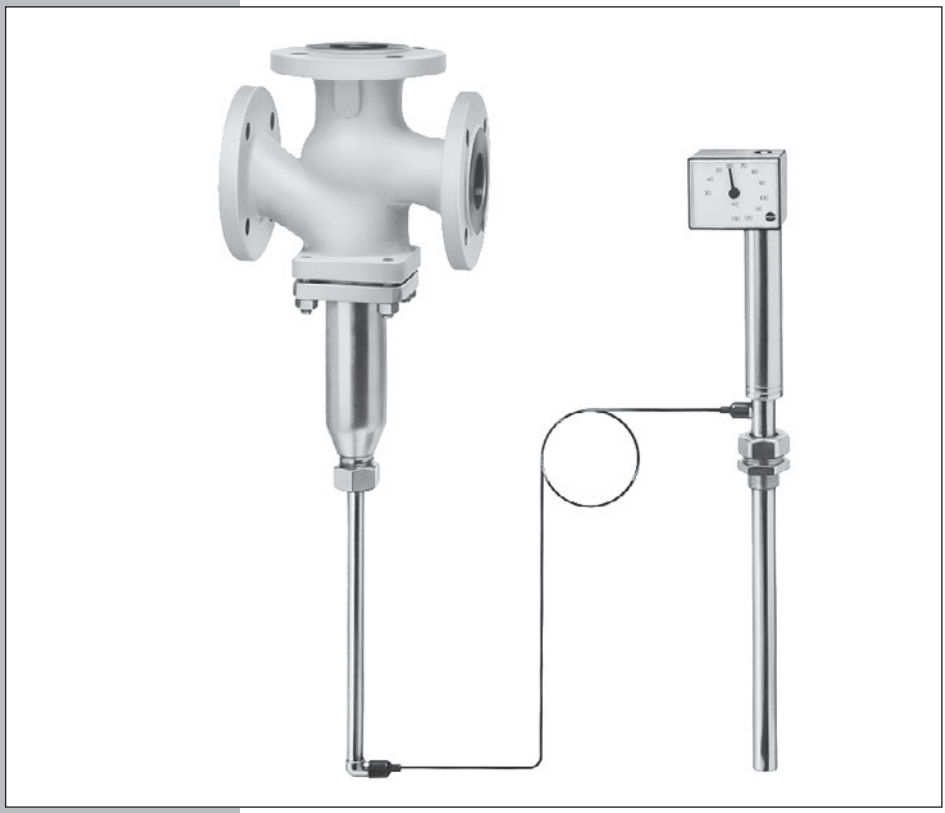
Self-operated Temperature Regulators

Type 9 Temperature Regulator



Mounting and Operating Instructions

EB 2133 EN

Edition March 2018

Testing according to DIN EN

The Types 2231 to 2235 Control Thermostats have been tested together with valves by the German Technical Inspectorate (TÜV) in accordance with DIN EN 14597. The register number is available on request.

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

- 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 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.

Note: Non-electric control valve versions whose bodies are not lined with an insulating material coating do not have their own potential ignition source according to the risk assessment stipulated in EN 13463-1: 2009, section 5.2, even in the rare incident of an operating fault. Therefore, such valve versions do not fall within the scope of Directive 2014/34/EU (ATEX). For connection to the equipotential bonding system, observe the requirements specified in section 6.3 of EN 60079-14: (VDE 0165 Part 1).

2 Process medium and scope of application

Temperature regulator with three-way valve for mixing and diverting service. For plants that are heated or cooled using liquids. With Type 2231 to Type 2235 Control Thermostats for set points from –10 to +250 °C. Valves in sizes DN 15 to 150. Nominal pressure PN 16 to 40. Suitable for temperatures up to 350 °C.

2.1 Transportation and storage

The temperature regulators must be carefully handled, transported and stored. Protect the regulator against adverse influences, such as dirt, moisture, frost or heat, during storage and transportation before being installed.

When temperature regulators are too heavy to be lifted by hand, fasten the lifting sling to a suitable place on the valve body.

WARNING!
Incorrectly attached lifting slings or rigging equipment will lead to injury or property damage due to valve falling.
Securely fasten slings and rigging equipment to the valve body and secure against slipping.

---

3 Design and principle of operation

See Fig. 2.

The temperature regulators consist of the valve (1), control thermostat with temperature sensor (16) and capillary tube (10).

The valve mainly consists of the body with two seats (2), plugs (3) and the plug stem (5). Depending on the application, different thermostats can be attached to the valve. The thermostat comprises the temperature sensor (16), set point adjuster (11), capillary tube (10) and operating element (8).
The temperature regulators operate according to the liquid expansion principle. The temperature sensor (16) is filled with an expansion liquid. The temperature-dependent change in volume of this liquid causes the double plug (3) to move over the capillary tube (10) and the operating element (8), which is connected to the valve by a coupling nut (7). For example, when the temperature at the sensor (16) rises, the liquid contained in the sensor expands and causes the pin of the operating element to move upwards. This movement is transmitted to the plug stem (5). As a result, the double plug (3) in the valve body is pushed upwards against the force of the return spring (5.1). The plug reduces the inflow at port B at the top seat (2) and increases the inflow at port A at the bottom seat (mixing valve). The Type 9 Temperature

Regulator in DN 32 and larger is balanced by a metal bellows (4.1). The pressure at port A is applied to the bottom side of the double plug and transmitted onto the inside of the metal bellows through the plug stem guide.
The pressure at port B is applied to the top of the double plug and transmitted to the outside of the metal bellows through the hollow plug stem (5). As a result, the forces acting on the valve plug are balanced out and the valve is fully balanced. Consequently, any pressure changes in the process medium do not affect the position of the valve plug.
When used as a mixing valve, port B closes when the temperature at the sensor rises. In diverting valves, port A closes when the temperature at the sensor rises.
The set point can be adjusted using a key (11). By turning the key, a spindle moves the piston (15) up or down. As a result, the valve plug travels according to the adjusted set point within a higher or lower temperature range measured by the sensor (16).

Legend for Fig. 2

Valve

1 Valve body
2 Seat
3 Plug
4 Bottom section
4.1 Balancing bellows
5 Plug stem
5.1 Spring
6 Threaded connection for operating element

Control thermostat

7 Coupling nut
8 Operating element
9 Pin of operating element
10 Capillary tube
11 Set point adjustment key
12 Set point dial
13 Coupling nut
14 Double nipple
15 Piston (inside)
16 Temperature sensor

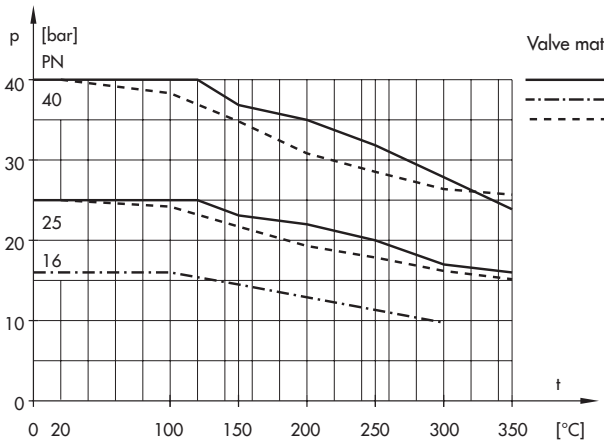


Fig. 1: *Pressure-temperature diagram (DIN)*

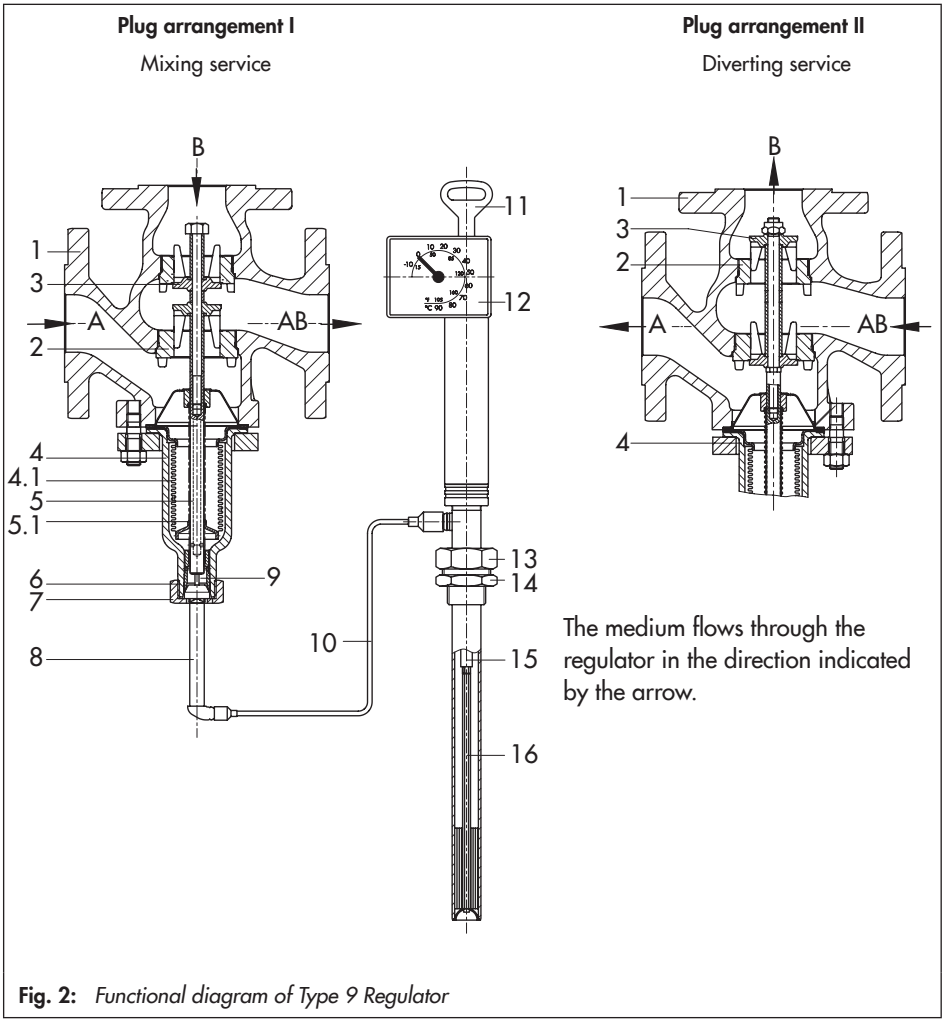


Fig. 2: *Functional diagram of Type 9 Regulator*

3.1 Excess temperature indication

If the temperature at the sensor exceeds 100 K, the inside piston (15) with the attached stem is pushed out of the housing of the set point dial (10).

If the stem does not move back after the temperature had dropped again, the operating element (8) has been damaged due to excessively high temperature. Send the thermostat back to SAMSON for repair.

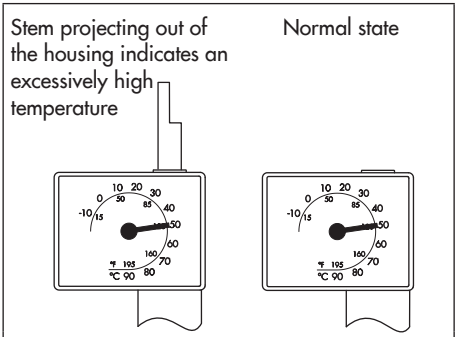


Fig. 3: *Excess temperature indication*

4 Installation

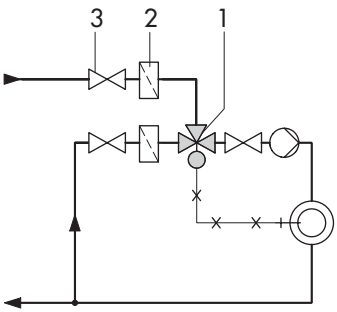
Installation instructions provided by the manufacturer of the plant must be observed.

If necessary, contact the manufacturer or supplier.

The following points must be observed during installation:

– First open the shut-off valves in the plant after the thermostat has been mounted on the valve.
– The temperature regulator is first sealed when the operating element is fastened onto the bottom section.

WARNING!
Risk of injury due to process medium escaping possibly under pressure. Screw the operating element of the thermostat tightly to the valve to seal the body connection. Afterwards, open the shut-off valves.



1 Temperature regulator (Type 9 as mixing valve)
2 Strainer
3 Shut-off valve

Fig. 4: *Installation example of Type 9 (plant schematics with heat exchanger)* · Sensor installation

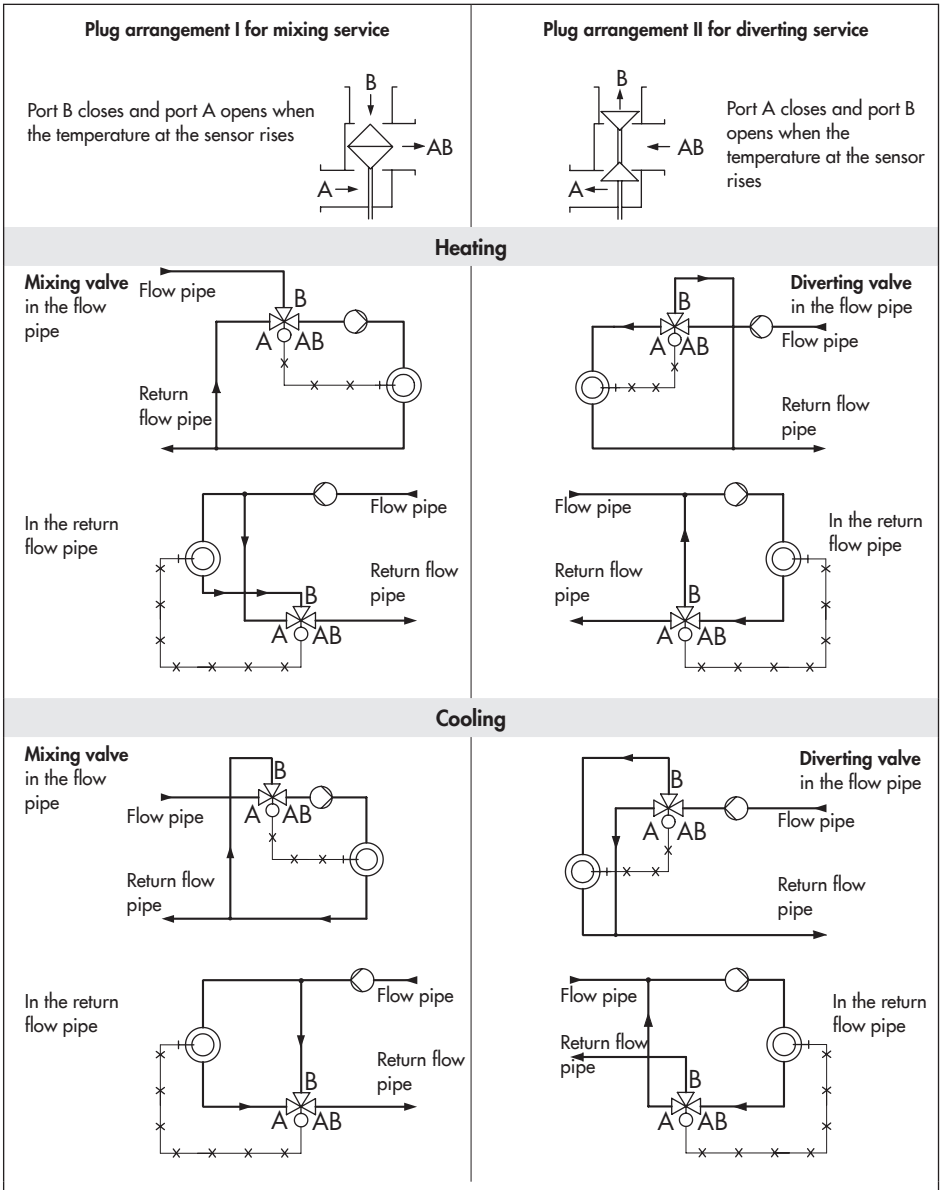


Fig. 5: *Application and arrangement of temperature regulators*

4.1 Installing the valve

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

Note:
*Do **not** install the temperature regulator between a pressure reducing valve and its control line connection.*

Flush the pipeline thoroughly before installing the temperature regulator. Install a strainer (see section 4.1.1) 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.
- When regulating steam, install upstream steam pipes with a slight upward slope and downstream steam pipes with a slight downward slope to prevent excessive amounts of condensed water from collecting.

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.

4.1.1 Strainer

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

4.1.2 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 set point, we recommend installing a thermometer near the sensor.

4.2 Thermostat installation

See Fig. 2.

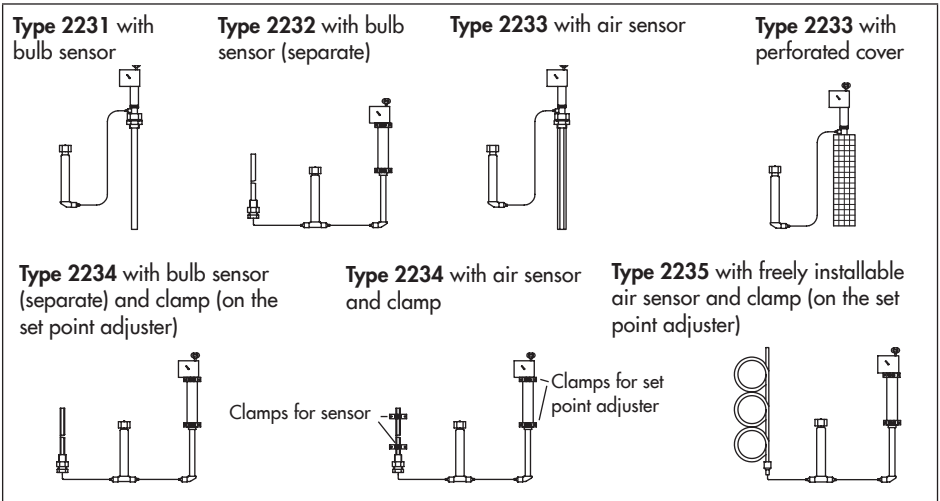


Fig. 6: *Thermostat versions*

Size specifications for SAMSON thermostats

Table 1: *Assignment of thermostat sizes and valves*

Size	**Thermostat** fitting ...	**Types 2111/2422/2119 Valves**
150	Types 2231, 2232, 2233, 2234, 2235	DN 15 to 150
	Type 2213 for STM	
	Type 2212 for STL	DN 65 to 150

4.2.1 Types 2231 and 2232 (bulb sensor)

Bulb sensors are used to measure the temperature of liquids. They are designed for installation in pipelines, heat exchangers, boilers, baths, tanks, etc.

Note:
The entire length of the sensor must be immersed in the process medium. Observe the permissible mounting position as illustrated in Fig. 7.

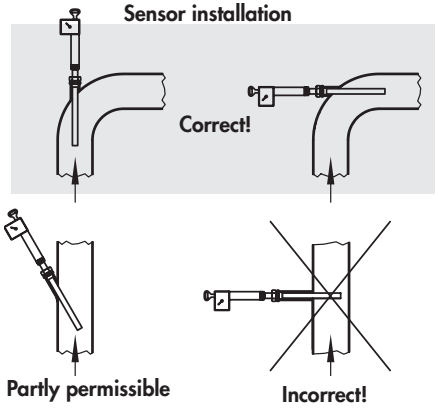


Fig. 7: *Sensor installation · Mounting positions*

Installation recommendations

Select the place of installation ensuring that the sensor is installed as close as possible to the heat source, but avoid exposing it to overheating.

When mounted in a boiler, install the sensor in the top third of the boiler.

When mounted in a counterflow heat exchanger, install the sensor in a pipe elbow, directly behind the pipe end socket piece.

In plants with only temporary heat consumption, install the temperature sensor so that it is totally immersed in the heat exchanger. If this is not possible, a circulating pipe must be provided to allow the sensor to always respond to temperature changes even when no medium is discharged from the heat exchanger.

1. Weld on a pipe socket with female thread (socket-weld design) of approx. 40 mm in length at the place of installation (this also applies when a thermowell is used).
2. Remove the double nipple (14) or thermowell (if used) from the sensor (16) and seal it into the welded socket.
3. Adjust the highest possible set point on the set point dial (12) using the key (11).
4. Insert the sensor with the associated seal into the double nipple or thermowell. Secure it with the coupling nut (7). The entire length of the temperature sensor (16) or thermowell must be immersed in the process medium.

Thermowell

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 expan-

sion 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).

4.2.2 Types 2233, 2234 and 2235 (air sensor)

Types 2233 and 2234 are designed for installation in air heaters, air ducts, drying cabinets, etc. Install the sensor from the outside into the room and secure it with a special flange (accessories). The entire length of the sensor must be immersed in the air flow to be regulated.

For Type 2234, install the set point adjustment in an easily accessible location.

Avoid locations with considerable ambient temperature fluctuations.

Type 2233 with perforated cover is generally used for installation in manufacturing facilities, living spaces, baths, etc.

Installation recommendations

Mount the sensor protected by a perforated cover to a suitable location on the middle of the wall.

Type 2234 with clamps (or perforated cover) is suitable for installation in drying chambers, dryers, air heaters, incubators, etc.

In case of forced air circulation, install the sensor near the supply air inlet.

Mount the set point adjustment outside the room to be controlled in an easily accessible location. The set point adjustment must be exposed to a constant as possible temperature.

Type 2235 is equipped with a temperature sensor to be calibrated on site in a room (for air) or in tanks (for liquids). This allows the measurement of almost all temperature layers. Make sure the set point adjustment for this sensor is installed outside the room or tank to be controlled in an easily accessible location. Avoid locations with considerable ambient temperature fluctuations.

When regulating the temperature in greenhouses, make sure that the thermostat and set point adjuster are not exposed to direct sunlight.

When the temperature regulating system is shut down during the summer, adjust a high set point to protect the thermostat.

4.2.3 Capillary tube

Carefully run the capillary tube (10) 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.

4.3 Operating element

Attach the operating element (8) to the valve body using the coupling nut (7). If necessary, use the key (11) to adjust the highest possible set point, causing the pin of the operating element (9) to retract.

4.4 Dynamic behavior of the thermostats

The dynamics of the regulator are mainly determined by the response of the sensor with its characteristic time constant. The response times of SAMSON sensors operating according to different principles measured in water are listed below.

Table 2: *Time constants of SAMSON thermostats*

Functional principle	Type ... Thermostat	Time constant [s]	
		Without Thermowell	With Thermowell
Liquid expansion	2231	70	120
	2232	65	110
	2233	25	–[1]
	2234	15	–[1]
	2235	10	–[1]
	2213	70	120
Adsorption	2212	–[1]	40

[1] Not permissible

5 Operation

See Fig. 2 on page 7.

5.1 Start-up

The temperature regulator is first sealed when the operating element is fastened onto the bottom section.

First open the shut-off valves in the plant after the thermostat has been mounted on the valve.

WARNING!
Risk of injury due to process medium escaping possibly under pressure. Screw the operating element of the thermostat tightly to the valve to seal the body connection! Afterwards, open the shut-off valves!

Fill the plant slowly with the process medium.

5.2 Set point adjustment

Only use the key (11) to adjust the required temperature set point at the set point dial (12).

1. Slowly open the hand-operated shut-off valve downstream of the valve and then the shut-off valve upstream of the valve.
2. Check the adjusted temperature set point at the thermometer installed near the temperature sensor.
3. Slowly turn the key clockwise (↻) to increase the temperature and counterclockwise (↺) to reduce it.

Tip:
Higher set point temperatures can be adjusted in increments as required. However, to lower the set point temperature, proceed in steps of 10 to 20 °C. When doing so, wait for the process medium to cool down before continuing. Watch the thermometer.

5.2.1 Correcting the set point dial

There are many ways to combine the temperature regulators with thermostats that have varying proportional control action. As a result, the temperature adjusted on the dial often deviates from the actual temperature (measured by a reference thermometer).

The temperature can be corrected by turning the dial housing:

1. Undo the screw labeled "Korrektur" on the back of the dial housing.
2. Turn the entire dial housing until the dial shows the same temperature as the reference thermometer.
3. Retighten the screw marked "Korrektur".

Viewed from the front with the dial housing on top. A 360° turn corresponds to a set point change of approx. 1.5 °C.

– Turn clockwise ↻:
  To increase the set point.
– Turn counterclockwise ↺:
  To reduce the set point.

6 Mounting additional parts

See Fig. 8 on page 17.

6.1 Extension piece

An extension piece is installed between valve and thermostat to protect the operating element of the thermostat against high temperatures.

An extension piece is required: from 220 °C to max. 350 °C (max. 300 °C when EN-GJL-250 is used).

A thermostat can be changed on site to install an extension piece, separating piece or double adapter.

Remember that process medium can escape while unscrewing the operating element. Therefore, take necessary precautions to prevent this.

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.

How to proceed:

1. Adjust the highest possible temperature set point, causing the pin of operating element to detach itself from the plug stem of the valve.
2. Unscrew the operating element.
3. Screw extension piece onto the valve body. Remount the operating element.
4. Adjust the set point as described in section 5.2 on page 15.

6.2 Separating piece

Mounted between the operating element and valve. In stainless steel regulators, it separates the operating element made free of non-ferrous metals from the medium in the valve. In addition,it prevents the medium from escaping on removing the thermostat.

Version **I**: The spindle (2) is fitted with O-rings which seals the operating element against the process medium.

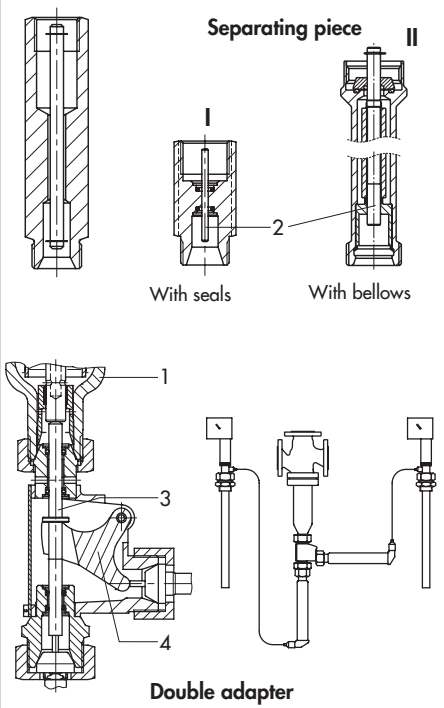
Version **II**: A metal bellows is used as a sealing element.

For mounting, proceed as described in section 6.1.

6.3 Double adapter

The double adapter allows a further thermostat to be connected to achieve additional temperature regulation.

For mounting, proceed as described in section 6.1.



1	Valve	5	Wooden bolt
2	Spindle	6	Washer
3	Stem	7	Coupling nut
4	Lever	8	Spring

Fig. 8: *Additional parts*

7 Maintenance – Replacing parts

See Fig. 2 on page 7.

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

Depending on the operating conditions, check the valve and thermostat at regular intervals to avoid possible malfunctions.

If the temperature exceeds the value adjusted at the temperature sensor, possible causes for this are:

– The thermostat is defective due to excessive temperatures.
– Valve seat and plug are contaminated with dirt.
– Seat and plug leak due to natural wear.

On replacing the thermostat, remember that process medium can escape while unscrewing the operating element. Therefore, take necessary precautions to prevent this.

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.

How to proceed:

Exchanging the thermostat and checking the seat and plug

1. If the thermostat still works, adjust the highest possible temperature set point, causing the pin (9) of operating element to detach itself from the plug stem of the valve.
2. Unscrew the coupling nut (7) and remove the operating element (8). Process medium still in the valve may escape.

– Mount new thermostat and fasten it tightly to the bottom section (4) using the coupling nut (7).

Checking the seat and plug

3. Unscrew the valve flange together with the bottom section (4) from the valve body and pull them out downward.
4. Clean the seat (2) and plug (4) and, if necessary, renew them.

7.1 Troubleshooting

The listed examples of malfunctions are caused by mechanical faults in the valve or thermostat as well as incorrect regulator sizing.

In the simplest case, the functioning can be restored following the recommended action. To repair the regulator, read the operating instructions for the corresponding regulator.

As in many cases, special tools are required, we advise you to contact SAMSON after-sales service to find out how to proceed to repair the regulator or replace a component.

Exceptional operating and installation conditions can lead to changed situations that may affect the control response and lead to malfunctions. In such cases, check the installation conditions, process medium, temperature and pressure conditions. A thorough analysis may often require the on-site assistance of SAMSON after-sales service.

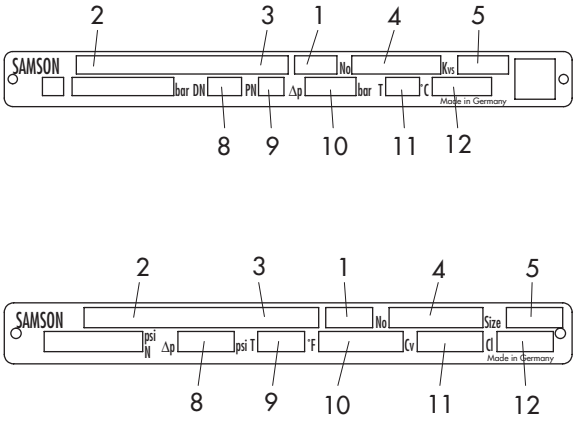
Table 3 is not intended to be exhaustive as there are diverse reasons for malfunctions.

Table 3: *Troubleshooting*

Possible reasons	Recommended action
Temperature regulators for heating applications	
Temperature at the sensor exceeds the set point.	
Leak at seat and plug	Remove valve from the pipeline and clean seat and plug. Renew plug, if necessary. If this is not possible, return regulator to SAMSON for repair.
Valve too large for control task	Recalculate K_{VS} coefficient. Contact SAMSON.
Sensor installed in the wrong location.	The entire length of the temperature sensor must be immersed in the process medium and where idle times cannot occur. Change mounting position accordingly.
The temperature at the sensor has exceeded the permissible excess temperature (100 K). The stem stands out of the housing of the set point dial and does move back into the housing after the temperature has dropped again.	The operating element has been damaged due to an excessively high temperature. Send back to SAMSON for repair. In mixing valves: port A opens In diverting valves: port B is closed.
Temperature at the sensor does not reach the set point.	
Nominal size (DN) of the valve is too small for the control task.	Recalculate K_{VS} coefficient. Contact SAMSON.
A safety device (e.g. STL, STM, etc.) has been triggered. Mixing valve: Port B closed Diverting valve: Port A closed	Check plant. Unlock safety device.
Insufficient heating energy available	Draw up an energy balance.
Strainer blocked	Drain and clean filter of the strainer.
Incorrectly installed valve	During installation, observe the correct direction of flow and arrangement of the ports A/B/AB (see Fig. 2 on page 7).
Control loop hunts.	
Nominal size (DN) of the valve is too large for the control task.	Recalculate K_{VS} coefficient. Contact SAMSON.
Time constant is too large for the control loop.	Fill the thermowell with thermal paste, remove thermowell or use sensor with smaller time constant.

Possible reasons	Recommended action
Temperature regulators for cooling applications	
Temperature at the sensor does not reach the set point.	
Leak at seat and plug	Remove valve from the pipeline and clean seat and plug. Renew plug, if necessary. If this is not possible, return regulator to SAMSON for repair.
Valve too large for control task	Recalculate K_{VS} coefficient. Contact SAMSON.
Sensor installed in the wrong location.	The entire length of the temperature sensor must be immersed in the process medium and where idle times or heat buildup cannot occur. Change mounting position accordingly.
A safety device (e.g. STL, STM, etc.) has been triggered. Mixing valve: Port B closed Diverting valve: Port A closed	Check plant. Unlock safety device.
Temperature at the sensor exceeds the set point.	
Nominal size (DN) of the valve is too small for the control task.	Recalculate K_{VS} coefficient. Contact SAMSON.
Thermostat defective	Mixing valve: port A closed · Diverting valve: port B is closed. Send the thermostat back to SAMSON for repair.
Insufficient cooling energy available	Draw up an energy balance.
Strainer blocked	Drain and clean filter of the strainer.
Incorrectly installed valve	During installation, observe the correct direction of flow and arrangement of the ports A/B/AB (see Fig. 2 on page 7).
Control loop hunts.	
Nominal size (DN) of the valve is too large for the control task.	Recalculate K_{VS} coefficient. Contact SAMSON.
Time constant is too large for the control loop.	Fill the thermowell with thermal paste, remove thermowell or use sensor with smaller time constant.

8 Nameplate



Valve

1 Valve type
2 Model number
3 Model number index
4 Order number/date
5 K_{VS} coefficient
8 Valve size
9 Nominal pressure
10 Perm. differential pressure Δp
11 Perm. temperature
12 Body material

ANSI version

5 Valve size
8 Perm. differential pressure Δp
9 Perm. temperature (°F)
10 Body material
11 C_V coefficient (K_{VS} x 1.17)
12 ANSI Class (pressure rating)

Fig. 9: *Nameplate*

9 After-sales service

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

Please send your inquiries to: kundendienst@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 (see Fig. 9):

– Type and nominal size of the valve, Type ... Thermostat
– Model number with index
– Upstream and downstream pressure
– Temperature and process medium
– Min. and max. flow rate
– Is a strainer installed?
– Installation drawing showing the exact location of the regulator and all the additionally installed components (shut-off valves, thermometer, etc.).

10 Dimensions and weights

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

Type 9 Temperature Regulator													
Valve size		DN	15	20	25	32	40	50	65	80	100	125	150
Length L	mm	**Type 2119 Valve**	130	150	160	180	200	230	290	310	350	400	480
H	mm		525			530		535	610		645	685	790
H1 [1]	mm		235			240		245	320		355	395	500
H2 [1]	mm		70	80	85	100	105	120	130	140	150	200	210
Weight [2], approx. kg			6	7	8.5	15	17	19	32	50	71	On request	

[1] Change in length when separating piece is used: +55 mm and when extension piece is used: +140 mm/180 mm
[2] For PN 16; with PN 25/40: +15 %

Thermostat	**Type**	**2231**	**2231/32** Size 250	**2232**	**2233**	**2234**	**2235**
Immersion depth T	mm	290	≈ 980	235	430	460	3460
Weight, approx.	kg	3.2	6.5	4	3.4	3.7	3.6

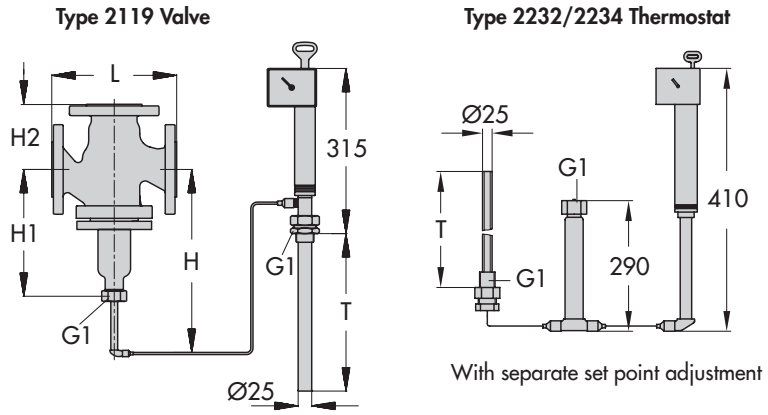
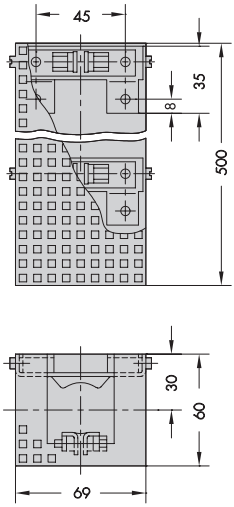


Fig. 10: *Dimension diagrams · All dimensions in mm*

10.1 Accessories

Types 2232/2233/2234/2235 · Clamps and perforated cover for wall mounting



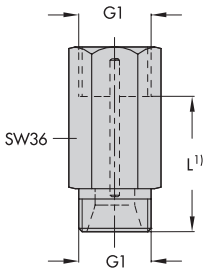
To mount the set point adjuster or sensor to a wall, suitable clamps (photo) are available.

The clamps for the sensor are integrated into the perforated cover.

Clamp with bracket

For set point adjuster (Ø40 mm)	Order no.:	8395-0039
For sensor (Ø25 mm)	Order no.:	8395-0037
1 pair of clamps for set point adjuster (Types 2232, 2234, 2235)	Order no.:	1400-5592

Extension piece/separating piece



Extension piece

Standard version

L = approx. 140 mm, approx. 0.5 kg

With bellows seal (special version)

L = approx. 180 mm, approx. 0.6 kg

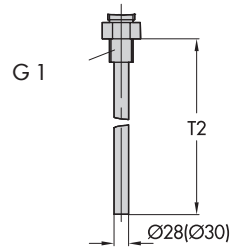
Separating piece with seals

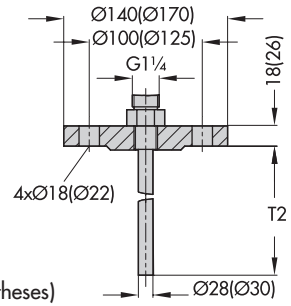
L = approx. 55 mm, approx. 0.2 kg

1) Add the dimension L to H and H1 (see Table 4) when these accessories are used.

Fig. 11: *Dimensions of accessories · Dimensions in mm*

Type 2231/2232 · Thermowells





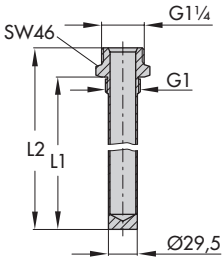
Thermostat	Type 2231	Type 2232
Immersion depth T2	325 mm	250 mm

Dimensions for PN 100 (in parentheses)

With threaded connection G 1 for PN 40 and PN 100

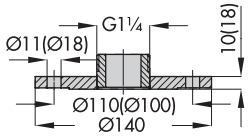
With **flanges** DN 32 for PN 40 · DN 40 for PN 100

Type 2231/2232 · Thermowells for flammable gases (G 1/PN 100)



Thermostat	Type 2231	Type 2232
Length L1	315 mm	255 mm
Length L2	340 mm	280 mm

Type 2233/Type 2234 · Flange



Flange PN 6, 140 Outside Ø · Flange PN 40/DN 32 (dimensions in parentheses)

Fig. 12: *Dimensions of accessories · Dimensions in mm*

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 2133 EN

2018-06-21 · English