

Sheet metal pad type thermocouple

Model : R990 series

Spec. sheet no. RD09-06

Service intended

Normally, when it comes to install thermocouple for measuring temperature on the surface of boiler or heat-exchanger, commonly used method was welding them with high temperature by attaching a metal plate or knife-edge type pad which has its thickness over 3 mm. This procedure can only be applied if the tube has the enough strength to endure high temperature welding process. However, this welding process can't be performed if the tubes are filled with water or oil inside because it may cause the damage to the tube and breakage of thermal-capacity, response time will be delayed and be difficult to measure exact temperature changes. To overcome these issues, R990 series are suitable for performing resistant welding by using spot-welding machine with under 3.2 mm O.D sheath and sheet metal pad, therefore, user can tightly install the pad along the curved surface of the tube, even if the user is not an expert welding operator. Furthermore, due to its compact size and low thermal-capacity, R990 series can offer fast response time without delay even if the measuring temperature fluctuates. Most of all, since R990 series does not cause any thermal-effect, it can be installed on the tubes which carry water or oil inside without expecting any damages to the tube or welded area.



Application

- Boiler tube skin temperature
- Heater tube and heater exchangers tube skin temperature
- Other various tube wall temperature measurement.

Standard feature

Element type

K, E, J, T, N

Accuracy

Standard : 0.75% (for reading temp.)

Special : 0.4% (for reading temp.)

Sheath outer diameters

1.0, 1.6 and 2.3 mm

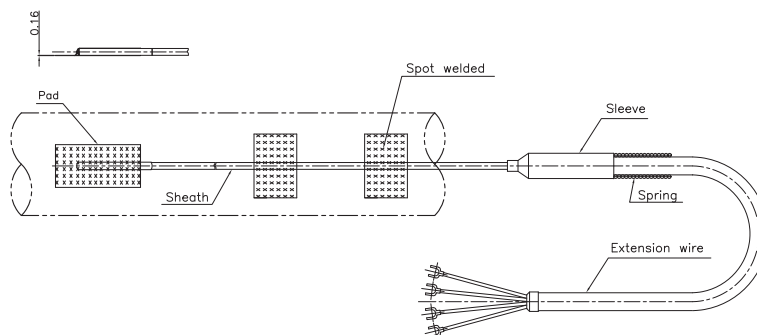
(*Double element is not 1.0 and 1.6 mm sheath outer diameter)

3.2 mm (Standard)

Pad and clip material

316L SS

Standard product drawing



1. Base model

- R991** Sheet metal pad type thermocouple (Single element)
R992 Sheet metal pad type thermocouple
 (Double (Duplex) element)

2. Head type

- A** Explosion proof and ungrounded
B Explosion proof and grounded
C General (Weatherproof) and ungrounded
D General (Weatherproof) and grounded
P Non head and ungrounded
Q Non head and grounded

3. Element

- K** K (0.75)
J J (0.75)
T T (0.75)
E E (0.5)
1 K (0.4)
2 J (0.4)
3 T (0.4)
4 E (0.4)
Z Other

4. Sheath material

- 1** 316SS
2 Inconel 600
3 310SS
4 446SS
5 347SS
6 321SS
7 316L SS
9 Other

5. Sheath outer diameter (mm)

- * **A** 1.0
 * **B** 1.6
C 2.3
D 3.2
E 4.8
Z Other

* (Double element is not for 1.0 and 1.6 sheath outer diameter)

6. Welded pad type

- 7** Sheet metal type

7. Conduit connection

- 1** ½" PF
2 ½" PT
3 ½" NPT
4 ¾" PF
5 ¾" PT
6 ¾" NPT
9 Other

8. Mounting type

- X** Refer to connection type (11th character)

9. Connection type

- XX** Refer to insert length table (12th and 13th character)

10. Insert length

- X** Refer to insert length table (14th character)

11. Option

- 0** None
1 Accessories (Spot welding machine)
2 Epoxy coated ALDC head
3 Head material : 304SS
4 Head material : 316SS
5 Accessories and epoxy coated ALDC head
6 Accessories and head material : 304SS
7 Accessories and head material : 316SS

1	2	3	4	5	6	7	8	9	10	11
R992	P	K	1	D	7	9	X	XX	X	4

Sample
ordering code

Mounting, connection type and insert length table - 11th thru 14th characters

11 th character		12 th character		13 th character		14 th character	
Code	Mounting	Code	Connection size and connector material	Code	Connection type	Code	Insert length (mm)
A	None	A	None	A	None	A	100 mm
	Fixed thread lag length						
B	80 mm	B	1/8" and 304SS	B	PT	B	200 mm
C	100 mm	C	1/4" and 304SS	C	NPT	C	300 mm
D	150 mm	D	3/8" and 304SS	D	PF	D	400 mm
E	200 mm	E	1/2" and 304SS	E	NPS	E	500 mm
F	Other	F	3/4" and 304SS	F	UNF	F	600 mm
	Fixed flange lag length						
G	80 mm	G	1" and 304SS	G	BSPT	G	700 mm
H	100 mm	H	1 1/4" and 304SS	H	BSPF	H	800 mm
J	150 mm	J	1 1/2" and 304SS	J	MM	J	900 mm
	Fixed flange lag length						
K	200 mm	K	2" and 304SS	K	ANSI 150 Lb RF	K	1,000 mm
L	Other	L	3" and 304SS	L	ANSI 150 Lb FF	L	1,500 mm
M	Movable thread	M	7/8" and 304SS	M	ANSI 300 Lb RF	M	2,000 mm
N	Movable flange	N	1 1/8" and 316SS	N	ANSI 300 Lb FF	N	2,500 mm
P	Compression fitting	P	1/4" and 316SS	O	Sanitary	P	3,000 mm
	Union and nipple length			P	ANSI 600 Lb RF		
Q	100 mm length	Q	3/8" and 316SS	Q	ANSI 600 Lb FF	Q	3,500 mm
R	150 mm length	R	1/2" and 316SS	R	JIS 5K RF	R	4,000 mm
S	Other	S	3/4" and 316SS	S	JIS 5K FF	S	4,500 mm
	Nipple length						
T	50 mm	T	1" and 316SS	T	JIS 10K RF	T	5,000 mm
U	100 mm	U	1 1/4" and 316SS	U	JIS 10K FF	U	6,000 mm
V	150 mm	V	1 1/2" and 316SS	V	JIS 20K RF	V	7,000 mm
W	Other	W	2" and 316SS	W	JIS 20K FF	W	8,000 mm
X	Fixed thread	X	3" and 316SS	X	ANSI 1,500 Lb RTJ	X	9,000 mm
		Y	7/8" and 316SS	Y	ANSI 2,500 Lb RTJ	Y	10,000 mm
Z	Other	Z	Other	Z	Other	Z	Other

Note for 14th character, please choose a code of next higher length if applicable length is not.
Actual length shall be specified.

Compact spot-welding machine

Specification

Model	THS-2500 (JAPAN)
Input power	AC220 V 3 phase 50/60 Hz
Max. short circuit current	2500A
Operating frequency	8 KHz
Control method	Primary current control secondary voltage control
Electrical parameters	Current 0.20 ~ 2.50 KA
	Voltage 0.20 ~ 4.00 V
Rated capacity	5.7 KVA
Control method	Primary current control secondary voltage control
Cooling method	Air cooling
Outer dimensions	182(W) x 302(H) x 429(D)
Weight	18 kg

