Self-operated Pressure Regulators

Pressure Reducing Valves
Type 50 ES
Type 50 EM

Type 50 ES

Type 50 EM

Fig. 1 · Pressure reducing valves

Mounting and Operating Instructions

EB 2555 EN

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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.*
  All safety instructions and warnings in these instructions, particularly those concerning installation, start-up and maintenance, must be observed.
- *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.*

Definition of the signal words used in these mounting and operating instructions

NOTICE
Indicates a property damage warning.

Note:
Indicates supplementary explanations, information and hints.

1 Design and principle of operation

The pressure reducing valves consist of a valve with seat and soft-seated plug and a valve bonnet with an operating diaphragm, positioning spring(s) and a set point adjuster.

Type 50 EM has a pressure gauge connection instead of a stopper (Type 50 ES). The connected pressure gauge indicate the downstream pressure p_2.

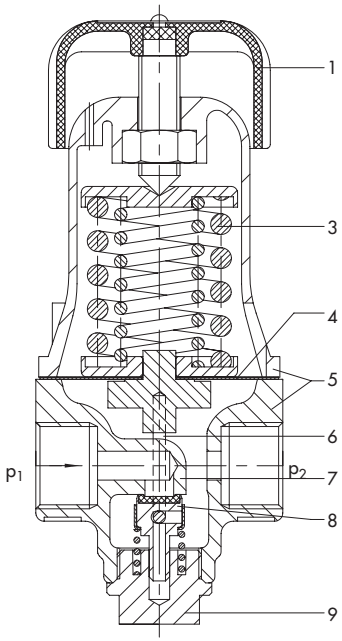
The pressure reducing valve is designed to maintain the pressure downstream of the valve to an adjusted set point.

The valve is open when it is depressurized. The valve closes when the pressure downstream of the valve rises above the adjusted set point.

The process medium flows through the valve between the seat (7) and the plug (8) in the direction indicated by the arrow. The position of the valve plug determines the flow rate and, hence, the pressure ratio across the valve.

The downstream pressure p_2 is transmitted to the operating diaphragm (4) and converted into a positioning force. This force is used to move the valve plug over the plug connection link (6) depending on the force of the positioning spring(s) (3).

The spring force can be adjusted at the set point adjuster (1).



1	Set point adjuster
3	Spring(s)
4	Operating diaphragm
5	Body
6	Plug connection link
7	Seat
8	Soft-seated plug
9	Stopper or connection for pressure gauge
p_1	Upstream pressure
p_2	Downstream pressure

Fig. 2 · Sectional drawing of Type 50 ES

2 Installation

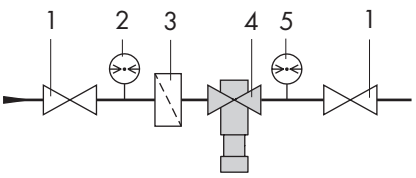
2.1 Mounting position

The pressure reducing valve can be installed in any desired position.

- The medium must flow through the valve in the direction indicated by the arrow on the valve body.

NOTICE
Protect the regulator against frost when the process medium (e.g. water) can freeze. Remove the valve from the pipeline while the plant is shut down.

Note: *Thoroughly flush the pipeline prior to installation of the valve! Otherwise sealing particles, globules and other impurities carried along by the process medium could impair the proper functioning of the valve, especially the tight shut-off.*



1 Shut-off valve
2 Pressure gauge for upstream pressure
3 Strainer
4 Type 50 ES Pressure Reducing Valve
5 Pressure gauge for downstream pressure

Fig. 3 · Typical installation

2.2 Strainer

Install a strainer (SAMSON Type 1 NI with a mesh size of 0.25 mm) upstream of the pressure reducing valve.

- Make sure the process medium flow corresponds with the direction indicated by the arrow on the strainer.
- In horizontal pipelines, install the strainer with the filter element suspended downwards.
- In upright pipelines where the medium flows upwards, install the strainer with the drain flange of the filter element facing upwards. In this case, the dirt particles are only retained, but not collected.

Ensure that enough clearance is provided to remove the filter.

2.3 Shut-off valve and pressure gauge

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

Install pressure gauges both upstream and downstream of the pressure reducing valve in order to monitor the pressures prevailing in the plant.

Type 50 EM has a mounted pressure gauge to indicate the downstream pressure p_2.

3 Operation

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

NOTICE
The pressure at the regulator must not exceed the maximum permissible operating pressure for the regulator.

3.1 Set point adjustment

Adjust the downstream pressure required by turning the set point adjuster (1).

- Turn the set point adjuster clockwise (↻) to increase the downstream pressure
- Turn the set point adjuster counterclockwise (↺) to reduce the downstream pressure

The pressure gauge mounted on the Type 50 EM Pressure Reducing Valve allows the adjusted set point to be monitored directly at the pressure gauge.

4 Maintenance

NOTICE
Remove the valve from the pipeline prior to performing any work.
Make sure the relevant section of the plant has been depressurized and, depending on the medium, drained as well.

The pressure reducing valve is maintenance-free, but is subject to wear and tear, especially at the seat and plug.

Depending on the application conditions that prevail, the valve must be inspected at appropriately scheduled intervals to prevent any problems before they occur.

If the valve does not shut off properly, this may be due to dirt between the seat and plug preventing tight shut-off or due to wear.

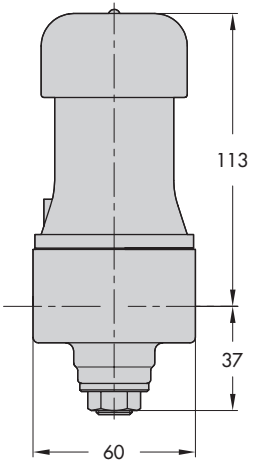
If external leakage occurs, check the operating diaphragm for leaks and replace the regulator, if necessary.

Prior to performing any cleaning routine, remove the pressure reducing valve from the pipeline.

Proceed

1. Tension the spring(s) by turning the set point adjuster (1) clockwise (↻) to lift the plug out of the seat.
2. Rinse the valve from both sides with water to remove any dirt from the seat and plug.
3. Release the spring tension by turning the set point adjuster counterclockwise (↺) and reinstall the valve in the pipeline.

5 Dimensions



Type 50 EM and Type 50 ES		
Connection	G 3/8	G ½
Weight, approx.	0.7 kg	

All dimensions in mm

Fig. 4 · Dimensional drawing

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 of the valve
- Model number with index
- Upstream and downstream pressures
- Temperature and process medium
- Min. and max. flow rates
- Has a strainer been installed?
- Installation drawing with exact location of the regulator and all additionally installed components (shut-off valves, pressure gauges etc.).

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