

Self-operated Pressure Regulators



Pressure Reducing Valves Type 44-2 and Type 44-3 (SSV)



Fig. 1 · Type 44-3 Safety Shut-off Valve (SSV)

Mounting and Operating Instructions

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Note:

Non-electric actuators and control valves do not have their own potential ignition source according to the risk assessment stipulated in EN 13463-1: 2009, paragraph 5.2, even in the rare incident of an operating fault. Therefore, they **do not** fall within the scope of Directive 94/9/EC.

For connection to the equipotential bonding system, observe the requirements specified in EN 60079-14: 2009 (VDE 0165 Part 1), paragraph 6.3.



General safety instructions

- ▶ *The devices must be mounted, 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.*

All safety instructions and warnings in these instructions, particularly those concerning installation, start-up and maintenance, must be observed.
- ▶ *The regulators fulfill the requirements of the European Pressure Equipment Directive 97/23/EC. Valves with a CE marking have a declaration of conformity that includes information on the applied conformity assessment procedure.*

The declaration of conformity is 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 valve 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 influences.*

Any hazards which could be caused in the regulator by the process medium, operating pressure, or by moving parts are to be prevented by means of appropriate measures.
- ▶ *Proper shipping and appropriate storage are assumed.*

1 Design and principle of operation

These regulators are used especially in district heating systems and large heating systems to maintain the downstream pressure to an adjusted set point.

The Type 44-2 and Type 44-3 Regulators consist of a valve body with a balanced valve plug and an actuator with an operating diaphragm and a spring assembly.

The Type 44-3 Regulator is a safety shut-off valve and has a second operating diaphragm. Should the first diaphragm fail, the second diaphragm allows the regulator to continue functioning. The regulator closes the valve for safety purposes when the downstream pressure exceeds a given limit.

The medium flows through the valve body in the direction indicated by the arrow. It flows between the seat (2) and plug (3) and leaves the valve outlet at a reduced pressure.

The downstream pressure to be controlled is transmitted through the attached control line (11) to the operating diaphragm (6.1) where it is converted into a positioning force. This force is used to adjust the valve plug as a function of the force of the spring assembly.

Turning the set point adjuster (10) changes the spring force and, as a result, the set point as well.

The valve closes when the downstream pressure rises.

Typetesting

The pressure regulator is typetested as a safety shut-off valve (SSV) by TÜV (German Technical Inspectorate). Test marks are available on request.

- 1 Valve body
- 1.1 Connection nut with seal ring and welding end
- 2 Seat
- 3 Plug section
- 3.1 Guide nipple
- 3.2 Stopper
- 4 Plug stem
- 5 Plug spring
- 6 Actuator
- 6.1 Operating diaphragm
- 6.2 Second diaphragm
- 7 Actuator stem
- 8 Spring assembly
- 9 Spring plate
- 10 Set point adjuster
- 11 Control line
- 12 Body screws
- 13 Intermediate ring
- 13.1 Diaphragm rupture indicator
- 14 Diaphragm plate
- 15 Nut
- 16 Stem

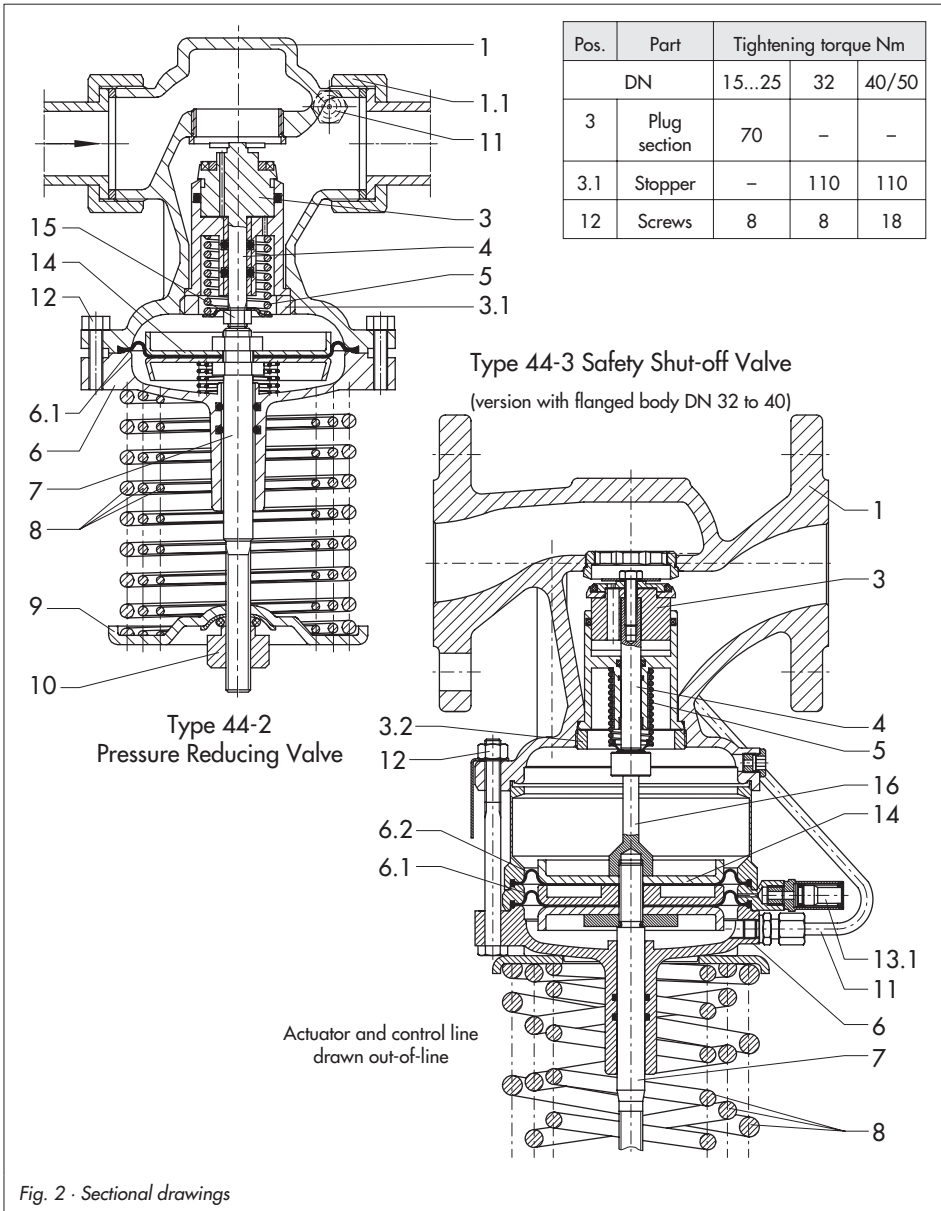


Fig. 2 · Sectional drawings

2 Installation

2.1 Mounting position

Always install the regulators in horizontal pipelines with the actuator and the spring assembly suspended downwards.

Make sure that the medium flows through the valve in the direction indicated by the arrow on the valve body.

2.2 Strainer

Since sealing parts, globules and other impurities carried along by the medium can impair the proper functioning of the valve and especially the tight shut-off, a strainer (SAMSON Type 1 NI) should be installed upstream of the pressure reducing valve.

Always install the strainer so that the medium's direction of flow matches the arrow on the body.

The filter element must hang downwards. Make sure that there is sufficient space available to remove the filter.

2.3 Additional installation instructions

We recommend installing hand-operated shut-off valves both upstream of the strainer and downstream of the regulator. This allows the plant to be shut down for cleaning or maintenance routines, or when the plant is not operated for extended periods.

Install pressure gauges both upstream and downstream of the regulator to allow the pressures prevailing in the plant to be observed.

3 Operation

3.1 Start-up

Allow the plant to fill up slowly on start-up. First open the shut-off valve downstream, then the one upstream of the pressure reducing valve.

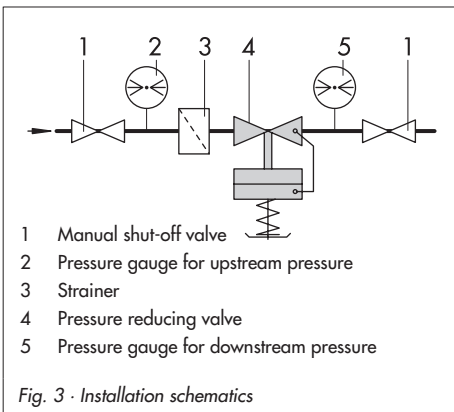
When pressure-testing the pipelines with the valve installed, make sure the diaphragm actuator is not damaged by the test pressure (max. permissible Δp).

If necessary, remove the control line at the valve and seal the open connection with a stopper (accessories: stopper 8323-0030 and seal 8412-0771).

3.2 Set point adjustment

Adjust the set point by tensioning the spring assembly (8), while monitoring the downstream pressure gauge:

- ▶ Turn set point adjuster (10) clockwise \odot to increase the downstream pressure
- ▶ Turn set point adjuster counterclockwise \ominus to reduce it.



3.3 Decommissioning

Close first the shut-off valve upstream of the valve, then the one downstream of the valve.

4 Maintenance

The valve is subject to natural wear. Depending on the operating conditions, it must be checked at regular intervals



NOTICE

Remove the valve from the pipeline when working on it. Make sure the relevant section of the plant has been depressurized and, depending on the medium, drained as well.

For high medium temperatures, allow the section of the plant to cool down to reach ambient temperature before starting.

Protect the regulator against frost when controlling freezing media.

If the downstream pressure drops considerably, the valve does not close tightly. This may happen when the tight shut-off is impaired by either dirt or natural wear on the seat and plug.

In the event that the actuator housing starts to leak or the downstream pressure drops considerably, check the operating diaphragm and replace it, if necessary.

Type 44-3 only (two diaphragms):

A borehole with a mechanical diaphragm rupture indicator (13.1) (with a point of response at approx. 1.5 bar) is located at the intermediate ring (13) of the safety shut-off valve.

In the event that the bottom diaphragm (6.1) becomes defective, the pressure in the space between the diaphragms rises to the downstream pressure which is indicated by a **red marking** that becomes visible at the diaphragm rupture indicator.

Using a pressure switch, a visual or acoustical signal can be triggered to indicate a diaphragm rupture.

When a rupture is indicated, the operating diaphragm (6.1) must be replaced.

4.1 Cleaning and replacing the plug

1. Remove the regulator from the pipeline. Unscrew control line (11) and remove spring assembly (8) with a suitable tool, e.g. SAMSON's spring removing clamp (order no. 1280-3098).



NOTICE

The spring assembly (8) is pretensioned by up to 180 mm with forces up to 4000 N.

2. Unscrew body screws (12) and remove actuator.

For sizes DN 15 to 25, unscrew and pull out the guide nipple (3.1) of the plug sec-

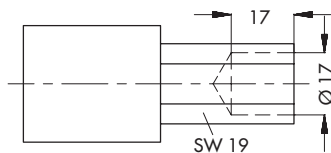


Fig. 4 - Socket wrench

tion using a socket wrench (order no. 1280-3001).

This wrench can also be made, for example, from a GEDORE screwdriver bit (IN 19-19) by drilling a 17 mm hole (\varnothing 17) into the 19 mm hexagon bit as illustrated in Fig. 4.

For sizes DN 32 to 50, unscrew stopper (3.2) and then pull out plug section (3).

3. Thoroughly clean the seat and plug section. Remove any dirt or blockages from the control line (11).

If the plug is damaged, replace the entire plug section with a new one.

4. Check the seat ring (2) for damage and, if necessary, unscrew it and replace it with a new one.
5. For reassembly, proceed in reverse order, observing the tightening torques specified in the table in Fig. 2.

4.2 Replacing the diaphragm

1. Remove valve from the pipeline.
2. Unscrew control line (11) and remove spring assembly (8) with a suitable tool, e.g. SAMSON's spring removing clamp (order no. 1280-3098).

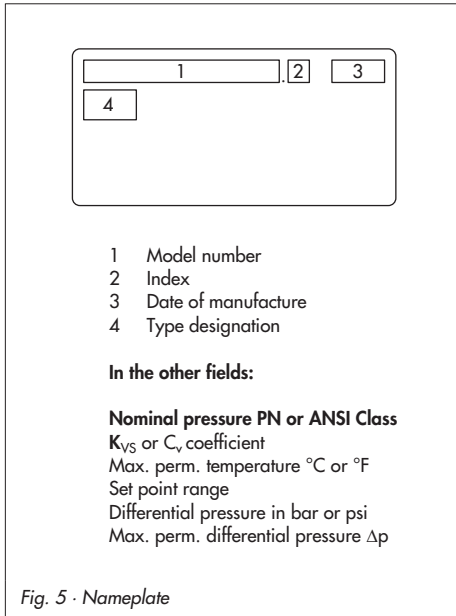


NOTICE

The spring assembly (8) is pretensioned by up to 180 mm with forces up to 4000 N.

3. Unscrew body screws (12) and remove actuator.
4. Unscrew nut (15) from the actuator stem and remove diaphragm plate (14).
For Type 44-3: Unscrew stem (16), lift off diaphragm plate (14) together with intermediate ring (13).
5. Replace diaphragm(s).
6. For reassembly, proceed in reverse order, observing the tightening torques specified in the table in Fig. 2.

5 Description of nameplate



6 Customer inquiries

Should any malfunctions or any defect occur, SAMSON's After-Sales Service is prepared to help you on site.

You can also send the defective regulator directly to 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.

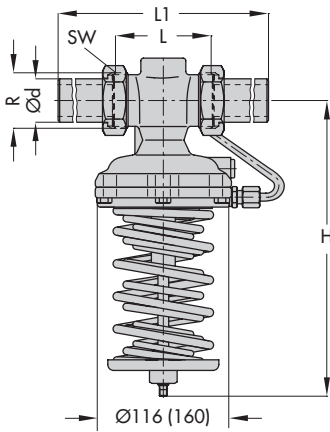
To allow SAMSON to find the fault and to have an idea of the installation situation, specify the following details (refer to the nameplate):

- ▶ Type and nominal size
- ▶ Order and model numbers
- ▶ Upstream and downstream pressures
- ▶ Temperature and process medium
- ▶ Min. and max. flow rates
- ▶ Has a strainer been installed?
- ▶ Installation drawing

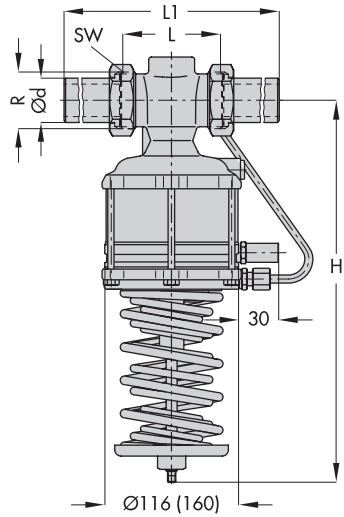
7 Dimensions and weights

Nominal size	DN	15	20	25	32	40	50
Pipe Ø d		21.3	26.8	33.7	42	48	60
Connection R		G ¾	G 1	G 1 ¼	G 1 ¾	G 2	G 2 ½
Width across flats SW		30	36	46	59	65	82
Length L		65	70	75	100	110	130
L1 with welding ends		210	234	244	268	294	330
Height H	Type 44-2	230			250	380	
	Type 44-3	285 ¹⁾			443		
Weight, approx. kg		2.0	2.1	2.2	8.5	9.0	9.5
With flanged body (DN 32/40/50)							
Length L3		-			180	200	230
Weight, approx. kg					11.7	13	14.5
Special version with threaded ends (male thread)							
Length L2		129	144	159	180	196	228
Male thread A		G ½	G ¾	G 1	G 1 ¼	G 1 ½	G 2
Weight, approx. kg		2.0	2.1	2.2	8.5	9.0	9.5

¹⁾ Set point range 6 to 10.5 bar: 310 mm



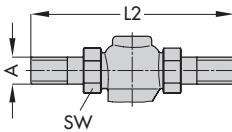
Type 44-2



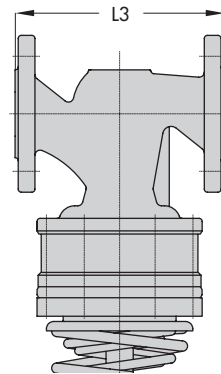
Type 44-3 (SSV)

Versions with connection nuts with welding ends
(values in parentheses for DN 32/40/50)

Special version



Version with connection nuts with threaded ends



Type 44-3 · Version with flanged body
DN 32 to 50

Fig. 6 · Dimensional drawings



SAMSON AG · MESS- UND REGELTECHNIK
Weismüllerstraße 3 · 60314 Frankfurt am Main · Germany
Phone +49 69 4009-0 · Fax +49 69 4009-1507
Internet: <http://www.samson.de>

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