

Safety Temperature Monitor (STM) with Safety Thermostat Type 2213



Fig. 1 · Safety temperature monitor (STM) with Type 2213 Safety Thermostat

Mounting and Operating Instructions

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Definitions of the signal words used in these instructions

CAUTION!
indicates a hazardous situation, which, if not avoided, may result in minor or moderate injury.

Note: *Supplementary explanations, information and tips*

NOTICE
indicates a property damage message.

General safety instructions



- ▶ *The safety temperature monitors must be installed, started up and serviced by fully trained and qualified personnel only, observing the accepted industry codes and practices. Make sure employees or third persons are not exposed to any danger.
All safety instructions and warnings in these instructions, particularly those concerning installation, start-up and maintenance, must be observed.*
- ▶ *The valve connected to the safety thermostat 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. The declaration of conformity can be provided on request.*
- ▶ *For appropriate operation, make sure that the safety temperature monitor is only used in applications where the operating pressure and temperatures do not exceed the operating values based on the sizing data submitted in the order.*
- ▶ *Note that the manufacturer does not assume any responsibility for damage caused by external forces or any other external factors.
Any hazards which could be caused in the safety temperature monitor by the process medium or operating pressure are to be prevented by means of appropriate measures.*
- ▶ *Proper shipping and appropriate storage are assumed.*



Typetesting

The safety temperature monitor (STM) with Type 2213 Safety Thermostat has been typetested by the German Technical Inspectorate (TÜV) according to DIN EN 14597.

The register number is available on request.

1 Design and principle of operation

The safety temperature monitor (STM) is used to limit temperatures by closing a SAMSON Type 2111, 2114, 2118 or 2119 Valve connected to the thermostat.

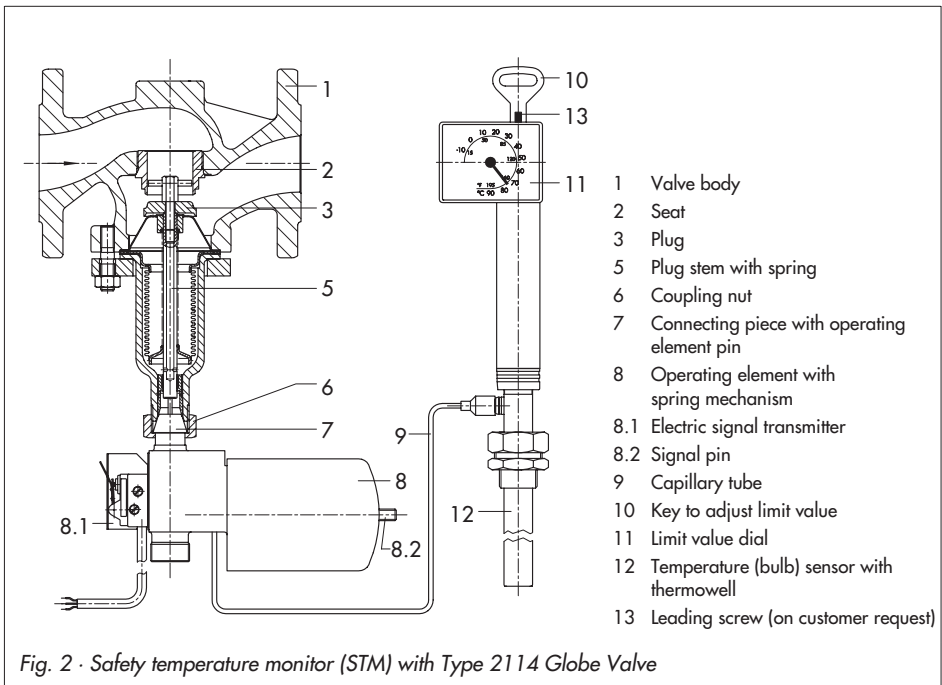
The safety temperature monitor basically consists of the thermostat with limit adjuster, capillary tube and operating element.

The safety temperature monitor (STM) operates according to the liquid expansion principle. The temperature sensor (12), the capillary tube (9) and the operating element (8) are filled with an expanding liquid.

The liquid in the bulb sensor (12) expands depending on the temperature, changing the position of the piston in the operating element (8) and the position of the operating element pin (7), the plug stem (5) and the valve plug (3).

When the adjusted temperature limit is reached, the thermostat closes the valve. It resets itself automatically after the temperature has fallen by approx. 5 K below the adjusted limit value.

If the capillary tube ruptures or there is a leak in the sensor, the spring mechanism located in the operating element is activated, closing and locking the valve. In this case, the thermostat cannot be reset.



2 Installation

NOTICE

Do not take the safety temperature monitor into service before the valve and safety thermostat have been installed.

Before removing the safety temperature monitor from the pipeline or installing it, make sure the relevant section of the pipeline is depressurized and drained, if necessary.

The Type 2213 Safety Thermostat is installed in the plant in combination with a valve.

The operating element of the thermostat can be connected to the valve body using the coupling nut (6) either before or after installation of the valve.

On installation make sure that the temperature cannot exceed or fall below the permissible ambient temperature range between $-40\text{ }^{\circ}\text{C}$ and $80\text{ }^{\circ}\text{C}$.

Allow the plant to fill up slowly on start-up.

NOTICE

Protect the regulator against frost if it is used to control freezing media.

In cases where the regulator is installed in rooms not free of frost, it must be removed from the pipeline when the plant is shut down.

A distance piece is required to connect the actuator (Types 2424, 2427, 2428 and 2429 with force limiting device) to the operating element of the thermostat when the safety thermostat is combined with a Series 42 Differential Pressure or Flow Regulator.

Note: Prior to installation, remove the circlip from the pin of the distance piece.

Table 1 · Distance piece

Versions of the distance piece	Order no.
Brass · For water	1190-9948
Stainless steel · For water	1590-7703
Stainless steel · For oil	1590-7704

2.1 Valve

Install the valve in a horizontal pipeline with the valve body assembly suspended downward. However, for valve versions for steam, it is absolutely necessary that the valve be installed horizontally.

The medium must flow through the valve in the direction indicated by the arrow on the valve body.

NOTICE

Flush the pipeline thoroughly prior to installation of the regulator, ensuring that sealing particles and other impurities carried along by the process medium do not impair proper operation, especially tight shut-off.

2.2 Strainer

Install a strainer upstream of the valve since sealing particles, globules or other impurities carried along by the process medium could impair the proper functioning of the valve, especially tight shut-off.

The filter element of the strainer must be vertically suspended. Ensure that ample space is available to remove the filter.

2.3 Additional installation instructions

We recommend to install hand-operated shut-off valves both upstream of the strainer and downstream of the safety temperature monitor. This allows the plant to be shut down for cleaning or maintenance routines, or when the plant is not operated for extended periods.

To monitor the adjusted temperature limit value, we recommend to install a thermometer immersed in the regulated medium near the temperature sensor.

2.4 Temperature sensor

The temperature sensor with thermowell can be installed in either a horizontal or vertical position. Its entire length must be immersed in the regulated medium. Select the installation position such that neither overheating nor considerable idle times can occur.

NOTICE

Do not remove the thermostat including capillary tube and temperature sensor from the connecting element.

Weld a welding socket with G 1 female thread at the location of installation. Seal the sensor into welding socket. If a thermowell is used, we recommend that you fill the free space between the sensor and the thermowell with oil, or if you want to install the thermowell horizontally, that you fill the space with grease or

another heat-transferring substance to prevent delays during heat transfer.

Note: *Take the heat expansion of the filling substance into account, i.e. do not fill the free space completely or tighten the sensor nut to compensate for the pressure.*

NOTICE

To prevent corrosion, only use identical or similar materials when installing the sensor or thermowell.

For example, do not insert a sensor or thermowell made of non-ferrous metal in a heat exchanger made of stainless steel. In this case, use a thermowell made of stainless steel for the sensor.

2.4.1 Capillary tube

Route the capillary tube in such a way that mechanical damage cannot occur.

The smallest bending radius is 50 mm. The excess length must be neatly coiled up. Do not, under any circumstances, shorten the tube.

The ambient temperature surrounding the capillary tube should not be subject to fluctuation.

2.5 Electric signal transmitter

The safety temperature monitor can be additionally equipped with an electric signal transmitter.

The signal transmitter contains a microswitch (max. load 10 A, 125 V, 250 V) which issues a signal if the temperature limit is exceeded or if the sensor fails (capillary tube is broken).

Wire the microswitch according to Fig. 3.

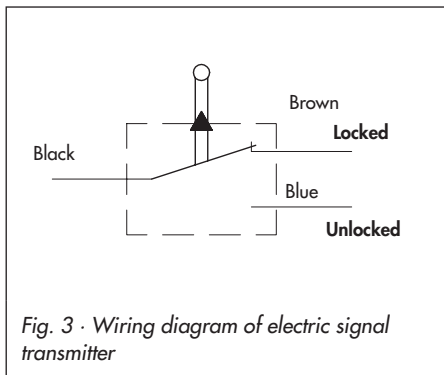


Fig. 3 · Wiring diagram of electric signal transmitter

2.5.1 Retrofitting an electric signal transmitter

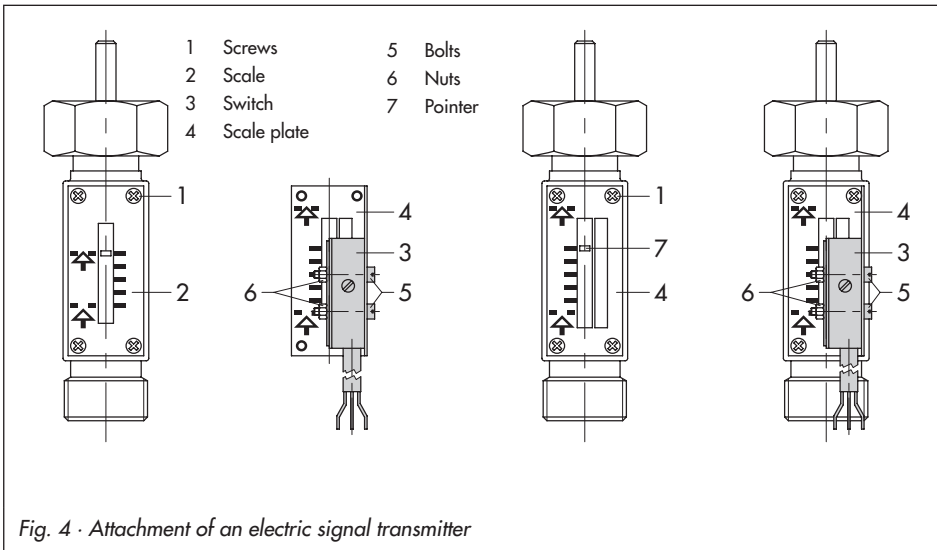
In order to retrofit an electric signal transmitter (order no. 1690-5724), proceed as follows:

1. Unfasten the four screws (1) at the connecting part and remove the scale (2).
2. Take the ready-assembled transmitter out of the packaging, remove the two bolts (5) and the nuts (6) and take the switch (3) off the scale plate (4).

3. Secure the scale plate (4) to the connecting part using the four screws (1), ensuring that the pointer (7) of the travel stem is able to move in a straight line in the middle of the left window.
4. Align the switch (3) with the scale and secure the switch to the scale plate by slightly tightening the bolts (5) and nuts (6).

Calibration

5. Reduce the limit value of the temperature monitor by turning the key (10, Fig. 2) until the pointer (7) of the travel stem reaches the value **0** on the scale.
6. Connect the black and the blue wires of the supply cable to a continuity tester or a test lamp.
7. Move the switch (3) slightly until the test lamp lights up. Then tighten the bolts (5).
8. For checking purposes, increase the limit value. The test lamp should go out. Then reduce the limit value. The test lamp should light up again when the value **0** is reached on the scale.



CAUTION!

Before carrying out any work on the regulator, first relieve the corresponding plant section of pressure and, depending on the process medium, drain it as well.

We recommend removing the regulator from the pipeline.

Let the plant section cool down to reach ambient temperature, if necessary.

As valves are not free of cavities, remember that residual process medium might still be contained in the regulator.

3 Operation

3.1 Adjusting the limit temperature

The safety temperature monitor is set to a limit temperature of approx. 60 °C at the factory.

In case another temperature is to be set, proceed as follows:

1. If the optional leading screw (13, Fig. 2) is used, unthread it upwards.
2. Use the key (10) to adjust the new limit value according to the scale. Slowly turn the key clockwise \curvearrowright to raise the temperature limit value and turn it counterclockwise \curvearrowleft to decrease it.
3. Lift off the key (10) and screw the leading screw back into the housing.

NOTICE**Indication of a defective sensor**

In the event of a defective sensor system, the green signal pin (8.2) disappears into the housing.

In the normal condition, the pin sticks up over the housing edge by approximately 1.5 cm.

When combining the safety temperature monitor with a Type 2231, 2232, 2233, 2234 or 2235 Control Thermostat, make sure that there is a minimum difference of approximately 15 K between the adjusted limit temperature of the temperature monitor and the set point temperature of the control thermostat.

3.2 Correcting the set point scale

Due to ambient and temperature conditions, the adjusted temperature might not be the same as the temperature indicated by the reference thermometer.

To correct the temperature, proceed as follows:

Undo the screw marked 'Korrektur' located on the back of the scale housing. Turn the entire scale housing (looking from the front with the scale housing on the top) until the set point reading is the same as the reading indicated by the reference thermometer.

- ▶ Turn the scale housing clockwise \curvearrowright to increase the set point reading
- ▶ Turn the scale housing counterclockwise \curvearrowleft to reduce the set point reading.

Turning the housing 360° corresponds to a set point change of approx. 1.5 K.

4 Customer inquiries

Should any malfunctions or any defect occur, SAMSON's After-Sales Service is prepared to help you on site.

You can also send the defective regulator directly to your local SAMSON representative for repair. Addresses of SAMSON subsidiaries, agencies and service centers are listed in the product catalogs and in the Internet at www.samson.de.

To allow SAMSON to find the fault and to have an idea of the installation situation, specify the following details (refer to the nameplate):

- ▶ Type and nominal size of the valve
- ▶ Order number and model number
- ▶ Upstream and downstream pressures
- ▶ Temperature conditions
- ▶ Min. and max. flow rate in m^3/h
- ▶ Has a strainer been installed?
- ▶ Installation drawing

5 Dimensions in mm

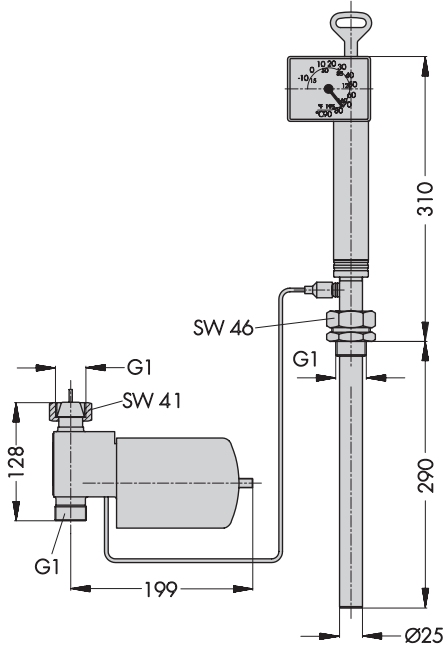


Fig. 5 · Dimensional drawing

6 Technical data

Table 2 · Technical data · All pressures in bar (gauge)

Valves															
Nominal size	DN	15	20	25	32	40	50	65	80	100	125	150	200 ¹⁾	250 ¹⁾	
Type 2111	Further details on the technical data of the valves and control thermostats can be found in the listed data sheets.	See Data Sheet T 2111 EN							-						
Type 2114		See Data Sheet T 2121 EN													
Type 2118		See Data Sheet T 2131 EN							-						
Type 2119		See Data Sheet T 2133 EN												-	
Nominal pressure		PN 16 to PN 40													
Type 2213 Safety Thermostat for STM															
Adjustable limit value range		-10 to 90 °C · 20 to 120 °C													
Permissible ambient temperature range at the limit value adjuster		-40 to +80 °C													
Permissible temperature at the sensor		100 K above adjusted temperature limit													
Permissible pressure at the sensor															
With G 1 thermowell		PN 40													
Without thermowell		PN 10													
Capillary tube length		5 m ²⁾													

1) Type 2114 only: on request

2) Special version 10 m or 15 m in copper and 5 m, 10 m or 15 m in plastic-coated copper (10 m and 15 m not type-tested)



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