

MTM4831S

Operation Manual



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Micro Sensor reserves the right to modify this operation manual due to product technology and process updates. Any modifications will be made without prior notice.

Refer to the latest version of this manual.

Micro Sensor also reserves the final interpretation right of this manual.

Version: V1.0

Thanks for using products from MICROSENSOR. To make the most of this product, it is recommended that you carefully read this manual before using it.

1 Introduction

MTM4831S Integrated Temperature Transmitter is designed to directly measure the temperature of liquids, gases, and solid surfaces within the range of -200°C to $+1000^{\circ}\text{C}$. It incorporates a dedicated temperature module for linearization of the sensing element and provides standard analog output signals. The transmitter is easy to use and is suitable for temperature measurement in various industrial applications, including petroleum, chemical processing, metallurgy, power generation, and light industry.

2 Specifications

Accuracy: $\pm 1.0\% \text{FS}$; $\pm 0.5\% \text{FS}$ (depending on the measuring range)

Measuring range: $-200^{\circ}\text{C} \dots 0^{\circ}\text{C} \sim +500^{\circ}\text{C}$ (Pt100 / Pt1000 RTD)

$-40^{\circ}\text{C} \dots 0^{\circ}\text{C} \sim +1000^{\circ}\text{C}$ (Type K thermocouple)

Power supply: 12V~32V DC (Typ. 24V DC)

Output signal: Analog 4mA~20mA DC (2-wire)

Ambient temperature: Standard type: $-30^{\circ}\text{C} \sim +80^{\circ}\text{C}$

Flameproof type: Marking: Ex db IIC T6 Gb; Ambient
temperature: $-30^{\circ}\text{C} \sim +60^{\circ}\text{C}$

IP rating: IP65(Standard type), IP67(Flameproof type)

Insulation resistance: $\geq 50\text{M}\Omega$, 500V DC

Explosion-proof specifications: Flameproof marking Ex db IIC T6 Gb

3 Outline Construction

3.1 Construction Materials

Housing: Die-cast aluminum alloy

Wetted parts: Stainless steel 304 / 316L or others

Sensing element: Pt100, Pt1000, Type K thermocouple

Display window: Flameproof glass

3.2 Overall Dimensions

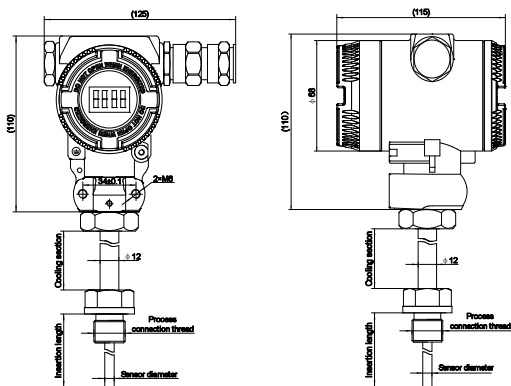


Figure 1 Integral Type (mm)

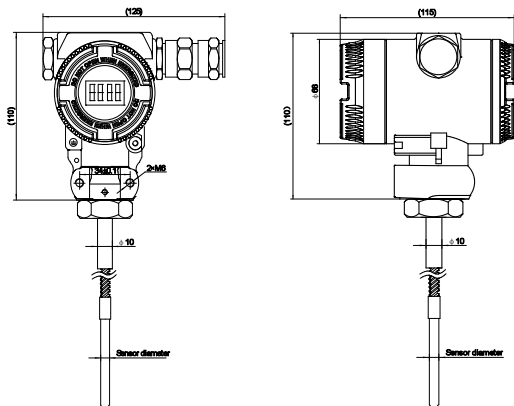


Figure 2 Remote Type (mm)

4 Installation

4.1 Pre-Installation Inspection

- Verify that the measurement range specified on the transmitter nameplate complies with the actual operational requirements on site.
- Check whether the mounting method and process connection thread dimensions match the actual site conditions.

4.2 Mounting Methods

There are five mounting methods available for the temperature transmitter: Fixed Thread, Fixed Flange, Fixed Clamp, Adjustable Threaded Compression Fitting, and Adjustable Flanged Compression Fitting.

4.2.1 Fixed Thread Mounting

Dimensions for fixed mounting threads are listed in Table 1.

The transmitter is secured directly via its process threads, with 11 standard interfaces available. See Figure 3 for fixed thread mounting.

Table 1 Fixed Mounting Threads

M	H	M	H
M10×1	8	G1/2	14
M12×1.5	12	G1/4	12
M14×1.5	12	G3/8	12
M16×1.5	12	NPT1/4	10
M20×1.5	14	NPT1/2	14
M27×2	16		

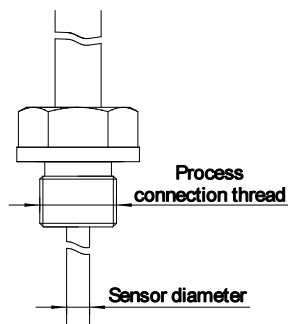


Figure 3 Fixed Thread Mounting

4.2.2 Fixed Flange Mounting

Available in six standard sizes: DN10, DN20, DN25, DN32, DN40, and DN50.

During installation, place a flange gasket between the transmitter flange and the process pipe flange, then tighten the bolts to ensure a leak-tight seal.

See Figure 4 for fixed flange mounting.

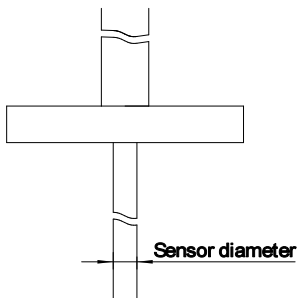


Fig. 4 Fixed Flange Mounting

4.2.3 Fixed Clamp Mounting

Available in two nominal sizes: $\phi 25.4$ and $\phi 50.5$. To install, align the transmitter clamp with the process connection, then secure with a matching clamp to achieve a tight seal.

See Figure 5 for fixed flange mounting.

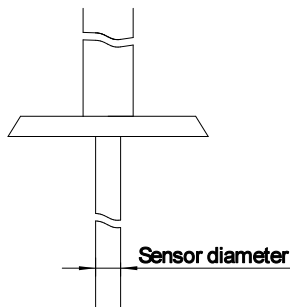


Figure 5 Fixed Clamp Mounting

4.2.4 Adjustable Threaded Compression Fitting

This method adjusts the stem insertion depth into the medium or thermowell by positioning the compression fitting before securing it in place. See Figure 6 for adjustable threaded compression fitting. Dimensions are listed in Table 2.

Table 2 Adjustable Compression Fitting Threads

M	H	M	H
M10×1	8	G1/2	14
M12×1.5	12	G1/4	12
M14×1.5	12	G3/8	12
M16×1.5	12	NPT1/4	10
M20×1.5	14	NPT1/2	14
M27×2	16		

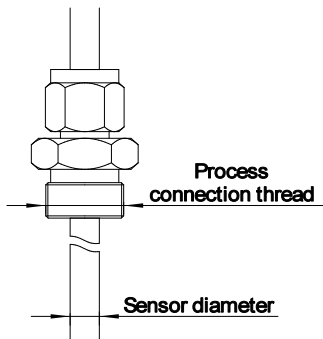


Figure 6 Adjustable Threaded Compression Fitting

4.2.5 Adjustable Flanged Compression Fitting

This method mounts a flange onto the sensor stem via an integrated threaded interface and compression fitting assembly to secure the transmitter. See Figure 7 for adjustable flanged compression fitting.

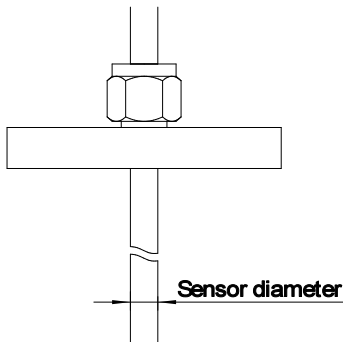


Figure 7 Adjustable Flanged Compression Fitting

Note 1: The sensor may be installed in any orientation. Ensure the sensing tip is fully immersed in the medium and that the protection tube insertion depth is sufficient. For pressurized pipelines, pay attention to sealing at the connection.

Note 2: Always use a wrench or other appropriate tools on the nut to tighten the device during installation. Do not rotate the junction box or display head directly by hand to prevent internal wiring from breaking.

4.3 Installation of Explosion-proof Transmitters

4.3.1 This instrument has passed technical testing for flameproof protection. Installation, external wiring, operation, and maintenance shall strictly comply with applicable regulations. Failure to observe these limitations will result in hazardous conditions.

4.3.2 To ensure the safety of explosion-proof equipment, extreme care shall be

taken during installation, wiring, and piping. Strict compliance with safety protocols is mandatory during maintenance and repair. Read the following instructions carefully.

MTM4831S Integrated Temperature Transmitter holds explosion-proof certificates for Flameproof (Ex db) protection. It is certified for use in hazardous areas containing explosive gases or flammable vapors.

4.3.3 Flameproof Type (Ex db)

MTM4831S Integrated Temperature Transmitter complies with GB/T 3836.1 (Explosive atmospheres-Part 1: Equipment-General requirements) and GB/T 3836.2 (Explosive atmospheres - Part 2: Equipment protection by flameproof enclosures “d”). It is suitable for hazardous areas containing explosive gases or flammable vapors.

Product installation, operation, and maintenance shall also comply with the relevant provisions of GB/T 3836.15 (Explosive atmospheres - Part 15: Specification of electrical installations design, selection and erection) and GB/T 3836.16 (Explosive atmospheres - Part 16: Electrical installations inspection and maintenance).

5 Electrical Connection

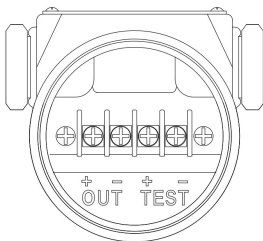


Figure 8 Transmitter Wiring Diagram

Figure 3 Transmitter Wiring Definition

Output Signal	Terminal	Definition	Remarks
4mA~20mA DC (2-wire)	+OUT	V+	Remaining terminals: NC
	-OUT	V-	

6 Unpacking and Components

6.1 Unpacking

a) Check the package completed or not firstly, and the box should be put as the sign “up”.

b) Be sure unpacking carefully, and prevent damaging instruments or accessories.

6.2 Components

Upon leaving the factory, the components shall include:

MTM4831S Integrated Temperature Transmitter 1 unit

Operation Manual 1 copy

Certificate of Conformity 1 copy

7 Operation, Maintenance, and Storage

7.1 Operation

The user could operate the transmitter without any adjustment. Before powering on, verify installation and electrical connections. Then, power on to start operation. The transmitter starts operating upon power-on, but a warm-up time of 30 minutes is recommended for a stable and reliable output signal.

7.2 Maintenance

The temperature transmitter is generally maintenance-free and shall not be adjusted on site. In case of malfunction, first check installation and electrical connections. If the issue persists despite correct installation, contact the service center of Micro Sensor.

7.3 Storage

Storage temperature: $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$; relative humidity $\leq 80\%$, in a dry, ventilated environment free from corrosive gases.

8 Safety Instructions for Flameproof Transmitters

8.1 Check whether there is Ex db IIC T6 Gb marking on the flameproof nameplate of the transmitter.

8.2 The product is certified for use in hazardous areas classified as Class IIA to IIC, where explosive gas mixtures or flammable vapors and air are present within temperature groups T1 to T6.

8.3 Consider the impact of the process medium temperature during operation to ensure strict compliance with the T6 temperature class.

8.4 Transmitter installation shall satisfy the following requirements:

a) The transmitter shall be installed with certified cable entry devices (cable glands) that match the product's explosion-proof rating. Ensure that the flameproof threaded joint dimensions comply with GB/T 3836.2 (IEC 60079-1), and strictly follow the operating instructions.

b) The enclosure cover shall be fully tightened with a minimum thread engagement of 6 full threads. Do not damage the threads.

c) All flameproof joints and components are strictly inspected prior to factory release. Do not scratch or damage any flameproof mating surfaces during operation. Custom or third-party fabrication of flameproof components is strictly prohibited. Damaged components shall be reordered from the MICROSENSOR immediately.

d) Route the cable to a designated safe area before stripping and terminating the individual conductors.

9 Parameter Configuration and Operation

9.1 Display and Button Descriptions

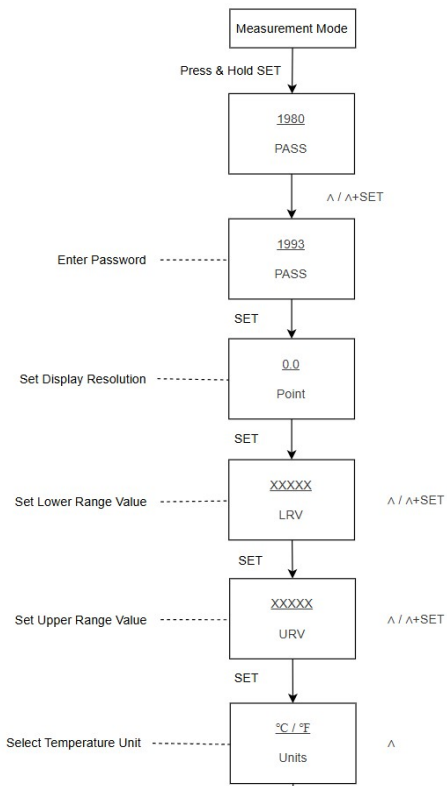
Upon power-up, the transmitter sequentially displays the lower limit and upper limit of the calibrated range, followed by the current measured temperature. The front panel features two buttons: SET and $\wedge$. The $\wedge$ button is used to modify parameter values. The SET button is used to navigate through functional parameters and confirm modifications.

9.2 Basic Parameter Configuration

The transmitter is factory-configured and calibrated according to user specifications and is ready for immediate operation. If site conditions require adjustments, users can modify parameters by following the steps outlined in Sections 9.3 and 9.4.

9.3 Password Access

In measurement mode, press and hold the SET for approximately 3 seconds. The secondary display will show "PASS" and the primary display will show "1980". Press $\wedge$ or the $\wedge$ + SET combination to change the password to "1993", then press SET to confirm. The transmitter will then display the first basic parameter symbol, as shown in the flowchart below:



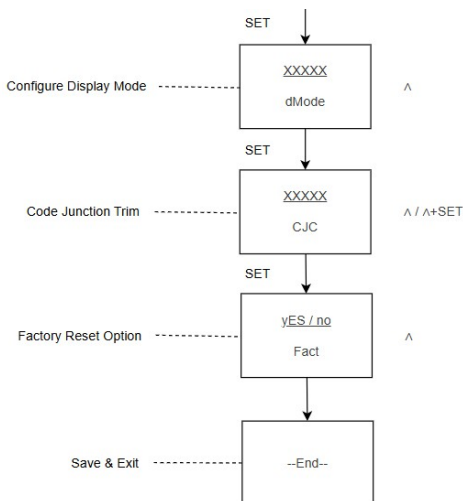


Figure 9

9.4 Operational Instructions

Upon power-up, the transmitter performs a full LCD segment test, then enters measurement mode. The primary display indicates the current temperature value, and the secondary display indicates the unit. In measurement mode, briefly press the $\wedge$ button (for less than 2 seconds) to cycle the primary display through the temperature value, voltage/current output, and percentage.

In configuration mode, if no button activity is detected for 30 seconds, the

transmitter automatically times out and returns to measurement mode.

Executing a factory reset restores all basic parameters to their original factory configuration.

The number of available menu items varies depending on the product model.

10 Responsibility

From the date of shipment, Micro Sensor provides free replacement or repair for products with material or workmanship defects for one (1) year. For faults caused by non-quality issues during use, the company offers repair services for the material cost only. Packaging and shipping fees costs shall be borne by the user.

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