

Safety Temperature Limiter (STL) with Safety Thermostat Type 2212



Type 2212 Safety Thermostat

Mounting and Operating Instructions

EB 2046 EN

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Definitions of the signal words used in these instructions

CAUTION!

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

Note:

Supplementary explanations, information and tips



General safety instructions

- ▶ *The regulators 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.*
- ▶ *According to these mounting and operating instructions, trained personnel is referred to as 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 relevant standards.*
- ▶ *All safety instructions and warnings in these instructions, particularly those concerning installation, start-up, and maintenance, must be observed.*
- ▶ *The regulator 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 regulator 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 regulator 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 Type 2212 Safety Temperature Limiter combined with Types 2111, 2114, 2118 and 2119 Valves 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 limiter (STL) is used to limit temperatures by closing and locking a SAMSON Type 2111, 2114, 2118 or 2119 Valve connected to the thermostat.

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

The medium temperature produces a pressure in the sensor (9) that corresponds to the actual temperature sensed. This pressure is transmitted through the capillary tube (10) to a positioning bellows, converted into a positioning force and compared with the force of a positioning spring. The spring force depends on the limit temperature adjusted at the set point adjuster (11). If the actual temperature exceeds the adjusted limit, the spring mechanism in the connecting element (8) is released. It closes and locks the valve over a pin (6) and plug stem (5). The valve is closed also if the capillary tube breaks or in case of leakage at the sensor. The valve can only be reset and put back into operation after the fault has been removed and the temperature has fallen below the limit value by approx. 10 K.

2 Installation

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 the spring mechanism (8) can be connected to the valve body prior to or after installation of the valve.

CAUTION!

First assemble the valve and control thermostat before starting up the safety temperature limiter.

During installation make sure that the permissible ambient temperature of 80 °C is not exceeded (with additional electromagnetic release device: 60 °C).

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

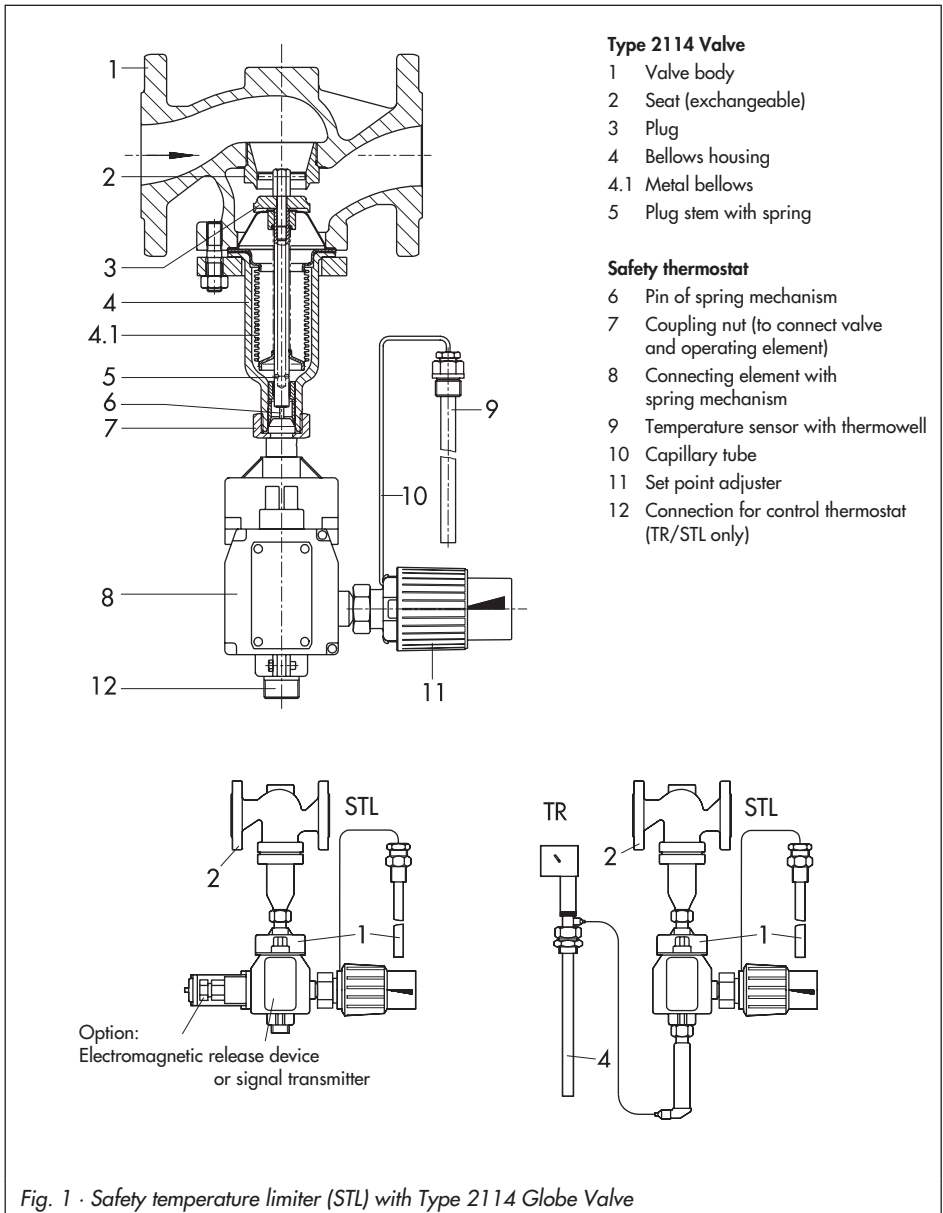


Fig. 1 · Safety temperature limiter (STL) with Type 2114 Globe Valve

2.1 Installing the valve

The valve must be installed in horizontal pipelines with the connecting element suspended downwards.

CAUTION!

Prior to removing or mounting the regulator, make sure the relevant section of the plant has been depressurized and drained.

The direction of the medium flow must match the direction indicated by the arrow.

CAUTION!

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

A strainer (SAMSON Type 1 NI) must be installed 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 limiter. 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 set point (limit value), we recommend to install a thermometer immersed in the regulated medium near the temperature sensor.

2.4 Temperature sensor

CAUTION!

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

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

CAUTION!

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.

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

A welding socket with G 1 female thread must be welded in at the location of installation. Seal thermowell into welding socket. Insert the sensor and secure with clamping screw.

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 Additional equipment

The safety temperature limiter can be additionally equipped with an electromagnetic release device and/or an electric signal transmitter.

2.5.1 Electromagnetic release device

The solenoid of the electromagnetic release device is switched in a safety interlock circuit and is energized in the normal operating state. In case of an interruption in the circuit, the solenoid is de-energized and releases the spring mechanism via a lever, closing the valve.

2.5.2 Electric signal transmitter

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

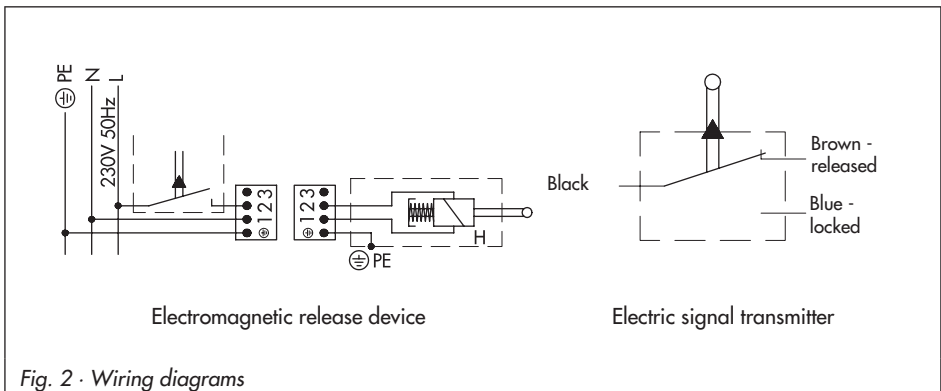


Fig. 2 · Wiring diagrams

3 Start-up and operation

On start-up, slowly fill the plant with the process medium.

CAUTION!

Protect the regulator against frost when controlling freezing media.

3.1 Adjusting the limit value


The safety temperature limiter is set to the value specified in the purchase order.

In case a value was not specified, the 10 to 95 °C range is set to 90 °C, the 20 to 120 °C range is set to 110 °C and the 30 to 170 °C is set to 150 °C.

If you want to adjust a different limit temperature, turn the black plastic ring according to the scale (see Table 2).

- ▶ Turn clockwise to lower the temperature
- ▶ Turn counter clockwise to raise the temperature

Table 2 · Limit value adjustment

Scale marking	Limit value range			
	10 to 95 °C	20 to 120 °C	30 to 170 °C	
	0	~ 10	~ 20	~ 30
	1	~ 35	~ 40	~ 55
	2	~ 55	~ 65	~ 95
	3	~ 75	~ 95	~ 135
	4	~ 95	~ 125	~ 180
Change of limit value range in K/turn	~ 3.2	~ 3.9	~ 5.6	

Note:

The STL must be mounted on the valve to adjust the limit value.

The safety temperature limiter is continuously adjustable. One turn of the black plastic ring is equal to approx. 3.2 K, 3.9 K or 5.6 K (see Table 2).

For a precise adjustment of the temperature limit, first turn the black plastic ring counter-clockwise to adjust the set point adjuster to the maximum set point.

Immerse the temperature sensor for at least five minutes in a temperature bath heated to the corresponding limit temperature. Afterwards, lower the set point by slowly turning the black plastic ring clockwise until the temperature limit is reached and the spring mechanism is triggered.

3.2 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 also adhesive label on the body).

To unlock the valve after the fault has been remedied, position the lever (Fig. 3) and move it upwards.

Note: *Unlocking is only possible if the limit temperature has dropped by at least 10 K below the adjusted limit value. For versions with an electromagnetic release device, the solenoid must be energized.*

3.3 Malfunction

In case of a defective safety temperature limiter, the spring mechanism in the connecting element cannot be tensioned.

Contact 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.

CAUTION!

Prior to removing or mounting the regulator, make sure the relevant section of the plant has been depressurized and drained.

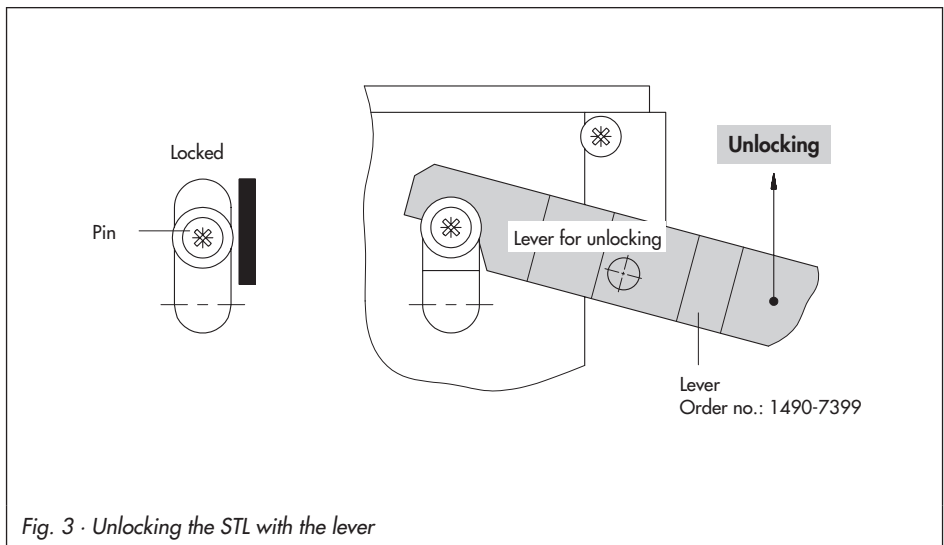


Fig. 3 · Unlocking the STL with the lever

4 Dimensions

Table 3 · Dimensions in mm and weights in kg

Nominal size	DN	15	20	25	32	40	50	15	20	25	65	80	100	125	150
Valve	Type	2114			2111/(2114)			2111			2114 ⁵⁾				
Length L		130	150	160	180	200	230	130	150	160	290	310	350	400	480
H1	W/o extension piece	225			225 ^{3)/152^{4)/}(225)}			225 ^{3)/82⁴⁾}			300	355	460	590	
	With piece	365			365 ^{3)/-4)/} (365)			365 ^{3)/-4)}			440	495	600	730	
Weight (PN 16) ²⁾ , kg		5	5.5	6.5	13	13.5	16	4	4.5	5.5	27	32	40	70	113
Valve	Type	2119			2118/2119			2118			2119				
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	190	210
H1	W/o extension piece ¹⁾	235			88/245			78			320	355	395	500	
	With piece	375			-/385			-			465	535	600	730	
Weight (PN 16) ²⁾ , kg		6	7	8.5	12.5/15	14.5/17	17/19	5	6.5	8	32	50	71	On request	
Total height H		STL: H = H1 + 255 · TR/STL: H = H1 + 515													
Type 2212 Safety Thermostat															
Weight, approx. kg		3.5													

1) Type 2118: The use of an extension piece does not allow an increase in the max. permissible temperature
 2) +15 % for PN 25/40 · 3) Type 2111: valve made of 1.0619 and 1.4581 · 4) Type 2111: valve made of EN-JS1049 and EN-JL1040 · 5) Specifications on STL and TR/STL with Type 2114 Valve in DN 200 and DN 250 on request!

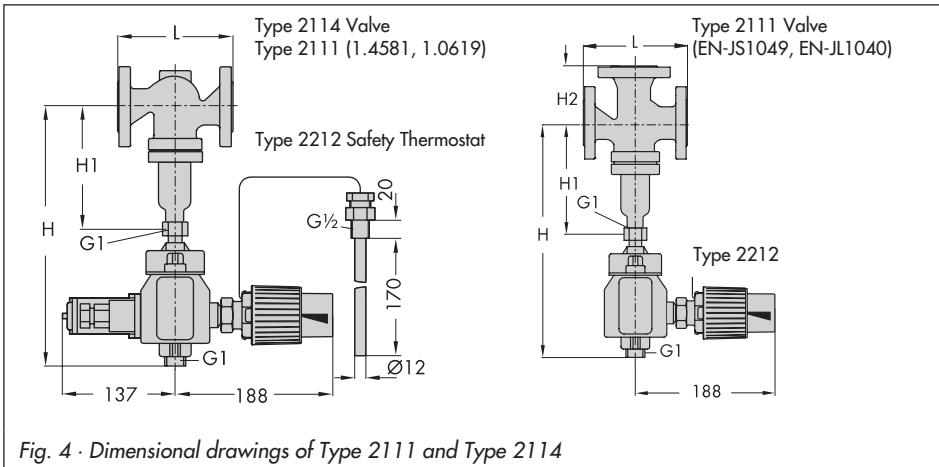


Fig. 4 · Dimensional drawings of Type 2111 and Type 2114

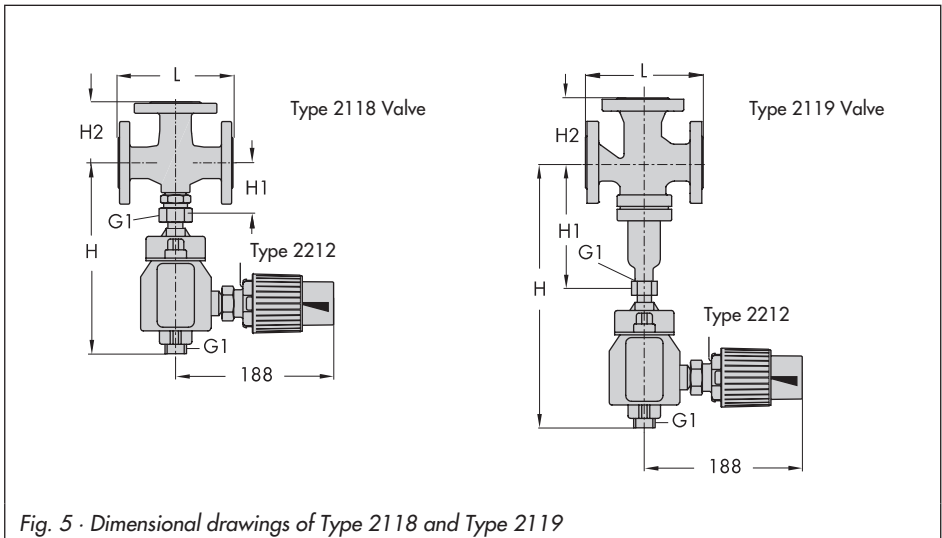


Fig. 5 · Dimensional drawings of Type 2118 and Type 2119

5 Technical data

Table 4 · Technical data

Type 2212 Safety Thermostat for STL	Size 50	Size 150
Adjustment range of limit value	10 to 95 °C · 20 to 120 °C · 30 to 170 °C	
Permissible ambient temperature with electromagnetic release device	-20 to +80 °C -20 to +60 °C	
Permissible temperature at sensor	Max. 20 K above the adjusted set point	
Length of capillary tube	5 m	
Perm. pressure at sensor with thermowell G ½	PN 40	
Electromagnetic release device	Power supply: 230 V _{AC} +5/-10 %, 50 Hz	
Degree of protection	IP 54	
Power consumption	31 VA (100 % ED)	
Electric signal transmitter	Permissible load: 230 V _{AC} , 10 A at ohmic load	



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