24	φ16	φ8	20	35
LD22B	M16×1.5	φ24	φ16	φ8	20	35
LD22C	M20×1.5	φ28	φ16	φ8	20	45
LD22D	M27×2	φ39	φ28	φ20	35	60
LD22E	M33×2	φ48	φ38	φ22	35	90
LD22F	NPT1/2	φ28	φ16	φ8	20	45
LD22G	NPT3/4	φ39	φ28	φ20	35	60
LD22H	NPT1	φ48	φ38	φ22	35	90



代号Code	M	D	D ₁	R	h	H
LD23A	M27×2	φ47	φ44	6	32	60
LD23B	M33×2	φ55	φ52	6	38	60

WR/Z□系列

防爆热电偶/阻

Explosion-proof Thermocouple / Thermal Resistance

应用 Application

通常和显示仪表、记录仪表、电子计算机等配套使用。直接测量生产现场存在碳氢化合物等爆炸的0~1300℃范围内液体、蒸汽和气体介质以及固体表面温度。

It is usually cooperated with display meter, recording meter and computer etc., to measure the surface temperature of the mediums as liquid, steam and gas ranging from 0~1300℃ during production locale which has explosive such as hydrocarbon compound.

特点 Features:

- 多种防爆形式，防爆性能好；
Multi explosion-proof type, good explosion-proof performance
- 压簧式感温元件，抗振性能好；
Spring thermal element with good shock-resistant performance
- 测量范围大；
Wide measuring range
- 机械强度高，耐压性能好；
High mechanical strength and good pressure-resistant performance

工作原理 Working Principle

防爆热电偶/阻利用间隙爆原理，设计具有足够强度的接线盒等部件，将所有会产生火花、电弧和危险温度的零部件都密封在接线盒腔内，当腔内发生爆炸时，能通过接合面间隙熄火和冷却，使爆炸后的火焰和温度传不到腔外，从而进行测温。

Explosion-proof thermocouple/thermal resistance is making use of the clearance principle to design the connection box and other components with enough strength, and then seal all components which has dangers as fire, arc, and dangerous temperature in the connection box. When there is explosion in the cavity, the fire and temperature will not

主要技术参数 Main Technical Parameter

● 产品执行标准 Standard

IEC584
IEC751
IEC1515
GB 3836-2000
GB/T 16839-1997
JB/T 5518-91
JB/T 8622-1997

● 常温绝缘电阻

Insulation Resistance at Normal Temperature

防爆热电偶在环境温度为15~35℃，相对湿度不大于80%，试验电压为500±50V（直流）电极及外套管之间的绝缘电阻≥100MΩ·m。

防爆热电阻在环境温度为15~35℃，相对湿度不大于80%，试验电压为10~100V（直流）电阻及外套管之间的绝缘电阻≥100MΩ。

The explosion-proof thermocouple, the insulation resistance between electrode and protection tube is no less than 100MΩ.m under condition that environment temperature is 15~35℃, relative humidity is no more than 80% and testing voltage is 500+/-50V(D.C).

The explosion-proof thermal resistance, the insulation resistance between electrode and protection tube is no less than 100MΩ.m under condition that environment temperature is 15~35℃, relative humidity is no more than 80% and testing voltage is 10~100V (D.C).



注：对于铠装元件，其绝缘电阻值，则以铠装热电偶、阻的绝缘电阻值计算。

Notice: For sheathed element, the insulation resistance should be calculated from the insulation resistance of sheathed thermocouple and thermal resistance.

● 热电偶测温范围及允差

Measuring Range & Tolerance of Thermocouple

型号	分度号	允差等级			
		I		II	
		允差值	测温范围℃	允差值	测温范围℃
WRN	K	±1.5℃	-40~+375	±2.5℃	-40~+333
		±0.004 t	375~1000	±0.0075 t	333~1200
WRM	N	±1.5℃	-40~375	±2.5℃	-40~333
		±0.004 t	375~1000	±0.0075 t	333~1200
WRE	E	±1.5℃	-40~+375	±2.5℃	-40~+333
		±0.004 t	375~800	±0.0075 t	333~900
WRF	J	±1.5℃	-40~+375	±2.5℃	-40~+333
		±0.004 t	375~750	±0.0075 t	333~750
WRC	T	±0.5℃	-40~+125	±1℃	-40~+133
		±0.004 t	125~350	±0.0075 t	133~350

● 热电阻测温范围及允差

Measuring Range & Tolerance of Thermal Resistance

型号 Type	分度号 Graduation	测量范围 Measuring Range	精度等级 Accuracy Class	允许偏差 Tolerance
WZP	Pt100	-200~+500	A级	±(0.15+0.002 t)
			B级	±(0.30+0.005 t)

注：t为感温元件实测温度。

Notice: t is the exact measured temperature for thermal element.

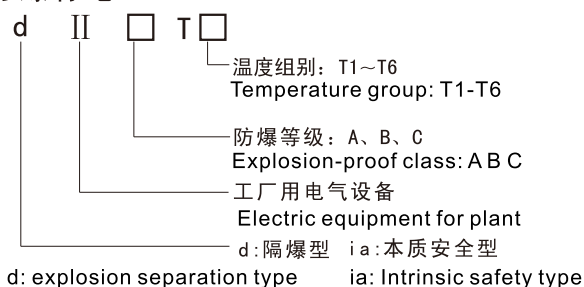
● 取证一览表

Certificates List

防爆级别 Explosion-proof Class	防爆证号 Certificate Number	认证机构 Certifying Institution
d II B T4	GYB02544	NEPSI
d II B T5	GYB02562	NEPSI
d II CT4	GYB02621	NEPSI
d II CT5	GYB02632	NEPSI
ia II CT6	GYB02653	NEPSI

注：NEPSI防爆认证系国家级仪器仪表防爆安全监督检验站
NEPSI explosion-proof certifying system, national & meter
explosion-proof security inspection

● 防爆标志 Explosion-proof Indication



● 电气设备类别 Electric Device Category

I 类——煤矿井下用电气设备

II 类——工厂用电气设备

I-----Electric device for coal mine well

II----Electric device for plant

● 防爆等级 Explosion-proof Class

防爆热电偶的防爆等级按其使用于爆炸性气体混合物最大安全间隙分为A、B、C三级。

It is divided into grade A, B and C according to maximum test safety gap in explosive gas compound.

类别 Category	级别 Class	最大试验安全间隙 (MESG) mm Maximum Test Safety Gap (MESG)
II	A	0.9≤MESG
	B	0.5<MESG<0.9
	C	MESG≤0.5

● 温度组别 Temperature Group

防爆热电偶的温度组别按其外露部分允许最高表面温度分为T1~T6。

Its temperature group is divided into T1~T6 according to its high surface temperature exposing parts allowed.

温度组别 Temperature Group	允许最高表面温度℃ Max Surface Temperature Allowed
T1	450
T2	300
T3	200
T4	135
T5	100
T6	85

● 防爆级别

Explosion-proof Class

EXd II □T□

Exia II □T□

● 防护等级：IP65

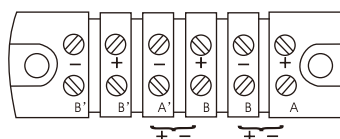
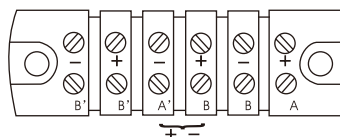
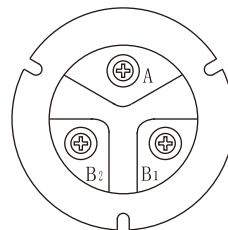
Protection Class: IP 65

● 接线盒形式

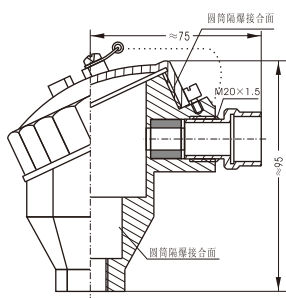
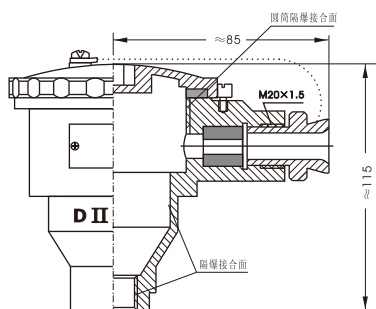
Connection Box Type

● 安装端子形式

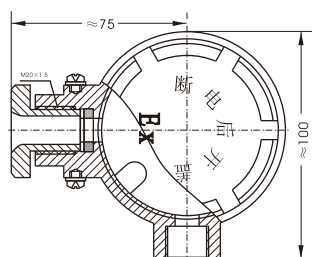
Installation End Type



● d II BT □ 级



● d II CT □ 级



● 可燃性气体、蒸汽级别、温度组别举例

Examples of Flammable Gas, Steam Class and Temperature Group

II A类

序号	气体、蒸汽名称	分子式	温度组别
1	甲烷	CH ₄	T1
2	乙烷	C ₂ H ₆	T1
3	丙烷	C ₃ H ₈	T1
4	丁烷	C ₄ H ₁₀	T2
5	戊烷	C ₅ H ₁₂	T3
6	己烷	C ₆ H ₁₄	T3
7	庚烷	C ₇ H ₁₆	T3
8	辛烷	C ₈ H ₁₈	T3
9	壬烷	C ₉ H ₂₀	T3
10	癸烷	C ₁₀ H ₂₂	T3
11	丙烯	C ₃ H ₄ =CH ₂	T2
12	苯乙烯	C ₆ H ₅ CH=CH ₂	T1
13	苯	C ₆ H ₆	T1
14	甲苯	C ₆ H ₅ CH ₃	T1
15	二甲苯	C ₆ H ₄ (CH ₃) ₂	T1
16	乙苯	C ₆ H ₅ C ₂ H ₅	T2
17	萘	C ₁₀ H ₈	T1
18	松节油		T3
19	石蜡油		T3
20	煤焦油石脑油		T3
21	石油(包括车用汽油)		T3
22	燃料油		T3
23	煤油		T3
24	柴油		T3
25	动力苯		T1
26	一氧化碳	CO	T1
27	甲醇	CH ₃ OH	T2
28	乙醇	C ₂ H ₅ OH	T2
29	丙醇	C ₃ H ₇ OH	T2
30	丁醇	C ₄ H ₉ OH	T2
31	戊醇	C ₅ H ₁₁ OH	T3
32	己醇	C ₆ H ₁₃ OH	T3
33	苯酚	C ₆ H ₅ OH	T1
34	甲酚	CH ₃ C ₆ H ₄ OH	T1
35	双丙酮醇	(CH ₃) ₂ C(OH)CH ₂ COCH ₃	T1
36	乙醛	CH ₃ CHO	T4
37	丙酮	(CH ₃) ₂ CO	T1
38	2-丁酮(乙基甲基酮)	C ₄ H ₈ COCH ₃	T1
39	2-戊酮	C ₅ H ₁₀ COCH ₃	T1
40	2-己酮	C ₆ H ₁₂ COCH ₃	T1
41	环乙酮	CH ₂ (CH ₂)CO	T2
42	甲酸甲基	HCOOCH ₃	T2
43	甲酸乙基	HCOOC ₂ H ₅	T2
44	醋酸甲基	CH ₃ COOCH ₃	T1
45	醋酸乙基	CH ₃ COOC ₂ H ₅	T2
46	醋酸丙基	CH ₃ COOC ₃ H ₇	T2
47	醋酸丁基	CH ₃ COOC ₄ H ₉	T2
48	醋酸戊基	CH ₃ COOC ₅ H ₁₁	T2
49	甲基丙烯酸甲酯	CH ₂ =C(CH ₃)COOCH ₃	T2
50	醋酸乙烯酯	CH ₃ COOCH=CH ₂	T2
51	乙酰基醋酸乙酯	CH ₃ COCH ₂ COOC ₂ H ₅	T2
52	醋酸	CH ₃ COOH	T1
53	甲基氯	CH ₃ Cl	T1
54	氯乙烷	C ₂ H ₅ Cl	T1
55	溴乙烷	C ₂ H ₅ Br	T1
56	氯丙烷	C ₃ H ₇ Cl	T1
57	氯丁烷	C ₄ H ₉ Cl	T3
58	溴丁烷	C ₄ H ₉ Br	T3

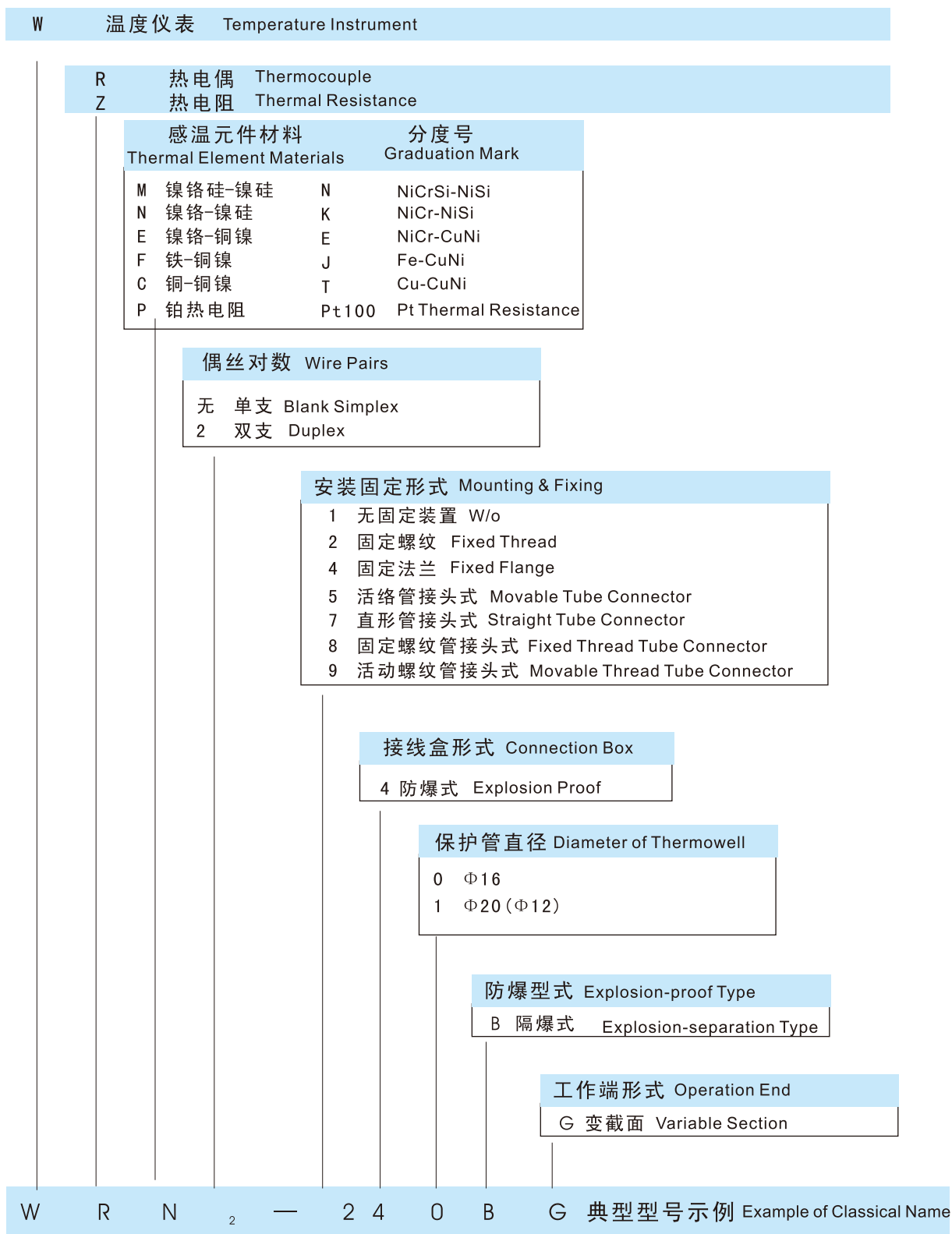
II A类

序号	气体、蒸汽名称	分子式	温度组别
59	二氯乙烷	C ₂ H ₄ Cl ₂	T2
60	二氯丙烷	C ₃ H ₆ Cl ₂	T1
61	氯苯	C ₆ H ₅ Cl	T1
62	二氯乙烯	CHCl=CHCl	T1
63	氯乙烯	CH ₂ =CHCl	T1
64	三氯甲苯	C ₆ H ₅ CF ₃	T1
65	二氯甲烷	CH ₂ Cl ₂	T1
66	氯乙醇	CH ₂ ClCH ₂ OH	T2
67	乙硫醇	C ₂ H ₅ SH	T3
68	氨	NH ₃	T1
69	乙腈	CH ₃ CN	T1
70	亚硝酸乙酯	CH ₃ CH ₂ ONO	T6
71	硝基甲烷	CH ₃ NO ₂	T2
72	硝基乙烷	C ₂ H ₅ NO ₂	T2
73	甲胺	CH ₃ NH ₂	T2
74	二甲胺	(CH ₃) ₂ NH	T2
75	三甲胺	(CH ₃) ₃ N	T4
76	二乙胺	(C ₂ H ₅) ₂ NH	T2
77	三乙胺	(C ₂ H ₅) ₃ N	T1
78	二氨基乙烷	NH ₂ CH ₂ CH ₂ NH ₂	T2
79	苯胺	C ₆ H ₅ NH ₂	T1
80	甲苯胺	CH ₃ C ₆ H ₄ NH ₂	T1

II B类

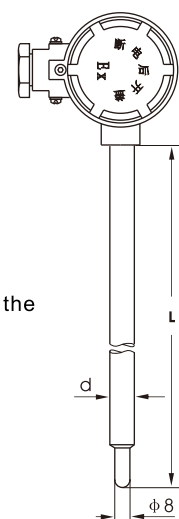
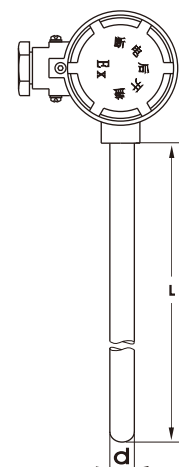
序号	气体、蒸汽名称	分子式	温度组别
1	丙炔	CH ₃ C≡CH	T1
2	乙烯	C ₂ H ₄	T2
3	环丙烷	CH ₂ CH ₂ CH ₂	T1
4	1,3-丁二烯	CH ₂ =CHCH=CH ₂	T2
5	丙烯腈	CH ₂ =CHCN	T1
6	氰化氢	HCN	T1
7	二甲醚	(CH ₃) ₂ O	T3
8	乙基甲基醚	CH ₃ OC ₂ H ₅	T4
9	二乙醚	(C ₂ H ₅) ₂ O	T4
10	二丁醚	(C ₄ H ₉) ₂ O	T4
11	环氧乙烷	CH ₂ CH ₂ O	T2
12	1,2-环氧丙烷	CH ₃ CHCH ₂ O	T2
13	1,4-二亚烷	CH ₂ CH ₂ OCH ₂ CH ₂ O	T2
14	1,3,5-三亚烷	CH ₂ OCH ₂ OCH ₂ O	T2
15	四氢糠醇	CH ₂ CH ₂ CH ₂ OCHCH ₂ OH	T3
16	丙烯酸甲酯	CH ₂ =CHCOOCH ₃	T2
17	丙烯酸乙酯	CH ₂ =CHCOOC ₂ H ₅	T2
18	呋喃	CH=CHCH=CHO	T2
19	丁烯醛	CH ₃ CH=CHCHO	T3
20	丙烯醛	CH ₂ =CHCHO	T3
21	四氢呋喃	CH ₂ (CH ₂) ₂ CH ₂ O	T3
22	焦炉煤气		T1
23	四氯乙烯	C ₂ F ₄	T4
24	氯甲代氧丙烷	OCH ₂ CHCH ₂ Cl	T2
25	硫化氢	H ₂ S	T3

型号命名方法



● 无固定装置热电偶/阻 Assembly Thermocouple w/o Fixing Device

型 号 Type	分度号	测温范围℃	连接尺寸	保护管材料 Thermowell Material	规 格 Specification	
	Graduation	Measuring Range	Connecting Size		d	l
WRM-140B WRM ₂ -140B	N	0-800		1Cr18Ni9Ti	φ 16	
		0-1000		0Cr25Ni20		
WRM-140G WRM ₂ -140G		0-800		1Cr18Ni9Ti		
		0-1000		0Cr25Ni20		
WRN-140B WRN ₂ -140B	K	0-800		1Cr18Ni9Ti		
		0-1000		0Cr25Ni20		
WRN-140G WRN ₂ -140G		0-800		1Cr18Ni9Ti		
		0-1000		0Cr25Ni20		
WRE-140B WRE ₂ -140B	E	0-700		1Cr18Ni9Ti		
WRE-140G WRE ₂ -140G						
WRC-140B WRC ₂ -140B	T	0-350		1Cr18Ni9Ti		
WRC-140G WRC ₂ -140G						
WRF-140B WRF ₂ -140B	J	0-600		1Cr18Ni9Ti		
WRF-140G WRF ₂ -140G						



- ★: 1) 防爆热电偶 I 级按协议订货:
Class I explosion-proof thermocouple shall be ordered as agreements
- 2) 防爆热电阻A级按协议订货, 结构同热电偶, 性能同普通热电阻:
Class A explosion-proof thermal resistance ordered according to agreements, structure is the same with thermocouple, while performance is the same with common thermal resistance
- 3) 保护管材质根据协议订货:
Protection tube material shall be ordered according to agreement
- 4) 变截面型式内配铠装元件:
For variable section type, there should be sheathed element inside.
- 5) “L” 可协议订货。
It can be ordered due to agreement for “L” .

选型须知

- 1) 型号
- 2) 分度号
- 3) 防爆等级
- 4) 精度等级
- 5) 安装固定形式
- 6) 保护管材质
- 7) 长度或插入深度

Notice in type's selection

- 1) Type
- 2) Graduation
- 3) Explosion-proof Class
- 4) Accuracy Class
- 5) Mounting & Fixing
- 6) Thermowell Material
- 7) Length or Insert Depth

例A: 防爆热电偶, K型, 固定螺纹M27×2, 隔爆等级dIIBT4级, 保护管材料316L, 直径Φ16, 长度450mm, 插入深度300mm。则为: WRN-240, K, L=450×300, M27×2, dIIBT4保护管316L

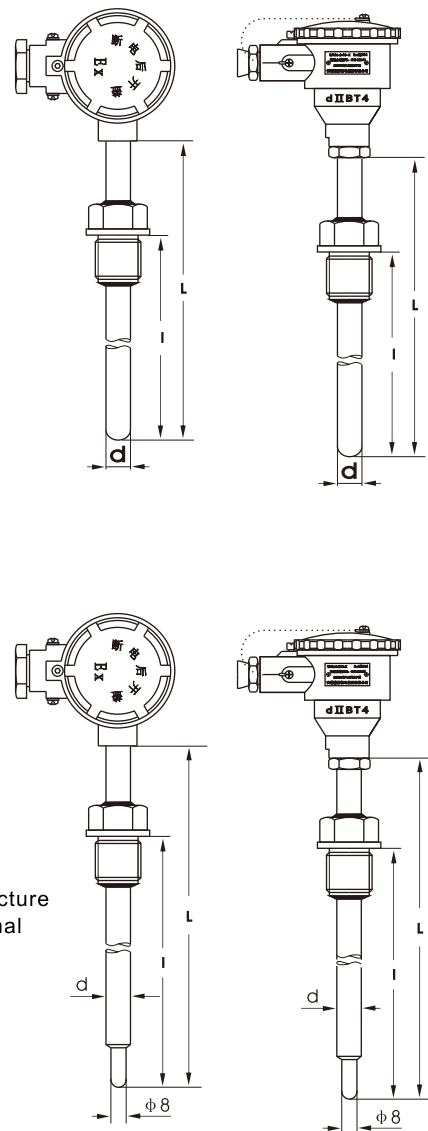
Example: explosion-proof thermocouple, type K, fixing thread M27×2, explosion-proof class 4 d I I B T, protection tube length of 316L 450mm, insert depth 300mm.

WRN-240, L=450×300 ,M27×2, d I I B T4 protection tube 316L

● 固定螺纹式热电偶/阻

Thermocouple/ Thermal Resistance w/ Fixed Thread

型 号 Type	分度号 Graduation	测温范围℃ Measuring range	热响应时间 TRT	保护管材料 Protection tube material	规格 Specification	
					d	L×I
WRM-240 WRM ₂ -240	N	0-800	<90S	1Cr18Ni9Ti	φ 16	300×150 350×200 400×250 450×300 500×350 550×400 650×500 900×750 1150×1000 1650×1500 2150×2000
		0-1000		0Cr25Ni20		
WRM-240G WRM ₂ -240G		0-800	<24S	1Cr18Ni9Ti		
		0-1000		0Cr25Ni20		
WRN-240 WRN ₂ -240	K	0-800	<90S	1Cr18Ni9Ti		
		0-1000		0Cr25Ni20		
WRN-240G WRN ₂ -240G		0-800	<24S	1Cr18Ni9Ti		
		0-1000		0Cr25Ni20		
WRE-240 WRE ₂ -240	E	0-600	<90S	1Cr18Ni9Ti		
			<24S			
WRC-240 WRC ₂ -240	T	0-350	<90S	1Cr18Ni9Ti		
			<24S			
WRF-240 WRF ₂ -240	J	0-500	<90S	1Cr18Ni9Ti		
			<24S			



★:1) 防爆热电偶 I 级按协议订货:

Class I explosion-proof thermocouple shall be ordered as agreements

2) 防爆热电阻A级按协议订货, 结构同热电偶, 性能同普通热电阻:

Class A explosion-proof thermal resistance ordered according to agreements, structure is the same with thermocouple, while performance is the same with common thermal resistance

3) 保护管材质根据协议订货:

Protection tube material shall be ordered according to agreement

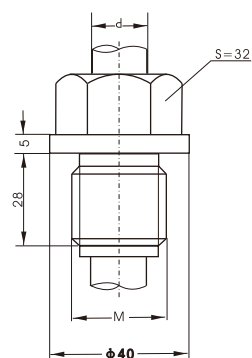
4) 变截面型式内配铠装元件:

For variable section type, there should be sheathed element inside.

5) “L” 可协议订货。

It can be ordered due to agreement for “L” .

型号示例 Type model	螺纹规格 Thread specification		公称压力NP MPa
	代号 Code	M	
WRN-240		M27×2	≤10
WRN-240A	A	G3/4	
WRN-240C	C	NPT3/4	
WRN-240G		M27×2	
WRN-240GA	A	G3/4	
WRN-240GC	C	NPT3/4	



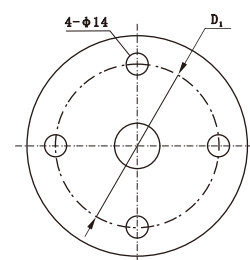
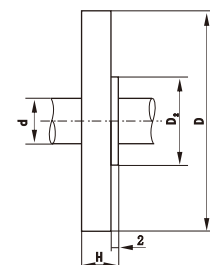
安装固定型式: 固定螺纹

Installation & Fixing: Fixed Thread

● 固定法兰式热电偶/阻

Thermocouple & Thermal Resistance w/ Fixed Flange

型 号 Type	分度号 Graduation	测温范围℃ Measuring range	热响应时间 TRT	保护管材料 Thermowell Material	规 格 Specification	
					d	L×I
WRM-440 WRM ₂ -440	N	0-800	<90S	1Cr18Ni9Ti	Φ 16	300×150 350×200 400×250 450×300 500×350 550×400 650×500 900×750 1150×1000 1650×1500 2150×2000
		0-1000		0Cr25Ni20		
WRM-440G WRM ₂ -440G		0-800	<24S	1Cr18Ni9Ti		
		0-1000		0Cr25Ni20		
WRN-440 WRN ₂ -440	K	0-800	<90S	1Cr18Ni9Ti		
		0-1000		0Cr25Ni20		
WRN-440G WRN ₂ -440G		0-800	<24S	1Cr18Ni9Ti		
		0-1000		0Cr25Ni20		
WRE-440 WRE ₂ -440	E	0-700	<90S	1Cr18Ni9Ti		
WRE-440G WRE ₂ -440G			<24S			
WRC-440 WRC ₂ -440	T	0-350	<90S	1Cr18Ni9Ti		
WRC-440G WRC ₂ -440G			<24S			
WRF-440 WRF ₂ -440	J	0-600	<90S	1Cr18Ni9Ti		
WRF-440G WRF ₂ -440G			<24S			



★: 1) 防爆热电偶 I 级按协议订货;

Class I explosion-proof thermocouple shall be ordered as agreements

2) 防爆热电阻A级按协议订货, 性能同普通热电阻;

Class A explosion-proof thermal resistance ordered according to agreements, structure is the same with thermocouple, while performance is the same with common thermal resistance

3) 保护管材质根据协议订货;

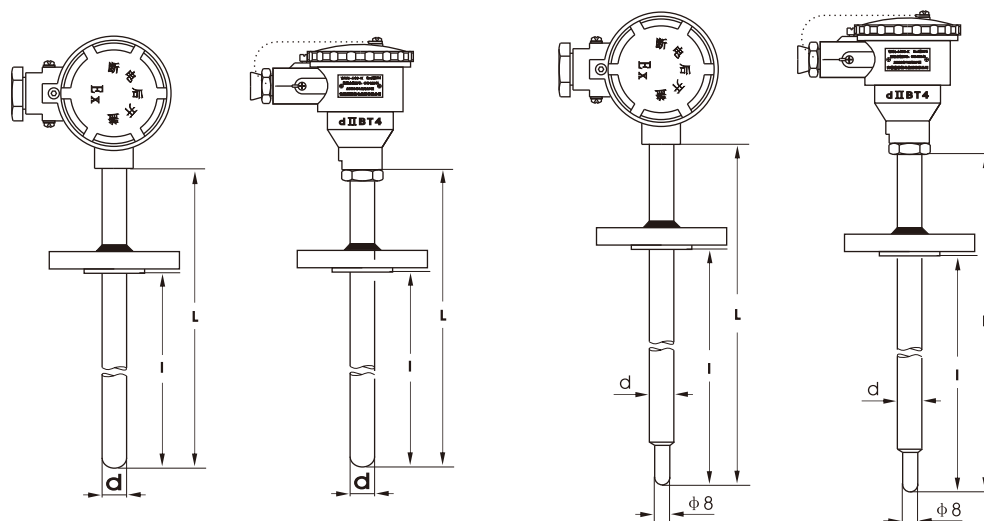
Protection tube material shall be ordered according to agreement

4) 变截面型式内配铠装元件;

For variable section type, there should be sheathed element inside.

5) “L” 可协议订货。

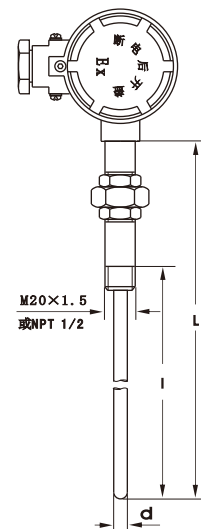
It can be ordered due to agreement for “L” .



● 活络管接头式热电偶/阻

Thermocouple & Thermal Resistance w/ Moveable Elbow Connector

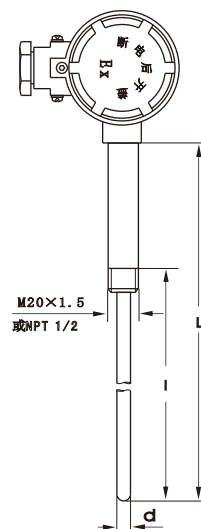
型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	热响应时间 TRT	规 格 Specification	
				d	L×I
WRM-54 WRM ₂ -54	N	0-1000	<90S	φ 16	300×150 350×200 400×250 450×300 500×350 550×400 650×500 900×750 1150×1000 1650×1500 2150×2000
WRM-54A WRM ₂ -54A		0-800			
		0-1000			
		0-800			
WRN-54 WRN ₂ -54	K	0-1000	<90S		
WRN-54A WRN ₂ -54A		0-800			
		0-1000			
		0-800			
WRE-54 WRE ₂ -54	E	0-600	<90S		
WRE-54A WRE ₂ -54A			<24S		
WRC-54 WRC ₂ -54	T	0-350	<90S		
WRC-54A WRC ₂ -54A			<24S		
			WRF-54 WRF ₂ -54	J	0-600
WRF-54A WRF ₂ -54A	<24S				



● 直形管接头式热电偶/阻

Thermocouple & Thermal Resistance w/ Straight Tube Connector

型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	螺纹规格 Thread Spec	规 格 Specification		
				d	l	
WRM-74 WRM ₂ -74	N	0-1000	M20×1.5	φ 3 φ 4 φ 5 φ 6 φ 8	250 275 300 350 400 450 550 650 750 900 1150	
WRM-74A WRM ₂ -74A		0-800				NPT1/2
		0-1000				
		0-800				
WRN-74 WRN ₂ -74	K	0-1000	M20×1.5			
WRN-74A WRN ₂ -74A		0-800				NPT1/2
		0-1000				
		0-800				
WRE-74 WRE ₂ -74	E	0-600	M20×1.5			φ 4
WRE-74A WRE ₂ -74A			NPT1/2			φ 5
						φ 6
WRC-74 WRC ₂ -74	T	0-350	M20×1.5			φ 8
WRC-74A WRC ₂ -74A						
			WRF-74 WRF ₂ -74			
WRF-74A WRF ₂ -74A	NPT1/2					

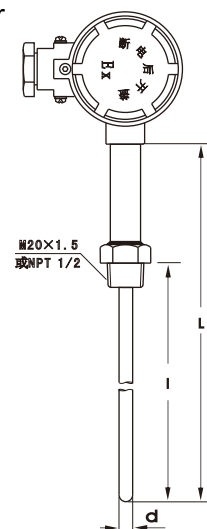


- 1) 如无特殊约定，L仅为参考尺寸，热电偶/阻插入深度应按热安装套管U尺寸计算；
L is reference size only if no special indication, the insert depth of thermocouple/ thermal resistance should be calculated according to U, the size of thermowell
- 2) 热安装套管详见后面的“热安装套管”；
Please refer to the Thermowell Installation Table at the end of this book.
- 3) 元件为弹性铠装式元件，对于热电阻元件 φ3 只适用于单支元件
Element is spring sheathed element, thermal resistance element φ3 is suitable for simplex element only.

● 固定螺纹管接头式热电偶/阻

Thermocouple & Thermal Resistance w/ Fixed Threaded Tube Connector

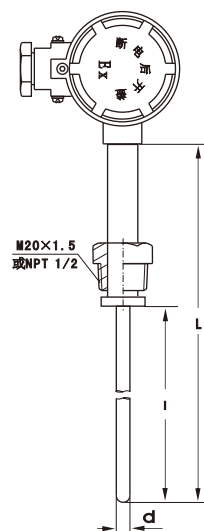
型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	螺纹规格 Thread Spec	规 格 Specification					
				d	l				
WRM-84 WRM ₂ -84	N	0-1000	M20×1.5	φ 3	250				
WRM-84A WRM ₂ -84A		0-800				NPT1/2			
		0-1000							
		0-800							
WRN-84 WRN ₂ -84	K	0-1000	M20×1.5		275				
WRN-84A WRN ₂ -84A		0-800				NPT1/2			
		0-1000							
		0-800							
WRE-84 WRE ₂ -84	E	0-600	M20×1.5		φ 4	300			
WRE-84A WRE ₂ -84A			NPT1/2				φ 5	350	
WRC-84 WRC ₂ -84	T	0-350	M20×1.5		φ 6	400			
WRC-84A WRC ₂ -84A			NPT1/2				φ 8	450	
WRF-84 WRF ₂ -84	J	0-500	M20×1.5		φ 8	550			
WRF-84A WRF ₂ -84A			NPT1/2				650		
					650				
					750				
					900				
					1150				



● 活动螺纹管接头式热电偶/阻

Thermocouple & Thermal Resistance w/ Moveable Threaded Tube Connector

型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	螺纹规格 Thread Spec	规 格 Specification	
				d	l
WRM-94 WRM ₂ -94	N	0-1000	M20×1.5	φ 3	250
		0-800			
WRM-94A WRM ₂ -94A		0-1000	NPT1/2		
		0-800			
WRN-94 WRN ₂ -94	K	0-1000	M20×1.5		275
		0-800			
WRN-94A WRN ₂ -94A		0-1000	NPT1/2		
		0-800			
WRE-94 WRE ₂ -94	E	0-600	M20×1.5		300
WRE-94A WRE ₂ -94A			NPT1/2		
WRC-94 WRC ₂ -94	T	0-350	M20×1.5		350
WRC-94A WRC ₂ -94A			NPT1/2		
WRF-94 WRF ₂ -94	J	0-500	M20×1.5		400
WRF-94A WRF ₂ -94A			NPT1/2		
				φ 4	450
				φ 5	550
				φ 6	650
				φ 8	750
					900
					1150



- 1) 如无特殊约定, L仅为参考尺寸, 热电偶/阻插入深度应按热安装套管U尺寸计算;
L is reference size only if no special indication, the insert depth of thermocouple/ thermal resistance should be calculated according to U, the size of thermowell
- 2) 热安装套管详见后面的“热安装套管”;
Please refer to the Thermowell Installation Table at the end of this book.
- 3) 元件为弹性铠装式元件, 对于热电阻元件 φ3只适用于单支元件
Element is spring sheathed element, thermal resistance element φ3 is suitable for simplex element only.

WR 、WZ系列

电站热电偶(阻)

Power Station Thermocouple/ Thermal Resistance

应用 Application

专业针对电站设计，可以满足30万、60万千瓦等发电机组及辅机测温需要。直接测量各种生产过程中的-100℃~800℃范围内液体、蒸汽和气体介质以及固体表面温度。

It is designed specially for power station, which can meet the temperature measurement demand of generator and assistant machine with 300,000 KW and 600,000 KW, to measure the surface temperature of the mediums as liquid, steam and gas ranging from -100℃ to 800℃ during various production processes directly.

工作原理 Working Principle

热电偶的电极由两根不同导体材质组成。当测量端与参比端存在温差时，就会产生热电势，工作仪表便显示出热电势所对应的温度值。

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

The two electrodes of sheathed thermocouple are made of different conductor materials. Where there is temperature difference between measuring end and reference end, there will be hydroelectric potential, then the meter shows the corresponding temperature of the hydroelectric potential. It is making use of the principle that when temperature of object changes, the resistance will change accordingly, to measure temperature. When the resistance value changes, the working meter will display relevant temperature.

主要技术参数 Main Technical Parameters

产品执行标准 Standard

IEC584

IEC751

IEC1515

GB/T16839-1997

JB/T8622-1997

JB/T8623-1997

● 常温绝缘电阻

Insulation Resistance at Normal Temperature

热电偶在环境温度为 $20 \pm 15^\circ\text{C}$ ，相对湿度不大于80%，试验电压为 $500 \pm 50\text{V}$ （直流）电极与电极间、电极与外套管之间的绝缘电阻 $\geq 1000\text{M}\Omega$ 。

热电阻在环境温度为 $15 \sim 35^\circ\text{C}$ ，相对湿度不大于80%，试验电压为 $10 \sim 100\text{V}$ （直流）组电极与组电极、电极与外套管之间的绝缘电阻 $\geq 100\text{M}\Omega$ 。

For thermocouple, environmental temperature is $20 \pm 15^\circ\text{C}$; relative humidity is not over 80%; test voltage is $500 \pm 50\text{V}$ (D.C.); insulation resistance between electrodes and electrodes, electrodes and outer thermowell is not less than $1000\text{M}\Omega$.

For thermal resistance, environmental temperature is $15 \sim 35^\circ\text{C}$; relative humidity is not over 80%; test voltage is $10 \sim 100\text{V}$ (D.C.); Insulation resistance between electrodes and electrodes, electrodes and outer thermowell is not less than $100\text{M}\Omega$.



● 测温范围及允差

Measure Range & Tolerance

● 热电偶

Thermocouple

型号 Type	分度号 Graduation	允差等级 Tolerance Class			
		I		II	
		允差值 Tolerance	测温范围℃ Temperature Range	允差值 Tolerance	测温范围℃ Temperature Range
WRN	K	±1.5℃	-40~+375	±2.5℃	-40~+333
		±0.004 t	375~1000	±0.0075 t	333~1200
WRE	E	±1.5℃	-40~+375	±2.5℃	-40~+333
		±0.004 t	375~800	±0.0075 t	333~900

● 热电阻

Thermal Resistance

型号 Type	分度号 Graduation	测温范围 Temperature Range	精度等级 Accuracy Class	允许偏差 Tolerance
WZP	Pt100	-200~+450	A级 Class A	±(0.15+0.002 t)
			B级 Class B	±(0.30+0.005 t)
WZC	Cu50 Cu100	-50~+150	-	±(0.30+0.006 t)

注：t为感温元件实测温度绝对值

Note: t is the absolute value of the actual temperature of thermal element.

WR 、WZ系列

热套热电偶(阻)

Thermocouple / Thermal Resistance
w/ Thermowell

应用 Application

适合于蒸汽管道、锅炉及其他对温度、压力、流速有所要求的场合。

It is applied to steam pipe, furnace and other occasions that have request on temperature, pressure, and flow speed.

主要技术参数

Main Technical Parameters

- 电气出口: M20X1.5, NPT1/2
Electric Outlet: M20 × 1.5, NPT1/2
- 连接尺寸: M20X1.5, NPT1/2
Connection Size: M20 × 1.5, NPT1/2
- 防护等级: IP65
Protection Class: IP65

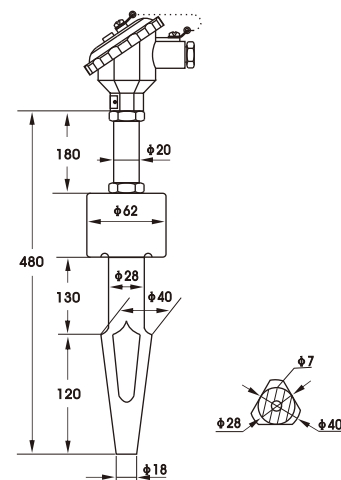
型号及规格

Type & Specification

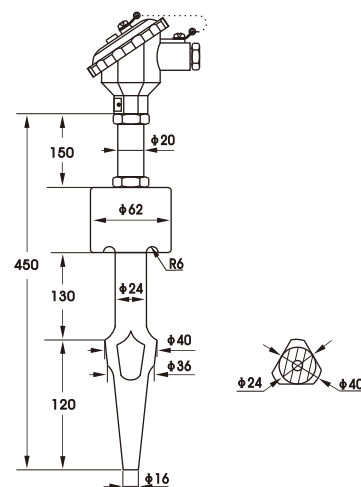
型 号 Type	分度号 Graduation	测温范围℃ Temperature Range	公称压力 NP	热响应时间 TRT	备 注 Remarks
WRNR-01 WRNR ₂ -01	K	0~800	≤30MPa	<180S	绝缘式 Insulation type
WRER-01 WRER ₂ -01	E	0~600			
WZPR-01 WZPR ₂ -01	Pt100	-200~500			
WRN-624 WRN ₂ -624	K	0~800	≤30MPa	<180S	绝缘式 Insulation type
WRE-624 WRE ₂ -624	E	0~600			
WZP-624 WZP ₂ -624	Pt100	-200~500			
WRN-625 WRN ₂ -625	K	0~800			接壳式 Shell-con- necting type
WRE-625 WRE ₂ -625	E	0~600			

★:保护管材质为1Cr18Ni9Ti,其余材质根据协议订货。

Protection tube material is 1Cr18Ni9Ti, while other materials are ordered according to agreement.



01型



624、625型

WR□、WZ□ 系列

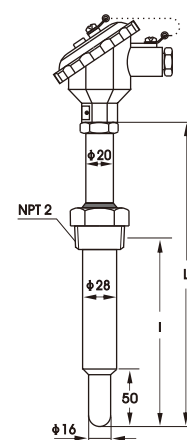
热套热电偶(阻)

Thermocouple / Thermal Resistance
w/ Thermowell

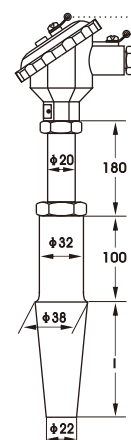
型号及规格

Type & Specification

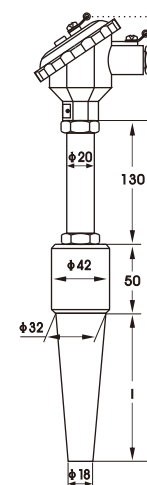
型 号 Type	分 度 号 Graduation	测温范围℃ Temperature Range	公称压力 NP	热响应时间 TRT.	规 格 L×1 Specification			
WRNR-12 WRNR ₂ -12	K	0~800	≤10MPa	<180S	440×230 640×430 840×630 1380×1130 2500×1200 3000×1500 3500×1700			
WRER-12 WRER ₂ -12	E	0~600						
WZPR-12 WZPR ₂ -12	Pt100	-200~500						
WRNR-12A WRNR ₂ -12A	K	0~800						
WRER-12A WRER ₂ -12A	E	0~600						
WZPR-12A WZPR ₂ -12A	Pt100	-200~500						
WRNR-13 WRNR ₂ -13	K	0~800	≤30MPa		<180S	330×50 380×100 430×150		
WRER-13 WRER ₂ -13	E	0~600						
WZPR-13 WZPR ₂ -13	Pt100	-200~500						
WRNR-14 WRNR ₂ -14	K	0~800	≤15MPa			<180S	230×50 280×100 330×150 380×250 430×250 480×300	
WRER-14 WRER ₂ -14	E	0~600						
WZPR-14 WZPR ₂ -14	Pt100	-200~500						
WRNR-14 WRNR ₂ -14	K	0~800	≤10MPa				<180S	230×50 280×100 330×150 380×250 430×250 480×300 530×350 580×400
WRER-15 WRER ₂ -15	E	0~600						
WZPR-15 WZPR ₂ -15	Pt100	-200~500						



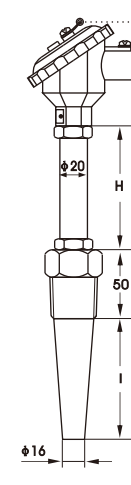
12型



13型



14型

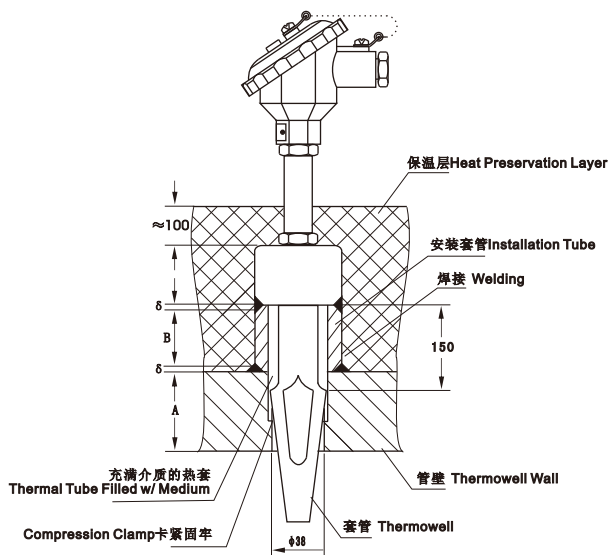


15型

- 1) 保护管材质为1Cr18Ni9Ti, 其余材质根据协议订货;
Protection tube material is 1Cr18Ni9Ti, while other materials are ordered according to agreement
- 2) “H” 尺寸常规为180, 其余尺寸可根据需要协议订货。
Normal size of H is 180, while other sizes are ordered according to agreement

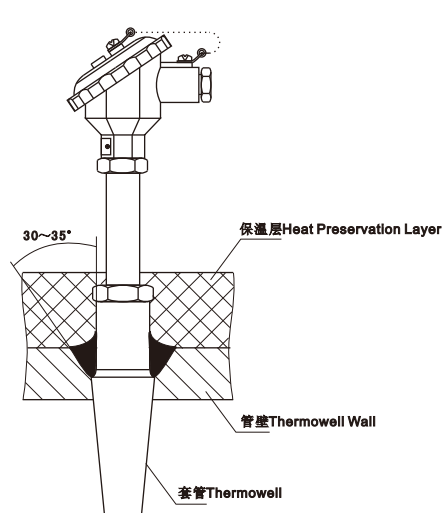
● 01型安装示意

Type01 Installation Sketch Map



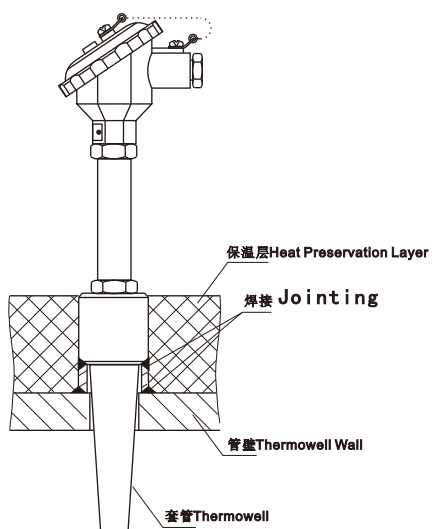
● 13型安装示意

Type13 Installation Sketch Map



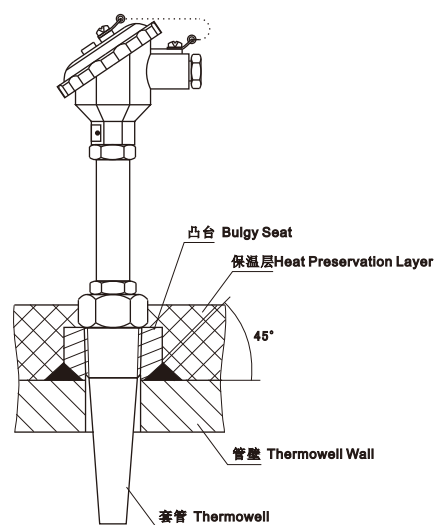
● 14型安装示意

Type14 Installation Sketch Map



● 15型安装示意

Type15 Installation Sketch Map



WR□ 系列

炉顶热电偶

Furnace Top Thermocouple

应用 Application

适合于电厂锅炉炉顶及其它须远距离、高压测温场合。

It is applied to the top of power plant furnace and other occasions in which temperature is measured from distance or high voltage.

主要技术参数

Main Technical Parameters

○电气出口: M16X1.5

Electric Outlet: M20 × 1.5, NPT1/2

○连接尺寸: M16X1.5

Connection Size: M20 × 1.5, NPT1/2

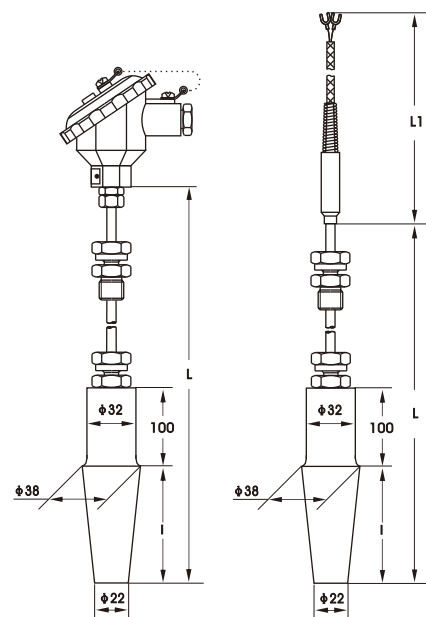
○防护等级: IP65

Protection Class: IP65

型号及规格

Type & Specification

型 号 Type	分度号 Graduation	测温范围℃ Temperature Range	公称压力 NP	流 速 Flow Speed	规格Specification	
					L	I
WRN-0313 WRN ₂ -0313	K	0~800	≤30MPa	≤100m/s	1000 2000 3000	50 100 150
WRE-0313 WRE ₂ -0313	E	0~600			4000 5000 6000	
WRN-0913 WRN ₂ -0913	K	0~800			8000 10000 12000	
WRE-0913 WRE ₂ -0913	E	0~600			20000 25000	



★: 1) 保护管材质为1Cr18Ni9Ti, 其余材质根据协议订货;

Protection tube material is 1Cr18Ni9Ti, while other materials are ordered according to agreement.

WR 系列

炉壁热电偶

Furnace Wall Thermocouple

应用 Application

锅炉炉壁热电偶采用铠装热电偶做测温元件，做成电缆状，热接点紧固在带有不同曲面的不锈钢导热上，可用于锅炉管壁、炉壁及其他圆柱表面测量温度。

Sheathed thermocouple is used as measuring element for furnace wall thermocouple which forms cable condition. Thermal connection point is fixed on stainless steel with different curves. It is used to surface temperature measurement in furnace pipe wall, furnace wall and other cylinder surfaces..



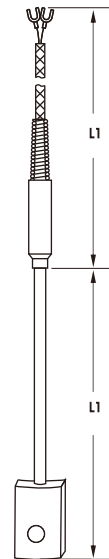
主要技术参数

Main Technical Parameter

- 精度等级：I、II
Accuracy Class: I II
- 公称压力：常压
Nominal Pressure: Normal Pressure
- 弯曲半径： $R \geq 5D$
Bending Radius: $R \geq 5D$

型号及规格 Type & Specification

型号 Type	分度号 Graduation	测温范围℃ Temperature range	热响应时间 $\tau_{0.95}$ TRT	测量端形式 Measurement Type	规格 Specification	
					L	L ₁
WRNK-191M WRNK ₂ -191M WRNT-11 WRNT ₂ -11	K	0~800	≤ 2.5	绝缘式 Insulation type	1000	1000
					2000	2000
					3000	3000
					4000	4000
					5000	5000
					6000	6000
					8000	8000
					10000	10000
					15000	15000
					20000	20000
					25000	25000
WREK-191M WREK ₂ -191M WRET-11 WRET ₂ -11	E	0~600				



★：1) 保护管材质为1Cr18Ni9Ti，其余材质根据协议订货；

Protection tube material is 1Cr18Ni9Ti, while other materials are ordered according to agreement

安装形式及尺寸 Installation Ways & Size

安装方法：1) 直接焊接于炉壁

Installation It is directly welded on furnace wall

Method: 2) M8螺钉紧固

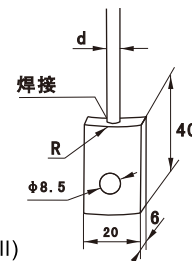
M8 screw fastening

3) 曲面尺寸 $R=29\text{mm}$, $R=100\text{mm}$.

Curve size $R=29\text{mm}$, $R=100\text{mm}$

★：选型时应注明R大小（即管壁或炉壁直径）

Please remark the size of R when select type (diameter of furnace wall or tube wall)



WR 、WZ 系列

轴承热电偶(阻)**Bearing Thermocouple (Thermal Resistance)****应用 Application**

适合于电厂带有轴承设备的轴承及其它须防震场合测温。

It is applied to temperature measurement in power plant with bearing equipment and other shock resistant occasions.

主要技术参数 Main Technical Parameters

○电气出口: M16X1.5

Electric Outlet: M20 × 1.5, NPT1/2

○连接尺寸: M27X2

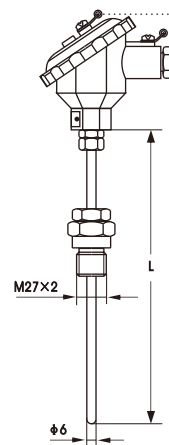
Connection Size: M20 × 1.5, NPT1/2

○防护等级: IP65

Protection Class: IP 65

型号及规格**Type & Specification**

型 号 Type	分 度 号 Graduation	测温范围℃ Temperature Range	热响应时间 TRT	规 格Specification	
				d	L
WRNT-31	K	0~300	≤6S	φ 6	100
WRNT-31	E				150
					200
					250
					300
WZP-31T	Pt100	0~100	≤6S		



WR□、WZ□系列

石油化工热电偶(阻)

Petroleum & Chemical Industry Thermocouple(Thermal Resistance)

应用 Application

专业针对石油化工部门设计，可以直接测量-200℃~1600℃范围内液体、蒸汽和气体介质以及固体表面温度。

Special design for petroleum chemical industry, can measure the surface temperature of liquid, steam, and gas medium from 200℃ to 1600℃.

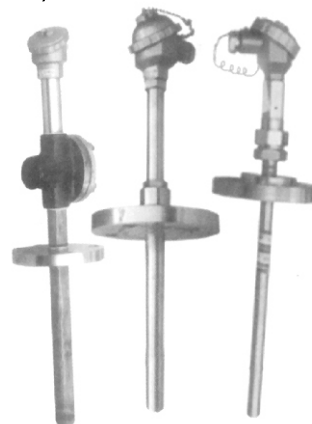
工作原理 Working Principle

○热电偶的电极由两根不同导体组成。当测量端与参比端存在温差时，就会产生热电势，工作仪表便显示出热电势所对应的温度值。

○热电阻是利用电阻与温度呈一定函数的关系原理。当被测介质中有温差存在时，就会产生热电阻，工作仪表便显示出电阻值所对应的温度值。

The electrode of thermocouple is made up of two different conductor materials, when temperature difference between measure terminal and standard terminal exists, thermal electromotive force appears. Working meter shows temperature that corresponding to thermal electromotive force.

Thermal resistance is made use of the principle that there is reference relationship between the resistance and temperature. When there is temperature difference in measured mediums, there will be thermal resistance, working meter will show the temperature corresponding to the resistance.



●测温范围及允差 Temperature Range & Tolerance

●热电偶 Thermocouple

型号 Type	分度号 Graduation	允差等级 T. Class			
		I		II	
		允差值 T.	测温范围℃ T. range	允差值 T.	测温范围℃ T. Range
WRN	K	±1.5℃	-40~+375	±2.5℃	-40~+333
		±0.004 t	375~1000	±0.0075 t	333~1200
WRE	E	±1.5℃	-40~+375	±2.5℃	-40~+333
		±0.004 t	375~800	±0.0075 t	333~900

●热电阻 Thermal Resistance

型号 Type	分度号 Graduation	测温范围℃ T. range	精度等级 Accuracy Class	允许偏差℃ Tolerance
WZP	Pt100	-200~+450	A级 Class A	±(0.15+0.002 t)
			—	±(0.30+0.005 t)
WZC	Cu50 Cu100	-50~+150	B级 Class B	±(0.30+0.006 t)

主要技术参数 Main Technical Parameters

●产品执行标准 Standard

IEC1515
IEC584
IEC751
JB/T5518-91
JB/T5582-91

●公称压力 Nominal Pressure

一般是指在常温下，保护管所能承受的静态外压而不破裂。允许工作压力不仅与保护管材料、直径、壁厚有关，且与其结构形式、安装方法及被测介质的流速、种类有关。

It is usually means the static outer pressure which the protection tube can offer and will not be broken under the working temperature. In fact, working pressure not only has relationship with protection tube material, diameter and thickness of wall, but also the structure form, installation method, inserting depth and the flow speed and type of the medium etc.

WR□ 系列

高温高压热电偶

High Temperature and Pressure Thermocouple

应用 Application

适合于石油、化工等生产过程中的高温高压场所的温度测量与控制。是炼油厂、高压聚乙烯等不可缺少的测温装置。

It is used to temperature measurement and control during production process under high temperature & pressure such as petroleum & chemical industry and is necessary temperature measuring device for refinery and HVPE production.

主要技术参数 Main technical Parameters

- 电气出口：M20×1.5, NPT1/2
Electric Outlet: M 20×1.5, NPT1/2
- 连接尺寸：M20×1.5, NPT1/2
Connection Size: M 20×1.5, NPT1/2
- 防护等级：IP65
Protection Class: IP65
- 隔爆等级：d II BT4, d II CT5
Explosion-separation Class: d II BT4, d II CT5
- 公称压力：15~40MPa
Nominal Pressure: 15~40Mpa

型号及规格 Type & Specification

型 号 Type	分 度 号 Graduation	测温范围℃ T. range	热响应时间 TRT	保护管材料 Thermowell Material	规格 L×I Specification
WRNG-430 WRN ₂ G-430	K	0~800	<180S	1Cr18Ni9Ti	380×150
WREG-430 WRE ₂ G-430	E	0~600			430×200
WRNG-440 WRN ₂ G-440	K	0~800			480×250
WREG-440 WRE ₂ G-440	E	0~600			530×300
					580×350
					630×400
					680×450

★: 1) 热电偶 I 级按协议订货;

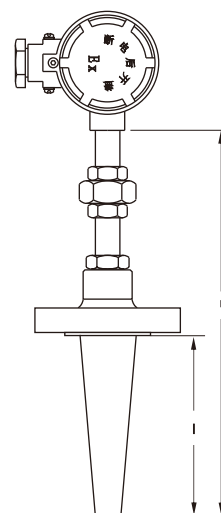
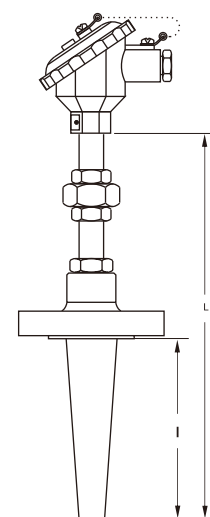
Class I thermocouple shall be ordered according to agreement

2) 保护管其余材质根据协议订货;

Other materials of thermowell shall be ordered as agreement

3) 型号430为防水式, 型号440为隔爆式

Type 430 is water-proof; type 440 is explosion-separation type



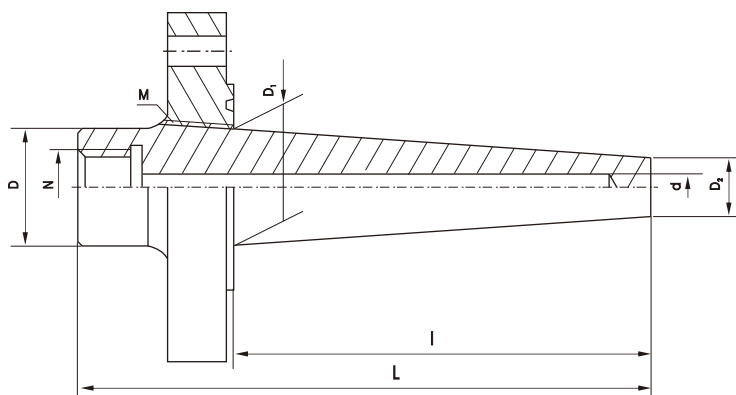
保护管材质及选用 Thermowell Material & Selection

材质 Material	使用温度 Operation Temperature	特点及用途 Features & Application
1Cr18Ni9Ti	-200~800	具有高温耐蚀性，通常作为一般耐热钢使用 W/ cauterization resisting performance in high temperature, normally for common thermal resisting steel.
304	-200~800	低碳含量，具有良好耐晶间腐蚀性，通常作为一般耐热钢使用 Low carbon content, w/ good Intergranular Corrosion resisting performance, normally for common thermal resisting steel.
316	-200~750	低碳含量，具有良好耐晶间腐蚀性，作为耐腐蚀钢使用 Low carbon content, w/ good Intergranular Corrosion resisting performance normally for cauterization resisting steel.
316L	-200~750	超低碳含量，具有良好耐晶间腐蚀性，作为耐腐蚀钢使用 Super low carbon content, w/ good Intergranular Corrosion resisting performance, normally for cauterization resisting steel.
310S	-200~1000	具有高温抗氧化性，耐腐蚀型通常作为耐热钢使用 W/ oxidation resisting performance in high temperature, cauterization type, normally for thermal resisting steel.
Gh3030	0~1100	镍基高温合金钢，具有优良抗氧化性，耐腐蚀型，通常作为耐热钢使用 High temperature nickel base alloy, w/ good oxidation resisting performance cauterization type, normally for thermal resisting steel.

套管形式选择 Tube Type Selection

法兰可选择900 (PN15) ~2500LB (PN40) RTJ等不同形式

Flange can be selected in different forms such as 900(PN15) ---2500LB (PN40) RTJ



代号 Code	N	M	D	d	D ₁	D ₂
A	M20X1.5 (NPT1/2)	NPT1 "	φ 34	φ 7	φ 23	φ 18
B		NPT11/4 "	φ 45	φ 7	φ 28	φ 22

选型须知

- 1) 型号
- 2) 分度号
- 3) 精度等级
- 4) 保护管材质及形式
- 5) 法兰规格及形式
- 6) 长度或插入深度

Type Selection

- 1) Type
- 2) Graduation
- 3) Accuracy Class
- 4) Thermowell Material & Type
- 5) Flange Specification & Type
- 6) Length & Insert Depth

例A: 高温高压隔爆电偶, K型, I 级, 保护管A型, 插入深度300mm。WRNG-440A, L=450×300, d II BT4, 316L, ANSI 1 " 1500#RJ

Example: Explosion-separation Thermocouple under High Temperature & Pressure, Type K, Class I, Type A Thermowell, Insert Depth 330mm, WRNG-440A, L=450×300, d II BT4, 316L, ANSI 1 " 1500#RJ

法兰型号及规格 Flange Type & Specification

● 法兰标准代号

Standard Code of Flange

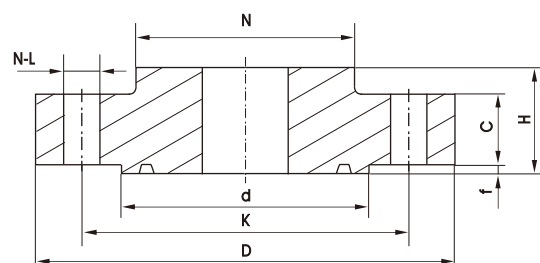
标准类属 Standard Category	标准代号 Standard Code
中国国家标准 National Standard	GB9112~9131-88
中国化工部标准 Chemical Dept Standard	HG20592~20635-97 (HGJ44~76-91) (HG5001~5028-58)
中国机械部标准 Mechanical Dept Standard	JB/T74~90-94 (JB81~82-59)
美国标准 American Standard	ASME/ANSI B16.5-96
德国标准 German Standard	DIN 2628~2638-1975
日本标准 Japan Standard	JIS2201-1976

● 法兰规格 Flange Spec

Flange Specification

CLASS150~600 RF

CLASS900~2500 RJ



RJ

WZ □ 系列

耐磨热电偶（阻）

Wear-resisting Thermocouple (Thermal Resistance)

应用 Application

适合于电厂球磨机及磨煤机、水泥窑头、窑层等对保护管磨损严重的场合。用于沸腾焙烧炉、煤碳进料炉等测量装置有严重磨损的介质的测温。

It is used for ball mill machine and coal mill machine in power plant, or other environment with serious wear on thermowell, it is applied to the temperature measurement for boiling-bed roaster coal incoming furnace, .

主要技术参数 Main Technical Parameters

○ 电气出口: M20×1.5, NPT1/2

Electric Outlet: M 20×1.5, NPT1/2

○ 耐磨头硬度: HRC62~65

Wear-resisting Head Hardness, HRC~65

○ 防护等级: IP65

Protection Class: IP65

申请专利号 Patent Number

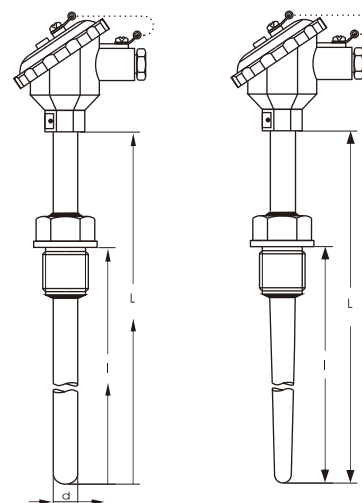
922029806

型号及规格 Type & Specification

型 号 Type	分 度 号 Graduation	测温范围℃ T. range	公称压力 NP	热响应时间 TRT	规 格Specification	
					d	L×I
NKWRN-230 NKWRN ₂ -230	K	0~800	≤10MPa	<180S	φ 16	300×150 350×200 400×250 450×300 500×350 550×400 650×500 900×750 1150×1000
NKWRE-230 NKWRE ₂ -230	E	0~600				
NKWZP-230 NKWZP ₂ -230	Pt100	-200~500				
NKWRN-630 NKWRN ₂ -630	K	0~800	≤30MPa	<180S	φ 16	
NKWRE-630 NKWRE ₂ -630	E	0~600				
NKWZP-630 NKWZP ₂ -630	Pt100	-200~500				

保护管材质为1Cr18Ni9Ti, 其余材质根据协议订货;

Thermowell material is 1Cr18Ni9Ti, other material shall be ordered as agreement



WR □ 系列

耐磨切断热电偶

Wear-resisting Cutting Thermocouple

应用 Application

通过在耐磨头喷焊Ni+Wc35, 使钢的硬度提高。适用于生产现场存在高耐磨固体颗粒或流体, 当保护管发生损坏时可切断电偶。是炼油厂不可缺少的测温装置。

Improving the hardness of steel through painting and welding Ni + Wc35 on the wear-resisting head. It is used for the occasions that there is highly wearable solid or liquid, when there is destroy for thermowell, thermocouple can cut off the power. It is a necessary device for refineries.

主要技术参数 Main Technical Parameters

○ 电气出口: M20×1.5, NPT1/2

Electric Outlet: M 20×1.5,NPT1/2

○ 耐磨头硬度: HRC62~65

Wear-resisting Head Hardness, HRC~65

○ 防护等级: IP65

Protection Class:IP65

○ 隔爆等级: d IIBT4, d IICT5

Explosion Separation Class

○ 公称压力 P_N : 2.5MPa

型号及规格 Type & Specification

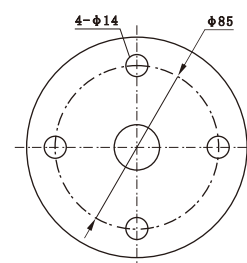
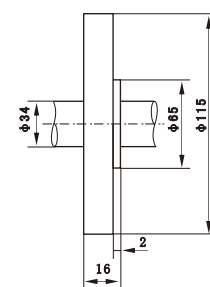
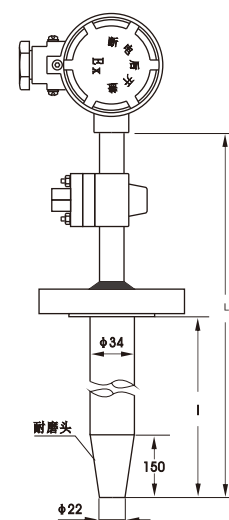
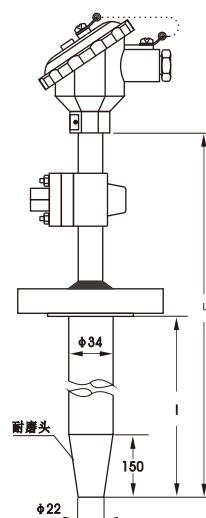
型 号 Type	分 度 号 Graduation	测温范围℃ T. range	保护管材料 Thermowell Material	热响应时间 TRT	规格 L×I Specification
QMWRR-430 QMWRR ₂ -430	S	0~1300	GH2140	<180S	450×300 500×350 550×400 600×450 650×500 750×600 950×750 1150×1000
QMWRRN-430 QMWRRN ₂ -430	K	0~1000 0~800	GH3030 1Cr18Ni9Ti		
QMWRE-430 QMWRE ₂ -430	E	0~600	1Cr18Ni9Ti		
QMWRR-440 QMWRR ₂ -440	S	0~1300	GH2140		
QMWRRN-440 QMWRRN ₂ -440	K	0~1000 0~800	GH3030 1Cr18Ni9Ti		
QMWRE-440 QMWRE ₂ -440	E	0~600	1Cr18Ni9Ti		

★:1) 热电偶 I 级按协议订货;

Class I thermocouple shall be ordered according to agreement

2) 型号430为防水式, 型号440为隔爆式

Type 430 is water proof, 440 is explosion separation.



WR□ 系列

耐磨阻漏热电偶/阻

Wear-resisting & Leakage-proof Thermocouple/ Thermal Resistance

应用 Application

在热电偶内部采用卡套卡死偶丝，彻底防止漏油或漏气。适用于生产现场存在高耐磨固体颗粒或流体，是炼油厂不可缺少的测温装置。

We adopt clamp inside the thermocouple to fasten wires to avoid oil or gas leakage thoroughly prevent it from oil or gas leakage completely. it is used for production with high abrasive solid granule or fluid on spot, it is necessary temperature measuring device for refineries.

主要技术参数 Main Technical Parameters

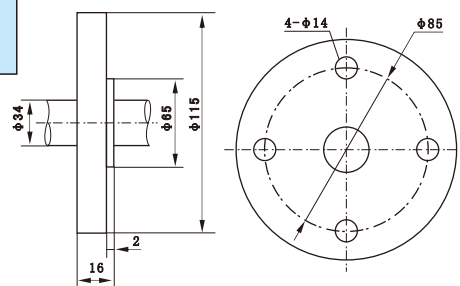
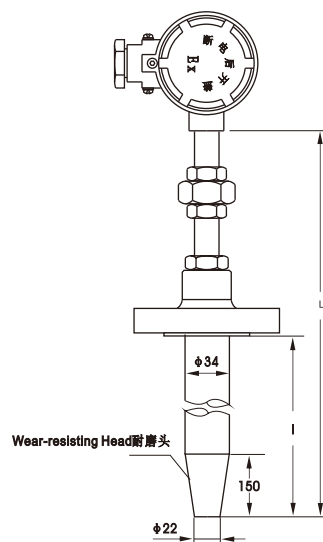
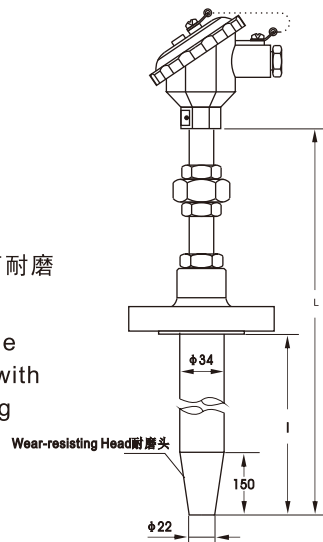
- 电气出口：M20×1.5，NPT1/2
Electric Outlet: M 20×1.5,NPT1/2
- 耐磨头硬度：HRC62~65
Wear-resisting Head Hardness: HRC 62~65
- 防护等级：IP65
Protection Class:IP65
- 隔爆等级：d II BT4，d II CT5
Explosion-separation Class: d II BT4, d II CT5
- 公称压力：2.5MPa
Nominal Pressure: 2.5Mpa

型号及规格 Type & Specification

型 号 Type	分 度 号 Graduation	测温范围℃ T. range	热响应时间 TRT	保护管材料 Thermowell Material	规格L×I Specification
WRN-430M WRN ₂ -430M	K	0~800	<180S	1Cr18Ni9Ti	450×300
WRE-430M WRE ₂ -430M	E	0~600			500×350
WRN-440M WRN ₂ -440M	K	0~800			550×400
WRE-440M WRE ₂ -440M	E	0~600			600×450 650×500 750×600 950×750 1150×1000

★：元件为铠装式。

The elements are sheathed.



WZ □ 系列

防腐热电阻

Corrosion-resistant Thermal Resistance

应用 Application

采用新型防腐材料，外包覆聚四氟乙烯F46，适用于石油化工各种腐蚀性介质中测温。是氯碱行业的专用测温仪表。

We adopt new type corrosion-resistant materials and cover with F46 outside. It is used to measure temperature of various corrosive medium in petroleum & chemical industry. It is special thermometer for soda chloride industry.

主要技术参数 Main Technical Parameters

电气出口：M20×1.5，NPT1/2

Electric Outlet: M 20×1.5, NPT1/2

热响应时间：≤8S

Thermal Response Time: ≤8S

防护等级：IP65

Protection Class: IP65

精度等级：A、B级

Accuracy Class: A, B

型号及规格 Type & Specification

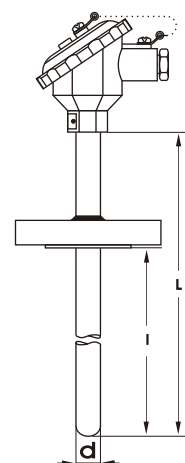
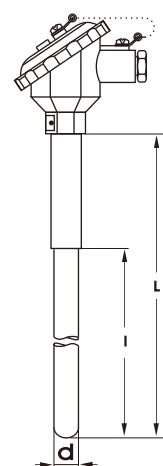
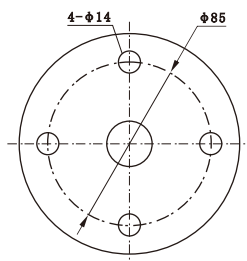
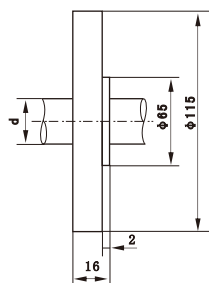
型号 Type	分度号 Graduation	测温范围℃ T. range	热响应时间 TRT	保护管材料 Thermowell Material	规格 Specification	
					d	L×I
WZPF-230 WZP ₂ F-230	Pt100	-200~250	<180S	1Cr18Ni9Ti	φ 16	300×150 350×200 400×250 450×300 500×350 550×400 650×500 750×600 1000×850
WZCF-230 WZC ₂ F-230	Cu50 Cu100	0~150				
WZPF-430 WZP ₂ F-430	Pt100	-200~250				
WZCF-430 WZC ₂ F-430	Cu50 Cu100	0~150				

★: 1) 元件为铠装元件;

The elements are sheathed.

2) 保护管其余材质根据协议订货;

Other material of thermowell shall be ordered according to agreement



WR □ 系列

高温防腐热电偶

Corrosion-resistant Thermocouple Under High Temperature

应用 Application

适用于各种生产过程中高温、腐蚀性场合，广泛应用石油化工、冶炼玻璃及陶瓷工业测温。
It is widely used to measure temperature during various production processes with high temperature and corrosion in petrochemical, metallurgy, glass and ceramic industries.

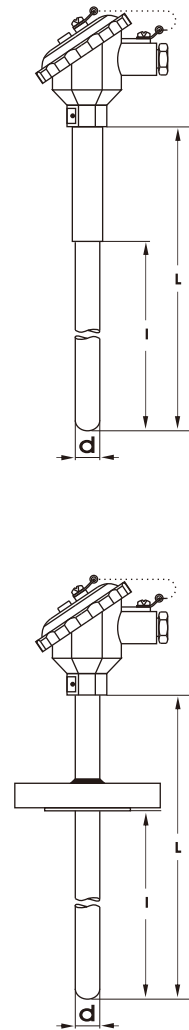
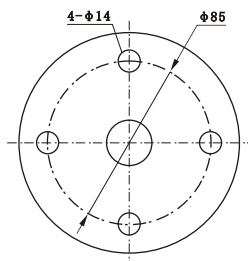
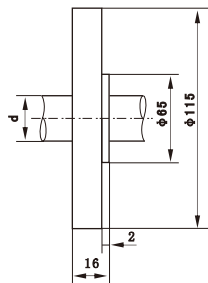
主要技术参数 Main Technical Parameters

- 电气出口：M20×1.5，NPT1/2
Electric Outlet: M 20×1.5,NPT1/2
- 精度等级：I、II 级
Accuracy Class: I, II
- 防护等级：IP65
Protection Class:IP65

型号及规格 Type & Specification

型 号 Type	分度号 Graduation	测温范围℃ T. range	保护管材料 Thermowell Material	热响应时间 TRT	规格 Specification	
					D	L×I
WRPF-330G WRP ₂ F-330G	S	0~1300	3YC52	<180S	Φ 16	300×150 350×200 400×250 450×300 500×350 550×400 650×500 750×600 1000×850
WRQF-330G WRQ ₂ F-330G	R	0~1300				
WRRF-330G WRR ₂ F-330G	B	0~1600	MoSi ₂			
WRPF-430G WRP ₂ F-430G	S	0~1300	3YC52			
WRQF-430G WRQ ₂ F-430G	R	0~1300				
WRRF-430G WRR ₂ F-430G	B	0~1600	MoSi ₂			

★:热电偶 I 级按协议订货;
Class I thermocouple shall be ordered as agreement



WR□ 系列

多点热电偶/阻

Multi-point Thermocouple/ Thermal Resistance

应用 Application

适用于生产现场存在温度梯度不显著，须同时测量多个位置或位置的多处测量。
广泛应用于大化肥合成塔、存储罐等装置中。

It is used for production locales which have no clear grads of temperature as well need temperature measurement of multi points. It is widely used in chemical fertilizer synthesizing tower and reserving tank devices.

主要技术参数

Main Technical Parameters

电气出口: M27×2, NPT3/4 □

Electric Outlet: M 20×1.5,NPT1/2

热响应时间: ≤4S

Thermal Response Time: ≤4S

防护等级: IP65

Protection Class:IP65

偶丝直径: Φ3

Wire Diameter: Φ3

型号及规格

Type & Specification

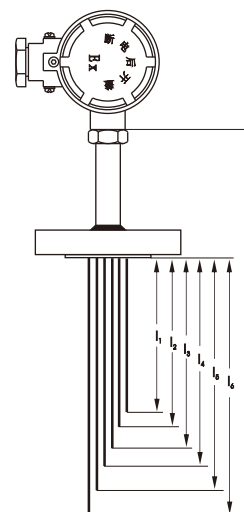
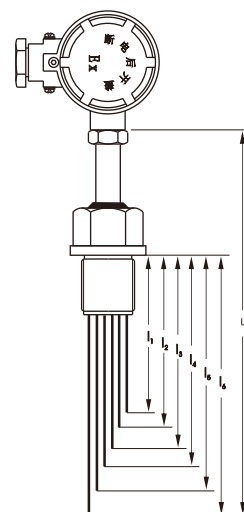
型 号 Type	分 度 号 Graduation	测温范围℃ T. range	测温点数 Measuring Points	保护管材料 Thermowell Material
WRNK-230D	K	0~1000	2~14	GH3030
		0~ 800		1Cr18Ni9Ti
WREK-230D	E	0~600		1Cr18Ni9Ti
WRNK-430D	K	0~1000		GH3030
		0~ 800		1Cr18Ni9Ti
WREK-430D	E	0~600		1Cr18Ni9Ti
WZPK-430D	Pt100	-200~+450		

★: 1) 保护管其余材质根据协议订货;

Other thermowell material shall be ordered according to agreement.

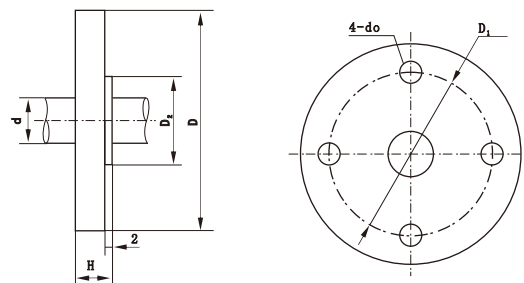
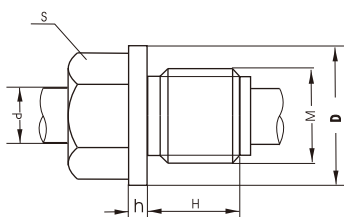
2) 外保护管和法兰尺寸根据用户而定。;

Size of outer thermowell and flange shall be designed according to users request.



安装固定形式 Mounting & Fixing Type

● 固定螺纹 Fixed Thread



测温点数 Measuring Points	M	D	H	h	S	d
2~6	M33X2	Φ48	33	5	36	Φ20
7~12	M42X2	Φ58	38	5	46	Φ22

测温点数 Measuring Points	D	D ₁	D ₂	H	D ₀	d
2~6	Φ105	Φ75	Φ55	16	Φ14	Φ20
7~12	Φ115	Φ85	Φ65	16	Φ14	Φ34

选型须知

- 1) 型号
- 2) 分度号
- 3) 精度等级
- 4) 热电偶点数
- 5) 安装固定形式
- 6) 保护管材质
- 7) 长度或插入深度

Selection Notice

- 1) Type
- 2) Graduation
- 3) Accuracy class
- 4) Thermocouple Points
- 5) Mounting & Fixing Type
- 6) Thermowell Materials
- 7) Length or Insert Depth

WR □ 系列

多点隔爆热电偶/阻**Multi Points Explosion-separation Thermocouple/ Thermal Resistance****应用 Application**

适用于生产现场存在易燃易爆化合物，须同时测量多个位置或位置的多处测量。

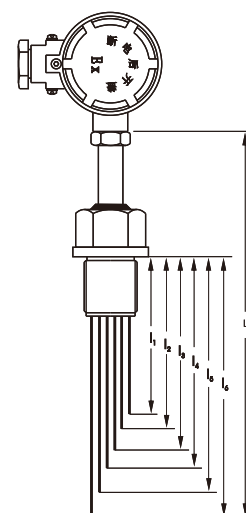
It is used for production locales with flammable and explosive chemicals as well need multi points measurement.

主要技术参数 Main Technical Parameters

- 电气出口：M20×1.5, NPT1/2
Electric Outlet: M 20×1.5, NPT1/2
- 热响应时间：≤8S
Thermal Response Time: ≤8S
- 偶丝直径：Φ2、Φ3
Wire Diameter: Φ2 Φ3
- 防护等级：IP65
Protection Class: IP65
- 隔爆等级：d IIBT4, d IICT5
Explosion-separation Class: d IIBT4, d IICT5

型号及规格 Type & Specification

型 号 Type	分 度 号 Graduation	测温范围℃ T. range	测温点数 Measuring Points	安装固定形式 Mounting & Fixing Type
WRNK-240D	K	0~1000 0~800	2~14	固定螺纹
WREK-240D	E	0~600		
WRNK-440D	K	0~1000 0~800		固定法兰
WREK-440D	E	0~600		
WZPK-440D	Pt100	-200~+450		



- 1) 保护管材质根据协议订货;
we also supply/ produce protection tube of other materials
- 2) 对于铂热电阻直径为 Φ3。
For Pt thermal resistance, the diameter is Φ3

WR□、WZ□ 系列

特殊热电偶(阻)

Special Thermocouple (Thermal Resistance)

应用 Application

特殊结构设计, 适合不同场合, 可以直接测量200℃~1600℃范围内液体、蒸汽和气体介质以及固体表面温度。

Special structure design for different occasions, can measure the surface temperature of liquid, Steam and gas mediums ranging from 200℃~1600℃ directly.

工作原理 Working Principle

○热电偶的电极由两根不同导体组成。当测量端与参比端存在温差时, 就会产生热电势, 工作仪表便显示出热电势所对应的温度值。

○热电阻是利用物质在测温度变化时, 其电阻也随着发生变化的特征来测量温度的。当阻值变化时, 工作仪表便显示出热电势所对应的温度值。

○The two electrodes of sheathed thermocouple are made of different conductor materials. Where there is temperature difference between measuring end and reference end, there will be hydroelectric potential, then the meter shows the corresponding temperature of the hydroelectric potential.

○The thermal resistance is made use of the principle that when temperature changes, the resistance will change accordingly to measure temperature, and when resistance changes, the working instrument will show the corresponding temperature.

主要技术参数 Main Technical Parameters:

○产品执行标准
Standard
IEC1515
I

EC584

IEC751

JB/T 5582-91

JB/T 8622-1997

JB/T 8623-1997

○公称压力 Nominal Pressure:

一般是指在常温下, 保护管所能承受的静态外压而不破裂。允许工作压力不仅与保护管材料、直径、壁厚有关, 且与其结构形式、安装方法、置入深度及被测介质的流速、种类有关。

It is usually means the static outer pressure which the protection tube can offer and will not be broken under the working temperature. In fact, working pressure not only has relationship with protection tube material, diameter and thickness of wall, but also the structure form, installation method, inserting depth and the flow speed and type of the medium etc.

○常温绝缘电阻

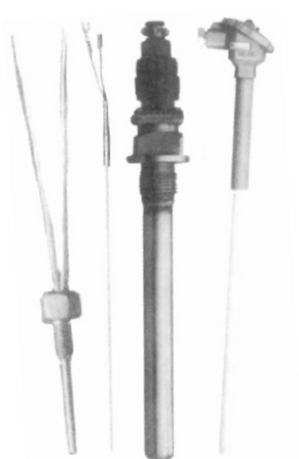
Insulation Resistance at Normal Temperature

热电偶在环境温度为 $20\pm 15^{\circ}\text{C}$, 相对湿度不大于80%, 试验电压为 $500\pm 50\text{V}$ (直流) 电其绝缘电阻 $\geq 1000\text{M}\Omega \cdot \text{m}$ 。

在环境温度为 $15\sim 35^{\circ}\text{C}$, 相对湿度不大于80%, 试验电压为 $10\sim 100\text{V}$ (直流), 铂热电阻绝缘电阻应不小于 $100\text{M}\Omega$; 铜热电阻绝缘电阻 $\geq 50\text{M}\Omega$ 。

The insulation resistance is no less than $1000\text{M}\Omega$ under condition that environment temperature is $20\pm 15^{\circ}\text{C}$, relative humidity is no more than 80% and testing voltage is $500\pm 50\text{V(D.C)}$.

The insulation resistance of Pt thermal resistance is no less than $100\text{M}\Omega$ and the Cu thermal resistance is no less than $50\text{M}\Omega$ under condition that environment temperature is $15\sim 35^{\circ}\text{C}$, relative humidity is no more than 80% and testing voltage is $10\sim 100\text{V(D.C)}$.



○ 测温范围及允差

Measuring Range & Tolerance

● 热电偶

Thermocouple

型号 Type	分度号 Graduation	允差等级 Tolerance Class			
		I		II	
		允差值 Trce	测温范围℃T.range	允差值 Trce	测温范围℃T.range
WRN	K	±1.5℃	-40~+375	±2.5℃	-40~+333
		±0.004 t	375~1000	±0.0075 t	333~1200
WRE	E	±1.5℃	-40~+375	±2.5℃	-40~+333
		±0.004 t	375~800	±0.0075 t	333~900
WRP	S	±1℃	0~+1100	±1.5℃	0~600
		±(1+0.003(t-1100))	1100~+1600	±0.0025 t	600~1600
WRQ	R	±1℃	0~+1100	±1.5℃	0~+1100
		±(1+0.003(t-1100))	1100~+1600	±0.0025 t	1100~+1600
WRR	B	-	-	-	-
		-	-	±0.0025 t	600~1700

● 热电阻

Thermal Resistance

型号 Type	分度号 Graduation	测温范围 T. Range	精度等级 AC.Class	允许偏差 Torance
WZP	Pt100	-200~500	A级 Class A	±(0.15+0.002 t)
			B级 Class B	±(0.30+0.005 t)
WZC	Cu50 Cu100	-50~100	-	±(0.30+0.006 t)

注：t为感温元件实测温度。

Notice: t is real temperature measured for thermal element

微型热电偶(阻)

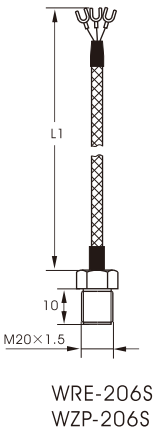
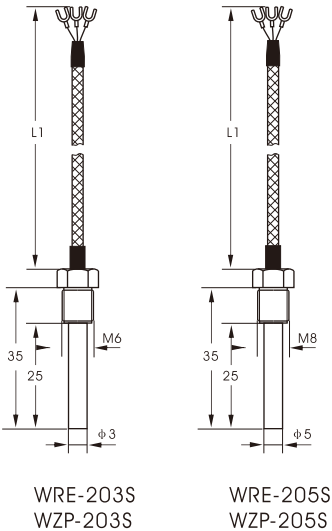
Mini-thermocouple (Thermal Resistance)

应用 Application

适用于狭小场所的温度测量与控制。是纺织、涤纶等行业不可缺少的测温装置。
It is used for temperature measurement & control in narrow place. It is necessary measuring device for textile and polyester fiber industries etc.

主要技术参数 Main Technical Parameters:

- 精度等级
Accuracy Class
热电偶：Ⅱ级
Thermocouple: Class II
热电阻：A、B级
Thermal Resistance: Class A, B
- 公称压力：常压
Nominal Pressure: Normal pressure
- 接线形式：电偶 两线制
Wiring Method: Thermocouple: Two Wire
电阻 三线制
Resistance: Three Wire



型号及规格 Type & Specification

型 号 Type	分 度 号 Graduation	测温范围℃ T. Range	热响应时间 TRT	保护管材料 Thermowell Material	规格L Specification
WRE-203S	E	-40~ 250	<5S	1Cr18Ni9Ti	500 1000 1500 2000 2500 3000
WRE-205S			<8S		
WRE-206S			<10S		
WZP-203S	Pt100	-200~250	<5S		
WZP-205S			<8S		
WZP-206S			<10S		

微细铠装热电偶

Tiny Sheathed Thermocouple

应用 Application

适用于狭小弯曲场所的温度测量与控制。是化工、化纤、制药等行业不可缺少的测温装置。

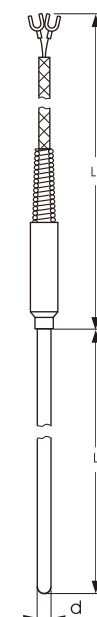
It is used for temperature measurement & control in narrow & bending place. It is necessary measuring device for chemical, chemical fiber and pharmaceutical industries etc.

主要技术参数 Main Technical Parameter

- 精度等级：Ⅰ级或Ⅱ级
Accuracy Class: Class I or II
- 公称直径： $\phi 0.5$ 、 $\phi 1$ 、 $\phi 1.5$
Nominal Diameter: $\phi 0.5$ 、 $\phi 1$ $\phi 1.5$
- 弯曲半径： $R \geq 5D$
Bending Radius : $R \geq 5D$
- 公称压力：常压
Nominal Pressure: Normal pressure

型号及规格 Type & Specification

型 号 Type	分 度 号 Graduation	测温范围℃ T. Range	热响应时间 TRT	保护管材料 Thermowell Material	规 格L×I Specification
WRNK-191S	K	0~600	<3S	1Cr18Ni9Ti	100×800
WREK-191S	E	0~400			200×800 300×800 500×800 750×800



压簧固定热电偶

Spring Fixed Thermocouple

应用 Application

采用弹性压紧装置，使测量端紧贴被测物表面。适用于塑料、轻防及食品等行业测温。

We adopt spring fixed device on thermocouple to make the measuring end closely contact on the surface of measured object. It is used to measure temperature in plastic, light textile and foodstuff industries etc.



主要技术参数 Main Technical Parameter

○精度等级：II

Accuracy Class: II

○热响应时间：<5S

Thermal Response Time: <5s

型号及规格 Type & Specification

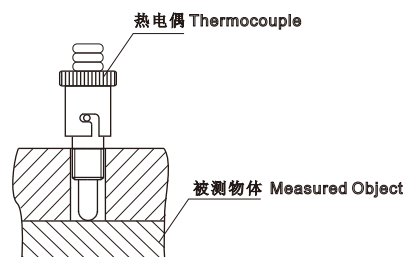
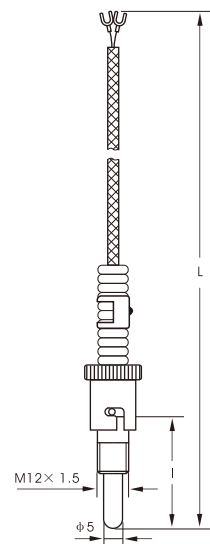
型号 Type	分度号 Graduation	测温范围℃ T. Range	保护管材质 Thermowell Material
WRET-01	E	0~400	1Cr18Ni9Ti

★: 1) 热电偶 I 级按协议订货;

Class I thermocouple shall be ordered according to agreements

规格 Specification

总长L Total L	保护管长度l Thermowell l
1000	30
1500	30
2000	30
2500	30
3000	30
3500	30
4000	30
1000	60
1500	60
2000	60
2500	60
3000	60
3500	60
4000	60



安装形式 Installation

WZ □ 系列

端面热电阻

Surface Measuring Thermal Resistance

应用 Application

适合于电厂汽轮机及电机轴瓦或其它机体表面测温。

It is used to measure surface temperature for steam turbine, axis bush of motor in power plant or other machine body

主要技术参数 Main Technical Parameter

○精度等级：A、B级

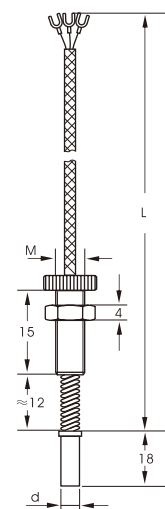
Accuracy Class: Class A, B

○公称压力：常压

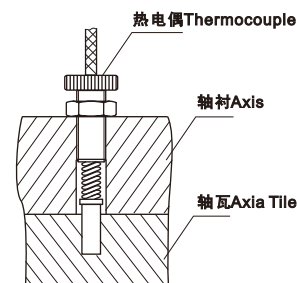
Nominal Pressure: Normal pressure

型号及规格 Type & Specification

型 号 Type	分 度 号 Graduation	测温范围℃ T. Range	公称压力MPa NP	热响应时间τ _{0.5} S TRT	规格 Specification		L
					d	M	
WZCM-201	Cu50 Cu100	-50~100	常压	≤15S	φ 6	M8×075	500 1000 1500 2000 2500
WZPM-201	Pt100	-100~150	常压	≤10S	φ 6	M8×075	
WZPM-201B	Pt100	-100~150	常压	≤10S	φ 87	M10×1	
WZPM-201	Pt100	-100~150	常压	≤10S	φ 6× 18电阻管 φ 6x18 Resistance Tube		
WZPM-201Y	Pt100	-100~150	常压	≤10S	φ 6× 18电阻管 φ 6x18 Resistance Tube 压簧 压片 Spring Compression Slice 2-M3× 8		



安装方法 Installation



WZP系列

给水泵专用端面铂热电阻

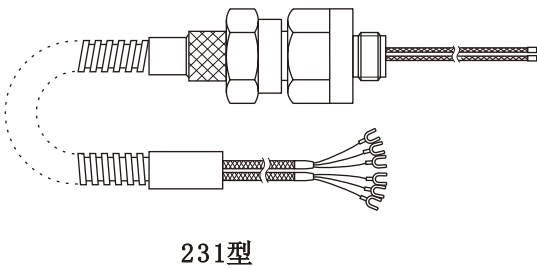
Pt Surface Measuring Thermal Resistance
for Water Supply Pump Specially

应用 Application

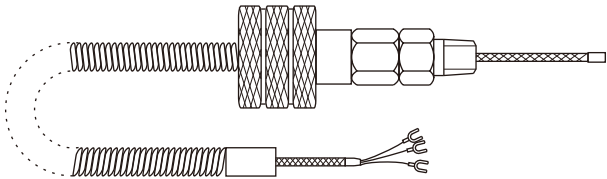
适合于各种给水泵的温度测量
It is used to measure the temperature of each kind of
water supply pump.

主要技术参数 Main Technical Parameter

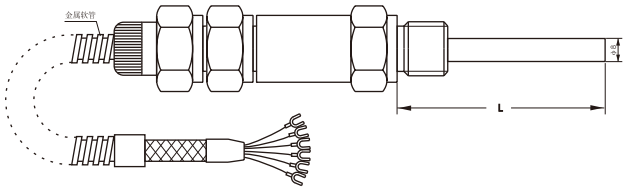
- 精度等级：A、B级
Accuracy Class: Class A, B
- 公称压力：常压
Nominal Pressure: Normal Pressure
- 接线形式：三线制、六线制
Wiring Form: Three-wire, Six-wire



231型



201型



236S型

型号及规格 Type & Specification

型 号 Type	分度号 Graduation	测温范围℃ T. Range	热响应时间 $\tau_{0.5}$ S TRT	电阻管规格Tube Spec.		金属软管 Metal Soft Tube D×L mm	耐油线长度 mm Length of Oil Resisting Wire
				d	螺纹 Thread		
WZPMP-201	Pt100	-50~100	≤10S	φ 3.2× 8	NPT 1/ 4	φ 8×4000	4100
WZPM ₂ P-231	Pt100	-50~100	≤10S	φ 3.2× 8	M20×1.5 NPT 1/ 2	φ 10×4000	5800
WZPM ₂ P-236S	Pt100	-100~300	≤15S	φ 6× 150	M20×1.5 NPT 1/ 2	φ 10×4000	4600

插座式热电阻

Thermal Resistance w/ Socket-shaped

应用 Application

采用接插件形式，安装方便。适用于测量-200~450℃范围内液体、气体及固体表面测温。
Easy for installation by using socket components. It is used to measure the surface temperature of liquid, gas and solid ranging from -200℃ to 450℃.

主要技术参数 Main Technical Parameter

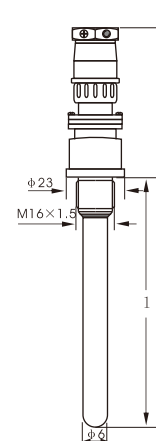
- 精度等级：A、B级
Accuracy Class: Class A, B
- 防护等级：IP65
Protection Class: IP65
- 公称压力：常压
NP: Normal Pressure

型号及规格 Type & Specification

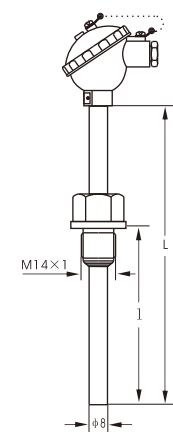
型号 Type	分度号 Graduation	测温范围℃ T. Range	热响应时间 TRT.	保护管材料 TMT.	规格 L Specification
WZP-260	Pt100	0~+100	<30S	1Cr18Ni9Ti	100
WZP ₂ -260			<45S		150
WZP-267M	Pt100	-50~+150	<30S		200
WZP-269	Pt100	-200~+300	<30S		250
WZP ₂ -269			<45S		300
WZC-269	Cu50	-50~+100	<120S		75
WZP-270	Pt100	-200~+420	<15S		100
WZC-270	Cu50	-50~+150	<45S		150
WZC-280	Pt100	-200~+300	<30S		200
WZP-26S	Pt100	-200~+300	<5S		50
					75
					100
					125
					150

★: 热电阻A级按协议订货;
Class A thermal resistance shall be ordered according to agreements

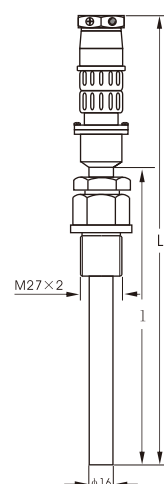
产品型号 Product type	保护管直径d(mm) Thermowell Diameter d
WZP-269	φ16
WZP ₂ -269	
WZC-269	φ12



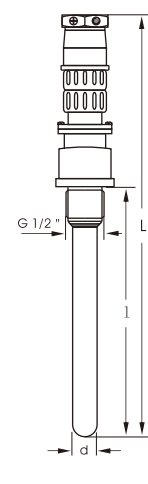
270型



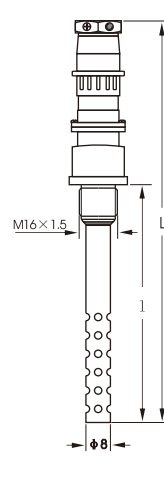
280型



267型



269型



26S型

直角弯头热电偶

Thermocouple w/ Right Angle Elbow

应用 Application

适用于生产现场存在高温和有害气体对热电偶接线盒有影响，或不宜直接水平及垂直安装场合。

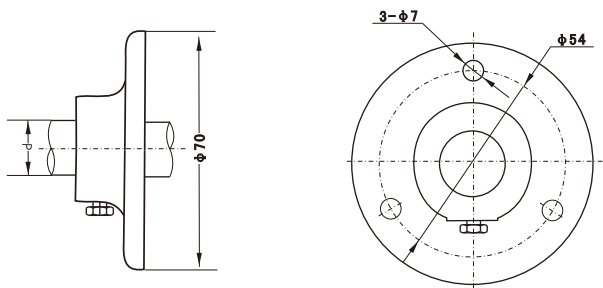
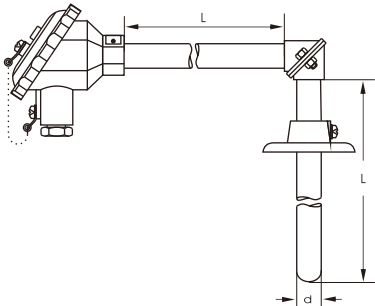
It is used for production on locales where there is high temperature and harmful gas which has affection to connection box of thermocouple or which is not suitable for direct horizontal and vertical installation.

主要技术参数 Main Technical Parameter

- 电气出口: M20×1.5, NPT1/2
Electric Outlet: M 20×1.5,NPT1/2
- 精度等级: I, II
Accuracy Class: I, II
- 防护等级: IP65
Protection Class:IP65

型号及规格 Type & Specification

型号 Type	分度号 Graduation	测温范围℃ T. Range	热响应时间 TRT.	保护管材料 TMT.	规格L×I Specification
WRN-530 WRN ₂ -530	K	0~800	≤90S	1Cr18Ni9Ti	300×150
					350×200
WRE-530 WRE ₂ -530	E	0~600			400×250
					450×300
WRM-530 WRM ₂ -530	N	0~800			500×350
					550×500
WRC-530	T				600×450
WRJ-530 WRJ ₂ -530	J	0~600			650×500



高温贵金属热电偶

Thermocouple w/ Precious Metal for High Temperature

应用 Application

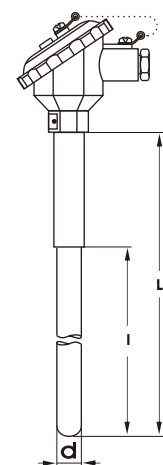
适用于各种生产过程中高温场合，广泛应用于玻璃、陶瓷及工业盐浴炉等测温。
It is widely used to measure temperature during various production processes with high temperature in glass, ceramic and industry salt-bashing furnace..

主要技术参数 Main Technical Parameter

- 电气出口：M20×1.5，NPT1/2
Electric Outlet: M 20×1.5,NPT1/2
- 精度等级：I、II
Accuracy Class: I, II
- 防护等级：IP65
Protection Class:IP65
- 偶丝直径：Φ 0.5
Wire Diameter: Φ 0.5
- 公称压力：常压
Nominal Pressure: Normal pressure

型号及规格 Type & Specification

型 号 Type	分 度 号 Graduation	测温范围℃ T. Range	保护管材料 TMT.	热响应时间 TRT.	规 格 Specification	
					d	L×I
WRP-130 WRP ₂ -130	S	0~1300	高 铝 质 High Al	<120S	φ 16	300×150 350×200 400×250 450×300 550×400 650×500 900×750 1150×1000 1650×1500 2150×2000
WRP-131 WRP ₂ -131				<360S	φ 25	
WRQ-130 WRQ ₂ -131	R	0~1300		<120S	φ 16	
WRQ-130 WRQ ₂ -131				<360S	φ 25	
WRR-130 WRR-131	B	0~1600	刚 玉 质 Corundum	<120S	φ 16	
WRR ₂ -130 WRR ₂ -131				<360S	φ 25	



WR□ 系列

炉管刀刃热电偶

Thermocouple w/ Edge on Furnace Tube

应用 Application

采用刀刃式接头直接焊接于炉管表面，适用于石油工业炉管、塔壁表面温度测量。是炼油厂分馏塔必备测温装置。特别是炼油厂加氢炉管表面温度测量，炉管表面温度约为570℃，炉膛温度约为1000℃，微负压。

Weld an edge connector on the surface of furnace tube directly, suitable for the temperature measurement of industrial furnace tube, and surface temperature of tower wall in petroleum industries. It is necessary measuring device for fractionating tower in refinery. Especially for the surface temperature measuring for the furnace w/ hydrogen in refinery, the surface temperature of furnace tube is about 570℃, the temperature in furnace is about 1000℃.

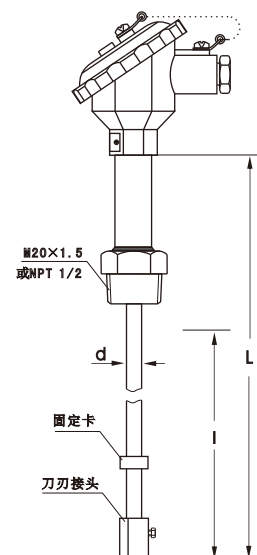
主要技术参数 Main Technical Parameter

- 电气出口：M20×1.5，NPT1/2
Electric Outlet: M 20×1.5,NPT1/2
- 精度等级：I、II
Accuracy Class: I, II
- 防护等级：IP65
Protection Class:IP65
- 公称压力：10MPa
Nominal Pressure: 10MPa

型号及规格 Type & Specification

型 号 Type	分度号 Graduation	测温范围℃ T. Range	保护管材料 Thermowell Material	热响应时间 $\tau_{0.5}$ S TRT.	规 格 Specification	
					D	L×I
WRNK-231D	K	0~1100	GH3030 316SS	≤10S	φ8	1000 1500 2000 3000
		0~800	1Cr18Ni9Ti		φ27	

保护管其余材质根据协议订货；
Other materials of thermowell shall be ordered according to agreement



WR□ 系列

吹气热电偶

Blowing Thermocouple

应用 Application

吹气型热电偶的结构原理是在感温元件和外保护管之间构成一定的气路,在气路中,通入一定压力的惰性气体,以排除或减少热电偶在高温、高压条件下还原气体的渗入,增加了吹气型热电偶的吸气特性,从而延长了热电偶的使用寿命。是30万吨合成氨装置中不可缺少的测温装置。

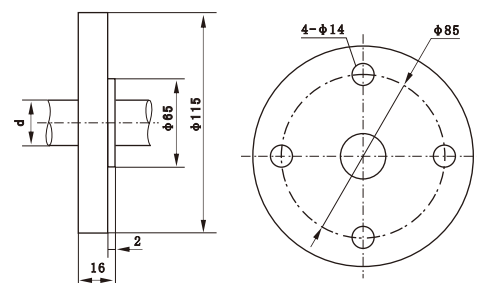
The structure principle of blowing thermocouple is: forming certain blowing circuit between thermal element and thermowell, and inject some inert gases to eliminate or reduce reversed gas penetrating into thermocouple under condition of high temperature and pressure. This can add the inspiration characteristic of blowing thermocouple, and then can extend it's use life. It is necessary measuring device for 300 thousand synthetic ammonia production equipments.

主要技术参数 Main Technical Parameter

- 电气出口: M20×1.5, NPT1/2
Electric Outlet: M 20×1.5,NPT1/2
- 防护等级: IP65
Protection Class: IP 65
- 吹气压力: 0.1MPa
Blowing Pressure: 0.1Mpa
- 公称压力: 2.5MPa
Nominal Pressure:2.5Mpa

型号及规格 Type & Specification

型 号 Type	分 度 号 Graduation	测温范围℃ T. Range	保护管材质 Thermowell Material.	规 格 Specification	
				D	L×I
WRPC-430 WRPC ₂ -430	S	800~1300	刚 玉 质 Corundum	Φ 20	650×500
WRRC-430 WRR ₂ C-430	B	800~1600	刚 玉 质 Corundum		850×700 900×750 1000×850 1150×1000



WRP系列

拱顶热电偶

Thermocouple for Arch Top of Furnace

应用 Application

拱顶热电偶是为了适应高炉拱顶温度的检测，而进行设计制造的新型热电偶。热电偶保护管选用进口SiC再结晶材料能够满足高炉测温的特殊要求，在构造上，有密封、耐振动、断管防喷出可以垂直安装和有快速装卸的法兰结构。

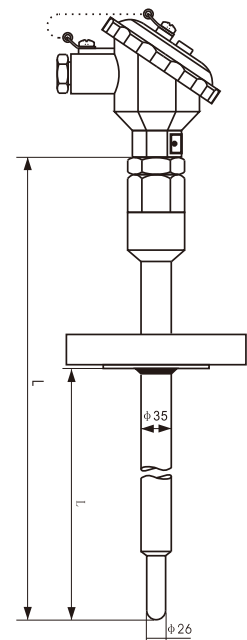
Thermocouple for arch top of furnace is new thermocouple designed and manufactured to suit to measure the temperature of arch top of furnace. The thermowell material is made use of imported SiC re-crystallized materials to meet special demands of high furnace temperature measurement. It has sealed, shock-resistant, anti-spray horizontal-available and quick-discharging flange structure on its structure.

主要技术参数 Main Technical Parameter

- 电气出口: M20×1.5, NPT1/2
- Electric Outlet: M 20×1.5, NPT1/2
- 分度号: S
- Graduation: S
- 测温范围: 0~+1300℃
- Measuring Range: 0~+1300℃

型号规格 Type & Specification

型 号 Type	分 度 号 Graduation	测温范围℃ T. Range	保护管材质 TMT.	规 格 Specification	
				D	L×I
WRP-430 WRP ₂ -430	B·S·R	0~+1600	SiC再结晶 外管 SiC re-crystallized Thermowell	φ 35	1400×1250 1750×1600



WR□、WZ□ 系列

电机热电偶（阻）

Thermocouple（Thermal Resistance）for Electric

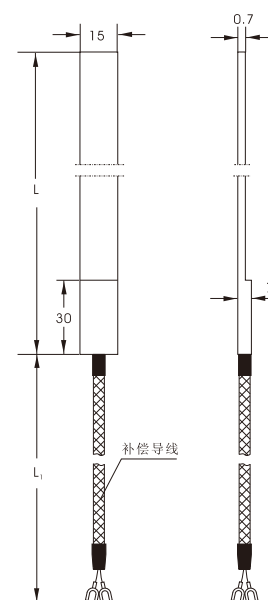
电机铁芯热电偶

Thermocouple for Steel Core of Electric

电机铁芯热电偶主要用于测量电机的定子铁芯温度，它除具有一般热电偶的特性外还具有抗振、耐压等优点，它的外保护管由非金属绝缘材料构成薄片状，因此具有良好的绝缘性能。使用时，可直接嵌入电极的铁芯，它与显示、记录、调节仪配合能直接测量0~150℃范围内温度。

This product is mainly used to measure the temperature of stator core, except the advantages that normal thermocouples have, it also has the advantages as resisting vibration and enduring pressure. The thermowell is made up of nonmetallic isolated material, so it has good isolation. It can be inserted into the core of electrode, cooperating with display, record and adjustor to measure the temperature 0~150℃ directly.

- 型号规格：WRCT-01 Model#, WZCT-201
- 测温范围：0~150℃ Temperature range, 0~150℃
- 分度号：T Graduation: T
- 热响应时间： $\tau_{0.5} < 30S$ TRT: $\tau_{0.5} < 30S$
- 名义长度I和补偿导线长度L（mm）：
Nominal Length I & Compensating Wire Length L(mm):
60×2500, 294×4000 390×4500, 570×4500, 590×4800, 797×12700

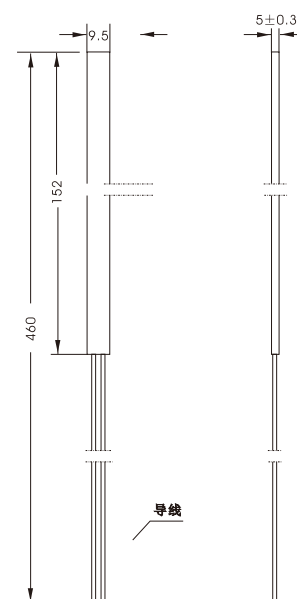


电机绕组铜电阻 Copper Resistance

电机绕组铜电阻主要用于测量大、中、小型电机绕组、定子及其它小间隙表面测温场合，它除具有热电阻的一般特性外，还具有抗振、耐压等优点，保护片采用非金属绝缘材料提高了元件的绝缘性能，它是电力工程必不可少的测温元件。

This product is mainly used to measure the copper and stator of big, middle, and small types of electric machines and others small clearance measurement occasion. Except the advantages that nomals have, it also has the advantages as resisting vibration and enduring pressure. The protective slice is made up of isolated material which improves the isolation, it is the must measurement element in electricity project.

- 型号规格：WZCT-201 Model#, WZCT-201
- 测温范围：0~120℃ Temperature range, 0~120℃
- 分度号：Cu50 Graduation: Cu50
- 允差： $R0 = 50 \pm 0.05 \Omega$ Tolerance $\alpha = 0.00428 \pm 0.00002$
- 热响应时间： $\tau_{0.5} < 30S$ TRT: $\tau_{0.5} < 30S$
- 压力试验：平面静压不小于0.14MPa
Pressure Test: Plane Static Pressure $\geq 0.14MPa$



WR□、WZ□ 系列

电机埋置式热电阻 Thermocouple in Motor

适用于电机绕组及定子铁芯的温度测量。

Suitable for the temperature measurement for the motor winding and stator core.

●型号规格：WZPD B×L 3D

Specification: WZPD B×L 3D

●测温范围：0~300℃

Measuring Range: 0~300℃

●分度号：Pt100

Graduation: Pt100

●最大激励电流：5mA

Max Exciting Current: 5mA

●绝缘等级：F级

Insulation Class: F

◆型号及规格 Type & Specification

WZPD B×L-3D-Pt100

分度号 Graduation

引出线长度代号 A: 150mm

Length of Lines B: 400mm

C: 1000mm

D: 2000mm

E: 3000mm

F: 4000mm

G: 5000mm

引出线数 Lines Lead out

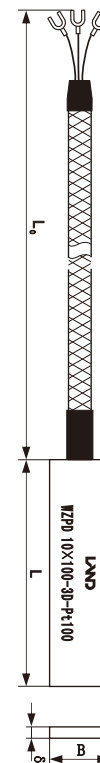
传感器外形：宽度×长度

Sensor Outside: Width X Length

◆传感器外形尺寸和极限偏差应符合下表规定：

The outer size and error limit of sensor should be referred to the list below

厚度δ(mm) Thickness		宽度B(mm) Width		长度L(mm) Length	
基本尺寸 Basic Size	偏差 Error	基本尺寸 Basic Size	偏差 Error	基本尺寸 Basic Size	偏差 Error
2	0 -0.2	6	0 -0.2	30	+2 0
		8		45	
		10		60	
		12		100	
1.8	+0.3 0	12	±1	200	0
5	0 -0.2	44	0 -0.2	250	±0.5
3	0 -0.2	44	0 -0.2	300	±0.5



WR□系列

裂解炉专用热电偶

Special Thermocouple for Heating Cracker

应用 Application

热电偶保护管采用特殊结构，使之紧贴于裂解炉管内侧，同时可以不影响物料流动。

适合于乙烯生产过程中裂解炉温度测量与控制。

We adopt special structure for thermowell, make it access to inside of cracker tube closely and have effect brought by the flow of materials. It is suitable for temperature measuring and control in heating cracker during the ethylene production process.

主要技术参数 Main Technical Parameter

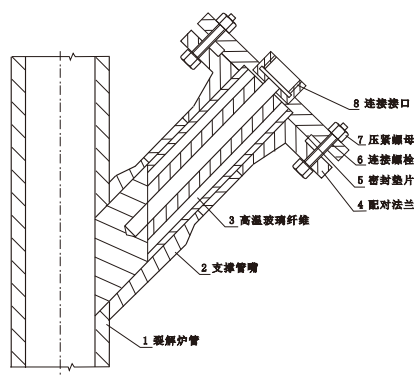
- 电气出口: M20×1.5, NPT1/2
Electric Outlet: M 20×1.5,NPT1/2
- 连接尺寸: M27×2, NPT3/4
Connection Size: M 20×1.5,NPT3/4
- 防护等级: IP65
Protection Class:IP65
- 防爆等级: d IIC T6
Explosion-proof Class: d IIC T6
- 精度等级: I 级
Accuracy Class: Class I

型号规格 Type & Specification

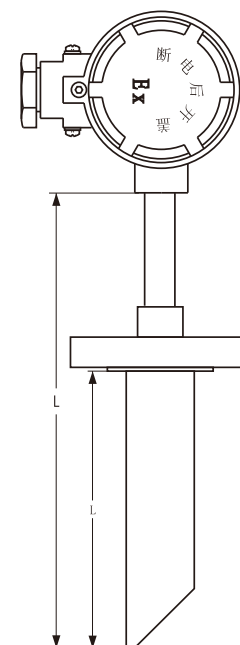
型 号 Type	分度号 Graduation	测温范围℃ T. Range	热响应时间 $\tau_{0.5}$ TRT.	规 格 Specification
WRN-440J WRN ₂ -440J	K	0~1000	<180S	430×200 480×250

安装示意图

Installation Sketch Map



1. Cracker Tube
2. Support Tube Mouth
3. High Temperature Glass Fiber
4. Paired Flange
5. Sealing Spacer
6. Connection Bolt
7. Compression Nut
8. Connector



WRPG系列高温盐浴炉专用热电偶

Special Thermocouple for WRPG Series Salt Bath Furnace Under High Temperature

应用 Application

WRPG系列高温盐浴炉专用热电偶，主要用于机械行业等高温盐浴炉的连续测量。该产品耐高温熔盐腐蚀及热冲击，可靠性高，使用寿命长，自83年获机械部科技二等奖后已推广到全国各地。本公司还有中温盐浴炉专用热电偶，使用效果也很好。

It is mainly used to continue measuring for salt bath furnace with high temperature in mechanical industry. This product is corrosion-resistant of high temperature melting salt, high reliability, long using expectancy. It has been promoted around country since achieving the second technology prize of mechanical department in 1983. we also produce special slat-bathing boiler with middle-temperature.

特点 Features

- 采用金属陶瓷及刚玉双层保护管，形成复合型结构。

Adopting metallic ceramic and Corundum protection tube with double-film to form compound structure

- 连接件采用耐热合金制造，寿命长。

Connection plug manufactured by heat alloy, long using life

- 耐高温熔盐腐蚀，抗热震性好。

Corrosion-resistant for high temperature melting salt, good shock-proof performance

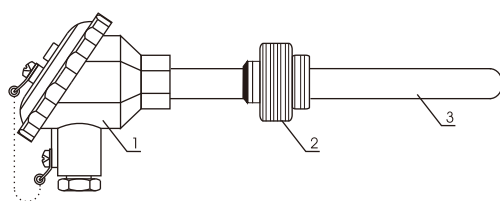
品种规格 Type & Specification

型 号 Type	分度号 Graduation	测温范围℃ T. Range	测量端保护管 Measuring End Thermowell			规格L或 L×1(mm) Specification or L×I	热响应时间 $\tau_{0.9}$ (秒) TRT.
			材料 Material	直径(mm) Diameter	长度(mm) Length		
WRPG-1323	S	0-1350	金属陶瓷 Metal Ceramic	Φ23	300	500 1000	<90
WRPG-5323						500×500 750×750 1000×1000	

主要技术指标 Main Technical Indicator

分度号 Graduation	允差值 Tolerance	使用寿命 Using Life	抗热震性 Heat & Shock-resisting	熔盐成份 Component of Fusing Salt
S	$\pm 0.25\%t$	在1280℃的BaCl ₂ 熔盐中使用寿命大于1400小时 It is longer than 1400 hours in BaCl ₂ fusing salt with temperature at 1280℃.	1280℃~15℃重复50次不出现裂纹 From 1280℃ to 15℃, nocrack after repeated 50times	BaCl ₂

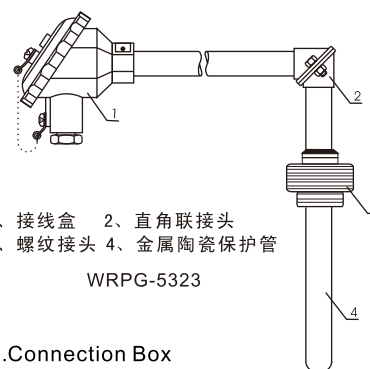
结构 Structure



1、接线盒 2、螺纹接头 3、金属陶瓷保护管

WRPG-1323

- 1.Connection Box
- 2.Thread Connector
- 3.Metallic Ceramic Thermowell

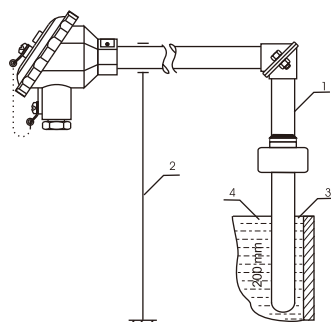


1、接线盒 2、直角联接头
3、螺纹接头 4、金属陶瓷保护管

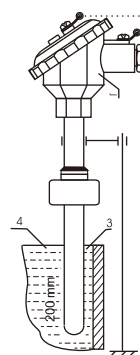
WRPG-5323

- 1.Connection Box
- 2.Straight Angle Connector
- 3.Thread Connector
- 4.Metallic Ceramic Thermowell

安装 Installation



WRPG-5323



1、热电偶
2、支架
3、溶盐
4、置入深度

WRPG-5323

- 1.Thermocouple
- 2.Support
- 3.Fusing Salt
- 4.Insert Depth

WR□ 系列

BXW系列便携式浸入型测温仪

BXW Series Portable Immersed Temperature Measurement Meter

应用 Application

这是一种机电仪一体化的产品，热电偶，显示仪表，测枪三位一体；显示仪表为3 1/2 位数字显示，并带有峰值保持功能，如特殊需要，还可带记忆存储功能。

I 型产品其结构为热电偶，测枪一体化（不可拆卸）。

II 型产品是在 I 型基础上在热电偶测量端配装功能各异可更换的耐腐蚀保护管，以适用于不同的测量介质。

III 型产品除具备 I、II 型的功能外，其热电偶与测枪可任意拆卸，以便于随时更换损坏的热电偶。

以上产品除 I 型适用于气体温度测量外，其它产品主要适用于铝加工及有色冶金工业中铝、铜、锌液及氟化物电解质等溶体的温度测量，既可以间断使用，也可以在一定时间内连续测量。

This is an all-in-one electromechanical product, combining thermocouple, display meter and measurement gun together; Display meter is 3 1/2 digit display with peak keeping performance, if special, it also has memory performance.

The structure of type I is combining thermocouple and measurement gun, can't be disassembled.

Type II is based on type I, installing a renewable cauterization-resisting protection tube with various performances on the measurement end of thermocouple.

Except the performance of type II and I, the thermocouple of type III can be disassembled optionally, so that can renew the broken thermocouple any time.

主要技术参数 Main Technical Parameters

型 号 Type	分度号 Graduation	允差值 Tolerance	测温范围℃ MeasuringRange	显示表 Display Meter	结构特征 Structure features
BXW- I	K	±0.4%t 或 ±0.75%t	0~1000	3 1/2 位数字 显示，精度 0.5 级	整体式，用于气体温度测量。 All-in-one, suitable for gas temperature measurement
BXW- II				3 1/2 Digital Display Accuracy Class: 0.5	带有可更换的耐腐蚀保护管。 Renewable cauterization-resisting protection tube
BXW-III					同上，且铠装热电偶与枪体可拆卸更换 Same as above, and sheathed thermocouple and measurement gun can be disassembled and renewed.

注：铠装偶外皮材料使用GH3030时测温上限可达1300℃。

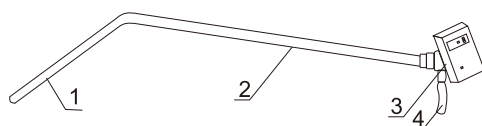
Notice: If use GH3030 as the outer material of sheathed thermocouple, the upper limit of temperature measurement can meet 1300 °C

品种规格 Type & Specification

型 号 Type	保 护 管 Thermowell				铠 装 偶 Sheathed Thermocouple	
	材 料 Material	外径D(mm) Outer Diameter	长度L(mm) Length	适用介质 Suitable Medium	直径D(mm) Diameter	长度L(mm) Length
BXW- I	1Cr18Ni9Ti HG3030	—	—	铝液电解质 Al Liquid Electrolyte	φ 4 φ 5 φ 6 φ 8	1000
BXW- II	金属陶瓷 Metal Ceramic	φ 16	300	铝液 Al Liquid		1250
				电解质 Electrolyte		1500
						1750
BXW- III	金属陶瓷 Metal Ceramic	φ 16 φ 10	140	铝液 Al Liquid		2000
			300	电解质 Electrolyte		
			190	铜液 Al Liquid		

注：该种测温仪精度高，经计量局整体检定后，精度可达0.2%t,可用作现场校验仪。

Notice: The temperature measurement meter with high accuracy, its accuracy can reach 0.2% t, which can be used as correcting meter on spot, that is integrally inspected by measurement bureau.

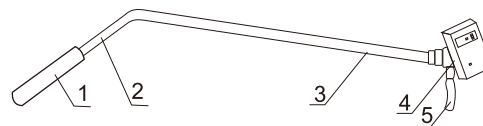


BXW- I 型

1、热电偶 2、测枪 3、数显表 4、手柄

Type BXW-I

- 1.Thermocouple
- 2.Measuring Gun
- 3.Digital Display Meter
- 4.Handle

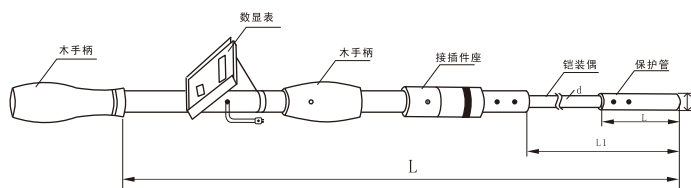


BXW- II 型

1、保护管 2、热电偶 3、测枪 4、数显表 5、手柄

Type BXW-II

- 1.Thermowell
- 2.Thermocouple
- 3.Measuring Gun
- 4.Digital Display Meter
- 5.Handle



BXW- III 型

1, 4 手柄 2、补偿导线的插头 3、数字温度表 5, 6连接卡套甲、乙 7、热电偶 8、保护套管

Type BXW-III

- | | | |
|--------------------------|-------------------------------|-------------------------|
| 1.4 Handle | 2 Plug with Compensating Wire | 3 Digital Display Meter |
| 5, 6 Connecting Fastener | 7 Thermocouple | 8 Thermowell |

WR□Z系列真空炉专用热电偶

Special Thermocouple for Vacuum Furnace

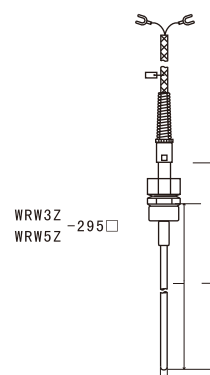
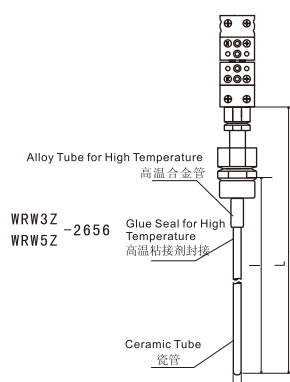
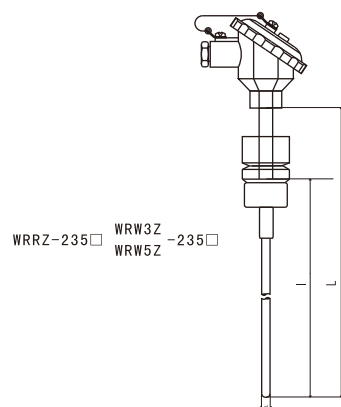
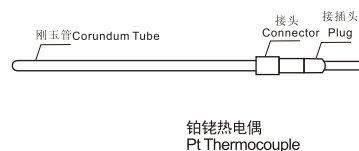
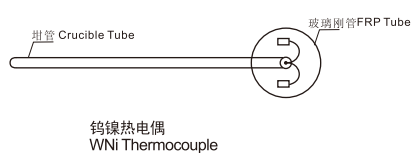
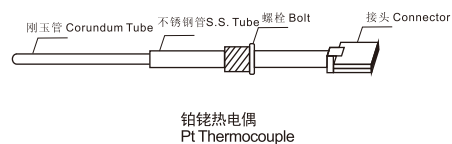
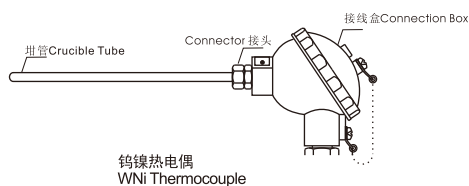
应用 Application

该系列产品由于采用了耐高温材料做保护管，因此，可在1800~2000℃高温下长期稳定地工作。为防止真空热处理过程中零件与周围空气接触，必须预防空气进入真空炉，因此，对用于真空炉的热电偶的漏气率提出要求。通常以压升率指标来控制。进口真空炉的压升率小于0.268Pa/h。本公司生产的专用热电偶因采用实体化结构及密封性极强的接线方式，保证热电偶的压升率小于0.1Pa/h，可以有效地保证不破坏炉内的真空度。因此，该系列产品主要适用于高温真空及热处理等各种真空炉的温度测量，可替代价格昂贵的进口产品。

This series are made use of high temperature resisting material for thermowell, so they can work stably and chronically from 1800 to 2000℃. We must hold the air into the vacuum furnace to avoid the parts contact to air in the vacuum thermal process, therefore, there is request about leakage for vacuum furnace thermocouple. Normally, it is controlled by the indicator of pressure raising rate. We can make sure the pressure raising rate of vacuum furnace is less than 0.268Pa/h. The special thermocouple we produce adopts materialization structure and the wiring method w/ strong seal performance, to make sure the pressure raising of thermocouple is less than 0.1Pa/h, and this can make sure never destroy the vacuum in furnace. So, this series products are mainly used to the temperature measurement of each kind of vacuum furnace in high temperature vacuum and thermal process, can replace the expensive imported products.

品种规格 Specification

型号 Type	密封结构 Sealed Structure	分度号 Graduation	允差值 Tolerance	使用温度 (℃) Using Temperature	热响应时间 $T_{0.95}$ (秒) TRT	保护管 Thermowell		长度L×1 (mm) Length
						材料 Material	直径d (mm) Diameter	
WRRZ-235□ -265□ -295□	NPT1/2 " 螺纹密封 Threaded Seal	B	±0.5t 或 ±0.25%t	600~1800				400×250 450×300
-435□ -465□ -495□	快速法兰 (真空双胶圈密封) Quick Flange (Vacuum Double Glue Seal)							
WRW3Z-235□ -265□ -295□	NPT1/2 " 螺纹密封 Threaded Seal	WRe3- WRe25	±0.5t 或 ±1.0%t	200~2000	φ6, φ8管≤60	复合刚玉 与 耐热合金 Complex Corundum & Thermal Resisting Alloy	φ8	550×400
-435□ -465□ -495□	快速法兰 (真空双胶圈密封) Quick Flange (Vacuum Double Glue Seal)				φ10, φ12管≤90		φ10 φ12 φ16	650×500 900×750 1150×1000 1650×1500
WRW5Z-235□ -265□ -295□	NPT1/2 " 螺纹密封 Threaded Seal	WRe5- WRe26	±0.5t 或 ±1.0%t	200~2000				
-435□ -465□ -495□	快速法兰 (真空双胶圈密封) Quick Flange (Vacuum Double Glue Seal)							



WR□ B、WZPB系列

带温度变送器热电偶(阻)

Thermocouple (Thermal Resistance) with Temperature Transmitter

应用 Application

通常和显示仪表、记录仪表、电子计算机等配套使用，输出4~20mA。直接测量各种生产过程中的0~1600℃范围内液体、蒸汽和气体介质以及固体表面温度。

It is usually used with display-meter, recording-meter and computer etc., outputting 4~20Ma, to directly measure temperature of liquid, vapor, gas medium and solid surface ranging from 0 to 1600 °C during various production processes.

特点 Features

- 二线制输出4~20mA，抗干扰能力强；
Two wire system output of 4~20Ma, strong anti-interference performance
- 节省补偿导线及安装温度变送器费用；
Save cost of compensation wire & installation of temperature transmitter
- 测量范围大；
Wide measuring range
- 冷端温度自动补偿，非线性校正电路；
Automatic compensation of temperature at cold end, non-linearity correcting circuit

工作原理 Working Principle

热电偶（阻）在工作状态下所测得的热电势（电阻）的变化，经过温度变送器的电桥产生不平衡信号，经放大后转换为4~20mA的直流电信号给工作仪表，工作仪表便显示出所对应的温度值。

Hydroelectric potential (resistance) of thermocouple (thermal resistance) will bring the unbalanced current signal through the electrical bridge, the signal will be amplified to 4~20mA D.C. signal and transfer to the instrument, the instrument will display the relevant temperature.

主要技术参数 Main Technical Parameters

○产品执行标准

Standard

IEC584

IEC1515

IEC751

JB/T7391-94

○测温范围及允差

Measuring Range & Tolerance

●热电阻

Thermal Resistance

型号 Type	分度号 Graduation	测温范围℃ Measuring Range	精度等级 Accuracy Class	允 差 Tolerance
WZPB	Pt100	-200~+450	A级 Class A	$\pm(0.15+0.002 t)$
			B级 Class B	$\pm(0.30+0.005 t)$
WZCB	Cu50 Cu100	-50~ +150	—	$\pm(0.30+0.006 t)$



●热电偶

Thermocouple

型号 Type	分度号 Graduation	允 差 等 级 Tolerance Class			
		I		II	
		允 差 值 Tolerance	测温范围℃ Measuring Rang	允 差 值 Tolerance	测温范围℃ Measuring Rang
WRNB	K	$\pm 1.5^{\circ}\text{C}$	-40~+375	$\pm 2.5^{\circ}\text{C}$	-40~+333
		$\pm 0.004 t $	375~1000	$\pm 0.0075 t $	333~1300
WRMB	N	$\pm 1.5^{\circ}\text{C}$	-40~+375	$\pm 2.5^{\circ}\text{C}$	-40~+333
		$\pm 0.004 t $	375~1000	$\pm 0.0075 t $	333~1200
WREB	E	$\pm 1.5^{\circ}\text{C}$	-40~+375	$\pm 2.5^{\circ}\text{C}$	-40~+333
		$\pm 0.004 t $	375~ 800	$\pm 0.0075 t $	333~ 900
WRFB	J	$\pm 1.5^{\circ}\text{C}$	-40~+375	$\pm 2.5^{\circ}\text{C}$	-40~+333
		$\pm 0.004 t $	375~ 750	$\pm 0.0075 t $	333~ 750
WRCB	T	$\pm 1.5^{\circ}\text{C}$	-40~+125	$\pm 2.5^{\circ}\text{C}$	-40~+133
		$\pm 0.004 t $	125~ 350	$\pm 0.0075 t $	133~ 350

- 输出信号：4~20mA，负载电阻250Ω，
Output Signal: 4~20ma, loading resistance, 250Ω
传输导线电阻100Ω
Transmitting wire resistance, 100Ω
- 输出方法：二线制
Output Way: Two-wire
- 允差等级：0.1；0.2；0.5
Tolerance Class :0.1, 0.2, 0.5
- 供电电源：24V.DC±10%
Power Supply: 24V.DC ±10%
- 防护等级：IP65
Protection Class: IP 65

● 绝缘电阻：

Insulation Resistance

仪表输出接线端子与外壳之间的绝缘电阻应不小于50Ω

Insulation resistance between instrument output connecting terminal and its case should be no less than 50 Ω

● 热响应时间 Thermal Response Time

当温度出现阶跃变化时，仪表的电流输出信号变化至相当于该阶跃变化的50%所需的时间，通常以 τ 0.5表示当温度变送器的阶跃响应稳定时间不超过热电偶（阻）热响应稳定时间 τ 0.5的五分之一时，则用热电偶（阻）热响应时间作为仪表的热响应时间；

当温度变送器的阶跃响应稳定时间不超过热电偶（阻）热响应稳定时间 τ 0.5的二分之一时，则用温度变送器热响应时间作为仪表的热响应时间；

When the temperature has step-jumping change, the needed time for current output signal of instrument changes to 50% of the step-jumping change, this time is called thermal response time, indicating with τ 0.5. When step-jumping response stable time of temperature transmitter is no more than 1/5 times of τ 0.5, thermal response time of instrument shall be considered as the thermal response time of thermocouple (thermal resistance).

When step-jumping response stable time of temperature transmitter is no more than 1/2 times of τ 0.5, thermal response time of instrument shall be considered as the thermal response time of temperature transmitter.

● 基本误差 Basic Error

仪表的基本误差应不超过热电偶（阻）和温度变送器基本误差的合成误差。

$$\Delta = \Delta_1 + \Delta_2$$

Δ_1 表示热电偶（阻）允许偏差；

Δ_2 表示变送器基本误差；

The basic error of instrument should be no more than the compound error caused by thermocouple (thermal resistance) and temperature transmitter.

$$\Delta = \Delta_1 + \Delta_2$$

Δ_1 tolerance value allowed by thermocouple (thermal resistance)

Δ_2 basic error of temperature transmitter

● 工作环境 Working Environment

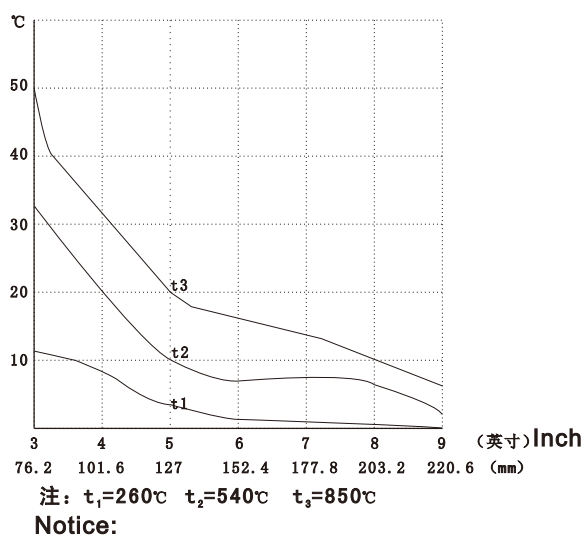
安装场所等级 Installation Place Class	温度℃ Temperature	相对湿度% Relative Humidity	大气压力kPa Atmosphere Pressure
Cx1	-25~+55	5~95	86~106
Cx2	-25~+70		
Cx3	-40~+80		

● 支撑管长度确定

Determination of Support Tube Length

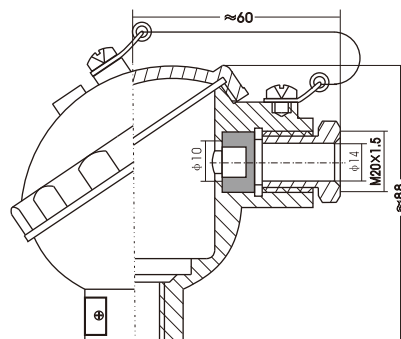
温度变送器的工作温度由支撑管所造成的壳体升温同环境温度之和。支撑管所造成的壳体升温见下图：

The working temperature of temperature transmitter equals to the case temperature rising caused by support tube and the environment temperature. For the case temperature rising caused by support tube, PLS see figure below:

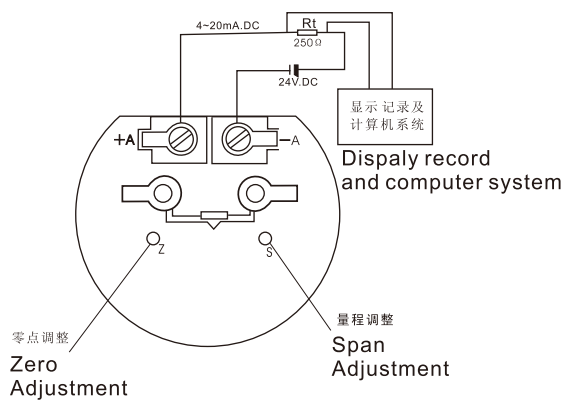
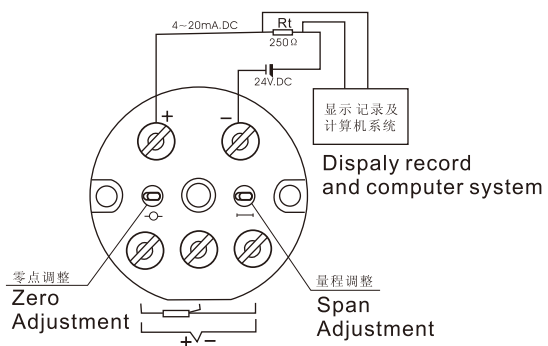


● 接线盒形式

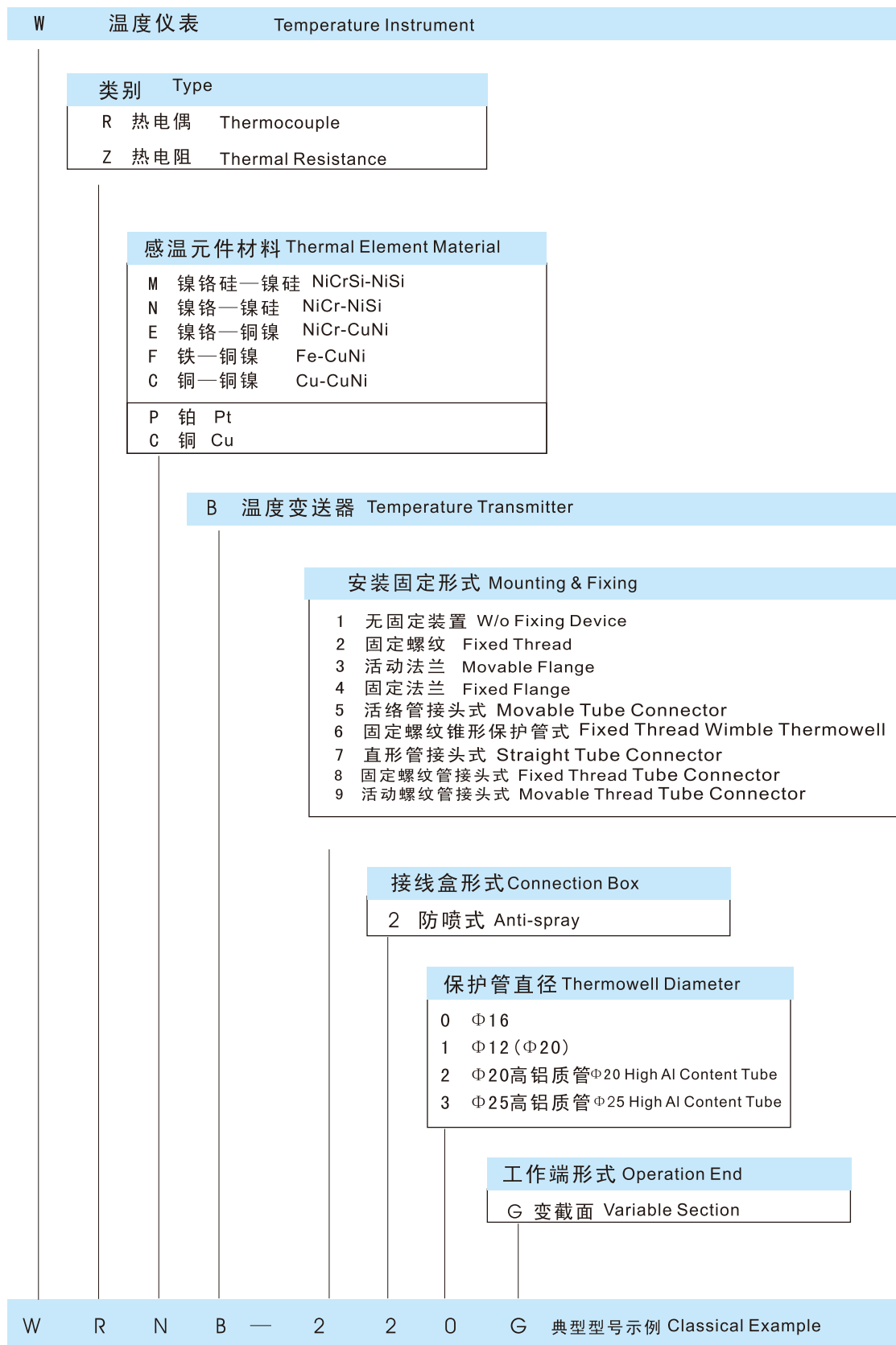
Connection Box Type



● 仪表接线方式 Instrument Wiring Method



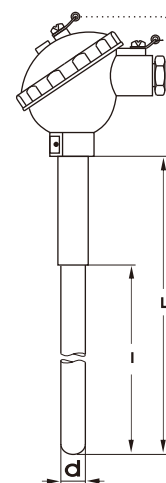
型号命名方法 Naming



型号及规格 Type & Specification

● 无固定装置 Without Fixed Device

型 号 Type	分 度 号 Graduation	测温范围℃ Measuring Range	热响应时间 TRT.	保护管材料 PTM	规 格 Specification	
					d	L×I
WRMB-122	N	0~1100	<120S	高 铝 质	φ 16	300×150 350×200 400×250 450×300 500×400 650×500 900×750 1150×1000 1650×1500 2150×2000
WRNB-122	K				φ 20	
WRMB-123	N					
WRNB-123	K					
WRMB-120 WRMB-120G	N	0~1000	<90S	0Cr25Ni20	φ 16	
		0~ 800	<24S	1Cr18Ni9Ti		
WRNB-120 WRNB-120G	K	0~1000	<90S	0Cr25Ni20		
		0~ 800	<24S	1Cr18Ni9Ti		
WREB-120 WREB-120G	E	0~600	<90S	1Cr18Ni9Ti		
			<24S			
WRCB-120 WRCB-120G	T	0~350	<90S			
			<24S			
WRFB-120 WRFB-120G	J	0~500	<90S			
			<24S			
WZPB-121 WZPB-121G	Pt100	-200~450	<120S	1Cr18Ni9Ti	φ 12	
			<24S			
WZCB-121 WZCB-121G	Cu50 Cu100	-50~150	<120S			
			<24S			



防喷式122 123型
Anti-spray Type 122 123

保护管其余材质根据协议订货；

Other materials of protection tube ordered according to agreement

选型须知

Type Selection:

1) 型号

Type

2) 分度号

Graduation

3) 温度范围

Measuring range

4) 热电偶（阻）精度等级

Accuracy class of thermocouple (thermal resistance)

5) 安装固定形式

Mounting & fixing type

6) 保护管材质

Protection tube material

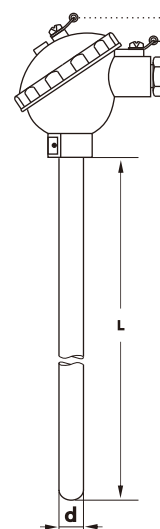
7) 长度或插入深度

Length or insert depth

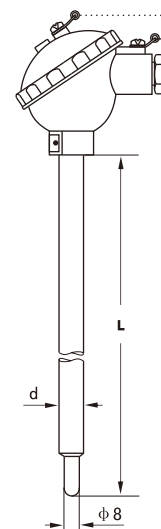
例A：带温度变送器热电偶，K型，固定螺纹M27×2，保护管316L，长度450mm，插入深度300mm。

Example A: Thermocouple with temperature transmitter, type K, fixed thread M27×2, protection tube 316L, length 450mm, insert depth 300mm.

WRNB-220, L=450×300, d II BT4, -100~+200℃, 保护管316L, 螺纹M27×2



防喷式120 121
Anti-spray Type 120 121



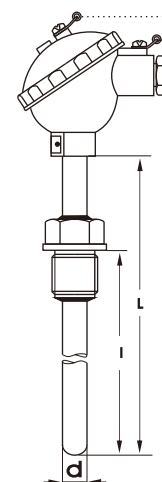
防喷式120G 121G
Anti-spray Type 20G 121G

● 固定螺纹式 Fixed Thread Type

型 号 Type	分 度 号 Graduation	测温范围℃ Measuring Range	热响应时间 TRT.	保护管材料 PTM	规 格 Specification	
					d	L×I
WRMB-220 WRMB-220G	N	0~1000	<90S	0Cr25Ni20	φ 16	300×150 350×200 400×250 450×300 500×400 650×500 900×750 1150×1000 1650×1500 2150×2000
		0~ 800	<24S	1Cr18Ni9Ti		
WRNB-220 WRNB-220G	K	0~1000	<90S	0Cr25Ni20		
		0~ 800	<24S	1Cr18Ni9Ti		
WREB-220 WREB-220G	E	0~600	<90S	1Cr18Ni9Ti		
			<24S			
WRCB-220 WRCB-220G	T	0~350	<90S			
			<24S			
WRFB-220 WRFB-220G	J	0~500	<90S			
			<24S			
WZPB-221 WZPB-221G	Pt100	-200~450	<120S	1Cr18Ni9Ti	φ 12	
			<24S			
WZCB-221 WZCB-221G	Cu50 Cu100	-50~150	<120S			
			<24S			

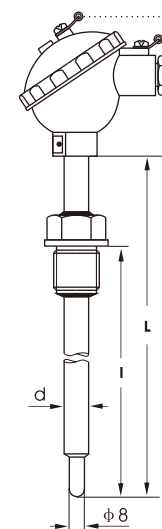
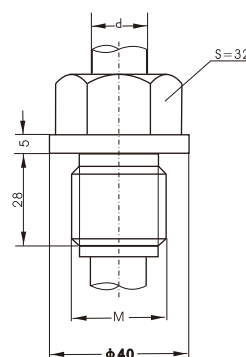
保护管其余材质根据协议订货；

Other materials of protection tube ordered according to agreement



防喷式220 221型
Anti-spray Type 220 221

型号示例 Type model	螺纹规格 Thread Specification		d	公称压力 NP Mpa
	代号 Code	M		
WRNB-220		M27×2	φ 16	≤10
WRNB-220A	A	G3/4		
WRNB-220C	C	NPT3/4		
WZPB-221G		M27×2	φ 12	
WZPB-221GA	A	G3/4		
WZPB-221GC	C	NPT3/4		

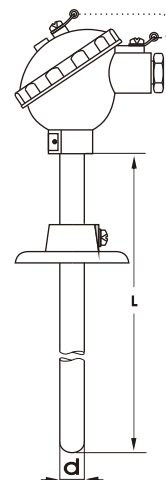


防喷式220G 221G型
Anti-spray Type 220G 221G

安装固定型式：固定螺纹
Installation & Fixing: Fixed Thread

● 活动法兰式 Movable Flange Type

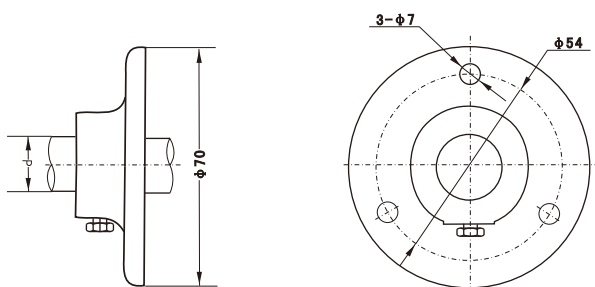
型 号 Type	分 度 号 Graduation	测温范围℃ Measuring Range	热响应时间 TRT.	保护管材料 PTM	规 格Specification	
					d	L
WRMB-320 WRMB-320G	N	0~1000	<90S	0Cr25Ni20	φ 16	300 350 400 450 500 650 900 1150 1650 2150
		0~ 800	<24S	1Cr18Ni9Ti		
WRNB-320 WRNB-320G	K	0~1000	<90S	0Cr25Ni20		
		0~ 800	<24S	1Cr18Ni9Ti		
WREB-320 WREB-320G	E	0~600	<90S	1Cr18Ni9Ti		
			<24S			
WRCB-320 WRCB-320G	T	0~350	<90S			
			<24S			
WRFB-320 WRFB-320G	J	0~500	<90S			
			<24S			
WZPB-321 WZPB-321G	Pt100	-200~450	<120S	1Cr18Ni9Ti	φ 12	
			<24S			
WZCB-321 WZCB-321G	Cu50 Cu100	-50~150	<120S			
			<24S			



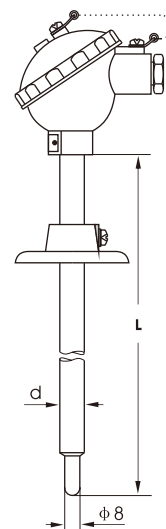
防喷式320 321型
Anti-spray Type 320 321

保护管其余材质根据协议订货：

Other materials of protection tube ordered according to agreement



安装固定型式：活动法兰
Installation & Fixing: Movable Flange



防喷式320G 321G型
Anti-spray Type 320G 321G

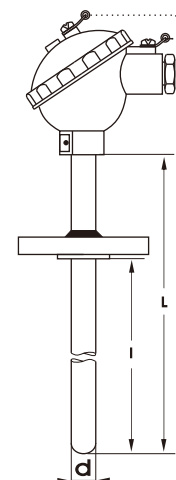
● 固定法兰式 Fixed Flange Type

型 号 Type	分 度 号 Graduation	测温范围℃ Measuring Range	热响应时间 TRT.	保护管材料 PTM	规 格 Specification	
					d	L×I
WRMB-420 WRMB-420G	N	0~1000	<90S	0Cr25Ni20	φ 16	300×150 350×200 400×250 450×300 500×400 650×500 900×750 1150×1000 1650×1500 2150×2000
		0~ 800	<24S	1Cr18Ni9Ti		
WRNB-420 WRNB-420G	K	0~1000	<90S	0Cr25Ni20		
		0~ 800	<24S	1Cr18Ni9Ti		
WREB-420 WREB-420G	E	0~600	<90S	1Cr18Ni9Ti		
			<24S			
WRCB-420 WRCB-420G	T	0~350	<90S			
			<24S			
WRFB-420 WRFB-420G	J	0~500	<90S			
			<24S			
WZPB-421 WZPB-421G	Pt100	-200~450	<120S		1Cr18Ni9Ti	φ 12
			<24S			
WZCB-421 WZCB-421G	Cu50 Cu100	-50~150	<120S			
			<24S			

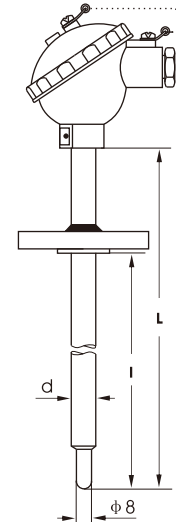
保护管其余材质根据协议订货；

Other materials of protection tube ordered according to agreement.

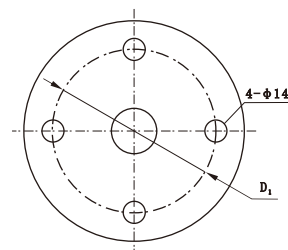
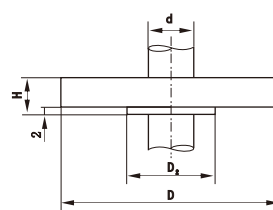
型号示例 Type	螺纹规格 Thread specification					公称压力 Mpa NP.
	D	D ₁	D ₂	H	D	
WRNB-420	φ 95	φ 65	φ 46	14	φ 16	≤2.5
WRNB-420G	φ 105	φ 75	φ 56	16		
WZPB-421	φ 115	φ 85	φ 65	16	φ 16	
WZPB-421G	φ 115	φ 85	φ 65			



防喷式420 421型
Anti-spray Type 420 421



防喷式420G 421G型
Anti-spray Type 420G 421 G

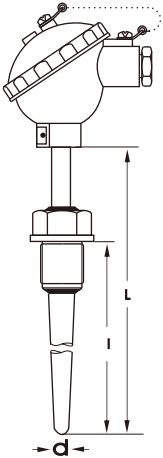


安装固定型式：固定法兰
Installation & Fixing: Fixed Flange

● 固定螺纹锥形保护管式

With Fixed Threaded Cone Connector Type

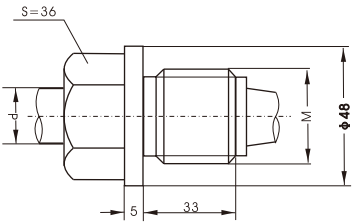
型 号 Type	分 度 号 Graduation	测温范围℃ Measuring Range	热响应时间 TRT.	保护管材料 PTM	规 格 Specification	
					d	L×I
WRMB-620 WRMB-620G	N	0~1000	<90S	0Cr25Ni20	φ 15	300×150 350×200 400×250 450×300 500×400
		0~ 800		1Cr18Ni9Ti		
WRNB-620 WRNB-620G	K	0~1000		0Cr25Ni20		
		0~ 800		1Cr18Ni9Ti		
WREB-620 WREB-620G	E	0~600		1Cr18Ni9Ti		
WRCB-620 WRCB-620G	T	0~350				
WRFB-620 WRFB-620G	J	0~500				
WZPB-621 WZPB-621G	Pt100	-200~450	<90S	1Cr18Ni9Ti		
WZCB-621 WZCB-621G	Cu50 Cu100	-50~150				



保护管其余材质根据协议订货；

Other materials of protection tube ordered according to agreement.

型号示例 Type Model	螺纹规格 Thread Specification		公称压力 NP Mpa
	代号Code	M	
WRNB-620		M33×2	≤30
WRNB-620A	A	NPT1	
WZPB-620		M33×2	
WZPB-620A	A	NPT1	



安装固定型式：固定螺纹锥形保护管

Installation & Fixing: Fixed Thread Wimble Thermowell

● 活络管接头式 Elbow Connector Type

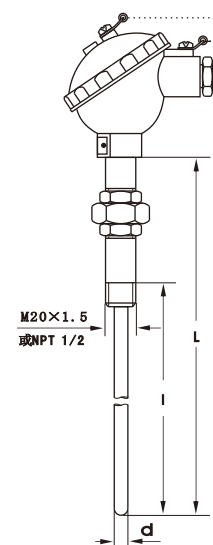
型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	螺纹规格 Thread Specification	保护管材料 PTM	规格Specification	
					d	L ₁
WRMB-52	N	0~1000	M20×1.5	1Cr18Ni9Ti	Φ3 Φ4 Φ5 Φ6 Φ8	245 270 295 345 395 445 545 645 745 899 1149
WRMB-52A			NPT1/2			
WRNB-52	K		M20×1.5			
WRNB-52A			NPT1/2			
WREB-52	E	0~600	M20×1.5			
WREB-52A			NPT1/2			
WRCB-52	T	0~350	M20×1.5			
WRCB-52A			NPT1/2			
WRFB-52	J	0~500	M20×1.5			
WRFB-52A			NPT1/2			
WZPB-52	Pt100	-200~450	M20×1.5	1Cr18Ni9Ti	Φ5 Φ6 Φ8	
WZPB-52A			NPT1/2			
WZCB-52	Cu50 Cu100	-50~150	M20×1.5			
WZCB-52A			NPT1/2			

★：1) 如无特殊之约定,L仅为参考尺寸,热电偶插入深度应为热安装套管U尺寸;

L is only for reference if there is no special agreement, insert depth of thermocouple should be thermal protection tube with size U

2) 热安装套管形式详见《热安装套管图》。

For more information about protection tube type, please see the figure.



防喷式52 52A型
Anti-spray 52 52A

● 直形管接头式 Straight Tube Connector Type

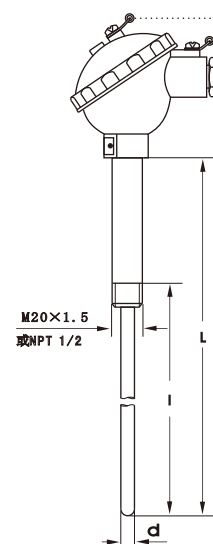
型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	螺纹规格 Thread Specification	保护管材料 PTM	规格Specification			
					d	L ₁		
WRMB-72	N	0~1000	M20×1.5	1Cr18Ni9Ti	φ 3 φ 4 φ 5 φ 6 φ 8	245 270 295 345 395 445 545 645 745 899 1149		
WRMB-72A			NPT1/2					
WRNB-72	M20×1.5							
WRNB-72A	NPT1/2							
WREB-72	E	0~600	M20×1.5					
WREB-72A			NPT1/2					
WRCB-72	T	0~350	M20×1.5					
WRCB-72A			NPT1/2					
WRFB-72	J	0~500	M20×1.5					
WRFB-72A			NPT1/2					
WZPB-72	Pt100	-200~450	M20×1.5	1Cr18Ni9Ti	φ 5 φ 6 φ 8			
WZPB-72A			NPT1/2					
WZCB-72	Cu50 Cu100	-50~150	M20×1.5					
WZCB-72A			NPT1/2					

★：1) 如无特殊之约定,L仅为参考尺寸,热电偶插入深度应为热安装套管U尺寸;

L is only for reference if there is no special agreement, insert depth of thermocouple should be thermal protection tube with size U

2) 热安装套管形式详见《热安装套管图》。

For more information about protection tube type, please see the figure.



防喷式72 72A型
Anti-spray Type 72 72A

● 固定螺纹管接头式 Fixed Threaded Tube Connector

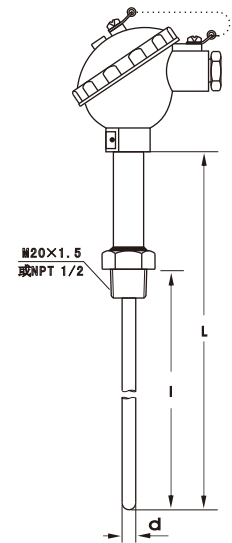
型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	螺纹规格 Thread Specification	保护管材料 PTM	规格Specification	
WRMB-82	N	0~1000	M20×1.5	1Cr18Ni9Ti	d	L ₁
WRMB-82A			NPT1/2			
WRNB-82			M20×1.5			
WRNB-82A	K		NPT1/2		φ3	245
					φ4	270
WREB-82	E	0~600	M20×1.5		φ5	295
WREB-82A			NPT1/2		φ6	345
WRCB-82			M20×1.5		φ8	395
WRCB-82A	T	0~350	NPT1/2			445
						545
WRFB-82	J	0~500	M20×1.5			645
WRFB-82A			NPT1/2			745
WZPB-82	Pt100	-200 ~ 450	M20×1.5	1Cr18Ni9Ti	φ5	899
WZPB-82A			NPT1/2		φ6	1149
WZCB-82	Cu50 Cu100	-50~150	M20×1.5		φ8	
WZCB-82A			NPT1/2			

★: 1) 如无特殊之约定,L仅为参考尺寸,热电偶插入深度应为热安装套管U尺寸;

L is only for reference if there is no special agreement, insert depth of thermocouple should be thermal protection tubewith size U

2) 热安装套管形式详见《热安装套管图》。

For more information about protection tube type, please see the figure.



防喷式82 82A型
Anti-spray Type 82 82A

● 活动螺纹管接头式 With Loose threaded Tube Connector

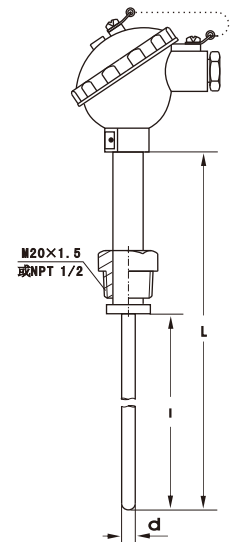
型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	螺纹规格 Thread Specification	保护管材料 PTM	规格Specification	
WRMB-92	N	0~1000	M20×1.5	1Cr18Ni9Ti	d	L ₁
WRMB-92A			NPT1/2			
WRNB-92			M20×1.5			
WRNB-92A	K		NPT1/2		φ3	245
					φ4	270
WREB-92	E	0~600	M20×1.5		φ5	295
WREB-92A			NPT1/2		φ6	345
WRCB-92			M20×1.5		φ8	395
WRCB-92A	T	0~350	NPT1/2			445
						545
WRFB-92	J	0~500	M20×1.5			645
WRFB-92A			NPT1/2			745
WZPB-92	Pt100	-200~450	M20×1.5	1Cr18Ni9Ti	φ5	899
WZPB-92A			NPT1/2		φ6	1149
WZCB-92	Cu50 Cu100	-50~150	M20×1.5		φ8	
WZCB-92A			NPT1/2			

★: 1) 如无特殊之约定,L仅为参考尺寸,热电偶插入深度应为热安装套管U尺寸;

L is only for reference if there is no special agreement, insert depth of thermocouple should be size U thermal protection tube

2) 热安装套管形式详见《热安装套管图》。

For more information about protection tube type, please see the figure.



防喷式92 92A型
Anti-spray Type 92 92A

WR□B系列

带温度变送器管显示防爆热电偶(阻)**Explosion-proof Thermocouple
(Thermal Resistance) with Temperature Transmitter Display Tube****应用 Application**

通常和显示仪表、记录仪表、电子计算机等配套使用，输出4~20mA。直接测量各种生产过程中的-200℃~1300℃范围内液体、蒸汽和气体介质以及固体表面温度。

It is usually used with display meter, recording meter and computer etc. to directly measure temperature of liquid, vapor, gas medium and solid surface ranging from -200 to 1300 °C during various production processes with output of 4~20Ma.

特点 Features

- 二线制输出4~20mA，抗干扰能力强：
Two-wire system output of 4~20Ma, strong anti-interference performance
- 节省补偿导线及安装温度变送器费用：
Save cost of compensation wire & installation of temperature transmitter
- 测量范围大：
Wide measuring range
- 冷端温度自动补偿，非线性校正电路：
Automatic compensation of temperature at cold end, non-linearity correcting circuit

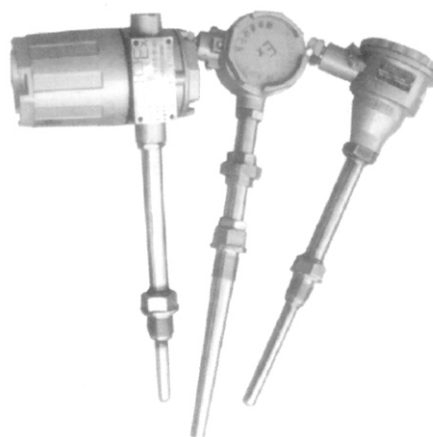
工作原理 Working Principle

隔爆热电偶利用间隙隔爆原理，当腔内发生爆炸时，能通过接合面间隙熄火和冷却，使爆炸后的火焰温度传不到腔外，从而进行测温。热电偶（阻）产生的热电动势（电阻值）经过温度变送器的电桥产生不平衡信号，经放大后转换为4~20mA的直流电信号给工作仪表，工作仪表便显示出所对应的温度值。

Explosion-proof thermocouple makes use of gap explosion-separation principle. When there is explosion inside the box, the fire can be extinguished and cooled through the gap on the interface, and the fire temperature will not lead outside, then measuring temperature. Hydroelectric potential (resistance) of thermocouple (thermal resistance) will bring the unbalanced current signal through the electrical bridge, the signal will be amplified to 4~20mA D.C. signal and transfer to the instrument, the instrument will display the relevant temperature.

主要技术参数 Main Technical Parameters● **产品执行标准
Standard**

IEC 584
IEC 1515
IEC 751
GB 3836-2000
JB/T 5518-91
JB/T 7391-94

● **测温范围及允差****Measuring Range & Tolerance**

- 热电偶
Thermocouple

型 号 Type	分度号 Graduation	允 差 等 级 Accuracy Class			
		允 差 值 Tolerance	测 温 范 围 Measuring Range	允 差 值 Tolerance	测 温 范 围 Measuring Range
WRNB	K	$\pm 1.5^{\circ}\text{C}$	-40~+375	$\pm 2.5^{\circ}\text{C}$	-40~+333
		$\pm 0.004 t $	375~1000	$\pm 0.0075 t $	333~1200
WRMB	N	$\pm 1.5^{\circ}\text{C}$	-40~+375	$\pm 2.5^{\circ}\text{C}$	-40~+333
		$\pm 0.004 t $	375~1000	$\pm 0.0075 t $	333~1200
WREB	E	$\pm 1.5^{\circ}\text{C}$	-40~+375	$\pm 2.5^{\circ}\text{C}$	-40~+333
		$\pm 0.004 t $	375~ 800	$\pm 0.0075 t $	375~ 900
WRFB	J	$\pm 1.5^{\circ}\text{C}$	-40~+375	$\pm 2.5^{\circ}\text{C}$	-40~+333
		$\pm 0.004 t $	375~ 750	$\pm 0.0075 t $	333~ 750
WRCB	T	$\pm 1.5^{\circ}\text{C}$	-40~+375	$\pm 2.5^{\circ}\text{C}$	-40~+133
		$\pm 0.004 t $	125~ 350	$\pm 0.0075 t $	133~1000

● 热电阻 Thermocouple

型 号 Type	分度号 Graduation	测 温 范 围 Measuring Range	精 度 等 级 Accuracy Class	允 许 偏 差 Tolerance Allowed
WZPB	Pt100	-200~+450	A级 Class A	$\pm(0.15+0.002 t)$
			B级 Class B	$\pm(0.30+0.005 t)$
WZCB	Cu50 Cu100	-50~150	-	$\pm(0.30+0.006 t)$

注：t为感温元件实测温度绝对值。

Notice: t is the absolute value of actual temperature measured

● 输出信号：4~20mA，负载电阻250 Ω ，传输导线电阻100 Ω

Output Signal: 4~20mA, Loading Resistance, 250 Ω
Transforming Wire Resistance, 100 Ω

输出方法：二线制
Output Method: Two Wire

● 精度等级

● 温度变送器精度等级：0.1；0.2；0.5

● 显示器精度：模拟指示2.5级；数字显示1.0级

Accuracy Class of Temperature Transmitter: 0.1, 0.2, 0.5
Accuracy of Display Meter: Analog Indication Class 2.5,
Digital Display Class 0.1

● 供电电源：24V.DC $\pm 10\%$

Power Supply: 24V.DC $\pm 10\%$

● 防护等级：IP65

Protection Class: Ip65

● 防爆等级：

Explosion-proof Class:

隔爆形：dIIBT4，dIICT5，dIICT6

Explosion-separation: dIIBT4，dIICT5，dIICT6

本质安全形：iaIICT6

Intrinsic Safety: iaIICT6

Explosion-proof class:

Explosion-separation type: d IIBT4, d IICT4, d IICT6

Intrinsic safety type: iaIICT6

● 绝缘电阻：Insulation Resistance

仪表输出接线端子与外壳之间的绝缘电阻应不小于50M Ω 。

Insulation resistance between instrument output wire connecting head and outer case should be no less than50 M Ω

● 热响应时间：Thermal Response Time

当温度出现阶跃变化时，仪表的电流输出信号变化至相当于该阶跃变化的50%所需的时间，通常以 $\tau 0.5$ 表示当温度变送器的阶跃响应稳定时间不超过热电偶（阻）热响应稳定时间 $\tau 0.5$ 的五分之一时，则用热电偶（阻）热响应时间作为仪表的热响应时间；

当温度变送器的阶跃响应稳定时间不超过热电偶（阻）热响应稳定时间 $\tau 0.5$ 的二分之一时，则用温度变送器热响应时间作为仪表的热响应时间；

When the temperature has step-jumping change, the needed time for current output signal of instrument changes to 50% of the step-jumping change, this time is called thermal response time, indicating with $\tau 0.5$. When step-jumping response stable time of temperature transmitter is no more than 1/5 times of $\tau 0.5$, thermal response time of instrument shall be considered as the thermal response time of thermocouple (thermal resistance).

When step-jumping response stable time of temperature transmitter is no more than 1/2 times of $\tau 0.5$, thermal response time of instrument shall be considered as the thermal response time of temperature transmitter.

● 基本误差 Basic error

带温度变送器的热电偶（阻）基本误差应不超过热电偶（阻）和温度变送器基本误差的合成误差。

即： $\Delta = \Delta_1 + \Delta_2$

Δ_1 为热电偶或热电阻的基本误差；

Δ_2 为温度变送器的基本误差。

The basic error of instrument should be no less than the compound error caused by thermocouple (thermal resistance) and temperature transmitter.

$$\Delta = \Delta_1 + \Delta_2$$

Δ_1 tolerance value allowed by thermocouple (thermal resistance)

Δ_2 basic error of temperature transmitter

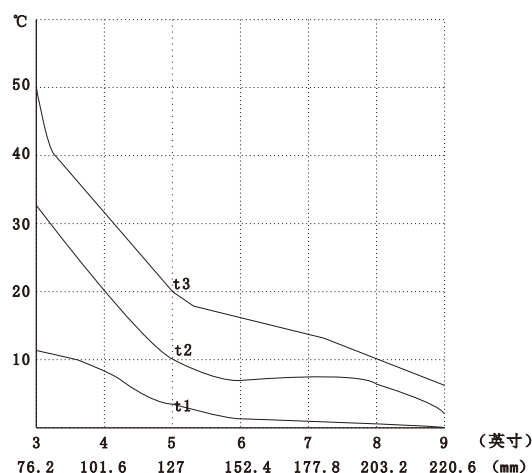
● 工作环境 Working environment

安装场所等级 Installation place class	温度℃ Temperature	相对湿度% Relative humidity	大气压力kPa Atmosphere pressure
Cx1	-25~+55	5~95	86~106
Cx2	-25~+70		
Cx3	-40~+80		

● 支撑管长度确定 Determination of Support Tube Length

温度变送器的工作温度由支撑管所造成的壳体升温同环境温度之和。支撑管所造成的壳体升温见下图：

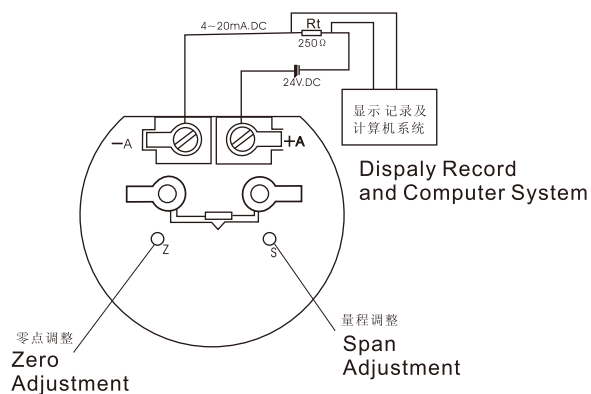
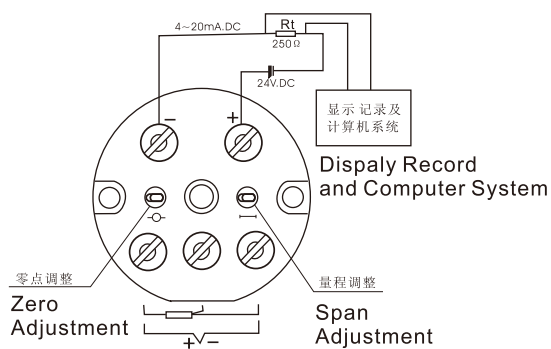
The shell temperature rising of the working temperature on temperature transmitter is the same with environment temperature. The shell temperature rising caused by support tube, PLS see figure below:



注: $t_1=260^{\circ}\text{C}$ $t_2=540^{\circ}\text{C}$ $t_3=850^{\circ}\text{C}$

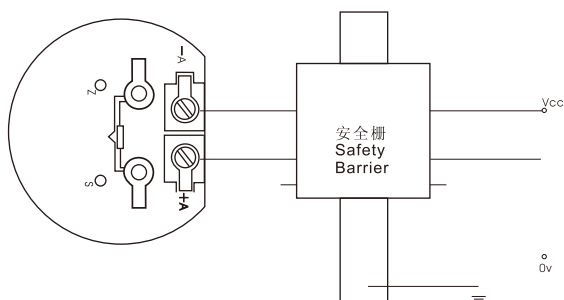
● 仪表接线方式

Instrument Wiring Method



● 本质安全式接线示意

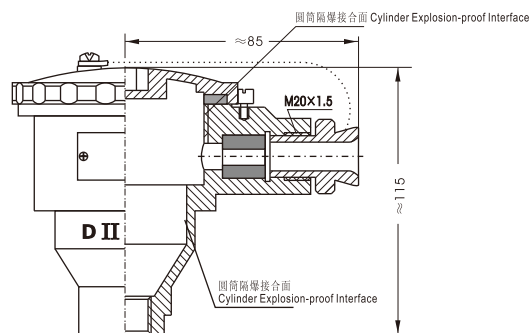
Intrinsic Safety Wiring Method



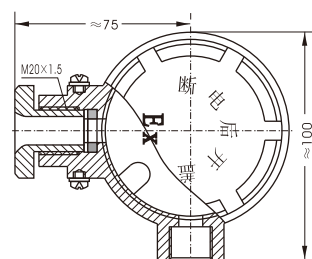
● 接线盒形式

Connection Box Type

● d II BT口级

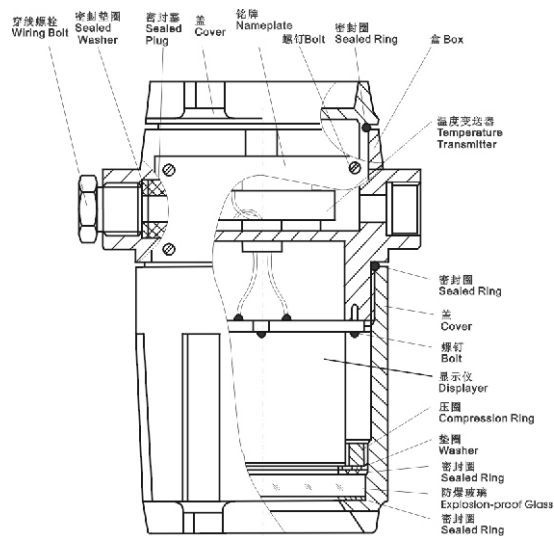


● d II CT口级

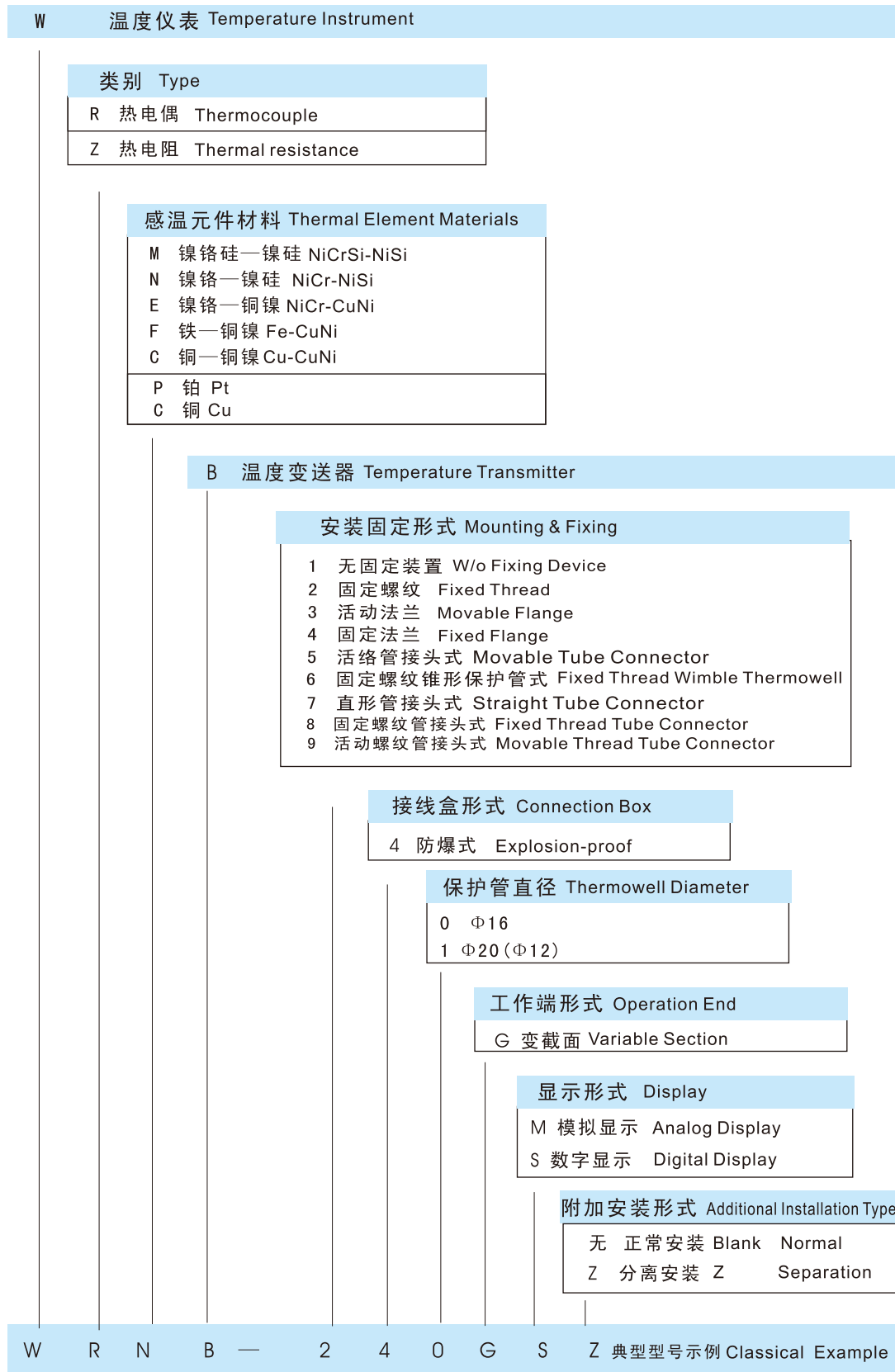


● 带显示接线盒结构示意图

W/ Display Wiring Method



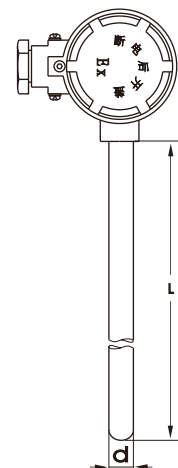
型号命名方法 Naming



型号及规格 Type & Specification

● 无固定装置式 Without Fixing Device

型 号 Type	分度号 Graduation	测温范围℃ Measuring range	热响应时间 TRT	隔爆等级 PTM.	规格Specification	
					d	L ₁
WRMB-140	N	0~800	<90S	dⅡBT4	φ 16	300 350 400 450 500 550 650 900 1150 1650 2150
WRMB-140G			<24S			
WRNB-140	K	0~800	<90S			
WRNB-140G			<24S			
WREB-140	E	0~600	<90S	dⅡCT5		
WREB-140G			<24S			
WRCB-140	T	0~350	<90S	dⅡCT6		
WRCB-140G			<24S			
WRFB-140	J	0~500	<90S	iaⅡCT6		
WRFB-140G			<24S			
WZPB-140	Pt100	-200~450	<120S			
WZPB-140G			<24S			
WZCB-140	Cu50 Cu100	-50~150	<120S			
WZCB-140G			<24S			



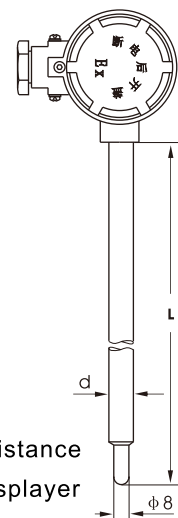
保护管材质为1Cr18Ni9Ti，其余根据协议订货；
other materials of protection tube ordered according to agreement

选型须知

- 1) 型号
- 2) 分度号
- 3) 防爆等级
- 4) 温度范围
- 5) 热电偶（阻）精度等级
- 6) 温度变送器（显示器）精度等级
- 7) 安装固定形式
- 8) 保护管材质
- 9) 长度或插入深度

Type Selection :

- 1) Type
- 2) Graduation
- 3) Explosion-proof Class
- 4) Temperature Range
- 5) Accuracy Class of Thermocouple/Thermal Resistance
- 6) Accuracy Class of Temperature Transmitter/Displayer
- 7) Mounting & Fixing
- 8) Thermowell Material
- 9) Length or Insert Depth



例A：带温度变送器防爆热电偶，K型，固定螺纹M27×2，防爆等级ia II CT4级，温度范围-200~+150℃，温度变送器精度等级0.5，保护管316L，长度450mm，插入深度300mm。

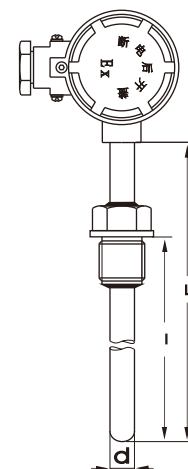
Example A: explosion-proof thermocouple with temperature transmitter, type K, fixed thread M27×2, accuracy class of temperature transmitter 0.5, protection tube 316L, length 450mm. Insert depth 300mm.

WRNB-140, L=450×300, ia II CT4, 温度变送器0.5级，保护管316L，螺纹M27×2
WRNB-110, L=450×300, d II BT4, temperature transmitter 0.5, protection tube 316L, thread M27×2

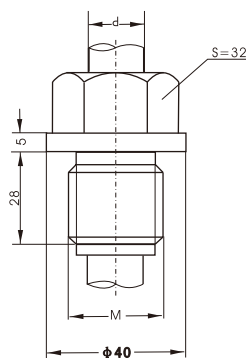
● 固定螺纹式 Fixed Thread

型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	热响应时间 TRT	隔爆等级 Explosion- separation Class	规格Specification	
					d	L×I
WRMB-240	N	0~800	<90S	d II BT4	φ 16	300×150
WRMB- 240G			<24S			350×200
WRNB-240	K	0~800	<90S			400×250
WRNB- 240G			<24S			450×300
WREB-240	E	0~600	<90S	d II CT5	φ 16	500×350
WREB- 240G			<24S			550×400
WRCB-240	T	0~350	<90S	d II CT6	φ 16	650×500
WRCB- 240G			<24S			900×750
WRFB-240	J	0~500	<90S	ia II CT6	φ 12	1150×1000
WRFB- 240G			<24S			1650×1500
WZPB-241	Pt100	-200~450	<120S			2150×2000
WZPB- 241G			<24S			
WZCB-241	Cu50 Cu100	-50~150	<120S			
WZCB- 241G			<24S			

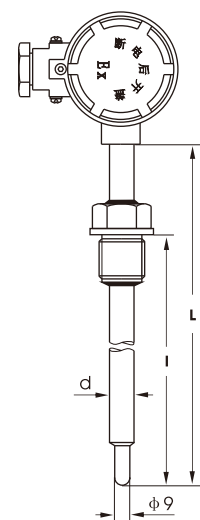
保护管材质为1Cr18Ni9Ti，其余材质根据协议订货；
Other materials of protection tube ordered according to agreement.



型号示例 Type Model	螺纹规格 Thread Specification		d	公称压力 NP Mpa
	代号 Code	M		
WRNB-240		M27×2	φ 16	≤10
WRNB-240A	A	G3/4		
WRNB-240C	C	NPT3/4		
WRNB-240G		M27×2		
WRNB-240GA	A	G3/4		
WRNB-240GC	C	NPT3/4		



安装固定型式：固定螺纹
Installation & Fixing: Fixed Thread

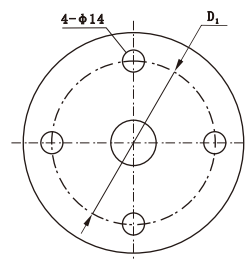
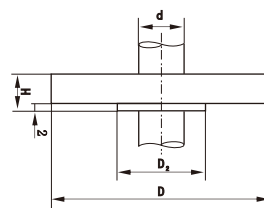
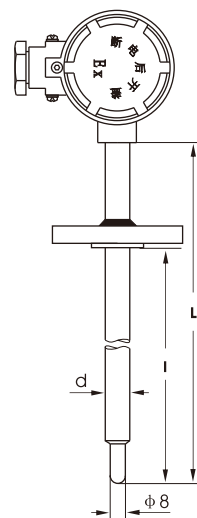
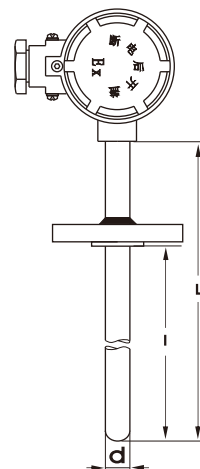


● 固定法兰式 Fixed Flange Type

型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	热响应时间 TRT	隔爆等级 Explosion-separation Class	规格Specification	
					d	L×I
WRMB-440	N	0~800	<90S	dⅡBT4	φ 16	300×150 350×200 400×250 450×300 500×350 550×400 650×500 900×750 1150×1000 1650×1500 2150×2000
WRMB-440G			<24S			
WRNB-440	K	0~800	<90S			
WRNB-440G			<24S			
WREB-440	E	0~600	<90S	dⅡCT5		
WREB-440G			<24S			
WRCB-440	T	0~350	<90S	dⅡCT6		
WRCB-440G			<24S			
WRFB-440	J	0~500	<90S	iaⅡCT6		
WRFB-440G			<24S			
WZPB-441	Pt100	-200~450	<120S		φ 12	
WZPB-441G			<24S			
WZCB-441	Cu50 Cu100	-50~150	<120S			
WZCB-441G			<24S			

保护管材质为1Cr18Ni9Ti，其余材质根据协议订货；

other materials of protection tube ordered according to agreement / we may provide protection tube of other materials as user's demand

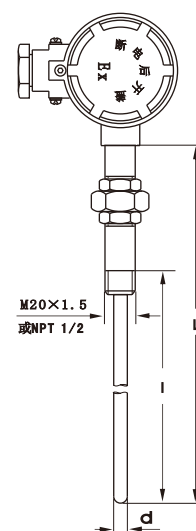


型号示例 Type Model	螺纹规格 Thread Specification					公称压力 NP Mpa
	D	D ₁	D ₂	H	d	
WRNB-440	φ 95	φ 65	φ 46	14	φ 16	≤2.5
WRNB-440G	φ 105	φ 75	φ 56	16		
WZPB-441	φ 115	φ 85	φ 65	16	φ 12	
WZPB-441G	φ 115	φ 85	φ 65			

安装固定型式：固定法兰
Installation & Fixing: Fixed Flange

● 活络管接头式 Elbow Connector Type

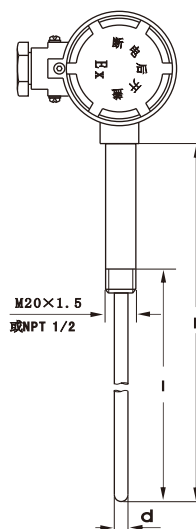
型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	螺纹规格 TRT	隔爆等级 Explosion- separation Class	规格Specification	
					d	L ₁
WRMB-54	N	0~800	M20×1.5	d II BT4	φ3	250
WRMB-54A			NPT1/2		φ4	275
WRNB-54	K	0~800	M20×1.5		φ5	295
WRNB-54A			NPT1/2		φ6	350
WREB-54	E	0~600	M20×1.5	d II CT5	φ8	400
WREB-54A			NPT1/2			450
WRCB-54	T	0~350	M20×1.5	d II CT6		550
WRCB-54A			NPT1/2			650
WRFB-54	J	0~500	M20×1.5	ia II CT6		750
WRFB-54A			NPT1/2			900
WZPB-54	Pt100	-200~450	M20×1.5		φ5	1150
WZPB-54A			NPT1/2		φ6	
WZCB-54	Cu50 Cu100	-50~150	M20×1.5		φ8	
WZCB-54A			NPT1/2			



- 1) 如无特殊之约定, L仅为参考尺寸, 热电偶插入深度应为热安装套管U尺寸;
L is only for reference if no special agreement, insert depth of thermocouple should be size U thermal protection tube
- 2) 热安装套管形式详见《热安装套管图》。
For more information about protection tube type, please see the figure.

● 直形管接头式 Straight Tube Connector Type

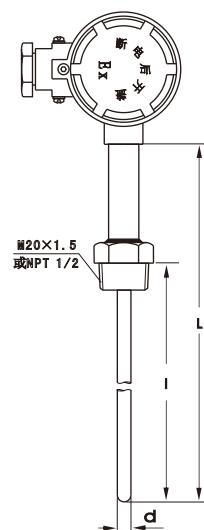
型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	螺纹规格 TRT	隔爆等级 Explosion- separation Class	规格Specification	
					d	L ₁
WRMB-74	N	0~800	M20×1.5	d II BT4	φ3	250
WRMB-74A			NPT1/2		φ4	275
WRNB-74	K	0~800	M20×1.5		φ5	295
WRNB-74A			NPT1/2		φ6	350
WREB-74	E	0~600	M20×1.5	d II CT5	φ8	400
WREB-74A			NPT1/2			450
WRCB-74	T	0~350	M20×1.5	d II CT6		550
WRCB-74A			NPT1/2			650
WRFB-74	J	0~500	M20×1.5	ia II CT6		750
WRFB-74A			NPT1/2			904
WZPB-74	Pt100	-200~450	M20×1.5		φ5	1154
WZPB-74A			NPT1/2		φ6	
WZCB-74	Cu50 Cu100	-50~150	M20×1.5		φ8	
WZCB-74A			NPT1/2			



- 1) 如无特殊之约定, L仅为参考尺寸, 热电偶插入深度应为热安装套管U尺寸;
L is only for reference if no special agreement, insert depth of thermocouple should be size U thermal protection tube
- 2) 热安装套管形式详见《热安装套管图》。
For more information about protection tube type, please see the figure.

● 固定螺纹管接头式 Fixed Thread Tube Connector

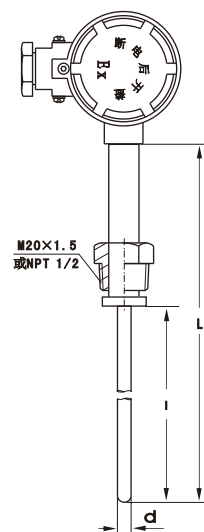
型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	连接尺寸 Connection Size	隔爆等级 Explosion- separation Class	规格Specification	
					d	L ₁
WRMB-84	N	0~800	M20×1.5	d II BT4	φ3	250
WRMB-84A			NPT1/2			275
WRNB-84	K	0~800	M20×1.5		φ4	295
WRNB-84A			NPT1/2			350
WREB-84	E	0~600	M20×1.5	d II CT5	φ5	400
WREB-84A			NPT1/2			450
WRCB-84	T	0~350	M20×1.5	d II CT6	φ6	550
WRCB-84A			NPT1/2			650
WRFB-84	J	0~500	M20×1.5	ia II CT6	φ8	750
WRFB-84A			NPT1/2			900
WZPB-84	Pt100	-200~450	M20×1.5		φ5	1150
WZPB-84A			NPT1/2			
WZCB-84	Cu50 Cu100	-50~150	M20×1.5		φ6	
WZCB-84A			NPT1/2			



- 1) 如无特殊之约定, L仅为参考尺寸, 热电偶插入深度应为热安装套管U尺寸;
L is only for reference if no special agreement, insert depth of thermocouple should be size U thermal protection tube
- 2) 热安装套管形式详见《热安装套管图》。
For more information about protection tube type, please see the figure.

● 活动螺纹管接头式 With moveable threaded tube connector

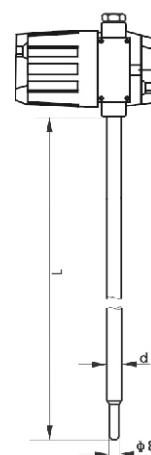
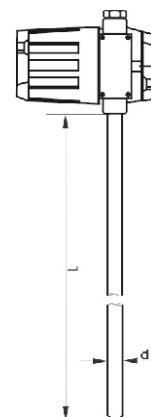
型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	连接尺寸 Connection Size	隔爆等级 Explosion- separation Class	规格Specification	
					d	L ₁
WRMB-94	N	0~800	M20×1.5	d II BT4	φ3	250
WRMB-94A			NPT1/2			275
WRNB-94	K	0~800	M20×1.5		φ4	295
WRNB-94A			NPT1/2			350
WREB-94	E	0~600	M20×1.5	d II CT5	φ5	400
WREB-94A			NPT1/2			450
WRCB-94	T	0~350	M20×1.5	d II CT6	φ6	550
WRCB-94A			NPT1/2			650
WRFB-94	J	0~500	M20×1.5	ia II CT6	φ8	750
WRFB-94A			NPT1/2			900
WZPB-94	Pt100	-200~450	M20×1.5		φ5	1150
WZPB-94A			NPT1/2			
WZCB-94	Cu50 Cu100	-50~150	M20×1.5		φ6	
WZCB-94A			NPT1/2			



- 1) 如无特殊之约定, L仅为参考尺寸, 热电偶插入深度应为热安装套管U尺寸;
L is only for reference if no special agreement, insert depth of thermocouple should be size U thermal protection tube
- 2) 热安装套管形式详见《热安装套管图》。
For more information about protection tube type, please see the figure.

● 无固定装置式 Without Fixing Device

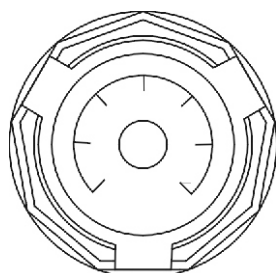
型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	热响应时间 TRT.	隔爆等级 Ex.-sep. Class	规 格 Specification					
WRMB-140M WRMB-140S	N	0~800	<90S	dⅡBT4	φ 16	300				
WRMB-140GM WRMB-140GS			<24S				350			
WRNB-140M WRNB-140S	K	0~800	<90S					400		
WRNB-140GM WRNB-140GS			<24S						450	
WREB-140M WREB-140S	E	0~600	<90S							500
WREB-140GM WREB-140GS			<24S							
WRCB-140M WRCB-140S	T	0~350	<90S		650					
WRCB-140GM WRCB-140GS			<24S			900				
WRFB-140M WRFB-140S	J	0~500	<90S				1150			
WRFB-140GM WRFB-140GS			<24S					1650		
WZPB-141M WZPB-141S	Pt100	-200~450	<90S						φ 12	2150
WZPB-141GM WZPB-141GS			<24S							
WZCB-141M WZCB-141S	Cu50 Cu100	-50~150	<90S							
WZCB-141GM WZCB-141GS			<24S							



保护管材质为1Cr18Ni9Ti，其余材质根据协议订货；

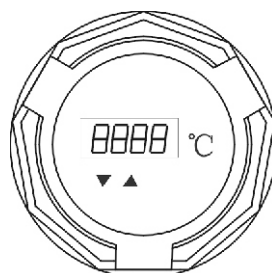
Other materials of protection tube ordered according to agreement

● 带显示表头
w/ Display Head



模拟表头（代号M）Simulation Head

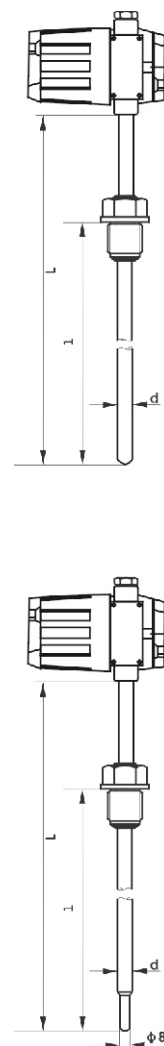
● 带显示接线盒结构示意图
W/ Display Connection Box



数显表头（代号S）Digital-display Head

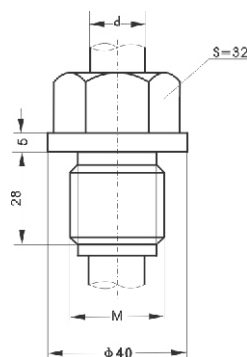
● 固定螺纹式 Fixed Thread

型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	热响应时间 TRT.	隔爆等级 Ex.-sep. Class	规格 Specification	
					d	L×I
WRMB-240M WRMB-240S	N	0~800	<90S	d II BT4	φ 16	300×150 350×200 400×250 450×300 500×350 550×400
WRMB-240GM WRMB-240GS			<24S			
WRNB-240M WRNB-240S	K	0~800	<90S			
WRNB-240GM WRNB-240GS			<24S			
WREB-240M WREB-240S	E	0~600	<90S			
WREB-240GM WREB-240GS			<24S			
WRCB-240M WRCB-240S	T	0~350	<90S			
WRCB-240GM WRCB-240GS			<24S			
WRFB-240M WRFB-240S	J	0~500	<90S			
WRFB-240GM WRFB-240GS			<24S			
WZPB-241M WZPB-241S	Pt100	-200~500	<90S		φ 12	2150×2000
WZPB-241GM WZPB-241GS			<24S			
WZCB-241M WZCB-241S	Cu50 Cu100	-50~150	<90S			
WZCB-241GM WZCB-241GS			<24S			



保护管材质为1Cr18Ni9Ti，其余材质根据协议订货；
Other materials of protection tube ordered according to agreement.

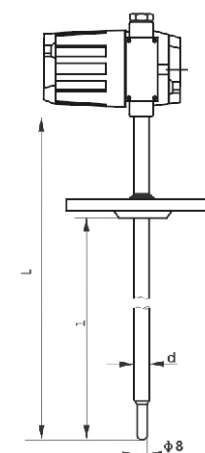
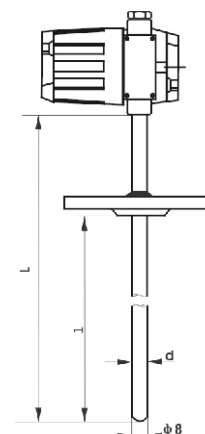
型号示例 Type Model	螺纹规格 Thread Specification		d	公称压力 NP Mpa
	代号 Code	M		
WRNB-240S		M27×2	φ 16	≤ 10
WRNB-240SA	A	G3/4		
WRNB-240SC	C	NPT3/4		
WRNB-240GS		M27×2		
WRNB-240GSA	A	G3/4		
WRNB-240GSC	C	NPT3/4		



安装固定装置型式：固定螺纹

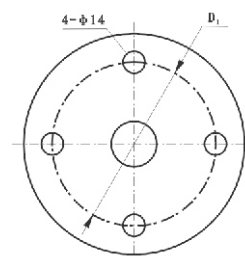
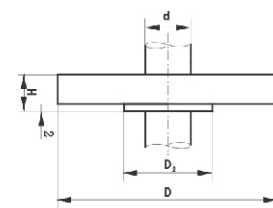
● 固定法兰式 Fixed Flange Type

型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	热响应时间 TRT.	隔爆等级 Ex.-sep. Class	规格Specification	
					d	l
WRMB-440M WRMB-440S	N	0~800	<90S	d II BT4	φ 16	300×150
WRMB-440GM WRMB-440GS			<24S			350×200
WRNB-440M WRNB-440S	K	0~800	<90S			400×250
WRNB-440GM WRNB-440GS			<24S			450×300
WREB-440M WREB-440S	E	0~600	<90S			500×350
WREB-440GM WREB-440GS			<24S			550×400
WRCB-440M WRCB-440S	T	0~350	<90S		d II CT5	650×500
WRCB-440GM WRCB-440GS			<24S			900×750
WRFB-440M WRFB-440S	J	0~500	<90S		d II CT6	1150×1000
WRFB-440GM WRFB-440GS			<24S			1650×1500
WZPB-441M WZPB-441S	Pt100	-200~500	<90S	ia II CT6	φ 12	2150×2000
WZPB-441GM WZPB-441GS			<24S			
WZCB-441M WZCB-441S	Cu50 Cu100	-50~150	<90S			
WZCB-441GM WZCB-441GS			<24S			



保护管材质为1Cr18Ni9Ti, 其余材质根据协议订货;
Other materials of protection tube ordered according to agreement.

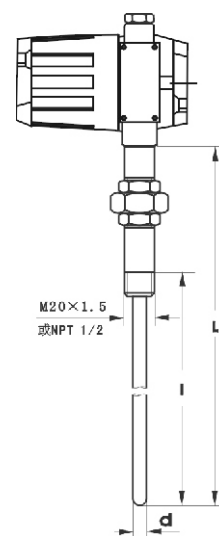
型号示例 Type Model	螺纹规格 Thread Specification					公称压力 NP Mpa
	D	D ₁	D ₂	H	d	
WRNB-440S	φ 105	φ 75	φ 55	16	φ 16	≤2.5
WRNB-440GS	φ 105	φ 75	φ 55		φ 16	
WZPB-441S	φ 105	φ 75	φ 55	16	φ 12	
WZPB-441GS	φ 105	φ 75	φ 55		φ 12	



安装固定装置型式: 固定法兰

● 活络管接头式 Elbow Connector Type

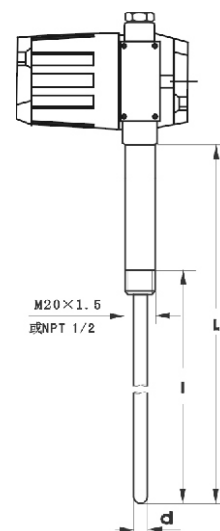
型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	螺纹规格 Thread Spec	隔爆等级 Ex.-sep. Class	规 格 Specification	
					d	l
WRMB-54M WRMB-54S	N	0~800	M20×1.5	d II BT4 d II CT5 d II CT6 ia II CT6	φ 3 φ 4 φ 5 φ 6	250 275 295 350
WRMB-54AM WRMB-54AS			NPT1/2			
WRNB-54M WRNB-54S	K	0~800	M20×1.5			
WRNB-54AM WRNB-54AS			NPT1/2			
WREB-54M WREB-54S	E	0~600	M20×1.5			
WREB-54AM WREB-54AS			NPT1/2			
WRCB-54M WRCB-54S	T	0~350	M20×1.5		φ 8	400
WRCB-54AM WRCB-54AS			NPT1/2			450
WRFB-54M WRFB-54S	J	0~500	M20×1.5		φ 5 φ 6 φ 8	550
WRFB-54AM WRFB-54AS			NPT1/2			650
WZPB-54M WZPB-54S	Pt100	-200~450	M20×1.5			750
WZPB-54AM WZPB-54AS			NPT1/2			904
WZCB-54M WZCB-54S	Cu50 Cu100	-50~150	M20×1.5			1154
WZCB-54AM WZCB-54AS			NPT1/2			



- 1) 如无特殊之约定, L仅为参考尺寸, 热电偶插入深度应为热安装套管U尺寸;
L is only for reference if no special agreement, insert depth of thermocouple should be size U thermal protection tube
- 2) 热安装套管形式详见《热安装套管图》。
For more information about protection tube type, please see the figure.

● 直形管接头式 Straight Tube Connector Type

型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	螺纹规格 Thread Spec	隔爆等级 Ex.-sep. Class	规格 Specification	
					d	l
WRMB-74M WRMB-74S	N	0~800	M20×1.5	d IIBT4	φ 3	250
WRMB-74AM WRMB-74AS			NPT1/2			
WRNB-74M WRNB-74S	K	0~800	M20×1.5			
WRNB-74AM WRNB-74AS			NPT1/2			
WREB-74M WREB-74S	E	0~600	M20×1.5			
WREB-74AM WREB-74AS			NPT1/2			
WRCB-74M WRCB-74S	T	0~350	M20×1.5			
WRCB-74AM WRCB-74AS			NPT1/2			
WRFB-74M WRFB-74S	J	0~500	M20×1.5			
WRFB-74AM WRFB-74AS			NPT1/2			
WZPB-74M WZPB-74S	Pt100	-200~450	M20×1.5			
WZPB-74AM WZPB-74AS			NPT1/2			
WZCB-74M WZCB-74S	Cu50 Cu100	-50~150	M20×1.5			
WZCB-74AM WZCB-74AS			NPT1/2			



1) 如无特殊之约定, L仅为参考尺寸, 热电偶插入深度应为热安装套管U尺寸;

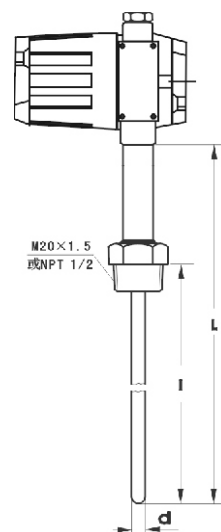
L is only for reference if no special agreement, insert depth of thermocouple should be size U thermal protection tube

2) 热安装套管形式详见《热安装套管图》。

For more information about protection tube type, please see the figure.

● 固定螺纹管接头式 Fixed Threaded Tube Connector

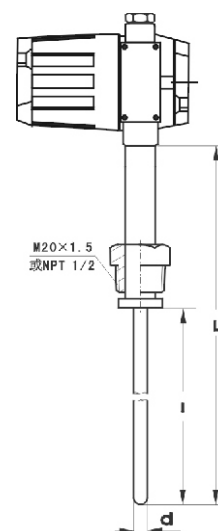
型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	螺纹规格 Thread Spec	隔爆等级 Ex.-sep. Class	规 格 Specification	
					d	l
WRMB-84M WRMB-84S	N	0~800	M20×1.5	d II BT4	φ3	250
WRMB-84AM WRMB-84AS			NPT1/2			
WRNB-84M WRNB-84S	K	0~800	M20×1.5			
WRNB-84AM WRNB-84AS			NPT1/2			
WREB-84M WREB-84S	E	0~600	M20×1.5			
WREB-84AM WREB-84AS			NPT1/2			
WRCB-84M WRCB-84S	T	0~350	M20×1.5		φ6	350
WRCB-84AM WRCB-84AS			NPT1/2			
WRFB-84M WRFB-84S	J	0~500	M20×1.5		φ8	400
WRFB-84AM WRFB-84AS			NPT1/2			
WZPB-84M WZPB-84S	Pt100	-200~450	M20×1.5		φ5	450
WZPB-84AM WZPB-84AS			NPT1/2			
WZCB-84M WZCB-84S	Cu50 Cu100	-50~150	M20×1.5		φ6	550
WZCB-84AM WZCB-84AS			NPT1/2			



- 1) 如无特殊之约定, L仅为参考尺寸, 热电偶插入深度应为热安装套管U尺寸;
L is only for reference if no special agreement, insert depth of thermocouple should be size U thermal protection tube
- 2) 热安装套管形式详见《热安装套管图》。
For more information about protection tube type, please see the figure.

● 活动螺纹管接头式 Moveable Threaded Tube Connector

型 号 Type	分度号 Graduation	测温范围℃ Measuring Range	螺纹规格 Thread Spec	隔爆等级 Ex.-sep. Class	规 格Specification	
					d	l
WRMB-94M WRMB-94S	N	0~800	M20×1.5	d II BT4 d II CT5 d II CT6 ia II CT6	Φ 3 Φ 4 Φ 5 Φ 6	250 275 295 350
WRMB-94AM WRMB-94AS			NPT1/2			
WRNB-94M WRNB-94S	K	0~800	M20×1.5			
WRNB-94AM WRNB-94AS			NPT1/2			
WREB-94M WREB-94S	E	0~600	M20×1.5			
WREB-94AM WREB-94AS			NPT1/2			
WRCB-94M WRCB-94S	T	0~350	M20×1.5		Φ 8	400 450 550
WRCB-94AM WRCB-94AS			NPT1/2			
WRFB-94M WRFB-94S	J	0~500	M20×1.5			650 750 900
WRFB-94AM WRFB-94AS			NPT1/2			
WZPB-94M WZPB-94S	Pt100	-200~450	M20×1.5		Φ 5 Φ 6	1150
WZPB-94AM WZPB-94AS			NPT1/2			
WZCB-94M WZCB-94S	Cu50 Cu100	-50~150	M20×1.5		Φ 8	
WZCB-94AM WZCB-94AS			NPT1/2			



1) 如无特殊之约定, L仅为参考尺寸, 热电偶插入深度应为热安装套管U尺寸;

L is only for reference if no special agreement, insert depth of thermocouple should be size U thermal protection tube

2) 热安装套管形式详见《热安装套管图》。

For more information about protection tube type, please see the figure.

LDWB系列

温度变送器

Temperature Transmitter

应用 Application

LDWB 二线制、三线制温度变送器其技术指标和结构特性等方面处于国内领先水平，并达到国外90年代末同类产品水平，它给广大从事自动化控制设计人员和用户带来极大的方便。

隔爆型机电一体化温度变送器是我厂自行研究设计开发的产品，本产品按照最新颁布的国标和专标，并吸取了同类先进产品的优点，结构新颖，安全可靠，方便了用户，可在现场观察温度变化等特点。设计制造、热电性能和隔爆性能均符合国际IEC标准。

本产品经国家仪表防爆安全监督检验站测试合格。

本产品可广泛用于石油、天然气、化工、冶金、热电、水泥、玻璃等行业，可与各种电动仪表、智能数显表及计算机控制系统等配套使用。

The technology index & structure characteristics ect. of LDWB double wire system, triple wire system temperature transmitter are ranking at national leading level, and also reaching the same products level abroad in late 1990s. it brings great convenience for many people with occupation of automatic control & design and other users.

Explosion-separation type mechanical-electrical integration temperature transmitter is designed and developed by our company. This product absorbs advantage of the same products according to the national standard & special standard newly promulgated. It features as novelty structure, safety reliable, convenient for users and observing the temperature change on spot. Design & manufacture, hydroelectric performance and explosion-separation are all in line with international IEC standard. This product is qualification which is tested by national instrument & meter explosion-proof safety surveillance inspection bureau

It is widely used in petroleum, natural gas, chemical industry, metallurgy, hydroelectric, cement, glass industries etc. it is connected with various electronic meter, intelligent digital-display meter and computer control system etc..

仪表主要特点

Main features for instrument

- 二线制传送，无需补偿导线；
Two wire transmitting, no compensation wire needed
- 抗干扰能力强，远传性能好；
Strong anti-interference performance, good remote-transmitting performance
- 结构简单、合理，安装方便；
Simple, suitable structure, convenient for installation
- 小型化、安全可靠，使用寿命长；
Small type, safety reliable, long life expectancy
- 三线制、二线制输入方法通用；
Both triple-wire system and double wire system input method are ok
- 液晶显示现场温度，清晰度高，无视觉误差。
Crystal-display temperature on spot with high clarity, without optical error

	一次测量元件 Once Measuring Element	分度号 Graduation Mark	测量范围 Measuring Range
热电偶 Thermocouple	镍铬-康铜 NiCr-CuNi	E	0~800℃范围内任选
	镍铬-镍硅 NiCr-CuSi	K	0~1100℃范围内任选
	铂铑 ₁₀ -铂 PtRh ₁₀ -Pt	S	0~1300℃范围内任选
	铂铑 ₃₀ -铂铑 ₆ PtRh ₃₀ -PtRh ₆	B	0~1600℃范围内任选
	铜-康铜 Cu-CuNi	T	0~400℃范围内任选
	铁-康铜 Fe-CuNi	J	0~750℃范围内任选
热电阻 Thermal Resistance	铜热电阻 Cu Thermal Resistance	Cu50	-50~150℃范围内任选
	铜热电阻 Cu Thermal Resistance	Cu100	-50~150℃范围内任选
	铂热电阻 Pt Thermal Resistance	Pt100	-200~500℃范围内任选

★：1) 在测温范围800℃以下，隔爆型机电一体化温度变送器的防爆性能有效；

Explosion-proof performance of explosion-separation electro mechanical integration temperature transmitter operates under temperature measuring range below 800℃.

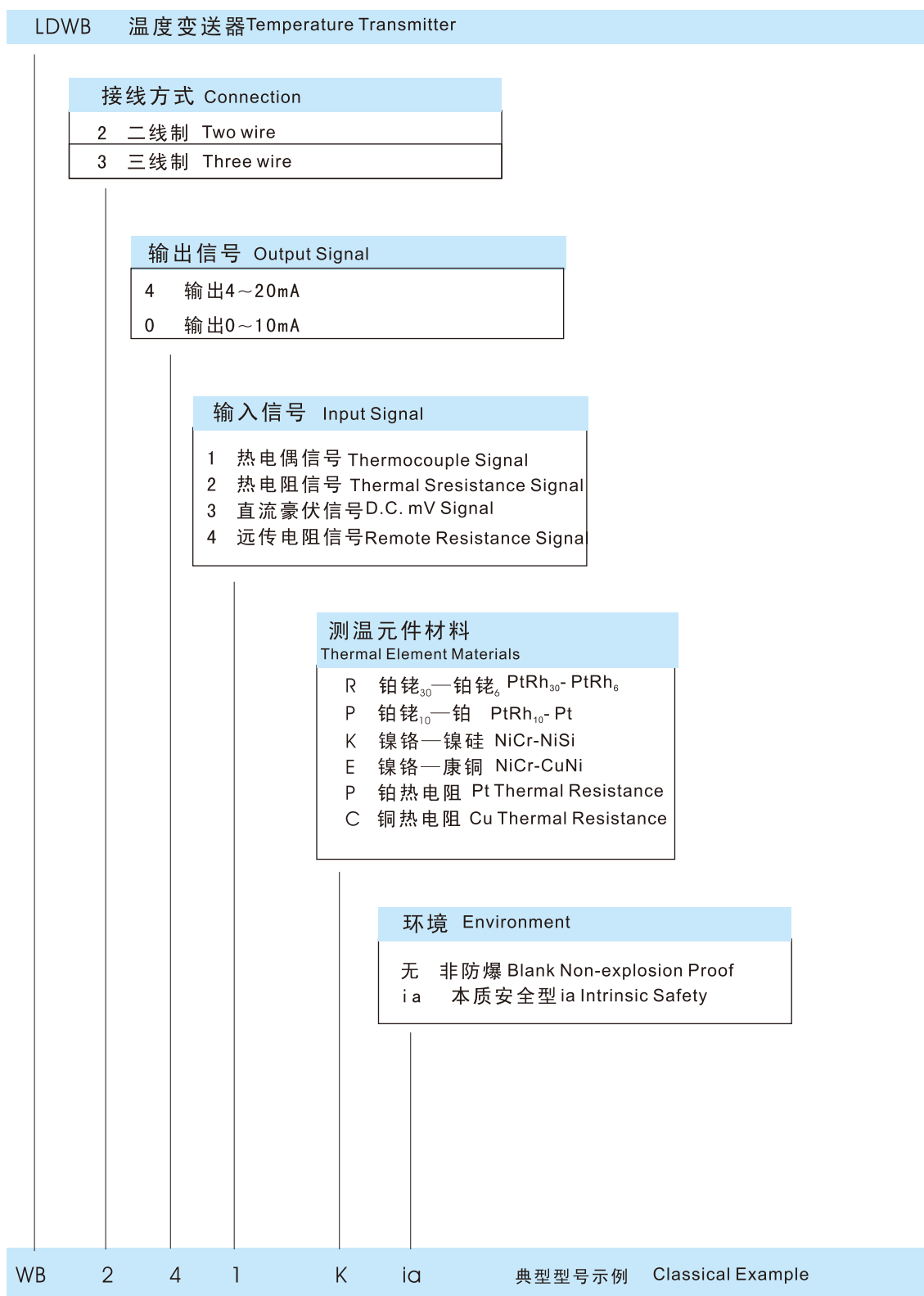
2) 可按用户要求生产其它型号的变送器并配备智能数字显示仪表。

We are in position to produce other types transmitter with intelligent digital-display meter according to user's demand.

特点 Features

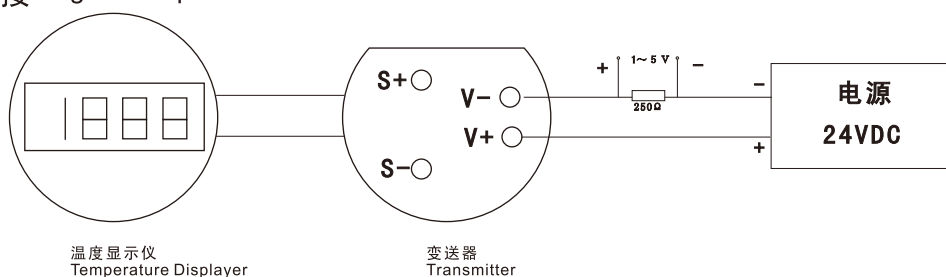
- 供电电源24VDC，允许范围为18~30VDC；
power supply source 240DV, range allowed 18~30VDC
- 输出信号为4~20mA；
Signal output 4~20ma
- 液晶显示现场温度；
Crystal-display temperature on spot
- 负载电阻：250Ω；
Loading resistance 250
- 允许基本误差：±0.5%F.S；
Basic errors allowed +/-0.5% F.S
- 温度附加误差：≤0.015 %/℃；
Additional error for temperature ≤0.015% °C
- 零点及量和调整：满量程的±15%；
Zero point and value adjustment +/-15%
- 使用环境温度：-20~70℃；
Operation environment temperature -20~70°C
- 功耗：≤0.5W；
Power exhaustion: ≤0.5W
- 防爆标志：ia II CT6；
Explosion-prooindication d IIBT4f
- 防护等级：IP65
Protection class IP 65

型号命名方法 Naming

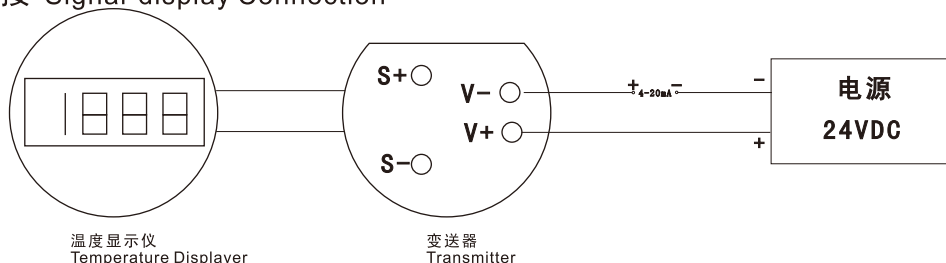


系统连接 System Connection

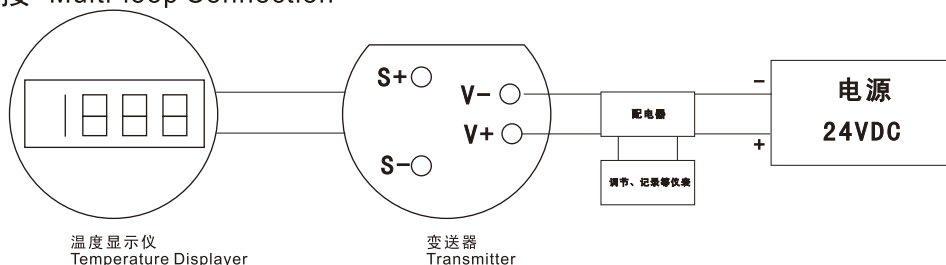
● 单回路连接 Signal-loop Connection



● 单显示连接 Signal-display Connection

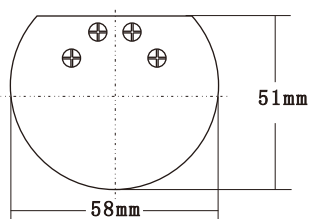


● 多回路连接 Multi-loop Connection

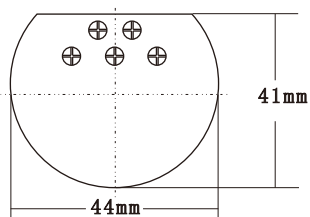


LDWB 信号转换器外形尺寸

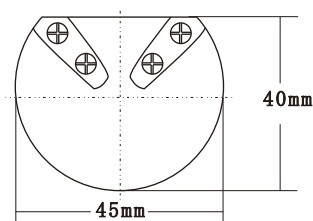
Outer Size of WB Signal Transducer



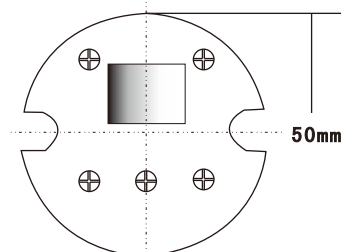
普通型厚度: 24mm
Thickness for Explosion-separation Type: 24mm



普通型三线制厚度: 18mm
Thickness for Normal Type w/ Three Wire: 18mm
(含接线端子为22mm)
(22mm if including connection End)



普通型厚度: 18mm
Thickness for Common Type: 18mm
(含接线端子为27mm)
(27mm if including connection End)



隔爆型三线制厚度: 20mm
Thickness for Explosion-separation Type w/ Three Wire: 20mm
(含接线端子为29mm)
(29mm if including connection End)

校验方法 Rectifying Method

- 用于爆炸危险场所时,请注意防爆标志与防护等级;
- 机电一体化温度变送器安装的环境必须是在-20℃~70℃内,当周围环境温度太高时,LDWB 信号转换器和显示模块可以与热电偶或热电阻分离安装.(我厂配有分离安装变送器的专用防爆盒);
- 加电前,请仔细检查电源的正负极性,不能接错,否则可能造成不可知后果;
- LDWB 信号转换器和显示仪模块用环氧树脂灌封固化,以加强其防震性能,并防湿、防腐、防潮;
- 温度变送器使用六个月后需进行校验。
- Please notice explosion indication & protection class under use of dangerous explosion environment
- The installation environment must be within -20~70℃ for electro mechanical integration temperature transmitter.
If the temperature is so high, LDWB signal transducer and display module can be separately installed with thermocouple or thermal resistance. (We provide special explosion-proof box for separation installation transducer)
- Please check the electrical source before powering, don't connect with error, or causing unexpected result
- LDWB signal transducer and display module are been in solid form by circle-oxygen sealing, which strengthen shock-resistant performance, and anti-wet, anti-corrosion, anti-humidity.
- Temperature transmitter should be rectifying after used for six months

● 热电阻温度变送器校验方法

Rectifying method for thermal resistance with temperature transmitter

设备要求: 4 1/2 数字电压表一台 0.01 Ω~1K Ω 电阻箱一台

250 Ω 线绕精密电阻一只 直流24V稳压电源一台

- 按系统连接方法接线
- 根据变送器铭牌上标明的传感器和量程范围, 输入相应的阻值, 使输出分别为1V和5V (可分别调整零点电位器满度电位器)
- 按量程十等分点输入各电阻值, 检查各温度点输出是否符合精度范围
- 按说明书技术指标逐项进行测试, 应符合技术要求

Equipment demand: 4 1/2 digital voltmeter (1) 1 resistance box with resistance 0.01 Ω~1K Ω

250 Ω precision resistance with revolving wire (1) stable voltage source with 24V DC. (1)

- Wire according to system connection method
- Input relevant resistance value according to sensor & range indicated on transducer, and output 1V & 5V respectively (adjust zero point electric-position and full electric-position machine respectively)
- Input each resistance value according to liangcheng +point, inspecting if each temperature point is in line with accuracy range
- Test one by one according to technology indication in description book, it should be in line with technology demand

● 热电偶温度变送器校验方法

Rectifying Method for Thermocouple w/ Temperature Transmitter

设备要求: 4 1/2 数字电压表一台 UJ33a电位差计一台

250 Ω 线绕精密电阻一只 直流24V稳压电源一台

- 按系统连接方法接线
- 根据变送器铭牌上标明的传感器和量程范围, 输入相应的电势, 使输出分别为1V和

5V（可分别调整零点电位器满度电位器）

- 按量程十等分点输入各电阻值，检查各温度点输出是否符合精度范围
- 按说明书技术指标逐项进行测试，应符合技术要求

Equipment demand: 4 1/2 digital voltmeter (1) UJ33a

electrical place differential gauge (1)

250 precision resistance with revolving wire (1)

stable voltage source with 24V DC. (1)

- Wiring according to system connection method
- Input relevant resistance value according to sensor & range indicated on transducer, and output 1V & 5V respectively (adjust zero point electric-position and full electric-position machine respectively)
- Input each hydroelectric potential value according to liangcheng +point, inspecting if each temperature point is in line with accuracy range
- Test one by one according to technology indication in description book, it should be in line with technology demand

订货须知

- 特殊规格订货可经双方协商决定
- 可根据用户需要配用相应材质的保护管，如刚玉质或高铝质保护管。
- 如果有其它特殊要求请在订货时注明。

Order notice

special specification ordered as negotiation

we can provide protection tube of relevant material according to user's demand

PLS indicate if having special demand in order

WSS系列

双金属温度计

Bimetalli Thermometer

应用 Application

双金属温度计是一种测量中低温度的现场检测仪表。可以直接测量各种生产过程中的-80℃~+600℃范围内液体、蒸汽和气体介质温度。

It is a kind of testing meter used to measure middle & low temperature on spot. It directly to measure temperature of liquid, vapor and gas medium ranging -80℃ to +600℃ during various production processes.

特点 Features

- 现场显示温度，直观方便；
Directly display temperature on spot with convenience
- 安全可靠，使用寿命长；
Safety reliable, long life expectancy
- 多种结构形式，可满足不同要求。
Many structure forms to meet different demands

工作原理 Working Principle

双金属温度计是基于绕制成环性弯曲状的双金属片组成。一端受热膨胀时，带动指针旋转，工作仪表便显示出所应的温度值。

Bimetallic thermometer is based on bimetal bended into ring shape. One side of bimetal expands after being heated, which shall result in revolving of indicator. The working meter shows relevant temperature value.

主要技术参数

Main Technical Parameters

- 产品执行标准
Standard
JB/T 8803-1998
GB 3836-2000

- 标度盘公称直径：60，100，150
Nominal Diameter of dial: 60, 100, 150
- 精度等级：（1.0），1.5
Accuracy class 1.0, 1.5
- 热响应时间：≤40S
Thermal response time: ≤40S
- 防护等级：IP55
Protection class: Ip65



- 角度调整误差
角度调整误差应不超过其量程的1.0%。
- 回差
温度计回差应不大于基本误差限的绝对值。
- 重复性
温度计重复性极限范围应不大于基本误差限绝对值的1/2。

- Angle-adjusting Error
Angle-adjusting error should be no more than 0.1% of its measuring range.
- Return Error
Return-error of thermometer shall be no more than the absolute value of basic error limit
- Repeat
Repeat range of thermometer shall be no more than 1/2the absolute value of basic error
- 测温范围
Measuring Range

测量范围℃ Measuring range	适用范围 Application range	
	工业、商业 For Industry, Commerce	实验室、小型 For Small Lab
-80~+40	√	√
-40~+80	√	√
0~50	√	√
0~100	√	√
0~150	√	√
0~200	√	√
0~300	√	√
0~400	√	√
0~500	√	√

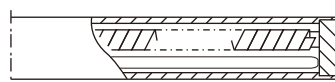
○正常工作大气条件

Normal Working Atmosphere condition

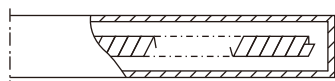
工作场所 Working Place	温度℃ Temperature	相对湿度% Relative Humidity
掩蔽场所 Shelter	-25~+55	5~100
户外场所 Outdoor	-40~+85	5~100

○测量端形式

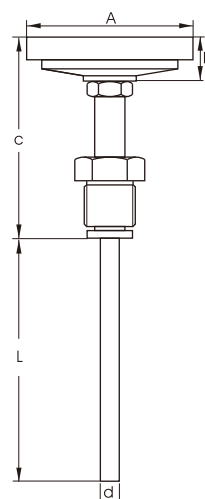
Measuring End Form



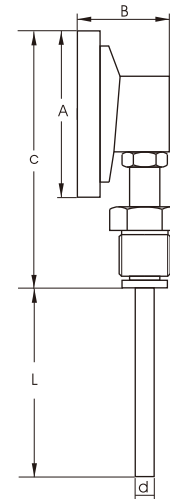
一体化
All-in-one



抽芯式
Core Pulling



轴向型
Axial

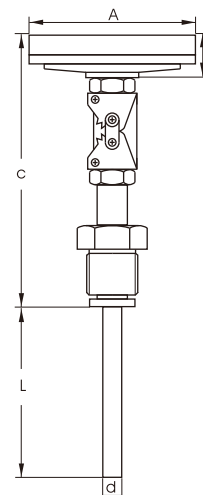


径向型
Radial

○外形及尺寸

Size & Outer Shape

形式 Type	A	B	C	E	L	d
轴向型 Axial	65	23	73	-	75	Φ6 Φ8 Φ10
	105	23	73	-	100	
	155	23	73	-	150	
径向型 Radial	65	50	110	34	200	
	105	50	110	34	300	
	105	50	110	34	400	
	105	50	110	34	500	
万向型 Universal	105	23	178	120	750	
	155	23	178	120	1000	

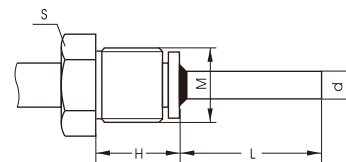


万向型
Radial

○安装固定形式 Mounting & Fixing Type

●可动外螺纹 Moveable Outer Thread

M	H	S	d
M16×1.5	12	18	$\phi 6$ $\phi 8$ $\phi 10$
M20×1.5	16	22	
M27×2	20	30	
NPT1/4	15	18	
NPT1/2	19	22	
NPT3/4	25	30	

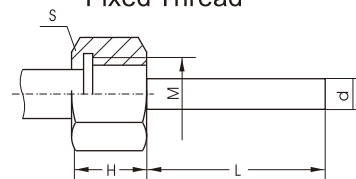


固定螺纹

Fixed Thread

●可内外螺纹 Moveable Inner Thread

M	H	S	d
M16×1.5	12	18	$\phi 6$ $\phi 8$ $\phi 10$
M20×1.5	16	22	
M27×2	20	30	
NPT1/4	15	18	
NPT1/2	19	22	
NPT3/4	25	30	

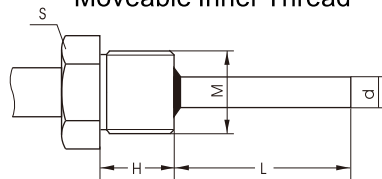


可动内螺纹

Moveable Inner Thread

●固定螺纹 Fixed Thread

M	H	S	d
M16×1.5	12	18	$\phi 6$ $\phi 8$ $\phi 10$
M20×1.5	16	22	
M27×2	20	30	
NPT1/4	15	18	
NPT1/2	19	22	
NPT3/4	25	30	

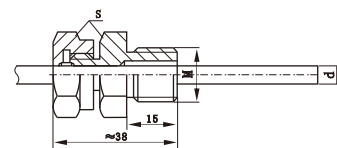


可动外螺纹

Moveable Outer Thread

●卡套螺纹 Compression Thread

M	H	S	d
M12×1.5	15	19	$\phi 6$
M16×1.5	15	22	$\phi 8$
M20×1.5	16	24	$\phi 10$

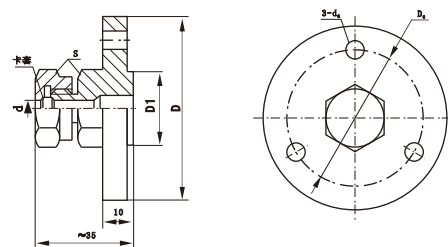


卡套螺纹

Compression Thread

●卡套法兰 Compression Flange

D	D ₀	D ₁	S	d ₀	d
$\phi 60$	$\phi 42$	$\phi 24$	22	$\phi 9$	$\phi 8$ $\phi 10$

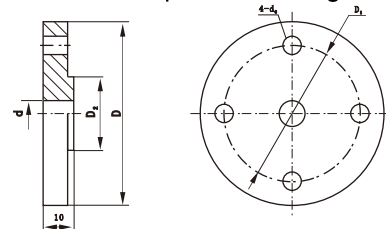


卡套法兰

Compression Flange

●固定法兰 Fixed Flange

D	D ₁	D ₂	H	d ₀	d
$\phi 105$	$\phi 75$	$\phi 55$	16	$\phi 14$	$\phi 8$ $\phi 10$



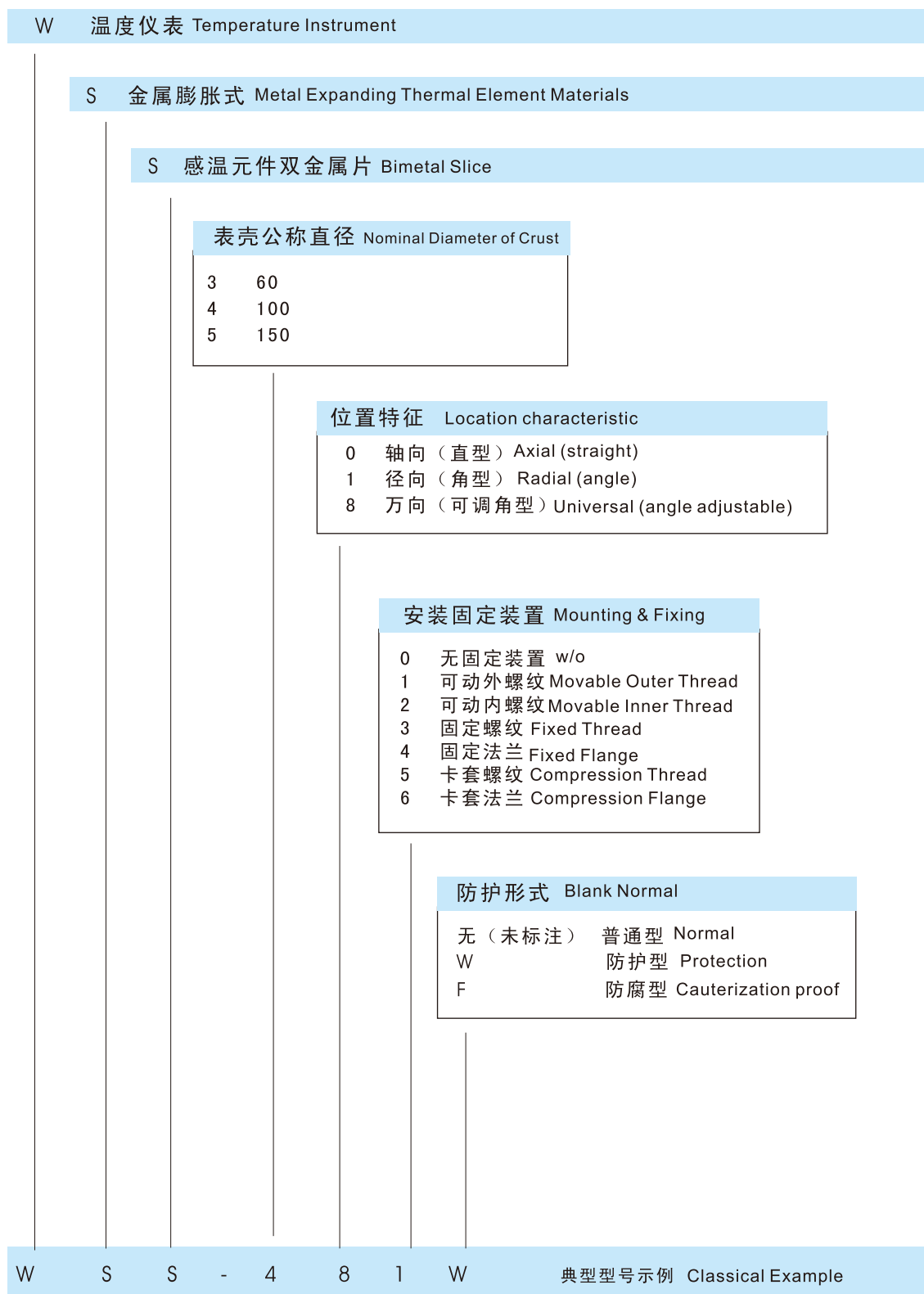
固定法兰

Fixed Flange

注：可提供ANSI、JB、HG等标准法兰

Notice: we can supply ANSI, JB, HG etc. standard flange

型号命名方法 Naming



型号及规格

Type & Specification

○ 轴向型

Axial Type

型 号 Type	测温范围℃ Measuring Range	精度等级 Accuracy Class	保护管材料 PTM.	规格Specification		安装固定装置 Mounting & Fixing Device
				D	L	
WSS-300	-80~+40 -40~+80 0~50 0~100 0~150 0~200 0~300 0~400 0~500 0~600	1.5	1Cr18Ni9Ti	φ 60	75	无固定装置 W/o
WSS-400				φ 100		
WSS-500				φ 150		
WSS-301				φ 60	100	可动外螺纹 Movable Outer Thread
WSS-401				φ 100		
WSS-501				φ 150		
WSS-302			304	φ 60	150	可动内螺纹 Movable Inner Thread
WSS-402				φ 100		
WSS-502				φ 150		
WSS-303			316	φ 60	300	固定螺纹 Fixed Thread
WSS-403				φ 100		
WSS-503				φ 150		
WSS-304			316L	φ 60	400	固定法兰 Fixed Flange
WSS-404				φ 100		
WSS-504				φ 150		
WSS-305			哈氏C-276	φ 60	500	卡套螺纹 Compression Thread
WSS-405				φ 100		
WSS-505				φ 150		
WSS-306				φ 60	750	卡套法兰 Compression Flange
WSS-406				φ 100		
WSS-506				φ 150		

注：其余长度“L”可协议订货。

For other length, L can be ordered due to agreement.

● 径向型 Radial Type

型号 Type	测温范围℃ Measuring Range	精度等级 Accuracy Class	保护管材料 PTM.	规格Specification		安装固定装置 Mounting & fixing device
				d	L	
WSS-310	-80~+40	1.5	1Cr18Ni9Ti	φ 60	75	无固定装置 W/o
WSS-410				φ 100		
WSS-510				φ 150		
WSS-311				φ 60	100	可动外螺纹 Movable Outer Thread
WSS-411				φ 100		
WSS-511	-40~+80		304	φ 150	150	
WSS-312				φ 60	200	可动内螺纹 Movable Inner Thread
WSS-412	0~50		316	φ 100	300	
WSS-512	0~100			φ 150	400	
WSS-313	0~150		316L	φ 60	400	固定螺纹 Fixed Thread
WSS-413	0~200			φ 100	500	
WSS-513	0~300		哈氏C-276	φ 150	750	
WSS-314	0~400			φ 60	1000	固定法兰 Fixed Flange
WSS-414	0~500			φ 100		
WSS-514	0~600			φ 150		
WSS-315	0~600				φ 60	卡套螺纹 Compression Thread
WSS-415					φ 100	
WSS-515					φ 150	
WSS-316					φ 60	卡套法兰 Compression Flange
WSS-416					φ 100	
WSS-516	φ 150					

注：其余长度“L”可协议订货。
For other length, L can be ordered due to agreement.

● 135° 向型 135° Angle Type

型号 Type	测温范围℃ Measuring Range	精度等级 Accuracy Class	保护管材料 PTM.	规格Specification		安装固定装置 Mounting & Fixing Device
				d	L	
WSS-420	-80~+40	1.5	1Cr18Ni9Ti	φ 100		无固定装置 W/o
WSS-520				φ 150		
WSS-421	-40~+80		304	φ 100	75	可动外螺纹 Movable Outer Thread
WSS-521				φ 150		
WSS-422	0~50		316	φ 100	150	可动内螺纹 Movable Inner Thread
WSS-522	0~100			φ 150		
WSS-423	0~150		316L	φ 100	300	固定螺纹 Fixed Thread
WSS-523	0~200			φ 150		
WSS-424	0~300		哈氏C-276	φ 100	500	固定法兰 Fixed Flange
WSS-524	0~400			φ 150	750	
WSS-425	0~500			φ 100	1000	卡套螺纹 Compression Thread
WSS-525	0~600			φ 150		
WSS-426				φ 100		卡套法兰 Compression Flange
WSS-526				φ 150		

注：其余长度“L”可协议订货。
For other length, L can be ordered due to agreement.

● 万向型 Universal Type

型号 Type	测温范围℃ Measuring range	精度等级 Accuracy class	保护管材料 PTM.	规格Specification		安装固定装置 Mounting & fixing device
				d	L	
WSS-480	-80~+40	1.5	1Cr18Ni9Ti	φ 100	75	无固定装置 W/o
WSS-580				φ 150		
WSS-481				φ 100		可动外螺纹 Movable Outer Thread
WSS-581				φ 150		
WSS-482	-40~+80			φ 100	100	可动内螺纹 Movable Inner Thread
WSS-582	0~50		304	φ 150	150	
WSS-483	0~100		316	φ 100	200	固定螺纹 Fixed Thread
WSS-583	0~150		316L	φ 150	300	
WSS-583	0~200		哈氏C-276	φ 100	400	固定法兰 Fixed Flange
WSS-583	0~300			φ 150	500	
WSS-584	0~400			φ 100	750	卡套螺纹 Compression Thread
WSS-584	0~500			φ 150	1000	
WSS-485	0~600			φ 100	1000	卡套法兰 Compression Flange
WSS-585				φ 150		
WSS-486				φ 100		
WSS-586				φ 150		

注：其余长度“L”可协议订货。
For other length, L can be ordered due to agreement.

选型须知

Type Selection:

- | | |
|------------|--------------------------|
| 1) 型号 | 1)Type |
| 2) 表盘直径 | 2)Graduation |
| 3) 精度等级 | 3)Accuracy Class |
| 4) 安装固定形式 | 4)Mounting & Fixing Form |
| 5) 测温范围 | 5)Measuring Range |
| 6) 长度或插入深度 | 6)Length or Insert Depth |

例A：万向型，表盘直径 φ 100，测温范围0-400℃,1.5级，活动外螺纹M27×2，长度450mm，

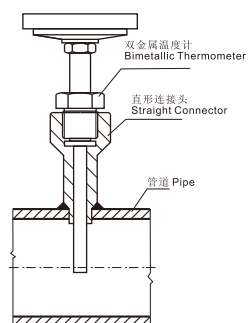
WSS-481, 0-400℃, L=450, M27×2, 1.5级

Example A: Universal Type, Dimeter of Meter is φ 100, Measuring Range 0-400℃, 1.5 Grade,
Movable Outer Thread M27×2, Length 450mm

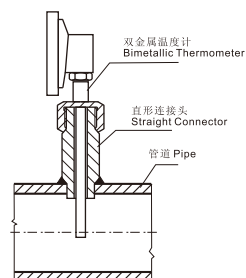
WSS-481, 0-400℃, L=450, M27×2, 1.5Grade

安装方法示意 Installation Sketch Map

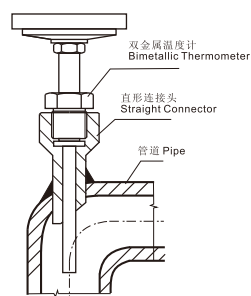
○垂直管道安装方法 Upright Pipe



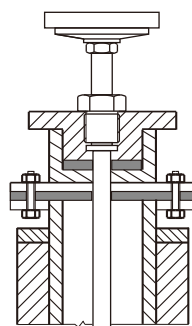
○垂直管道安装方法 Upright Pipe



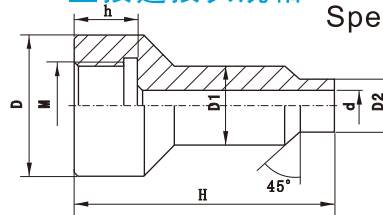
○弯曲管道安装方法 Bending Pipe



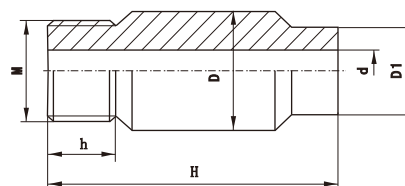
○法兰安装方法 Flange



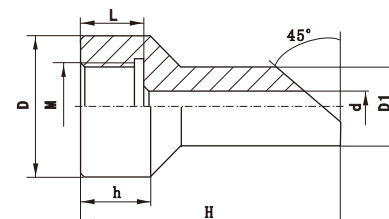
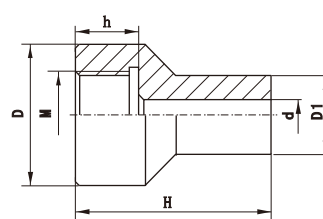
直接连接头规格 Direct Connector Specification



代号 Code	M	D	D ₁	D ₂	d	h	H
LD21A	M12×1.5	φ24	φ16	φ12	φ8	20	60
LD21B	M16×1.5	φ24	φ16	φ12	φ8	20	60
LD21C	M20×1.5	φ28	φ16	φ12	φ8	20	60
LD21D	M27×2	φ39	φ28	φ24	φ20	35	60
LD21E	M33×2	φ48	φ38	φ30	φ22	35	90
LD21F	NPT1/2	φ28	φ16	φ12	φ8	20	60
LD21G	NPT3/4	φ39	φ28	φ24	φ20	35	
LD21H	NPT1	φ48	φ38	φ30	φ22	35	90



代号 Code	M	D	D ₁	D	h	H
LD23B	M16×1.5	φ24	φ16	φ8	20	45
LD23C	M20×1.5	φ28	φ16	φ8	20	45
LD23D	M27×2	φ39	φ28	φ20	35	80
LD23E	M33×2	φ48	φ38	φ22	35	80
LD23F	NPT1/2	φ28	φ16	φ8	20	45
LD23G	NPT3/4	φ39	φ28	φ20	35	80
LD23H	NPT1	φ48	φ38	φ22	35	80



代号 Code	M	D	D ₁	d	h	H
LD22A	M12×1.5	φ24	φ16	φ8	20	35
LD22B	M16×1.5	φ24	φ16	φ8	20	35
LD22C	M20×1.5	φ28	φ16	φ8	20	45
LD22D	M27×2	φ39	φ28	φ20	35	60
LD22E	M33×2	φ48	φ38	φ22	35	90
LD22F	NPT1/2	φ28	φ16	φ8	20	45
LD22G	NPT3/4	φ39	φ28	φ20	35	60
LD22H	NPT1	φ48	φ38	φ22	35	90

WSSX系列

电接点双金属温度计

Electric Junction Bimetallic Thermometer

应用 Application

电接点双金属温度计应用于生产现场对温度需自动控制和报警。直接测量各种生产过程中-80~500℃范围内体、蒸汽和气体介质温度。

It is used on production spot with demand of automatic control and alarming on temperature to directly measure temperature of liquid, vapor and gas medium ranging from -80℃ to 500℃ during various production processes.

特点 Features

- 现场显示温度，直观方便；
Directly display temperature on spot with convenience
- 具有自动切断电源和报警功能；
Automatically break power and alarm
- 安全可靠，使用寿命长；
High reliability and long life expectancy
- 多种结构形式，可满足不同要求。
Many structure forms to meet different demands

工作原理 Working Principle

电接点双金属温度计是利用温度变化时带动触点变化，当其与上下限触点接触或断开的同时，使电路中的继电器工作，从而自动控制及报警。

Temperature change results in contact or break of electric contact which leads to operation of relay in circuit to realize automatic control and alarming.

主要技术参数

Main Technical Parameters

- 产品执行标准
Standard
JB/T 8803-1998
GB 3836-2000
- 标度盘公称直径：100
Nominal Diameter of Dial 100
- 精度等级：（1.0），1.5
Accuracy Class 1.0, 1.5

○热响应时间：≤40S

Thermal Response Time: ≤40S

○防护等级：IP55

Protection Class: Ip55



○电气参数

Electric Parameters

额定功率VA Rated Power	最高工作电压V Max. Working Voltage	最大允许电流 Max. Allowed Current
10	220 a.c	0.7A
	24 d.c	

○绝缘电阻

Insulation Resistance

额定电压 Rated Voltage	直流试验电压 Testing Voltage D.C	绝缘电阻 Insulation Resistance
24 d.c	100	7
220 a.c	500	20

○正常工作大气条件

温度-25~+55℃，相对湿度≤85%。

○设定点误差

设定点误差应不超过基本误差限的1.5倍。

○切换差

切换差应不超过基本误差限的1.5倍。

○切换重复性

切换重复性极限范围不大于基本误差限绝对值的1/2。

○ Normal Ambient Condition

Temperature -25~+55℃, relative humidity ≤80%

○ Setting Point Error

Setting point error should be no more than 1.5 times of basic error limit

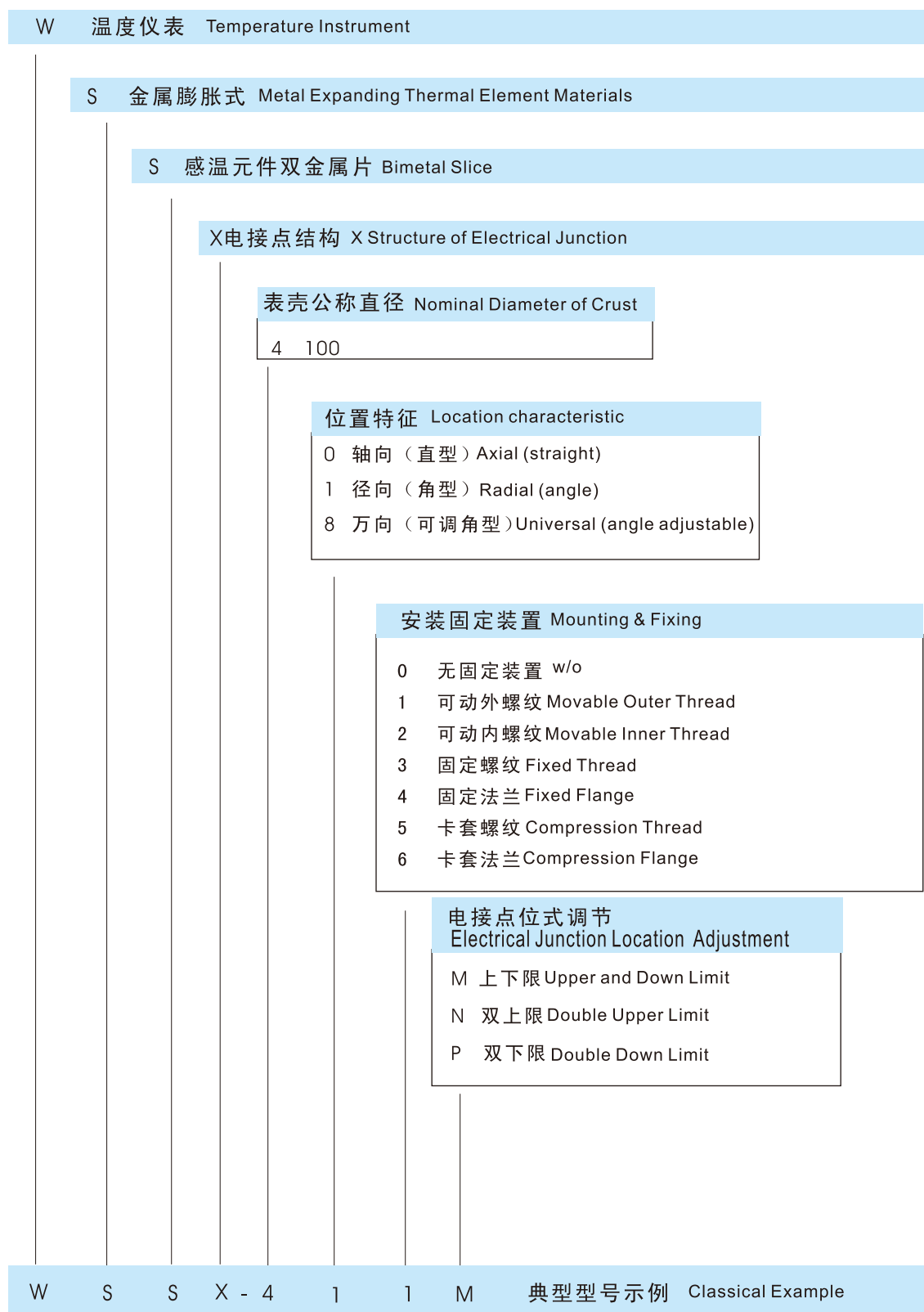
○ Switching Error

It shall be no more than 1.5 times of basic error limit

○ Switching Repeat

Its limit range shall be no more than 1/2 the absolute value of basic error

型号命名方法 Type naming method

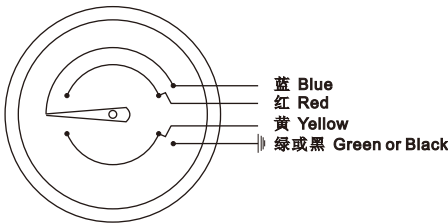


型号及规格 Type & Specification

型号 Type	测温范围℃ Measuring Range	精度等级 Accuracy Class	保护管材料 PTM.	规格 Specification	安装固定装置 Mounting & Fixing Device
WSSX-400	-80~+40	1.5	1Cr18Ni9Ti	75	无固定装置 W/o
WSSX-401					
WSSX-480					
WSSX-401					
WSSX-411					
WSSX-481	-40~+80	1.5	304	100	可动外螺纹 Movable Outer Thread
WSSX-402	0~50			150	
WSSX-412	0~100			200	
WSSX-482	0~150			300	
WSSX-403	0~200			400	
WSSX-413	0~300	1.5	316L	400	固定螺纹 Fixed Thread
WSSX-483	0~400			500	
WSSX-404	0~500			750	
WSSX-414				1000	
WSSX-484					
WSSX-405		1.5	哈氏C-276		固定法兰 Fixed Flange
WSSX-415					
WSSX-485					
WSSX-406					
WSSX-416					
WSSX-486		1.5	哈氏C-276		卡套螺纹 Compression Thread
WSSX-407					
WSSX-417					
WSSX-487					
WSSX-408					
WSSX-409		1.5	哈氏C-276		卡套法兰 Compression Flange
WSSX-419					
WSSX-489					
WSSX-410					
WSSX-490					

★：特殊形式可根据协议订货。
 Notice: we may provide that type of special form as user's demand

电接点接线方式 Electric Junction Wiring Method



WSSX-B系列

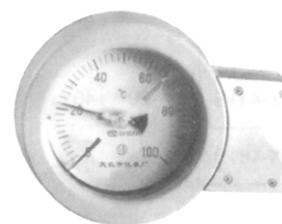
隔爆双金属温度计

Explosion-separation Bimetallic
Thermometer

应用 Application

双金属温度计可以直接测量生产现场存在碳化物等爆炸物各过程中的-80~+350℃范围内液体、蒸汽和气体介质以及固体表面测温。

It is used to directly measure temperature of liquid, vapor and solid surface ranging from -80℃ to +350℃ during production on spot with explosives such as hydrocarbon.



技术参数 Technical Parameters

○标度盘公称直径：100

Nominal Diameter of Dial, 100

○热响应时间：≤40S

Thermal Response Time: ≤40S

○隔爆等级：d IIBT4

Explosion-separation Class: d IIBT4

○额定功率：10VA

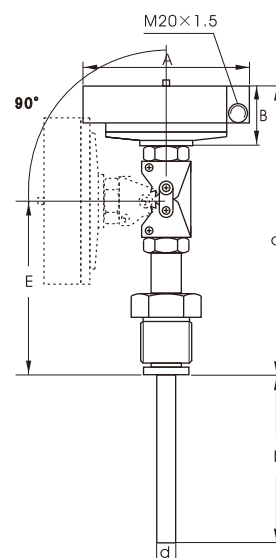
Rated Power: 10VA

○最高电压：24V

Max. Voltage: 24V

○最高工作电流：0.7A

Max. Working Current: 0.7A



外形及尺寸 Outer Shape & Size

形式 Type	D	A	B	E	d
电接点轴向型 Axial Type w/ E. Junction	130	190	65	-	Φ8
电接点万向型 Universal Type w/ E. Junction	130	215	60	110	Φ10

○型号及规格 Type & Specification

型号 Type	测量范围℃ Measuring Range	精度等级 Accuracy Class	保护管材料 PTM.	L	安装固定装置 Mounting & Fixing Device
WSSX-410B	-80~+40	1.5	1Cr18Ni9Ti	75	无固定装置 W/o
WSSX-480B					可动外螺纹 Movable Outer Thread
WSSX-411B					
WSSX-481B					
WSSX-412B	-40~+80		304	100	可动内螺纹 Movable Inner Thread
WSSX-482B	0~50			150	
WSSX-413B	0~100			200	
WSSX-483B	0~150			300	
WSSX-414B	0~200		316	400	固定螺纹 Fixed Thread
WSSX-484B	0~300			400	
WSSX-415B	0~400			500	
WSSX-485B	0~500			750	
WSSX-416B			哈氏C-276	1000	固定法兰 Fixed Flange
WSSX-486B					
					卡套螺纹 Compression Thread
					卡套法兰 Compression Flange

★：特殊形式可根据协议订货。

Notice: we may provide that type of special form as user's demand

选型须知

Notices in type selection

- | | |
|------------|-------------------------------|
| 1) 型号 | 1)Type |
| 2) 精度等级 | 2)Accuracy class |
| 3) 测温范围 | 3)Measuring Range |
| 4) 电接点位式调节 | 4)Electric Contact Regulation |
| 5) 安装固定形式 | 5)Mounting & Fixing |
| 6) 插入长度 | 6)Insert Length |
| 7) 防爆等级 | 7)Explosion-proof Class |

例A：隔爆型万向式双金属温度计，位式调节上下限，测温范围0-400℃,保护管316，插入长300mm，

WSS481BM, 0-400℃, L=300, 保护管316, 防爆等级: d II CT5

Example A: Explosion-separtion Universal type Bimetallic Thermometer, Upper & Lower limit Adjustment, Measuring Range 0~400℃, Thermowell 316, Insert Length 300mm.

WSSX-481BM, 0~400℃, L=300 Thermowell 316.

WSS系列

热套式双金属温度计

Bimetallic Thermometer w/ Thermowell

应用 Application

双金属温度计配合各式安装套管，满足不同压力等级要求。可以直接测量各种过程中的-80~+350℃范围内液体、蒸汽和气体介质以及固体表面测温。

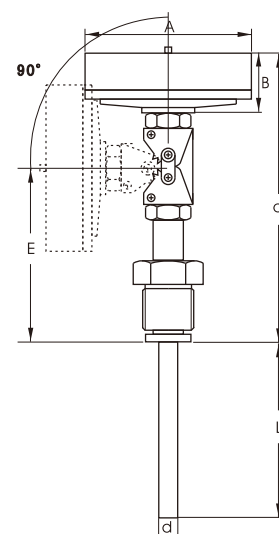
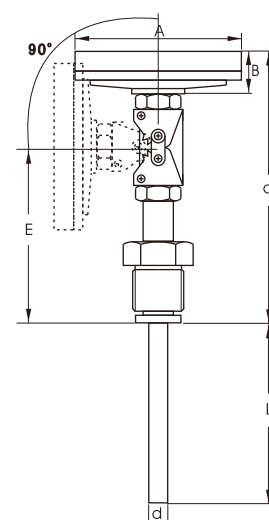
It is connected / matched with various installation tubes to meet different demands on pressure class. It is used to directly measure temperature of liquid, vapor, gas medium and solid surface ranging from -80℃ to +350℃ during various production processes.

技术参数 Technical Parameters

- 标度盘公称直径：100、150
Nominal Diameter of Dial 100, 150
- 精度等级：（1.0），1.5
Accuracy Class: 1.0, 1.5
- 热响应时间：≤40S
Thermal Response Time: ≤40S
- 防护等级：IP55
Protection Class: IP55
- 连接尺寸：M20X1.5, NPT1/2
Connection Size: m201.5, NPT1/2

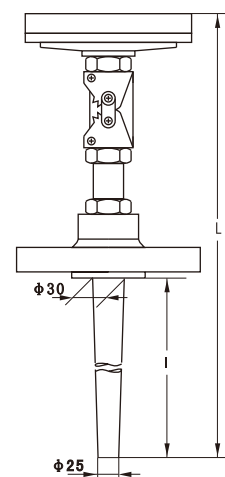
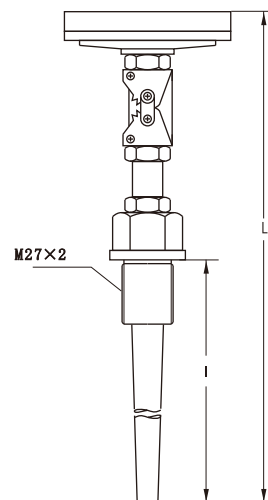
外形及尺寸 Outer Shape & Size

形式 Form	D	A	B	E	d
径向型 Radial	105	73	23	-	Φ8
	155	73	23	-	
轴向型 Axial	65	110	50	34	
	105	110	50	34	
万向型 Universal	105	178	23	120	Φ10
	155	178	23	120	
电接点轴向 Axial w/ E. Junction	128	135	40	-	
电接点径向型 Radial w/ E. Junction	128	150	72	42	
电接点万向型 Universal w/ E. Junction	128	175	40	98	



型号及规格 Type & Specification

型号 Type	测量范围℃ Measuring Range	精度等级 Accuracy Class	保护和材料 PTM.	规格 Specification	公称压力 NP.	安装固定装置 Mounting & Fixing Device
WSS-403S	-80~+40	1.5	1Cr18Ni9Ti	150	≤30Mpa	螺纹连接式 Thread Connection
WSS-503S						
WSS-413S						
WSS-513S						
WSS-483S						
WSS-583S						
WSSX-403S	0~50	1.5	304	250	1.5-40Mpa*	法兰连接式 Flange Connection
WSSX-413S	0~100			300		
WSSX-480S	0~150			350		
WSS-403L	0~200		哈氏C-276	400		
WSS-503L	0~300			500		
WSS-413L	0~400			550		
WSS-513L	0~500					
WSS-483L						
WSS-583L						
WSSX-403S						
WSSX-413L						
WSSX-483L						



- ★：1) 可配各式安装套管，热安装套管形式详见《热安装套管图》；
It can match with different types thermal sleeves, please refer to Thermowell Table.
- 2) 保护管其余材质根据协议订货；
We also produce protection tube of other materials as user's demand
- 3) 打“*”表示公称压力根据法兰压力等级而定。
Nominal pressure with * depends on pressure class of flange.

选型须知

- 1) 型号
- 2) 精度等级
- 3) 测温范围
- 4) 安装固定形式
- 5) 热安装套管形式
- 6) 插入长度

Type Selection

- 1)Type
- 2)Accuracy Class
- 3)Measuring Range
- 4)Mounting & Fixing Type
- 5)Thermowell Form
- 6)Insert Length

例A：万向型双金属温度计，测温范围0~400℃,热安装套管LD01F，插入长300mm，WSS-483 LD01F，
0~400℃，L=300

Example A: universal type bimetallic thermometer, measuring range 0~40℃, thermal mounting sleeves LD01F,
insert length 300mm, WSS-483, LD01F, 0~40℃, L=300

WSSX系列

带热电偶（阻）双金属温度计

Bimetallic Thermometer with Thermocouple (Thermal Resistance)

应用 Application

采用双金属温度计与热电偶（阻）一体的方式，既满足现场测温需求，亦满足远距离传输需求。可以直接测量各种过程中的-80~500℃范围内液体、蒸汽和气体介质以及固体表面测温。

We adopt integral design for bimetallic thermocouple with thermocouple (thermal resistance) to meet demands on measuring temperature on spot or long distance transmission. It is used to directly measure temperature of liquid, vapor, gas medium and solid surface ranging from -80℃ to 5000℃ during various production processes.

技术参数 Technical Parameters

● 标度盘公称直径：φ100、φ150

Nominal Diameter of dial 100, 150

● 热响应时间：≤40S

Thermal Response Time: ≤40S

● 防护等级：IP55

Protection Class: IP 55

● 精度等级：

Accuracy Class: 1.0, 1.5

热电偶：I级，1.5℃；II级，2.5℃

Thermocouple: Class I, 1.5℃, Class II, 2.5℃

热电阻：A级：±(0.15+0.002|t|)

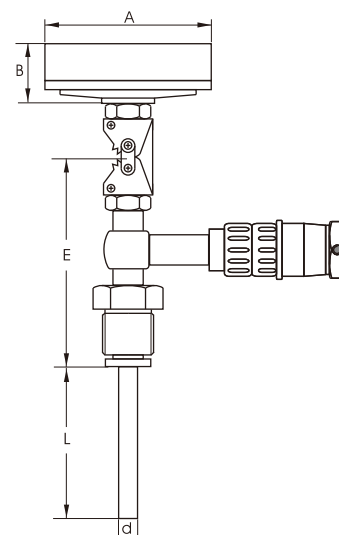
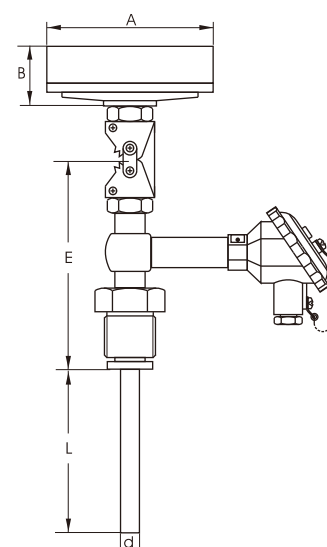
Thermal Resistance: Class A: ±(0.15+0.002 /t/)

B级：±(0.30+0.005|t|)

Class B: ±(0.30+0.005 /t/)

外形及尺寸 Outer Shape & Size

形式 Form	D	A	B	E	d
径向型 Radial Type	105	73	23	-	φ12
	155	73	23	-	
轴向型 Axial Type	105	110	50	34	
	155	110	50	34	
万向型 Universal Type	105	178	23	120	φ14
	155	178	23	120	
电接点轴向 Axial w/ E. Junction	105	135	40	-	
电接点径向型 Radial w/ E. Junction	105	150	72	42	
电接点万向型 Universal w/ E. Junction.	105	175	40	98	



型号及规格

Type & Specification

型号 Type	分度号 Graduation	测温范围 Measuring Range	精度等级 Accuracy Class	保护管材料 Thermowell Material	插入长度 Insert Length	
WSSE-401	E	-80~+40	1.5	1Cr18Ni9Ti	150	
WSSE-501						
WSSE-411						
WSSE-511						
WSSE-481						
WSSE-581						
WSSP-401	Pt100	0~50	1.5	320	200	
WSSP-501		0~100			300	
WSSP-411		0~150			316	400
WSSP-511		0~200			316L	500
WSSP-481		0~300				750
WSSP-581						
WSSXE-401	E	0~400	1.5	哈氏c-276	1000	
WSSXP-401	Pt100	0~500				
WSSXE-411	E					
WSSXP-411	Pt100					
WSSXE-481	E					
WSSXP-481	Pt100					

保护管其余材质根据协议订货。

Other material should be ordered according to agreement.

选型须知

- 1) 型号
- 2) 热电偶（阻）分度号
- 3) 热电偶（阻）精度等级
- 4) 双金属温度计精度等级
- 5) 测温范围
- 6) 安装固定形式
- 7) 保护管材质
- 8) 长度或插入深度

例A: 带热电偶双金属温度计，轴向型，E型，I级，测温范围0-400℃,活动螺纹M27×2，保护管316，插入长度300mm，

WSSE-401, 0-400℃，L=300，I级，保护管316，螺纹27×2

Example: Bimetallic Thermometer with thermocouple, Axial Type, Type E, Class I, Measuring Range

0~40℃, Moveable Thread M27×2, Thermowell 316, Insert Depth 300mm

WSSE-401, 0~40℃, L=300, class I, Thermowell 316, thread M27×2

Type Selection Notice

- 1) Type
- 2) Graduation of Thermocouple (Thermal Resistance)
- 3) Accuracy Class of Thermocouple (Thermal Resistance)
- 4) Accuracy Class of Bimetal Thermometer
- 5) Measuring range
- 6) Installation & Fixing Type
- 7) Thermowell Material
- 8) Insert Length or Depth

热安装套管

Thermowell

应用 Application

与两节式热电偶（阻）和双金属温度计配套使用，保护热电偶（阻）和双金属温度计正常工作。且可用于高压高流速场合。

It is matched with thermocouple (thermal resistance) and bimetallic thermometer to ensure their normal operation. It can be also used for environment under high pressure and with high flow speed.

特点 Features

- 全部参照IEC国际标准设计；
All designed according to IEC international standard
- 盲孔加工厂，耐高压；
Resistance again high pressure
- 与设备同期制造和安装；
Manufactured and installed at same time with concerned equipment
- 不同压力等级，可满足不同需要。
Different pressure class can meet different demands

工作原理 Working Principle

○ 公称压力 Nominal Pressure

一般是指在常温下，保护管所能承受静态外压而不破裂。允许工作压力不仅与保护管材料、直径、壁厚有关，且与其结构形式、安装方法、置入深度及被测介质的流速、种类有关。

It is usually means the static outer pressure which the protection tube can offer and will not be broken under the working temperature. In fact, working pressure not only has relationship with with protection tube material, diameter and thickness of wall, but also the structure form, installation method, inserting depth and the flow speed and type of the medium etc.

○ 水压试验 Water Pressure Test

对保护管的耐压和泄漏检查有要求时，须对保护管进行试验。试验压力为保护管公称压力的1.5倍。

When there is request about pressure resisting and leakage of thermowell, we need to test the thermowell, the tested pressure should be 1.5 times to the nominal pressure of thermowell.

○ X射线探伤试验 X-ray Test

对保护管的壁厚、偏心距等项目检查有要求时，须按用户要求进行检查。

When there is request of wall thickness and eccentricity of thermowell, we need to test according to user's demand.



型号命名方法 Name

LD 热安装套管 Thermowell	
LD	连接形式 Connection Type
	01 螺纹连接 Thread
	02 法兰连接式 Flange
02	03 焊接式 Welding
	□ 序号 Series Number
A	套管材质 Thermowell Material
	无（未标注） 1Cr18Ni9Ti
	Blank
	A 304
	B 316
B	C 316L
	D 其它 Others

LD 02 A B 典型型号示例 Examples of Classical Name

选型须知 Type Selection Notice

1) 型号

Type

2) 套管代号

Thermowell Code

3) 插入深度

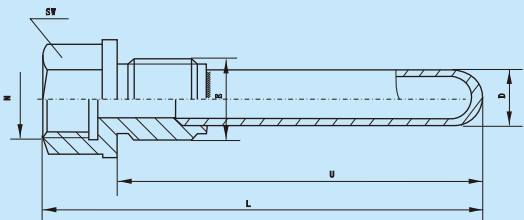
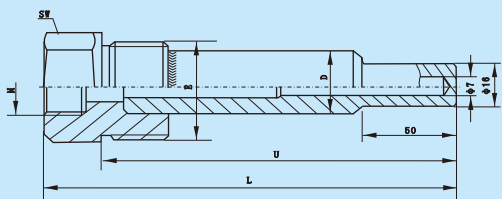
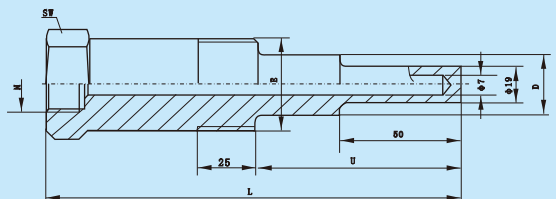
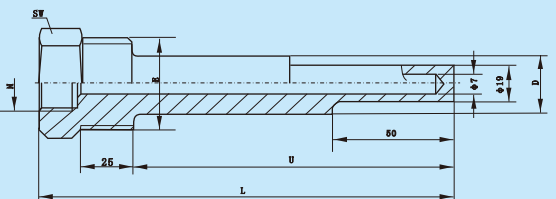
Insert Depth

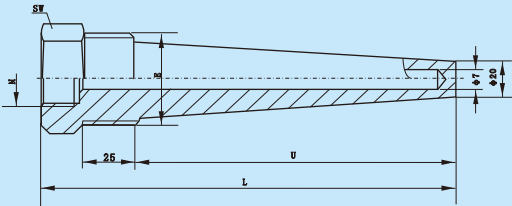
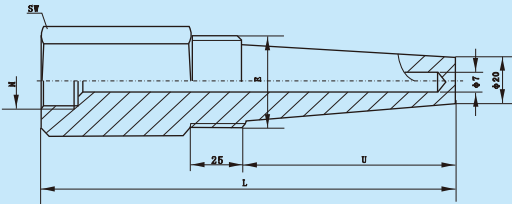
4) 套管材料

Thermowell Material

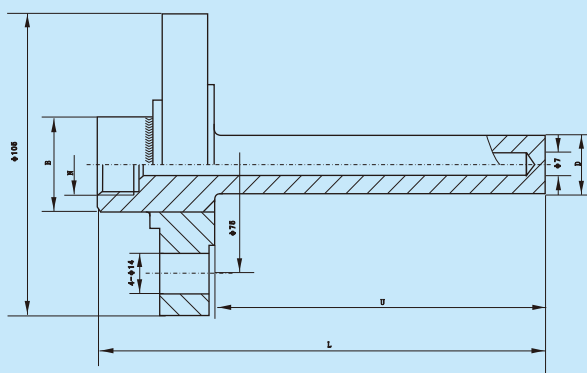
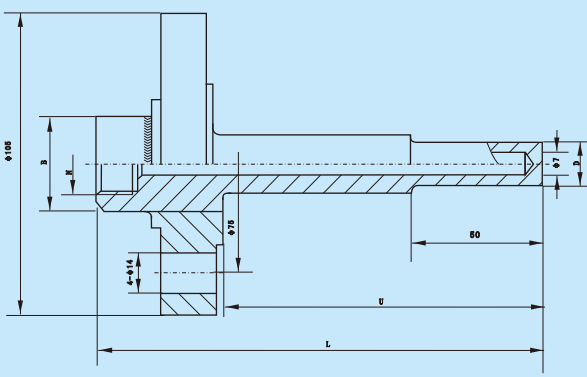
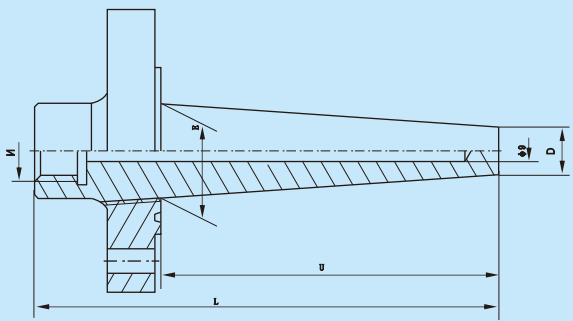
例A: 装配热电偶, 活络管接头式, K型, 套管代号
LD02AB, 插入长度150mm。套管材料316,
WRN-52 LD02AB, U=150

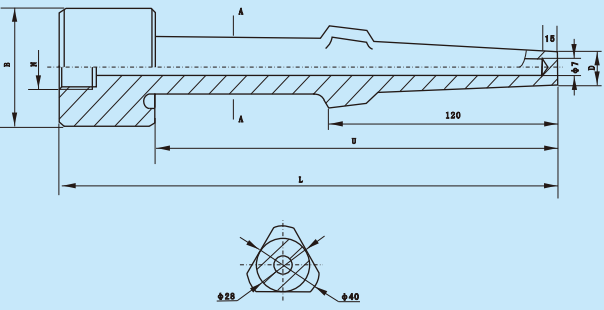
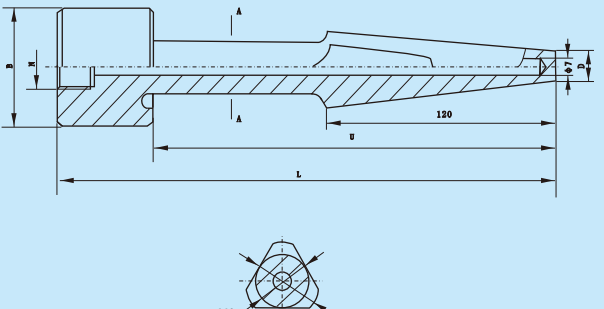
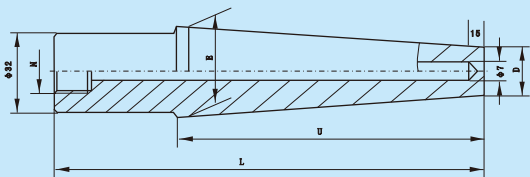
Example A: Assembly thermocouple, elbow tube
connector, type K, thermowell code LD02AB,
insert length 1500mm, thermowell material 316
WRN-52, LD02AB, U=150

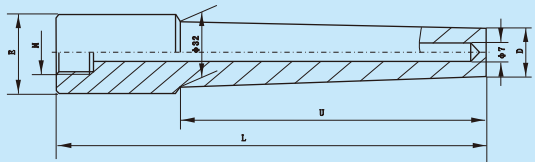
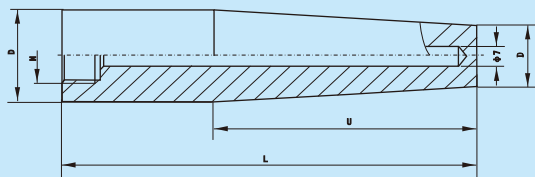
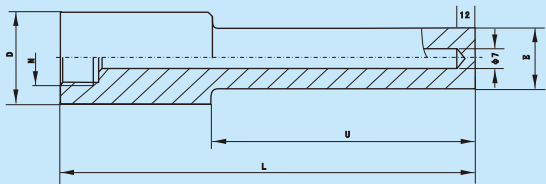
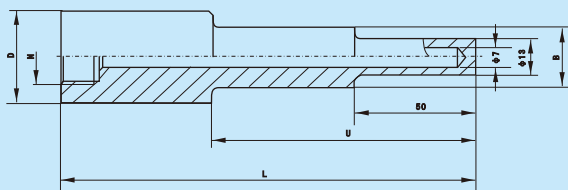
外型及尺寸 Outer Shape and Size			型号 Type	N	E	D	SW	U	L
			LD01T	M20X1.5 NPT1/2	M27X2	Φ16	32	95 145 195 245 345 445 545	150 200 250 300 400 500 600
			LD01V	M20X1.5 NPT1/2		Φ12			
U (mm)	介质流速 (m/s) Flow Speed	公称压力 (NP) MPa							
≤260	0	≤6.4							
其余U Others	0	常压 Normal Pressure							
			LD01V	M20X1.5 NPT1/2	M60X3	Φ28	36	230 430 630 1130	260 460 660 1160
			LD01V	M20X1.5 NPT1/2	NPT2				
U (mm)	介质流速 (m/s) Flow Speed	公称压力 (NP) MPa							
≤1100	0	≤9.8							
			LD01A	M20X1.5 NPT1/2	NPT1	Φ25.4	34	60 110 160 210 260 360	150 200 250 300 400 500
			LD01B	M20X1.5 NPT1/2	NPT3/4	Φ22.2			
U (mm)	介质流速 (m/s) Flow Speed	公称压力 (NP) MPa							
≤360	0	≤6.4							
			LD01C	M20X1.5 NPT1/2	NPT1	Φ25.4		160 210 260 360 460 560	200 250 300 400 500 600
			LD01D	M20X1.5 NPT1/2	NPT3/4	Φ22.2			
U (mm)	介质流速 (m/s) Flow Speed	公称压力 (NP) MPa							
≤560	0	≤6.4							

外型及尺寸 Outer Shape and Size			型号 Type	N	E	D	SW	U	L
			LD01E	M20X1.5 NPT1/2	NPT1	-	34	60 85 110 160 210 260 360	100 125 150 200 250 300 400
			LD01F	M20X1.5 NPT1/2	NPT3/4	-			
			LD01G	M20X1.5 NPT1/2	NPT1	-			
			LD01H	M20X1.5 NPT1/2	NPT3/4	-			
			LD01J	M20X1.5 NPT1/2	NPT1	Φ28			
U (mm)	介质流速 (m/S) Flow Speed	公称压力 (NP) MPa							
≤110	≤80	≤30							
≤260	≤18	≤30							
其余U Others	0	≤6.4							
			LD01K	M20X1.5 NPT1/2	NPT3/4	Φ22	34	60 85 110 160 210 260 360	100 125 150 200 250 300 400
			LD01L	M20X1.5 NPT1/2	NPT1	Φ22.2			
			LD01M	M20X1.5 NPT1/2	NPT3/4	Φ19			
			LD01N	M20X1.5 NPT1/2	NPT1	Φ19			
			LD01O	M20X1.5 NPT1/2	NPT3/4	Φ19			
U (mm)	介质流速 (m/S) Flow Speed	公称压力 (NP) MPa							
≤260	0	≤6.4							
其余U Others	0	常压 Normal Pressure							

156

外型及尺寸 Outer Shape and Size			型号 Type	N	E	D	SW	U	L
			LD02A	M20X1.5 NPT1/2	Φ41.5	Φ36	—	90 140 190 240 340 440 540	150 200 250 300 400 500 600
			LD02B	M20X1.5 NPT1/2	Φ38	Φ28			
U (mm)	介质流速 (m/s) Flow Speed	公称压力 (NP) MPa							
≤260	0	≤6.4							
其余U Others	0	常压 Normal Pressure							
			LD02C	M20X1.5 NPT1/2	Φ33.5	Φ13	—	95 145 195 245 345 445 545	150 200 250 300 400 500 600
			LD02D	M20X1.5 NPT1/2	Φ26.5	Φ13			
U (mm)	介质流速 (m/s) Flow Speed	公称压力 (NP) MPa							
≤260	0	≤6.4							
其余U Others	0	常压Normal Pressure							
			LD02G	M20X1.5 NPT1/2	Φ25	Φ21	—	150 200 250 300 350 400 450 500 550	230 280 330 380 430 480 530 580 630
			LD02H	M20X1.5 NPT1/2	Φ30	Φ25			
U (mm)	介质流速 (m/s) Flow Speed	公称压力 (NP) MPa							
550	≤80	*≤40							

外型及尺寸 Outer Shape and Size			型号 Type	N	E	D	SW	U	L
			LD03G	M20X1.5 NPT1/2	Φ62	Φ16	-	250	300
U (mm)	介质流速 (m/S) Flow Speed	公称压力 (NP) MPa							
250	≤80	≤30							
			LD03H	M20X1.5 NPT1/2	Φ62	Φ18	-	250	300
U (mm)	介质流速 (m/S) Flow Speed	公称压力 (NP) MPa							
250	≤100	≤30							
			LD03J	M20X1.5 NPT1/2	Φ38	Φ22	-	50 100 150	150 200 250 300 350
U (mm)	介质流速 (m/S) Flow Speed	公称压力 (NP) MPa							
≤150	≤80	≤30							

外型及尺寸 Outer Shape and Size					型号 type	N	E	D	SW	U	L							
					LD03K	M20X1.5 NPT1/2	Φ42	Φ18	—	50 100 150 200 250 300	100 150 200 250 300 350							
U (mm)	介质流速 (m/S) Flow Speed		公称压力 (NP) MPa															
≤300	≤30		≤6.4															
					LD03E	M20X1.5 NPT1/2	Φ28	Φ18	—	100	250 300							
U (mm)	介质流速 (m/S) Flow Speed		公称压力 (NP) MPa		LD03F	M20X1.5 NPT1/2		Φ20	—									
≤110	≤18	≤80	≤6.4	≤30														
					LD03C	M20X1.5 NPT1/2	Φ28	Φ36	—	95 145 195 245 345 445 545	150 200 250 300 400 500 600							
U (mm)	介质流速 (m/S) Flow Speed		公称压力 (NP) MPa		LD03D	M20X1.5 NPT1/2	Φ36	Φ41.5										
	LD03C	LD03D	LD03C	LD03D														
≤110	≤18	≤80	≤6.4	≤30														
≤260	—	≤18	—	≤30														
其余U	—	≤6.4	—	≤6.4														
≤360	0	≤6.4	≤6.4	—														
					LD03A	M20X1.5 NPT1/2	Φ19	Φ26.5	—	95 145 195 245 345 445 545	150 200 250 300 400 500 600							
U (mm)	介质流速 (m/S) Flow Speed		公称压力 (NP) MPa		LD03B	M20X1.5 NPT1/2	Φ22	Φ33.5										
≤545	0		≤6.4															

保护管材质及选用

材 质 Material	使用温度 Using Temperature	特 点 及 用 途 Features & Application
1Cr18Ni9Ti	-200~800	具有高温耐蚀性，通常作为一般耐热钢使用 W/ cauterization resisting performance in high temperature, normally for common thermal resisting steel.
304	-200~800	低碳含量，具有良好耐晶间腐蚀性，通常作为一般耐热钢使用 Low carbon content, w/ good Intergranular Corrosion resisting performance, normally for common thermal resisting steel.
316	-200~750	低碳含量，具有良好耐晶间腐蚀性，作为耐腐蚀钢使用 Low carbon content, w/ good Intergranular Corrosion resisting performance normally for cauterization resisting steel.
316L	-200~750	超低碳含量，具有良好耐晶间腐蚀性，作为耐腐蚀钢使用 Super low carbon content, w/ good Intergranular Corrosion resisting performance, normally for cauterization resisting steel.
蒙乃乐K500	-100~700	镍铜合金，具有良好耐晶间腐蚀性，适用于强硫酸等耐腐蚀性场合使用 Ni & Cu Alloy, w/ good Intergranular Corrosion resisting performance, suitable for the corrosion resisting locales w/ strong vitriol.
哈氏合金-276	-100~700	具有优良耐晶间腐蚀性，作为耐腐蚀钢使用 W/ good Intergranular Corrosion resisting performance, for cauterization resisting steel.
Inconel600	-100~1000	镍铬铁合金，具有优良高温抗氧化性，通常作为耐热钢使用 Ni & Cu Alloy, w/ oxidation resisting performance in high temperature normally for thermal resisting steel.
310S	-200~1000	具有高温抗氧化性，耐腐蚀型，通常作为耐热钢使用 W/ oxidation resisting performance in high temperature, cauterization type, normally for thermal resisting steel.
Gh3030	0~1100	镍基高温合金钢，具有优良抗氧化性，耐腐蚀型，通常作为耐热钢使用 High temperature nickel base alloy, w/ good oxidation resisting performance cauterization resisting type, normally for thermal resisting steel.
Gh3039	0~1300	镍基高温合金钢，具有优良抗氧化性，耐腐蚀型，通常作为耐热钢使用 High temperature nickel base alloy, w/ good oxidation resisting performance cauterization type, normally for thermal resisting steel.
高铝质 High Al	0~1300	工业陶瓷管，具有优良抗氧化性，耐腐蚀型 Industrial ceramic tube, w/ good oxidation resisting performance cauterization resisting type.
刚玉质 Corundum	0~1600	工业陶瓷管，具有优良抗氧化性，耐腐蚀型 Industrial ceramic tube, w/ good oxidation resisting performance cauterization resisting type.
3YC52	0~1300	高温合金，具有优良抗氧化性，耐腐蚀型，机械性能好，适用于高温场所 High temperature alloy, w/ good oxidation resisting performance, cauterization resisting type, w/ good mechanical performance, for the occasions w/ high temperature.
二硅化钼 Two Molybdenum Silicides	0~1600	具有优良抗氧化性，耐腐蚀型，机械性能好，适用于高温场所 W/ good oxidation resisting performance, cauterization resisting type, w/ good mechanical performance, for the occasions w/ high temperature.