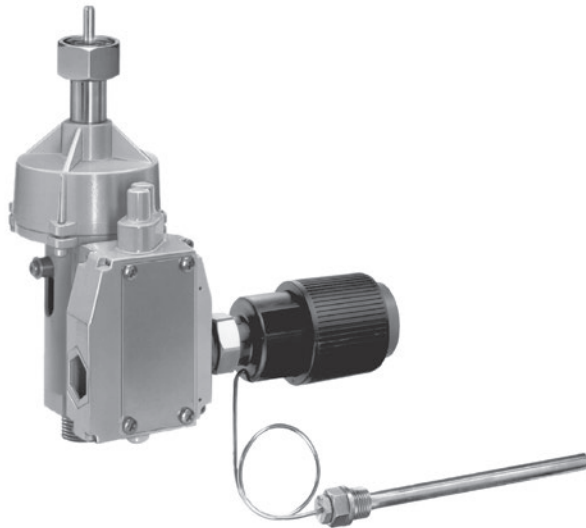


# Safety Temperature Limiters (STL) with Type 2212 Safety Thermostat

SAMSON



Safety Temperature Limiters (STL) with Type 2212 Safety Thermostat

## Mounting and Operating Instructions

**EB 2046 EN**

Edition November 2017



## 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*

<b>1</b>	<b>General safety instructions.....</b>	<b>4</b>
<b>2</b>	<b>Process medium and scope of application.....</b>	<b>5</b>
<b>3</b>	<b>Transportation and storage.....</b>	<b>5</b>
<b>4</b>	<b>Design and principle of operation .....</b>	<b>5</b>
<b>5</b>	<b>Installation .....</b>	<b>6</b>
5.1	Installing the valve.....	8
5.2	Strainer (filter).....	8
5.3	Additional mounting instructions .....	8
5.4	Temperature sensor .....	8
5.4.1	Capillary tube .....	9
5.5	Additional electric unit.....	9
5.5.1	Electric signal transmitter .....	9
<b>6</b>	<b>Start-up and operation .....</b>	<b>10</b>
6.1	Limit adjustment .....	10
6.2	Unlocking after a fault.....	11
6.3	Special version of Type 2401 Pressure Element.....	11
6.3.1	Unlock the Type 2401 Pressure Element .....	11
6.4	Maintenance .....	12
<b>7</b>	<b>Technical data.....</b>	<b>14</b>
<b>8</b>	<b>Dimensions .....</b>	<b>15</b>



### 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 Type 2212 Safety Temperature Limiter combined with Types 2111, 2422, 2118 and 2119 Valves has been 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 limitation of the energy supply for 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, 2118 or 2119 Valve connected to the thermostat.

The safety temperature limiter consists of a connecting element with spring mechanism (8) and 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 limit temperature adjusted at the set point adjuster (11). If the measured temperature exceeds the adjusted limit, the spring mechanism in the connecting element (8) is triggered, moving the pin (6) and the plug stem (5) of the valve. The valve is also closed when the capillary tube breaks or when leakage occurs in the sensor. It can only be reset and put back into operation when the fault has been remedied and the temperature has fallen below the limit by approx. 10 K.



**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.*

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## 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.

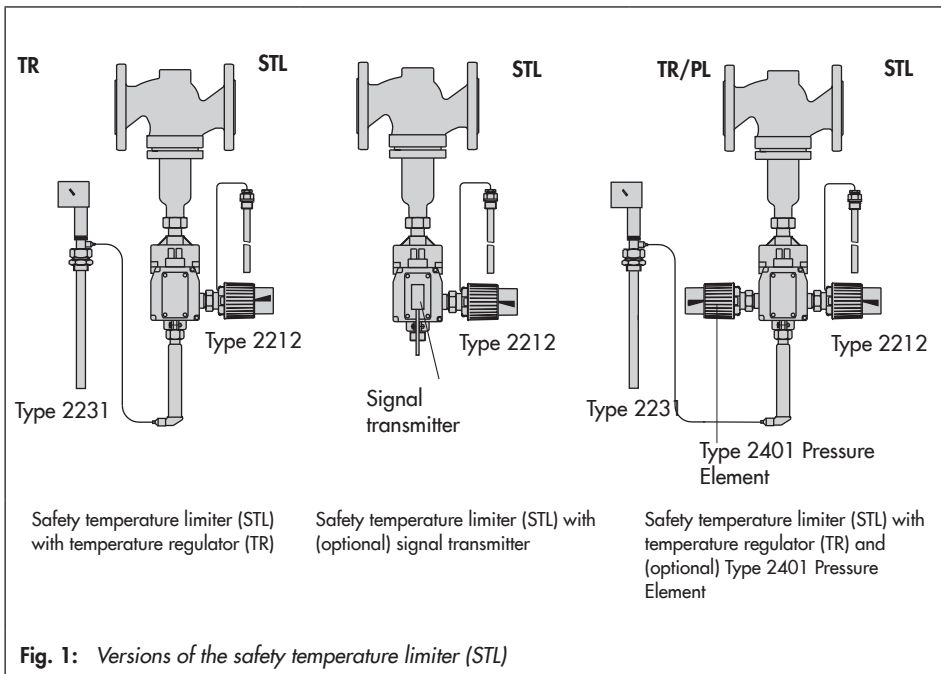
On installation, make sure that the temperature does not exceed the max. permissible ambient temperature of 80 °C.

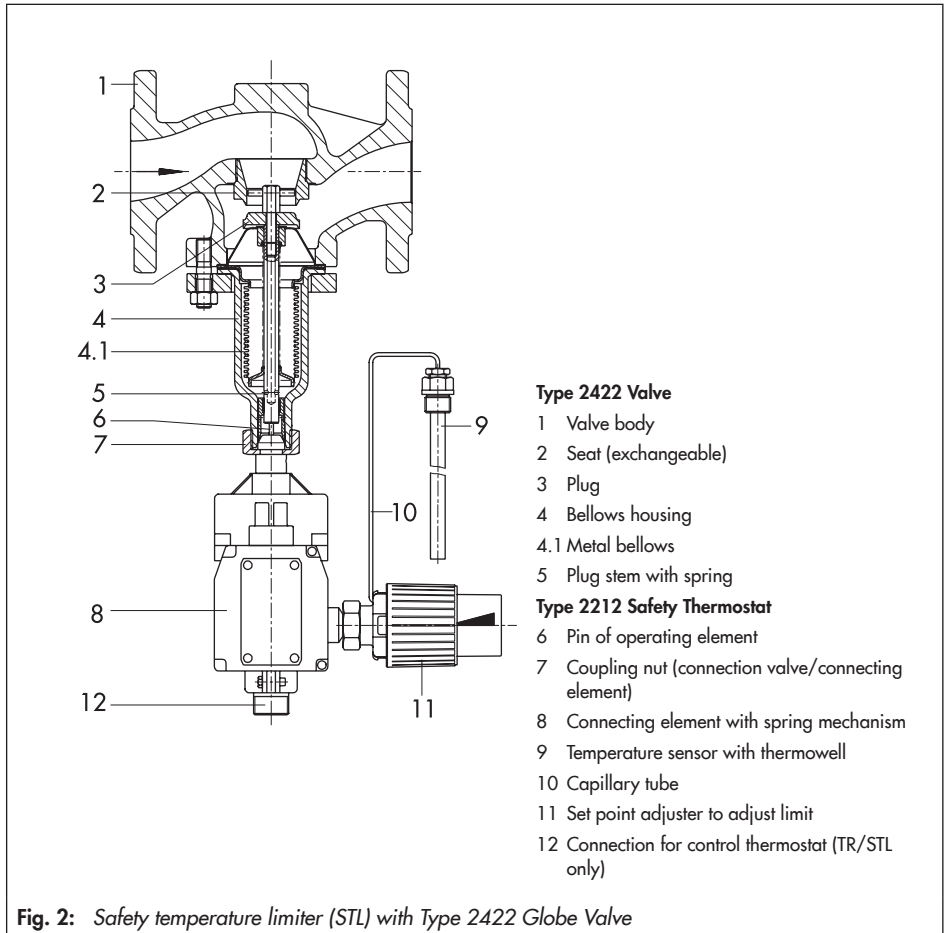
If the safety thermostat is used in combination with Series 42 Differential Pressure and Flow Regulators (see TV-SK 7770), a separating piece must be mounted on the operating element of the thermostat to connect the actuator (Types 2424, 2427, 2428 and 2429 with force limiter). See Table 1.



**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 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.



**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 Strainer (filter)

Install a strainer (e.g. SAMSON Type 1 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



**Note:**

*Do not separate the thermostat and the 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.



**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.



**Note:**

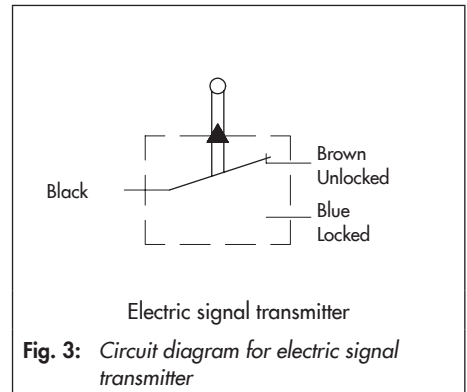
*Do not damage or shorten the capillary tube. Roll up any capillary tube that is not used. The smallest permissible bending radius is 50 mm.*

## 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 (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).



**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 effects of 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 limit temperature 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 value 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 in K/turn	~3.2	~3.9	~5.6	



### 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 limit temperature by turning the black plastic ring counterclockwise (↺). Immerse the temperature sensor for at least five minutes in a temperature bath heated to the corresponding limit temperature. Afterwards, reduce the set point by slowly turning the black plastic ring clockwise (↻) until the limit temperature 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).

To unlock the valve after the fault has been remedied, position the lever (Fig. 4) and move it upward.



**Note:**

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

## 6.3 Special version of Type 2401 Pressure Element

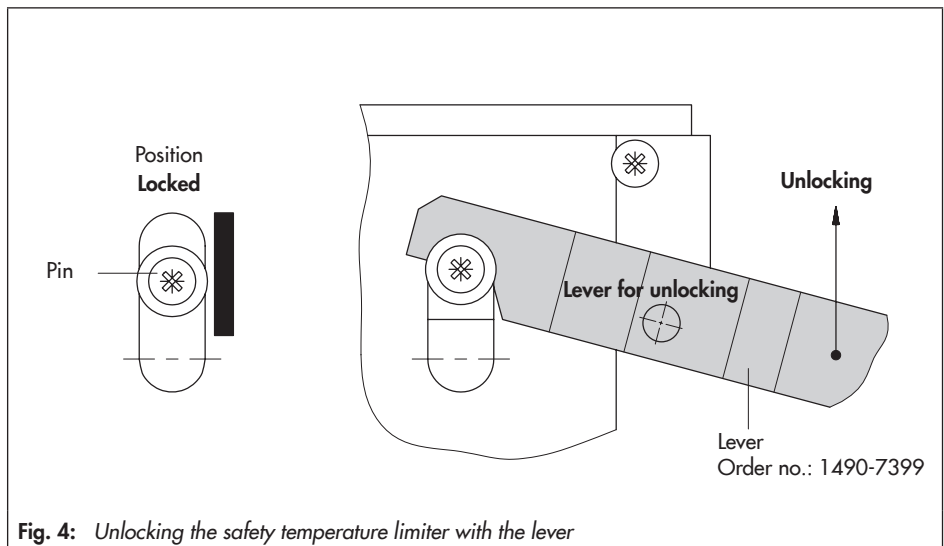
Pressure limiters (PL): unlocking after the pressure exceeds the adjusted pressure limit.

Safety pressure limiters: unlocking after the pressure exceeds the adjusted pressure limit and upon pressure failure

### 6.3.1 Unlock 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 exceeds 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 department for support concerning maintenance or repair work or when malfunctions or defects arise.

**E-mail:** [aftersaleservice@samson.de](mailto: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.samson.de](http://www.samson.de)), in all SAMSON product documents 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.*

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## 7 Technical data

**Table 3:** *Technical data*

Type 2212 Safety Thermostat for STL	Size 50 <sup>1)</sup>	Size 150 <sup>1)</sup>
Adjustable limit value range	10 to 95 °C · 20 to 120 °C · 40 to 170 °C	
Max. perm. ambient temperature	+80 °C	
Min. permissible sensor temperature <sup>2)</sup> at 0 °C ambient temperature	Smallest adjustable limit temperature of the selected limit range	
Min. permissible temperature of the STL including sensor during plant shutdown <sup>2)</sup> with Limit value range 10 to 95 °C Limit value range 20 to 120 °C Limit value range 40 to 170 °C	-10 °C 0 °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) <sup>3)</sup>	
Nominal pressure with G ½ thermowell	PN 40	
Electric signal transmitter Max. load at 230 V (AC)	10 A with resistive load	
Compliance		

<sup>1)</sup> Size 50: Type 2212 for valve DN 15 to 50 | Size 150: Type 2212 for valve DN 65 to 150

<sup>2)</sup> The STL is triggered when the temperature falls below the specified temperature

<sup>3)</sup> Not tested according to DIN EN



**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](http://www.samson.de/chrome-en.html)

## 8 Dimensions

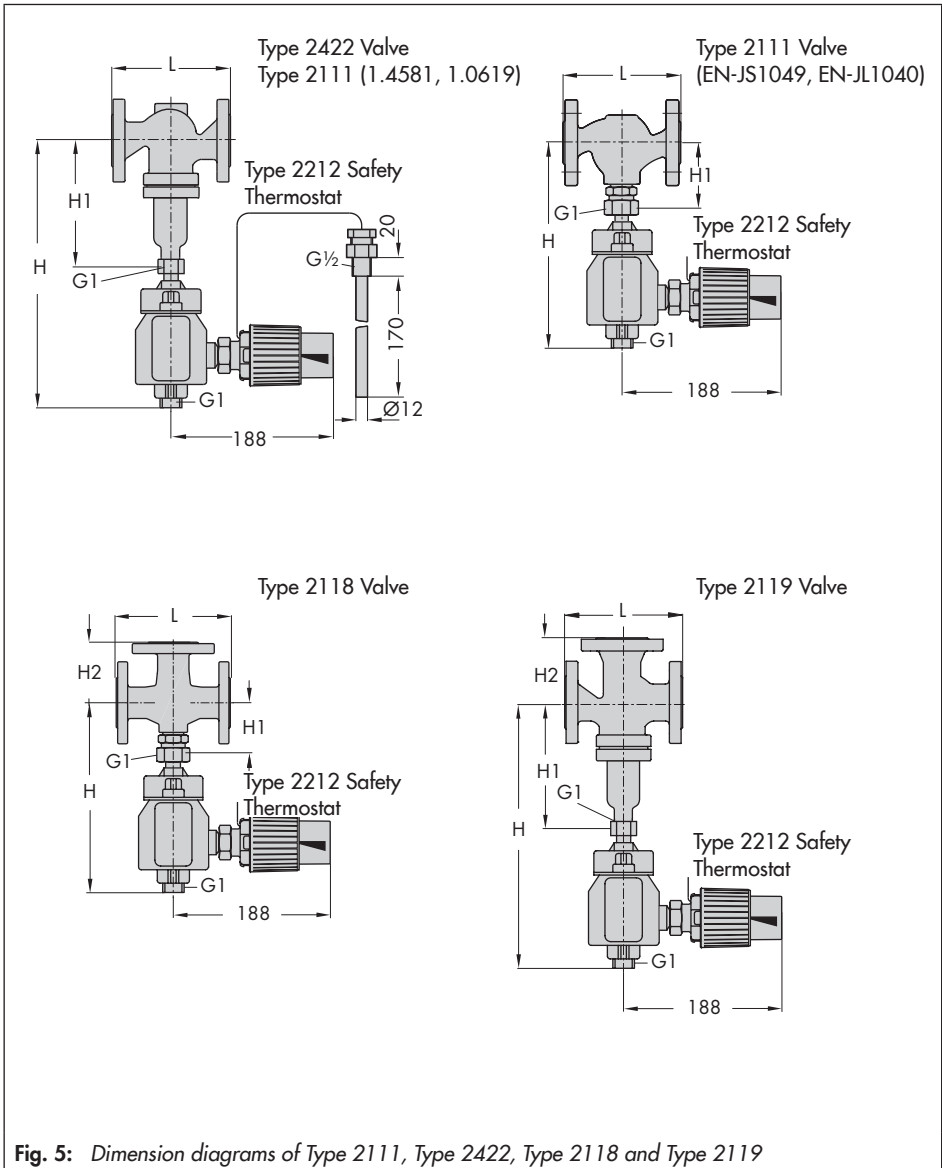


Fig. 5: Dimension diagrams of Type 2111, Type 2422, Type 2118 and Type 2119

**Table 4: Dimensions in mm and weights in kg**

Nominal size DN	15	20	25	32	40	50	15	20	25	65	80	100	125	150
<b>Valve</b>	<b>Type 2422</b>			<b>Type 2111/ (Type 2422)</b>			<b>Type 2111</b>			<b>Type 2422<sup>5)</sup></b>				
Length L	130	150	160	180	200	230	130	150	160	290	310	350	400	480
H1 Without ext. With piece <sup>1)</sup>	225			225 <sup>3)/152<sup>4)/</sup>(225)</sup>			225 <sup>3)/82<sup>4)</sup></sup>			300	355	460	590	
	365			365 <sup>3)/-<sup>4)/</sup>(365)</sup>			365 <sup>3)/-<sup>4)</sup></sup>			440	495	600	730	
Weight (PN 16 body) <sup>2)</sup> , approx. kg	5	5.5	6.5	13	13.5	16	4	4.5	5.5	27	32	40	70	113
<b>Valve</b>	<b>Type 2119</b>			<b>Type 2118/ Type 2119</b>			<b>Type 2118</b>			<b>Type 2119</b>				
Length L	130	150	160	180	200	230	130	150	160	290	310	350	400	480
H2	70	80	85	100	105	120	70	80	85	130	140	150	200	210
H1 Without ext. With piece <sup>1)</sup>	235			88/245			78			320	355	395	500	
	375			- /385			-			460	495	535	640	
Weight (PN 16 body) <sup>2)</sup> , approx. kg	6	7	8.5	12.5/ 15	14.5/ 17	17/ 19	5	6.5	8	32	50	71	On request	
Overall height H	STL			H = H1 + 255										
	TR/STL			H = H1 + 545										
<b>Type 2212 Safety Thermostat</b>														
Weight	Approx. 3.5 kg													

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

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



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