# WP-303 RS485 intelligent temperature transmitter

—WP-303A/B1, WP-303A/B2 and WP-303A/B3

Working principle

The temperature of the industrial field can be inputted into WP-303X by thermal resistance or thermocouple transducer and then converted into the corresponding digital quantity by microprocessor after "analog-digital conversion". Then the digital temperature value will be transmitted to the highlighted LCD real-time display, and, at the same time, be sent to the main control equipment via RS485 bus. The remote parameter setting and debugging can be conducted on the transmitter via Rs485 protocol.

WP303X
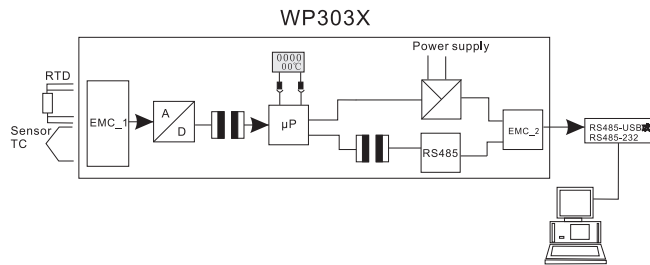
Characteristics

• The transmitter, which is based on RS485 communication protocol, can provide the temperature acquisition with high speed, long distance and high reliability.

• 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, the parameters can be set conveniently and, at the same time, the parameters of the transmitter can be set via RS485 bus.

• 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:

WP303A/B1: Pt100, Pt1000, Cu50, Cu100

WP303A/B2: S, R, B, K, N, E, J, T, WRe3-25

WP303A/B3: Pt100, Pt1000, Cu50, Cu100

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

Accept the user's designation

Connection modes

WP-303A/B1: A two/three/four-wire system thermal resistance transducer

WP-303A/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.)

WP-303A/B3: adopt the connection mode of WP303A/B1 or WP303A/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

Measurement accuracy

Digital measurement accuracy

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

Long term drift

The first year ＜0.035% full scale

Temperature effects

See appendix 2: Effects of ambient temperature

Rated operating conditions

Ambient temperature

−40~85℃ −20~60℃ (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

1.3kg (not including temperature sensor)

Cable sealed tube connecting thread

M20×1.5 other threads need to use adapters

Connection of sensor

Integrated type

split type

Size

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

Display and control

Size of display

33×23mm

Display precision

5 digits

Unit (Switchable)

℃ or ℉

Settings

The 3 buttons of the panel or PC

Power supply

+24V DC ±5%

Certificate and licence

Flame−proof type

Exd‖CT6

Intrinsic safety type

Exia‖CT6

Communication interface

RS485 Modbus RTU

Default setting of transmitter

Sensor
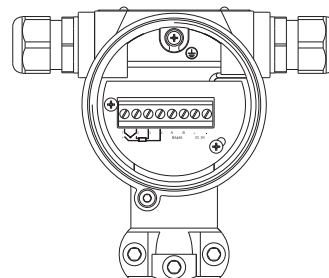
Pt100 or B type thermocouple or designated by the customer

Sensor migration

0℃

Damp

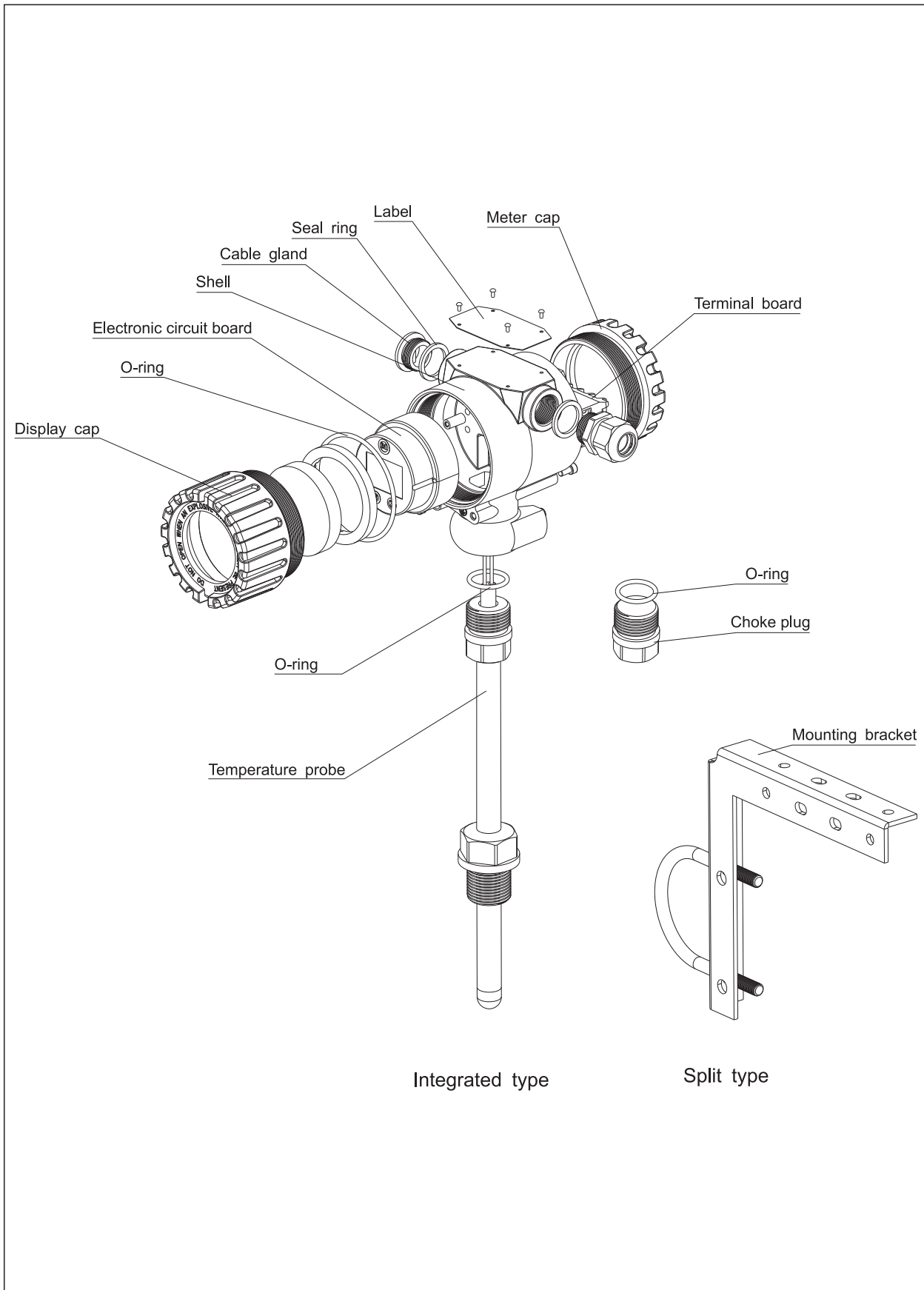0.0S

Wiring diagram for the transmitter

Label

Seal ring

Meter cap

Cable gland

Shell

Terminal board

Electronic circuit board

O-ring

Display cap

O-ring

Choke plug

O-ring

Mounting bracket

Temperature probe

Integrated type

Split type

Type spectrum table for WP-303 RS485 intelligent temperature transmitter

Model	Product description
WP-303	Rs485 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‖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

WP-303A1-01S2 (-200℃~850℃)

It means the integrated type RS485 intelligent temperature transmitter, with user-defined range -200℃~850℃. The matched sensor is Pt100 thermal resistance.

＊Note：

① WP-303 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.