



SMART TEMPERATURE TRANSMITTER BTT301

(with HART® Protocol)

- Output signal 4...20mA with Hart protocol
- Galvanic insulation (In, Out)
- Programmable sensor type
- Programmable measuring range
- Resistant thermo resistance line compensation
- Compensation of thermocouple cold junction
- Autodiagnostic system
- Intrinsic safety certificate (ATEX, IECEx)
- Explosion proof certificate (ATEX, IECEx)

GENERAL DESCRIPTIONS

The temperature transmitter BTT300 series is applicable to converting resistance of temperature or voltage of thermocouple sensor to standard current signal 4-20mA. The transmitter has two separate channels enabling measurement of difference temperature, average, average with redundancy, max. or min. temperature. Transmitter has compensation of ambient temperature influence and compensation of thermocouple cold junction using internal/external (Pt100) sensor or constant temperature. Most of parameters such as: sensor type, measuring range, current alarm signal when electric circuit is broken, output characteristic correction, user characteristic (60 points) are programmed using PC with Hart/USB/Bluetooth converter and communicator. For request BASI can set temperature transmitter parameters like measuring range, type of sensor. The Transmitter BTT300 is designed for field use. BTT300 can be used with temperature sensors mounted directly in transmitter's casing or with external sensors connected with cable. Their values are printed on label.

TECHNICAL SPECIFICATIONS

Input signal : K, J, S, B, N, T, R, E, voltage, Pt-xxx, Ni100, Resistance

Limit Process : $-10\text{mV} < E < 100\text{mV}$ or $-100\text{mV} < E < 1000\text{mV}$
 $0\ \Omega < R < 400\ \Omega$ or $0\ \Omega < R < 2000\ \Omega$

Min Range : 10mV or 10 Ω or 10K

Wire Resistance : max 500 Ω

Output signal : Two-wire 4-20, 20-4 mA + HART® Protocol

Power supply : 13,5...55 VDC (Ex 13,5...30 VDC) when display illumination switched on
 16,5...55 VDC (Ex 16,5...30 VDC)

Load limitation : 0 - 600 Ω for 24VDC

Indicator : LCD indicator with backlight

Ambient. temp : -40 to 80°C (Ex -40 to 75°C)

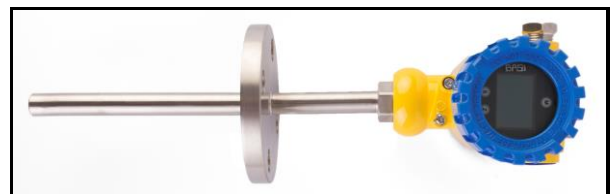
Time constant : 0,3 seconds

Sensor break : 3,75mA / 21,5mA (NORMAL) or 3,6 mA / 21mA (NAMUR NE89) or setting by user

Humidity limits : 0 - 100% RH

Damping adj. : Adjustable 0-30 seconds

Configuration : By pushbutton on the transmitter or HHT, PC using HART® Protocol



Performance Specifications

Accuracy : $\pm 0.1\%$

Hazardous area : IP67 weather-proof,
 Intrinsic safety certificate (ATEX, IECEx)
 Explosion proof certificate (ATEX, IECEx)

Physical Specifications

Electrical connection : M20x1,5 or 1/2"-14NPT

Process connection : Remote mounted temperature sensor or direct mounted temperature sensor

Electronic housing : Injected aluminum with polyester painting IP67 or SS316 housing

Identification plate : 304 SST

Mounting : Directly supported by piping or optionally with mounting bracket for 2" pipes or



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Smart Temperature Transmitter


BPT301

No. DS 26:3-E Issue: 5 19/10/18

Model list for BTT300 series intelligent temperature transmitter

	Application	Anti-explosion grade	Installation	Configuration			
Two-wire system HART intelligent temperature transmitter	  	BTT301 □ 1 • Connect to thermal resistance transducer • Apply to the bad industrial environment • 4-20mA • Two-wire system HART	S: Standard type D: Flame-proof type Exd II CT6 I: Intrinsic-safety type Exia II CT6	Integrated-type Split-type	Conduct local operation by buttons and configure by HART modem		
		BTT301 □ 2 • Connect to thermocouple transducer • Apply to the bad industrial environment • 4-20mA • Two-wire system HART	S: Standard type D: Flame-proof type Exd II CT6 I: Intrinsic-safety type Exia II CT6	Integrated-type Split-type	Conduct local operation by buttons and configure by HART modem		
		BTT301 □ 3 • Connect to thermal resistance and thermocouple transducers • Apply to the bad industrial environment • 4-20mA • Two-wire system HART	S: Standard type D: Flame-proof type Exd II CT6 I: Intrinsic-safety type Exia II CT6	Integrated-type Split-type	Conduct local operation by buttons and configure by HART modem		
	Two-wire system intelligent temperature transmitter	  	BTT302 □ 1 • Connect to thermal resistance transducer • Apply to the bad industrial environment • Two-wire system 4-20mA	S: Standard type D: Flame-proof type Exd II CT6 I: Intrinsic-safety type Exia II CT6	Integrated-type Split-type	Conduct local operation by buttons	
			BTT302 □ 2 • Connect to thermocouple transducer • Apply to the bad industrial environment • Two-wire system 4-20mA	S: Standard type D: Flame-proof type Exd II CT6 I: Intrinsic-safety type Exia II CT6	Integrated-type Split-type	Conduct local operation by buttons	
			BTT302 □ 3 • Connect to thermal resistance and thermocouple transducers • Apply to the bad industrial environment • Two-wire system 4-20mA	S: Standard type D: Flame-proof type Exd II CT6 I: Intrinsic-safety type Exia II CT6	Integrated-type Split-type	Conduct local operation by buttons	
		RS485 intelligent temperature transmitter	  	BTT303 □ 1 • Connect to thermal resistance transducer • Apply to the bad industrial environment • RS485	S: Standard type D: Flame-proof type Exd II CT6	Integrated-type Split-type	Conduct local operation by buttons and configure by RS485
				BTT303 □ 2 • Connect to thermocouple transducer • Apply to the bad industrial environment • RS485	S: Standard type D: Flame-proof type Exd II CT6	Integrated-type Split-type	Conduct local operation by buttons and configure by RS485
			BTT303 □ 3 • Connect to thermal resistance and thermocouple transducers • Apply to the bad industrial environment • RS485	S: Standard type D: Flame-proof type Exd II CT6	Integrated-type Split-type	Conduct local operation by buttons and configure by RS485	

Model list for BTT300 series intelligent temperature transmitter

	Application	Communication protocol	Transmitting power	Configuration
 Wireless intelligent temperature transmitter	BTT304 □ N1 (indoors 30m, outdoors 100m) <ul style="list-style-type: none"> • Connect to thermal resistance transducer • Apply to the bad industrial environment 	Zigbee protocol	General type	Conduct local operation by buttons and configure by protocol converter
	BTT304 □ P1 (indoors 100m, outdoors 1500m) <ul style="list-style-type: none"> • Connect to thermal resistance transducer • Apply to the bad industrial environment 	Zigbee protocol	Enhanced type	Conduct local operation by buttons and configure by protocol converter
	BTT304 □ N2 (indoors 30m, outdoors 100m) <ul style="list-style-type: none"> • Connect to thermocouple transducer • Apply to the bad industrial environment 	Zigbee protocol	General type	Conduct local operation by buttons and configure by protocol converter
	BTT304 □ P2 (indoors 100m, outdoors 1500m) <ul style="list-style-type: none"> • Connect to thermocouple transducer • Apply to the bad industrial environment 	Zigbee protocol	Enhanced type	Conduct local operation by buttons and configure by protocol converter

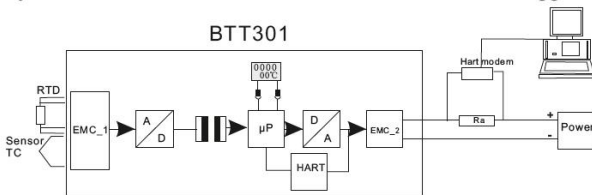
* Note: Please see the sensor model selection part for the matched sensor.

BTT301 two-wire system HART intelligent temperature transmitter

—BTT301A/B1, BTT301A/B2 and BTT301A/B3

Working principle

The temperature of the industrial field can be inputted into BTT301X by thermal resistance or thermocouple transducer and then converted into the corresponding temperature measured value by microprocessor after “analog-digital conversion”. Then the microprocessor will transmit the measured value to the highlighted LCD real-time display and convert it to the corresponding 4-20mA current signal output according to the proportion through “digital-analog conversion”. The information of the transmitter (including the measured value and diagnostic messages etc.) can be read in real time by HART communication and the transmitter can be debugged.



Characteristics

- The two-wire system transmitter, which is based on current loop power supply, can effectively reduce the wiring costs and power consumption and enhance the anti-interference ability.
- HART communication protocol.
- 4-20mA output.
- While connecting to the thermal resistance transducer, it has short-circuit and open-circuit monitoring function; while connecting to the thermocouple transducer, it has open-circuit monitoring function.
- By using the 3 built-in operating buttons together with the highlighted LCD display, the parameters of the transmitter can be set locally conveniently. In addition, the remote parameter configuration of the transmitter can be realized easily by HART modem.
- The rotatable LCD display enhances the flexibility of transmitter installation and displays the percentage of current measured value in the full scale, current measured value and its unit and the sensor type and the diagnostic messages of transmitter etc.
- The protection level of shell is IP67, which can be applied to the outdoor usage.
- Support all the transducers conforming to IEC751 and IEC584.

Application

- Metallurgical and steel industry
- Petrochemical industry
- Machine manufacturing industry
- Food and beverage industry
- Municipal water and sewage treatment industry
- Little textile/sugaring/papermaking/glass and other industries



The most reliable **quality experience**
Advanced manufacturing technique



Technical parameters

Input

Sensor type:

BTT301A/B1: Pt100, Pt1000, Cu50, Cu100

BTT301A/B2: S, R, B, K, N, E, J, T, WRe3-25

BTT301A/B3: Pt100, Pt1000, Cu50, Cu100

S, R, B, K, N, E, J, T, WRe3-25

Accept the user's designation

Connection modes

BTT301A/B1: A two/three/four-wire system thermal resistance transducer

BTT301A/B2: A thermocouple transducer and a thermal resistance transducer (three-wire) can work as the cold junction compensation or set the fixed cold-junction temperature to compensate without connecting to the thermal resistance transducer, or use the built-in thermal resistance transducer of the transmitter to conduct cold junction compensation (The compensation precision will effect the final measurement accuracy.)

BTT301A/B3: adopt the connection mode of BTT301A/B1 or BTT301A/B2 according to the needs

Measurement range

Appendix 1: List for the inputted sensor types and accuracies

Response time

≤250ms with sensor short-circuit and open-circuit monitoring

Output

Two-wire system 4-20mA

HART

Load resistance Ra

$R_a \leq (U_s - 14.7V) / 0.024A$, U_s is the loop voltage

Sensor faults

Short circuit: accept the user's designation (3.5~3.75mA)

Open circuit: accept the user's designation (21~23mA)

System faults

Can be set as 3.2mA or 24mA

Measurement accuracy

Accuracy (Digital measurement accuracy)

See appendix 1: List for the inputted sensor types and accuracies

Analog output accuracy

0.025% full scale

Long term drift

The first year <0.2% full scale

Temperature effects

See appendix 2: Effects of ambient temperature

Rated operating conditions

Ambient temperature

-40~85°C -20~60°C (Anti-explosion type)

Condensation

Allowable

Electromagnetic compatibility

GB/T 17626, Grade 3

Protection grade according to EN 60529

IP67

Design

Shell

Aluminium die casting

Weight

1kg (not including temperature sensor)

Size

See Appendix 3: Dimensional drawing for two-wire system intelligent temperature transmitter

Cable sealed tube connecting thread

M20×1.5 other threads need to use adapters

Connection of sensor

Integrated type

split type

Display and control

Size of display

33×23mm

Display precision

5 digits

Unit (Switchable)

°C or °F

Settings

The 3 buttons of panel or HART handle and configuration software which is compatible with HART protocol

Power supply

15~36V DC

Electric isolation

Between the input and output $U_{eff} = 1 \text{ kV}$, 50 Hz, 1 min

Certificate and licence

Flame-proof type

Exd II CT6

Intrinsic safety type

Exia II CT6



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Hardware and software requirements

If using PC to debug and configure the transmitter via HART

Hardware

PC with RS232/USB interface

Software

The testing software of CH intelligent temperature transmitter

Communication

HART connecting load

250~500Ω

Twin-core shield

≤3km

Multicore shield

≤1.5km

Protocol

HART protocol 5.2

Default setting of transmitter

Sensor

Pt100 or B type thermocouple or designated by the customer

Sensor migration

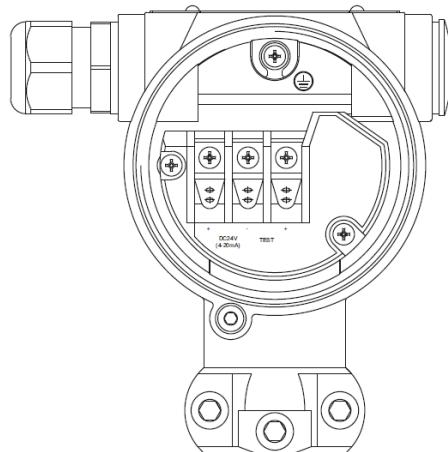
0°C

Damp

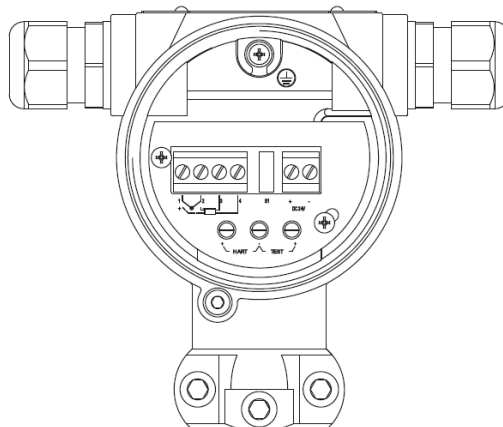
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Wiring diagram for the transmitter

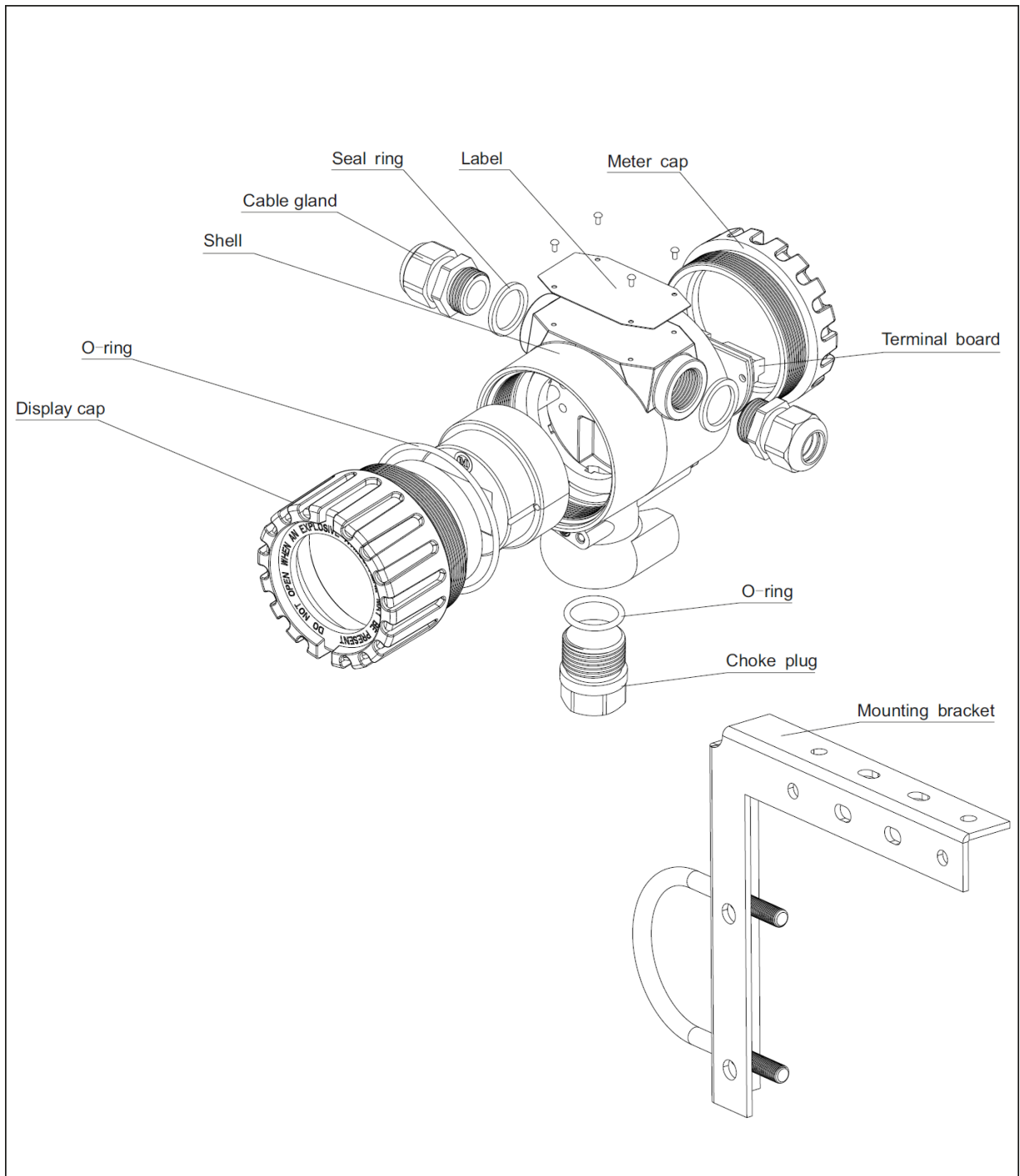
Wiring diagram for the integrated type transmitter



Wiring diagram for the split type transmitter



Structure diagram for BTT301 two-wire system HART intelligent temperature transmitter



Type spectrum table for BTT301 two-wire system HART intelligent temperature transmitter

Model	Product description
BTT301	Two-wire system HART intelligent temperature transmitter
Code	Display header
A	Integrated type (with temperature sensor, see the spectrum table for temperature sensor in Page 28 and 29 for details)
B	Split type (without temperature sensor, can be connected to any temperature sensor)
Code	Sensor type
1	Thermal resistance (The corresponding codes of sensor model are 01~04, 14.)
2	Thermocouple (The corresponding codes of sensor model are 05~13, 14.)
3	Full input (thermal resistance or thermocouple, the corresponding codes of sensor model are 01~14.)
Code	Sensor model ^①
01	Pt100
02	Pt1000
03	Cu50
04	Cu100
05	B
06	E
07	J
08	K
09	N
10	R
11	S
12	T
13	WRe3-25
14	Designated by user
Code	Anti-explosion grade
S	Standard type
D	Flame-proof type Exd II CT6
I	Intrinsic safety type Exia II CT6
Code	Range ^①
1	The default range: thermal resistance and full input model are Pt100:0~100℃; for thermocouple model, see (Appendix 1: List for the inputted sensor types and accuracies)
2	User-defined
Code	Electrical interface
1	M20×1.5
2	1/2NPT
Code	Range ability ^①
	Filled by the users (For example: -200℃~850℃), when the sensor model is designated by users, The writing form is: "Sensor model: range" For instance: Pt100: -200℃~850℃.

*See the sensor type spectrum table for the model of sensor

Example

BTT301A1-01D2(-200℃~850℃)

It means the integrated type two-wire system intelligent temperature transmitter, with user-defined range -200℃~850℃. The matched sensor is Pt100 thermal resistance and the anti-explosion grade is flame-proof type Exd II CT6.

*Note:

①BTT301 series has covered the sensors (model: 01~13). While the users designating the sensor type and range ability, it only directs at the default configuration when leaving the factory.

Appendix 1: List for the input sensor types and accuracies

Sensor	Sensor standard	Input range		Min. range		Digital accuracy		Digital/analog accuracy	
		°C	°F	°C	°F	°C	°F		
Two/three/four-wire thermal resistance	Pt100	IEC751,1995 JB/T8622-1997	-200~850	-328~1562	100	212	±0.15	±0.27	±0.025% range
	Pt1000	IEC751,1995 JB/T8622-1997	-200~600	-328~1562	100	212	±0.15	±0.27	±0.025% range
	Cu50	JB/T8623-1997	-50~150	-58~302	50	122	±0.15	±0.27	±0.025% range
	Cu100	JB/T8623-1997	-50~150	-58~302	50	122	±0.15	±0.27	±0.025% range
Thermocouple	B	IEC584 GB/T16839-1997 JB/T9238-1999	250~1800	482~3272	100	212	±0.25	±0.45	±0.025% range
	E	IEC584 GB/T16839-1997 JB/T9238-1999	-200~1000	-328~1832	100	212	±0.15	±0.27	±0.025% range
	J	IEC584 GB/T16839-1997 JB/T9238-1999	-210~1200	-346~2192	100	212	±0.15	±0.27	±0.025% range
	K	IEC584 GB/T16839-1997 JB/T9238-1999	-200~1370	-328~2498	100	212	±0.15	±0.27	±0.025% range
	N	IEC584 GB/T16839-1997 JB/T9238-1999	-200~1300	-328~2372	100	212	±0.15	±0.27	±0.025% range
	R	IEC584 GB/T16839-1997 JB/T9238-1999	-50~1760	-58~3200	100	212	±0.25	±0.45	±0.025% range
	S	IEC584 GB/T16839-1997 JB/T9238-1999	-50~1760	-58~3200	100	212	±0.25	±0.45	±0.025% range
	T	IEC584 GB/T16839-1997 JB/T9238-1999	-200~400	-328~752	100	212	±0.15	±0.27	±0.025% range
	WRe3-25 type	IEC584 GB/T16839-1997 JB/T9238-1999	0~2320	32~4208	100	212	±0.25	±0.45	±0.025% range

Note:

1. The total analog accuracy is the sum total of the digital and digital/analog accuracy.
2. B type thermocouple digital accuracy: 250~300°C (482~572°F), the accuracy within the range ability is ±3°C (±5.4°F)
3. K type thermocouple digital accuracy: -200~-90°C (-328~-130°F), the accuracy within the range ability is ±0.7°C (±1.26°F)
4. The cold junction compensation accuracy of thermocouple: ±0.5°C

Appendix 2: Effects of ambient temperature

Sensor option		When the temperature change by 1 (1.8) the effect on accuracy	Range	Digital/analog accuracy
Two/three/four-wire system thermal resistance	Pt100($\alpha=0.00385$)	0.003°C (0.0054°F)	Input range of the whole sensor	0.001% range
	Pt1000	0.003°C (0.0054°F)	Input range of the whole sensor	0.001% range
	Cu50	0.003°C (0.0054°F)	Input range of the whole sensor	0.001% range
	Cu100	0.003°C (0.0054°F)	Input range of the whole sensor	0.001% range
Thermocouple	B	0.014°C	$R \geq 1000^{\circ}\text{C}$	0.001% range
		0.032°C-(0.0025%(R-300))	$300^{\circ}\text{C} \leq R < 1000^{\circ}\text{C}$	
		0.054°C-(0.011%(R-100))	$100^{\circ}\text{C} \leq R < 300^{\circ}\text{C}$	
	E	0.005°C+(0.00043%R)		0.001% range
	J	0.0054°C+(0.00029%R)	$R \geq 0^{\circ}\text{C}$	0.001% range
		0.0054°C+(0.00025% absolute value R)	$R < 0^{\circ}\text{C}$	
	K	0.0061°C+(0.00054%R)	$R \geq 0^{\circ}\text{C}$	0.001% range
		0.0061°C+(0.0025% absolute value R)	$R < 0^{\circ}\text{C}$	
	N	0.0068°C+(0.00036%R)		0.001% range
	R	0.016°C	$R \geq 200^{\circ}\text{C}$	0.001% range
		0.023°C-(0.0036%R)	$R < 200^{\circ}\text{C}$	
	S	0.016°C	$R \geq 200^{\circ}\text{C}$	0.001% range
		0.023°C-(0.0036%R)	$R < 200^{\circ}\text{C}$	
	T	0.0064°C	$R \geq 0^{\circ}\text{C}$	0.001% range
		0.0064°C+(0.0043% absolute value R)	$R < 0^{\circ}\text{C}$	
	WRe3-25 type	0.016°C	$R \geq 200^{\circ}\text{C}$	0.001% range
0.023°C-(0.0036%R)		$R < 200^{\circ}\text{C}$		

Note: This ambient temperature effect table is referred to the factory calibrated temperature 20°C (68°F) of the transmitter.

Example of temperature effect (HART equipment)

When adopting Pt100 ($\alpha=0.00385$) sensor input and the ambient temperature is 30°C :

Digital temperature effect: $0.003^{\circ}\text{C} \times (30-20) = 0.03^{\circ}\text{C}$

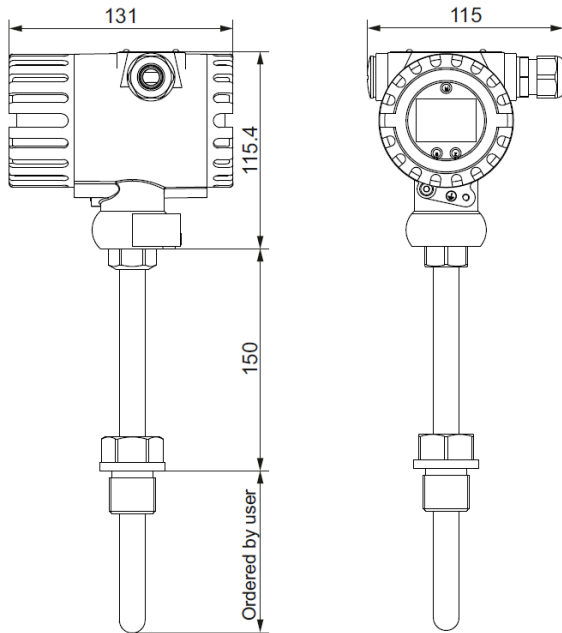
Digital/analog effect: $0.001/^{\circ}\text{C} \times (30-20) = 0.01^{\circ}\text{C}$

Under the worst condition, digit+digital/analog+digital temperature effect+digital/analog effect= $0.15^{\circ}\text{C}+0.03^{\circ}\text{C}+0.03^{\circ}\text{C}+0.01^{\circ}\text{C}=0.22^{\circ}\text{C}$

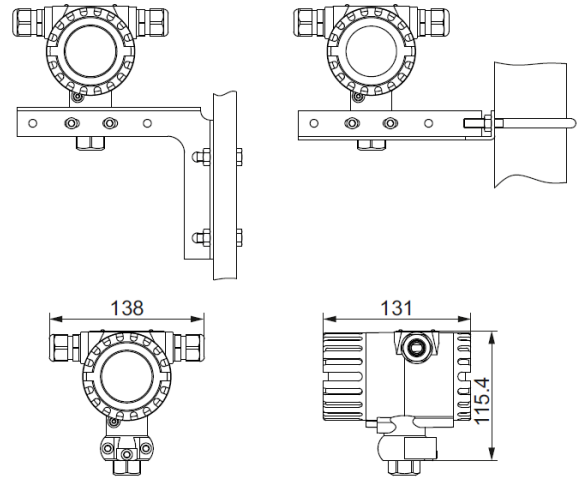
The possible total error: $\sqrt{0.15^2+0.03^2+0.003^2+0.01^2} = 0.156^{\circ}\text{C}$

Appendix 3: Dimensional drawing for two-wire system intelligent transmitter

Integrated type

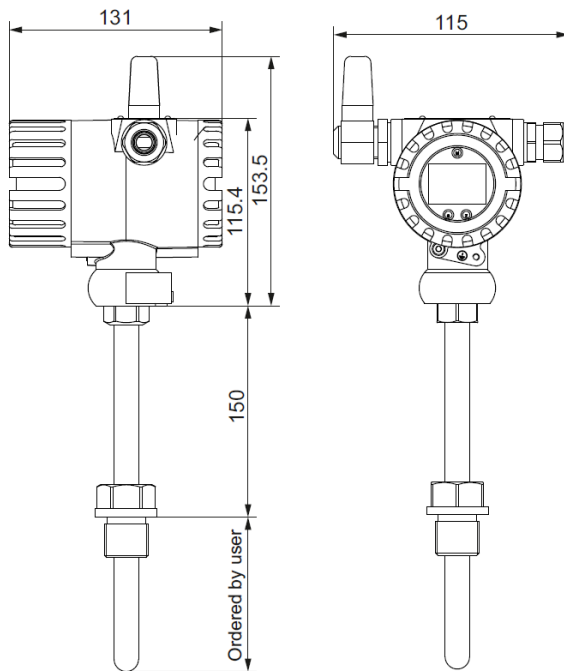


Split type

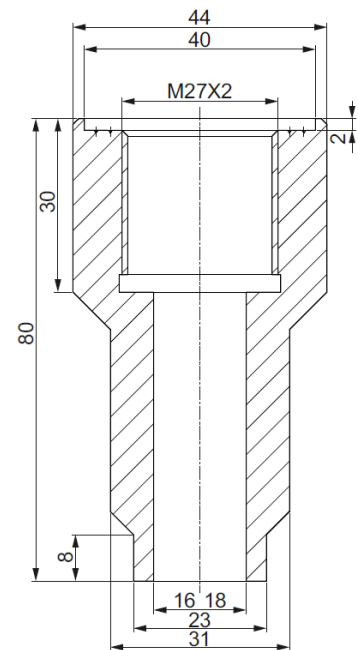


Appendix 4: Dimensional drawing for wireless intelligent temperature transmitter

Integrated type



M27x2 straight connector



Unit: mm



Type spectrum table for BTS-Z series integrated-type thermal resistance sensor

Model	Product description		
BTS-Z	Thermal resistance series sensor		
Code	Sensor type		
P	Platinum thermistor	Pt100	-200~500℃
T	Platinum thermistor	Pt1000	-200~500℃
C	Copper thermistor	Cu50	-50~100℃
G	Copper thermistor	Cu100	-50~100℃
Code	Fixed form of sensor		
1	No fixed position		
2	Fixed thread	Standard M27×2	Standard option
4	Fixed flange	Standard PN1.6MPa	For special requirements, designated by user
6	With straight connector (welded type) Fixed thread M27×2+welded straight connector		
9	Designated by user		
Code	Shell form		
4	Aluminium alloy (match used with the integrated type intelligent temperature transmitter)		
Code	Diameter of protection tube		
0-	Φ12		
1-	Φ16 (standard type)		
3-	Others		
Code	Material of protection tube		
A	304 (standard option)		
B	316		
C	HC		
Y	Others		
Code	Pressure grade		
1	1.6MPa (standard option)		
2	4.0MPa		
4	Designated by user		
Code	Flange standard	Remark	
1	GB CNS		
2	HG China Chemical Industry Standard		
3	JB China Mechanical Standard	Required while selecting the fixed form of flange	
4	ANSI United States Standard	Not required while selecting none-fixing and thread tightening	
5	DIN Europe Standard		
6	JIS Japanese Standard		
7	Other standards		
Code	Insertion depth	Remark	
()	The insertion depth designated by user	For example, L=300 means the insertion depth is 300mm Max. insertion depth L=1m (while exceeding, please consult before ordering.)	
Example			
BTS-ZP441-A12 (L=300 mm)			
Platinum thermistor Pt100/fixed flange/protection tube Φ16/material 304/pressure 1.6MPa/Chemical Standard/insertion depth L=300 mm			



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Type spectrum table for BTS-R series integrated-type thermocouple sensor

Model	Product description	
BTS-R	Thermocouple series sensor	
Code	Sensor type	
E	E type thermocouple	0~600℃
J	J type thermocouple	0~500℃
K	K type thermocouple	0~1000℃
N	N type thermocouple	0~1000℃
T	T type thermocouple	0~350℃
Y	Others	
Code	Fixed form of sensor	
1	No fixed position	
2	Fixed thread	Standard M27×2 Standard option
4	Fixed flange	Standard PN1.6MPa For special requirements, designated by user
6	With straight connector (welded type) Standard M27×2 thread	
9	Designated by user	
Code	Shell form	
4	Aluminium alloy (match used with the integrated type intelligent temperature transmitter)	
Code	Diameter of protection tube	
0-	Φ12	
1-	Φ16 (standard type)	
3-	Others	
Code	Material of protection tube	
A	304 (standard option)	
B	316	
C	HC	
Y	Others	
Code	Pressure grade	
1	1.6MPa (standard option)	
2	4.0MPa	
4	Designated by user	
Code	Flange standard	Remark
1	GB CNS	
2	HG China Chemical Industry Standard	
3	JB China Mechanical Standard	Required while selecting the fixed form of flange
4	ANSI United States Standard	Not required while selecting none-fixing and thread tightening
5	DIN Europe standard	
6	JIS Japanese Standard	
7	Other standards	
Code	Insertion depth	Remark
()	The insertion depth designated by user For example, L=300 means the insertion depth is 300mm	Max. insertion depth L=1m (while exceeding, please consult before ordering.)
Example		
BTS-RE441-A12 (L=300 mm)		
Platinum thermistor/fixed flange/protection tube Φ 16/material 304/pressure 1.6MPa/Chemical Standard/insertion depth L=300 mm		



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The protective tube material selection & operating temperature limit of temperature sensor:

Material	Features and purpose	Operating temperature
304	With low carbon content, it has good intergranular corrosion resistance and can be used as the general heat resistant steel.	-200~800
316	With low carbon content, it has good intergranular corrosion resistance and can be used as the corrosion-resistant steel.	-200~750
316L	With ultralow carbon content, it has good intergranular corrosion resistance and can be used as the corrosion-resistant steel.	-200~750
Monel	Nickel-copper, it has good intergranular corrosion resistance and can be applied to the corrosive occasions with strong sulfuric acid.	-100~700
Hastelloy	It has excellent intergranular corrosion resistance and can be used as the corrosion-resistant steel.	-100~700
1600	Nickel-chromium iron alloy, it has excellent high-temperature oxidation resistance and is usually used as heat resistant steel.	-100~1000
310S	It has high-temperature oxidation and corrosion resistance and is usually used as heat resistant steel.	-200~1000
GH3030	Nickel high-temperature alloy steel, it has excellent oxidation and corrosion resistance and is usually used as heat resistant steel.	0~1100
GH3039	Nickel high-temperature alloy steel, it has excellent oxidation and corrosion resistance and is usually used as heat resistant steel.	0~1300
High alumina	Industrial ceramic tube, it has excellent oxidation and corrosion resistance.	0~1300
Corundum	Industrial ceramic tube, it has excellent oxidation and corrosion resistance.	0~1600
3YC52	High-temperature alloy, it has excellent oxidation and corrosion resistance and good mechanical property, which can be applied to the high-temp occasions.	0~1300
Molybdenum disilicide	It has excellent oxidation and corrosion resistance and good mechanical property, which can be applied to the high-temp occasions.	0~1600



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Smart Temperature Transmitter

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