Datasheet

Temperature Transmitter

SUP-TBY100

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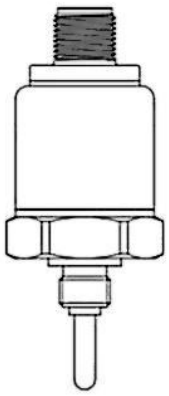
Temperature Transmitter

SUP-TBY100

With a Pt100 resistance temperature detector (RTD) as the sensing element, the temperature transmitter integrated with a signal conditioning and amplification module. It is designed to measure the liquid temperature in various industrial process. Besides, the transmitter adopts a highly stable signal-processing circuit to ensure continuous temperature measurement and signal output. A 24-bit ADC is used for digital signal conversion, enabling functions such as local display and remote transmission. It is widely used for temperature measurement of water, oil, and other liquids in industries such as petroleum, chemical processing, power generation, light industry, textile manufacturing, and environmental protection.

Features

- Compact structure and easy installation.
- High stability and high reliability.
- Anti-vibration, anti-radio frequency interference.
- High precision, all stainless steel structure.
- Strong anti-interference, good long-term stability.
- Wide range.



Temperature Transmitter

Principle

The measurement principle is based on the property that the resistance of a platinum resistance element varies with temperature according to a defined functional relationship.

When the temperature changes, the resistance value of the sensing element changes accordingly. This variation affects the current in the measurement circuit and generates a corresponding electrical signal. The signal is then processed and converted into a temperature value.

The temperature transmitter converts the temperature change into an electrical signal, which can be used for monitoring, control, or transmission to other systems.

Parameters

Input	
Measured variables	Temperature
Temperature sensor	Pt100
Measuring range	(0～100)℃; (-50～100)℃
Output	
Current output	(4～20)mA, load capacity R_L=(U-10V)/0.02A U: supply voltage, unit: V
Communication	RS485 interface; Modbus
Power supply	
Power supply	Current output: (10~32)VDC
	RS485 output: (8-32)VDC
Power consumption	Current output≤0.6W@24VDC
	RS485 output≤0.2W@24VDC
Electrical interface	Aviation, Hirschmann, Packard, direct leads
Performance parameters	
Accuracy	±0.5%FS
Response time	T_{90}≤60s
Insulation resistance	20MΩ, 500 VDC
Insulation strength	500VAC
Protection level	IP65
Process conditions	
Media type	Media that do not corrode silicon and stainless steel (or aluminum alloys)
Medium temperature	(-50～100)℃
Process pressure	4MPa
Environmental conditions	
Ambient temperature	(-20~70)℃
Storage temperature	(-20~70)℃

Wiring

(1) Aviation Connector

Fig.1

Table 1

No./ Cable color	Current output	Voltage output	RS485 output
1 / brown	$V_{supply+}$	$V_{supply+}$	$V_{supply+}$
2 / Black	-	$V_{supply-}$	$V_{supply-}$
3 / Blue	I_{out}	V_{out}	RS485-A
4 / White	-	-	RS485-B

(2) Hirschmann Connector

Fig.2

Table 2

No.	Current output	Voltage output	RS485 output
1	$V_{supply+}$	$V_{supply+}$	$V_{supply+}$
2	I_{out}	$V_{supply-}$	$V_{supply-}$
3	-	V_{out}	RS485-A
4	-	-	RS485-B

(3) Direct Lead Wire

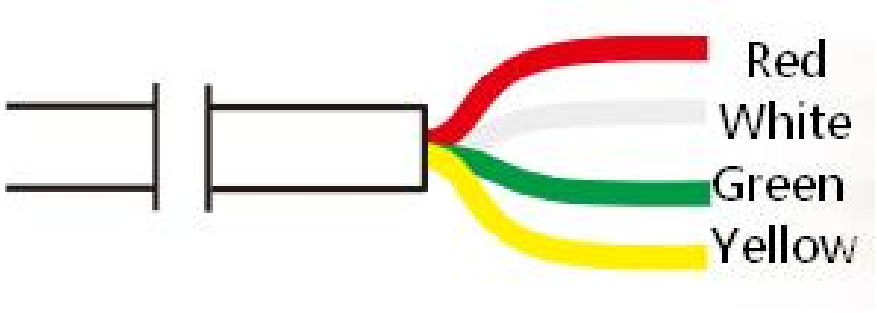


Fig.3

Table 3

Cable color	Current output	Voltage output	RS485 output
Red	$V_{supply+}$	$V_{supply+}$	$V_{supply+}$
Yellow	-	V_{out}	RS485-B
Green	I_{out}	$V_{supply-}$	RS485-A
White	-	-	$V_{supply-}$

(4) Packard Connector

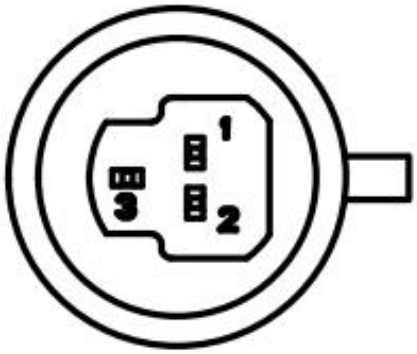


Fig.4

Table 4 Packard connector diagram

No.	1	2	3
Description	I_{out}	$V_{supply+}$	-

Dimensions

(1) Hirschmann Connector

Unit: mm

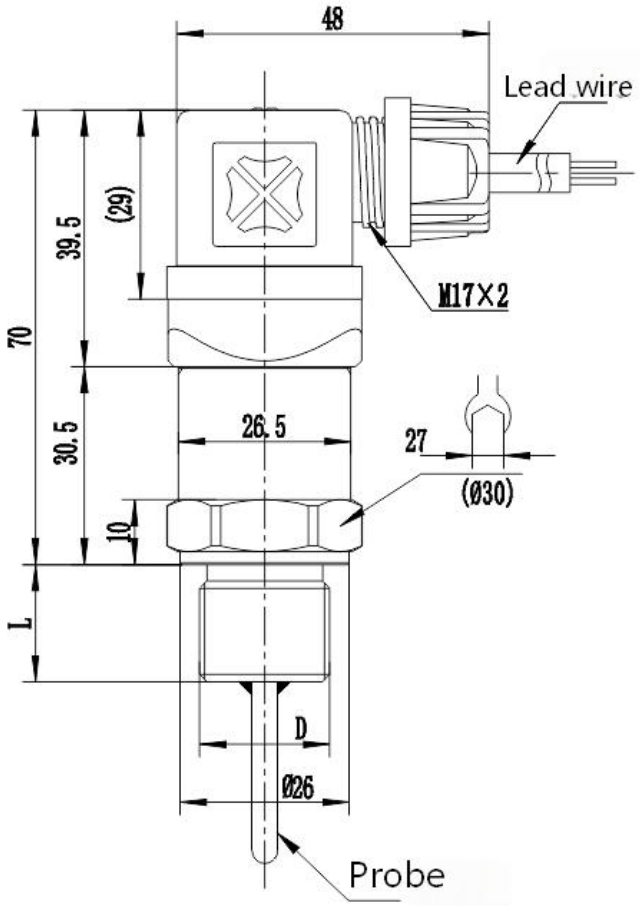


Fig.5 Dimensions of an integrated temperature transmitter (unit: mm)

Note: The probe length L and diameter Φ D are customized according to the order.

(2) Aviation Connector

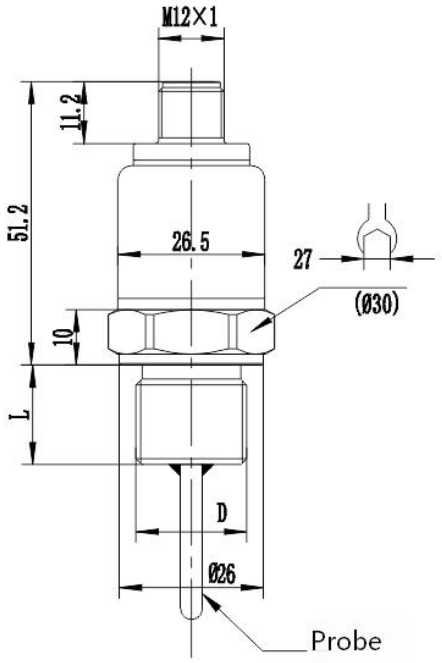


Fig.6 Dimensions of the type with aviation connector (unit: mm)

Note: The probe length L and diameter Φ D are customized according to the order.

(3) Direct Lead Wire

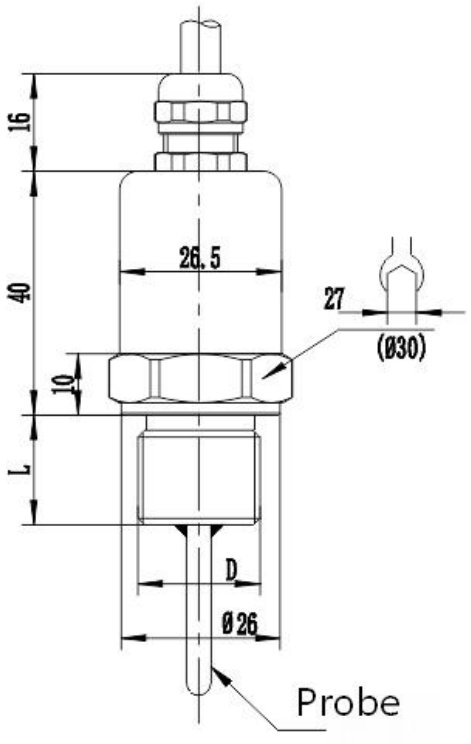


Fig.7 Dimensions of the type with lead wire (unit: mm)

Note: The probe length L and diameter Φ D are customized according to the order.

(4) Packard Connector

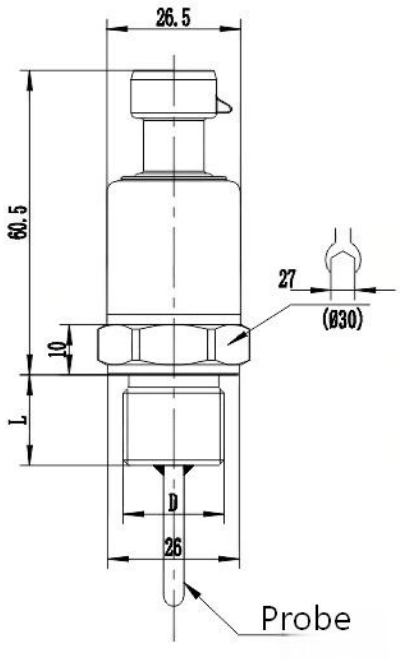


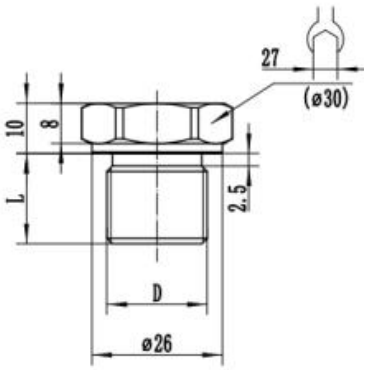
Fig.8 Dimensions of the type with packard connector (unit: mm)

Note: The probe length L and diameter Φ D are customized according to the order.

Process connection

Process connections: standard M27×2 thread, M20×1.5 thread, M14×1.5 thread, G1/8 thread, G1/4 thread, G1/2 thread, NPT 1/4 thread, NPT 1/2 thread, etc. Special threads require customization.

Table 5 Thread size



Thread type D	Thread length L (mm)
M27×2	20
M20×1.5	18
M14×1.5	15
G1/8	15
G1/4	15
G1/2	18
NPT 1/4	15
NPT 1/2	18

Material

Housing material: 304SS or 316LSS

Process connection material: 304SS or 316LSS

Ordering code

SUP-TBY100											Description
Sensor type	PA										Pt100, Grade A
Measuring range		1									0-100℃
		3									-50 to 200℃
		2									-50 to 100℃
		X									others
Accuracy			K								Level 0.5
Output and power supply				A1							Two-wire 4-20mA
Process connection					L2						M20×1.5 thread
					L3						M27×2 thread
					G1						G1/2 thread
					G2						G1/4 thread
					NC						NPT1/2 thread
					G6						G1/8 thread
					N2						G 1/2 thread (ED seal type)
					N3						G 1/4 thread (ED seal type)
					N4						G 1/8 thread (ED seal type)
					L1						M14×1.5 thread
					XX						others
Probe (sheath) diameter						3F					Φ8mm assembly type
						4F					Φ10mm assembly type
						5F					Φ12mm assembly type
						6F					Φ16mm

						assembly type
	5E					Φ8mm retractable sheath
	9E					Φ10mm retractable sheath
	6E					Φ12mm retractable sheath
	AE					Φ14mm retractable sheath
	7E					Φ16mm retractable sheath
	2F					Φ6mm assembly type
	1F					Φ4mm assembly type
	XX					others
Probe (sheath) length		30				30mm
		40				40mm
		50				50mm
		1H				100mm
		2H				200mm
		3H				300mm
		4H				400mm
		5H				500mm
		60				60mm
		80				80mm
		XX				others
Probe type			0			Insertion depth excluding threads
			1			Insertion depth including thread

Process connection and probe material	M1			304SS
	M3			316LSS
	XX			others
Electrical interfaces and protection levels		WA		Hirschmann connector, IP65
		WB		Aviation connector, IP65
Cable length			02	2m
			05	5m
			10	10m
			XX	others