

# CONVENTIONAL TYPE THERMOCOUPLE ASSEMBLIES

NEW-FLOW conventional type thermocouple is high precision and reliability measuring temperature sensor.

## Technical Data

**Head housing:** IP65 & IP67. Explosion proof available. R type available.

**Insulator Dial Size:** Ø4.0~Ø6.0 mm on request

**Insulated material:** Ceramic

**Protection tube material:** Metal, Non-metal. Refer to protection tube table.

**Working temperature limited:** -200~1700°C according to applicable standards table.

**Measuring junction type:** Grounded type, Ungrounded type, Ungrounded separated type



## Thermocouple Model

**Protection Well: Metal**

(A-1) CDC Type      (A-2) CFC Type      (A-3) CTC Type

**Protection Well: Non-Metal**      \* Ceramic Tube Style Type

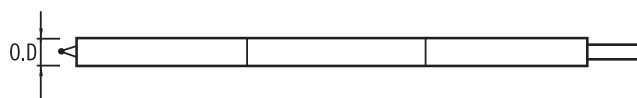
(B-1) CDC Type      (B-2) CFC Type      (B-3) CTC Type

## Applicable Standards Table

Standard	IEC 584-2-1982 / JIS C1605-1995			ASTM E230-1996		
	Class	Temp. Range(°C)	Tolerance	Class	Temp. Range(°C)	Tolerance
<b>B</b>	2	600~1700	±0.0025 t	STD.	870~1700	±0.5%
	3	600~800	±4			
		800~1700	±0.005 t			
<b>R &amp; S</b>	1	0~1100	±1	STD.	0~1450	±1.5 or ±0.25%
	2	0~600	±1.5	SP.		±0.6 or ±0.1%
			600~1600		±0.0025 t	
	<b>N</b>	1	-40~+375	±1.5	STD.	0~1260
+375~+1000			±0.004 t			
2		-40~+133	±2.5	SP.		±1.1 or ±0.4%
		+333~+1200	±0.0075 t			
3		-167~40	±2.5	STD.	-200~0	±2.2 or ±2%
		-200~-167	±0.015 t			

\*|t| : display temperature (°C) on request range.

## Wire Element With Ceramic Insulator



O.D.    Ø4.0    Ø6.0

## Thermowell Tube Table

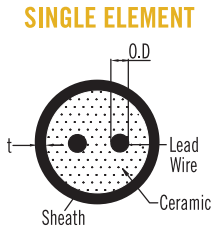
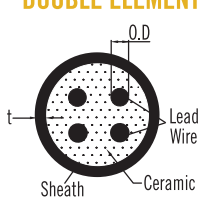
### A. Metal

Material	Max. Temp. Limit (°C)		Symbol	Dimension (∅mm)		Max Length (mm)
	Nor.	Max.		O.D	I.D	
SS316	850	950	C	10	7	2000
				12	9	
				15	11	3950
				21.7	15.7	
SS316L	850	950	CL	10	7	2000
				12	9	
				15	11	3950
				21.7	16.1	
SS304	850	950	A	10	7	2000
				12	9	
				15	11	3950
				21.7	15.7	
SS310S	1050	1100	D	15	7	3950
				21.7	16.1	
				27.2	21.4	
Titanium	250	500	T	15	11	3950
				17.3	12.7	
				21.7	16.1	
				27.2	21.6	
Kanthal AF	1100	1300	K	22	16	3950
NCF600 (Inconel 600)	1000	1250	B	22	16	3950
Sandvik P4	1050	1100	P	21.7	16.1	3950
				21.3	16	
				26.9	21.6	
UMCo 50	1150	1200	U	22	16	3950
				27	21	

### B. Non-Metal

Material	Max. Temp. Limit (°C)		Symbol	Dimension (∅mm)		Max Length (mm)
	Nor.	Max.		O.D	I.D	
Silicon Carbide	1650	-	GK	20	12	1000
				by25	17	
				30	20	
				35	25	
				40	25	
				45	30	
Alumina	1600	1700	P1	8	5	1000
				10	6	
				13	9	
				15	11	
				17	13	
				20	15	
High Alumina	1700	1900	P0	8	5	1000
				10	6	
				13	9	
				15	11	
				20	16	
				15	6	
20	10					

## Working Temperature Limits In Wire Of Element Dimension Size

 SINGLE ELEMENT	Thermocouple Type	Wire Dia.		Working Temperature Limit (°C)		Available Dimensions Protection Tube (∅ mm)	
		Symbol	O.D.	Nor.	Max.	Metal Tube	Non-Metal Tube
 DOUBLE ELEMENT	B	L	0.5	1500	1700	—	15x11
	R	L	0.5	1400	1600	—	15x11
	S	L	0.5	1400	1600	—	15x11
	N	A	1.0	950	1000	21.7x16.1	—
B		1.6	1050	1100	21.7x16.1	—	
C		2.3	1100	1150	15x11	—	
D		3.2	1200	1250	12x9	—	

## Measuring Junction Type



(A) Grounded Type



(B) Ungrounded Type



(C) Ungrounded Separated Type

- (A) It is not suitable for using in location such as electromagnetic induction interfered by radio frequency.  
 (B) It has response slower than grounded. But ensured a long life, it is available for measuring in various location.  
 (C) It could be used in two control loop separately.

## Material Of Thermocouple Element

Type		Feature
Symbol	Composition	
B	Pt-30Rh/Pt-6Rh	(+) <b>Positive Wire:</b> Platinum-rhodium alloy –30% rhodium and 70% platinum. (-) <b>Negative Wire:</b> Platinum-rhodium alloy –6% rhodium and 94% platinum.
R	Pt-13Rh/Pt	(+) <b>Positive Wire:</b> Platinum-rhodium alloy –13% rhodium and 87% platinum. (-) <b>Negative Wire:</b> PurePlatinum
S	Pt-10Rh/Pt	(+) <b>Positive Wire:</b> Platinum-rhodium alloy –10% rhodium and 90% platinum. (-) <b>Negative Wire:</b> PurePlatinum
N	Ni-Cr-Si/Ni-Si	(+) <b>Positive Wire:</b> Nicrosil (-) <b>Negative Wire:</b> Nisil

## Ordering Information

Model	CDC	CFC	CTC			
<div style="display: flex; justify-content: space-between; width: 100%; margin-bottom: 5px;"> <div style="width: 100px;">↓</div> <div style="width: 100px;">↓</div> <div style="width: 100px;">↓</div> <div style="width: 100px;">↓</div> <div style="width: 100px;">↓</div> <div style="width: 100px;">↓</div> <div style="width: 100px;">↓</div> <div style="width: 100px;">↓</div> <div style="width: 100px;">↓</div> <div style="width: 100px;">↓</div> <div style="width: 100px;">↓</div> <div style="width: 100px;">↓</div> <div style="width: 100px;">↓</div> <div style="width: 100px;">↓</div> </div>	<b>Code</b>	<b>Head Housing Protection</b>				
		IP65 & IP67 (1) HN (2) HP (3) HD (4) HI (5) HB				
		Explosion proof (6) KS (7) S1 (8) S2				
	<b>Code</b>	<b>Conduit Connection</b>				
	A	1/2"NPT Female	B	3/4"NPT Female	0	option
	<b>Code</b>	<b>Element Type</b>				
		B	R	S	N	
	<b>Code</b>	<b>Element No</b>				
	S	Single		D	Double	
	<b>Code</b>	<b>Wire Element Dimensions "O.D" mm</b>				
		(1) 0.5 (2) 1.0 (3) 1.6 (4) 2.3 (5) 3.2 (0) option				
	<b>Code</b>	<b>Measuring Junction</b>				
	G	Grounded type				
	U	Ungrounded type				
	US	Ungrounded separated type				
<b>Code</b>	<b>Element Class</b>					
	(1) Class 1 (2) Class 2 (3) Class 3					
<b>Code</b>	<b>Insulated Ceramic Dimensions</b>					
	(1) Ø 4.0 (2) Ø 6.0					
<b>Code</b>	<b>Thermowell Material</b>					
	<b>Metal</b> (1)SS316 (2)SS316L (3)SS304 (4)SS310S (5)Titanium (6)Kanthal AF (7)NCF600 (8)SUH446 (9)Sandvik P4 (10)UMCo50					
	<b>Non-Metal</b> (1)Silicon carbide (2)Alumina (3)High alumina					
<b>Code</b>	<b>Thermowell Size "O.D"</b>					
	Please refer to thermowell table directly fill in requesting "OD".					
<b>Code</b>	<b>Thermowell "L" Inserion Length</b>					
	Please directly fill in requesting length (mm).					
<b>Complete Ordering Code</b>						