

# MTM4832E

## Integrated Temperature Transmitter



### Introduction

MTM4832E Temperature Transmitter is designed to measure the temperature of various liquids, gases, and solid surfaces within the range of  $-30^{\circ}\text{C}$  to  $+200^{\circ}\text{C}$ , and to convert the measured temperature into a standard two-wire current output signal ( $4\text{mA} \sim 20\text{mA}$  DC). The transmitter features a compact design, providing fast thermal response and high vibration resistance. Featuring a compact design and versatile electrical connections, it meets diverse installation and application requirements across various industrial sites.

### Applications

- Refrigeration systems
- Pumps and compressors
- Hydraulic and pneumatic systems
- Measurement and control
- Marine and shipbuilding

### Features

- Measuring range:  $-30^{\circ}\text{C} \sim +200^{\circ}\text{C}$
- Compact design, specifically engineered for confined-space applications
- Versatile electrical connections
- Two-wire  $4\text{mA} \sim 20\text{mA}$  DC output, compliant with NAMUR NE 43

### Specifications

- Measuring element: Pt100/Pt1000
- Measuring range:  $-30^{\circ}\text{C} \sim +200^{\circ}\text{C}$
- Power supply:  $10\text{V} \sim 35\text{V}$  DC
- Output signal:  $4\text{mA} \sim 20\text{mA}$  DC
- Ambient temperature:  $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
- Storage temperature:  $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$
- Accuracy: Refer to Accuracy Specifications
- Electrical connection: Hirschmann, Packard, and M12×1 (4-pin)
- Process connection: Fixed threaded; thread specifications refer to the Order Guide
- IP rating: IP65

## Accuracy Specifications

|                                          |                                              |
|------------------------------------------|----------------------------------------------|
| Tolerance of sensing element (IEC 60751) | Class AA / Class A / Class B                 |
| Transmitter error (IEC 62828)            | ±0.05%FS                                     |
| Total measurement error (IEC 62828)      | Sensing element tolerance+ transmitter error |
| Ambient temperature effect               | ±0.05%FS (+25°C)                             |
|                                          | ±0.1%FS (-40°C~ +85°C)                       |
| Output error                             | ±0.05%FS                                     |

### Calculation Example: Total Measurement Error

(Measuring range: 0°C ~100°C ; Supply voltage: 24V DC; Ambient temperature: 40°C ; Process temperature: 50°C )

|                                                                |         |
|----------------------------------------------------------------|---------|
| Sensor element (Class A, IEC 60751): $\pm(0.15+(0.0020 t ))$ : | ±0.25°C |
| Transmitter error ±0.05%FS:                                    | ±0.05°C |
| Output error ±0.05%FS:                                         | ±0.05°C |
| Ambient temperature effect:                                    | ±0.1°C  |

Total measurement error (typ.)

$$\text{sqrt}(0.25^2 + 0.05^2 + 0.05^2 + 0.1^2) = \text{sqrt}(0.0775) = 0.28^\circ\text{C}$$

Total measurement error (max.)

$$0.25+0.05+0.05+0.1=0.45^\circ\text{C}$$

## Output Signal

|                 |                                            |
|-----------------|--------------------------------------------|
| Analog output   | 4mA ~ 20 mA DC                             |
| Load resistance | $RL \leq (UB-10V)/21\text{mA}$             |
|                 | RL: Max. load resistance; UB: Power supply |
| Load curve      |                                            |

## Operating Conditions

|                            |                        |
|----------------------------|------------------------|
| Ambient temperature        | -40°C~ +85°C           |
| Maximum operating pressure | 80bar                  |
| IP rating                  | IP65, per IEC/EN 60529 |

## Factory Configuration

|                        |                                                                                                                                           |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Measuring range        | As specified by customer selection                                                                                                        |
| Failure signal current | Configurable, per NAMUR NE 043<br>Upper alarm: $\geq 21\text{mA}$ (factory default)<br>Lower alarm: $\leq 3.6\text{mA}$                   |
| Response time          | Power-on delay: $\leq 1.5\text{s}$ (Time before the first measured value)<br>Warm-up time: Approx. 4 min to reach full specified accuracy |

## EMC

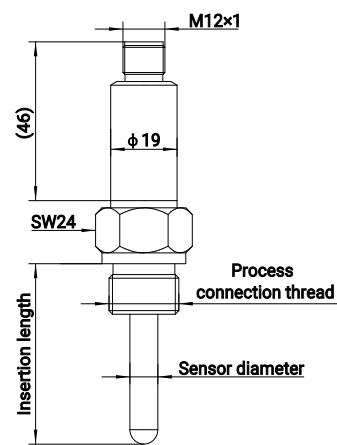
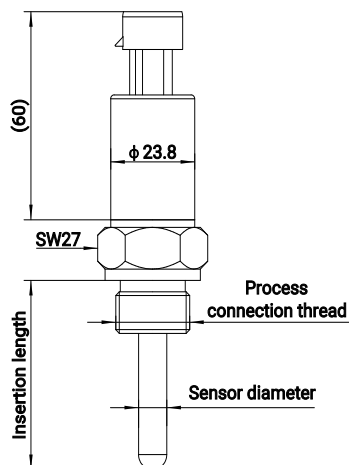
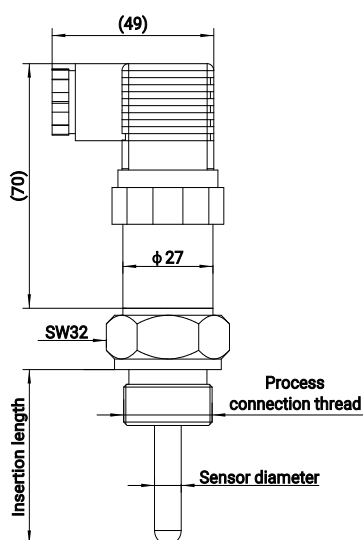
| SN                                                             | Test item                                                                                                                                                                                     | Standard                                     | Test conditions                          | Performance level |
|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|------------------------------------------|-------------------|
| 1                                                              | Conducted emissions (CE) test                                                                                                                                                                 | GD019-2024 3.2<br>CISPR 16-2-1               | Frequency range:<br>10kHz ~ 30MHz        | Pass              |
| 2                                                              | Radiated emissions (enclosure port)                                                                                                                                                           | GD019-2024 3.3<br>CISPR 16-2-3               | Frequency range:<br>150kHz ~ 6GHz        | Pass              |
| 3                                                              | Electrostatic discharge immunity test                                                                                                                                                         | GD019-2024 3.4<br>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<br>GB/T 17626.3/IEC 61000-4-3 | 80MHz ~ 6GHz, 10V/m                      | A                 |
| 5                                                              | Electrical fast transient/burst immunity test                                                                                                                                                 | GD019-2024 3.6<br>GB/T 17626.4/IEC 61000-4-4 | 2kV, 5kHz, 5/50ns                        | A                 |
| 6                                                              | Surge immunity test                                                                                                                                                                           | GD019-2024 3.7<br>GB/T 17626.5/IEC 61000-4-5 | Line-to-line: 1kV,<br>Line-to-earth: 2kV | B                 |
| 7                                                              | Low-frequency conducted immunity test                                                                                                                                                         | GD019-2024 3.8<br>GB/T 17626.6/IEC 61000-4-6 | Frequency range:<br>50Hz ~ 10kHz         | A                 |
| 8                                                              | Immunity to conducted disturbances, induced by radio-frequency fields                                                                                                                         | GD019-2024 3.9<br>GB/T 17626.6/IEC 61000-4-6 | 150kHz ~ 80MHz                           | A                 |
| 9                                                              | Power frequency magnetic field immunity test                                                                                                                                                  | GB/T 17626.8/IEC 61000-4-8                   | 50Hz, 60Hz, 30A/m                        | A                 |
| Performance level A: Normal operation within specified limits. |                                                                                                                                                                                               |                                              |                                          |                   |
| <b>Note:</b>                                                   | 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

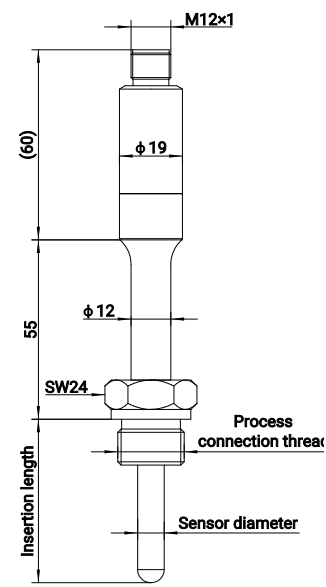
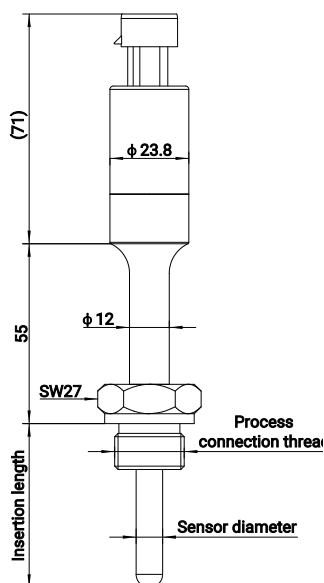
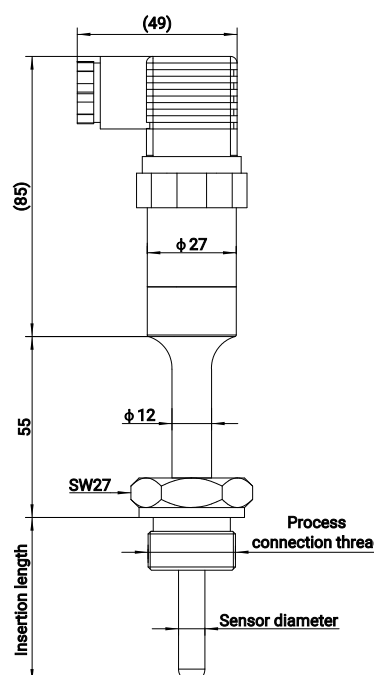
| Mark                                                                              | Description                                                                                       | Region                |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------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

## Outline Construction

Unit: mm



### Standard Type



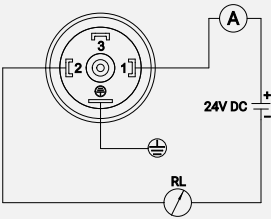
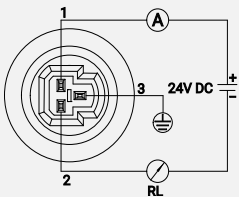
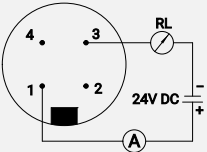
### Extended Type



Process Connection

| Thread spec. | Thread length (mm) | Standard          |
|--------------|--------------------|-------------------|
| G1/4         | 12                 | ISO 1179-2-2022   |
| G1/2         | 14                 |                   |
| G3/8         | 12                 |                   |
| NPT1/4       | 10                 | ANSI/ASME B1.20.1 |
| NPT1/2       | 14                 |                   |
| M12×1.5      | 12                 | ISO 9974-2-2000   |
| M20×1.5      | 14                 |                   |

Electrical Connection

|                 | Hirschmann connector                                                               | Packard plug                                                                        | M12×1, 4-pin connector                                                                |
|-----------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Connection type |  |  |  |
| Pin assignment  | 1:V+ 2:OUT 3:n.c. ⏏:Earth                                                          | 1:V+ 2:OUT 3:Earth                                                                  | 1:V+ 2:n.c. 3:OUT 4:n.c.                                                              |

## Order Guide

|          |                                    |                                                                             |
|----------|------------------------------------|-----------------------------------------------------------------------------|
| MTM4832E | 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                                                               |
|          | Code                               | Accuracy                                                                    |
|          | A1                                 | ±1%FS or ±1°C (max.)                                                        |
|          | A2                                 | ±0.5%FS or ±0.5°C (max.)                                                    |
|          | A3                                 | Other accuracy                                                              |
|          | Code                               | Electrical connection                                                       |
|          | H                                  | Hirschmann connector                                                        |
|          | P                                  | Packard plug                                                                |
|          | M                                  | M12×1, 4-pin connector                                                      |
|          | Code                               | Sensor diameter (mm)                                                        |
|          | 06                                 | φ6                                                                          |
|          | 08                                 | φ8                                                                          |
|          | Y                                  | Other diameters (specify)                                                   |
|          | Code                               | Sensor material                                                             |
|          | A                                  | 304                                                                         |
|          | L                                  | 316L                                                                        |
|          | Code                               | Extension length (mm)                                                       |
|          | N                                  | None (max. medium temperature +120°C)                                       |
|          | L                                  | 55                                                                          |
|          | Code                               | Insertion length (mm) (including thread length)                             |
|          | 050                                | 50                                                                          |
|          | 075                                | 75                                                                          |
|          | 100                                | 100                                                                         |
|          | 120                                | 120                                                                         |
|          | 150                                | 150                                                                         |
|          | 200                                | 200                                                                         |
|          | 250                                | 250                                                                         |
|          | 300                                | 300                                                                         |
|          | 350                                | 350                                                                         |
|          | 400                                | 400                                                                         |
|          | Y                                  | Other insertion lengths (specify)                                           |
|          | Code                               | Process connection                                                          |
|          | I                                  | Fixed thread, G1/4, thread length 12mm                                      |
|          | II                                 | Fixed thread, G1/2, thread length 14mm                                      |
|          | III                                | Fixed thread, G3/8, thread length 12mm                                      |
|          | IV                                 | Fixed thread, NPT1/4, thread length 10mm                                    |
|          | V                                  | Fixed thread, NPT1/2, thread length 14mm                                    |
|          | VI                                 | Fixed thread, M12×1.5, thread length 12mm                                   |
|          | VII                                | Fixed thread, M20×1.5, thread length 14mm                                   |
|          | Y                                  | Other process connections (specify)                                         |
|          | Code                               | Accessories                                                                 |
|          | HT                                 | Welded thermowell                                                           |
|          | LT                                 | Threaded thermowell                                                         |
|          | HJ                                 | Welded base                                                                 |
|          | N                                  | No thermowell                                                               |

MTM4832E [-30°C ~ +200°C] - E - A1 - H - 06 - A - L - 050 - I - HT

The complete spec.

## Notes

1. Transmitter electronics temperature:  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$  .
2. For standard type (without extension length), the maximum process temperature is  $+120^{\circ}\text{C}$  .
3. The electronics temperature depends on process temperature, extension length, ambient temperature, and air flow velocity.
4. Selection example

Example: MTM4832E $[-30^{\circ}\text{C} \sim +200^{\circ}\text{C}]$ -E-A1-H-06-A-L-050-I-HT

Description: MTM4832E Integrated Temperature Transmitter; Measuring range  $[-30^{\circ}\text{C} \sim +200^{\circ}\text{C}]$ ; Output signal: 4mA~20mA DC; Accuracy  $\pm 1\% \text{FS}$  or  $\pm 1^{\circ}\text{C}$  (max.); Electrical connection: Hirschmann connector; Sensor diameter  $\phi 6$ ; Sensor material 304; Extension length 55mm; Insertion length 50mm; Fixed thread, G1/4, thread length 12mm; Welded thermowell.

## 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.