

# RESISTANCE THERMOMETER (RTD) 白金測溫阻抗體

## TYPE OF RTD SENSOR 白金測溫阻抗體種類

JIS C1604-1997

normal resistance value at 0 °C 0 °C 阻抗值	class 等級	measuring current 規定電流	R100 / R0
Pt100Ω JPt100Ω	A	below 2 m A	1.3851
	B		1.3916

- Note : 1. R100 is the resistance value of the sensing resistor at 100°C      註:1. R100 為在 100°C時阻抗元件之阻抗值。  
 2. R0 is the resistance value of the sensing resistor at 0°C      2. R0 為在 0°C時阻抗元件之阻抗值。  
 3. JPt100 was abolished from JIS      3. JPt100 已經廢止。

## TOLERANCE of RTD 白金測溫阻抗體精確度

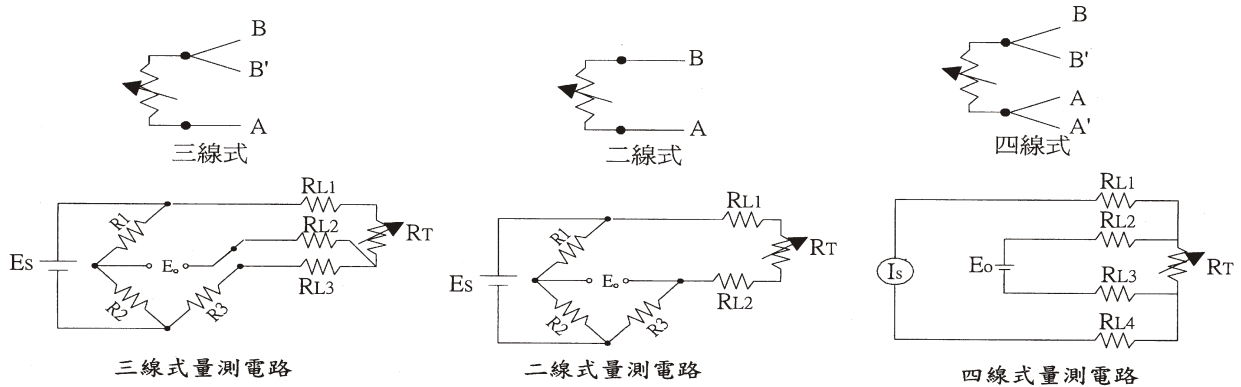
規格 種類	JIS C1604-1997 IEC Pub.751-1983	
	class 等級	tolerance 容許差 (°C)
Pt100Ω R100 / R0 = 1.3851	A	+/- ( 0.15+0.002 t  )
	B	+/- ( 0.3+0.005 t  )

- Note 1. Tolerance is defined as the maximum allowable deviation from the temperature vs. resistance reference table.      註:1. 容許誤差為阻抗元件之量測阻抗值依標準阻抗值表所換算之值(溫度)減去測定溫度所得值，該差值最大限度之容許值之稱為容許誤差。  
 2. |t| = modulus of temperature in degrees Celsius without regard sign.      2. |t| 為無關 +、- 符號以溫度(°C)表示之測定溫度。

## RTD TEMPERATURE RANGE

LOW TEMP(低溫) : -200 ~ +100 °C	MID TEMP(中溫) : 0 ~ +350 °C	HIGH TEMP(高溫) : 0 ~ +600 °C
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## WIRING METHOD OF RTD SENSOR 測溫阻抗體之結線方式



### Two-conductor type:

Since a conductor resistance is added to the resistance value, it is necessary to reduce the conductor resistance in advance. This type is not usually used, except for a high resistance RTD's.

### Three-conductor type:

Use to eliminate the effect of conductor resistance, care should be taken for long-distance transmission because a variation of resistance of conductors has an effect on accuracy. This type of connection is most widely used in industrial applications.

### Four-conductor type:

This type of connection is used for high-accuracy measurement and standards because it is not affected by conductor resistance. Generally, a constant current is applied and the resistance value is measured by a potential difference.

### 2 導線式:

因阻抗值須加算導線阻抗，雖然導線阻抗值非常小，但有必要於開始就知道導線之阻抗值。相較之下，R 為高阻抗之場合以外不太被使用之型式。

### 3 導線式:

一般最常被採用的型式。此種型式各導線之材質、線徑、長度與線阻抗要相等，且全長之溫度分佈必須要等溫。因導線 3 線之差異將對於精度有不良之影響，在長距離傳輸時必須要注意。



### 4 導線式:

導線阻抗並不會對精度造成很大之影響，被使用在高精度計測時。一般量測時給與固定電流，再依電位差測定阻抗值。

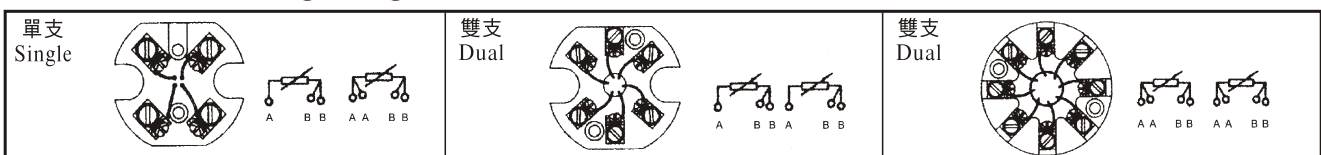
## MINERAL INSULATED RTD (金屬被覆熱電阻元件)

1. wide application in measuring small diameter is very useful for the place where space is at premium .  
應用範圍廣,受空間限制小直徑特別有用。
2. quick response 反應速率快。
3. easily bent for installation 可撓性大。
4. long life span 壽命長。
5. excellent mechanical strength and pressure resistance 機械強度及耐壓性強。

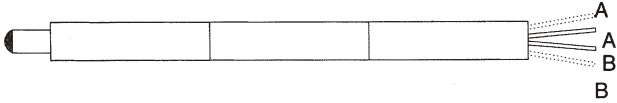
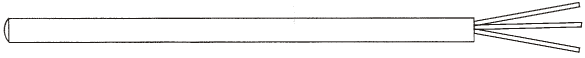
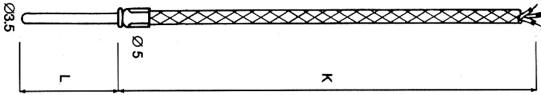
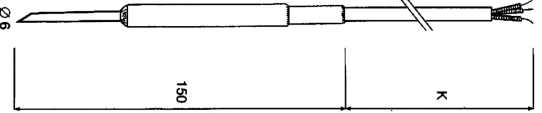
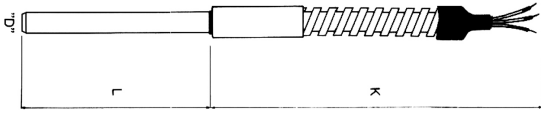
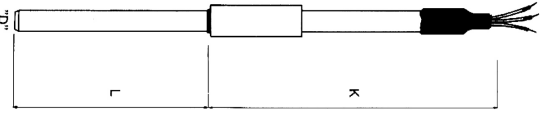
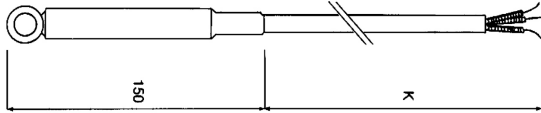
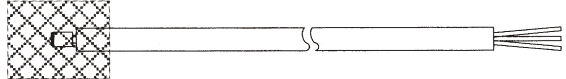

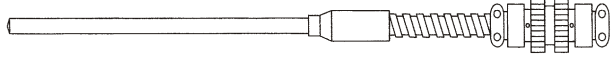
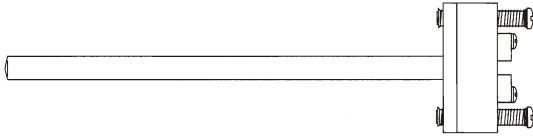
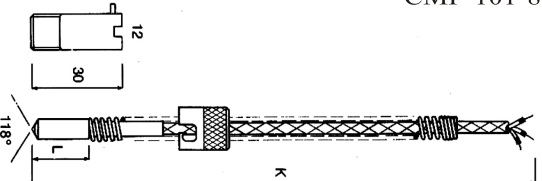
### standard specification of AEROPAK<sup>®</sup> sheath RTD

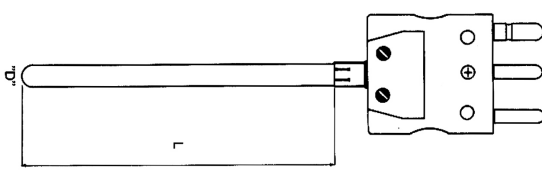
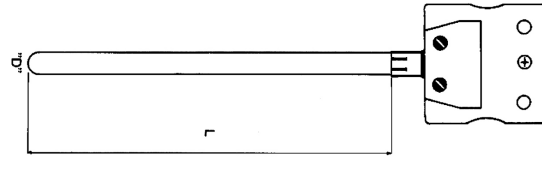
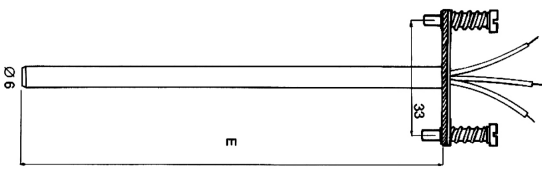
	sheath ( mm )			wire dia ( mm )素線徑	maximum length ( M ) 最大長度 ( 米 )
	O.D 外徑	t 肉厚	MATERIAL 材質		
SINGLE ELEMENT(單組) 	Ø 1.6	0.25	SUS 316	Ø 0.25	100
	Ø 3.2	0.47		Ø 0.51	83
	Ø 4.8	0.72		Ø 0.76	35
	Ø 6.4	0.93		Ø 1.00	20
	Ø 8.0	1.16		Ø 1.30	11.5
	Ø 9.0	1.25		Ø 1.46	21
	Ø 12.75	1.8		Ø 1.50	10.5
	DOUBLE ELEMENT (雙組) 	Ø 3.2		0.38	Ø 0.3
Ø 4.8		0.72	Ø 0.5	35	
Ø 6.4		0.93	Ø 0.72	20	
Ø 8.0		1.16	Ø 0.9	11.5	
Ø 9.0		1.25	Ø 1.00	21	
Ø 12.75		1.8	Ø 1.5	10.5	

### 熱電阻接線圖 Wring diagram of RTD

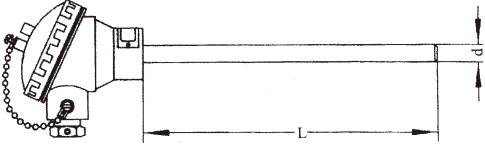
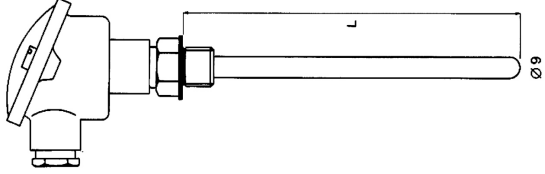
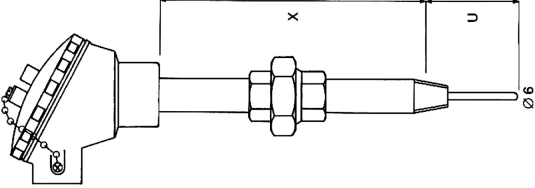
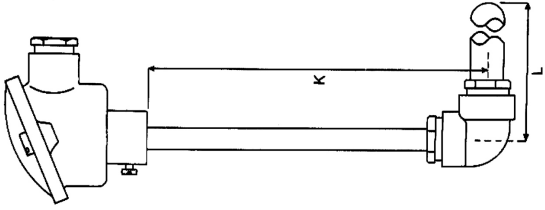
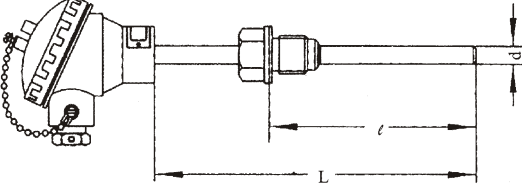
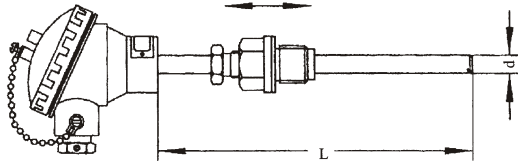
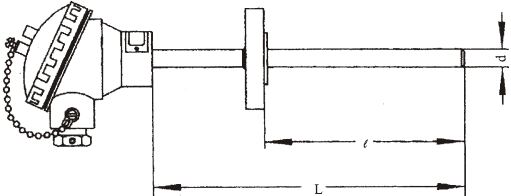
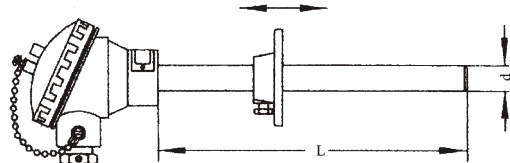
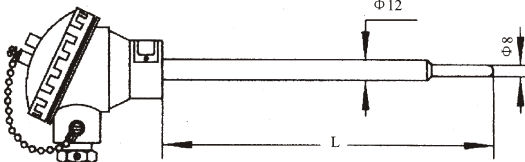
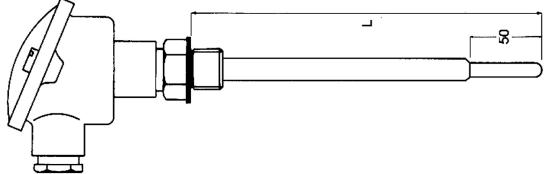
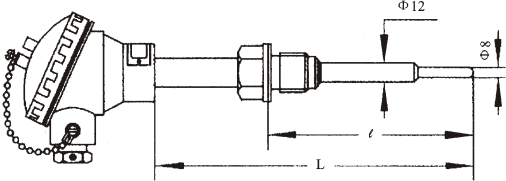
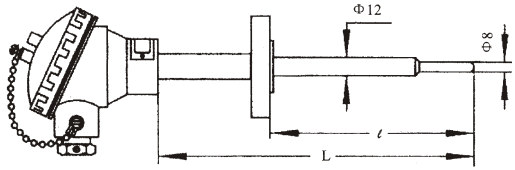


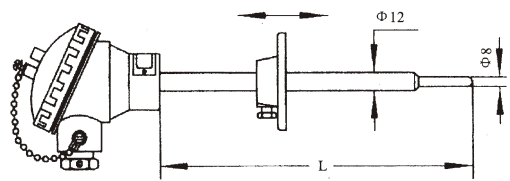
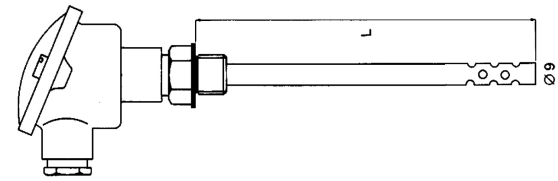
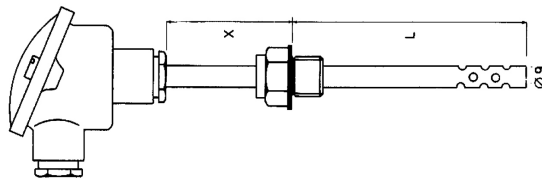
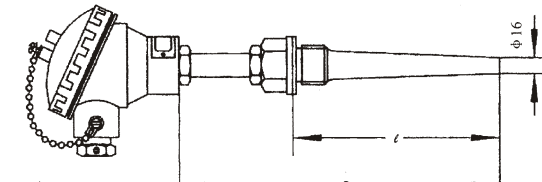
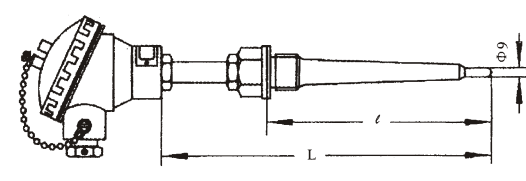
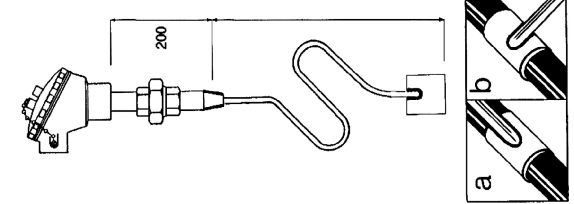
**GENERAL RTD (1) 一般熱電電阻型式 (1)**

<p>Basic RTD 基本型</p>	<p>general purpose tube and wire RTD 金屬被覆型</p>
<p>CMP-201</p> 	<p>CMP-201-6</p> 
<p>Flexible RTD extension 延長型</p>	<p>general purpose tube and wire RTD 金屬被覆型</p>
<p>CMP-203</p> 	<p>CMP-201-6a</p> 
<p>General purpose tube and armor wire RTD 金屬蛇管被覆型</p>	<p>general purpose tube and wire RTD 金屬被覆型</p>
<p>CMP-201-6b</p> 	<p>CMP-201-6c</p> 
<p>O Type general purpose tube and wire RTD 末端O型金屬被覆型</p>	<p>spade RTD 片狀型</p>
<p>CMP-201-6F</p> 	<p>CMP-201S</p> 
<p>threaded nozzle RTD 螺絲嵌入型 (2)</p>	<p>armor adjustable immersion RTD 金屬蛇管彈簧可調浸入型</p>
<p>CMP-201B</p> 	<p>CMP-201C</p> 
<p>DIN terminator RTD DIN 型端子</p>	<p>Spring adjustable immersion RTD 彈簧可調浸入型</p>
<p>CMP-205DIN</p> 	<p>CMP-101-8</p> 

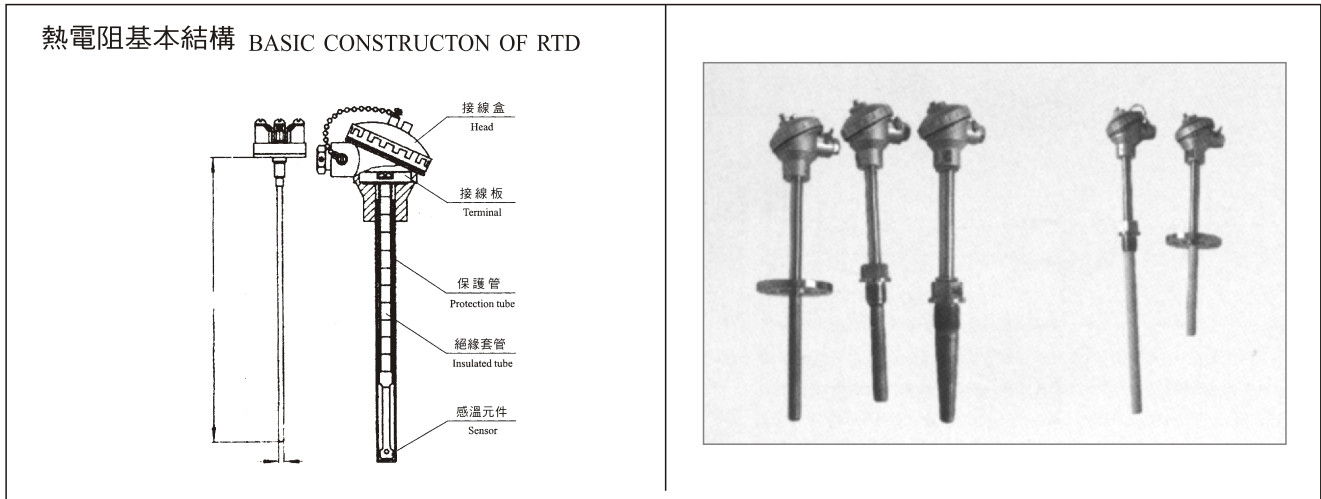
Plug RTD 快速接頭熱電阻	Plug RTD 快速接頭熱電阻
SP-70M 	SP-70FE 
Round plate RTD 圓盤熱電阻	
SP-70R 	

model 型號	CMP 201, 201-6, 203, 201-6a, 201-6b, 201-6c, 201-6F, 201s, 201c, 101-8 201-B, 205DIN, SP-70R, SP-70M, SP-70FE		
type of element 類型	A =Pt 100 Ω , B =JPt 100 Ω , C =Pt 500 Ω , D =OTHER ,		
element quantity 測溫點數量	S=Single , D=DUAL , O=OTHER		
process connection parts 製程接和附件	5 =None , 7=fixed type bushing , 8=compression fitting , 9=compression fitting with bushing 10=compression fitting with bayonet cap and spring if need connection parts , See page (20,21) please note connection size : _____ inch ( PT , NPT, G , R )		
terminal connector 接線端子	O=O type Y=Y type, T=T type, S=standard connector, M=mini connector see page(19)		
probe material 外管材質	S4=SUS304 , S6=SUS316, S10 = SUS310 , NCF=INCONEL 600 , CERA=ceramic , TEF = Teflon		
probe diameter 外管直徑	Ø1.6 mm , Ø2.3 mm , Ø3.2 mm , Ø4.8 mm , Ø6.4 mm , Ø9 mm , Ø12.7 mm , Ø21.7 mm , specify		
probe length 外管長度	_____ mm		
lead wire length 導線長度	flexible SUS316 tube armor length (if need) + leadwire length		
lead wire insulated material 導線絕緣材質	PVC, fiber glass teflon, (page 25,26,27)		
measuring junction 測溫點種類	2= 2 wired , 3= 3 wired , 4= 4 wired		
CLASS 等級	A= CLASS A , B =CLASS B		

無固定裝置式熱電阻 Non-Fixed Type RTD	固定螺栓式熱電阻 Fixed Screw-In Type RTD
CMP-207 	CMP-206 
延長型熱電阻 Extended type RTD	角尺式熱電阻 Right angle RTD
CMP-206 UN 	CMP-207L 
固定螺栓式熱電阻 Fixed Screw-In Type RTD	活動螺栓式鉑熱電阻 Movable Screw-In Type Pt-RTD
CMP-206-1 	CMP-206M 
固定法蘭式熱電阻 Fixed Flange Type RTD	活動法蘭式熱電阻 Movable Flange Type RTD
CMP-207F 	CMP-207MF 
無固定裝置變徑式鉑熱電阻 Non-Fixed Type Pt-RTD With Variable Diameter	固定螺栓變徑式熱電阻 Fixed Screw-in With Variable diameter RTD
CMP-207 IV1 	CMP-206 IV1 
固定螺栓變徑式鉑熱電阻 Fixed Screw-in Type Pt-RTD With Variable Diameter	固定法蘭變徑式鉑熱電阻 Fixed Flange Type Pt-RTD With Variable Diameter
CMP-206 IV2 	CMP-207 VFF 

活動法蘭變徑式鉑電阻 Movable Flange Type Pt-RTD With Variable Diameter	空氣用熱電阻 Air type RTD
<p>CMP-207VMF</p> 	<p>CMP-206 Air 1</p> 
空氣用熱電阻 Air type RTD	固定螺紋錐形保護管式鉑熱電阻 Fixed Screw-In Type Pt-RTD with Tapered Drilled Tube
<p>CMP-206 Air 2</p> 	<p>CMP-207 ITW</p> 
固定螺紋錐形保護管變長式鉑熱電阻 Fixed Screw-in Pt-RTD With Variable Diameter Tapered Drilled Thermoweli	延長型熱電阻 Extended sheath type RTD
<p>CMP-207-IVTW</p> 	<p>CMP-206 UN-SH</p> 

## RTD basic model & appearance shape ( 熱電阻元件基本型式和外觀)



model 型號	CMP 206, 207, 206NU, 207L, 206-1, 206M, 207F, 207MF, 207-IV1, 206-IV1, 206-IV2, 207-VFF, 207-VMF, 206-Air1, 206-Air2, 207-ITW, 207-IVTW, 206-UNSH		
type of element 種類	A =Pt 100 Ω , B =JPt 100 Ω , C =Pt 500 Ω , D =OTHER ,		
element quantity 測溫點數量	S=Single , D=DUAL , O=OTHER		
probe extension & connection type 測溫管接和方式	5 =None , 6NUN=nipple-union-nipple , 6N=Nipple, 6NU=nipple-union 7=fixed type bushing , 8=compression fitting , 9=compression fitting with bushing Page(19,20,21) if need extension parts , please note extension length = ____ mm & connection size : ____ inch PT ( or other ) ,		
spring loaded 彈簧伸縮	0=with , 1=without		
terminal head 接線盒	KB , KNC , KI , KD , KT , LS, 1080AE(explosion) ,1080SE(explosion) Page( 18 )		
PROBE MATERIAL 測溫管材質	S4=SUS304 , S6=SUS316, S10 = SUS310 , NCF=INCONEL 600 , TEF =Teflon		
probe diameter 測溫管直徑	Ø1.8 mm , Ø2.3 mm , Ø3.2 mm , Ø4.8 mm , Ø6.4 mm , Ø9 mm , Ø12.7 mm , Ø21.7 mm ,specific		
probe length 測溫管長度	_____ mm		
measuring junction 測溫點種類	2= 2 wired , 3= 3 wired , 4= 4 wired		
CLASS 等級	Class A Class B		
THERMOWELL 保護套管	TW=with thermowell NTW=without thermowell (see page 22,23,24)		