



MTM4831S

Integrated Temperature Transmitter

Applications

- Machinery manufacturing
- Hydraulic and pneumatic control systems
- Marine and shipbuilding
- Petrochemical industry
- Natural gas
- Municipal and environmental protection

Features

- CNEX-certified
- Equipped with local display
- Output signals: 4mA~20mA DC or 1V~5V DC
- Easy on-site installation with user-configurable menu
- Compliant with CE requirements

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 °C . It incorporates a dedicated temperature module for linearization of the sensing element and provides standard output signals of 4mA~20mA DC or 1V~5V DC. 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.

MICROSENSOR



Specifications

- Measuring range: -200°C ...0°C ~+1000°C
-200°C ...0°C ~+500°C
- Power supply: 12V~32V DC(Typ. 24V DC)
- Output signal: 4mA~20mA DC
1V~5V DC
- Accuracy: See Accuracy Specifications
- Display: LCD with backlight
- Long-term stability: $\pm 0.05\%$ FS/year
- Insulation resistance: $\geq 50\text{M}\Omega@500\text{V DC}$
- Ambient temperature: -30°C ~+80°C
- Storage temperature: -40°C ~+85°C
- Relative humidity: < 95%
- IP rating: IP65 or IP67
- Flameproof mark: Ex db IIC T6 Gb

Construction Materials

- Housing: Die-cast aluminum alloy
- Sensing element: Pt100, Pt1000, Type K thermocouple
- Wetted parts: Stainless steel 304 / 321 / 316L or others
- Display window: Flameproof glass

Accuracy Specifications

Tolerance of Pt100/Pt1000 sensing elements (IEC 60751)	Class AA / Class A / Class B
Tolerance of Type K thermocouple (IEC 60584)	Class 1
Transmitter error (IEC 62828)	±0.02%FS
Total measurement error (IEC 62828)	Sensing element tolerance+ transmitter error
Ambient temperature effect	±0.05%FS (+25°C)
	±0.1%FS/10°C
Output error	±0.03%FS
Cold junction compensation error (thermocouple)	±1°C

Note: Cold junction compensation error shall be considered when using thermocouples

Calculation Example: Total Measurement Error

(Measuring range: 0°C ~+100°C ; Supply voltage: 24V DC; Ambient temperature: 25°C ; Process temperature: 50°C)

Sensor element (Class A, IEC 60751): $\pm(0.15+(0.0020 t))$:	±0.25°C
Transmitter error ±0.02%FS:	±0.02°C
Output error ±0.03%FS:	±0.03°C
Ambient temperature effect:	±0.05°C

Total measurement error (typ.)

$$\text{sqrt}(0.25^2 + 0.02^2 + 0.03^2 + 0.05^2) = \text{sqrt}(0.0663) = 0.26^\circ\text{C}$$

Total measurement error (max.)

$$0.25+0.02+0.03+0.05=0.35^\circ\text{C}$$

Output Signal

Analog output	4mA~20 mA DC	1V~5V DC
Load resistance	$RL \leq (VS-VM)V/0.022A$ RL: Max. load resistance; VS: Supply voltage; VM=10V	$RL \geq 5k\Omega @ 5V$ DC
Load curve		

Operating Conditions

Ambient temperature	-30°C ~+80°C
Salt spray resistance	IEC 60068-2-52
IP rating	IP65 or IP67, per IEC/EN 60529





EMC

SN	Test item	Standard	Test conditions	Performance level
1	Conducted emissions (CE) test	GD22-2015 3.2 CISPR 16-2-1	Frequency range: 150kHz~30MHz	Pass
2	Radiated emissions (enclosure port)	GD22-2015 3.3 CISPR 16-2-3	Frequency range: 30MHz~6GHz	Pass
3	Electrostatic discharge immunity test	GD22-2015 3.4 GB/T 17626.2/IEC 61000-4-2	4kV(contact); 8kV(air)	A
4	Radiated, radio-frequency, electromagnetic field immunity test	GD22-2015 3.5 GB/T 17626.3/IEC 61000-4-3	80MHz~1GHz, 10V/m 1.4GHz~6GHz, 3V/m	A
5	Electrical fast transient/burst immunity test	GD22-2015 3.6 GB/T 17626.4/IEC 61000-4-4	2 kV, 5kHz, 5/50 ns	A
6	Surge immunity test	GD22-2015 3.7 GB/T 17626.5/IEC 61000-4-5	Line-to-line: 1 kV Line-to-earth: 2 kV	B
7	Power frequency magnetic field immunity test	GB/T 17626.6/IEC 61000-4-8	50Hz, 60Hz, 30A/m	A
8	Immunity to conducted disturbances, induced by radio-frequency fields	GD22-2015 3.9 GB/T 17626.6/IEC 61000-4-6	150kHz~80MHz	A

Performance level A: The transmitter operates as intended during and after the test, with no degradation of performance.

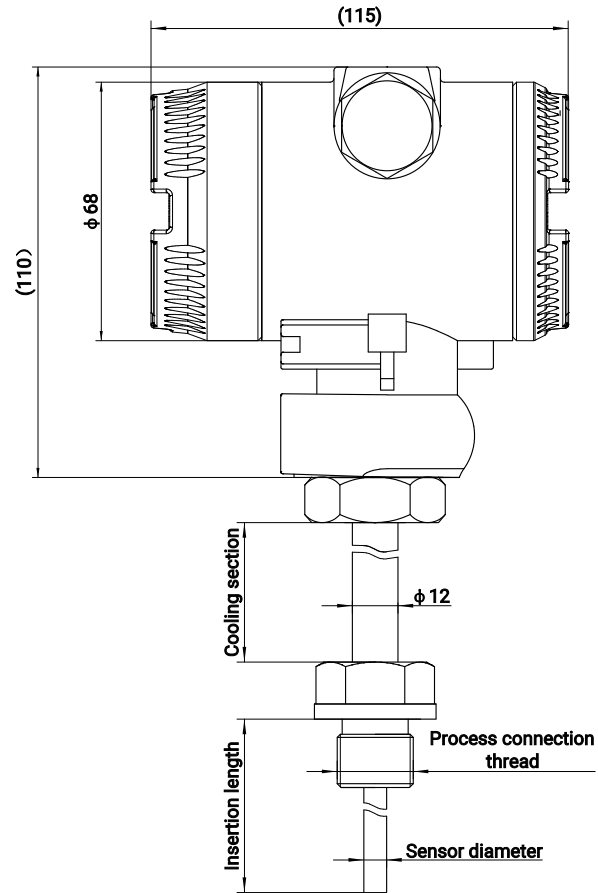
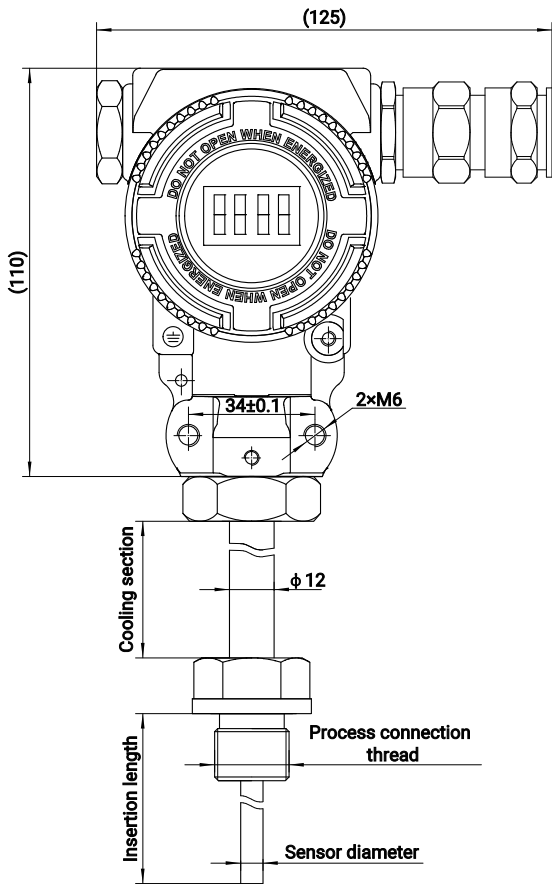
Performance level B: Temporary loss of function or degradation is allowed during the test, without affecting the operating state or stored data; full performance is restored after the test.

Certification Details

Mark	Description	Region
	EU Declaration of Conformity EMC Directive (electromagnetic emission and immunity)	European Union
	RoHS	European Union
	CNEX-certified	China
	CCCS Technical compliance certification (e.g. electrical safety, environmental requirements)	China & International

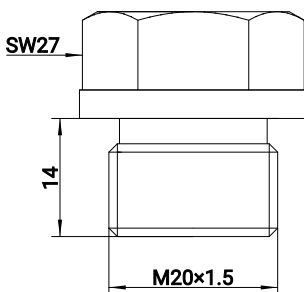
Outline Construction

Unit: mm

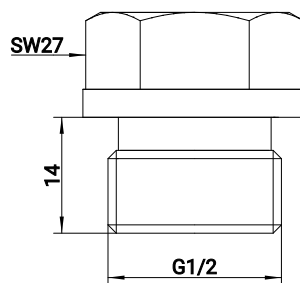


Process Connection

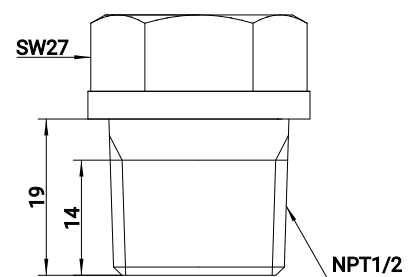
Unit: mm



Fixed Thread
M20x1.5



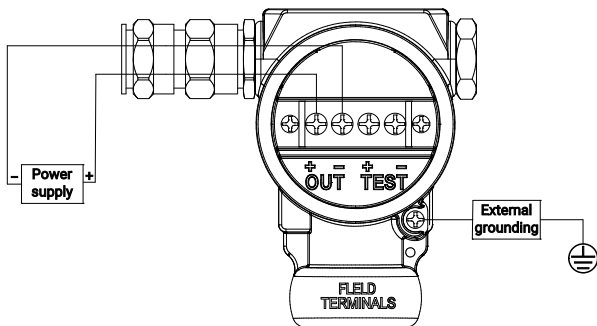
Fixed Thread
G1/2



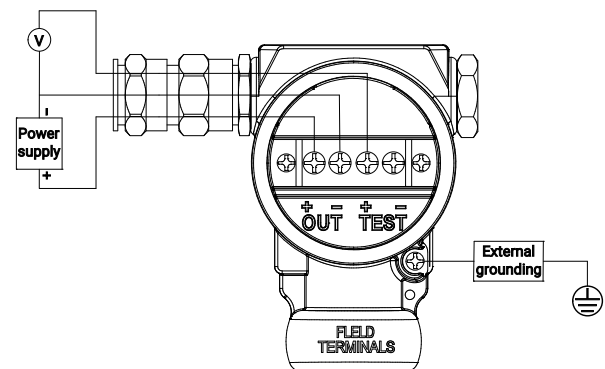
Fixed Thread
NPT1/2

Thread spec.	Thread length	Standard
M10×1	8	ISO 9974-2-2000
M12×1.5	12	
M14×1.5	12	
M16×1.5	12	
M20×1.5	14	
M27×2	16	
G1/2	14	ISO 1179-2-2022
G1/4	12	
G3/8	12	
NPT1/4	10	ASME B1.20.1
NPT1/2	14	

Electrical Connection



4mA~20mA DC Output



1V~5V DC Output

Output signal	Terminal	Definition	Remarks
4mA~20mA DC	+OUT	V+	Other terminals remain unconnected
	-OUT	OUT	
1V~5V DC	+OUT	V+	Other terminals remain unconnected
	-OUT	V-	
	+TEST	OUT	

Order Guide

MTM4831S Integrated Temperature Transmitter		
Code	Measuring range	
[X°C ~Y°C]	X and Y represent the lower and upper temperature limits, respectively (°C)	
Code	Output signal	
E	4mA~20mA DC	
F	1V~5V DC	
Y	Other output signals (specify)	
Code	Accuracy	
A1	±1%FS(-200°C ~+1000°C)	
A2	±0.5%FS(-200°C ~+500°C)	
A3	Other accuracy	
Code	Sensor diameter (mm)	
03	φ3	
06	φ6	
08	φ8	
Y	Other diameters (specify)	
Code	Sensor material	
A	304	
G	321	
L	316L	
P	PTFE sheath(<200°C)	
Y	Other materials (specify)	
Code	Mounting type	
I	Fixed thread	
II	Fixed flange	
III	Fixed clamp	
IV	Adjustable compression fitting thread	
V	Adjustable compression fitting flange	
Y	Other mounting types (specify)	
Code	Process connection	
C24	Thread M10 × 1, length: 8mm	Fixed thread, adjustable compression fitting thread
C23	Thread M12 × 1.5, length: 12mm	
C18	Thread M14 × 1.5, length: 12mm	
C40	Thread M16 × 1.5, length: 12mm	
C1	Thread M20 × 1.5, length: 14mm	
H1	Thread M27 × 2, length: 16mm	
C3	Thread G1/ 2, length: 14mm	
C30	Thread G1/ 4, length: 12mm	
C16	Thread G3/ 8, length: 12mm	
C6	Thread NPT1/ 4, length: 10mm	
C10	Thread NPT1/ 2, length: 14mm	
F1	DN10	Fixed flange, adjustable compression fitting flange
F2	DN20	
F3	DN25	
F4	DN32	
F5	DN40	
F6	DN50	
G1	Fixed clamp φ25.4	Fixed clamp
G2	Fixed clamp φ50.5	
Y	Other process connections (specify)	

MTM4831S [0°C ~+300°C] - E - A1 - 03 - A - I - C24

The complete spec.

Number	Insertion length (mm) (including thread length)	
	Code	Cooling section length (mm)
	N	0[-50°C ~+100°C]
	S	50[-50°C ~+100°C]
	M	100[-200°C ~+150°C]
	L	150[-200°C ~+1000°C]
	Code	Certification requirement
	d	※Flameproof Ex db IIC T6 Gb
	i	Intrinsically safe Ex ia IIC T4 Ga
	N	None
	Code	Accessories
	HT	Welded thermowell
	LT	Threaded thermowell
	FT	Flanged thermowell
	HJ	Welded base
	KT	Clamp-type thermowell
	N	None

Number	-	L	-	d	-	HJ	The complete spec.
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Notes

1. Unless otherwise specified, all materials are stainless steel 304, except for the probe and explosion-proof housing.
2. For configurations not covered in this selection, please contact the MICROSENSOR for customization.
3. ※For flameproof products, certified cable glands compatible with the product's explosion protection rating shall be used during installation. Ensure that the flameproof threaded joints comply with GB/T 3836.2-2021, and strictly follow the instructions in the operation manual.
4. Selection example

Example: MTM4831S[0°C ~+300°C]-E-A1-03-A-I-C24-100-L-d-HJ

Description: MTM4831S Integrated Temperature Transmitter; Measuring range: [-200°C ~+1000°C]; Output signal: 4mA~20mA DC; Accuracy $\pm 1\%$ FS; Sensor diameter $\phi 3$; Sensor material: 304; Fixed thread; Thread M10 \times 1, length: 8mm; Insertion length: 100mm; Cooling section length: 150mm; Flameproof Ex db IIC T6 Gb; Welded base.

Insertion Depth

1. Insertion depth should be selected based on pipe diameter and installation configuration. For optimal accuracy, the probe tip should generally be positioned at the center of the medium.
2. If installation conditions on site do not allow the required insertion depth, thermal insulation shall be applied to the pipe surface to improve measurement accuracy.