

Smart temperature transmitter

Model: SMT3000 series

Spec. sheet no. SD03-01

Service intended

SMT3000 series is the high performance temperature transmitter that accepts thermocouple, RTD, ohms or DC millivolts inputs and converts it to a 4 to 20 mA DC signal for transmission.

The SMT3000 series supports HART protocol. Reduce complexity and simplify the day-to-day operations of your diverse temperature applications with the versatile SMT3000 series of temperature transmitters.



SMT3000



SMT3100

Degree of protection

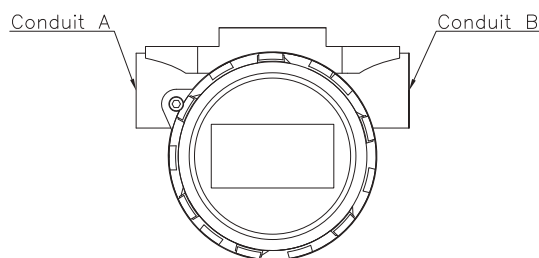
EN60529/IEC529/IP66

EN60529/IEC529/IP67

Standard features

Housing

- Material : Aluminium
- Conduit connection



Conduit 'A'	Conduit 'B'	
M20X1.5P (F)	M20X1.5P (F)	Standard
NPT 1/2"(F)	NPT 1/2"(F)	Only remote type

If you want to apply Conduit 'A' and Conduit 'B' differently, you need to use adaptor.

* NPT 1/2" Adaptor : M20x1.5P(M) - NPT 1/2"(F)

* M20x1.5P Adaptor : NPT 1/2"(M) - M20x1.5P(F)

Power supply

10~42 VDC

Input

Thermocouple : K, J, T, N, E, B, R, S

RTD : Pt 100 Ω at 0 °C

Output

4~20 mA with HART Protocol

Display

PV : Temperature °C (Standard), °F, °R, K

Current : 4~20 mA

Percent : 0~100 %

The display default setting is PV value.

Measured value number

Max. 7-digit character string comprising letters and numbers

Sheath material

RTD : 316L SS

Thermocouple : 316L SS, Inconel 600, 310SS, 446SS, 347SS, 321SS

Bracket material

304SS (Standard)

Ambient temperature

Tamb : -40~65 °C, Silicone

Tamb : -20~65 °C, Viton, NBR

Certificates

KCs Ex d IIC T6 Gb

CE conformity EMC directive

EN IEC 61000-6-2

EN IEC 61000-6-4

WISE[®]

1. Base model

SMT3000 Side installation type
SMT3100 Top installation type

2. Type

A Direct type
B Direct and Spring-loaded type
C Remote type
D Only transmitter head type (Only SMT3000)

3. Input signal / Element (Tolerance)

K	K (0.75)	1	K (0.4)
J	J (0.75)	2	J (0.4)
T	T (0.75)	3	T (0.4)
N	N (0.75)	4	E (0.4)
E	E (0.5)	5	N (0.4)
B	B (0.5)	R	R (0.25)
S	S (0.25)	A	Pt 100 Ω (B), 4 wire
Q	Pt 100 Ω (B), 3 wire	C	Pt 100 Ω (A), 4 wire
9	Pt 100 Ω (A), 3 wire	0	None

4. Sheath material

0	None	5	347SS (T/C)
2	Inconel 600 (T/C)	6	321SS (T/C)
3	310SS (T/C)	7	316L SS
4	446SS (T/C)		

5. Sheath outer diameter (mm)

D9 3.2
E9 4.8
F9 6.4
G9 8.0
00 None

6. Conduit connection

1 ½" PF
3 ½" NPT
8 M20 x 1.5P (Standard)
9 Other

7. Mounting type

X Refer to mounting table (14th character)

8. Connection type

XX Refer to mounting table (15th, 16th character)

9. Insert length

X Refer to insert table (17th character)

10. Temperature transmitter

A WTT-3000 (WISE)
B iTEMP TMT82 (Endress+Hauser)
C Rosemount 644 (EMERSON)

11. Measuring range (°C)

5 0~100
6 0~200
7 0~300
X Other calibration ranges available on request

12. Display

A PV (Temperature °C, °F) (Standard)
B Current (4~20 mA)
C Percent (0~100 %)

13. Burnout (Error signal)

U Upscale (Standard)
D Downscale

14. Certificates

0 None
1 KCs Ex d IIC T6 Gb

15. Option

0 None
1 With thermowell
2 2" bracket ass'y
3 Wall mounting bracket
4 With thermowell and 2" bracket ass'y

Sample ordering code

1	2	3	4	5	6	7	8	9	10	11
SMT3000	A	K	7	F9	7	X	XX	X	A	5
12	13	14	15							
A	U	1	0							



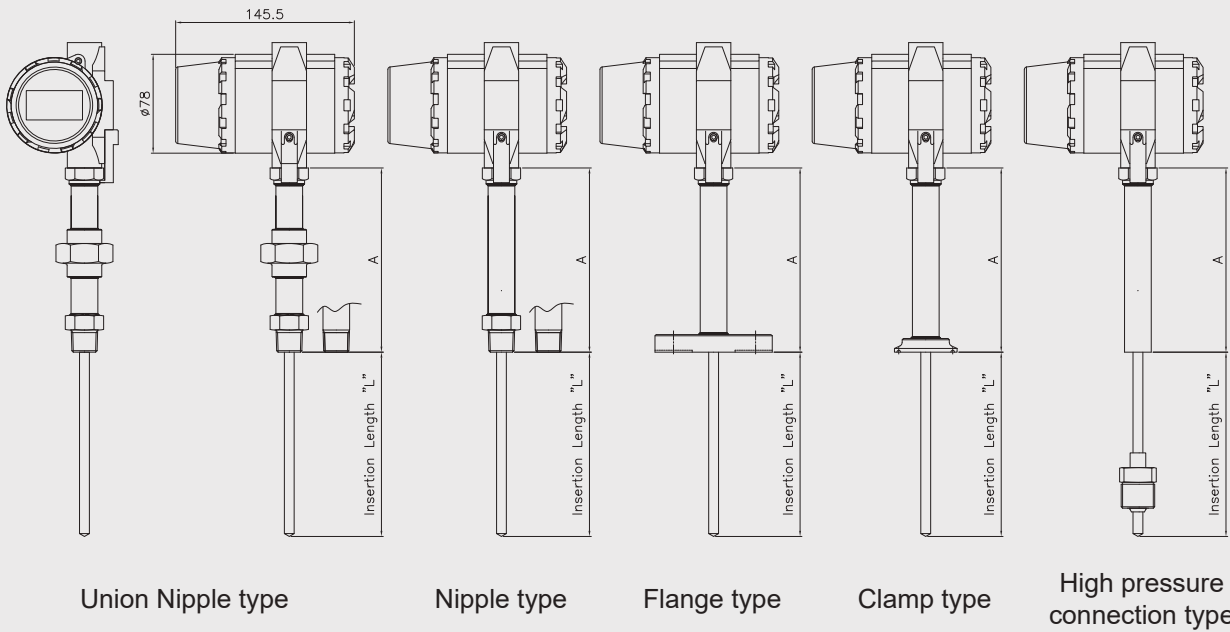
Mounting, connection type and insert length table - 14th thru 17th characters

14 th character		15 th character		16 th character		17 th character	
Code	Mounting	Code	Connection size and connector material	Code	Connection type	Code	Insert length (mm)
	Remote type	A	None	A	None	A	100
A	None (No sensor)	E	½" and 304SS	B	PT	B	200
	Fixed flange lag length	F	¾" and 304SS	C	NPT	C	300
G	80 mm	G	1" and 304SS	D	PF	D	400
H	100 mm	H	1¼" and 304SS	E	NPS	E	500
J	150 mm	J	1½" and 304SS	F	UNF	F	600
K	200 mm	K	2" and 304SS	G	BSPT	G	700
L	Other	L	3" and 304SS	H	BSPF	H	800
P	Compression fitting	R	½" and 316SS	J	MM	J	900
	Union and Nipple length	S	¾" and 316SS	K	B16.5 Class 150 RF	K	1000
Q	100 mm	T	1" and 316SS	L	B16.5 Class 150 FF	L	1500
R	150 mm	U	1¼" and 316SS	M	B16.5 Class 300 RF	M	2000
S	Other	V	1½" and 316SS	N	B16.5 Class 300 FF	N	2500
	Nipple length	W	2" and 316SS	O	Sanitary	P	3000
T	50 mm	X	3" and 316SS	P	B16.5 Class 600 RF	Q	3500
U	100 mm	1	9/16" and 316SS	Q	B16.5 Class 600 FF	R	4000
V	150 mm	Z	Other	R	JIS 5K RF	S	4500
W	Other			S	JIS 5K FF	T	5000
X	Fixed thread			T	JIS 10K RF	U	6000
1	High pressure connection			U	JIS 10K FF	V	7000
Z	Other			V	JIS 20K RF	W	8000
				W	JIS 20K FF	X	9000
				Z	Other	Y	10000
						Z	Other

* Note

- For 17th character, please choose a code of next higher length if applicable length is not. Actual length shall be specified.
- For *Y code (Oil sealing type), only available with spring-loaded head type.
- The *1 code(High pressure connection type) in the 14th character, not used to spring-loaded head type.
- For the High pressure connection type, the 15th,16th characters are 1,F code as standard. If you require other specifications, please contact the head office.
- High pressure connection types require pressure testing. (Helium pressure test : 99MPa, 10min.)

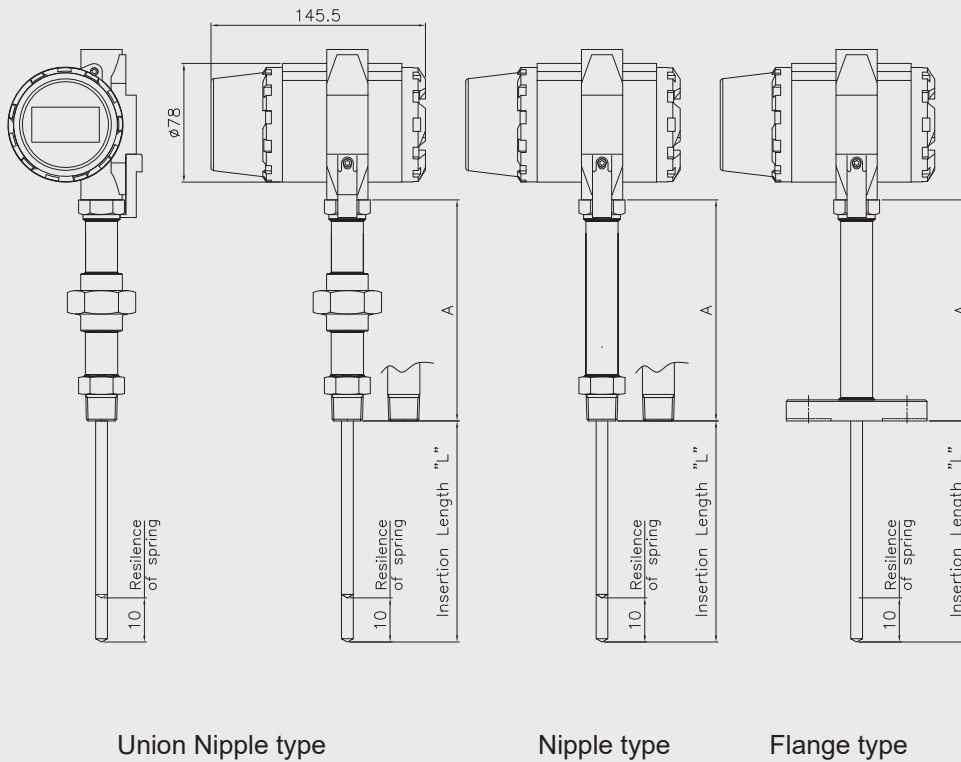
Direct Type (SMT3000)



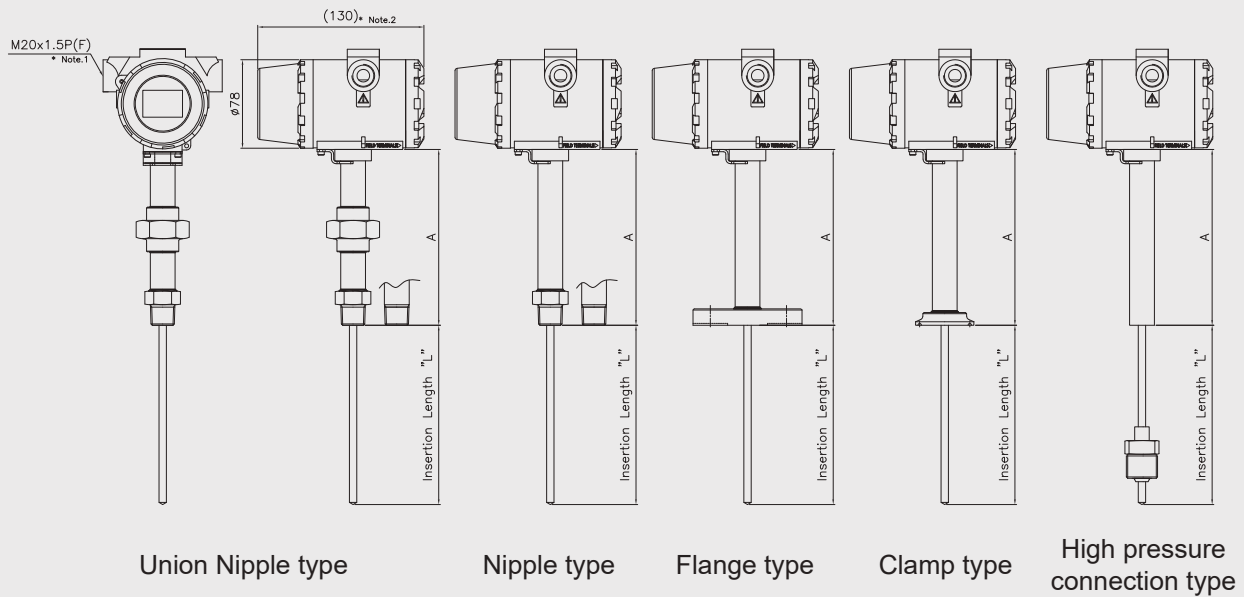
Note.

1. If you request NPT 1/2"(F), you need to use adapter. (M20x1.5P(M) – NPT 1/2"(F)).
2. Long housing (146 mm) must be used when selecting a Rosemount 644 transmitter.

Direct and Spring Load Type (SMT3000)



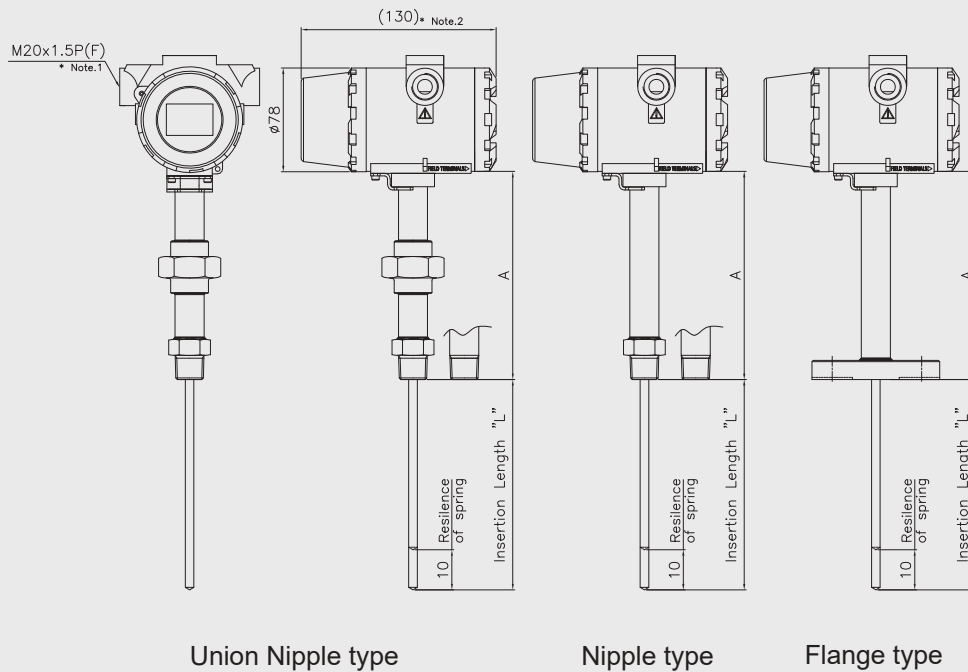
Direct Type (SMT3100)



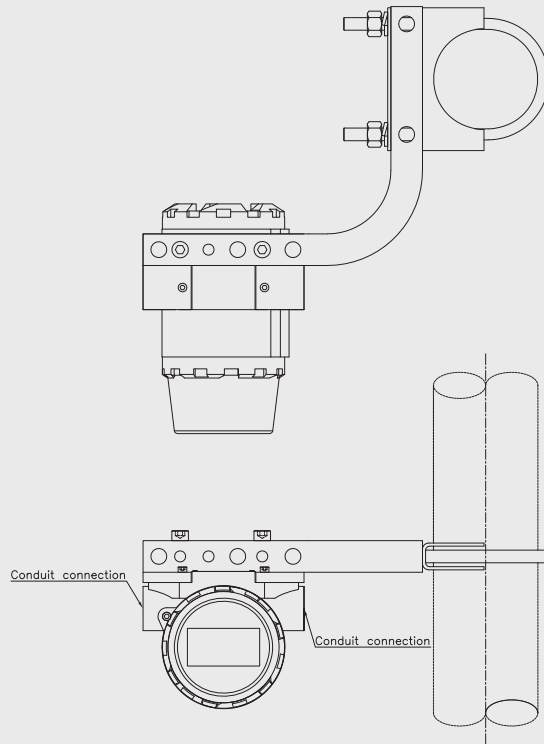
Note.

1. If you request NPT 1/2"(F), you need to use adapter. (M20x1.5P(M) – NPT 1/2"(F)).
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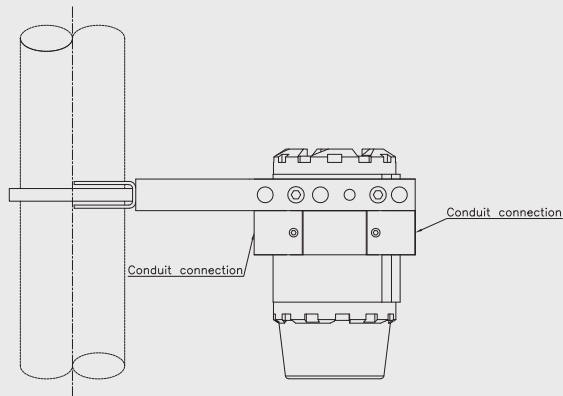
Direct and Spring Load Type (SMT3100)



Remote Type with 2" Mounting Bracket



Vertical



Horizontal

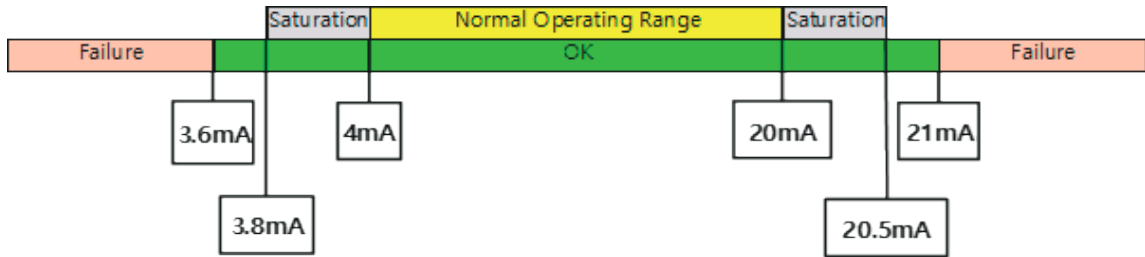
Transmitter failure (NAMUR NE43)

Namur NE43 specifies a sensor fault is signaled by extending the range of the 4-20 mA signal. When the loop current is below 3.6 mA or above 21 mA this is interpreted as a sensor fault. In order to avoid false alarms, the signal shall be present for at least 4 seconds before it is interpreted as sensor fault.

Transmitter failure can be caused because of sensor or converter failure. When these errors occur, smart instruments will adjust the output signal to 3.6 mA or 21.0 mA, based on how the user set the fail-safe mode.

Now a days there are many transmitters and equipments that are set fail safe mode according to NAMUR NE43 standard and also let you allow to choose between down scale and upscale failure mode.

There is only 0.2 mA gap between the medium saturation area's 3.6 mA downscale signal rate and the higher saturation area's 3.8 mA start value as a 2-wire transmitter needs the current below 3.6 mA for its proper operation. Many suppliers also have equipment that uses less than 3.6 mA.



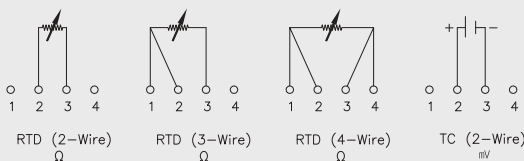
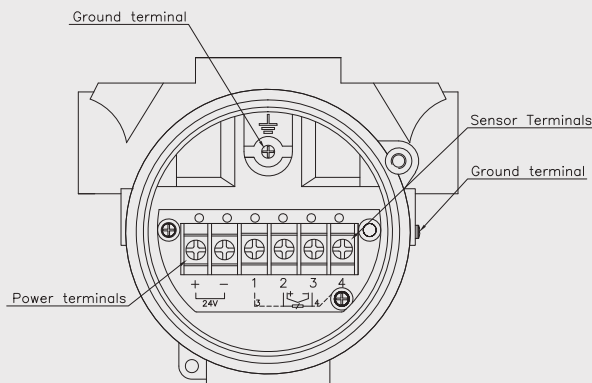
Level	NAMUR NE43		WTT-3000 (WISE)		iTEMP TMT82 (Endress+Hauser)		Rosemount 644H (EMERSON)	
	Saturation	Alarm	Saturation	Alarm	Saturation	Alarm	Saturation	Alarm
Low	3.8 mA (3.7~3.9)	≤3.6 mA (3.5~3.75)	3.9 mA	≤3.75 mA	3.8 mA	≤3.6 mA	3.9 mA	≤3.75 mA
High	20.5 mA (20.5~20.9)	≥21 mA (21~23)	21 mA	≥22 mA	20.5 mA	≥21 mA	20.5 mA	≥21.75 mA

* Error signal (NAMUR NE43) : High/Low (Adjustable)

* Note : The standard setting of failure alarm is High Mode.

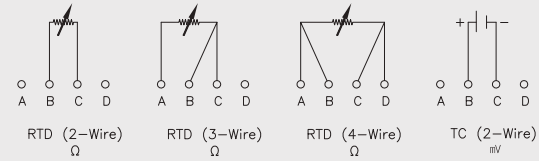
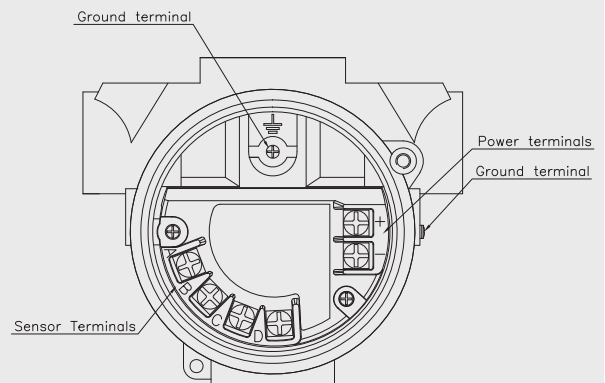
Wiring diagram

• WTT-3000 (WISE)



Wiring Diagram

• iTEMP TMT82 / Rosemount 644H



Wiring Diagram

Transmitter type

Manufacture	WISE	Endress+Hauser	EMERSON
Model No.	WTT-3000	iTEMP TMT82	Rosemount 644H
Supply	10~32 VDC	11~42 VDC	12~40 VDC
Input	Pt100 Ω K, J, T, N, E, B, R, S	Pt100 Ω K, J, T, N, E, B, R, S	Pt100 Ω K, J, T, N, E, B, R, S
Output	4~20 mA with HART® Protocol	4~20 mA with HART® Protocol	4~20 mA with HART® Protocol
HART® Version	Revision 7 (Generic)	Revision 7	Revision 5 or 7
Humidity Limits	0~90 % Relative humidity	0~95 % Relative humidity	0~95 % Relative humidity
Load Limitations	Load resistance ≤ (U-10)/0.022	Maximum load = (Supply voltage - 11 V) / 0.023 A(Current output)	Maximum load = 40.8 × (Supply voltage - 12.0)
	250~500 Ω	250~1098 Ω	250~1100 Ω

Please refer to the company manual of each model.

Accuracy

Standard	Sensor Type	WISE			Endress+Hauser				EMERSON		
		WTT-3000			iTemp TMT82				Rosemount 644H		
		Measuring range limits (°C)	Min. Span (°C)	Accuracy	Measuring range limits (°C)	Recommended Temperature range (°C)	Min. Span (°C)	Accuracy	Measuring range limits (°C)	Min. Span (°C)	Accuracy
IEC 60751	Pt100 (a=0.00385)	-200~850	10	±0.15 °C or Span*0.1% (Apply greater value)	-200~850	-200~850	10	Measured error digital + Measured error D/A [Digital = ±(0.06 °C + 0.006% * (MV-LRV)) ≤ 0.12 D/A = 0.03% * Span]	-200~850	10	Digital accuracy + D/A accuracy [Digital = ±0.15, D/A = 0.03% * Span]
	T	-200~400	25	±0.4 °C or Span*0.1% (Apply greater value)	-260~400	-150~400	50	Measured error digital + Measured error D/A [Digital = ±(0.35 °C - 0.04% * (MV-LRV)) ≤ 0.35 D/A = 0.03% * Span]	-200~851	25	Digital accuracy + D/A accuracy [Digital = ±0.35, D/A = 0.03% * Span]
	E	-200~1000	25	±0.4 °C or Span*0.1% (Apply greater value)	-270~1000	-150~1000	50	Measured error digital + Measured error D/A [Digital = ±(0.22 °C - 0.006% * (MV - LRV)) ≤ 0.22 D/A = 0.03% * Span]	-200~1000	25	Digital accuracy + D/A accuracy [Digital = ±0.20, D/A = 0.03% * Span]
	J	-210~1200	25	±0.4 °C or Span*0.1% (Apply greater value)	-210~1200	-150~1200	50	Measured error digital + Measured error D/A [Digital = ±(0.27 °C - 0.005% * (MV - LRV)) ≤ 0.27 D/A = 0.03% * Span]	-180~760	25	Digital accuracy + D/A accuracy [Digital = ±0.35, D/A = 0.03% * Span]
IEC 60584-1	K	-200~1372	25	±0.4 °C or Span*0.1% (Apply greater value)	-270~1372	-150~1200	50	Measured error digital + Measured error D/A [Digital = ±(0.35 °C - 0.005% * (MV - LRV)) ≤ 0.35 D/A = 0.03% * Span]	-180~1372	25	Digital accuracy + D/A accuracy [Digital = ±0.50, D/A = 0.03% * Span]
	N	-200~1300	25	±0.4 °C or Span*0.1% (Apply greater value)	-270~1300	-150~1300	50	Measured error digital + Measured error D/A [Digital = ±(0.48 °C - 0.014% * (MV - LRV)) ≤ 0.48 D/A = 0.03% * Span]	-200~1300	25	Digital accuracy + D/A accuracy [Digital = ±0.50, D/A = 0.03% * Span]
	B	150~1820	100	±1.0 °C or Span*0.1% (Apply greater value)	40~1820	500~1820	50	Measured error digital + Measured error D/A [Digital = ±(1.43 °C - 0.06% * (MV - LRV)) ≤ 1.43 D/A = 0.03% * Span]	100~1820	25	Digital accuracy + D/A accuracy [Digital = ±0.77, D/A = 0.03% * Span]
	R	0~1768	100	±0.8 °C or Span*0.1% (Apply greater value)	-50~1768	50~1768	50	Measured error digital + Measured error D/A [Digital = ±(1.12 °C - 0.03% * (MV - LRV)) ≤ 1.12 D/A = 0.03% * Span]	0~1768	25	Digital accuracy + D/A accuracy [Digital = ±0.75, D/A = 0.03% * Span]
	S	0~1768	100	±0.8 °C or Span*0.1% (Apply greater value)	-50~1768	50~1768	50	Measured error digital + Measured error D/A [Digital = ±(1.15 °C - 0.022% * (MV - LRV)) ≤ 1.15 D/A = 0.03% * Span]	0~1768	25	Digital accuracy + D/A accuracy [Digital = ±0.70, D/A = 0.03% * Span]

Please refer to the company manual of each model.