

# Explosion proof Thermocouple and resistance temperature detector Model : R940 series (ETR series)

Spec. sheet no. **RS09-05**

## Service intended

Measuring the temperature in the area where combustible gas, particles and flammable liquid exist can be a very dangerous task. The electrical energy of measuring instrument is lower than electric motor, however, the malfunction of the instrument or the accident can cause to start the explosion. Therefore, ETR series is explosion proof type product which is designed to be used in a critical danger Zone 1 by acquiring IECEx and ATEX certification.



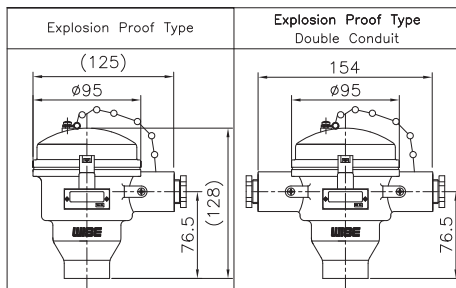
## Certificates

ATEX II 2G Ex d IIC T6 Gb  
IECEX Ex d IIC T6 Gb

## Ambient temperature

-40 ~ +65 °C

## Head type



Sheath type



Non-metallic protection tube type

## Standard features

### Element

#### ■ Sheath type

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

#### ■ Non-metallic protection tube type

Type R (87 % Pt, 13 % Rh/Pt)  
Type S (90 % Pt, 10 % Rh/Pt)  
Type B (70 % Pt, 30 % Rh / 94 % Pt, 6 % Rh)  
Type K

### Head material

ALDC (Standard)  
316SS

### Tolerances on temperature reading

#### ■ Sheath type

- 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 : ± (0.15 + 0.002 | t |)  
Class B : ± (0.3 + 0.005 | t |)

#### ■ Non-metallic protection tube type

"K" type : Class 2 (0.75 %)  
Standard (0.75 %)  
"R", "S" type : Class 2 (0.25 %)  
Standard (0.5 %)  
"B" type : Class 3 (0.5 %)  
Standard (0.5 %)

**1. Base model**

- R941** Single element  
**R942** Double (Duplex) element  
**R943** Single element with spring load type  
**R944** Double (Duplex) element with spring load type

**2. Head and tip shape type**

- A** ALDC head and ungrounded  
**B** ALDC head and grounded  
**C** ALDC head(Double conduit) and ungrounded  
**D** ALDC head(Double conduit) and grounded  
**E** 316SS head and ungrounded  
**F** 316SS head and grounded  
**G** 316SS head(Double conduit) and ungrounded  
**H** 316SS head(Double conduit) and grounded

**3. Element**

- |          |                       |          |                       |
|----------|-----------------------|----------|-----------------------|
| <b>K</b> | K (0.75)              | <b>1</b> | K (0.4)               |
| <b>J</b> | J (0.75)              | <b>2</b> | J (0.4)               |
| <b>T</b> | T (0.75)              | <b>3</b> | T (0.4)               |
| <b>E</b> | E (0.5)               | <b>4</b> | E (0.4)               |
| <b>N</b> | N (0.75)              | <b>5</b> | N (0.4)               |
| <b>Q</b> | Pt 100 Ω (B), 3 wire  | <b>9</b> | Pt 100 Ω (A), 3 wire  |
| <b>U</b> | JPt 100 Ω (B), 3 wire | <b>0</b> | JPt 100 Ω (A), 3 wire |
| <b>A</b> | Pt 100 Ω (B), 4 wire  | <b>C</b> | Pt 100 Ω (A), 4 wire  |
| <b>B</b> | JPt 100 Ω (B), 4 wire | <b>D</b> | JPt 100 Ω (A), 4 wire |
| <b>Z</b> | Other                 |          |                       |

**4. Sheath material (RTD. is only 316SS and 316L SS)**

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

**5. Sheath outer diameter (mm)**

- A9** 1.0 (Thermocouple only)  
**B9** 1.6 (Thermocouple only)  
**C9** 2.3 (Thermocouple only)  
**D9** 3.2  
**E9** 4.8  
**F9** 6.4  
**G9** 8.0  
**H9** 9.5 (Thermocouple only)  
**J9** 10  
**L9** 12.7 (Thermocouple only)

**6. Conduit connection**

- 3** ½" NPT  
**6** ¾" NPT  
**7** None  
**8** M20 x 1.5P  
**9** Other

**7. Mounting type**

- X** Refer to mounting table (11<sup>th</sup> character)

**8. Connection type**

- XX** Refer to mounting table (12<sup>th</sup> and 13<sup>th</sup> character)

**9. Insert length**

- X** Refer to insert length table (14<sup>th</sup> character)

**10. Integral transmitter (See note 1.)**

- 0** None  
**1** T900  
**2** T990 (RTD only)  
**3** TH300 (SIEMENS)  
**4** TTH300 (ABB)  
**5** YTA70 (YOKOGAWA)  
**6** 644H (ROSEMOUNT)  
**7** Other

**11. Option**

- 0** None  
**1** Accessories  
**3** IECEx certificate  
**4** Accessories and ATEX certificate  
**5** Accessories and IECEx certificate

\*\* Note 1. Although temperature element is selected double(Duplex) type, output of integral transmitter is single.

1	2	3	4	5	6	7	8	9	10	11	Sample ordering code
R941	A	K	1	F9	3	X	XX	X	0	0	

**1. Base model**

- R947** Single element  
**R948** Double (Duplex) element

**2. Head and tip shape type**

- A** ALDC head and ungrounded  
**C** ALDC head(Double conduit) and ungrounded  
**E** 316SS head and ungrounded  
**G** 316SS head(Double conduit) and ungrounded

**3. Element**

- K** K (0.75)  
**B** B (0.5)  
**1** K (0.4)  
**R** R (0.25)  
**S** S (0.25)

**4. Mounting type and extension length (mm)**

- |                             |                               |
|-----------------------------|-------------------------------|
| <b>A</b> None               | <b>K</b> Fixed flange (300)   |
| <b>B</b> Support tube (100) | <b>L</b> Movable thread (100) |
| <b>C</b> Support tube (150) | <b>M</b> Movable thread (150) |
| <b>D</b> Support tube (300) | <b>N</b> Movable thread (300) |
| <b>E</b> Fixed thread (100) | <b>P</b> Movable flange (100) |
| <b>F</b> Fixed thread (150) | <b>Q</b> Movable flange (150) |
| <b>G</b> Fixed thread (300) | <b>R</b> Movable flange (300) |
| <b>H</b> Fixed flange (100) | <b>Z</b> Other                |
| <b>J</b> Fixed flange (150) |                               |

**5. Outer protection tube diameter (mm)**

- |              |              |
|--------------|--------------|
| <b>00</b> 8  | <b>40</b> 21 |
| <b>10</b> 10 | <b>50</b> 25 |
| <b>20</b> 13 | <b>60</b> 30 |
| <b>25</b> 15 | <b>70</b> 40 |
| <b>30</b> 17 |              |

**6. Outer protection tube material**

- |                            |                  |
|----------------------------|------------------|
| <b>0</b> 316SS             | <b>5</b> Inconel |
| <b>1</b> SSA-S (8~25 mm)   | <b>6</b> 446SS   |
| <b>3</b> HB (8~21 mm)      | <b>7</b> Other   |
| <b>4</b> GK-SiC (25~40 mm) | <b>8</b> 310SS   |

**7. Inner tube material**

- 0** None  
**1** SSA-S  
**3** HB  
**5** Inconel  
**9** Other

**8. Connection type**

- XX** Refer to connection type table (12<sup>th</sup> and 13<sup>th</sup> character)

**9. Insert length**

- X** Refer to insert length table (14<sup>th</sup> character)

**10. Integral transmitter (See note 1.)**

- 0** None  
**1** T900  
**2** T990 (RTD only)  
**3** TH300 (SIEMENS)  
**4** TTH300 (ABB)  
**5** YTA70 (YOKOGAWA)  
**6** 644H (ROSEMOUNT)  
**7** Other

**11. Option**

- 0** None  
**1** Accessories  
**3** IECEx certificate  
**4** Accessories and ATEX certificate  
**5** Accessories and IECEx certificate

\*\* Note 1. Although temperature element is selected double(Duplex) type, output of integral transmitter is single.

1	2	3	4	5	6	7	8	9	10	11	Sample ordering code
R947	A	K	A	00	0	0	XX	X	0	0	

## Sheath type

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
	Fixed thread lag length	B	1/8" and 304SS	B	PT	B	200
B	80 mm	C	1/4" and 304SS	C	NPT	C	300
C	100 mm	D	3/8" and 304SS	D	PF	D	400
D	150 mm	E	1/2" and 304SS	E	NPS	E	500
E	200 mm	F	3/4" and 304SS	F	UNF	F	600
F	Other	G	1" and 304SS	G	BSPT	G	700
	Fixed flange lag length	H	1 1/4" and 304SS	H	BSPF	H	800
G	80 mm	J	1 1/2" and 304SS	J	MM	J	900
H	100 mm	K	2" and 304SS	K	B16.5 Class 150 RF	K	1,000
J	150 mm	L	3" and 304SS	L	B16.5 Class 150 FF	L	1,500
K	200 mm	M	7/16" and 304SS	M	B16.5 Class 300 RF	M	2,000
L	Other	N	1/8" and 316SS	N	B16.5 Class 300 FF	N	2,500
M	Movable thread	P	1/4" and 316SS	O	Sanitary	P	3,000
N	Movable flange	Q	3/8" and 316SS	P	B16.5 Class 600 RF	Q	3,500
P	Compression fitting	R	1/2" and 316SS	Q	B16.5 Class 600 FF	R	4,000
	Union and nipple length	S	3/4" and 316SS	R	JIS 5K RF	S	4,500
Q	100 mm length	T	1" and 316SS	S	JIS 5K FF	T	5,000
R	150 mm length	U	1 1/4" and 316SS	T	JIS 10K RF	U	6,000
S	Other	V	1 1/2" and 316SS	U	JIS 10K FF	V	7,000
	Nipple length	W	2" and 316SS	V	JIS 20K RF	W	8,000
T	50 mm	X	3" and 316SS	W	JIS 20K FF	X	9,000
U	100 mm	Y	7/16" and 316SS	X	B16.5 Class 1,500 RTJ	Y	10,000
V	150 mm	Z	Other	Y	B16.5 Class 2,500 RTJ	Z	Other
W	Other			Z	Other		
X	Fixed thread						
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.

## Non-metallic protection tube type

Mounting, connection type and insert length table - 12<sup>th</sup> thru 14<sup>th</sup> characters

12 <sup>th</sup> character		13 <sup>th</sup> character		14 <sup>th</sup> character	
Code	Connection size	Code	Connection type	Code	Insertion length (mm)
A	None	A	None	A	100
E	½" (15A)	B	PT	B	200
F	¾" (20A)	C	NPT	C	300
G	1" (25A)	D	PF	D	400
H	1¼" (32A)	K	B16.5 Class 150 RF	E	500
J	1½" (40A)	L	B16.5 Class 150 FF	F	600
K	2" (50A)	M	B16.5 Class 300 RF	G	700
L	2½" (65A)	N	B16.5 Class 300 FF	H	800
M	3" (80A)	P	B16.5 Class 600 RF	J	900
Z	Other	Q	B16.5 Class 600 FF	K	1,000
		R	JIS 5K RF	L	1,500
		S	JIS 5K FF	M	2,000
		T	JIS 10K RF	Z	Other
		U	JIS 10K FF		
		V	JIS 20K RF		
		W	JIS 20K FF		
		Z	Other		

Note : Please choose a code of next higher length if applicable length is not. Actual length shall be specified.

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