

WSS、WSSX 系列

WSS, WSSX Series

工业双金属温度计

Industrial double metal thermometer

说 明 书

Manual

红器自控（江苏）有限公司

Hongqi Automatic Control (Jiangsu) Co., LTD

一、用途

双金属温度计是一种适合测量中、低温的现场检测工业仪表。可用来直接测量气体、液体和蒸汽的温度。带电接点双金属温度计，并能在工作温度超过给定值时，自动发出控制信号切断电源或报警。

双金属温度计具有无汞害、易读数、坚固和耐振等优点，可代替工业玻璃水银温度计广泛适用于工业和科研部门。

双金属温度计分为普通型、户外型、防腐型三种。普通型外壳用铁皮电镀，保护管用不锈钢，适用于室内一般场合使用。户外型外壳用铝金制造，保护管，连接柱均采用不锈钢，密封性较好，适用于室内外，一般耐腐蚀场所。防腐型外壳采用全不锈钢，保护管、连接柱可用钼二钛材料，连接部分均采用密封胶，可适用于多数腐蚀介质、气体的测量。

二、结构原理

双金属温度计感温元件采用多圈直螺旋形双金属片。一端固定，另一端（自由端）连接在芯轴上，轴向型温度计指针直接装在芯轴上。径向型结构指示针通过转角弹簧与芯轴连接。当温度变化时，感温元件自由端旋转，经芯轴传动指针在刻度盘上指示被测介质温度的变化值。

电接点温度计，指针上装有动接点，固定接点装在设业指针上指针触头随温度变化旋转，当温度达到或超过设定值时，接点闭合发出信号，以达自动控制和报警的目的。

三、主要技术参数

- 1、 温度计为轴向型、径向型、135° 三种型式。
- 2、 温度计的精度等级为 1 级、1.5 级。
- 3、 温度计的测量范围见表一。
- 4、 温度计的时间常数不超过 40s。

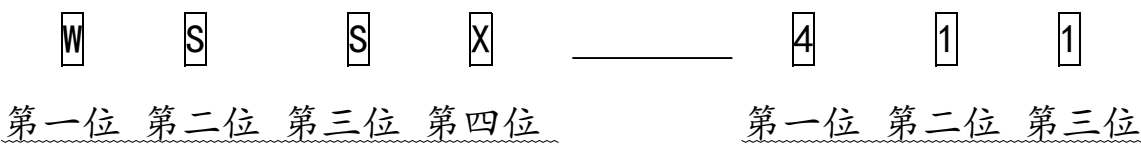
- 5、 保护管的材料为 1Cr18Ni9Ti 不锈钢和钼二钛，其所能承受的分称压力为 6.4MaP。
- 6、 温度计分普通型、户外型、防腐型三种型式。
- 7、 温度计的接点为上、下限，单限，双上限（全部常开）。
- 8、 接点额定功率：10VA（无感负载）。
最高工作电压：220V。
最大工作电流：1A。
- 9、 指示表头使用环境温度 $-40\sim 85^{\circ}\text{C}$ 。
- 10、 指示表头使用环境湿度 $5\sim 100\%$ 。
- 11、 WSS 系列双金属温度计属于耐震机械仪表。
- 12、 测量温度时应将保护管下面 100mm 长全部浸入被测量介质，以保持温度准确性。
- 13、 执行标准：JB/T8803-1998

四、 型号表示方法

节位		代号	表示意义	
第一节	第一位	W	温度测量仪表	
	第二位	S	金属膨胀式温度计	
	第三位	S	感温元件为热双金属片	
	第四位	X	带电接点	
		—	单指示	
第二节	第一位	3	表壳公称直径	$\phi 60\text{mm}$
		4		$\phi 100\text{mm}$
		5		$\phi 150\text{mm}$
	第二位	0	型式	轴向型

		1		径向型
		2		135° 角型
		6		万向型
	第三位	0	安装方式	无固定装置
		1		可动外螺纹
		2		可动内螺纹
		3		固定外螺纹
		4		固定法兰
		5		凸装
	第四位	F	户外型（铝合金外壳）	
		W	不锈钢外壳	

双金属温度计型号的组成



第一节

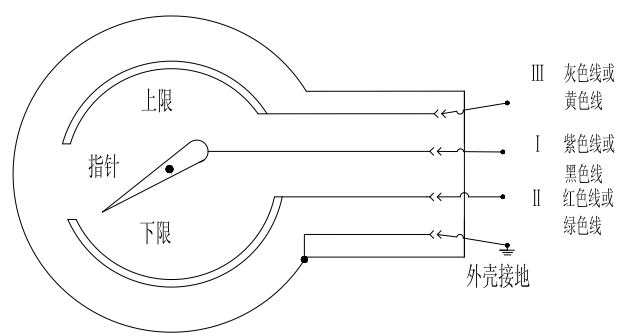
第二节

型号示例：

表壳公称直径为 φ100（mm）的轴向式普通型双金属温度计，安装方式为可动外螺纹。

型号表示：WSS-401。

五、 接点接线示意



六、 型号、规格、参考价

序号	型号	结构型式	表壳 直径	保护管 直径	保护管 长度	安装螺 纹	温度范 围℃	备注
1	WSX-71	轴向电接点	φ 60	φ 6	75	M27*2	-60-40 -40-60 -40-80 -20-80 0-50 0-100 0-120 0-150 0-200 0-300 0-400 0-500	选择螺纹有 M27*2、M16*1、 M18*1.5 、 G1/2、G3/4、 M27*2 内螺纹 G3/4 内螺纹
2	WS-71	轴向	φ 60		100			
3	WSS-301	轴向	φ 60		150			
4	WSS-311	径向	φ 60		200			
5	WS-70	轴向	φ 75		φ 10	250		
				300				
				400				
				500				
6	WSS-401	轴向	φ 100	75		M27*2		
7	WSS-411	径向	φ 100	100				
8	WSSX-401	轴向电接点	φ 100	120				
9	WSSX-411	径向电接点	φ 100	150				
10	WSS-401F	轴向	φ 126	200				
11	WSS-411F	径向	φ 126	250				
12	WSSX-401F	轴向电接点	φ 100	300				

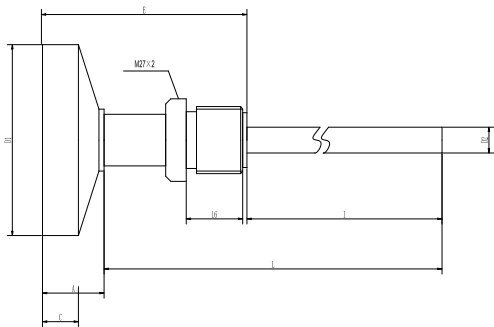
13	WSSX-411F	径向电接点	φ 126		400			保护管。 “W”型号为全 不锈钢外壳
14	WSS-501	轴向	φ 150		500			
15	WSS-511	径向	φ 150		750			
16	WSS-511F	轴向	φ 166		1000			
17	WSS-511F	径向	φ 166		1200			
18	WSS-461W	万向	φ 110		1500			
19	WSS-401W	轴向	φ 110		1750			
20	WSS-411W	径向	φ 110		2000			
				2500				
				3000				

注：0-50℃表尾长≥100mm，WSS-481W 请注明轴芯式。

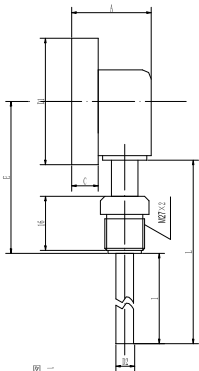
七、 型号与尺寸

代号 型号	A	B	C	D1	E	D2	见图
WSX-71	46	/	42	φ 60	80	φ 6	图一
WS-71	30	/	27	φ 60	68	φ 6	图一
WSS-311	60	46	25	φ 60	75	φ 6	图二
WS-70	30	/	25	φ 75	50	φ 6	图一
WSS-401	30	/	25	φ 100	80	φ 10	图一
WSS-401F	30	/	15	φ 126	80	φ 10	图一
WSS-411	60	46	25	φ 100	90	φ 10	图二
WSS-411F	60	46	15	φ 126	105	φ 10	图二
WSS-501	30	/	20	φ 150	80	φ 10	图一
WSS-501F	30	/	15	φ 166	80	φ 10	图一

WSS-511	60	46	20	φ 150	113	φ 10	图二
WSS-511F	60	46	15	φ 166	113	φ 10	图二
WSSX-401	60	/	48	φ 100	108	φ 10	图一
WSSX-411	87	72	50	φ 100	90	φ 10	图二



图一



图二

八、 使用和维护

- 1、 双金属温度计保护管浸入被测介质中的长度必须大于感温元件的长度，一般浸入长度大于 100mm，0-50℃量程的浸入长度大于 150mm，以保证测量的准确性。

- 2、 双金属温度计在保管、使用安装及运输中，应避免碰撞保护管，切勿使保护管弯曲变形及将表壳当扳手使用。
- 3、 各类双金属温度计不宜用于测量敞开容器内介质温度，带接点温度计，不宜在工作振动较大场合的控制回路中使用。
- 4、 温度计在正常的情况下，应予以定期检验。一般以每隔 6 个月检验一次为宜。
- 5、 电接点温度计不允许在强烈震动下工作，以免影响接点可靠性。
- 6、 WSS 万向型温度计的波纹管只有 0.1mm 厚，所以转向时必须旋松 M4 螺母、螺丝。并小心转向，切勿用力。安装时必须用两把扳手，以免损坏。
- 7、 本产品实行三包。

九、 订货须知

- 1、 订货时须写明产品的型号、测量范围、安装螺纹、保护管长度，外壳公称直径、精度级别等技术参数。
- 2、 需要户外型和防腐品种的须注明。
- 3、 用户有特殊要求时，须具体注明。

I、 Use

Two-metal thermometer is a suitable measure, the low temperature of the industrial scene detection instruments. Can be used to direct measurement of gas, liquid and steam temperature. Charged contact bimetallic thermometer

and can work in temperature over a given value, the automatic control signals cut off the power or the police.

Bimetal thermometers with mercury-free harm, easy reading, strong and resistant to vibration, and other advantages, instead of industrial glass mercury thermometers widely applied to industrial and scientific research departments.

Two-metal thermometer into ordinary type, outdoor type, preservative-three. Ex-general with shell plating, stainless steel and effective protection, apply to indoor use of general occasions. Al-casing of the outdoor production, protection of connecting the columns are stainless steel, seal better, apply to indoor and outdoor, general corrosion-resistant places. Use of all anti-corrosion stainless steel casing, the protection of linking the two molybdenum-titanium materials can be used to connect parts of a sealant, applicable to most corrosive medium, the gas measurement.

II、 the structure principle

Two-metal thermometer temperature components used more laps straight double-helix-shaped metal sheets. One end fixed, the other side (the Liberal side) connected to the Mandrel, axial-pointer directly with the thermometer on the Mandrel. Radial-type structure through direct contacts with the corner of Spring Mandrel connection. When the temperature changes, temperature-free components rotation, the Mandrel transmission pointer in the dial on the instructions of the change in temperature measured media

value.

Xinhua contact thermometer, with indicators on the dynamic contact, in constant contact with the guidelines established guidelines on contact with the temperature changes in rotation, when the temperature reached or exceeded settings, close contact sent a signal to achieve the purpose of automatic control and alarm.

III、 the main technical parameters

- 1, the thermometer for the axial type, radial-type, 135 ° three types.
- 2, the accuracy of the thermometer as a class, 1.5.
- 3, the thermometer measured the scope of a table.
- 4, the time constant temperature not exceeding 40 S.
- 5, the protection of the materials for 1 Cr18Ni9Ti stainless steel and titanium molybdenum Second, the points that can bear the pressure of 6.4 MaP.
- 6, the thermometer at ordinary type, outdoor type, three types of anti-corrosion.
- 7, the contact point for the thermometer on the floor, single-limit, double the ceiling (all normally open).
- 8, contact Power Rating: 10 VA (no flu load).
The maximum operating voltage: 220 V.
The largest current work: 1 A.
- 9, the first direct use of environmental temperature table $-40 \sim 85^{\circ}\text{C}$.
- 10, directed the first use of the environment in Table 5 to 100 percent

humidity.

11, WSS series of dual-metal thermometer Seismic mechanical meters.

12, the temperature measurement should be the protection of below 100 mm long been immersed all media measurement, in order to maintain temperature accuracy.

13, implementation of the standards: JB/T8803-1998

IV、 models that way

Festival -		Code	That sense	
Section 1	First	W	Temperature measuring instruments	
	Second	S	Metal expansion thermometer	
	Third	S	Hot temperature components for the double-metal	
	Fourth	X	Charged contact	
		-	Single-instruction	
Section II	First	3	Case nominal diameter	φ 60mm
		4		φ 100mm
		5		φ 150mm
	Second	0	Type	Axial -
		1		Radial -
		2		135 ° -angle
		6		Universal -
	Third	0	Installation	No fixtures
		1		Moving outside the thread

		2		Moving within the thread
		3		Fixed, thread
		4		Fixed flange
		5		With convex
	Fourth	F	Outdoor (aluminum alloy shell)	
		W	Stainless steel casing	

Double models thermometers metal components

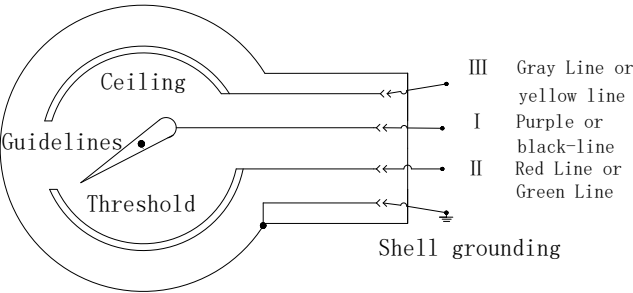
W	S	S	X	_____	4	1	1
<u>first second third fourth</u>						<u>first second third</u>	
Section 1						Section II	

Model examples:

Case said the diameter of $\phi 100$ (mm) of the general-axial dual-metal thermometer, for the installation of movable thread.

Model said: WSS-401.

V、 contact indicate wiring



NO	Model	Structure	Case diameter	Protection of the diameter	Length of protection	Installation thread	Temperature range °C	Remarks
1	WSX-71	Axial, contact	φ 60	φ 6	75	M27*2	-60-40	Select a thread M27 * 2, M16 * 1, M18 * 1.5, G1 / 2, G3 / 4, M27 * 2 Thread G3 / 4 Thread
2	WS-71	Axial	φ 60		100		-40-60	
3	WSS-301	Axial	φ 60		150		-40-80	
4	WSS-311	Radial	φ 60		200	M16*1.5	-20-80	
5	WS-70	Axial	φ 75		250		0-50	
					300	M16*1	0-100	
					400		0-120	
					500		0-150	
6	WSS-401	Axial	φ 100	φ 10	75	M27*2	0-200	

7	WSS-411	Radial	ϕ 100		100		0-300	"F" models
8	WSSX-401	Axial, contact	ϕ 100		120		0-400	applicable
					150		0-500	to the
9	WSSX-411	Radial, contact	ϕ 100		200			indoor
					250			water,
10	WSS-401F	Axial	ϕ 126		300			steam and
					400			anti-corros
11	WSS-411F	Radial	ϕ 126		500			ion
					750			occasions.
12	WSSX-401F	Axial, contact	ϕ 100		1000			Mei-→ 1500
					1200			mm, the
13	WSSX-411F	Radial, contact	ϕ 126		1500			protection
					1750			of the ϕ 12
14	WSS-501	Axial	ϕ 150		2000			protection.
15	WSS-511	Radial	ϕ 150		2500			
16	WSS-511F	Axial	ϕ 166		3000			"W" model
								for the
17	WSS-511F	Radial	ϕ 166					whole
								stainless
18	WSS-461W	Univers al	ϕ 110					steel
								casing
19	WSS-401W	Axial	ϕ 110					

20	WSS-411 W	Radial	$\phi 110$					
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VI、 models, specifications, the reference price

Note :0-50 °C table tail length ≥ 100 mm, WSS-481W-please specify core axis.

VII、 model and size

Code Model	A	B	C	D1	E	D2	见图
WSX-71	46	/	42	$\phi 60$	80	$\phi 6$	Figure 1
WS-71	30	/	27	$\phi 60$	68	$\phi 6$	Figure 1
WSS-311	60	46	25	$\phi 60$	75	$\phi 6$	Figure 2
WS-70	30	/	25	$\phi 75$	50	$\phi 6$	Figure 1
WSS-401	30	/	25	$\phi 100$	80	$\phi 10$	Figure 1
WSS-401F	30	/	15	$\phi 126$	80	$\phi 10$	Figure 1
WSS-411	60	46	25	$\phi 100$	90	$\phi 10$	Figure 2
WSS-411F	60	46	15	$\phi 126$	105	$\phi 10$	Figure 2
WSS-501	30	/	20	$\phi 150$	80	$\phi 10$	Figure 1
WSS-501F	30	/	15	$\phi 166$	80	$\phi 10$	Figure 1
WSS-511	60	46	20	$\phi 150$	113	$\phi 10$	Figure 2
WSS-511F	60	46	15	$\phi 166$	113	$\phi 10$	Figure 2
WSSX-401	60	/	48	$\phi 100$	108	$\phi 10$	Figure 1

WSSX-411	87	72	50	$\phi 100$	90	$\phi 10$	Figure 2
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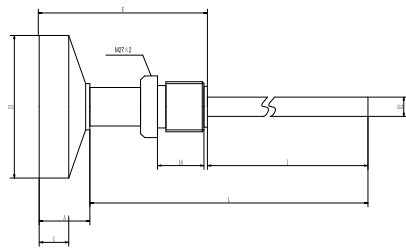


Figure 1

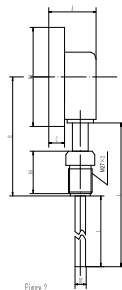


Figure 2

VIII、 use and maintenance

1, double the protection of submerged metal thermometer measured the length of medium temperature must be greater than the length of components, the general immersion longer than 100 mm ,0-50 °C range greater than the length of immersion 150 mm, to ensure the accuracy of measurement.

2, double-metal thermometer in custody, installation and use of transport, protection of the collision should be avoided, not to make the protection of deformation and Case will use the wrench.

3, various types of dual-metal thermometer should not be used to measure open containers medium temperature, contact with the thermometer, it is not appropriate in the work of vibration larger occasions the use of the control

loop.

4, the thermometer under normal circumstances, should be regularly inspected.

General every six months to test a suitable.

5, electrical contacts are not allowed in the thermometer under strong vibration, so as not to affect contact reliability.

6, WSS universal bellows-type thermometer only 0.1 mm thick, so to the time of spin-M4 nuts, screws. And to carefully and not forced. Installation of two wrenches to be used, so as to avoid damage.

7, the Three Guarantees products.