

# Safety Temperature Monitor (STM) with Safety Thermostat Type 2403 K



Type 2432 K/2403 K Safety Temperature Monitor equipped with an additional Type 2430 K Control Thermostat

## Mounting and Operating Instructions



**EB 2183 EN**

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### Type testing

The safety temperature monitor is type tested by the German Technical Inspectorate (TÜV) according to DIN EN 14597 (with the designation Type 2750-5).  
Register number is available on request.

### Note:

Non-electric actuators and control valve versions do not have their own potential ignition source according to the ignition risk assessment stipulated in EN 13463-1: 2001, section 5.2, even in the rare incident of an operating fault. Therefore, they **do not** fall within the scope of Directive 94/9/EC.

For connection to the equipotential bonding system, observe the requirements specified in EN 60079-14: 1977 (VDE 0165 Part 1) section 6.3.



### General safety instructions

- ▶ The safety temperature monitor must be installed, started up, and serviced only by skilled or semi-skilled staff in accordance with good engineering practice so that employees and third persons are not exposed to danger.
- ▶ The valve complies with the requirements of the European Pressure Equipment Directive 97/23/EC. The declaration of conformity issued for a valve bearing the CE marking includes information on the applied conformity assessment procedure and will be provided on request.
- ▶ To ensure appropriate use, only use the safety temperature monitor in applications where the operating pressure and temperatures do not exceed the operating values specified in the order.  
Note that the manufacturer does not assume any responsibility for damage caused by external forces or any other external factors.  
Take appropriate safety precautions to prevent hazards that may be caused in the safety temperature monitor by the process medium or the operating pressure.
- ▶ Make sure the safety temperature monitor is shipped and stored properly.

### Important!

- ▶ Always assemble the valve and the control thermostat prior to starting up the safety temperature monitor.
- ▶ Depressurize and drain the relevant section of the plant prior to removing the valve from the pipeline.
- ▶ Fill the plant very slowly on start-up.
- ▶ When controlling freezing media, protect the safety temperature monitor against frost.

### 1 Design and principle of operation

The safety temperature monitor consists of a Series 43 valve and a thermostat with a capillary tube and a bulb sensor. It limits the temperature by closing the valve connected to the thermostat.

By additionally connecting a second thermostat, the safety temperature monitor (STM) can be converted to a temperature regulator with a safety temperature monitor (TR/STM).

The safety temperature monitor operates according to the vapor pressure principle. The temperature of the medium produces a pressure in the temperature sensor (9), which is proportional to the actual temperature. This pressure is transferred via the capillary tube (8) to the metal bellows of the operating ele-

ment (10) where it is converted into a positioning force. This force acts on the valve plug stem (4) and valve plug (3) over the pin (11). The position of the valve plug determines the free area between the plug and the seat (2), regulating the flow rate of the heating medium.

When the limit temperature adjusted by the set point adjuster (12) is reached, the thermostat closes the connected valve. It is reset automatically.

Make sure that there is a minimum difference of 15 K between the adjusted limit value and the set point of the temperature regulator.

When the capillary tube ruptures or the sensor leaks, the spring mechanism is released and the pin (11) closes the valve due to the pressure decrease in the system. In this case, a reset will not be possible.

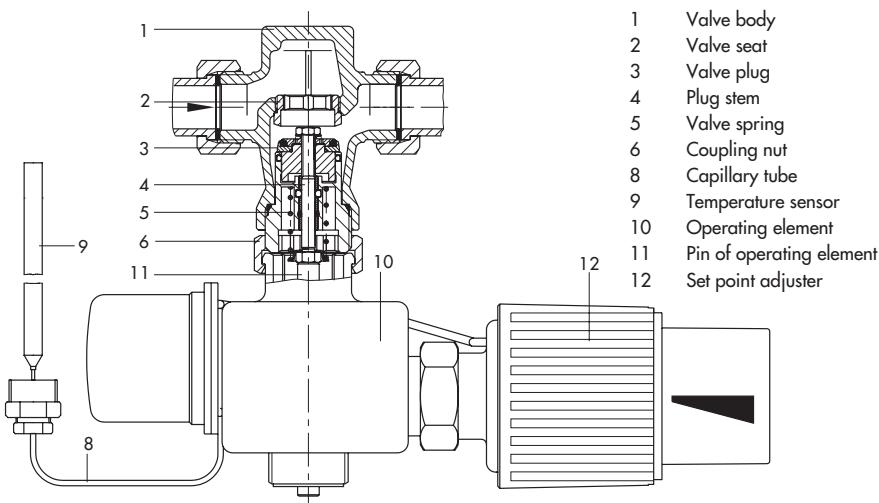


Fig. 1 · Sectional drawing

## 2 Installation

In case of an STM, the safety temperature monitor assembly is always installed in combination with a valve and, in case of a temperature regulator (TR/STM), additionally in combination with a second thermostat.

The safety thermostat can be screwed to the valve body before or after the installation of the valve. To do this, place the thermostat on the valve body and tighten the coupling nut with a torque of 20 Nm.

When installing the device, make sure that the permissible ambient temperature of 50 °C is not exceeded.

### 2.1 Installing the valve

Install the valve in a horizontal pipeline with the thermostat suspended downwards.

Make sure that the medium flows through the valve in the direction indicated by the arrow on the valve body.

### 2.2 Strainer

Install a strainer (SAMSON Type 1 NI) upstream of the valve to prevent sealing particles, weld spatter, pipe scale, and other impurities carried along by the process medium from impairing the proper operation, especially the tight shut-off of the valve.

Install the strainer with the filter element suspended downward.

Ensure that ample space is available to remove the filter.

### 2.3 Additional installation instructions

We recommend installing hand-operated shut-off valves both upstream of the strainer and downstream of the monitor or regulator. This allows the plant to be shut down for cleaning and maintenance routines, or when it is not operated for long periods of time.

To check the adjusted set point, install a thermometer near the sensor. Make sure that the thermometer is completely immersed in the medium to be controlled.

### 2.4 Installing the temperature sensor

#### NOTICE

*Do not separate the thermostat and the operating element with capillary tube and temperature sensor (pressure system).*

The mounting position of the temperature sensor depends on the sensor version used:

Sensor installed **horizontally** or with its tip pointing **upward**

The German abbreviation "o" for "upward" is stamped on the screw gland. The notch on the sensor must face upward when the sensor is installed horizontally.

Sensor installed **horizontally** or with its sensor tip pointing **downward**

The German abbreviation "u" for "downward" is stamped on the screw gland. The notch on the sensor must face upward when the sensor is installed horizontally.

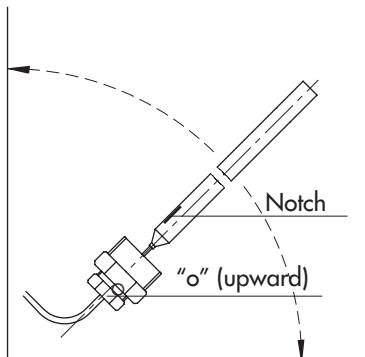
- ▶ Weld in a socket weld end with G 1/2" female thread at the point of installation.
- ▶ Make sure the entire sensor is immersed in the process medium.
- ▶ Install the sensor in a location where overheating and considerable idle times will not occur.

### 2.4.1 Capillary tube

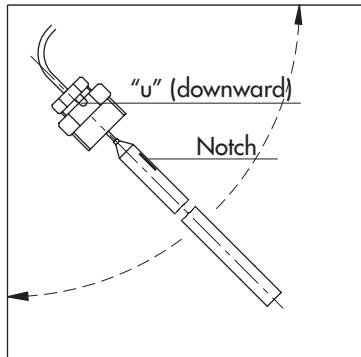
Install the capillary tube so that mechanical damage will not occur.

The minimum bending radius is 50 mm. Any excess length of the capillary tube must be rolled in a ring. Under no circumstances must the capillary tube be bent or shortened.

Make sure that the capillary tube is not exposed to considerable temperature fluctuations.



Sensor installed horizontally or with its tip pointing upward and the varying positions



Sensor installed horizontally or with its tip pointing downward and the varying positions

Fig. 2 · Installing the temperature sensor

## 3 Operation

### 3.1 Adjusting the set point

Limit range	Scale division	Limit value change per turn
	0      1      2      3      4	approx.
60 to 75 °C	60 °C      75 °C	2.6 °C
75 to 100 °C	75 °C      100°C	2.2 °C
100 to 120 °C	100°C      120°C	2.35 °C

To adjust the limit temperature, turn the black plastic ring at the scale (see table above).

Turn the ring clockwise to reduce the temperature and turn it counterclockwise to increase it. The adjustment is infinitely variable.

The number of turns required to adjust the limit value can also be determined by referring to the "Limit value change per turn" in the table.

**Note:** On adjusting the limit value, make sure that there is a minimum difference of 15 K between the adjusted limit temperature and the set point of the temperature regulator.

### 4 Dimensions in mm

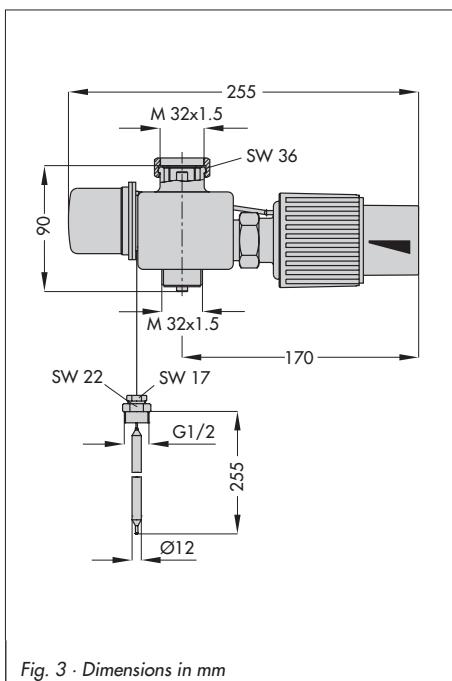


Fig. 3 · Dimensions in mm



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