



MTM4831S

Integrated Temperature Transmitter



Applications

- Machinery manufacturing
- Hydraulic and pneumatic control systems
- Marine and shipbuilding
- Oil and gas
- Petrochemical
- 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 $+1000^{\circ}\text{C}$. It incorporates a dedicated temperature module for linearization of the sensing element and provides standard output signals of 4 ~ 20mA DC or 1 ~ 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.

Specifications

- Measuring range:
 - $-200^{\circ}\text{C} \sim +500^{\circ}\text{C}$ (Pt100/Pt1000 RTD)
 - $-40^{\circ}\text{C} \sim +1000^{\circ}\text{C}$ (Type K thermocouple)
- Power supply: 12V ~ 32V DC (Typ. 24V DC)
- Output signal: 4mA ~ 20mA DC
1V ~ 5V DC
- Accuracy: See Accuracy Specifications
- Display type: LCD with backlight
- Long-term stability: $\pm 0.05\%$ FS/year
- Insulation resistance: $\geq 50\text{M}\Omega @ 500\text{V DC}$
- Ambient temperature: $-30^{\circ}\text{C} \sim +80^{\circ}\text{C}$
- Storage temperature: $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
- 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 / 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)	$\pm 0.02\%FS$
Total measurement error (IEC 62828)	Sensing element tolerance+ transmitter error
Ambient temperature effect	$\pm 0.05\%FS$ (+25°C)
	$\pm 0.1\%FS/10^{\circ}C$
Output error	$\pm 0.03\%FS$
Cold junction compensation error (thermocouple)	$\pm 1^{\circ}C$

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: 35°C ; Process temperature: 50°C)

Sensor element (Class A, IEC 60751): $\pm(0.15+(0.0020|t|))$: $\pm 0.25^{\circ}C$

Transmitter error $\pm 0.02\%FS$: $\pm 0.02^{\circ}C$

Output error $\pm 0.03\%FS$: $\pm 0.03^{\circ}C$

Ambient temperature effect: $\pm 0.15^{\circ}C$

Total measurement error (typ.)

$\text{sqrt}(0.25^2 + 0.02^2 + 0.03^2 + 0.15^2) = \text{sqrt}(0.0863) = 0.29^{\circ}C$

Total measurement error (max.)

$0.25+0.02+0.03+0.15=0.45^{\circ}C$

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; $RL \geq 5k\Omega @ 5V$ DC VM=10V	
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	GD019-2024 3.2 CISPR 16-2-1	Frequency range: 150kHz ~ 30MHz	Pass
2	Radiated emissions (enclosure port)	GD019-2024 3.3 CISPR 16-2-3	Frequency range: 30MHz ~ 6GHz	Pass
3	Electrostatic discharge immunity test	GD019-2024 3.4 GB/T 17626.2/IEC 61000-4-2	4kV(contact), 8kV(air)	A
4	Radiated, radio-frequency, electromagnetic field immunity test	GD019-2024 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	GD019-2024 3.6 GB/T 17626.4/IEC 61000-4-4	2 kV , 5kHz, 5/50 ns	A
6	Surge immunity test	GD019-2024 3.7 GB/T 17626.5/IEC 61000-4-5	Line-to-line: 1 kV, Line-to-earth:2 kV	B
7	Low-frequency conducted 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	GD019-2024 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.

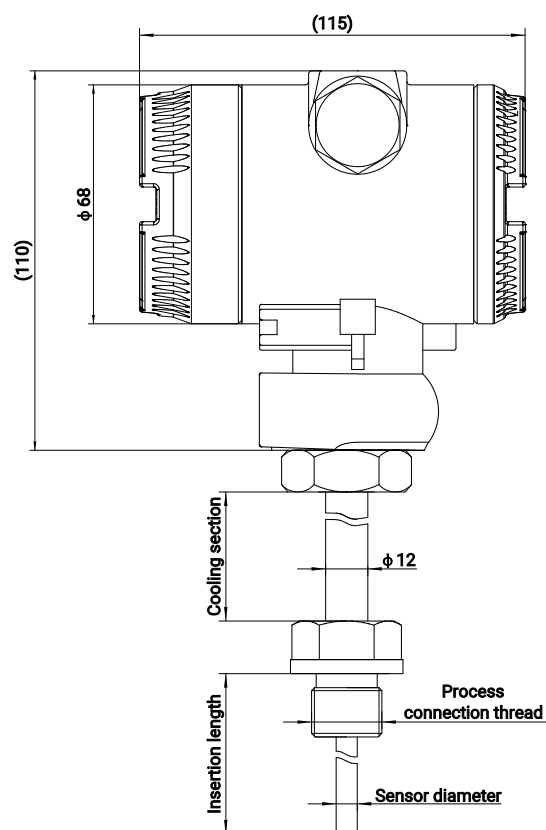
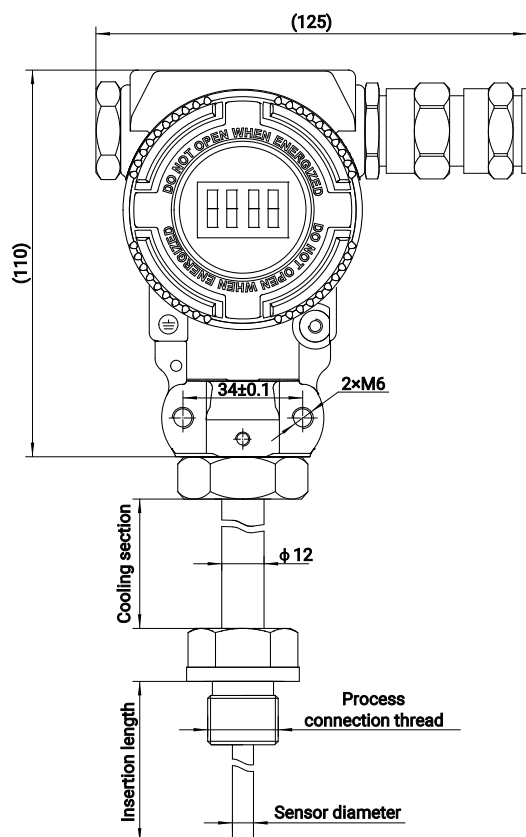
Performance level B: Temporary loss of function or degradation is allowed during the test, without affecting the operating state or stored data; full performance is restored after the test.

Certification Details

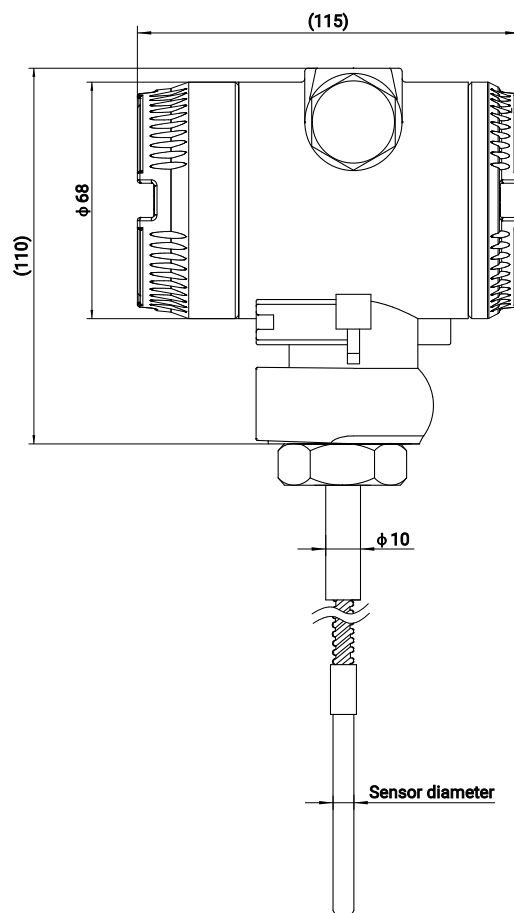
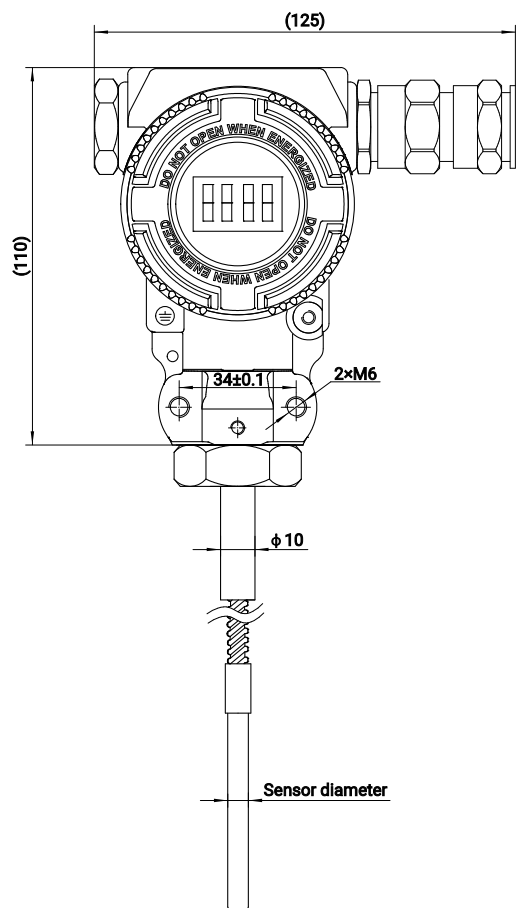
Mark	Description	Region
	EU Declaration of Conformity EMC Directive (electromagnetic emission and immunity)	European Union
	RoHS	European Union
	CNEX-certified	China

Outline Construction

Unit: mm



Integral Type

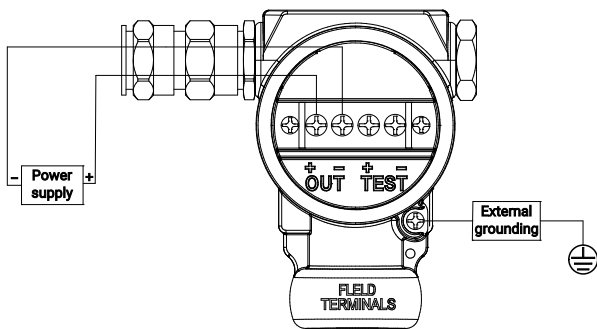


Remote Type

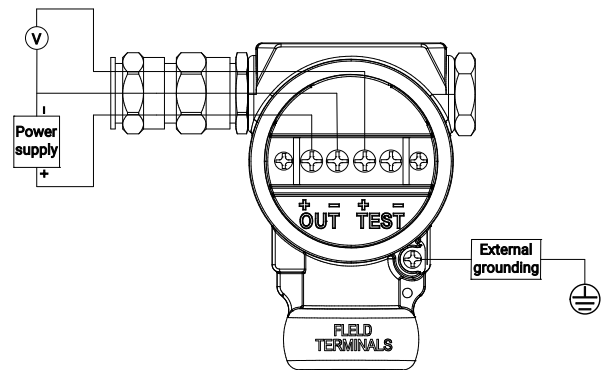
Process Connection

Thread spec.	Thread length (mm)	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	ANSI/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+	Remaining terminals: NC
	-OUT	OUT	
1V ~ 5V DC	+OUT	V+	Remaining terminals: NC
	-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 or ±1°C (max.)
	A2	±0.5%FS or ±0.5°C (max.)
	A3	Other accuracy
	Code	Display type
	A	LCD display
	B	Without display
	Code	Electrical connection
	M	M20×1.5
	N	NPT1/2
	G	G1/2
	Code	Sensor diameter (mm)
	03	φ3
	05	φ5
	06	φ6
	08	φ8
	Y	Other diameters (specify)
	Code	Sensor material (including process connection)
	A	304
	L	316L
	Y	Other materials (specify)
	Code	Mounting type
	I	Fixed thread
	II	Fixed flange
	III	Fixed clamp
	IV	Adjustable threaded compression fitting
	V	Adjustable flanged compression fitting
	Y	Other mounting types (specify)

Code	Process connection		
C24	Thread M10 × 1, length: 8mm		Fixed thread, adjustable threaded compression fitting
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	Flanged connection: specify flange standard, PN (nominal pressure), and RF (sealing face))	Fixed flange, adjustable flanged compression fitting
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)		
	Number	Insertion length (mm) (including thread length)	
		Code	Cooling section length (mm)
		N	0[-50℃～ +100℃]
		S	50[-50℃～ +100℃]
		M	100[-200℃～ +150℃]
		L	150[-200℃～ +1000℃]
		Code	Certification requirement
		d	※Flameproof Ex db IIC T6 Gb
		N	None
		Code	Accessories (multi-option)
		HT	Welded thermowell
		LT	Threaded thermowell
		FT	Flanged thermowell
		HJ	Welded base
		KT	Clamp-type thermowell
		N	None
		ZJ	Mounting bracket
		WP	304 stainless steel tag plate

- C1 - 100 - L - d - HJ

The complete spec.

MTM4831S Integrated Temperature Transmitter												
MTM4831S	F	Remote type										
		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 or ±1°C (max.)								
		A2		±0.5%FS 或 ±0.5°C (max.)								
		A3		Other accuracy								
		Code		Display type								
		A		LCD display								
		B		Without display								
		Code		Electrical connection								
		M		M20×1.5								
		N		NPT1/2								
		G		G1/2								
		Number		Cable length (m)								
		Code		Cable material								
		S		Shielded PTFE(corrosion resistant, flame retardant, -60°C ~+250°C)								
		Y		Other materials (specify)								
		Code		Cable sheath								
		TH		Spring								
		BW		Bellows								
		Y		Other sheaths (specify)								
		Code		Sensor diameter (mm)								
		03		φ3								
		05		φ5								
		06		φ6								
		08		φ8								
		Y		Other diameters (specify)								

MTM4831S	F	[0°C ~+300°C]	-	E	-	A1	-	A	-	M	-	3	-	S	-	BW	-	06	The complete spec.
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Code	Sensor material (including process connection)			
A	304			
L	316L			
Y	Other materials (specify)			
	Code	Mounting type		
	I	Fixed thread		
	II	Fixed flange		
	III	Fixed clamp		
	IV	Adjustable threaded compression fitting		
	V	Adjustable flanged compression fitting		
	Y	Other mounting types (specify)		
	Code	Process connection		
	C24	Thread M10 × 1, length: 8mm		
	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	Flanged connection: specify flange standard, PN (nominal pressure), and RF (sealing face)	
	F2	DN20		
	F3	DN25		
	F4	DN32		
	F5	DN40		
	F6	DN50		
	G1	Fixed clamp φ25.4		
	G2	Fixed clamp φ50.5		
	Y	Other process connections (specify)		
		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		
N		None		
Code		Accessories (multi-option)		
HT		Welded thermowell		
LT		Threaded thermowell		
FT		Flanged thermowell		
HJ		Welded base		
KT		Clamp-type thermowell		
N		None		
ZJ		Mounting bracket		
WP	304 stainless steel tag plate			

- A - I - C1 - 100 - L - d - HJ

The complete spec.

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 1: MTM4831S[0°C~+300°C]-E-A1-A-M-06-A-I-C1-100-L-d-HJ

Description: MTM4831S Integrated Temperature Transmitter; Measuring range: [0°C~+300°C]; Output signal: 4mA~20mA DC; Accuracy: $\pm 1\%$ FS or $\pm 1^\circ\text{C}$ (max.); LCD display; Electrical connection: M20×1.5; Sensor diameter $\phi 6$; Sensor material (including process connection): 304; Fixed thread; Thread M20 × 1.5, length: 14mm; Insertion length (including thread length): 100mm; Cooling section length: 150mm [-200°C~+1000°C]; Flameproof Ex db IIC T6 Gb; Welded base.

Example 2: MTM4831SF[0°C~+300°C]-E-A1-A-M-3-S-BW-06-A-I-C1-100-L-d-HJ

Description: MTM4831S Integrated Temperature Transmitter; Remote type; Measuring range: [0°C~+300°C]; Output signal: 4mA~20mA DC; Accuracy: $\pm 1\%$ FS or $\pm 1^\circ\text{C}$ (max.); LCD display; Electrical connection: M20×1.5; Cable length 3m; Cable material: Shielded PTFE (corrosion resistant, flame retardant, (-60°C~+250°C)); Cable sheath: Bellows; Sensor diameter $\phi 6$; Sensor material (including process connection): 304; Fixed thread; Thread M20 × 1.5, length: 14mm; Insertion length (including thread length): 100mm; Cooling section length: 150mm [-200°C~+1000°C]; 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.