

High class model  
with accurate measurement

精准度极高精密型

NEW MODEL

# High Superior Surface Probes

## 高性能静止表面用温度传感器

Contact support type  
表面接触辅助型

# SX

series  
系列

Flexible  
Head

 ANRITSU METER CO.,LTD.



# Highly accurate surface temperature measurement by flexible contact

## 更具灵活性的高维度表面温度测量

“Support function of contact with tolerance slope range of  $\pm 4$  degrees” added to the most accurate Model S series of ANRITSU-METER.

As the head part can be tilted, the temperature sensing part follows and closely contacts the object to be measured, realizing more simple and highly accurate surface temperature measurement.

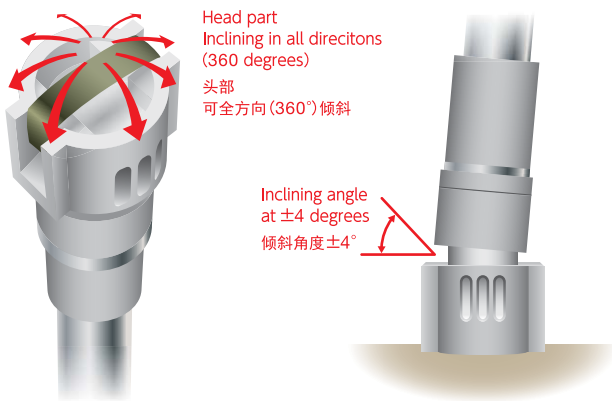
君临安立计器表面温度传感器顶点的S型系列基础上附加 $\pm 4^\circ$ 表面接触辅助功能。可摆动头部更易与被测物密切接触，更简单的实现高次元的表面温度测量。

### Contact support 表面接触辅助

The feature of the SX series is “contact support function” in which the head part is tilted.

Since the head part is tilted, the temperature sensitive part of the probe follows the object to be measured, and it's possible to high accurate measure more easily.

SX系列的最大特点为头部可摆动的“辅助接触功能”。可摆动头部更易与被测物密切接触，可更简单的实现高次元的表面温度测量。



### Product variation 产品种类

Specifications can be selected for each item such as head size, material, pipe shape, and length, so probes suitable for your application are available.

可自由选择头部大小·材质 / 钢管形状·长度等，根据客户的用途自由搭配。



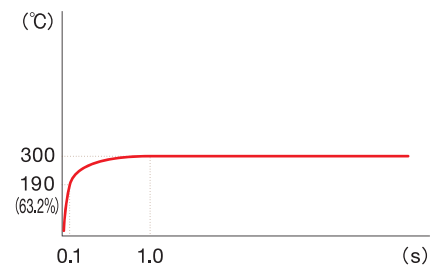
### Response time 响应速度

The fast response time is also one of the features of the SX series. The response time of the SX series is shown in the table below. 63.2% in the table represents the time constant defined as the time to reach 63.2% of the temperature change  $\Delta t$  of the object to be measured.

响应速度快为SX系列的特点。下表为SX系列响应速度的数据图。表中的63.2%为被测物的温度变化达到 $\Delta t$ 的63.2%时的被定义时间常数。

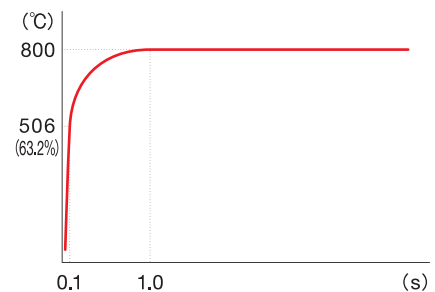
The response time on the stationary surface of metal. (1)  
于静止金属表面上的响应速度(1)

EX For low temp.  
低温用



The response time on the stationary surface of metal. (2)  
于静止金属表面上的响应速度(2)

EX For high temp.  
高温用



### Durability 耐久性

Another characteristic of the SX series is that durability stands out.

Evaluation of the durability of the temperature probe is very difficult, because depend on measurement conditions and environment.

In the SX series, durability is defined on the condition that the contact time is less than 5 seconds at the maximum temperature in the measurable temperature range. This is a guideline in actual use.

SX系列的另外一个特点为，寿命特别长。

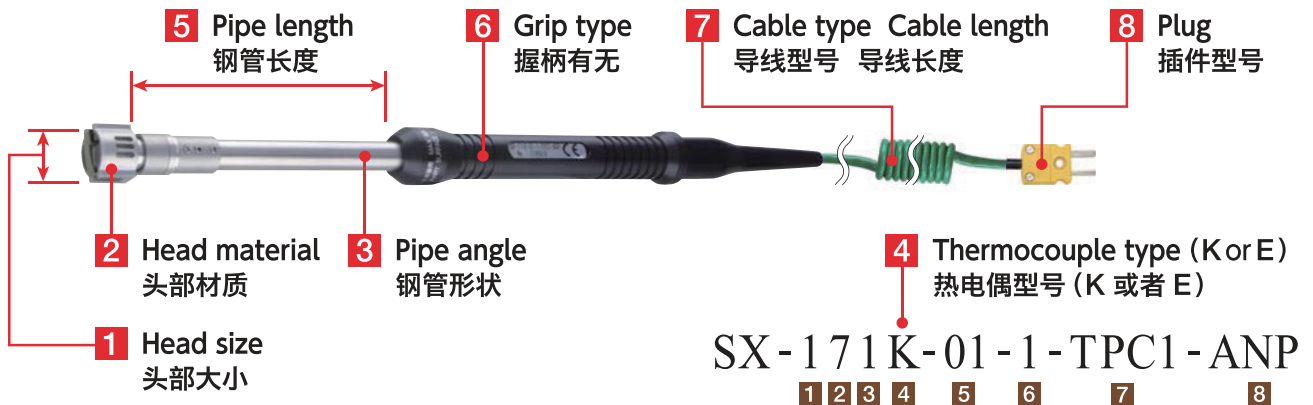
表面温度传感器的耐久性能评价十分困难，特别是根据测量条件环境的不同会存在很大的差异。

SX系列的寿命为，在可正常使用情况下，可测量使用温度范围上限值(1回5秒以内)的回数。

On the metallic surface at 300°C 300°C静止金属表面温度	More than 100,000 contacts 10万回以上
On the metallic surface at 800°C 800°C静止金属表面温度	More than 60,000 contacts 6万回以上

# SX series [Customization 选型]

Specific components may be combined to customize products for the needs of a customer's specific application. 可根据多种多样的用途进行选型。可根据客户的用途自由搭配。



## 1 Head size 头部大小    2 Head material 头部材质

Please choose head size and material from the followings according to the heat capacity and temperature of the object to be measured.

根据被测物的热容量，测量温度选择头部。

**φ15mm**

For low temp. 低温用 <b>SX-16*</b> Temp. range : -50~300°C 温度范围	For high temp. 高温用 <b>SX-17*</b> Temp. range : -50~800°C 温度范围
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**φ10mm**

For low temp. 低温用 <b>SX-36*</b> Temp. range : -50~300°C 温度范围	For high temp. 高温用 <b>SX-37*</b> Temp. range : -50~800°C 温度范围
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Features 特点  
• Standard model 标准型

Features 特点  
• Suitable for measuring objects with small heat capacity 适合测量热容量小的被测物  
• Half of contact area compared to the model of diameter 15mm 接触面为φ15mm的1/2

## 3 Pipe angle 钢管形状

Please choose pipe angle from among 4 types according to the application. 可根据用途从这4类中选择。

### Straight 直管 SX-\*\*\*1



### 45 degrees 45度弯曲 SX-\*\*\*2



### 90 degrees 90度弯曲 SX-\*\*\*3



### 90 degrees (elbow) 90度直角弯曲 SX-\*\*\*4



\* The longer direction of the contact strip is parallel to the pipe. 感温片与钢管平行。

## 4 Thermocouple type (K or E) 热电偶型号 (K 或者 E)

Select the same thermocouple type as thermometer.  
选择温度计主机同一种类热电偶。

Select a Type-K or Type-E thermocouple.  
选择热电偶种类, K 型 或 E 型。

When thermocouple type of thermometer is Type-K 温度计主机的热电偶型号 [K 型]	When thermocouple type of thermometer is Type-E 温度计主机的热电偶型号 [E 型]
<b>K</b> Chromel-Alumel 镍铬合金-康铝合金	<b>E</b> Chromel-Constantan 镍铬合金-康铜合金

## 5 Pipe length 钢管长度

Please choose pipe length from the following. 钢管长度可从下表选择。

Pipe length 钢管长度 (mm)	30	100	200	300	400	500	600	700	800	900	1000	1500	2000
Straight 直管													
45 degrees 45度弯曲													
90 degrees 90度弯曲													
90 degrees (elbow) 90度直角弯曲													

00 01 02 03 04 05 06 07 08 09 10 15 20

\*When the pipe length 600mm (Symbol: 06) or more, the pipe outer diameter closed to the head is  $\phi 10\text{mm}$  (length: 300mm), and the pipe outer diameter close to the grip is  $\phi 20\text{mm}$ .  
钢管长度为600mm(记号:06)以上时, 钢管外径分2段。头部端300mm长钢管直径为 $\phi 10\text{mm}$ , 握柄端钢管直径为 $\phi 20\text{mm}$ 。



## 6 Grip type 握柄有无

Only with grip. 只有带握柄型。 **1**

## 8 Plug 插件型号

Select the type that best fits the shape of the plug of the thermometer.

请选择与温度计主机的插件形状符合的插头。

## 7 Cable type Cable length 导线型号 导线长度

Standard specifications [TPC cable 1m (only 1m)]

标配品的式样 [TPC 导线 1m(导线只能指定 1m)]

<b>TPC1</b>	
Thermocouple type 对应热电偶种类	Type K or E K型或E型
Cable outer diameter 导线外径	$\phi 3.8\text{mm}$
Sheath material 外层材质	Polyurethane 聚氨酯
Heat resistant 耐热温度	110°C
Notes 备注	Coiled cord Contraction/extension range : 0.3~1.5m 卷曲导线: 伸缩 0.3~1.5m, 长度只能指定 1m

Miniature plug ANP 插头	<b>ANP</b>	
Anritsu standard plug 标配插头	<b>ASP</b>	
Without plug 裸线	<b>W</b>	
Spade terminal for $\phi 3\text{mm}$ , $\phi 4\text{mm}$ , $\phi 5\text{mm}$ Y端子 M3 / M4 / M5 用	<b>WT3 / WT4 / WT5</b>	
Ring terminal for $\phi 3\text{mm}$ , $\phi 4\text{mm}$ , $\phi 5\text{mm}$ O型端子 M3 / M4 / M5 用	<b>WC3 / WC4 / WC5</b>	

# SX series [Representative example 代表例]



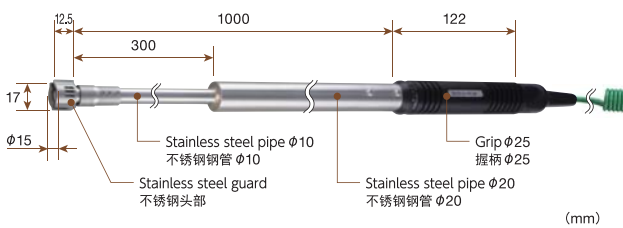
Type K K型热电偶 Model **SX-171K-01-1-TPC1-ANP**  
 Type E E型热电偶 Model **SX-171E-01-1-TPC1-ANP**

Temp. range 温度范围	Tolerance 精度	Response time 响应速度
-50 ~ 800°C	±2.5°C (Tolerance at 100°C surface) (于100°C金属表面的精度)	1 S 1秒



Type K K型热电偶 Model **SX-173K-01-1-TPC1-ANP**  
 Type E E型热电偶 Model **SX-173E-01-1-TPC1-ANP**

Temp. range 温度范围	Tolerance 精度	Response time 响应速度
-50 ~ 800°C	±2.5°C (Tolerance at 100°C surface) (于100°C金属表面的精度)	1 S 1秒



Type K K型热电偶 Model **SX-171K-10-1-TPC1-ANP**  
 Type E E型热电偶 Model **SX-171E-10-1-TPC1-ANP**

Temp. range 温度范围	Tolerance 精度	Response time 响应速度
-50 ~ 800°C	±2.5°C (Tolerance at 100°C surface) (于100°C金属表面的精度)	1 S 1秒



Type K K型热电偶 Model **SX-174K-01-1-TPC1-ANP**  
 Type E E型热电偶 Model **SX-174E-01-1-TPC1-ANP**

Temp. range 温度范围	Tolerance 精度	Response time 响应速度
-50 ~ 800°C	±2.5°C (Tolerance at 100°C surface) (于100°C金属表面的精度)	1 S 1秒



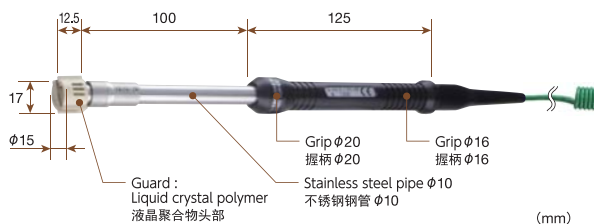
Type K K型热电偶 Model **SX-371K-01-1-TPC1-ANP**  
 Type E E型热电偶 Model **SX-371E-01-1-TPC1-ANP**

Temp. range 温度范围	Tolerance 精度	Response time 响应速度
-50 ~ 800°C	±2.5°C (Tolerance at 100°C surface) (于100°C金属表面的精度)	1 S 1秒



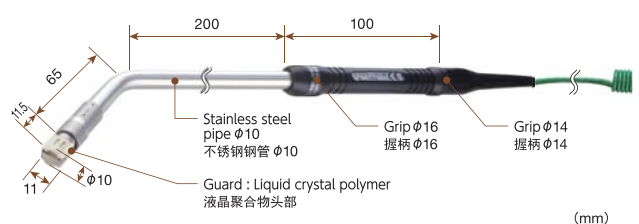
Type K K型热电偶 Model **SX-163K-01-1-TPC1-ANP**  
 Type E E型热电偶 Model **SX-163E-01-1-TPC1-ANP**

Temp. range 温度范围	Tolerance 精度	Response time 响应速度
-50 ~ 300°C	±2.5°C (Tolerance at 100°C surface) (于100°C金属表面的精度)	1 S 1秒



Type K K型热电偶 Model **SX-161K-01-1-TPC1-ANP**  
 Type E E型热电偶 Model **SX-161E-01-1-TPC1-ANP**

Temp. range 温度范围	Tolerance 精度	Response time 响应速度
-50 ~ 300°C	±2.5°C (Tolerance at 100°C surface) (于100°C金属表面的精度)	1 S 1秒



Type K K型热电偶 Model **SX-362K-02-1-TPC1-ANP**  
 Type E E型热电偶 Model **SX-362E-02-1-TPC1-ANP**

Temp. range 温度范围	Tolerance 精度	Response time 响应速度
-50 ~ 300°C	±2.5°C (Tolerance at 100°C surface) (于100°C金属表面的精度)	1 S 1秒

Model 型号 *1	SX-16*■	SX-17*■	SX-36*■	SX-37*■
Thermocouple type 热电偶种类	Type K or E K型或E型			
Temp. range 温度范围 *2	-50 ~ 300°C	-50 ~ 800°C	-50 ~ 300°C	-50 ~ 800°C
Tolerance 精度 *3	0°C	±2.5°C	±2.5°C	±2.5°C
	100°C	±2.5°C	±2.5°C	±2.5°C
	200°C	±2.5°C	±2.5°C	±2.5°C
	300°C	±2.5°C	±2.5°C	±2.5°C
	400°C	—	±3.0°C	—
	500°C	—	±3.8°C	—
	600°C	—	±9.0°C	—
	700°C	—	±10.5°C	—
	800°C	—	±16.0°C	—
Tolerance calculation method 精度的计算方法 t : Temperature (°C) t : 温度 (°C)	① 0°C ≤ t < 333°C : ±2.5°C ② 333°C ≤ t ≤ 500°C : ±(0.0075 ×  t )°C ③ 500°C ≤ t ≤ 700°C : ±(0.015 ×  t )°C ④ 700°C ≤ t ≤ 800°C : ±(0.02 ×  t )°C			
Calibration points of test report 校正点	100, 200, 300°C	100, 300, 500°C	100, 200, 300°C	100, 300, 500°C
Response time 响应速度 *4	1s 1秒			
Durability 耐久性 *5	More than 100,000 contacts at 300°C 300°C 10万回	More than 60,000 contacts at 800°C 800°C 6万回	More than 100,000 contacts at 300°C 300°C 10万回	More than 60,000 contacts at 800°C 800°C 6万回
Movable range of the head 头部摆动幅度	±4 degrees ±4°			
Contact strip material 感温片材质	Inconel 镍铬铁合金			
Head material 头部材质	Liquid crystal polymer 液晶聚合物	Stainless (SUS304) 不锈钢	Liquid crystal polymer 液晶聚合物	Stainless (SUS304) 不锈钢
Pipe material 钢管材质	Stainless 不锈钢 (SUS316)			
Grip material 握柄材质	Polyacetal 聚缩醛树脂			
Repair 修理	Repairable 可修理			

SX-171K-01-1-TPC1-ANP

1	Head size 头部大小	1	φ15mm
		3	φ10mm
2	Head material 头部材质	6	Liquid crystal polymer (for low temp.) 液晶聚合物 (低温用)
		7	SUS304 (for high temp.) SUS304 (高温用)
3	Pipe angle 钢管形状	1	Straight 直管
		2	45 degrees 45度弯曲
		3	90 degrees 90度弯曲
		4	90 degrees (elbow) 90度直角弯曲
4	Thermocouple type 热电偶型号	K	Type K K型热电偶
		E	Type E E型热电偶
5	Pipe length 钢管长度	00	30mm
		01	100mm
		02	200mm
		⋮	⋮
		10	1000mm
		⋮	⋮
		20	2000mm
6	Grip type 握柄有无	1	With grip 有握柄
7	Cable type 导线型号	TPC	Coiled cord 卷曲导线
	Cable length 导线长度	1	1m
8	Plug 插件型号	ANP	Miniature plug ANP插头
		ASP	Anritsu standard plug 标配插头
		W	Without plug 裸线
		WT3	Spade terminal for φ3mm Y端子 M3用
		WT4	Spade terminal for φ4mm Y端子 M4用
		WT5	Spade terminal for φ5mm Y端子 M5用
		WC3	Ring terminal for φ3mm O型端子 M3用
		WC4	Ring terminal for φ4mm O型端子 M4用
WC5	Ring terminal for φ5mm O型端子 M5用		

\*1 The asterisk (\*) is replaced by the number of the model name you selected. The (■) symbol is replaced by the corresponding thermocouple type (K or E). The rest of the type name is omitted.  
型号的 \*里, 输入能选择型号的数字, ■里输入热电偶种类 (K型或E型)。并, 省略热电偶种类以下的型号。

\*2 The operating temperature limit is determined by the allowable temperature limit of the sensor head contacts the measurement target. Note that the operating temperature limit is not the same as the allowable temperature limits of the grip, cord, and plug.  
使用极限温度是根据接触测试对象的感应器顶端的耐热温度来决定。请注意, 夹扣, 电线和插头等部分的耐热温度与使用极限温度有一定的差异。

\*3 Tolerance is available at 0°C or above within the operating temperature on a stationary flat and smooth metal surface.  
为测量0°C以上的静止光滑金属表面温度的精度。

\*4 The response time is the time required to detect 99% of the true value on a flat and smooth metal surface.  
响应速度是指, 测量0°C以上的静止光滑金属表面温度时达到99%的温度显示的速度。

\*5 Number of contacts enabling measurement within the tolerance range on a flat and smooth metal surface at a temperature.  
耐久性是指, 用机械法测量静止光滑金属表面, 且能保证测量结果在允许误差范围内时能使用的次数。