OCTOGON

# MANUAL

# TFMA

## SCREW-IN TEMPERATURE SENSOR RADIO

Operating manual



| Document | Version | Date | Applies to |
|---|---|---|---|
| Operating manual | V00x | 11/2026 | TFMA, Pt100 4-wire, radio 868 MHz, battery |

This operating manual describes use, safety, mounting, supply and connection, operation, technical data and dimensions of the TFMA radio screw-in temperature sensor.

octogon GmbH · Roseggerstrasse 16 · 8700 Leoben · Austria · office@octogon.org

# Contents

**1 General** ... 2
1.1 Use ... 2
1.2 Safety instructions ... 2
1.3 Device ... 2
**2 Mounting** ... 3
**3 Supply and electrical connection** ... 3
3.1 Versions ... 3
3.2 Assignment M12x1, 4-pole ... 3
3.3 Battery and charging ... 3
**4 Operation** ... 4
4.1 Switching on and off ... 4
4.2 Radio link ... 4
4.3 Reading out and remote configuration ... 4
**5 Technical data** ... 4
5.1 Input and output ... 4
5.2 Performance ... 4
5.3 Supply and environment ... 5
5.4 Mechanics ... 5
**6 Commissioning** ... 5
**7 Maintenance** ... 5
**8 Dimensions** ... 6

# 1 General

## 1.1 Use

Screw-in temperature sensor that sends its reading by radio and lives on a battery — for measuring points no cable reaches. The service life depends on the measuring rate, see note (4).

For use in the whole range of industrial applications where the distance between measuring point and evaluation has to be bridged by radio. Use the sensor only for this purpose and only within the values given in chapter 5.

## 1.2 Safety instructions

**Warning** Mounting, connection and commissioning only by qualified staff. Depressurise the installation and let it cool down before screwing the sensor in or out; sheath and medium may be hot. Keep to the system pressure and the temperatures given in chapter 5. Charge the battery only with the supply given in 3.3 and only within the temperature range for charging; do not charge or reuse a damaged battery. Do not put a damaged instrument into operation. Non-compliance may cause injuries and damage.

## 1.3 Device

| Feature | Version |
|---|---|
| Design | screw-in temperature sensor with radio transceiver and battery |
| Sensing element | Pt100, 4-wire, class A |
| Output | radio signal, SRD band 868 MHz |
| Antenna | internal or external (as ordered) |
| Electrical connection | none or M12x1, 4-pole (as ordered, see 3.1) |
| Manufacturer type | METS-WR |

# 2 Mounting

The sensor is screwed into the installation by its process connection (thread see 5.4). Use the hexagon, width across flats 27, for screwing in, not the head. Any mounting position is possible; the system pressure must not exceed PN 25.

The neck tube decides the medium temperature: with 100 mm up to 200 °C, with 200 mm up to 400 °C.

The ambient temperature is not the medium temperature: the medium may be hotter than the electronics in the head.

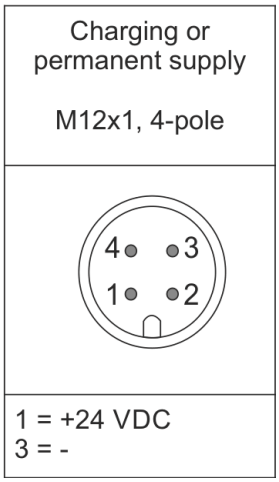
Mount the sensor so that there is as free a line of sight as possible between head and receiver. The range applies in free line of sight; walls, metal and plant structures shorten it.

# 3 Supply and electrical connection

## 3.1 Versions

| Electrical connection | Supply |
|---|---|
| none | battery; the battery is exchanged for charging |
| M12x1, 4-pole, without battery | permanently from 24 VDC via the plug |
| M12x1, 4-pole, with battery | permanently from 24 VDC, battery in parallel and charged in the device |

## 3.2 Assignment M12x1, 4-pole




Charging or permanent supply, view on the plug pins at the device

| Pin | Function |
|---|---|
| 1 | +24 VDC |
| 3 | – |

## 3.3 Battery and charging

| Feature | Value |
|---|---|
| Battery | lithium-ion battery pack, 3.6 V, 2600 mAh |
| Charging and external supply | 24 VDC, max. 1 A, charging time approx. 2 hours |
| Charging | 0 … +45 °C |
| Power consumption radio | 14 … 24 mA (transmit) · 0.8 … 7.5 µA (sleep mode) |
| Power consumption Pt100 measurement | max. 7 mA (active) |
| Power management | optimised in the factory |

The battery charges only between 0 and +45 °C while the device works up to +60 °C. Above +45 °C it can measure but not charge.

The service life depends on the measuring rate: one measurement per minute gives about six months, six per minute about 50 days.

# 4 Operation

## 4.1 Switching on and off

The sensor is switched on and off on top of the head with a magnet. Two LEDs (red, green) under the lens on top are used for signalling.

## 4.2 Radio link

| Feature | Value |
|---|---|
| Frequency, modulation | SRD band 868 MHz, FSK |
| RF output power | up to 5 dBm (approx. 3.2 mW) |
| Transmission rate | 19.2 kb/s |
| Range | internal antenna 20 m · external antenna 100 m, each in free line of sight |
| External antenna | SMA plug, panel socket (option) |

## 4.3 Reading out and remote configuration

The sensor is read out and configured remotely via a USB transceiver on a PC or notebook with a terminal program. The USB transceiver is transmitter and receiver in one (SRD band 868 MHz, range 100 m in free line of sight) and is available as an accessory.

Factory setting: Pt100, 4-wire, set range -50 … 250 °C. A customer-specific configuration must be stated with the order.

# 5 Technical data

## 5.1 Input and output

| Feature | Value |
|---|---|
| Sensor | Pt100, 4-wire, class A |
| Maximum range | -50 … +400 °C |
| Pt100 module | 16 bit, 0.1 °C |
| Measuring rate | 8 measurements/s |
| Filter | 0 … 1 s |
| Accuracy | 0.15 % of span |
| Temperature coefficient | 50 ppm/K |
| Radio module | up to 5 dBm (approx. 3.2 mW) |
| Transmission rate | 19.2 kb/s |
| Frequency | SRD band 868 MHz, FSK |

## 5.2 Performance

| Feature | Value |
|---|---|
| Range internal | 20 m in free line of sight (2) |
| Range external | 100 m in free line of sight (2) |
| External antenna | SMA connector, panel socket (option) |
| Signalling | 2 LEDs red/green under the lens |
| Battery | lithium-ion, 3.6 V, 2600 mAh |
| Life 1 measurement/min | approx. 6 months (4) |
| Life 6 measurements/min | approx. 50 days (4) |
| Charging | 24 VDC, max. 1 A, approx. 2 hours |
| Power consumption | 14 … 24 mA in transmit mode |
| ON/OFF | on top, switched with a magnet |

## 5.3 Supply and environment

| Feature | Value |
|---|---|
| Supply | battery, option 24 VDC permanent |
| Ambient | -20 ... +60 °C (1) |
| Charging the battery | 0 ... +45 °C (3) |
| Medium | -50 ... +400 °C |
| Storage | -20 ... +50 °C |
| Humidity | max. 80 % rH at 20 °C |

## 5.4 Mechanics

| Feature | Value |
|---|---|
| Process connection | 1/4″ · 3/8″ · 1/2″ · 3/4″ · 1″ · 1/4NPT · 3/8NPT · 1/2NPT |
| Neck tube (option) | 100 mm, medium up to 200 °C · 200 mm, medium up to 400 °C (5) |
| Sheath | stainless steel 1.4571, standard Ø 6 mm |
| Neck tube, process connection | stainless steel 1.4571 |
| Lens · screw cap | PMMA · PA6.6 GF30 |
| Mounting position | any |
| System pressure | PN 25 |
| Protection | at least IP 65 (electronics) |
| Weight | approx. 400 g (50 mm, 1/2″, M12x1) |
| Conformity | ETSI directive, EMC directive 2014/30/EU |

(1) The ambient temperature is not the medium temperature: the medium may be hotter than the electronics in the head.

(2) The range applies in free line of sight; walls, metal and plant structures shorten it.

(3) The battery charges only between 0 and +45 °C while the device works up to +60 °C. Above +45 °C it can measure but not charge.

(4) The service life depends on the measuring rate: one measurement per minute gives about six months, six per minute about 50 days.

(5) The neck tube decides the medium temperature: with 100 mm up to 200 °C, with 200 mm up to 400 °C.

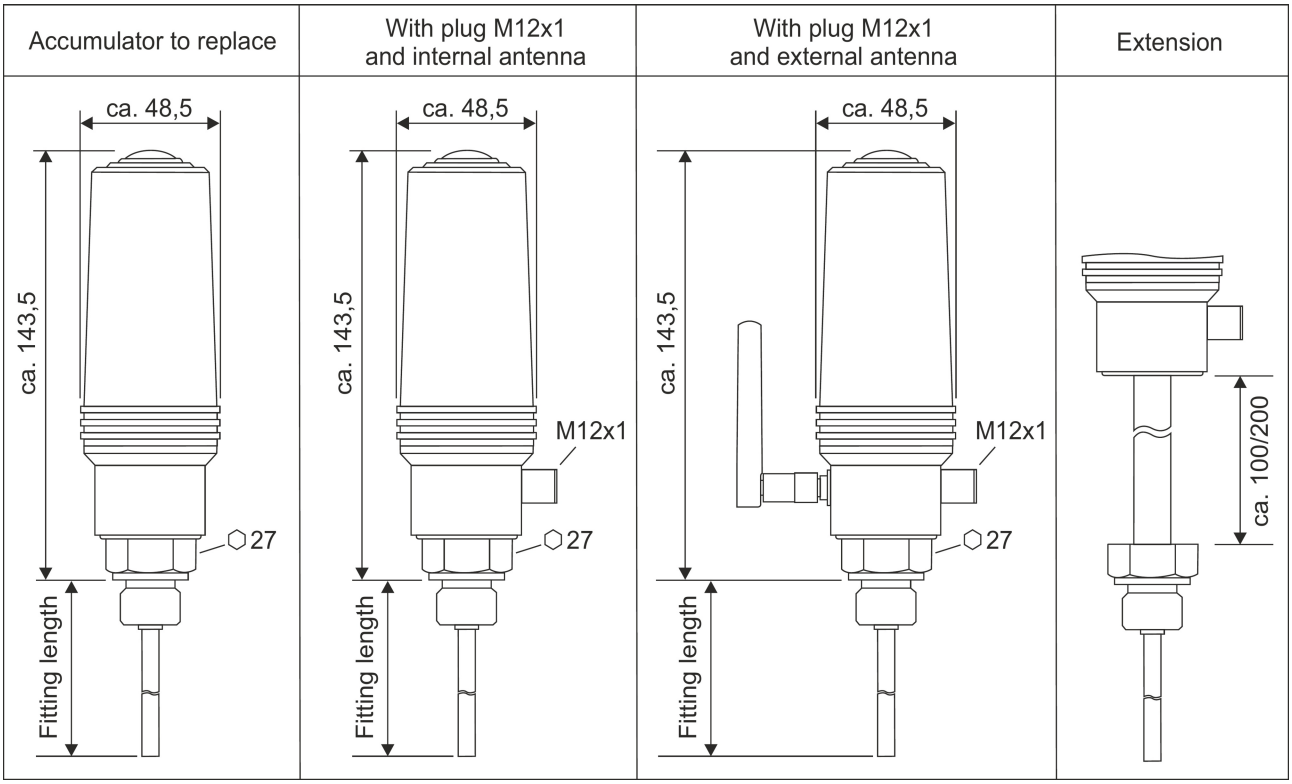
# 6 Commissioning

Charge the battery (see 3.3) or connect the permanent supply (see 3.2), switch the sensor on with the magnet and check on the PC with the USB transceiver that readings arrive. If no readings arrive: check that the sensor is switched on and the battery is charged, and that the range is sufficient for the existing line of sight (see chapter 2).

# 7 Maintenance

Charge or exchange the battery in good time; the service life depends on the measuring rate (see 3.3). Check at regular intervals: tight and leak-free fit at the process connection, condition of lens, screw cap, plug and antenna. Replace a damaged instrument.

# 8 Dimensions




Dimensions in mm. Fitting length as ordered (50 ... 1000 mm).