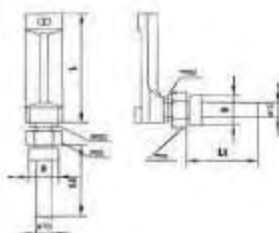


3. WL_G型外标式(V形)玻璃温度计 WL_G Series Outside-scale Series (V form) Glass Thermometer

型号 Model	测量范围(°C) Measuring Range	上体长度L (mm) Length of The Upper Part		下体长度L ₁ (mm) Length of The Lower Part		安装螺紋D及扳手 尺寸S (mm) Installing Thread D and Spanner Size S.	
		110	150,200				
		分格值(°C) Scale Division					
WL _G -11 (量程 110mm) WL _G -12 (量程 150,200mm)	-40 ~ +40	2	1	80 _{±0.5}	80 _{±0.5}	M27x2 G3/4 (S=32)	
	-30 ~ +70			100 _{±0.5}	120 _{±0.5}		
	0 ~ 50	1	0.5	160 _{±0.5}	200 _{±0.5}		
	0 ~ 100	2	1	250 _{±0.5}	320 _{±0.5}		
WL _G -11 (量程 110mm) WL _G -12 (量程 150,200mm)	0 ~ 150	5	3	400 _{±0.5}	550 _{±0.5}		M20x1.5 G1/2 (S=27)
	0 ~ 200	4	2	也可根据客户要求 Can according to customers requirements			
	0 ~ 300	—	5				
	0 ~ 400						
	0 ~ 500		5 或 10				



4. WLB-21型二等标准玻璃水银温度计 WLB-21 Series Second Standard Glass Hg Thermometer

该类型一套七支。可用作标准传递及精密测量。

The series have 7 units, can be used for standard transmission and precision measurement.

测量范围(°C) Measuring Range	辅助标度(°C) Auxiliary Mark Graduation	分格值(°C) Scale Division	全长(mm) Whole Length	外径(mm) Outside Diameter	浸没 Soak
-30 ~ +20	-1 -1	0.1	< 540	6.5 - 8	全浸 whole soak
0					
50 ~ 100					
100 ~ 150					
150 ~ 200					
200 ~ 250					
250 ~ 300					



5. WLS-201型棒式精密玻璃水银温度计 WLS-201 Series Solid-stem Type Accurate Glass Hg Thermometer

产品规格及外形尺寸同WLB-21型二等标准玻璃水银温度计

The standards and size is the same as WLB-21 series second standard glass Hg thermometer.

五、热电偶、热电阻 Thermocouple(TC), Resistance Thermometer Detector(RTD)

热电偶是利用物体的热电性质来测量温度的。其测温范围广。能远距离传送。适于中、高温测量。热电阻是利用导体电阻值随温度变化的性质来测量温度的。其准确度高。能远距离传送。适于低、中温测量。

TC measure temperature use the pyroelectricity. Its measuring range is large. And it can lanuch long-distance. It use in measuring high or medium temperature. RTD measuring temperature use the principle that the resistance of conductor semiconductor change according to the temperature. Its advantages are extreme accuracy. long-distance lanuching, high or medium timperature measuring.

1. 装配式热电偶、热电阻

Assembled Thermocouple, Assembled Resistance Thermometer Detector

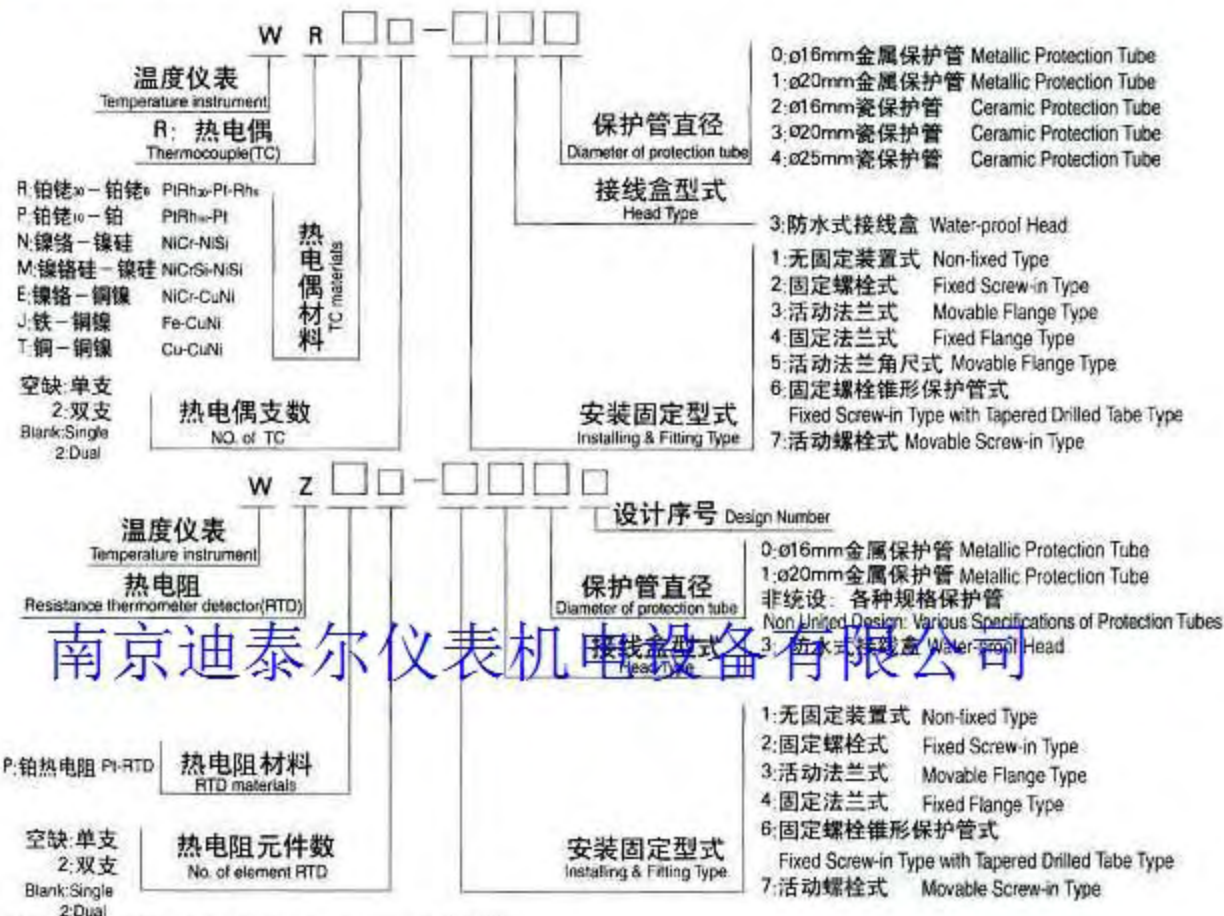
装配式热电偶、热电阻装配简单。更换方便；抗振性能好；机械强度高，耐压性好。通常和显示仪表，记录仪表，电子计算机等配套使用。

Assembled thermocouple and assembled resistance thermometer detector have advantages as easy assembling and changing, firm in structure, vibration resistant, shockproof and so on. Usually using with display instrument, recording instrument, computer and so on.



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型号命名 Model Terminology



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注: (1) 型号后加(K), 内芯为铠装元件, 例: WRN-530(K)。

(2) 如客户需要特殊规格, 请予我们联系。

Note: (1) "K" after model means that the inner core is the mineral insulated thermocouple element. Example: WRN-530(K).

(2) If you need special specification, please communicate with us.

主要技术参数及外形尺寸 Main Technical Data and Appearance Dimensions

简易式 Simple Type

产品名称 Name	型号 Model	分度号 Grad. Sybil.	测量范围(°C) Measuring Range	热响应时间 $\tau_{0.95}(s)$ Thermal Response Time	保护管材料 Protection Tube Material	规格 (mm) Specification		示意图 Sketch Map
						d	L	
简易式 贵金属 热电阻 Simple Type Precious Metal TC	WRR-010	B	0~1600	< 2	刚玉 Corundum	$\phi 8$	320 670	
	WRR2-010						370 920	
	WRP-010	S	0~1300				420 1170	
	WRP2-010						470 1670	
简易式 廉金属 热电阻 Simple Type Base-metal TC	WRN-010	K	0~1100	< 5	粘土质 Multiple Ceramic	$\phi 11$	500 2170	
	WRN2-010						570	
	WRE-010	E	0~900					

注: (1) 贵金属热电阻丝直径为 $\phi 0.5$ mm, 廉金属热电阻丝直径为 $\phi 1.1 \sim \phi 3.2$ mm。

(2) WR□-010可作本公司的装配式热电阻内芯的替换元件, 亦可用作检定炉控温热电阻; 其长度应为外保护管总长度L。

例: 外保护管总长度L=300mm, 其内芯长度为320mm。

Note: (1) Diameter of precious metal TC wire is $\phi 0.5$ mm, diameter of base-metal TC wire is $\phi 1.1 \sim \phi 3.2$ mm.

(2) WR□-010 can be used as inner core replacement for assembly type TC. It can also be used to control the temperature of calibration baths. $L_1=L+20$ (mm), where L_1 : Length of inner core, L: total length of the protection tube.

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产品名称 Name	型号 Model	分度号 Grad. Symb.	测量范围 (°C) Measuring Range	热响应时间 T ₉₀ (s) Thermal Response Time	保护管材料 Protection Tube Material	规格 (mm) Specification		示意图 Sketch Map
						d	L	
简易式 铂热电阻元件 Simple Type Pt-RTD Element	WZP-010	Pt100	-200 ~ +420	< 60	云母 Mica	φ12	275 675	
	WZP-010						325 952	
	WZP-011						375 1175	
	WZP-011						425 1425	
	WZP-011			475 1675				
				< 30			575 2175	

注：主要用于装配铂热电阻内芯更换。其长度应为外保护管总长+25mm。例：外保护管总长度L=300mm，其内芯长度应为325mm。
Note: Major use is to replace inner core of assembled Pt-RTD, L₁=L+25(mm) where L₁:length of inner core, L: total length of the protection tube.

● 无固定装置式 Non-Fixed Type

产品名称 Name	型号 Model	分度号 Grad. Symb.	测量范围 (°C) Measuring Range	热响应时间 T ₉₀ (s) Thermal Response Time	保护管材料 Protection Tube Material	规格 (mm) Specification		示意图 Sketch Map
						d	L	
热电偶 TC	WRP-132	B	0 ~ 1600	< 120	刚玉 Corundum	φ16	300,350,400,450,550,650	
	WRP-134						800,1150,1650,2150	
	WRP-132						具体规格同上	
	WRP-134						具体规格同上	
	WRP-132	S	0 ~ 1300	< 120	高铝质 High Al ₂ O ₃ Ceramic	φ16	300-2150	
	WRP-134						具体规格同上	
	WRP-132						具体规格同上	
	WRP-134						具体规格同上	
	WRN-132	K	0 ~ 1100	< 120	高铝质 High Al ₂ O ₃ Ceramic	φ20	400-1650	
	WRN-132						具体规格同上	
	WRN-133						具体规格同上	
	WRN-133						具体规格同上	
	WRN-130	K	0 ~ 900	< 160	1Cr18Ni9Ti	φ25	550-2150	
	WRN-130		0 ~ 1000					
WRM-130	E	0 ~ 900	< 160	1Cr18Ni9Ti	φ25	550-2150		
WRM-130		0 ~ 1000						
WRE-130	J	0 ~ 500	< 160	1Cr18Ni9Ti	φ25	550-2150		
WRE-130		0 ~ 600						
WRJ-130	T	0 ~ 500	< 160	1Cr18Ni9Ti	φ25	550-2150		
WRJ-130		0 ~ 600						
热电阻 RTD	WZP-130	Pt100	-200 ~ +420	< 30	1Cr18Ni9Ti	φ18	225 ~ 2150	
	WZP-130		-200 ~ +420	< 30				
	WZP-130(K)		-200 ~ +500	< 45				
	WZP-130(K)		-200 ~ +500	< 45				
	WZP-131		-200 ~ +420	< 60				
	WZP-131(K)		-200 ~ +500	< 30				
WZP-131(K)	-200 ~ +500	< 30						

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● 固定螺栓式 Fixed Screw-in Type

产品名称 Name	型号 Model	分度号 Grad. Symb.	测量范围 (°C) Measuring Range	热响应时间 T ₉₀ (s) Thermal Response Time	保护管材料 Protection Tube Material	规格 (mm) Specification		安装螺纹 Insulating Screw	示意图 Sketch Map			
						d	L					
热电偶 TC	WRN-230	K	0 ~ 900	< 60	1Cr18Ni9Ti	φ16	250 ~ 2150	M27x2				
	WRN-230		0 ~ 1000		OC-25Ni20							
	WRM-230	0 ~ 900	1Cr18Ni9Ti									
	WRM-230	0 ~ 1600	OC-25Ni20									
	WRE-230	E	0 ~ 900		1Cr18Ni9Ti					φ16	225 ~ 2150	G3/4
	WRE-230		0 ~ 600									
	WRJ-230	J	0 ~ 500									
	WRJ-230		0 ~ 600									
WRT-230	T	-40 ~ +350										
WRT-230		-40 ~ +350										
热电阻 RTD	WZP-230	Pt100	-200 ~ +420	< 30		1Cr18Ni9Ti	φ16	225 ~ 2150	G3/4			
	WZP-230		-200 ~ +420	< 30								
	WZP-230(K)		-200 ~ +500	< 45								
	WZP-230(K)		-200 ~ +500	< 45								
	WZP-231		-200 ~ +420	< 60								
WZP-231(K)	-200 ~ +500	< 30										
WZP-231(K)	-200 ~ +500	< 30										

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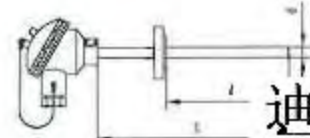
● 固定螺栓锥形保护管式 Fixed Screw-in Type with Tapered Drilled Thermowell

产品名称 Name	型号 Model	分度号 Grad. Symb.	测量范围 (°C) Measuring Range	热响应时间 T ₉₀ (s) Thermal Response Time	保护管材料 Protection Tube Material	公称压力 (MPa) Normal Pressure	L(mm)	安装螺攻 Installing Screw	示意图 Sketch Map
热 电 偶 TC	WRN-630(K) WRN-630(K)	K	0-600	< 45	1Cr18Ni9Ti	30 (流速 < 40m/s) (Velocity of flow: 50m/s)	225-650	M27x2 G3/4	 <p>示意图 Sketch Map</p>
	WRE-630(K) WRE-630(K)	E	0-600						
热 电 阻 RTD	WZP-630(K) WZP-630(K)	Pt100	200-500	< 60	1Cr18Ni9Ti				 <p>示意图 Sketch Map</p>

● 活动法兰式 Movable Flange Type

产品名称 Name	型号 Model	分度号 Grad. Symb.	测量范围 (°C) Measuring Range	热响应时间 T ₉₀ (s) Thermal Response Time	保护管材料 Protection Tube Material	规格 (mm) Specification		示意图 Sketch Map		
						d	L			
热 电 偶 TC	WRP-330 WRP-330	B	0-1600	< 120	刚玉 Corundum	φ15	300,360 400,450 550,600 900,1150 1650,2150			
	WRP-330 WRP-330	S	0-1300							
	WRN-332 WRN-332	K	0-1100							
	WRN-333 WRN-333	K	0-1200	< 100	高铝质 High Al ₂ O ₃ Ceramic	φ15	400-1650 具体规格同上 Same to the upper			
	WRM-332 WRM-332		0-1100	< 120			300-2150 具体规格同上 Same to the upper			
	WRM-333 WRM-333	N	0-1200	< 90	1Cr18Ni9Ti OC25Ni20	φ15	300-2150 具体规格同上 Same to the upper			
	WRM-330 WRM-330	N	0-1000	< 90			250-2150			
	WRE-330 WRE-330	E	0-600	1Cr18Ni9Ti	φ15	250-2150				
	WRJ-330 WRJ-330	J	0-500							
	WRT-330 WRT-330	T	-40-+350							
	热 电 阻 RTD	WZP-330 WZP-330	Pt100	-200-+420	< 90	1Cr18Ni9Ti	φ16		225-2150	
		WZP-330(K) WZP-330(K)		-200-+500	< 45					
WZP-331 WZP-331		-200-+420		< 60						
WZP-331(K) WZP-331(K)		-200-+500		< 30						
WZP-331(K) WZP-331(K)		-200-+500		< 30						

● 固定法兰式 Fixed Flange Type

产品名称 Name	型号 Model	分度号 Grad. Symb.	测量范围 (°C) Measuring Range	热响应时间 T ₉₀ (s) Thermal Response Time	保护管材料 Protection Tube Material	规格 (mm) Specification		示意图 Sketch Map
						d	L	
热 电 偶 TC	WRN-430 WRN-430	K	0-800	< 90	1Cr18Ni9Ti OC25Ni20	φ16	250-2150	
	WRM-430 WRM-430		0-1000					
	WRE-430 WRE-430	0-900						
	WRJ-430 WRJ-430	0-500						
	WRT-430 WRT-430	-40-+350						
	WZP-430 WZP-430	Pt100	-200-+420					
WZP-430(K) WZP-430(K)	-200-+500		< 45					
WZP-431 WZP-431	-200-+420		< 60					
WZP-431(K) WZP-431(K)	-200-+500		< 30					
WZP-431(K) WZP-431(K)	-200-+500		< 30					

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主要技术参数 Main Technical Parameters

● 热电偶类型及分度号 TC Type and Grad Symb

类型 Type	代号 Code	分度号 Grad.Symb.	铠装直径(mm) Diameter of Minn	测量范围(°C) Measuring Range	最高使用温度(°C) Measuring Range	允许偏差Δt(°C)(两者中取其大者) Tolerance Δt(°C) [whichever is more]	
						I	II
镍铬-镍硅 NiCr-NiSi	WRNK	K	φ2	0-800	950	±1.5°C 或(or) ±0.4%t	±1.5°C 或(or) ±0.4%t
镍铬-铜镍 NiCr-CuNi	WREK	E	φ3	0-800	700		
铁-铜镍 Fe-CuNi	WRJK	J	φ4	0-500	600		
铜-铜镍 Cu-CuNi	WRTK	T	φ5	-40-+350	400	±0.5°C 或(or) ±0.4%t	±1°C 或(or) ±0.75%t
铂铑-铂 PtRh10-Pt	WRPK	S	φ6				

● 热电偶常温绝缘电阻

TC Insulation Resistance at Room Temperature

铠装型铠装热电偶在环境温度为 $20 \pm 15^\circ\text{C}$ ，相对湿度不大于80%时，热电极与外套管以及双支之间的绝缘电阻应符合下表的规定：

Insulation resistance for MITC of the insulated junction type between each wire and sheath should accord with values as given in following table, when temperature is $20 \pm 15^\circ\text{C}$ and relative humidity is $\leq 80\%$

铠装热电偶直径(mm) MITC Diameter	试验电压(V DC) Test Voltage	绝缘电阻(MΩ.m) Insulation Resistance
0.5-1.5	50 ± 5	> 1000
> 1.5	500 ± 50	> 1000


● 热电偶高温绝缘电阻

TC Insulation Resistance at High Temperature

绝缘型铠装热电偶高温绝缘电阻应符合下表的规定：
Insulation resistance for insulated MITC as given in following table:

分度号 Grad. Symb	试验温度(°C) Test Temperature	试验温度(°C) Test Temperature	绝缘电阻(MΩ.m) Insulation Resistance
K	300 ± 15	300 ± 15	> 5
T	300 ± 10	300 ± 10	> 500

● 热电偶测量端结构型式 TC Forms of Measuring Junction

铠装热电偶直径d(mm) MITC Diameter	可供长度(m) Length	保护管材料 Protection Tube Material	热响应时间 Thermal Response Time $\tau_{0.95}$ (s)		测量端结构型式 Forms of Measuring Junction
			接壳式 Ground Junction	绝缘式 Insulated Junction	
φ2	≤80	1Cr18Ni9Ti	0.4	0.5	 接壳式 Ground Junction
φ3	≤50		0.6	1.2	
φ4	≤45		0.8	2.5	 绝缘式 Insulated Junction
φ5	≤40		1.2	4.0	
φ6	≤35		2.0	6.0	
φ8	≤20		4.0	6.0	

● 热电阻类型及分度号 RTD Type and Grad symb

类型 Type	型号 Model	分度号 Grad.Symb.	测量范围(°C) Measuring Range	准确度等级 Accuracy	允许偏差Δt(°C) Tolerance
铂热电阻 RTD	WZPK	Pt100	-200-+500	A级	-200-+850℃时 为 $(0.15 \pm 0.002) \pm 0$
				B级	-200-+800℃时 为 $(0.30 \pm 0.005) \pm 0$

注：式中“|t|”为感温元件实测温度绝对值。

Note: " |t| " is actually measured temperature of the sensor

● 热电阻常温绝缘电阻 RTD Insulation Resistance at Room Temperature

试验电压(V DC) Test Voltage	环境温度(°C) Ambient Temperature	相对湿度 RH	绝缘电阻(MΩ.m) Insulation Resistance
10-100	15-35	$< 80\%$	> 100

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● 防爆热电偶、热电阻类型、测量范围与允差
EPTC, EPRTD Series, Measuring Range and Tolerance

类型 Type	代号 Code	测量范围(℃) Measuring Range	分度号 Grad.Symb.	准确度等级 Accuracy	允许偏差Δt(℃) Tolerance Δt(℃)
镍铬-镍硅 NiCr-NiSi	WRN	0~800	K	I	±1.5℃或(or)0.4%t
				II	±2.5℃或(or)0.75%t
镍铬-铜镍 NiCr-CuNi	WRE	0~800	E	I	±1.5℃或(or)0.4%t
				II	±2.5℃或(or)0.75%t
铁-铜镍 Fe-CuNi	WRF	0~500	J	I	±1.5℃或(or)0.4%t
				II	±2.5℃或(or)0.75%t
铜-铜镍 Cu-CuNi	WRT	-40~+350	T	I	±1.5℃或(or)0.4%t
				II	±2.5℃或(or)0.75%t
铂热电阻 Pt-RTD	WZP	-200~+850	Pt100	A	(-200~+850)℃ ±(0.15+0.002 t)
				B	(-200~+850)℃ ±(0.30+0.005 t)

注:(1)t为感温元件的实测温度。
(2)允许偏差两者中取其大者。

Note: (1)t is actually measured temperature.
(2)Tolerance whichever is more.

● 防爆类型和级组 Type And Classes of Explosion-proof(EP)

防爆级组: d II CT5

Explosion-Proof classes: d II CT5

防爆证号: 防爆铠装热电偶: GYB05413

No. of Explosion-proof: Explosion-proof MITC: GYB05413

防爆铠装热电阻: GYB05414

Explosion-proof MIRTD: GYB05414

防爆级组: d II BT4

Explosion-Proof classes: d II BT4

防爆证号: 隔爆热电偶: GYB99111

No. of Explosion-proof: Explosion-proof TC: GYB99111

隔爆热电阻: GYB99112

Explosion-proof RTD: GYB99112

隔爆铠装热电偶: GYB99113

Explosion-proof MITC: GYB99113

隔爆铠装热电阻: GYB99114

Explosion-proof MIRTD: GYB99114

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■ 外形示意图 Appearance Sketch Map

● 普通型铠装热电偶/热电阻 Normal MITC/MIRTD

接线箱型式 Terminal Form	型号 Model	无固定装置式铠装热电偶/热电阻 Non-Fixed Type MITC/MIRTD
简易式 Simple	WR□K-10□ WR□K ₂ -10□ WZPK-10□ WZPK ₂ -10□	
防水式 Water-proof	WR□K-13□ WR□K ₂ -13□ WZPK-13□ WZPK ₂ -13□	
快速插接式 Quick Disconnect	WR□K-15□ WR□K ₂ -15□ WZPK-15□ WZPK ₂ -15□	
航空插座式 Air Plug	WR□K-18□ WR□K ₂ -18□ WZPK-18□ WZPK ₂ -18□	
手柄式 Handle	WR□K-18□ WR□K ₂ -18□ WZPK-18□ WZPK ₂ -18□	

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注: 测量端常规供货为绝缘式, 如需接壳式, 型号尾数“1”改为“2”, 例: 131, 187改为132, 188等。

Note: Measuring junction is insulated type, change end number from odd to even number, if ground type is needed.

Example: 131 to 132, 187 to 188.

接线端型式 Terminal Form	型号 Model	卡套螺栓式铠装热电偶 / 热电阻 Bush Screw-in Type MITC/MRTD
防水式 Water-proof	WR□K-23□ WR□K ₂ -23□ WR□K-33□ WR□K ₂ -33□	WZPK-23□□ WZPK ₂ -23□□ WZPK-33□□ WZPK ₂ -33□□
快速插插式 Quick Disconnect	WR□K-25□ WR□K ₂ -25□ WR□K-35□ WR□K ₂ -35□	WZPK-25□□ WZPK ₂ -25□□ WZPK-35□□ WZPK ₂ -35□□
航空插座式 Air Plug	WR□K-26□ WR□K ₂ -26□ WR□K-36□ WR□K ₂ -36□	WZPK-26□□ WZPK ₂ -26□□ WZPK-36□□ WZPK ₂ -36□□

注: (1) 铠装热电偶直径 $\geq \phi 5$ 卡套螺栓的螺纹常规供货为 M16 x 1.5

(2) 固定卡套螺栓公称压力 2.5MPa, 活动卡套螺栓公称压力为常压。

Note: (1) Regular thread for bush Screw-in type is M16 x 1.5. When diameter of MITC $d \geq \phi 5$.

(2) Normal pressure for fixed bush screw-in is 2.5MPa. Normal pressure for movable bush screw-in is atmospheric pressure.

接线端型式 Terminal Form	型号 Model	卡套法兰式铠装热电偶 / 热电阻 Bush-Flange Type MITC/MRTD
防水式 Water-proof	WR□K-43□ WR□K ₂ -43□ WR□K-53□ WR□K ₂ -53□	WZPK-43□□ WZPK ₂ -43□□ WZPK-53□□ WZPK ₂ -53□□
快速插插式 Quick Disconnect	WR□K-45□ WR□K ₂ -45□ WR□K-55□ WR□K ₂ -55□	WZPK-45□□ WZPK ₂ -45□□ WZPK-55□□ WZPK ₂ -55□□
航空插座式 Air Plug	WR□K-46□ WR□K ₂ -46□ WR□K-56□ WR□K ₂ -56□	WZPK-46□□ WZPK ₂ -46□□ WZPK-56□□ WZPK ₂ -56□□

注: (1) 铠装热电偶直径 $d > \phi 5$ 卡套法兰盘常规供货为 $\phi 60$, $d < \phi 4$ 为 $\phi 50$ 。

(2) 固定卡套法兰公称压力 2.5MPa, 活动卡套法兰公称压力为常压。

Note: (1) Regular specification for bush flange type is: $\phi 60$ When diameter of MITC $\geq \phi 5$, $\phi 50$ when diameter

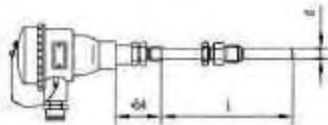
(2) Normal pressure for fixed bush flange is 2.5MPa. Normal pressure for movable bush flange is atmospheric pressure.

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防爆型铠装热电偶/热电阻 EPMITC and EPMIRTD

● 固定螺栓式防爆铠装热电偶铂热电阻 Fixed Bush Screw-in Type EPMITC and EPMIPT-RTD

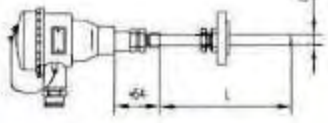
型号 Model	分度号 Dist. Syms	测量范围 (°C) Measuring Range	热响应时间 T ₉₀ (s) Thermal Response Time	保护管材料 Protection Tube Material	规格 (mm) Specification	
					φ	L
WRK-24 WRK-24	K	0-800	<1.2	1Cr18Ni9Ti	φ3	100
					φ4	150
WRK-24 WRK-24	E	0-800	<2.5		φ4	200
					φ5	250
WRK-24 WRK-24	J	0-500	<4		φ5	300
					φ6	350
WRT-24 WRT-24	T	-40-+350	<8		φ6	400
					φ8	450
WRK-244 WRK-244	Pt100	-200-+500	<5		φ4	500
					φ5	550
WRK-245 WRK-245				φ5	750	
WRK-248 WRK-248				φ6	1500	
WRK-248 WRK-248				φ6	2000	
WRK-248 WRK-248				φ8	2500	
				φ8	3000	



注：公称压力：2.5MPa。
Note: Normal pressure: 2.5 MPa.

● 固定卡套法兰式防爆铠装热电偶，铂热电阻 Fixed Bush Flange Type EPMITC and EPMIPT-RTD

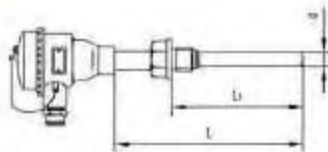
型号 Model	分度号 Dist. Syms	测量范围 (°C) Measuring Range	热响应时间 T ₉₀ (s) Thermal Response Time	保护管材料 Protection Tube Material	规格 (mm) Specification	
					φ	L
WRK-44 WRK-44	K	0-800	<1.2	1Cr18Ni9Ti	φ3	100
					φ4	150
WRK-44 WRK-44	E	0-800	<2.5		φ4	200
					φ5	250
WRK-44 WRK-44	J	0-500	<4		φ5	300
					φ6	350
WRT-44 WRT-44	T	-40-+350	<8		φ6	400
					φ8	450
WRK-444 WRK-444	Pt100	-200-+500	<5		φ4	500
					φ5	550
WRK-445 WRK-445				φ5	750	
WRK-448 WRK-448				φ6	1500	
WRK-448 WRK-448				φ6	2000	
WRK-448 WRK-448				φ8	2500	
				φ8	3000	



注：公称压力：2.5MPa。
Note: Normal pressure: 2.5 MPa.

● 固定螺栓式防爆热电阻，铂热电阻 Fixed Screw-in Type EPTC and EPPT-RTD

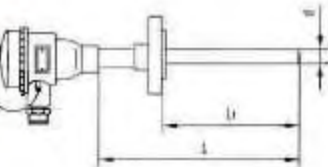
型号 Model	分度号 Dist. Syms	测量范围 (°C) Measuring Range	热响应时间 T ₉₀ (s) Thermal Response Time	保护管材料 Protection Tube Material	规格 (mm) Specification	
					φ	LxL ₁
WRN-24 WRN-24	K	0-800	<45	1Cr18Ni9Ti	φ16	250 100
					φ16	300 150
WRN-240 WRN-240	E	0-800			φ16	350 200
					φ16	400 250
WRJ-240 WRJ-240	J	0-500			φ16	450 300
					φ16	550 400
WRT-240 WRT-240	T	-40-+350			φ16	650 500
					φ16	900 750
WZP-240 WZP-240	Pt100	-200-+500			φ12	1150 1000
					φ12	1600 1500
			φ12	2150 2000		



注：(1)公称压力：10MPa。
(2)内芯可采用铠装元件。
Note: (1) Normal pressure: 10MPa.
(2) Inner core can use mineral insulated thermocouple element.

● 固定法兰式防爆热电阻，铂热电阻 Fixed Flange Type EPTC and EPPT-RTD

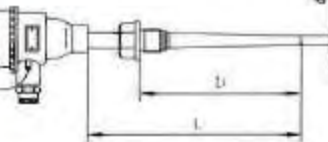
型号 Model	分度号 Dist. Syms	测量范围 (°C) Measuring Range	热响应时间 T ₉₀ (s) Thermal Response Time	保护管材料 Protection Tube Material	规格 (mm) Specification	
					φ	LxL ₁
WRN-440 WRN-440	K	0-800	<45	1Cr18Ni9Ti	φ16	250 100
					φ16	300 150
WRN-440 WRN-440	E	0-800			φ16	350 200
					φ16	400 250
WRJ-440 WRJ-440	J	0-500			φ16	450 300
					φ16	550 400
WRT-440 WRT-440	T	-40-+350			φ16	650 500
					φ16	900 750
WZP-440 WZP-440	Pt100	-200-+500			φ12	1150 1000
					φ12	1650 1500
			φ12	2150 2000		



注：(1)公称压力：10MPa。
(2)内芯可采用铠装元件。
Note: (1) Normal pressure: 10MPa.
(2) Inner core can use mineral insulated thermocouple element.

● 固定螺栓锥形保护管式防爆热电阻，铂热电阻 Fixed Screw-in Type EPTC and EPPT-RTD with Ta

型号 Model	分度号 Dist. Syms	测量范围 (°C) Measuring Range	热响应时间 T ₉₀ (s) Thermal Response Time	保护管材料 Protection Tube Material	规格 (mm) Specification	
					φ	LxL ₁
WRN-640 WRN-640	K	0-800	<60	1Cr18Ni9Ti	φ20	100
					φ20	150
WRN-640 WRN-640	E	0-800			φ20	200
					φ20	250
WRJ-640 WRJ-640	J	0-500			φ20	300
					φ20	350
WZP-640 WZP-640	Pt100	-200-+500			φ20	450
					φ20	500



注：(1)公称压力：30MPa。
(2)内芯可采用铠装元件。
Note: (1) Normal pressure: 30 MPa.
(2) Inner core can use mineral insulated thermocouple element.

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3. 带温度变送器一体化热电偶（阻） Integrated TC and RTD with Temperature Transmitter

带温度变送器一体化热电偶，热电阻系列产品是在普通装配式、铠装式热电偶、热电阻产品的接线盒内装入二线制温度变送器模块（SBR,SBWZ）组成了具有温度检测和变送功能的一体化结构的热电偶、热电阻产品。可直接测量液体、气体或蒸汽介质的温度。它接受标准分度号的热电偶、热电阻输入信号，产生了被测量温度成线性的(4-20)mA DC直流电流输出信号与计算机系统配套，从而实现对各种温度的检测与控制。可广泛应用于电力、冶金、石油、化工、航空、机械、轻工、纺织、医药、食品、国防等工业部门和科研领域。

Integrated TC and RTD can measure temperature and transmit the same time. They are formed when 2 wire system temperature transmitter block (SBR,SBWZ) is installed into the head of assembled TC and RTD, MITC and MIRT. They can measure temperature in liquid, vapor or steam during the manufacturing process, and transmit 4-20mA current output which has a linear relationship with the temperature. They are used broadly in electrical, metallurgy, petroleum, chemical, textile, medicine and food industries national defense and other research.



■ 型号命名 Model Terminology



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■ 热电偶、热电阻推荐测温范围

Recommended Measuring Range of TC and RTD

温度传感器类型 Type of Temperature Detector	分度号 Grad. Symb.	推荐测量范围(℃) Recommended Measuring Range(°C)
热电偶 TC	B	600 - 1600 800 - 1600 900 - 1800 1000 - 1600 1000 - 1800
	S	0 - 1300 0 - 1600 400 - 1600 600 - 1600 800 - 1400 800 - 1600 900 - 1400 1000 - 1400
	K	0 - 300 0 - 600 0 - 800 0 - 1000 0 - 1300 400 - 800 400 - 1300 600 - 1300
	E	0 - 200 0 - 400 0 - 600 0 - 800 200 - 600 300 - 500 400 - 600
	J	0 - 200 0 - 400 0 - 600 300 - 600
	T	-200 - 0 -200 - 300 0 - 200 0 - 300
铂热电阻 Pt-RTD	Pt100	-200 - +50 -100 - +50 -50 - +50 -50 - +100 0 - 50 0 - 100 0 - 150 0 - 200 0 - 300 0 - 400 0 - 500 200 - 400 200 - 500

■ 主要技术参数 Main Technical Data

1. 输入信号: 热电偶: B, S, K, E, J, T
热电阻: Pt100

1. Input Signal: TC: B, S, K, E, J, T
RTD: Pt100
2. 输出信号: 在量程范围内输出与温度成线性的(4-20) mA 直流信号

2. Output Signal: As 4-20mA DC, within measuring range, has a linear relationship with temperature
3. 准确度: 热电偶温度变送器 $\pm 0.5\%F \cdot S$
热电阻温度变送器 $\pm 0.2\%F \cdot S$

3. Basic precision: $\pm 0.5\%F \cdot S$ for TC; $\pm 0.2\%F \cdot S$ for RTD
4. 传输方式: 二线制

4. Transmission model: 2 wire system
5. 直流电源: (12-30)V DC 额定电压24V DC

5. Direct current source: minimum 12v, maximum 30v. Normal 24v
6. 负载阻抗: 极限负载电阻按下式计算:
 $Rl(max) = 50(U-12)$
式中U为变送器直流电源电压
在额定电压24V下
 $Rl(max) = 50(24-12) = 600 \Omega (max)$

6. Load Resistance: Calculate maximum load with the following formula:
 $Rl(max) = 50(U-12)$
U: direct current voltage of transmitter
Under normal voltage of transmitter
Under normal voltage 24v:
 $Rl(max) = 50(24-12) = 600 \Omega (max)$
7. 正常工作环境:

 - a. 环境温度: $-25 \sim +85^\circ C$ (特殊要求为 $-40 \sim +90^\circ C$)
 - b. 相对湿度: 5% - 95%
 - c. 机械振动: 10 - 150Hz, A=0.15mm
 - d. 周围空气中不含有引起变送器腐蚀的介质

7. Normal working conditions:

 - a. Environmental temperature > -25 to $85^\circ C$ (special demand: -40 to $90^\circ C$)
 - b. Relative humidity: 5% - 95%
 - c. Machine vibration: 10 - 150Hz, A=0.15mm
 - d. Atmosphere free from corrosive media to transmitter
8. 电磁干扰: 当离开变送器0.5m处有20-1000MHz, 5W功率的无线电发送器工作时变化 $\pm 0.15\%F \cdot S$

8. Electrical magnetic interference: When radio with 20 - 1000MHz, 5W power operer operates 0.5m from the transmitter, the output chane of the transmitter should be less than $\pm 0.15\%F \cdot S$
9. 温度漂移: 环境温度每变化1℃, 零点变化 $\pm 0.15\%F \cdot S$, 量程变化 $\pm 0.1\%F \cdot S$

9. Temperature deviation: When environmental temperature cl space changes are $\pm 0.15\%F \cdot S$ and $\pm 0.1\%F \cdot S$ respectively

六、温度仪表外保护套 Temperature Gauge Outside Protector

外保护套系仪表保护装置，使仪表与被测介质隔离，提高仪表使用寿命，并可在装置运行情况下，方便地对仪表进行维修或更换。整体钻孔式外保护套可适用于较高压力的工作条件下；钢管式外保护套一般用于低压场合，用户应根据不同场合的使用条件（温度、压力、流速等）合理选用。

The outside protector is a equipment which is protecting the gauge. It insulate gauge from medjum, and increase gauges' using life. We can maintain or replace the gauge expediently. Whole drill type outside protector can use in the higher pressure occasion, and the steel tube type can be used in the lower pressure occasion. Consumers choose it rightly should according to the different occasion's using conditions (temperature, pressure, velocity of flow and so on).

主要技术参数 Main Technical Data

外保护套型式 Outside Protector Type	安装方式 Instaling Type	材料 Material	公称压力 Pressure-resisibnt
整体钻孔式、钢管式 Whole Drill Steel Tube	法兰、螺纹、焊接 Flange Screw Seal	IC18Ni9Ti 304 316 (可根据用户要求) Can according to consumers' requirements	整体钻孔式 Whole Drill <6.4MPa 钢管式 Steel Tube <6.4MPa (静压) (Static Pressure)

型号命名 Model Terminology

型号 BT-□
Type

插入长度 L
Inserted Length

内螺纹 t1
Female Screw

外螺纹 t2

(法兰、焊接式不标注)

Outside Screw (flange, seal no label)

材料
Material

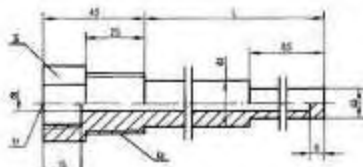
测量端小端直径
或钢管壁厚
Steel Tube Thickness

外保护套管内径 d2
Outside Protector Inner Diameter

外型尺寸 Appearance Dimensions

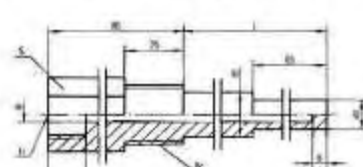
BT-1型

S	t1	t2	d1	d2	d3	L
30	NPT1/2 M20X1.5	NPT3/4	ø6.5	ø20	ø13	75
			ø10.5	ø22.5	ø17	100
			ø10.5	ø22.5	ø17	150
36	NPT3/4 M27X2	NPT1	ø6.5	ø25	ø13	200
			ø6.5	ø25	ø13	250
			ø10.5	ø28	ø17	300
			ø10.5	ø28	ø17	400
			ø10.5	ø28	ø17	500



BT-2型

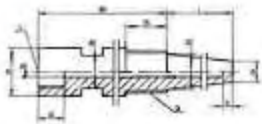
S	t1	t2	d1	d2	d3	L
30	NPT1/2 M20X1.5	NPT3/4	ø6.5	ø20	ø13	75
			ø10.5	ø22.5	ø17	100
			ø10.5	ø22.5	ø17	150
36	NPT3/4 M27X2	NPT1	ø6.5	ø25	ø13	200
			ø6.5	ø25	ø13	250
			ø10.5	ø28	ø17	300
			ø10.5	ø28	ø17	350
			ø10.5	ø28	ø17	450




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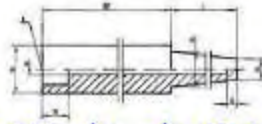
BT-3型

t1	t2	d1	d2	d3	d4	d5	L
NPT1/2 M20X1.5	NPT3/4	ø30	ø6.5	ø22	ø16		75
			ø10.5				100
							150
NPT3/4 M27X2	NPT1	ø36	ø6.5	ø28	ø20		200
			ø10.5				250
							300
							350
							450



BT-4型

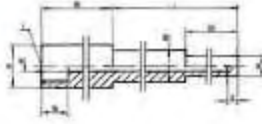
t	d1	d2	d3	d4	L
NPT1/2 M20X1.5	ø30	ø6.5	ø25	ø16	75
		ø10.5			100
					150
NPT3/4 M27X2	ø34	ø6.5	ø30	ø20	200
		ø10.5			250
					300
					350
					450



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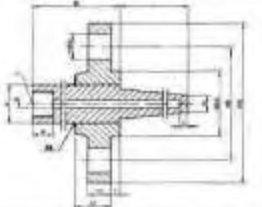
BT-5型

t	d1	d2	d3	d4	L
NPT1/2 M20X1.5	ø27	ø6.5	ø20	ø13	75
		ø10.5	ø22.5	ø17	100
					150
NPT3/4 M27X2	ø34	ø6.5	ø25	ø13	200
		ø10.5	ø28	ø17	250
					300
					350
					450



BT-6型

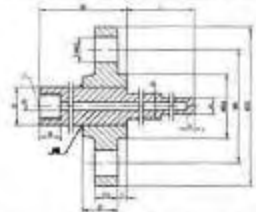
t	d1	d2	d3	L
NPT1/2 M20X1.5	ø30	ø6.5	ø16	75
		ø10.5		100
				150
NPT3/4 M27X2	ø34	ø6.5	ø20	200
		ø10.5		250
				300
				350
				450



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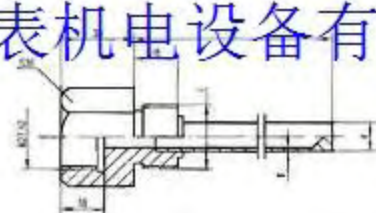
BT-7型

t	d1	d2	d3	d4	L
NPT1/2 M20X1.5	ø27	ø6.5	ø20	ø13	75 100 150 200
		ø10.5	ø22.5	ø17	250 300 350 450
		ø6.5	ø25	ø13	
NPT3/4 M27X2	ø34	ø10.5	ø28	ø17	



BT-8型

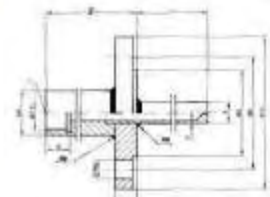
t	d	δ	L
M27X2	ø16	2	100 150 200 250 300 400 500
			100 150 200 250 300 400 500 750 1000
M33X2	ø20	3	100 150 200 250 300 400 500 750 1000
			100 150 200 250 300 400 500 750 1000 1250 1500 1750 2000



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BT-9型

d	δ	L
ø16	2	100 150 200 250 300 400 500 750 1000
		100 150 200 250 300 400 500 750 1000
ø20	3	100 150 200 250 300 400 500 750 1000
		100 150 200 250 300 400 500 750 1000 1250 1500 1750 2000



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