

Self-operated Temperature Regulators



Type 3 D

Type 4 D and Type 4 E

Return Flow Temperature Limiters



Type 3 D



Type 4 E

Mounting and Operating Instructions

EB 2080 EN

Edition July 2014

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

1	General safety instructions	4
2	Design and principle of operation	5
2.1	Process medium and scope of application	5
3	Installation	7
3.1	Strainer	8
3.2	Shut-off valve.....	8
4	Start-up and operation	8
4.1	Set points	8
4.2	Lead-sealing	9
4.3	Decommissioning	9
5	Cleaning and maintenance	10
6	Dimensions	11
7	Customer inquiries	15
8	Technical data	15



1 General safety instructions

- The regulators are to 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.
- To ensure appropriate use, only use the regulators in applications where the operating pressure and temperatures do not exceed the specifications used for sizing the regulators 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 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.

2 Design and principle of operation

The return flow temperature limiters operate according to the liquid expansion principle.

The Type 3 and Type 4 Return Temperature Limiters basically function in the same manner. They only differ in their design and connection thread size.

Type 3 D/4 D: Globe valve

Type 4 E: Globe valve with downward facing outlet

The regulators basically consist of a valve with seat (6) and an integrated thermostat (3) including a plug (4), safety spring (2) to safeguard against excess temperatures and scaled cap (1) for set point adjustment.

The heating water flowing through the return flow pipe flows through the valve and around the thermostat (3). The temperature-based volume change of the expanding liquid in the thermostat (3) moves the thermowell (4) together with the valve plug (5). The set point can be adjusted by turning the scaled cap (1). This adjustment causes the thermostat, thermowell and valve plug to move.

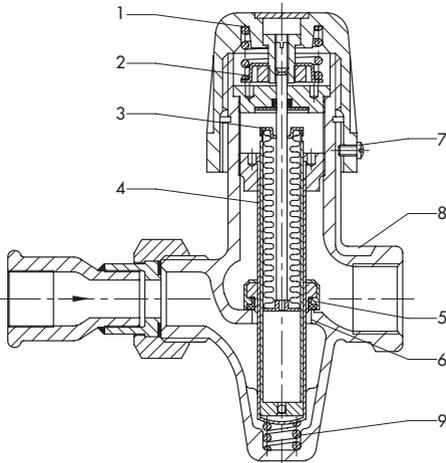
The valve starts to close when the return flow temperature rises above the adjusted set point. The valve opens as the temperature of the heating water drops below the adjusted set point again. The position of the valve plug determines the flow rate across the free area between the plug (5) and the valve seat (6).

The spring (2) safeguards the thermostat up to a maximum operating temperature of 120 °C.

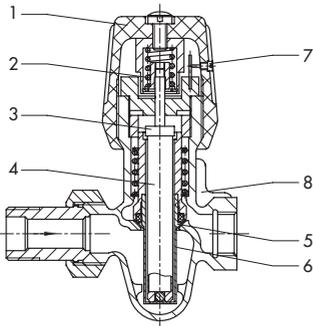
2.1 Process medium and scope of application

The Type 3 D, Type 4 D and Type 4 E Return Temperature Limiters are used to limit the temperature in the return flow pipe of a heating water circuit.

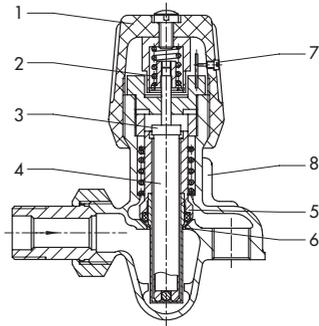
- For water up to max. 120 °C
- Set point range +10 to +70 °C



Type 3 D



Type 4 D



Type 4 E

- 1 Scaled cap for set point adjustment
- 2 Spring for excess temperature protection
- 3 Thermostat with bellows
- 4 Thermowell
- 5 Plug
- 6 Valve seat
- 7 Stop screw
- 8 Marking rib

Fig. 1: Functional diagrams

3 Installation



NOTICE!

Malfunction and damage due to adverse effects of weather (temperature, humidity).

Do not install the 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.

Flush the pipeline thoroughly before installing the regulator to ensure that any sealing parts, weld spatter and other impurities carried along by the process medium do not impair the proper functioning of the valve and tight shut-off.



Note:

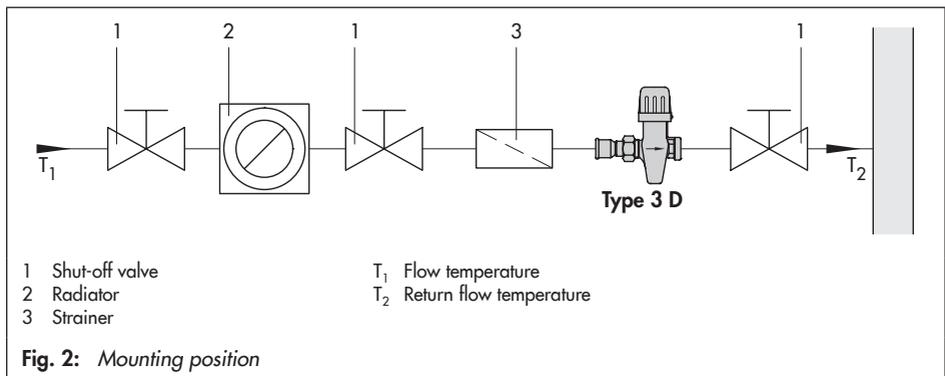
Do **not** insulate the valve body. Otherwise, the regulator cannot function properly.

Type 3 D

Globe valve G 1/2, G 3/4 and G 1

The Type 3 D Return Temperature Limiter is mainly installed in the return flow pipe of a heating network in apartments and houses supplied by a district heating distribution network. In small heating networks with just one limiter, the regulator is usually installed upstream of the district heating substation or upstream of the network return flow pipe. In large heating networks supplying several residential units each with their own limiter, it must be installed inside the residential unit upstream of the network return flow pipe.

The regulator can be mounted in any desired position. However, we recommend installing the regulator in horizontal pipelines with the black cap point upwards. The direction of flow must correspond to the arrow on the body.



Type 4 D and Type 4 E

Globe valve G $\frac{3}{8}$ and G $\frac{1}{2}$

Install the Type 4 D and Type 4 E Return Temperature Limiters at the outlet of a radiator. The direction of flow must correspond to the arrow on the body.

Type 4 E: Globe valve with downward facing outlet

3.1 Strainer

A strainer installed upstream in the flow pipe holds back any dirt or other foreign particles.

- The direction of flow must correspond to the arrow on the body.
- The filter element must be installed to hang downwards.



Tip:

Remember to leave enough space to remove the filter element.

3.2 Shut-off valve

Install a hand-operated shut-off valve both upstream of the strainer and downstream of the 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.

4 Start-up and operation

First start up the regulator after mounting all parts.

Fill the plant slowly with the process medium.



Note:

The pressure must not exceed the maximum permissible operating pressure on testing the pressure of the plant (refer to section 8 on page 13).

4.1 Set points

Table 1: Set point adjustments

Scaled cap Setting	Temperature set point	
	Type 4 D/E (10 to 60 °C)	Type 3 D (20 to 70 °C)
0	10 °C	20 °C
1	15 °C	25 °C
2	20 °C	30 °C
3	25 °C	35 °C
4	30 °C	40 °C
5	35 °C	45 °C
6	40 °C	50 °C
7	45 °C	55 °C
8	50 °C	60 °C
9	55 °C	65 °C
0	60 °C	70 °C

**Note:**

The specified temperatures apply to a differential pressure Δp of 1 bar. When the differential pressure is different, the specified temperatures may vary slightly as a result.

First adjust the scaled cap to midway between the top and bottom temperature settings. The rib (8) on the valve body serves as the marking. This initial setting can then be changed to achieve the required room temperature by turning the cap towards the '9' setting (warmer) or '0' setting (cooler). Once the right temperature has been set, the room temperature is kept to this setting.

Use the same setting again after the room temperature has been reduced, for example, at night or after it has been turned up again in the morning to heat up the room more quickly. This setting only needs to be corrected when the outdoor temperature fluctuates.

**Note:**

Do not use the regulator as a shut-off valve. Do not turn the cap as far as it will go. Otherwise, the regulator will not function properly.

4.2 Lead-sealing

See Fig. 1.

The set point setting can be lead-sealed. Drill a hole with approx. 1 mm diameter through the marking rib (8) on the valve body. Thread a sealing wire through this hole and through one of the holes in the stop screw (7) on the scaled cap (1) and lead-seal it.

On customer request, the limiters can also be delivered with the set point setting already limited to a certain range.

4.3 Decommissioning

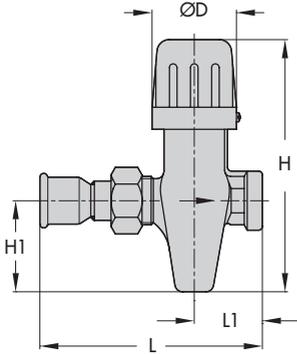
Close first the shut-off valve on the supply flow side and then on the return flow side.

5 Cleaning and maintenance

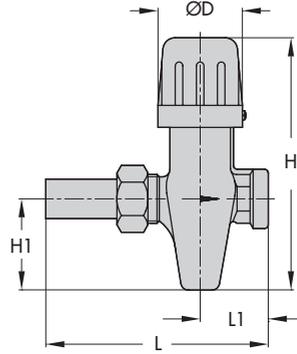
The regulators do not require any maintenance. Nevertheless, they are subject to natural wear, particularly at the seat and thermostat with plug.

Depending on the operating conditions, check the regulator at regular intervals to avoid possible malfunctions.

6 Dimensions

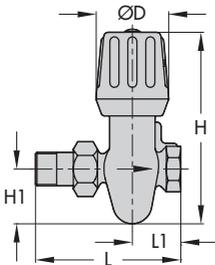


Type 3 D · With threaded connection

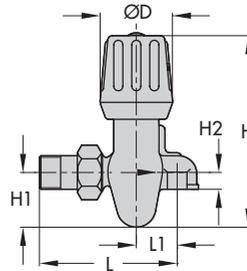


Type 3 D · With welding ends

Option for Type 3 D and Type 4 D: Threaded connections or welding ends on both sides



Type 4 D · With threaded connection



Type 4 D · With threaded connection

Fig. 3: Dimensional drawings

Table 2: *Dimensions and weights*

Type	3 D			4 D		4 E	
Thread size	G ½	G ¾	G 1	G ¾	G ½	G ¾	G ½
Threaded connection L	112 mm	144 mm	151 mm	98 mm	0.8	95 mm	
Welding end L	140 mm		150 mm	115 mm		110 mm	
L1	45 mm			33 mm		27 mm	
H	Max. 150 mm			Max. 127 mm			
H1	60 mm			35 mm			
H2	-			-		15 mm	
ØD	61 mm			48 mm			
Weight, approx.	1.3 kg	1.4 kg	1.5 kg	0.75 kg			

7 Customer inquiries

If malfunctions or defects occur, contact the SAMSON After-sales Service Department for support.

Please send your inquiries to: service@samson.de

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.

To assist diagnosis, specify the following details:

- Type and nominal size of the valve
- If known: model number with index and serial number
- Upstream and downstream pressure
- Medium temperature and process medium
- Min. and max. flow rate in m³/h
- Is a strainer installed?
- Installation drawing showing the exact location of the regulator and all the additionally installed components (shut-off valves, pressure gauge, etc.)

8 Technical data

Table 3: *Technical data · All pressures in bar (gauge)*

Type	3 D			4 D/4 E	
Thread size	G ½	G ¾	G 1	G ¾	G ½
K _{VS} coefficient	1.2	1.6	2	0.6	0.8
Max. permissible differential pressure	6 bar			4 bar	
Set point range ¹⁾	20 to 70 °C			10 to 60 °C	
Max. permissible temperature	120 °C				
Max. permissible operating pressure	25 bar			16 bar	

¹⁾ Option: Limited to a minimum or maximum temperature within the set point range · Adjusted to a temperature set point, possibly also lead-sealed



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 2080 EN

2014-08-01