

SBWZ-PT100

PT100 RTD Temperature Transmitter Module

4–20 mA Current Loop Output · 0–300 °C Default Range · 3-Wire PT100 Input

1. Overview

The SBWZ-PT100 is a compact DIN-rail-mountable signal transmitter designed to interface with 3-wire PT100 Resistance Temperature Detectors (RTDs). It converts the resistance signal from a PT100 sensor into a standard industrial 4–20 mA current loop output, proportional to the measured temperature.

The module is compatible with PLCs, digital display meters, controllers, and data recorders, making it suitable for a wide range of industrial process monitoring and automation applications.

2. Electrical & Functional Specifications

Parameter	Specification
Model	SBWZ-PT100
Sensor Input	PT100 RTD (3-Wire)
Output Signal	4–20 mA (Current Loop)
Measuring Range	0–300 °C (Default)
Available Ranges	0–50 / 0–100 / 0–150 / 0–200 / 0–250 / 0–300 / 0–400 / 0–500 / 0–600 °C -20–60 / -20–80 / -50–50 / -50–100 / -50–150 / -50–200 / -50–250 / -50–300 / -50–400 °C
Temperature Coefficient (Range ≤100 °C)	250 ppm/K F.S.
Temperature Coefficient (Range >150 °C)	≤150 ppm/K F.S.
Compatible Equipment	PLC, Controller, Display Meter, Recorder
Calibration	Manual — Zero & Span Potentiometers (on-board)
Mounting	Module with M3 screw mounting
Package Contents	1× RTD PT100 Temperature Transmitter Module, 2× M3 Screws

3. Available Temperature Measurement Ranges

The transmitter can be factory-configured or user-specified for any of the ranges listed below. Select a range closest to the actual process temperature for optimal signal resolution.

Positive Ranges	Negative-Start Ranges
0–50 °C	–20–60 °C
0–100 °C	–20–80 °C
0–150 °C	–50–50 °C

0–200 °C	–50–100 °C
0–250 °C	–50–150 °C
0–300 °C (Default)	–50–200 °C
0–400 °C	–50–250 °C
0–500 °C	–50–300 °C
0–600 °C	–50–400 °C

- A wider range reduces effective resolution. Always select the smallest range that covers your process.
- Default as-shipped configuration: 0–300 °C.

4. Wiring — PT100 Sensor to Transmitter

The SBWZ-PT100 accepts a standard 3-wire PT100 connection. Refer to the table below for terminal assignments:

Wire Color	Terminal	Description
Red	RTD–	Sensor negative (–) connection
Red	RTD–	Sensor negative (–) connection (3-wire bridge)
White	RTD+	Sensor positive (+) connection

- For 3-wire PT100 sensors: connect both RTD– wires to the two RTD– terminals. The RTD+ wire connects to the RTD+ terminal.
- Output terminals supply 4–20 mA to the connected PLC or controller loop. Ensure correct loop polarity.

5. On-Board Calibration Potentiometers

Two trimmer potentiometers on the module allow field calibration of Zero and Span (Compensate) without external instruments:

Potentiometer	Position	Clockwise	Counter-Clockwise
Zero (Left)	Left-side on board	Output increases	Output decreases
Span / Compensate (Right)	Right-side on board (AM)	Output decreases	Output increases

- Calibration procedure: Apply a known temperature reference to the PT100, adjust Zero first to achieve 4 mA at the low end, then adjust Span to achieve 20 mA at the high end.
- Repeat adjustment iteratively if required, as Zero and Span may interact slightly.

6. PT100 RTD Technology — Background

PT100 is a Resistance Temperature Detector (RTD) manufactured from platinum, with a nominal resistance of 100 Ω at 0 °C. Its resistance increases linearly with temperature according to the IEC 60751 standard, offering high accuracy and long-term stability compared to thermocouples.

The SBWZ-PT100 transmitter module amplifies and linearizes the low-level resistance signal from the PT100 element, delivering a robust 4–20 mA current loop output that is immune to cable-induced voltage noise over long runs — an important advantage in industrial environments.

The 4–20 mA output maps directly to the selected temperature span: 4 mA corresponds to the minimum temperature and 20 mA to the maximum temperature of the configured range.

7. Application Notes & Recommendations

- *Range selection: Choose the range closest to your actual process temperature span. An unnecessarily wide range reduces resolution and may cause signal instability.*
- *Cable routing: Keep sensor wiring away from power cables to minimize electromagnetic interference.*
- *3-wire compensation: Always use a 3-wire PT100 connection for proper lead resistance compensation; 2-wire connections will introduce measurement error.*
- *Compatible systems: PLC analog input cards, process controllers, paperless recorders, digital panel meters with 4–20 mA inputs.*
- *If operating near the limits of a range, consider selecting the next wider range to maintain transmitter stability.*

8. Package Contents

Each unit is supplied with:

- 1 × SBWZ-PT100 RTD Temperature Transmitter Module
- 2 × M3 Mounting Screws

This document was prepared based on available product specifications and is provided for reference purposes. Specifications are subject to change without notice. For safety-critical applications, verify performance against your specific process conditions.