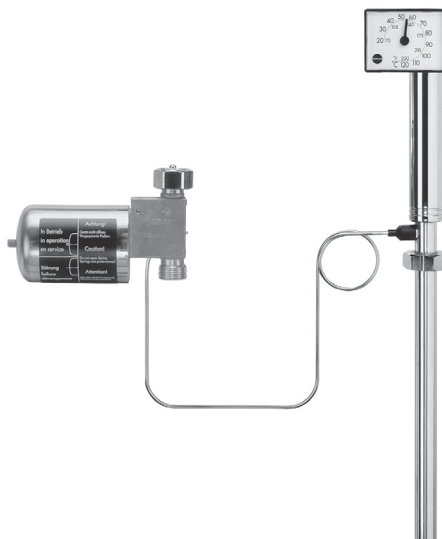


Self-operated Temperature Regulators



Safety Temperature Monitors (STM) with Type 2213 Safety Thermostat



Safety temperature monitor (STM) with Type 2213 Safety Thermostat

Mounting and Operating Instructions

EB 2043 EN

Edition May 2015



Definition of signal words



DANGER!

Hazardous situations which, if not avoided, will result in death or serious injury



WARNING!

Hazardous situations which, if not avoided, could result in death or serious injury



NOTICE

Property damage message or malfunction



Note:

Additional information



Tip:

Recommended action

Contents	Page
1	General safety instructions.....4
2	Process medium and scope of application.....5
3	Transportation and storage.....5
4	Design and principle of operation5
5	Installation6
5.1	Installing the valve.....6
5.2	Strainer (filter).....6
5.3	Additional components.....8
5.4	Temperature sensor8
5.4.1	Capillary tube8
5.5	Electric signal transmitter9
5.5.1	Retrofitting an electric signal transmitter9
6	Start-up and operation10
6.1	Adjusting the limit temperature.....10
6.1.1	Sensor malfunction.....11
6.2	Correcting the limit value dial.....11
7	Service/maintenance.....11
8	Technical data13
9	Dimensions14



1 General safety instructions

- The device must be mounted, started up or serviced by fully trained and qualified personnel only; the accepted industry codes and practices are to be observed. Make sure employees or third persons are not exposed to any danger.
- All safety instructions and warnings given in these mounting and operating instructions, particularly those concerning installation, start-up and maintenance, must be strictly observed.
- According to these mounting and operating instructions, trained personnel refers to individuals who are able to judge the work they are assigned to and recognize possible dangers due to their specialized training, their knowledge and experience as well as their knowledge of the applicable standards.
- The devices comply with the requirements of the European Pressure Equipment Directive 2014/68/EU. Devices with a CE marking have a declaration of conformity, which includes information about the applied conformity assessment procedure. This declaration of conformity can be provided on request.
- To ensure appropriate use, only use the device in applications where the operating pressure and temperatures do not exceed the specifications used for sizing the device at the ordering stage.
- The manufacturer does not assume any responsibility for damage caused by external forces or any other external factors.
- Any hazards that could be caused in the temperature regulator by the process medium, operating pressure or by moving parts are to be prevented by taking appropriate precautions.
- Proper transport, storage, installation, operation and maintenance are assumed.



Testing according to DIN EN

The safety temperature monitors are tested by the German Technical Inspectorate (TÜV) according to DIN EN 14597.

The register number is available on request.

2 Process medium and scope of application

Safety temperature monitoring of the energy supply for heat generators or heat exchangers by closing the valve.

For limit signals from -10 to 120 °C · Valves **DN 15** to **150** · **PN 16** to **40** · Max. **350** °C

Safety temperature monitors (STM), with a valve and Type 2213 Safety Thermostat, operate without auxiliary energy and are designed for extended safety according to DIN EN 14597. The valve is closed by a spring mechanism when the temperature reaches the adjusted limit, when the capillary tube breaks or when leakage occurs in the sensor system. The devices are automatically reset and put back into operation after the temperature has fallen below the limit and the fault has been remedied.

3 Transportation and storage

The device must be carefully handled, transported and stored. Protect the device against adverse influences, such as dirt, moisture or temperature outside the permissible ambient temperature range.

4 Design and principle of operation

See Fig. 1 on page 7.

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

The temperature-dependent change in volume of the liquid in the bulb sensor (12) causes the piston in the operating element (8) to move. As a result, the pin of the operating element (7) moves the plug stem (5) with the plug (3). The limit temperature can be adjusted by a key (10). This limit value is indicated on the dial (11).

The thermostat closes the valve when the temperature reaches the adjusted limit temperature. The thermostat resets itself automatically when the temperature has fallen to a value of approx. 5 K below the adjusted limit.

The spring mechanism in the operating element is released when the capillary tube breaks or when there is a leak in the sensor. It moves the plug stem (5) with the plug (3) over the pin (7) and closes and locks the valve.

5 Installation

See Fig. 1 on page 7.

The Type 2213 Safety Thermostat is always installed in conjunction with a valve to act as a safety temperature monitor (STM). The operating element with the spring mechanism (8) can be attached to the valve body using the coupling nut (6) either before or after the valve is installed in the pipeline.



Note:

Put the safety temperature monitor in to operation after mounting the valve and control thermostat.

On installation, make sure that the ambient temperature does not fall below $-40\text{ }^{\circ}\text{C}$ or exceed $80\text{ }^{\circ}\text{C}$.

If the safety thermostat is used in combination with Series 42 Differential Pressure and Flow Regulators, a separating piece must be mounted on the operating element of the thermostat to connect the actuator (Types 2424, 2427, 2428 and 2429 with force limiter).



Note:

Before installation, remove the snap ring on the pin of the separating piece.

Table 1: Separating pieces

Separating piece	Order no.
Brass (for water)	1190-9948
Stainless steel (for water)	1590-7703
Stainless steel (for oil)	1590-7704

5.1 Installing the valve

Choose a place of installation that allows you to freely access the regulator even after the entire plant has been completed.

Flush the pipeline thoroughly before installing the safety temperature monitor with valve. Install a strainer upstream of the regulator to prevent any sealing parts, weld spatter and other impurities carried along by the process medium impairing the proper functioning of the valve, above all the tight shut-off.



Note:

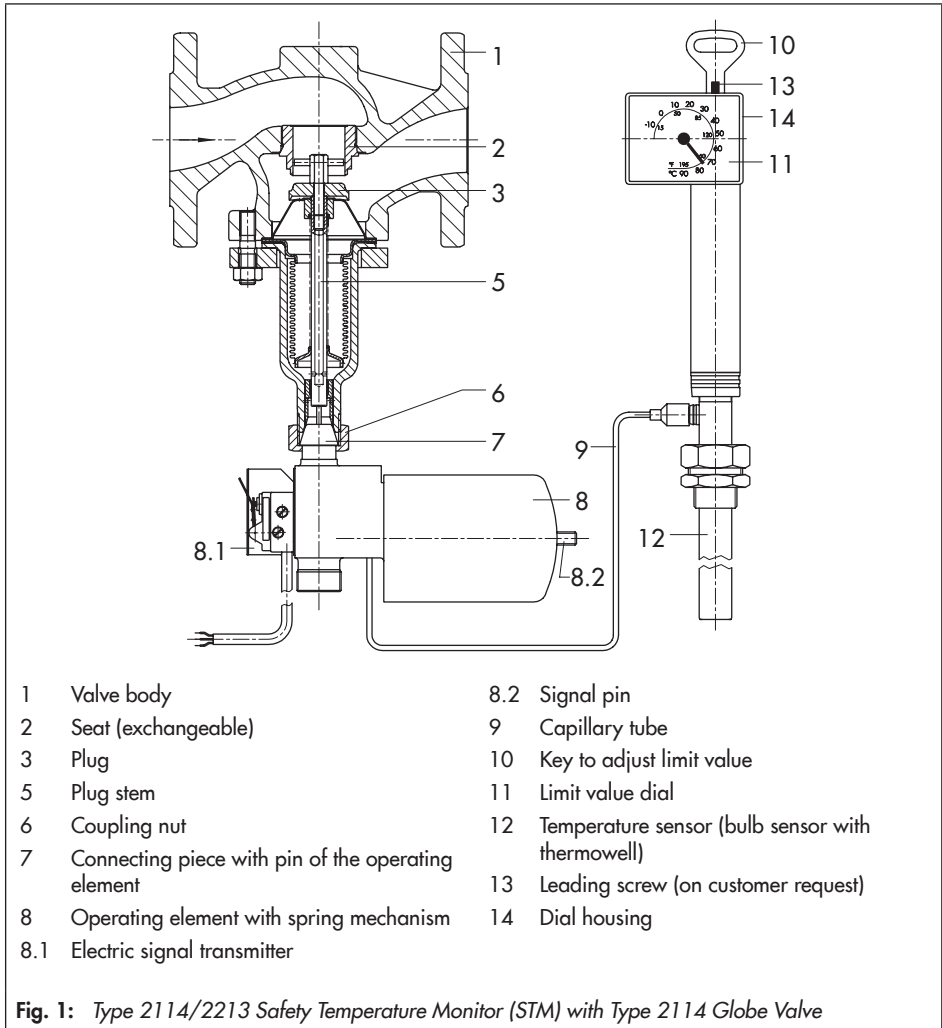
Install the valve in a horizontal pipeline with the operating element connection suspended downward.

- Install the valve free of stress and with the least amount of vibrations as possible. If necessary, support the pipelines near the connections.
- The flow of direction must correspond with the direction indicated by the arrow on the valve body.

5.2 Strainer (filter)

Install a strainer (e.g. SAMSON Type 1 N/ Type 2 N) upstream of the temperature regulator.

- The flow of direction must correspond with the direction indicated by the arrow on the valve body.
- The filter element must be installed to hang downwards or sideways for applications with steam.



Tip:

Remember to leave enough space to remove the filter element for cleaning.

5.3 Additional components

We recommend installing a hand-operated shut-off valve both upstream of the strainer and downstream of the temperature regulator. This allows the plant to be shut down for cleaning and maintenance, and when the plant is not used for longer periods of time.

To check the adjusted limit, we recommend installing a thermometer near the sensor.

5.4 Temperature sensor



Note:

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

The temperature sensor may be installed in either a horizontal or vertical position. However, make sure its entire length is immersed in the process medium to be controlled. It must be installed in a location where overheating or considerable idling times cannot occur.

- Weld a welding socket with G 1 female thread at the place of installation.
- Seal the sensor into welded socket.
- When a thermowell is used, we recommend filling the free space between sensor and thermowell with oil or, when installed horizontally, with grease or any other heat transfer medium to avoid delays during heat transmission. This prevents heat transfer delays. Observe the

thermal expansion of the filling medium. Allow some space for expansion and do not fill the entire free space or slightly loosen sensor nut for pressure compensation.



NOTICE

Galvanic corrosion due to incorrectly selected materials of the mounting parts.

On installing the sensor or thermowell, only combine the same kind of materials (e.g. stainless steel with stainless steel or copper together with other copper materials).

5.4.1 Capillary tube

Carefully run the capillary tube (9) without bending or twisting it. Avoid locations with considerable ambient temperature fluctuations along the entire length of the tube.



Note:

Do not damage or shorten the capillary tube. Roll up excess tube to form a ring. The smallest permissible bending radius is 50 mm.

5.5 Electric signal transmitter

The safety temperature monitor can be fitted with an electric signal transmitter. The signal transmitter contains a microswitch (max. load 10 A, 125 V, 250 V) which generates a signal if the limit temperature is exceeded or if the sensor fails (capillary tube is broken).

Wire the microswitch according to Fig. 2.

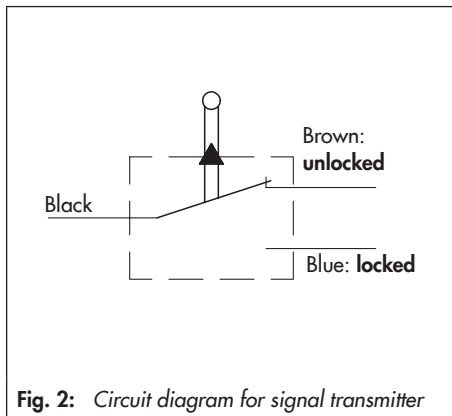


Fig. 2: Circuit diagram for signal transmitter

5.5.1 Retrofitting an electric signal transmitter

See Fig. 3 on page 10.

The electric signal transmitter (order no. 1690-5724) can be fitted 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

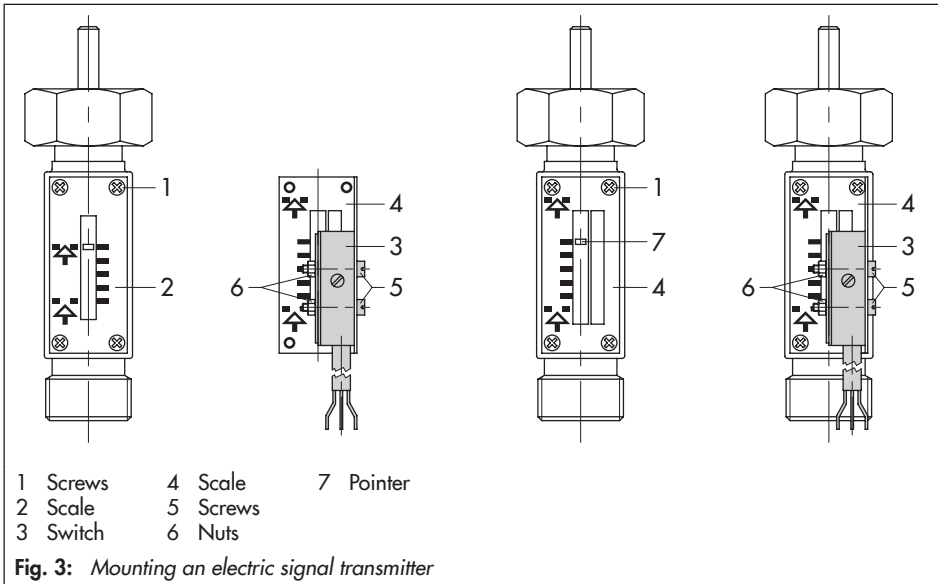
(5) and nuts (6) and take the switch (3) off the scale (4).

3. Secure the scale (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 by slightly tightening the bolts (5) and nuts (6).

Calibration

5. Reduce the limit value of the temperature monitor by turning the key (10) 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.

Reduce the limit value. The test lamp should light up again when the value 0 is indicated on the scale.



6 Start-up and operation

Fill the plant slowly with the process medium on start-up.



NOTICE

Malfunction and damage due to adverse effects of weather conditions (temperature, humidity). Do not install the safety temperature monitor outdoors or in rooms prone to frost. If such a location cannot be avoided, protect the regulator against freezing up if the process medium flowing through the valve can freeze up. Either heat the regulator or remove it from the plant and completely drain the residual medium.

6.1 Adjusting the limit temperature

See Fig. 1 on page 7.

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

To adjust a different temperature, proceed as follows:

1. If the optional leading screw (13) is used, unthread it upwards.
2. Use the key (10) to adjust the new limit value according to the dial.

- Slowly turn the key clockwise (↻) to increase the temperature and counterclockwise (↺) to reduce it.
- Lift off the key (10) and screw the leading screw back into the housing, if applicable.

6.1.1 Sensor malfunction

Indication after sensor malfunction

In the event of a defective sensor (e.g. leakage in the sensor system), the green signal pin (8.2) disappears into the housing. In the normal state, the pin sticks out over the housing by approximately 1.5 cm.

When the safety temperature monitor is combined with a Type 2231 to 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.

6.2 Correcting the limit value dial

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 labeled "Korrektur" on the back of the dial housing (14).
- Turn the entire dial housing until the dial shows the same temperature as the reference thermometer.

Turn clockwise (↻) to increase the limit and counterclockwise (↺) to reduce it (viewed from the front with the dial housing on top).

A 360° turn corresponds to a limit change of approx. 1.5 K.

7 Customer inquiries/maintenance

Contact SAMSON's After-sales Service department for support concerning maintenance or repair work or when malfunctions or defects arise.

E-mail

You can reach the After-sales Service Department at kundendienst@samson.

Addresses of SAMSON AG and its subsidiaries

The addresses of SAMSON AG, its subsidiaries, representatives and service facilities worldwide can be found on the SAMSON website (▶ www.samson.de) in all SAMSON product catalogs or on the back of these Mounting and Operating Instructions.



WARNING!

On installing or removing the regulator, remember that the pipeline may still contain some process medium. Risk of injury due to process medium escaping possibly under pressure. Depressurize the relevant section of the pipeline and, if necessary, drain it as well. When used at high temperatures, allow the plant section to cool down to ambient temperature.

To assist diagnosis and in case of an unclear mounting situation, specify the following details (so far as possible):

- Device type and nominal size
- Order and model number
- Upstream and downstream pressure
- Temperature conditions
- Min. and max. flow rate in m³/h
- Is a strainer installed?
- Installation drawing



Note:

Conversion from chromate coating to iridescent passivation

We at SAMSON are converting the surface treatment of passivated steel parts in our production. As a result, you may receive a device assembled from parts that have been subjected to different surface treatment methods. This means that the surfaces of some parts show different reflections. Parts can have an iridescent yellow or silver color. This has no effect on corrosion protection.

For further information go to ► www.samson.de/chrome-en.html

8 Technical data

Table 2: *Technical data · Type 2213 (STM)*

Type 2213 Safety Thermostat for STM	
Adjustment ranges of limit temperature	-10 to +90 °C · +20 to +120 °C
Permissible ambient temperature range at the limit value adjuster	-40 to +80 °C
Permissible temperature at sensor	100 K above the adjusted limit
Permissible pressure at the sensor	
With G 1 thermowell	40 bar
Without thermowell	6 bar
Capillary tube length	5 m ¹⁾
Compliance	CE · EAC

¹⁾ 10 or 15 m made of copper and 5, 10 or 15 m made of plastic-coated copper (10 and 15 m not tested according to DIN EN)

Table 3: *Technical data · Types 2111, 2114, 2118 and 2119 Valves*

Valve	Type 2111, Type 2114, Type 2118 and Type 2119												
	Valve size DN	15	20	25	32	40	50	65	80	100	125	150	200 ¹⁾
Type 2111	See T 2111							-					
Type 2114	See T 2121												
Type 2118	See T 2131							-					
Type 2119	See T 2133											-	
Nominal pressure	PN 16 to 40												
Compliance	CE · EAC												

¹⁾ Type 2114 only (on request)

9 Dimensions

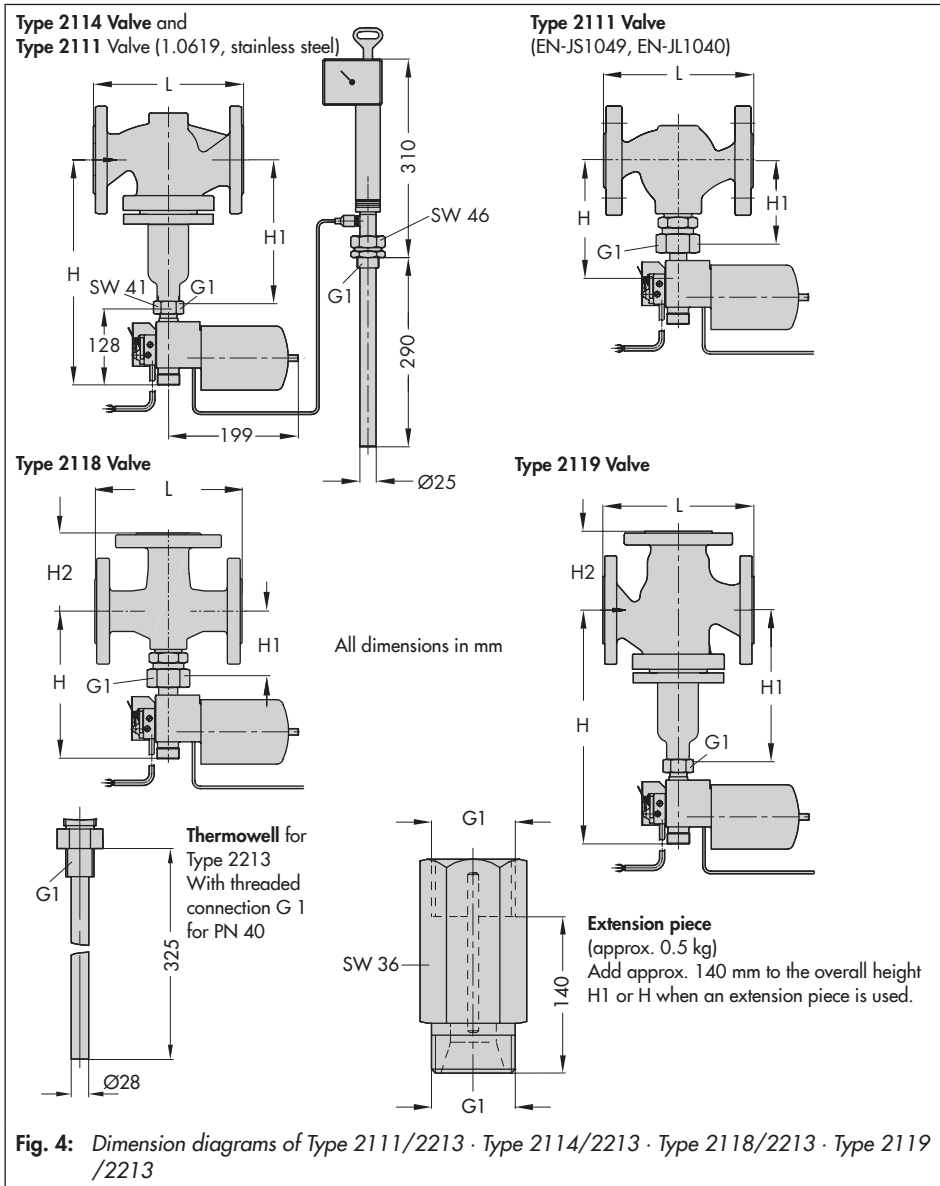


Fig. 4: Dimension diagrams of Type 2111/2213 · Type 2114/2213 · Type 2118/2213 · Type 2119/2213

Table 4: Dimensions in mm and weights in kg

Valve	Type 2111					
Nominal size DN	15	20	25	32	40	50
Length L	130	150	160	180	200	230
H1 Without Extension	225 ³⁾ /82 ⁴⁾			225 ³⁾ /152 ⁴⁾		
	365 ³⁾ /– ⁴⁾			365 ³⁾ /– ⁴⁾		
Weight (PN 16 body) ²⁾ , approx. kg	4	4.5	5.5	13	13.5	16

Valve	Type 2114										
Nominal size DN	15	20	25	32	40	50	65	80	100	125	150
Length L	130	150	160	180	200	230	290	310	350	400	480
H1 Without Extension	225			225			300		355	460	590
	365			365			440		495	600	730
Weight (PN 16 body) ²⁾ , approx. kg	5	5.5	6.5	13	13.5	16	27	32	40	70	113

Valve	Type 2118					
Nominal size DN	15	20	25	32	40	50
Length L	130	150	160	180	200	230
H2	70	80	85	100	105	120
H1 Without Extension ¹⁾	78			88		
	–			–		
Weight (PN 16 body) ²⁾ , approx. kg	5	6.5	8	12.5	14.5	17

Valve	Type 2119										
Nominal size DN	15	20	25	32	40	50	65	80	100	125	150
Length L	130	150	160	180	200	230	290	310	350	400	480
H2	70	80	85	100	105	120	130	140	150	200	210
H1 Without Extension	235			245			320		355	395	500
	375			385			460		495	535	640
Weight (PN 16 body) ²⁾ , approx. kg	6	7	8.5	15	17	19	32	50	71	On request	

Type 2213 Safety Thermostat		
Weight	Thermostat	5 kg
	Thermowell	0.5 kg
Overall height H	STM	H = H1 + 125
	TR/STM	H = H1 + 415

1) Type 2118: an extension piece does not permit a higher max. permissible temperature

2) +15 % for PN 25/40

3) Type 2111, valve material 1.0619 and stainless steel

4) Type 2111, valve material EN-JS1049 and EN-JL1040



SAMSON AG · MESS- UND REGELTECHNIK
Weismüllerstraße 3 · 60314 Frankfurt am Main, Germany
Phone: +49 69 4009-0 · Fax: +49 69 4009-1507
samson@samson.de · www.samson.de

EB 2043 EN

2015-08-18 · English