

# Sanitary resistance temperature detector

**Model : R231 single element**  
**R232 double element**

Spec. sheet no. **RD02-04**

## Service intended

Sanitary RTDs can measure temperature from -50 to 200°C. These sensors are available in Tri-clamp design with the immersion length from 50 to 250 mm. The wetted part of this assembly is polished to exceed No.4 minimum finish which is required by 3-A sanitary council standard #74-06.



## Element

Pt 100Ω at 0°C

## Tolerances on temperature reading

Class A :  $\pm (0.15 + 0.002 |t|)$

Class B :  $\pm (0.3 + 0.005 |t|)$

\* t : Reading temperature (°C)

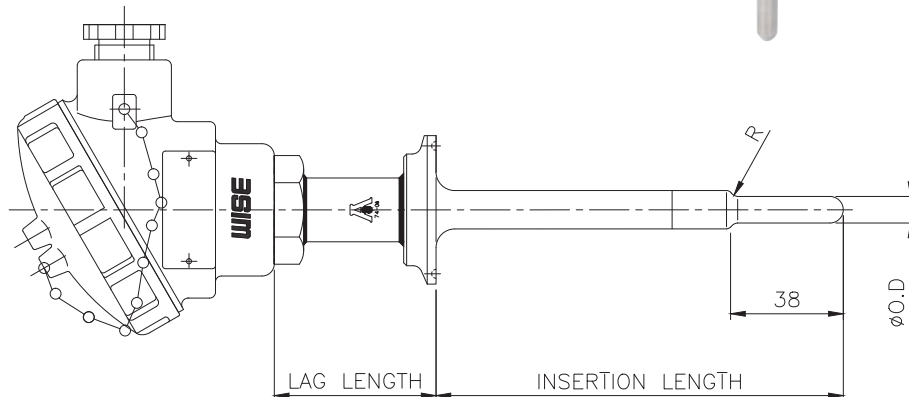
## Element and lead wire configurations

Single element : 2, 3 and 4 wire

Double element : 4, 6 and 8 wire



## Outline drawing



## Standard features

### Head type

Weatherproof (304SS)

### Process connection

Tri - clamp connection  
1, 1½ and 2S

### Stem material

304SS, 316SS

## Main order

## Ordering information

### 1. Base model

- R231** Sanitary resistance temperature detector  
(Single element)
- R232** Sanitary resistance temperature detector  
(Double (Duplex) element)

### 2. Head type

- A** General (Weatherproof)
- P** Other

### 3. Element

- Q** Pt 100Ω (B)
- 9** Pt 100Ω (A)

### 4. Insertion material

- 0** 304SS
- 1** 316SS
- 9** Other

### 5. Insertion outer diameter (mm)

- F9** 6.4
- G9** 8.0
- J9** 10.0
- K9** 12.0

### 6. Conduit connection

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

### 7. Lag length (mm)

- G** 80
- H** 100
- J** 150

### 8. Connection size and material

- G** 1S and 304SS
- J** 1½S and 304SS
- K** 2S and 304SS
- T** 1S and 316SS
- V** 1½S and 316SS
- W** 2S and 316SS

### 9. Connection type

- A** Tri - clamp

### 10. Insert length (mm)

- A** 100
- B** 200
- C** 300
- D** 400
- E** 500
- F** 600
- G** 700
- H** 800
- J** 900
- K** 1,000

### 11. Option

- 0** None
- 1** Accessories

1	2	3	4	5	6	7	8	9	10	11
R231	A	Q	1	F9	1	G	G	A	A	0

Sample  
ordering code

# Extension lead wire thermocouple and resistance temperature detector

**Model : R300 series**

Spec. sheet no. **RD03-01**

## Service intended

This type of detector does not use terminal head, rather it directly connects to an indicator or a transmitter. It is very useful where the distance between measuring parts and the location of its head is too far. The measuring parts and its head can be connected by using an extension wire.

Extension wire can be selected according to its installation site condition, its protection shape of armored tube, and its wire covering material.



## Standard features

### Element

Thermocouple : K, E, J, T, N, R, S, B  
RTD : Pt 100Ω at 0°C

### Tolerances on temperature reading

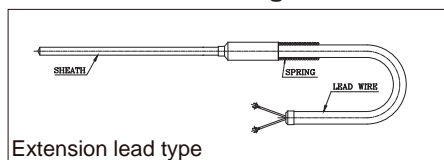
■ Thermocouple  
Class 1, Class 2 (DIN/IEC584-2, BS/EN60584-2, JIS C1602)  
Special, Standard (ASTM E230 E988 ISA-MC96.1)

■ R.T.D.

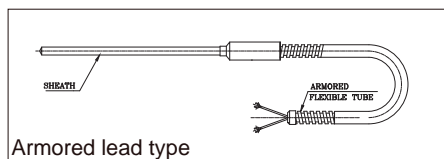
Class A :  $\pm (0.15 + 0.002 |t|)$

Class B :  $\pm (0.3 + 0.005 |t|)$

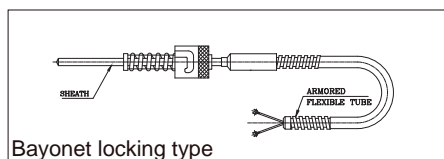
### Basic outline drawing



Extension lead type



Armored lead type



Bayonet locking type

### Sheath outer diameter

■ Thermocouple

1.0, 1.6, 2.3, 3.2, 4.8, 6.4, 8.0, 9.5 and 12.7 mm

\* Double element is not available for 1.0 and 1.6 mm sheath outer diameter

■ R.T.D.

3.2, 4.8, 6.4 and 8.0 mm

### Sensing element structure

Protection tube or sheathed

### Protecting tube outer diameter

6.4, 8.0, 10.0, 12.0 and 15.0 mm

**1. Base model**

<b>R311</b>	Extension lead type single element
<b>R312</b>	Extension lead type double element
<b>R321</b>	Armored lead type single element
<b>R322</b>	Armored lead type double element
<b>R331</b>	Bayonet locking type single element
<b>R332</b>	Bayonet locking type double element

**2. Head type**

<b>A</b>	General (Weatherproof)
<b>P</b>	None head

**3. Element**

<b>K</b>	K (0.75)	<b>3</b>	T (0.4)
<b>J</b>	J (0.75)	<b>4</b>	E (0.4)
<b>T</b>	T (0.75)	<b>5</b>	N (0.4)
<b>N</b>	N (0.75)	<b>R</b>	R (0.25)
<b>E</b>	E (0.5)	<b>S</b>	S (0.25)
<b>B</b>	B (0.5)	<b>Q</b>	Pt 100Ω (B)
<b>1</b>	K (0.4)	<b>9</b>	Pt 100Ω (A)
<b>2</b>	J (0.4)	<b>Z</b>	Other

**4. Sheath or protecting tube material**

<b>0</b>	304SS
<b>1</b>	316SS
<b>2</b>	Inconel 600
<b>3</b>	310SS
<b>4</b>	446SS
<b>5</b>	347SS
<b>6</b>	321SS
<b>7</b>	316L SS
<b>9</b>	Other

**5. Sheath or protecting tube outer diameter (mm)**

<b>A9</b>	1.0 (Sheath / Single TC only)
<b>B9</b>	1.6 (Sheath / Single TC only)
<b>C9</b>	2.3 (Sheath / TC only)
<b>D9</b>	3.2 (Sheath)
<b>E9</b>	4.8 (Sheath)
<b>F9</b>	6.4 (Sheath)
<b>G9</b>	8.0 (Sheath)
<b>H9</b>	9.5 (Sheath / TC only)
<b>L9</b>	12.7 (Sheath / TC only)
<b>E8</b>	4.8 (Tube / Not available for double RTD)
<b>F8</b>	6.4 (Tube)
<b>G8</b>	8.0 (Tube)
<b>J0</b>	10.0 (Tube)
<b>K9</b>	12.0 (Tube)
<b>M9</b>	15.0 (Tube)

**6. Conduit connection**

<b>1</b>	½" PF
<b>2</b>	½" PT
<b>3</b>	½" NPT
<b>4</b>	¾" PF
<b>5</b>	¾" PT
<b>6</b>	¾" NPT
<b>9</b>	Other

**7. Mounting type**

<b>X</b>	Refer to mounting table (11 <sup>th</sup> character)
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**8. Connection type**

<b>XX</b>	Refer to mounting table (12 <sup>th</sup> and 13 <sup>th</sup> character)
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**9. Insert length**

<b>X</b>	Refer to insert length table (14 <sup>th</sup> character)
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**10. Option**

<b>00</b>	None
<b>01</b>	Accessories
<b>1A</b>	Epoxy coated ALDC head
<b>1B</b>	Head material : 304SS
<b>1C</b>	Head material : 316SS
<b>1D</b>	Accessories and epoxy coated ALDC head
<b>1E</b>	Accessories and head material : 304SS
<b>1F</b>	Accessories and head material : 316SS

1	2	3	4	5	6	7	8	9	10
R311	P	K	1	F9	9	X	XX	X	1A

Sample  
ordering code

**Mounting, connection type and insert length table - 11<sup>th</sup> thru 14<sup>th</sup> characters**

11 <sup>th</sup> character		12 <sup>th</sup> character		13 <sup>th</sup> character		14 <sup>th</sup> 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
				P	ANSI 600 Lb RF		
	Union and nipple length						
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
*Y	150 mm length						
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 14<sup>th</sup> character, please choose a code of next higher length if applicable length is not. Actual length shall be specified.
- Note for \*Y code (Oil sealing type), only available with spring-loaded head type.

