

SBW系列温度变送器

SBW Series Temperature Transmitter

产品概述

Product Application

SBW系列热电偶、热电阻温度变送器是现场安装式温度变送器单元，与工业热电偶、热电阻配套使用，它采用二线制传输方式（两根导线作为电源输入和信号输出的公用传输线）。将工业热电偶、热电阻信号转换成与输入信号或与温度信号成线性的4-20mA、0-10mA的输出信号。

该变送器可直接安装在热电偶、热电阻的接线盒内与之形成一体化结构。它作为新一代测温仪表可广泛应用于冶金、石油、化工、电力、轻工、纺织、食品、国防以及科研等工业部门。

SBW Series Thermocouple, Thermal Resistor temperature transmitter is a field mounted temperature transmitter unit, which is used in conjunction with industrial thermocouples and RTDs. SBW Series Thermocouple, Thermal Resistor temperature transmitter adopts the two-wire transmission mode (two wires as the power input and signal output of the common transmission line). SBW Series Thermocouple, Thermal Resistor temperature transmitter can be industrial thermocouple, RTD signal into the input signal or with the temperature signal into a linear 4~20mA, 0-10mA output signal.

The transmitter can be directly installed in the junction box of thermocouple and RTD to form an integrated structure. As a new generation of temperature measuring instruments, SBW Series Thermocouple, Thermal Resistor temperature transmitter can be widely used in metallurgy, petroleum, chemical industry, electric power, light industry, textile, food, national defense and scientific research and other industrial sectors.

产品原理

Product Principle

热电偶或热电阻传感器反被测温度转换成电信号，再将该信号送入变送器的输入网络，该网络包含调零和热电偶补偿等相关电路。经调零后的信号输入到运算放大器进行信号放大，放大的信号一路经V/I转换器处理后以4~20mA直流电流输出；另一路经A/D转换器处理后到表头显示。变送器的线性化电路有两种，均采用反馈方式。对热电阻传感器，用正反馈方式校正，对热电偶传感器，用多段折线逼近法进行校正。一体化数字显示温度变送器有两种显示方式。LCD显示的温度变送器用二线制方式输出，LED显示的温度变送器用三线制方式输出。

The thermocouple or thermal resistance sensor converts the measured temperature into an electrical signal, and then sends the signal to the input network of the transmitter, which includes related circuits such as zero adjustment and thermocouple compensation. The zeroed signal is input to the operational amplifier for signal amplification. One path of the amplified signal is processed by the V/I converter and then output as 4~20mA DC current, and the other path is processed by the A/D converter and then displayed on the meter head. There are two types of linearization circuits for the transmitter, both of which use feedback. For the thermal resistance sensor, the positive feedback method is used for correction, and for the thermocouple sensor, the multi-segment broken line approximation method is used for correction. The integrated digital display temperature transmitter has two display modes. The temperature transmitter with LCD display is output in two-wire mode, and the temperature transmitter with LED display is output in three-wire mode.

技术参数

Technical Parameter

1、输入信号：热电偶：K、E、J、B、S、T、N。热电阻：Pt100、Cu100、Cu50（三线制、四线制）。智能型温度变送器的输入信号可通过PC机或手持器任意设置；

2、输出信号：在量程范围内输出4~20mA直流信号，与热电偶、热电阻的输入信号成线性或与温度成线性。智能型温度变送器输出4~20mA直流信号同时叠加符合HART标准协议通信信号；隔离式温度变送器，输入与输出相隔离，隔离电压0.5KV，增加了抗共模干扰能力，更适合于计算机连网使用；

3、基本误差：智能型0.2%FS/0.5%FS、HART型0.1%FS；

4、接线方式：输入二线制、三线制、四线制；

- 5、显示方式：四位LCD显示现场温度，智能型四位LCD可通过PC机或手持器设定使之显示现场温度、传感器值、输出电流和百分比中的任一种参数；
- 6、工作电压：智能型8~36(V)，HART型12~30(V)，额定工作电压为24V；
- 7、允许负载电阻：600Ω(24VDC供电)；
- 8、工作环境：
 - a: 环境温度
(-20~80)℃(智能型)、(-40~85)℃(HART型)、(20~80)℃(数显型)
 - b: 相对湿度：<85%RH
 - c: 温度漂移：<50ppm/℃
 - d: 无腐蚀气体或类似的环境；
- 9、温度影响系数： $\delta \leq 0.05\%/^{\circ}\text{C}$ ；

1. Input signal: Thermocouple: K, E, J, B, S, T, N. Thermal resistance: Pt100, Cu100, Cu50 (three-wire system, four-wire system). The input signal of the intelligent temperature transmitter can be set arbitrarily by PC or handheld.
2. Output signal: Output 4~20mA DC signal in the range, linear with the input signal of thermocouple and thermal resistor or linear with temperature. The intelligent temperature transmitter outputs 4~20mA DC signals simultaneously superimposed in line with HART standard protocol communication signals; Isolated temperature transmitter, input and output are isolated, isolation voltage 0.5KV, increase the ability to resist common mode interference, more suitable for computer network use.
3. Basic error: Intelligent 0.2%FS/0.5%FS, HART type 0.1%FS.
4. Wiring method: Two wire system, three wire system, and four wire system.
5. Display mode: Four-digit LCD displays the field temperature, and the intelligent four-digit LCD can be set by PC or handheld to display any of the parameters of the field temperature, sensor value, output current and percentage ratio;
6. Working voltage: Intelligent type 8~36(V), HART type 12~30(V), rated working voltage of 24V.
7. Load resistance: 600Ω(24VDC power supply).
8. Working environment:
 - a: Ambient temperature
(20~80)-C (smart), (85)-40~C (HART), (20~80)-C (digital display type)
 - b: Relative humidity: <85%RH
 - c: Temperature drift: <50ppm/C
 - d: No corrosive gas or similar environment
9. Temperature influence coefficient: $\delta < 0.05\%/^{\circ}\text{C}$.

产品特点

Product Features

- 1、采用硅胶或环氧树脂密封结构，因此耐震、耐湿、适合在恶劣的现场境中安装使用；
- 2、现场安装在热电偶、热电阻的接线盒内使用，直接输出4~20mA、0~10mA、的输出信号。这样既节约了昂贵的补偿导线费用，又提高了信号远距离传输过程中的抗干扰能力；
- 3、热电偶变送器具有冷端温度自动补偿功能；
- 4、精度高、功耗低，使用环境温度范围宽，工作稳定可靠；
- 5、适用范围广、既可以与热电偶、热电阻形成一体化现场安装结构，也可以作为功能模块安装在检测设备和仪表盘上使用；
- 6、智能型温度变送器可通过HART调制解调器与上位机通讯或与手持器和PC机对变送器的型号、分度号、量程进行远程信息管理、组态、变量监测、校准和维护等功能；
- 7、智能型温度变送器可按用户实际需要调整变送器的显示方向，并可显示变送器所测的介质温度、传感器值的变化、输出电流和百分比。

1. Silicone or epoxy resin seal structure, shock-resistant and moisture-resistant, suitable for installation and use in harsh site environment.
2. On-site installation in the junction box of thermocouple and thermal resistance, direct output of 4~20mA, 0~10mA

output signal, which not only saves the cost of compensation wire, but also improves the anti-interference ability of signal long-distance transmission process.

3. Thermocouple transmitter with cold end temperature automatic compensation function.

4. High precision, low power consumption, wide ambient temperature range, stable and reliable work.

5. Applicable to a wide range of applications, it can form an integrated field installation structure with thermocouples and thermoelectric positives, and can also be installed as a functional module in testing equipment and instrument panel.

6. The intelligent temperature transmitter can communicate with the host computer through HART modem or carry out remote information management, configuration, variable monitoring, calibration and maintenance of the transmitter model, index number and range with handheld and PC.

7. The intelligent temperature transmitter can adjust the display direction of the transmitter according to the actual needs of the user, and can display the medium temperature measured by the transmitter, the change of the sensor value, the output current and the percentage.

测量范围

Measuring Range

类别 Category	材质 Material	分度号 Graduation	测量范围 Measuring range
热电偶 Thermocouple	镍铬-康铜 Nichrome-Constantan	E	(0~800) °C范围内任选 Optional within the range of (0-800) °C
	镍铬-镍硅 Nichrome-Nickel-Silicon	K	(0~1300) °C范围内任选 Optional within the range of (0-1300) °C
	镍铬硅-镍硅 Nichrome-Silicon-Nickel-Silicon	N	(0~1300) °C范围内任选 Optional within the range of (0-1300) °C
	铂铑10-铂铑 Platinum-Rhodium 10 -Platinum-Rhodium	S	(0~1600) °C范围内任选 Optional within the range of (0-1600) °C
	铂铑30-铂铑6 Platinum-Rhodium 30 -Platinum-Rhodium 6	B	(600~1800) °C范围内任选 Optional within the range of (600-1800) °C
热电偶 Thermocouple	铜-康铜 Copper - Constantan	T	(0~400) °C范围内任选 Optional within the range of (0-400) °C
	铁-康铜 Iron-constantan	J	(0~800) °C范围内任选 Optional within the range of (0-800) °C
热电阻 Thermal Resistor	铜热电阻 Copper Thermal Resistor	Cu50	(-50~150) °C范围内任选 Optional within the range of (-50-150) °C
	铜热电阻 Copper Thermal Resistor	Cu100	(-50~150) °C范围内任选 Optional within the range of (-50-150) °C
	铂热电阻 Platinum Thermal Resistor	Pt100	(200~600) °C范围内任选 Optional within the range of (200-800) °C

型号代码及说明

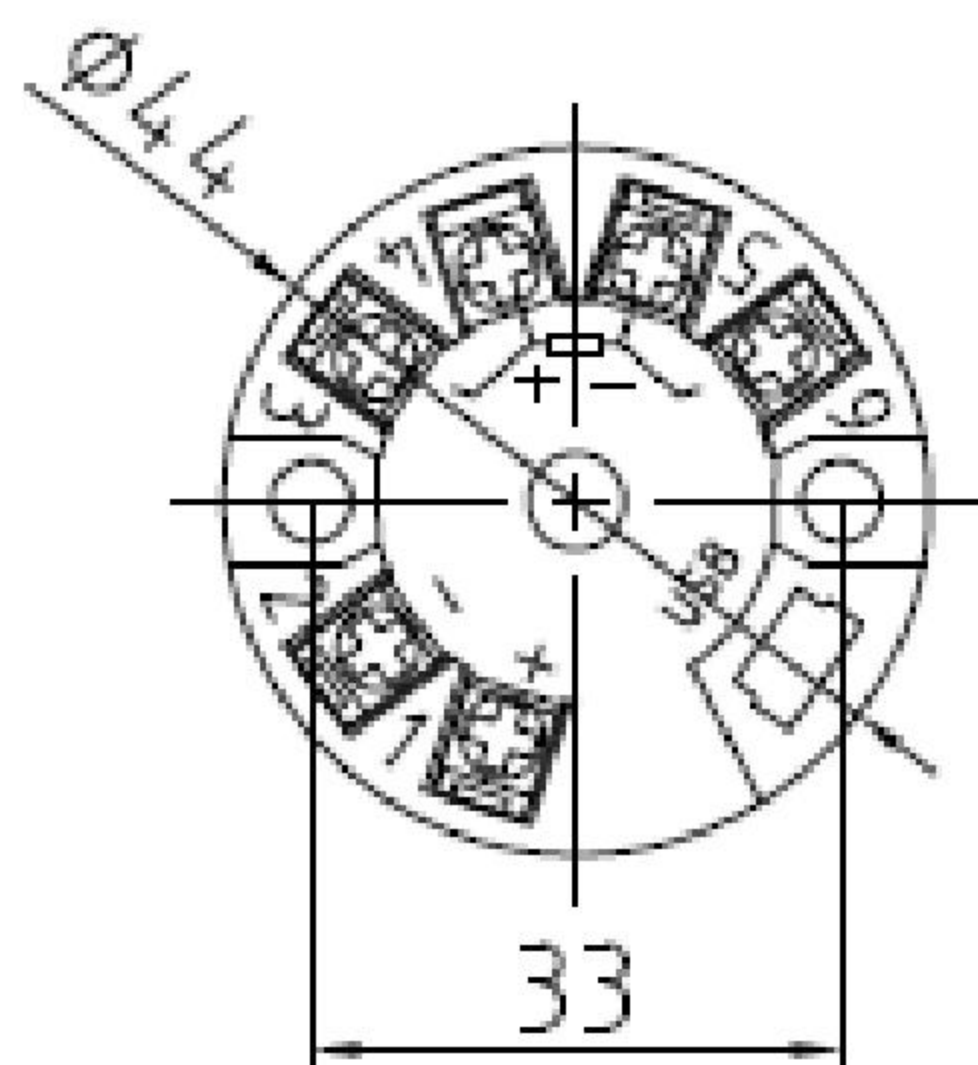
Model code and description

型号 Model				说明 Description
SBW				温度变送器 Temperature transmitter
类别 Category	R			热电偶 Thermocouple
	Z			热电阻 Thermal Resistor
传感器 Sensor	1			适配K热电偶/适配Pt100热电阻 Adapted K-thermocouple/Adapted Pt100 thermistor
	2			适配E热电偶/适配Cu100热电阻 Adapted E thermocouple/Adapted Cu100 thermistor
	3			配J热电偶/适配Cu50热电阻 Adapted J thermocouple/Cu50 thermistor
	4			适配B热电偶 Adapted B thermocouple
	5			适配S热电偶 Adapted S-thermocouple
	6			适配T热电偶 Adapted T thermocouple
	7			适配N热电偶 Adapted N thermocouple
	9			用户自定 Custom by user
电路类别 Circuit category		0		隔离型 Isolated type
		1		非隔离型 Non isolated type
安装方式 Installation method		0		常规型 Conventional type
		1		导轨型 Guide rail type
变送器种类 Type of transmitter		0		常规型 Conventional type
		1		隔离型 Isolated type
		2		数显型 Digital display type
		3		带HART协议型 HART Protocol type
		4		自供电 Self-power
		5		其它型式 Other types

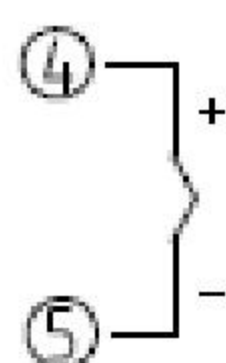
接线说明

Wiring Instructions

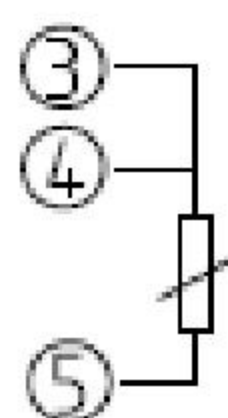
智能型温度模块
Intelligent temperature module



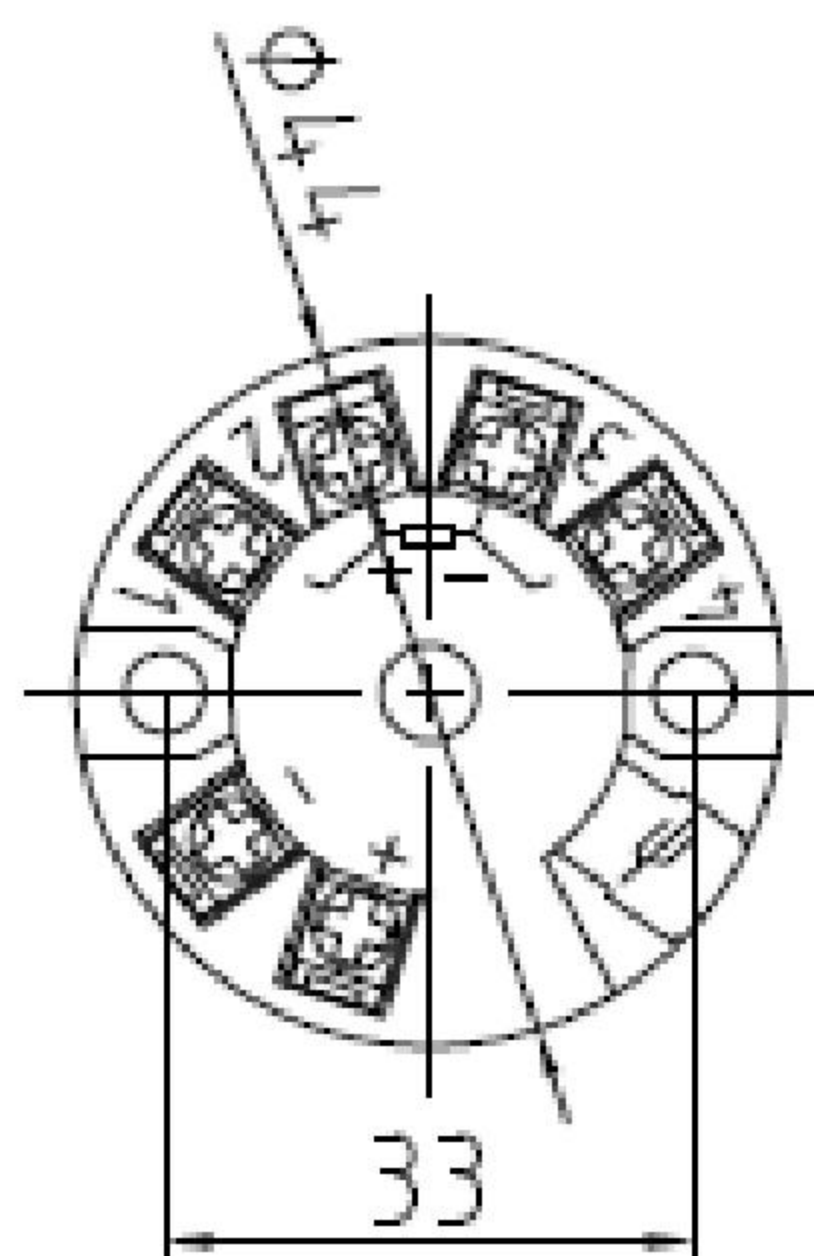
热电偶接线:
Thermocouple wiring



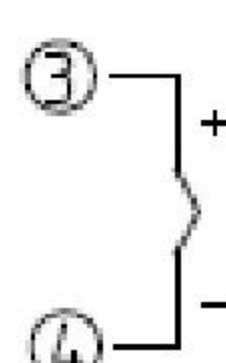
热电阻接线:
Thermal Resistor wiring



HART温度模块
HART temperature module



热电偶
Thermocouple



热电阻接线:
Thermal Resistor wiring

