

MOUNTING AND OPERATING INSTRUCTIONS



EB 2046 EN

Translation of original instructions



Safety Temperature Limiter (STL) with Type 2212 Safety Thermostat

Safety Temperature Limiters (STL) with Type 2212 Safety Thermostat Self-operated Regulators

Edition March 2020



Note on these mounting and operating instructions

These mounting and operating instructions assist you in mounting and operating the device safely. The instructions are binding for handling SAMSON devices.

- For the safe and proper use of these instructions, read them carefully and keep them for later reference.
- If you have any questions about these instructions, contact SAMSON's After-sales Service (aftersaleservice@samsongroup.com).



The mounting and operating instructions for the devices are included in the scope of delivery. The latest documentation is available on our website at www.samsongroup.com > **Service & Support** > **Downloads** > **Documentation**.

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

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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 must be observed. Make sure employees or third parties 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 an EU declaration of conformity, which includes information about the applied conformity assessment procedure. This EU 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 Type 2212 Safety Temperature Limiter combined with Types 2111, 2422 and 2119 Valves has been tested by the German Technical Inspectorate (TÜV) according to DIN EN 14597. The registration number is available on request.

2 Process medium and scope of application

Safety temperature limitation of the energy supply to heat generators or heat exchangers by closing and locking a valve. Additional pressure limitation if equipped with pressure element.

For limit signals from **10 to 170 °C** · Valves **DN 15 to 150** · **PN 16 to 40** · Max. **350 °C**

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. 2 on page 7.

The safety temperature limiter (STL) is used to limit the temperature by closing and locking a SAMSON Type 2111, 2422 or 2119 Valve connected to the thermostat.

The safety temperature limiter consists of a connecting element with spring mechanism (8) and a thermostat with capillary tube (10) and temperature bulb sensor with thermowell (9). The connection of an additional thermostat converts the safety temperature limiter (STL) into a temperature regulator with safety temperature limiter (TR/STL).

The temperature of the measured medium creates a pressure in the sensor (9) which is proportional to the measured temperature. This pressure is transferred to an operating bellows through a capillary tube (10) where it is converted into a positioning force and compared to the force of the set point spring. The spring force depends on the temperature limit adjusted at the set point adjuster (11). When the temperature exceeds the adjusted limit value, the spring mechanism in the connecting element (8) is released. This causes a pin (6) to move the plug stem (5) to close and lock the valve. The valve closes when the capillary tube ruptures or the sensor leaks. They can only be reset and put back into operation after the fault has been remedied and the temperature falls below the limit by approx. 10 K.

i Note

The Type 2212 Safety Temperature Limiter requires no maintenance. For example, the moving parts in the connecting element do not need to be lubricated.

5 Installation

See Fig. 2 on page 7.

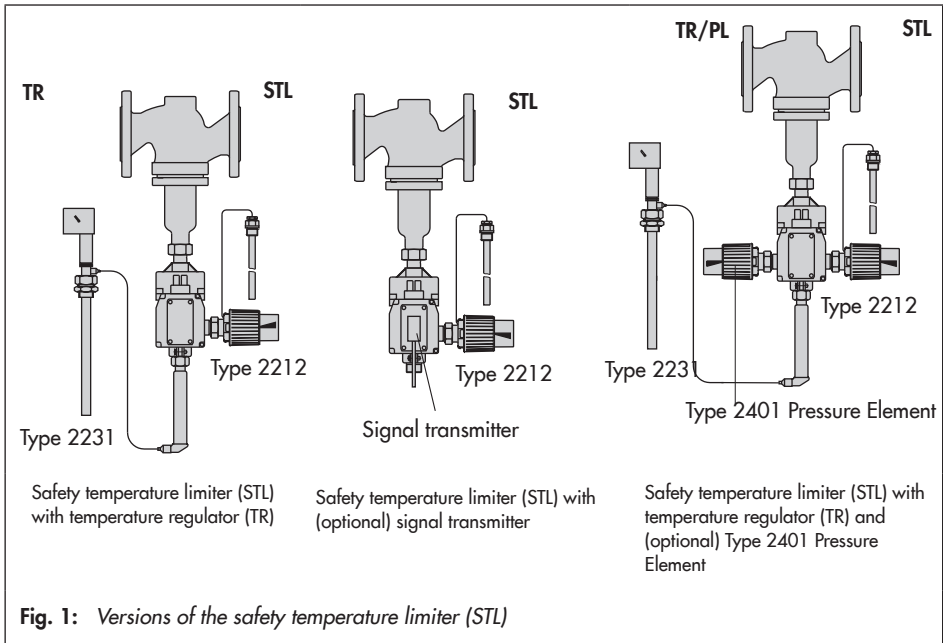
The safety temperature limiter is always installed in the plant in combination with a valve to form an STL or additionally with a temperature regulator to form a TR/STL. The connecting element with spring mechanism (8) can be connected to the valve either before or after the valve is installed in the pipeline.

On installation, make sure that the temperature does not exceed the max. permissible ambient temperature of 80 °C.

If the safety thermostat is used in combination with Series 42 Differential Pressure and Flow Regulators (see TV-SK 7770 document), 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). See Table 1.

i Note

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



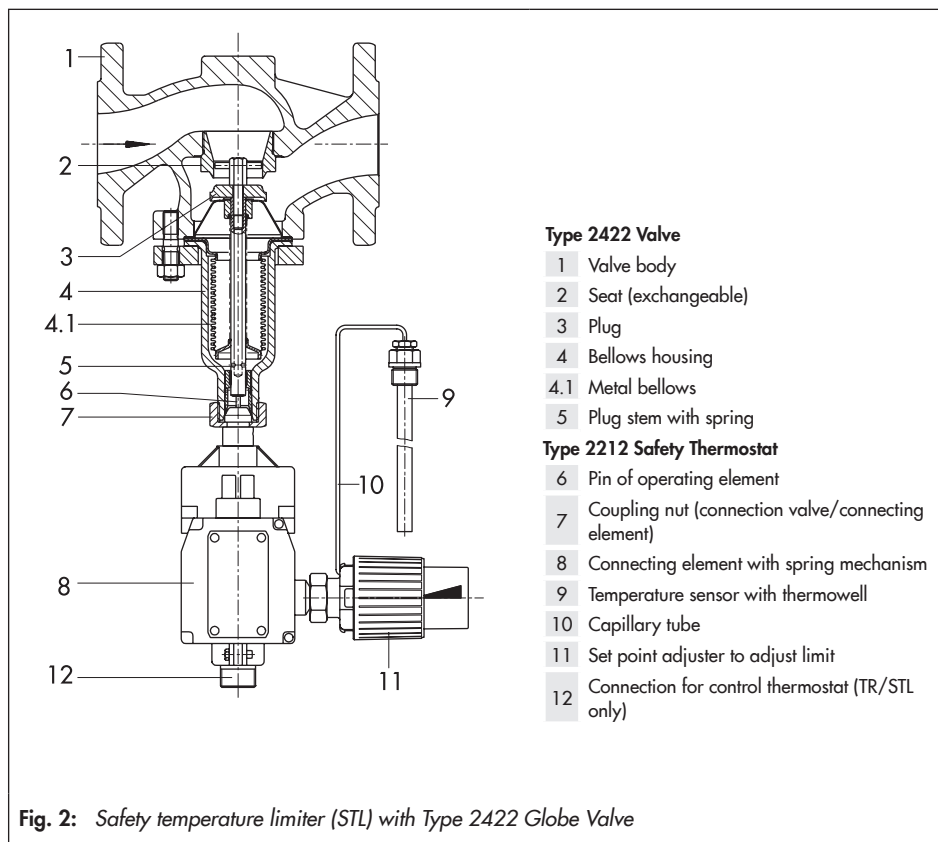


Table 1: Separating pieces

Version with 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 limiter 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.

i 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.

5.2 Strainers

Install a strainer (e.g. SAMSON Type 2 NI) upstream of the valve 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.

The filter element must be installed to hang downward. Remember to leave enough space to remove the filter element.

5.3 Additional mounting instructions

We recommend installing a hand-operated shut-off valve upstream of the strainer and downstream of the regulator to be able to shut down the plant 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 immersed in the medium to be controlled near the sensor.

5.4 Temperature sensor

i Note

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

The temperature sensor with a thermowell may be installed in any 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.

! 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).

Weld a welding socket with G 1 female thread at the place of installation. Seal the

thermowell into the welding socket. Insert the sensor and tighten it with the clamping screw.

i Note

For temperature regulators with safety temperature limiter (TR/STL), install the sensor of the limiter near the sensor of the regulator.

5.4.1 Capillary tube

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

i Note

Do not damage or shorten the capillary tube. Roll up any capillary tube that is not used. The smallest permissible bending radius is 50 mm.

5.5 Additional electric unit

The safety temperature limiter can be fitted with an electric signal transmitter.

5.5.1 Electric signal transmitter

The signal transmitter contains a microswitch which generates a signal if the temperature limit is exceeded or if the sensor fails (capillary tube ruptures).

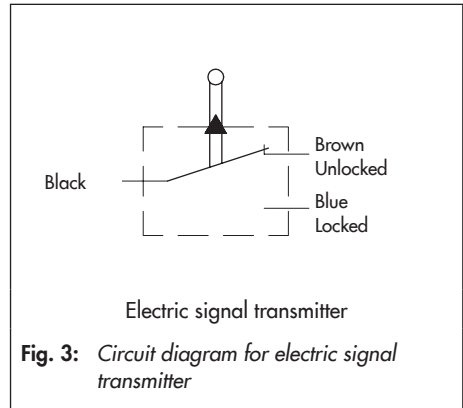


Fig. 3: Circuit diagram for electric signal transmitter

6 Start-up and operation

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

⚠ NOTICE

Malfunction and damage due to adverse weather conditions (temperature, humidity). Do not install the temperature regulator 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 Limit adjustment


The safety temperature limiter is adjusted to the limit value specified in the order.

If no value has been specified, the range from 10 to 95 °C is set to 90 °C, the range from 20 to 120 °C to 110 °C and the range from 40 to 170 °C to 150 °C.

If another temperature limit is to be adjusted, turn the black plastic ring according to the scale (see Table 2).

- Turn clockwise (↻) to reduce the temperature
- Turn counterclockwise (↺) to increase the temperature

Table 2: Limit adjustment

Scale marking	Limit range			
	10 to 95 °C	20 to 120 °C	40 to 170 °C	
	0	~10 °C	~20 °C	~40 °C
	1	~35 °C	~40 °C	~55 °C
	2	~55 °C	~65 °C	~95 °C
	3	~75 °C	~95 °C	~135 °C
	4	~95 °C	~125 °C	~180 °C
Change of limit range Changes per turn in K	~3.2	~3.9	~5.6	

i Note

Before adjusting the limit value, the safety temperature limiter must be mounted on the valve.

The setting is continuously adjustable. A turn corresponds to approx. 3.2 K, 3.9 K or 5.6 K depending on the limit range (see Table 2).

For precise adjustment, first set the maximum set point by turning the black plastic ring counterclockwise (↺). Immerse the temperature sensor for at least five minutes in a temperature bath heated to the corresponding temperature limit. Afterwards, reduce the set point by slowly turning the black plastic ring clockwise (↻) until the temperature limit is reached and the spring mechanism is triggered.

6.2 Unlocking after a fault

The valve is locked when the pin has moved to the top of the inspection window of the connecting element (see Fig. 4).

Unlock the valve at the lever (Fig. 4) after the fault has been remedied. Position the lever and move it upward.

i Note

The valve can only be unlocked after the temperature limit has fallen below the adjusted limit value by at least 10 K.

i Note

If the hydraulic system of the Type 2212 is defective (pressure loss), the STL cannot be unlocked as a result. It must be replaced with a new device.

6.3 Special version of Type 2401 Pressure Element

Pressure limiters (PL): locking after the pressure exceeds the adjusted pressure limit.

Safety pressure limiters: locking after the pressure exceeds the adjusted pressure limit and upon pressure loss

6.3.1 Unlocking the Type 2401 Pressure Element

Pressure limiters (PL): unlocking after the pressure falls below the limit by 0.5 bar.

Safety pressure limiters: unlocking only at a pressure of 1 bar or more and after the pressure falls below the adjusted pressure limit by 0.5 bar

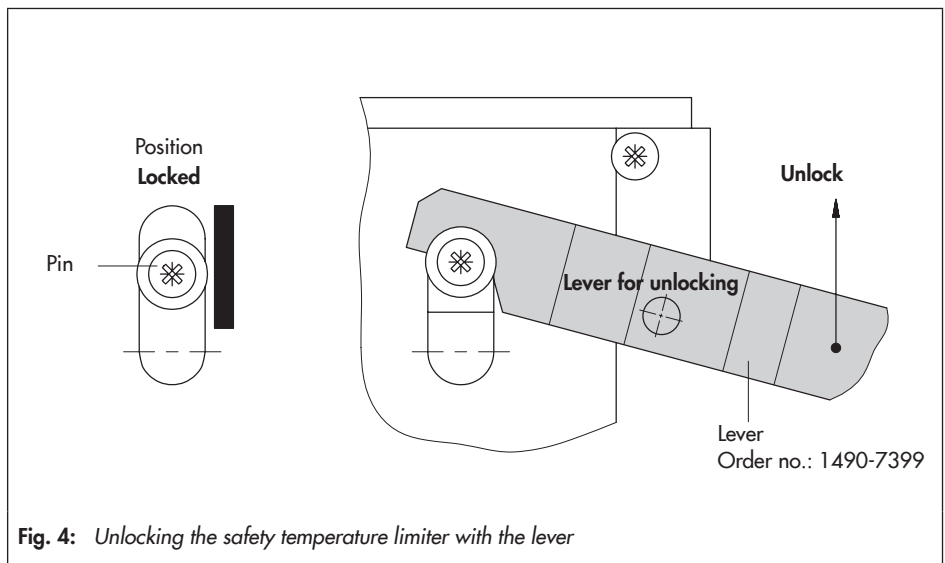


Fig. 4: Unlocking the safety temperature limiter with the lever

6.4 Maintenance

When the connecting element of the safety temperature limiter is defective, the spring mechanism can no longer be compressed.

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

E-mail: aftersaleservice@samson.de

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.samsongroup.com), in all SAMSON product catalogs or on the back of these Mounting and Operating Instructions.

Observe the following points on installing or removing the regulator from the pipeline:

WARNING

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.

6.5 Returning devices to SAMSON

Defective devices can be returned to SAMSON for repair.

Proceed as follows to return devices:

1. Exceptions apply concerning some special device models
 - ▶ www.samsongroup.com > Service & Support > After-sales Service.
 2. Send an e-mail
 - ▶ retouren@samsongroup.com to register the return shipment including the following information:
 - Type
 - Material number
 - Item numbers of accessories
 - Original order
 - Completed Declaration on Contamination, which can be downloaded from our website at
 - ▶ www.samsongroup.com > Service & Support > After-sales Service.
- After checking your registration, we will send you a return merchandise authorization (RMA).**
3. Attach the RMA (together with the Declaration on Decontamination) to the outside of your shipment so that the documents are clearly visible.
 4. Send the shipment to the address given on the RMA.

i Note

Further information on returned devices and how they are handled can be found at www.samsongroup.com > Service & Support > After-sales Service.

7 Technical data

Table 3: Technical data

Type 2212 Safety Thermostat for STL	Size 50 ¹⁾	Size 150 ¹⁾
Adjustable limit range	10 to 95 °C · 20 to 120 °C · 40 to 170 °C	
Max. perm. ambient temperature	+80 °C	
Min. permissible sensor temperature ²⁾ at 0 °C ambient temperature	Smallest adjustable temperature limit of the selected limit range	
Min. permissible temperature of the STL including sensor when the plant is shut down ²⁾ with		
Limit range 10 to 95 °C	-10 °C	
Limit range 20 to 120 °C	0 °C	
Limit range 40 to 170 °C	10 °C	
Max. permissible temperature at sensor	20 K above the adjusted set point	
Capillary tube length	5 m (10 m as special version) ³⁾	
Pressure rating with G ½ thermowell	PN 40	
Electric signal transmitter		
Max. load at 120/230 V (AC)	10 A with resistive load	
Class of protection	IP 67	
Conformity	CE	

¹⁾ Size 50: Type 2212 for valve DN 15 to 50 | Size 150: Type 2212 for valve DN 65 to 150

²⁾ The STL is locked when the temperature falls below the specified temperature.

³⁾ Not tested according to DIN EN

8 Dimensions

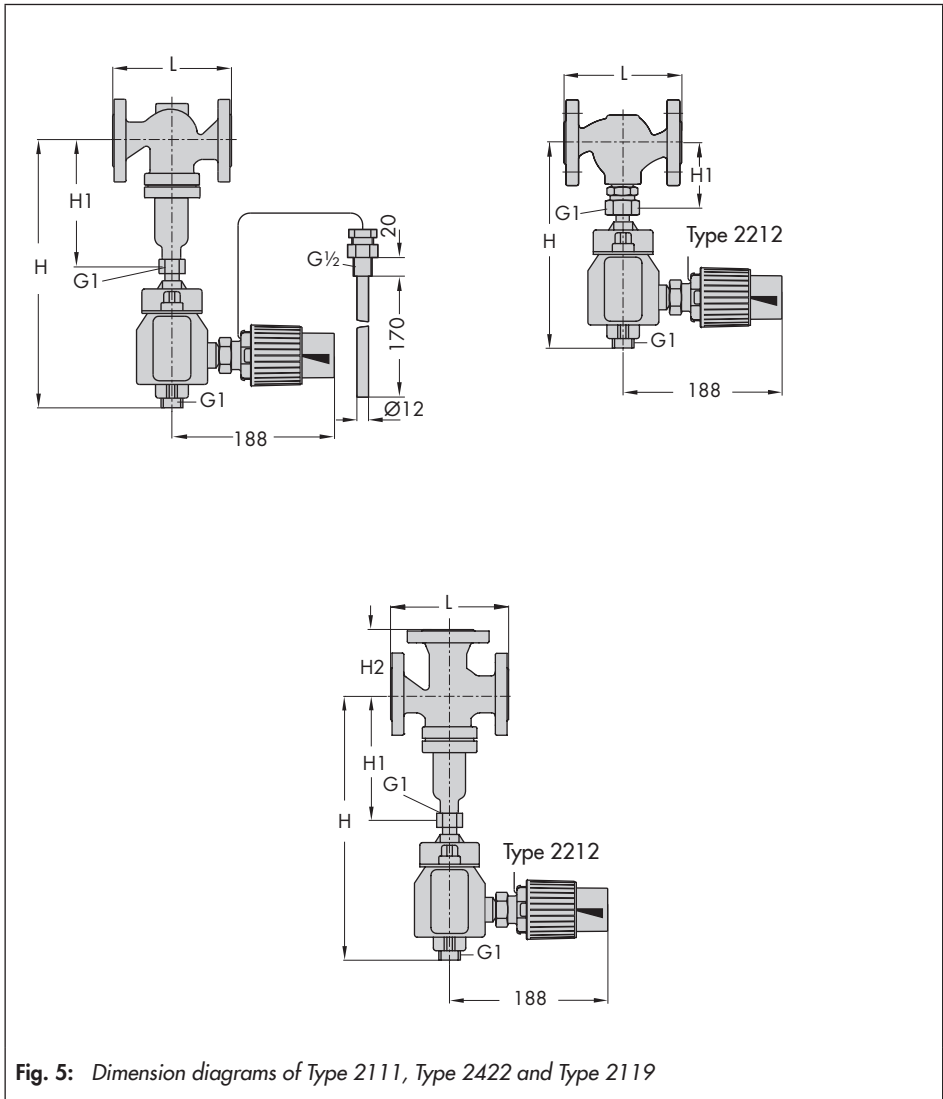


Fig. 5: Dimension diagrams of Type 2111, Type 2422 and Type 2119

Table 4: Dimensions in mm and weights in kg

Valve size DN	15	20	25	32	40	50	15	20	25	65	80	100	125	150
Valve	Type 2422			Type 2111/ (Type 2422)			Type 2111			Type 2422¹⁾				
Length L	130	150	160	180	200	230	130	150	160	290	310	350	400	480
H1 $\frac{w/o}{w}$ extension	225			225 ³⁾ /152 ⁴⁾ /(225)			225 ³⁾ /82 ⁴⁾			300	355	460	590	
	365			365 ³⁾ /- ⁴⁾ /(365)			365 ³⁾ /- ⁴⁾			440	495	600	730	
Weight (PN 16 body) ²⁾ , approx. kg	5	5.5	6.5	13	13.5	16	4	4.5	5.5	27	32	40	70	113
Valve	Type 2119													
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 $\frac{w/o}{w}$ extension	235			88/245			-			320	355	395	500	
	375			-/385			-			460	495	535	640	
Weight (PN 16 body) ²⁾ , approx. kg	6	7	8.5	12.5/ 15	14.5/ 17	17/ 19	-			32	50	71	On request	
Overall STL	H = H1 + 255													
height H TR/STL	H = H1 + 545													
Type 2212 Safety Thermostat														
Weight	Approx. 3.5 kg													

1) Details on STL and TR/STL with Type 2422 Valve in DN 200 and 250 available on request.

2) +15 % for PN 25/40

3) Type 2111, valve material 1.0619 and stainless steel

4) Type 2111, valve material EN-GJS-400-18-LT and EN-JL-1040



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