

Series 250
Pneumatic Control Valves
Type 3259-1 and Type 3259-7



Fig. 1 · Type 3259-7 Control Valve according to the IG standard

Mounting and Operating Instructions

EB 8059 EN

Edition May 2006



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General safety instructions



- ▶ *The control valve may only be mounted, started up or serviced by fully trained and qualified personnel, 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 control valve fulfills 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 can be viewed and downloaded on the Internet at <http://www.samson.de>.*
- ▶ *For appropriate operation, make sure that the control valve is only used in areas where the operating pressure and temperatures do not exceed the operating values based on the valve sizing data submitted in the order. The manufacturer does not assume any responsibility for damage caused by external forces or any other external influence!
Any hazards which could be caused in the control valve by the process medium, operating pressure, signal pressure or by moving parts are to be prevented by means of the appropriate measures.*
- ▶ *Proper shipping and appropriate storage are assumed.*

Caution!

- ▶ *For installation and maintenance work on the valve, make sure the relevant section of the pipeline is depressurized and, depending on the process medium used, drained as well. If necessary, allow the control valve to cool down or warm up to reach ambient temperature prior to starting any work on the valve.*
- ▶ *When working on the valve, make sure that the supply lines for the air supply as well as the control signal are disconnected to prevent any hazards that could be caused by moving parts.*

1. Design and principle of operation

The Type 3259-1 and Type 3259-7 Control Valves consist of the single-seated Type 3259 Angle Valve and either the Type 3271 or Type 3277 Pneumatic Actuator.

The process medium flows through the valve in the direction indicated by the arrow. The position of the plug (3) is changed by the signal pressure acting on the diaphragm in the actuator (8).

The plug stem (6) and plug are connected to the actuator stem (8.1) by the stem connector (7). The plug stem is sealed by spring-loaded PTFE V-ring packing (4.2) or by an adjustable high-temperature packing. The control valve can be equipped with an extension bonnet with metal bellows which functions as an additional seal to comply with stringent regulations.

Fail-safe action:

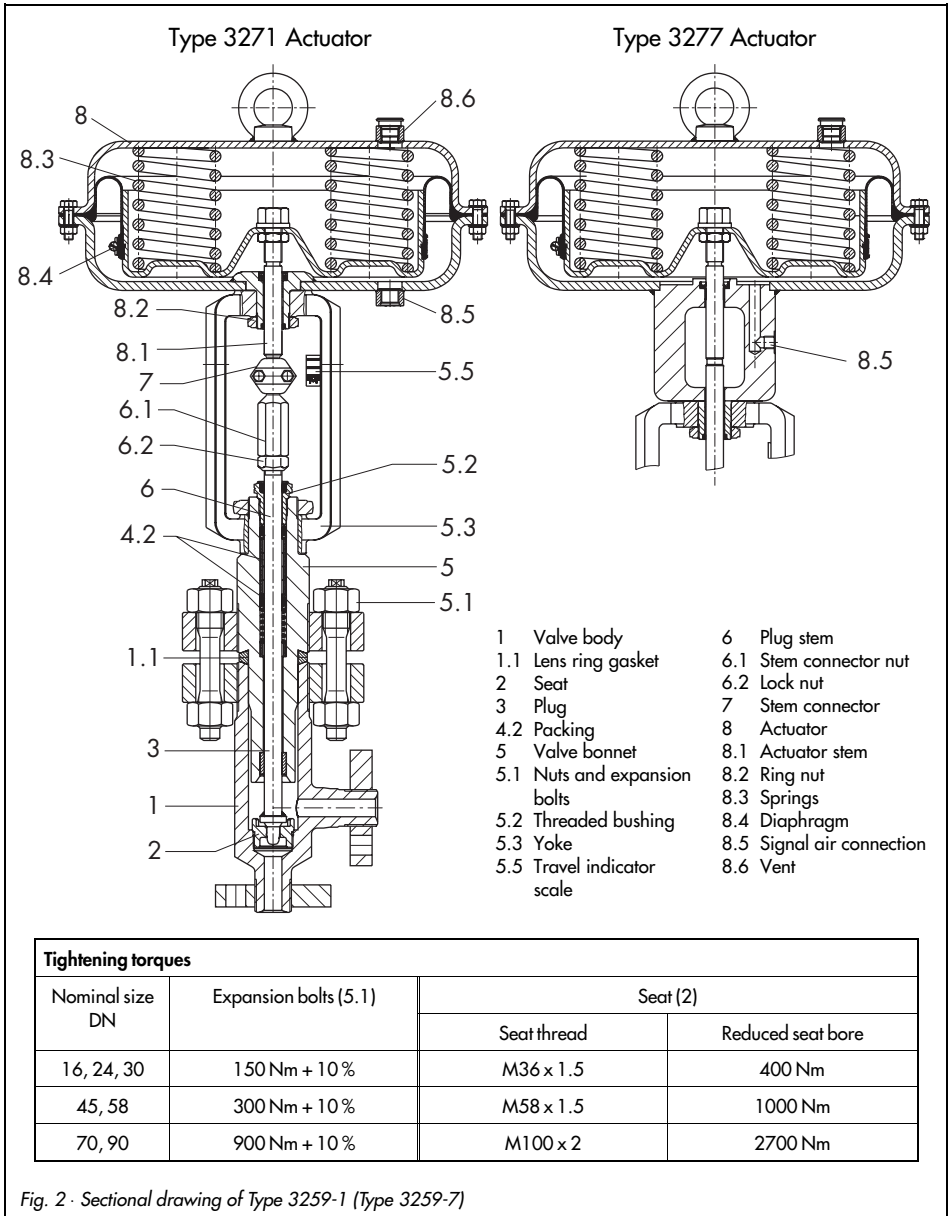
Depending on the arrangement of the compression springs (8.3) in the actuator, the control valve provides two different types of fail-safe action:

Actuator stem extends:

When the signal pressure is reduced or the air supply fails, the springs force the actuator stem to move downward and close the valve. When the signal pressure rises, the valve opens while acting against the force of the springs.

Actuator stem retracts:

When the signal pressure is reduced or the air supply fails, the springs force the actuator stem to move upward and open the valve. When the signal pressure rises, the valve closes while acting against the force of the springs.



2. Assembling valve and actuator

If the valve and the actuator were not assembled by the manufacturer or if the original actuator attached to the valve is to be exchanged for an actuator of another type or size, proceed as follows:

1. Loosen the lock nut (6.2) and the stem connector nut (6.1) on the valve. Press the plug and plug stem firmly into the seat ring, then thread the stem connector nut and the lock nut down
2. Unscrew the connector stem parts (7) and the ring nut (8.2) from the actuator. Slide the ring nut over the plug stem of the valve.
3. Place the actuator on the yoke (5.3) and secure with the ring nut (8.2). Read the bench range and fail-safe action of the actuator stated on the nameplate.

The fail-safe action "actuator stem extends" or "actuator stem retracts" is marked with the letters "FA" or "FE" respectively on the Type 3271 Actuator, and with a symbol on the Type 3277 Actuator.

The lower bench range value corresponds to the initial value of the bench range to be set and the upper bench range value corresponds to the final value of the bench range.

4. For actuators with **actuator stem extends**, apply a signal pressure that corresponds to the lower bench range value (e.g. 0.8 when the range is between 0.8 to 2.4 bar) to the lower diaphragm chamber connection. For actuators with **actuator stem retracts**, apply a signal pressure that corresponds to the upper bench range value (e.g. 2 bar when the range is be-

tween 0.4 to 2 bar) to the upper diaphragm chamber connection.

5. Turn the stem connector nut (6.1) by hand until it contacts the actuator stem (8.1). Turn it another 1/4 turn and secure this position with the lock nut (6.2).
6. Attach the stem connector parts (7) and screw tight. Align the travel indicator scale (5.5) with the tip of the stem connector.

Note on disassembly:

When disassembling an actuator, first apply a loading pressure slightly higher than the lower bench range value (see nameplate on actuator) to the signal pressure connection before unscrewing the ring nut (8).

3. Installation

3.1 Mounting position

The valve and actuator can be mounted in any position, however, large valves should preferably be installed in horizontal pipelines with the actuator pointing upwards to help make any maintenance work easier.

For valves with insulating section or bellows seal or with for actuators that weigh more than 50 kg, the actuator must be fitted with a suitable support or suspended.

Note!

The valve must be installed free of stress and with the least amount of vibrations possible.

Thoroughly flush the pipeline before installing the valve.

3.2 Signal pressure line

For valves with fail-safe action "actuator stem extends", connect the signal pressure line to the lower diaphragm case, and for valves with fail-safe action "actuator stem retracts", connect it to the upper diaphragm case.

The Type 3277 Actuator's connection for the lower diaphragm case is located on the side of the yoke underneath the lower case.

3.3 Shut-off valves and bypass

We recommend that you install hand-operated shut-off valves both upstream and downstream of the control valve as well as to make a bypass so that it is not necessary to shut down the plant for maintenance routines.

3.4 Test connection

Versions with metal bellows (Fig. 4) include a test connection (11.1) located on the upper flange for checking any leakage from the bellows.

Especially for liquids and vapors, we recommend connecting a suitable leakage indicator (e.g. contact pressure gauge, outlet into an open receptacle or sight-glass) at the test connection.

4. Operation

(e.g. reversing the operating direction)
Please refer to the Mounting and operating instructions EB 8310 EN for Type 3271 Pneumatic Actuator and EB 8311 EN for Type 3277 Actuator.

5. Troubleshooting – replacing parts

The control valve is subject to natural wear especially at the seat, plug and packing. Depending of the application conditions that prevail, the valve must be inspected at appropriately scheduled intervals to prevent any problems before they occur.

If any leaks occur to the atmosphere, the packing may be leaking. If the valve does not seal properly, this may be because tight shut-off is prevented by dirt or other impurities between the seat and plug or because the seating surfaces have been damaged.

We recommend removing the parts, thoroughly cleaning them and, replacing them with new parts, if necessary.



Important!

If you intend carrying out maintenance work on the valve, first relieve the corresponding plant section of pressure and, depending on the process medium, drain it as well. Let the plant section cool down to reach ambient temperature, if necessary.

As the process medium cannot drain completely out of the valve, be aware that the some of the process medium could still be in the valve. This applies particularly to valves with a bellows seal or an insulating section.

Prior to performing any work on the valve body, disconnect the signal pressure, remove the signal pressure line and dismantle the actuator.

We recommend removing the valve from the pipeline.

Note:

The tightening torques required for assembling the valve are listed in the table on page 5. The appropriate seat wrenches can be found in EB 029 EN (formerly WA 029 EN). Also available at http://www.samson.de/pdf_en/e00290en.pdf

Disassembling the actuator:

1. Unscrew the ring nut (8.2) and remove the stem connector (7) .
Before proceeding with actuators with "actuator stem extends" and especially for actuators with pre-tensioned springs, apply a signal pressure that is slightly higher than the lower bench range (see nameplate) to the actuator. After unscrewing the ring nut, disconnect the loading pressure again.
2. Lift the actuator off the valve yoke.

5.1 Replacing parts of standard valves

5.1.1 Packing

If the stuffing box leaks, its packing (4.2) and sealing parts (4.5 and 4.6) must be replaced as described below:

Disassembly

1. Remove nuts (5.1) and bolts and lift the valve bonnet (5) together with plug stem and plug out of the valve body (1.1).
2. Unscrew the stem connector nut and lock nut (6.1 and 6.2) from the plug

stem.

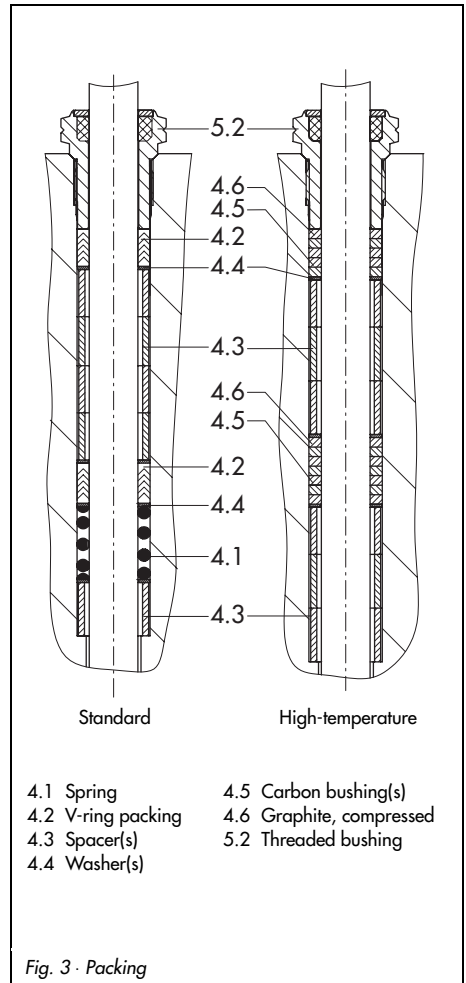
Unthread the threaded nut (5.2) from the stuffing box.

3. Pull the plug and plug stem out of the valve bonnet (5).
4. Take all the stuffing box parts out of the packing chamber using a suitable tool. Replace damaged parts. Thoroughly clean the packing chamber.

Assembly

1. Apply lubricant (order no. 8150-0111) to all parts as well as to the plug stem (6). Do not apply lubricant to graphite packing!
2. Push the plug stem into the valve bonnet (5).
3. Carefully slide the packing parts over the plug stem into the packing chamber. Make sure you keep the correct order. Depending on the nominal size of the valve, the number of bushings (4.3) may vary.
4. Screw threaded bushing (5.2) over the plug stem into the valve bonnet. Do not tighten.
5. Insert a new lens ring gasket (1.1) into the valve body and carefully push the whole valve bonnet into the valve body.
6. Attach expansion bolts with nuts (5.1) and fasten the valve bonnet in the valve body. (See table on page 5 for tightening torques used for expansion bolts).
7. Screw tight the threaded bushing (5.2). With high-temperature packings, only slightly tighten the threaded bushing. In case of leakage, also only tighten slightly.

8. Screw the lock nut (6.2) and stem connector nut (6.1) onto the plug stem with-out tightening them.
9. Attach the actuator as described in section 2 and adjust the lower and upper bench range according to section 2.



5.1.2 Seat and/or plug

When replacing the seat or plug, we recommend to replace the packing (4.2 or 4.5 and 4.6) as well.

Seat:

1. Remove nuts (5.1) and bolts. Pull the valve bonnet (5) together with plug stem and plug out of the valve body.
2. Unscrew the seat (2) using the appropriate seat wrench (see sheet WA 029).
3. Apply lubricant (order no. 8150-0119) to the thread and sealing cone of the new seat (or the old one after it has been cleaned or reworked) and screw it in.
The tightening torques for the seats are listed in the table on page 5.

Plug:

1. Remove nuts (5.1) and bolts. Lift the valve bonnet (5) together with the plug stem (6) and plug out of the valve body (1).
2. Unscrew nuts (6.1, 6.2) and threaded bushing (5.2).
3. Pull the plug out of the valve bonnet.
4. Replace the used plug with a new plug (3) and plug stem (6).
Apply lubricant (order no. 8150-0119) to the plug stem (6) and insert it.
5. Reassemble as described in section 5.1.1.

5.2 Replacing parts in valve with bellows seal



Caution!

On disassembling and assembling the bellows seal, no torque should be transferred to the metal bellows.

5.2.1 Packing

Replace parts as described for standard valves in chapter 5.1.1. However, remove nuts (11.2) and bolts. Then separate the bonnet (11) and intermediate piece (9). Replace gaskets (9.1) with new ones. Separating the bonnet and the intermediate piece is only necessary when the packing needs to be replaced.

5.2.2 Metal bellows

The metal bellows (10) can only be replaced as a whole bellows seal together with the plug stem. To do this, proceed as described in section 5.1.2.

5.3 Replacing parts in valve with insulating section

Replace packing as described in section 5.1.1.

Replace the seat and plug as described for standard valves in section 5.1.2.

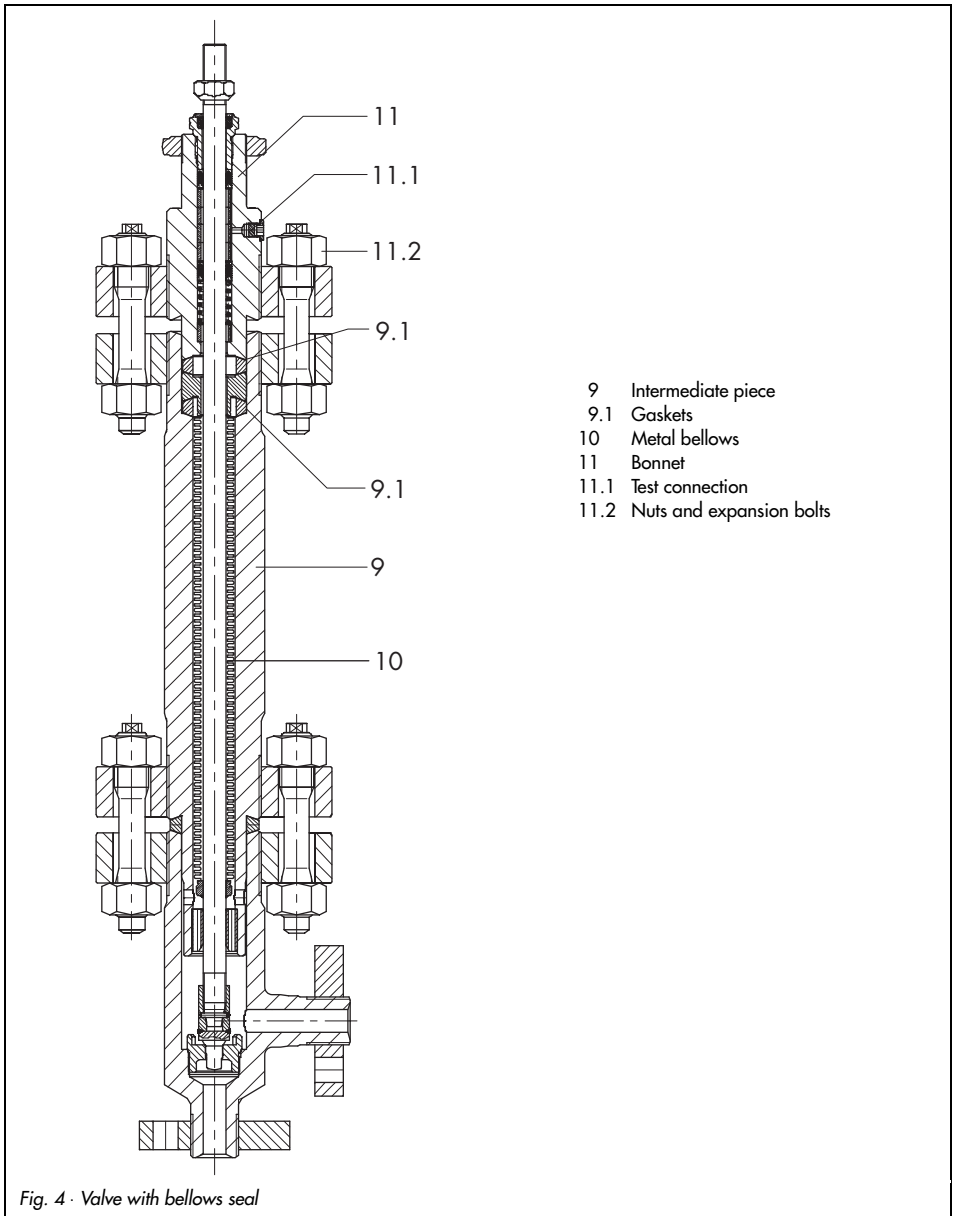
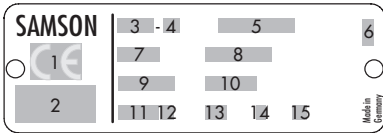


Fig. 4 · Valve with bellows seal

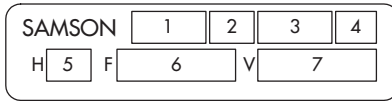
6. Description of nameplates

Type 3259 Valve

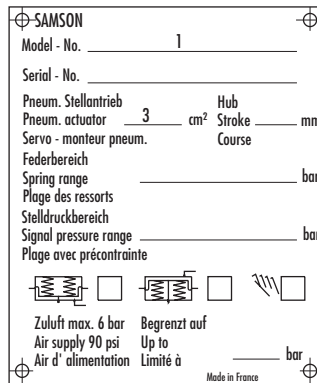


- 1 CE marking or Art. 3, Abs. 3 (see article 3, § 3 of PED), where applicable
- 2 Ident. number of notified body, fluid group and category, where applicable
- 3 Type designation
- 4 Modification index of the valve
- 5 Material
- 6 Year of manufacture
- 7 Nominal size: DIN: DN, ANSI: Size
- 8 Permissible excess operating pressure at room temperature: DIN: PN, ANSI: CL
- 9 Order number with modification index
- 10 Item position in the order
- 11 Flow coefficient:
DIN: K_{vs} value, ANSI: C_v value
- 12 Characteristic:
% equal percentage, **Lin** linear,
DIN: **A/Z** quick opening, ANSI: **O/C**
- 13 Sealing:
ME metal, **ST** stellited, **Ni** nickel-plated
PT soft sealing with PTFE,
PK soft sealing with PEEK
- 14 Pressure balancing: DIN: **D**, ANSI: **B**

Type 3271 Actuator



Type 3277 Actuator



- 1 Type designation
- 2 Modification index
- 3 Effective diaphragm area cm^2
- 4 Fail-safe action:
DIN: **FA**, ANSI: **C** Actuator stem extends
DIN: **FE**, ANSI: **O** Actuator stem retracts
- 5 Travel
DIN: H in mm, ANSI: S in mm
- 6 Bench range (spring range)
DIN: F in bar, ANSI: R in psi
- 7 Bench range with pre-tensioned springs
DIN: V in bar, ANSI: R in psi

Fig. 5 · Nameplates

7. Customer inquiries

Should you have any questions regarding the control valve, please submit the following details (see also nameplate):

- ▶ Order number
- ▶ Type, product number, nominal size and valve version
- ▶ Pressure and temperature of the process medium
- ▶ Flow rate in m³/h
- ▶ Direction of flow through the valve
- ▶ Bench rate (e.g. 0.2 to 1 bar) of the mounted actuator
- ▶ Has a strainer been installed?
- ▶ Installation drawing

Refer to Data Sheet T 8059 EN for dimensions and weights of the different valve versions.



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