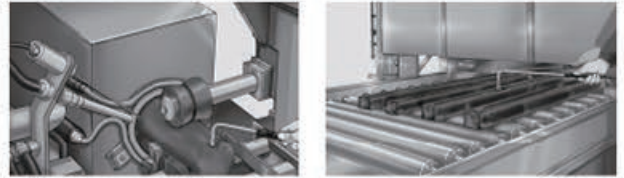


Model S/SX series

High Superior Surface Probes

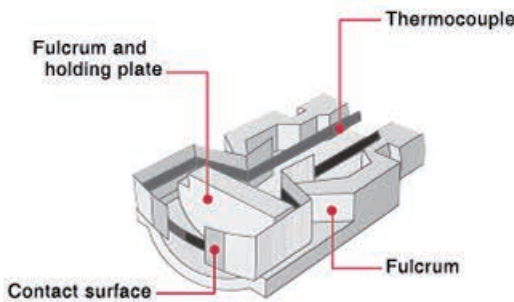


Temperature measurement of billet during induction heating
铝材诱导加热温度检测

Model S series probes are high-performance temperature sensors developed using Anritsu Meter's full range of proprietary technologies to achieve the highest levels of accuracy, response time, and durability. The head of the SX is tilted $\pm 4^\circ$, enabling stable measurement at the time of contact.

S系列为可测量金属·非金属等通用型高性能表面温度传感器。响应速度极快·耐久性最高的高等级产品。SX系列产品的头部可摆动 $\pm 4^\circ$ ，带接触辅助功能。更易与被测物表面密切接触，更简单的实现高次元的表面温度测量。

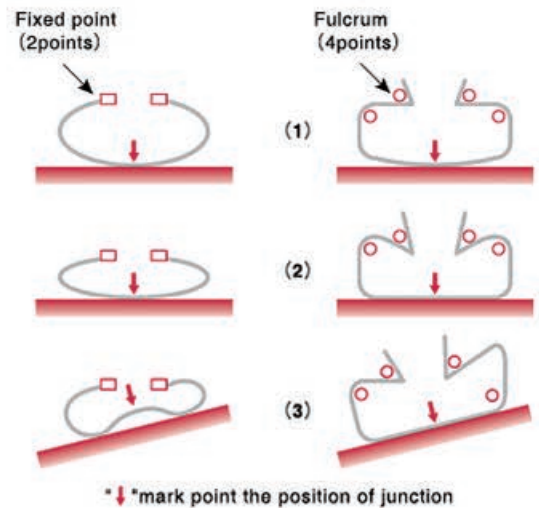
The greatest feature of Model S/SX series is the four-fulcrum structure.



Right illustration represents the transformation of the contact strip in Model S/SX series and traditional probe. Figure (2) of ideal contact condition is possible to measure the accurate temperature.

But, on condition of Figure (3) can not measure the accurate temperature because of transformation. Even if you repeated the measurement over and over times on conditions of (1) → (2) → (3), Model S/SX series is not transformed at all.

● Transformation of a contact strip



Accuracy, Test certificate

The traceability of temperature is administrated by the fixed point of temperature (ice point, boiling point of water, etc.), but it can not apply the rule in the surface temperature measurement. Anritsu Meter Co.,Ltd. established the original standard of surface temperature by development of the surface temperature calibration system. Model S/SX series are attached the test certificate by this calibration system.

Durability

The greatest feature of Model S/SX series is the four fulcrum structure. Model S/SX series realize a extreme durability to the severe temperature measurement.

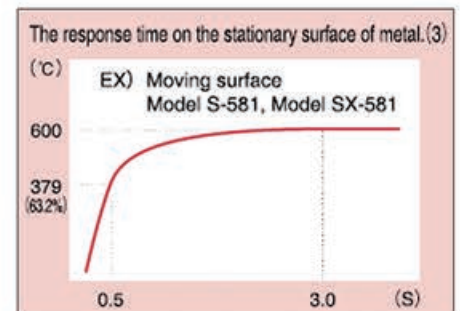
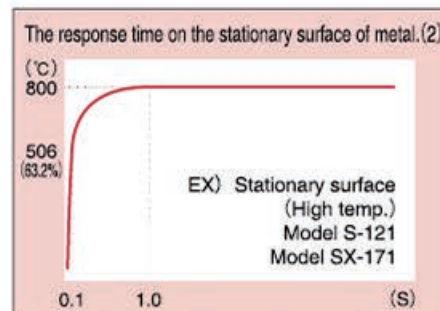
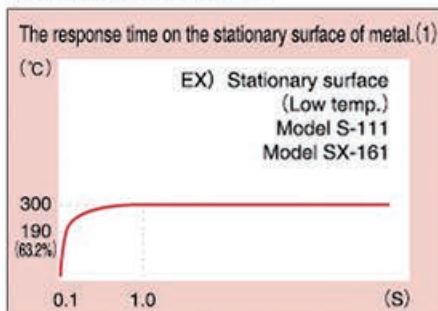
● Model S/SX series for the stationary surface (S-1, S-2, S-3, S-4, S-7, SX-1, SX-3)

On the metallic surface at 300°C	more than 100,000 contacts
On the metallic surface at 800°C	more than 60,000 contacts

● Model S/SX series for the moving surface (S-5, S-6, SX-5, SX-6)

On the steel plate with smooth surface at 300°C and speed of 200m / min	more than 2000 hours
On the steel plate with smooth surface at 600°C and speed of 200m / min	more than 1000 hours

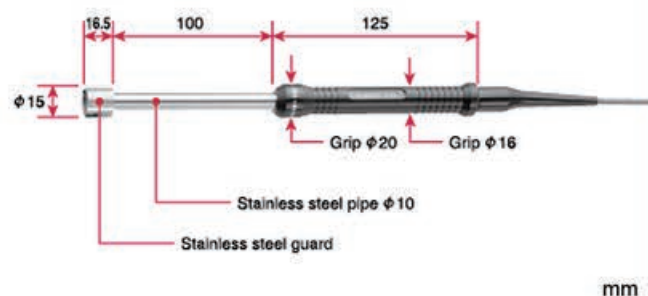
Response curve



Typical probes of S/SX series 典型产品

Type K Model S-121K-01-1-TPC1-ANP

Type E Model S-121E-01-1-TPC1-ANP

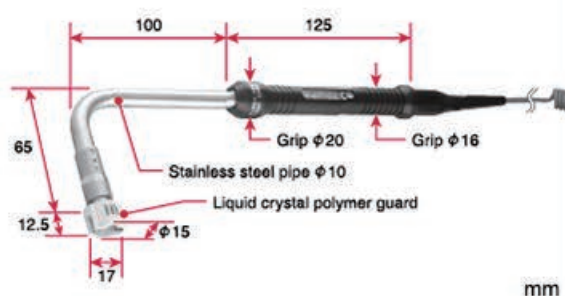


Temp. range	Tolerance	Response time	Durability
-50~800°C	±2.5°C (at 100°C surface)	1 s	※

Type K Model SX-163K-01-1-TPC1-ANP

Type E Model SX-163E-01-1-TPC1-ANP

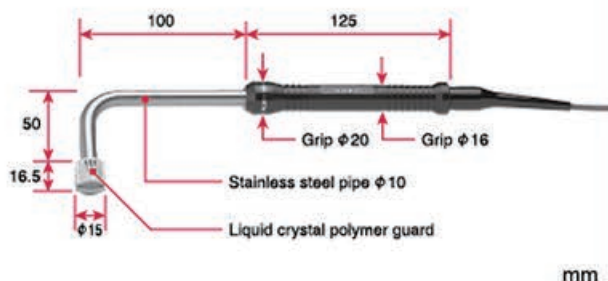
Contact support



Temp. range	Tolerance	Response time	Durability
-50~300°C	±2.5°C (at 100°C surface)	1 s	※

Type K Model S-213K-01-1-TPC1-ANP

Type E Model S-213E-01-1-TPC1-ANP

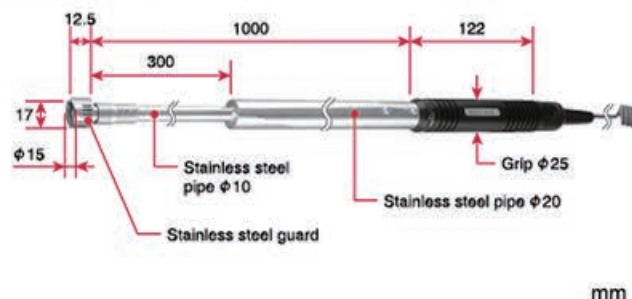


Temp. range	Tolerance	Response time	Durability
-50~300°C	±2.5°C (at 100°C surface)	1 s	※

Type K Model SX-171K-10-1-TPC1-ANP

Type E Model SX-171E-10-1-TPC1-ANP

Contact support



Temp. range	Tolerance	Response time	Durability
-50~800°C	±2.5°C (at 100°C surface)	1 s	※

Type K Model S-311K-00-1-TPC1-ANP

Type E Model S-311E-00-1-TPC1-ANP



Temp. range	Tolerance	Response time	Durability
-50~300°C	±2.5°C (at 100°C surface)	1 s	※

Type K Model SX-362K-01-1-TPC1-ANP

Type E Model SX-362E-01-1-TPC1-ANP

Contact support

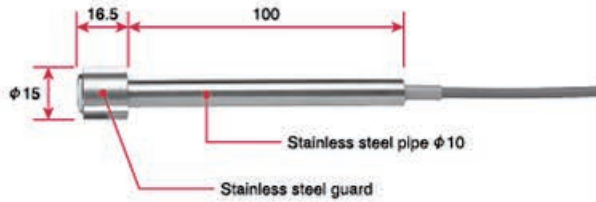


Temp. range	Tolerance	Response time	Durability
-50~300°C	±2.5°C (at 100°C surface)	1 s	※

※ Please refer to P31 for detail of durability.

Typical probes of S/SX series 典型产品

Type K Model S-121K-01-0-TC1-W
Type E Model S-121E-01-0-TC1-W

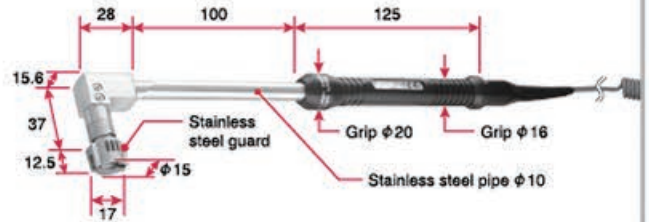


mm

Temp. range	Tolerance	Response time	Durability
-50~800°C	±2.5°C (at 100°C surface)	1 s	※

Type K Model SX-174K-01-1-TPC1-ANP
Type E Model SX-174E-01-1-TPC1-ANP

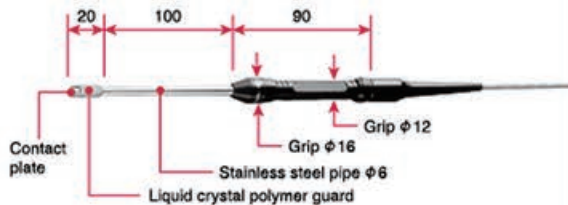
Contact support



mm

Temp. range	Tolerance	Response time	Durability
-50~800°C	±2.5°C (at 100°C surface)	1 s	※

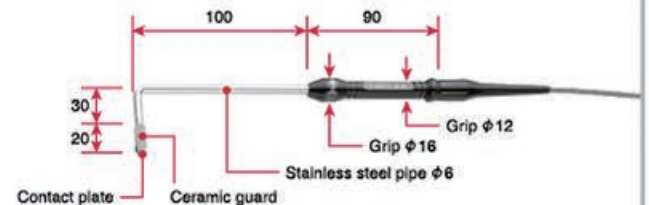
Type K Model S-411K-01-1-TPC1-ANP
Type E Model S-411E-01-1-TPC1-ANP



mm

Temp. range	Tolerance	Response time	Durability
-50~300°C	±2.5°C (at 100°C surface)	1 s	※

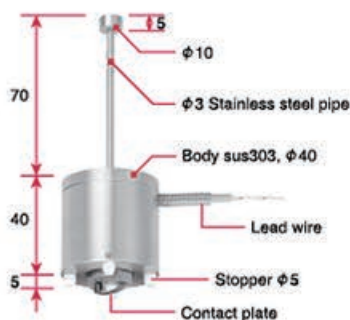
Type K Model S-423K-01-1-TPC1-ANP
Type E Model S-423E-01-1-TPC1-ANP



mm

Temp. range	Tolerance	Response time	Durability
-50~800°C	±2.5°C (at 100°C surface)	1 s	※

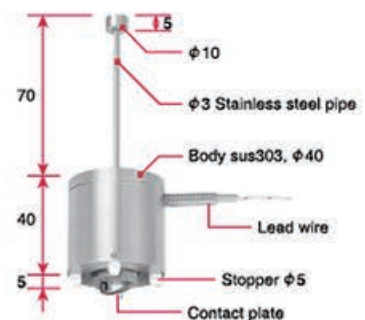
Type K Model S-770K-GW1-ANP
Type E Model S-770E-GW1-ANP



mm

Temp. range	Tolerance	Response time	Durability
-50~300°C	±2.5°C (at 100°C surface)	1 s	※

Type K Model S-780K-GW1-ANP
Type E Model S-780E-GW1-ANP

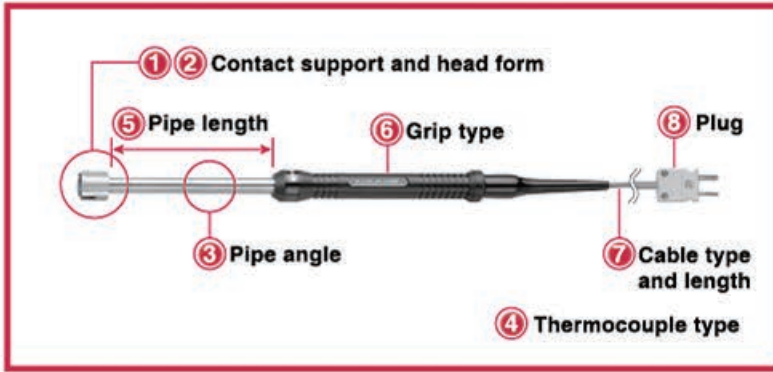


mm

Temp. range	Tolerance	Response time	Durability
-50~600°C	±2.5°C (at 100°C surface)	1 s	※

※ Please refer to P31 for detail of durability.

How to order of S/SX series 选型



No contact support **S-121K-01-1-TPC1-ANP**
 Contact support **SX-171K-01-1-TPC1-ANP**

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

① ② Contact support and head form 接触辅助和头部大小	<p>No contact support</p> <p>S-11 : φ 15mm (Liquid crystal polymer) MAX:300°C S-12 : φ 15mm (SUS303) MAX:800°C S-21 : φ 15mm (Liquid crystal polymer) MAX:300°C S-22 : φ 15mm (SUS303) MAX:800°C S-31 : φ 10mm (Liquid crystal polymer) MAX:300°C S-32 : φ 10mm (SUS303) MAX:800°C</p> <p>Contact support</p> <p>SX-16 : φ 15mm (Liquid crystal polymer) MAX:300°C SX-17 : φ 15mm (SUS304) MAX:800°C SX-36 : φ 10mm (Liquid crystal polymer) MAX:300°C SX-37 : φ 10mm (SUS304) MAX:800°C</p>
③ Pipe angle 钢管形状	<p>1 : Straight 2 : 45 degrees 3 : 90 degrees 4 : Elbow (Only SX)</p>
④ Thermocouple type 热电偶种类	<p>K : Chromel-Alumel E : Chromel-Constantan</p>
⑤ Pipe length 钢管长度	<p>00 : 30mm 01 : 100mm 02 : 200mm 10 : 1000mm</p>
⑥ Grip type 握柄	<p>1 : Standard grip 0 : No grip (Only S)</p>
⑦ Cable type and length 导线种类和长度 (See page 9)	<p>TPC1 (Coiled code, Length 1m only : 0.3m to 1.5m) TC1 (Only no grip type) Standard specifications : 1m The cable length can be specified each 0.5m.</p>
⑧ Plug 插头 (See page 8)	<p>ANP (For AM-9***, HR-1*5*, AP-450, AR-650*) ASP (For HR-1*0*, AP-400) W (Without plug)</p>

① ② Contact support and head form 接触辅助和头部大小

No contact support 无接触辅助

(mm)

Normal model

S-11 Temp. range :
-50~300°C

S-12 Temp. range :
-50~800°C



Allowable tilt ±8°

S-21 Temp. range :
-50~300°C

S-22 Temp. range :
-50~800°C



For measure small parts

S-31 Temp. range :
-50~300°C

S-32 Temp. range :
-50~800°C



Contact support 接触辅助型

(mm)

Normal model

SX-16 Temp. range :
-50~300°C

SX-17 Temp. range :
-50~800°C

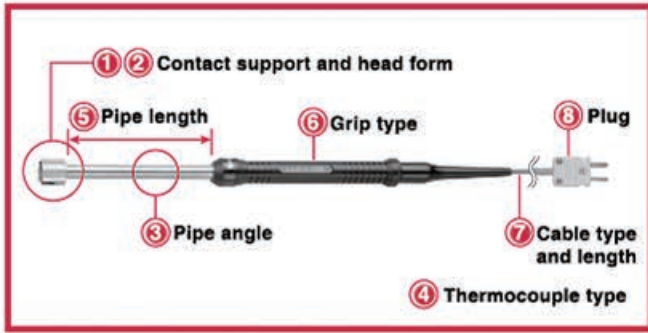


For measure small parts

SX-36 Temp. range :
-50~300°C

SX-37 Temp. range :
-50~800°C





No contact support
Contact support

S-121K-01-1-TPC1-ANP
SX-171K-01-1-TPC1-ANP

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

③ Pipe angle
钢管形状

	No contact support	Contact support
Straight	S-***1 	SX-***1
45 degrees	S-***2 	SX-***2
90 degrees	S-***3 	SX-***3
Elbow		SX-***4

※ The longer direction of the contact strip is parallel to the pipe.

④ Thermocouple type
热电偶种类

※ Select the same type of thermocouple as thermometer.

K Type K	E Type E
--------------------	--------------------

⑤ Pipe length
钢管长度

00 30mm **01** 100mm **02** 200mm **10** 1000mm

	S series No contact support	SX series Contact support
Straight		
45 degrees		
90 degrees		
Elbow		

⑥ Grip type
握柄

1 Standard grip	
0 No grip	※ Only S

⑦ Cable type and length
导线种类和长度

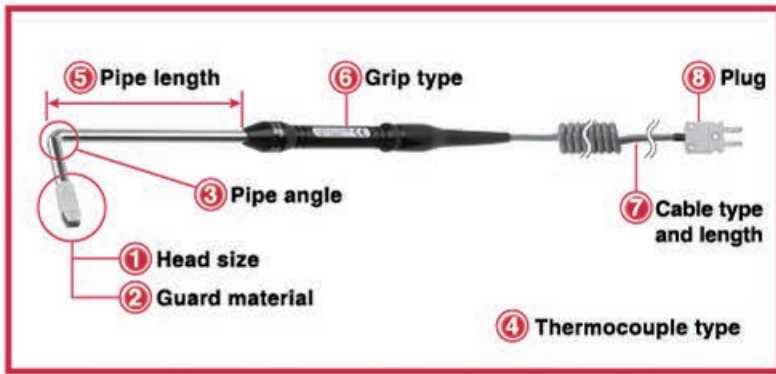
	Outer diameter	Heat resistant
TPC1 ※1	φ3.8mm	110℃
TC1 ※2	φ4mm	240℃

※1 Coiled code / Extension range : 0.3m to 1.5m / Length 1m only

※2 Standard specifications : 1m
The cable length can be specified each 0.5m.

⑧ Plug
插头

ANP For AM-9*** HR-1*5* AP-450 AR-650*	
ASP For HR-1*0* AP-400	
W Without plug	



S-423K-01-1-TPC1-ANP



① ② Head size / Guard material 头部大小和材质	41 : □6×7mm Liquid crystal polymer (MAX:300°C) 42 : □6×7mm Ceramic (MAX:800°C)
③ Pipe angle 钢管形状	1 : Straight 2 : 45 degrees 3 : 90 degrees
④ Thermocouple type 热电偶种类	K : Chromel-Alumel E : Chromel-Constantan
⑤ Pipe length 钢管长度	00 : 30mm 01 : 100mm 02 : 200mm 05 : 500mm
⑥ Grip type 握柄	1 : Standard grip 0 : No grip
⑦ Cable type and length 导线种类和长度 (See page 9)	TPC1 (Coiled code, Length 1m only: 0.3m to 1.5m) TC1 (Only no grip type) Standard specifications: 1m The cable length can be specified each 0.5m.
⑧ Plug 插头 (See page 8)	ANP (For AM-9***, HR-1*5*, AP-450, AR-650*) ASP (For HR-1*0*, AP-400) W (Without plug)

① Head size 头部大小

② Guard material 材质

S-41 Temp. range : -50~300°C Liquid crystal polymer	S-42 Temp. range : -50~800°C Ceramic

③ Pipe angle
钢管形状



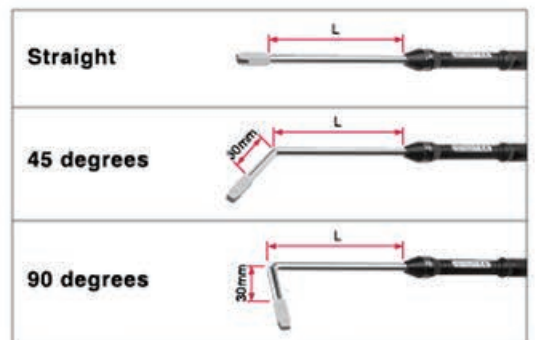
④ Thermocouple type
热电偶种类

※ Select the same type of thermocouple as thermometer.

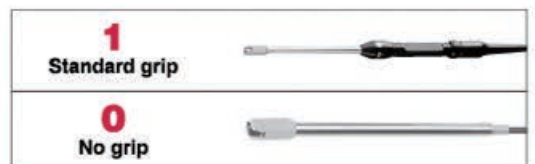
K Type K	E Type E
--------------------	--------------------

⑤ Pipe length
钢管长度

00 01 02 05
30mm 100mm 200mm 500mm



⑥ Grip type
握柄



⑦ Cable type and length
导线种类和长度

Standard	Outer diameter	Heat resistant
TPC1 ^{※1}	φ3.8mm	110°C
TS1 ^{※2}	φ2.3mm	240°C

※1 Coiled code / Extension range :
0.3m to 1.5m / Length 1m only

※2 Standard specifications : 1m
The cable length can be specified each 0.5m.

Specifications of S/SX series 规格

Model number ^{※1}	S-11* S-21* S-31*	S-12* S-22* S-32*	SX-16* SX-36*	SX-17* SX-37*	S-41*	S-42*
Thermocouple type	Type K or E					
Temp. range ^{※2}	-50~300℃	-50~800℃	-50~300℃	-50~800℃	-50~300℃	-50~800℃
Tolerance ^{※3}	-50℃	±2.5℃	±2.5℃	±2.5℃	±2.5℃	±2.5℃
	0℃	±2.5℃	±2.5℃	±2.5℃	±2.5℃	±2.5℃
	100℃	±2.5℃	±2.5℃	±2.5℃	±2.5℃	±2.5℃
	200℃	±2.5℃	±2.5℃	±2.5℃	±2.5℃	±2.5℃
	300℃	±2.5℃	±2.5℃	±2.5℃	±2.5℃	±2.5℃
	400℃	—	±3.0℃	—	±3.0℃	—
	500℃	—	±3.8℃	—	±3.8℃	—
	600℃	—	±9.0℃	—	±9.0℃	—
	700℃	—	±10.5℃	—	±10.5℃	—
	800℃	—	±16.0℃	—	±16.0℃	—
Tolerance calculation method t: Temperature (℃)	At within temperature range 1) -50℃ ≤ t < -40℃ : ±2.5℃ 2) -40℃ ≤ t ≤ 500℃ : ±2.5℃ or ±(0.0075× t)℃, whichever is greater 3) 500℃ < t ≤ 700℃ : ±(0.015× t)℃ 4) 700℃ < t ≤ 800℃ : ±(0.02× t)℃					
Calibration points of test report	100, 200, 300℃	100, 300, 500℃	100, 200, 300℃	100, 300, 500℃	100, 200, 300℃	100, 300, 500℃
Response time ^{※4}	0.1~0.15s (63.2%) 0.3~0.4s (90%) 1s (99%)					
Durability ^{※5}	More than 100,000 contacts at 300℃	More than 60,000 contacts at 800℃	More than 100,000 contacts at 300℃	More than 60,000 contacts at 800℃	More than 100,000 contacts at 300℃	More than 60,000 contacts at 800℃
Allowable tilt	S-11* : ±4° S-21* : ±8° S-31* : ±4°	S-12* : ±4° S-22* : ±8° S-32* : ±4°	—	—	±5°	±5°
Movable range of the head	—		±4°	±4°	—	
Head materials	Liquid Crystal Polymer	Stainless (SUS303)	Liquid Crystal Polymer	Stainless (SUS304)	Liquid Crystal Polymer	Ceramic
Pipe materials	Stainless (SUS316)				Stainless (SUS304)	
Contact plate material	Inconel thickness t = 100μm				Inconel thickness t = 50μm	
Grip material	Polyacetal					

※1 The asterisk (*) is replaced by the number of the model name you selected. The model number after thermocouple type is omitted.

※2 The operating temperature limit is determined by the allowable temperature limit of the sensor head contacts the measurement target.

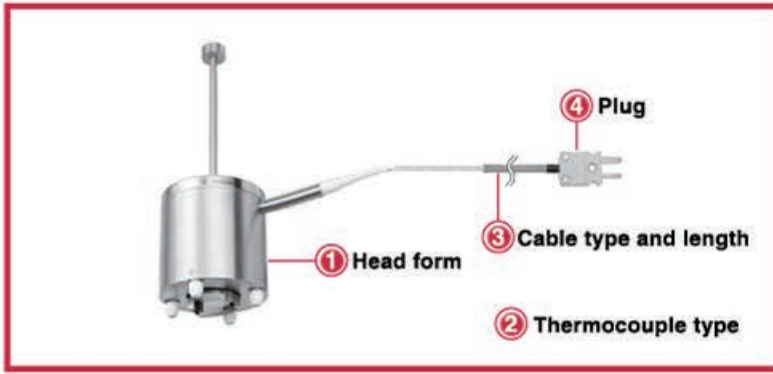
Note that the operating temperature limit is not the same as the allowable temperature limits of the grip, cable, and plug.

※3 Tolerance is available at -50℃ or above within the operating temperature on a stationary flat and smooth metal surface.

For tolerance at temperature not listed in the above table, please refer to calculation method of tolerance.

※4 The response time is the time required to detect the true value on a flat and smooth metal surface.

※5 Number of contacts enabling measurement within the tolerance range on a flat and smooth metal surface.

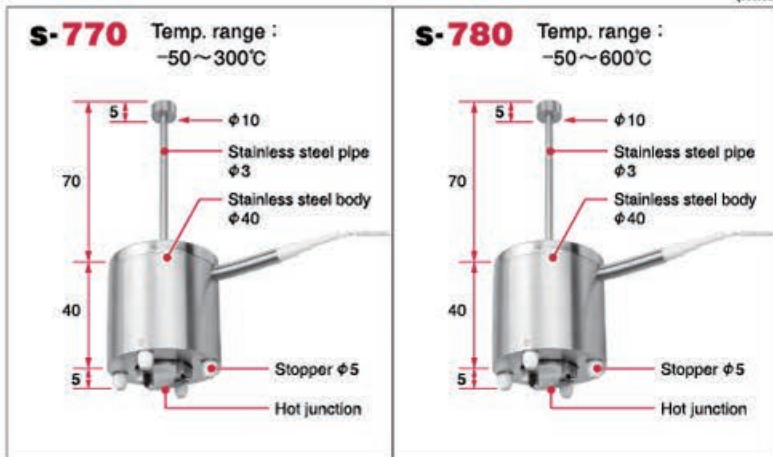


S-780K-GW1-ANP



① Head form 头部	770 : Self Supporting type (φ40mm) -50~300°C 780 : Self Supporting type (φ40mm) -50~600°C
② Thermocouple type 热电偶种类	K : Chromel-Alumel E : Chromel-Constantan
③ Cable type and length 导线种类和长度 (See page 9)	GW Standard specifications : 1m The cable length can be specified each 0.5m.
④ Plug 插头 (See page 8)	ANP (For AM-9***, HR-1*5*, AP-450, AR-650*) ASP (For HR-1*0*, AP-400)

① Head form 头部



② Thermocouple type 热电偶种类

※ Select the same type of thermocouple as thermometer.

K Type K	E Type E
--------------------	--------------------

③ Cable type and length 导线种类和长度

Standard	Outer diameter	Heat resistant
GW1 *	1.2mm×1.7mm	300°C

※ Standard specifications : 1m
The cable length can be specified each 0.5m.

④ Plug 插头



Specifications of S-7 series 规格

Model number	S-770	S-780	
Thermocouple type	Type K or E		
Temp. range	-50~300°C	-50~600°C	
Tolerance	-50°C	±2.5°C	±2.5°C
	0°C	±2.5°C	±2.5°C
	100°C	±2.5°C	±2.5°C
	200°C	±2.5°C	±2.5°C
	300°C	±2.5°C	±2.5°C
	400°C	-	±3.0°C
	500°C	-	±3.8°C
600°C	-	±9.0°C	
Tolerance calculation method t: Temperature(°C)	At within temperature range 1) -50°C ≤ t < -40°C : ±2.5°C 2) -40°C ≤ t ≤ 500°C : ±2.5°C or ±(0.0075× t)°C, whichever is greater 3) 500°C < t ≤ 600°C : ±(0.015× t)°C		
Calibration points of test report	100, 200, 300°C	100, 300, 500°C	
Response time	0.1~0.15s (63.2%) 0.3~0.4s (90%) 1s (99%)		
Durability	More than 100,000 contacts at 300°C	More than 60,000 contacts at 600°C	
Body material	Ceramic		
Contact plate material	Inconel thickness t = 50 μm		
Weight	380g		

※ Please see website specifications of S-7 series.