



Fig. 1 · Type 3252 High-pressure Valve with Type 3277 Pneumatic Actuator and Type 3767 i/p Positioner

1. Design and principle of operation

The Type 3252 Valve with globe-style or angle-style body can be joined with the Type 3271 Pneumatic Actuator or Type 3277 Pneumatic Actuator for integral positioner attachment to form a pneumatic control valve.

The standard valve bodies are available with either G- or NPT threaded connections.

There are also special versions with weld-on flanges or weld-on fittings designed to be welded in pipelines.

Thanks to the modular assembly principle, the actuators can be exchanged and the standard valve version can be supplemented to become a version with insulating section or metal bellows seal.

The process medium flows through the valve in the direction indicated by the arrow. The position of the valve plug (3) is changed by the signal pressure acting on the diaphragm of the actuator. A plug stem connector (7) is used to connect the plug stem (6) to the actuator stem (8.1).

The plug stem is sealed through the diaphragm (6.2) and the downstream backup stuffing box (4) containing a spring-loaded PTFE ring packing (4.2).

Fail-safe position

Depending on the arrangement of the springs in the actuator, the following fail-safe positions are available:

"Actuator stem extends "

When pressure is relieved from the actuator diaphragm and when the air supply fails, the springs close the valve.

"Actuator stem retracts"

When pressure is relieved from the actuator diaphragm and when the air supply fails, the springs open the valve.

1.1 Option of exchanging the actuators

A pneumatic actuator can be exchanged for a pneumatic actuator of another size.

When the travel range of the actuator is larger than that of the valve in a valve-actuator assembly, the manufacturer will pre-load the spring assembly of the actuator so that the travels match.



Assembly, start-up and operation of the device may only be performed by trained and experienced personnel familiar with this product.

According to these Mounting and operating instructions, trained personnel is referred to persons 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 relevant standards.

Any hazards which could be caused by the process medium, the signal pressure and moving parts of the control valve are to be prevented by means of appropriate measures.

Moreover, you are required to make sure that the control valve is only used for applications where operating pressure and temperatures do not exceed the operating values which are based on the valve sizing data submitted in the order.

Proper shipping and appropriate storage are assumed.

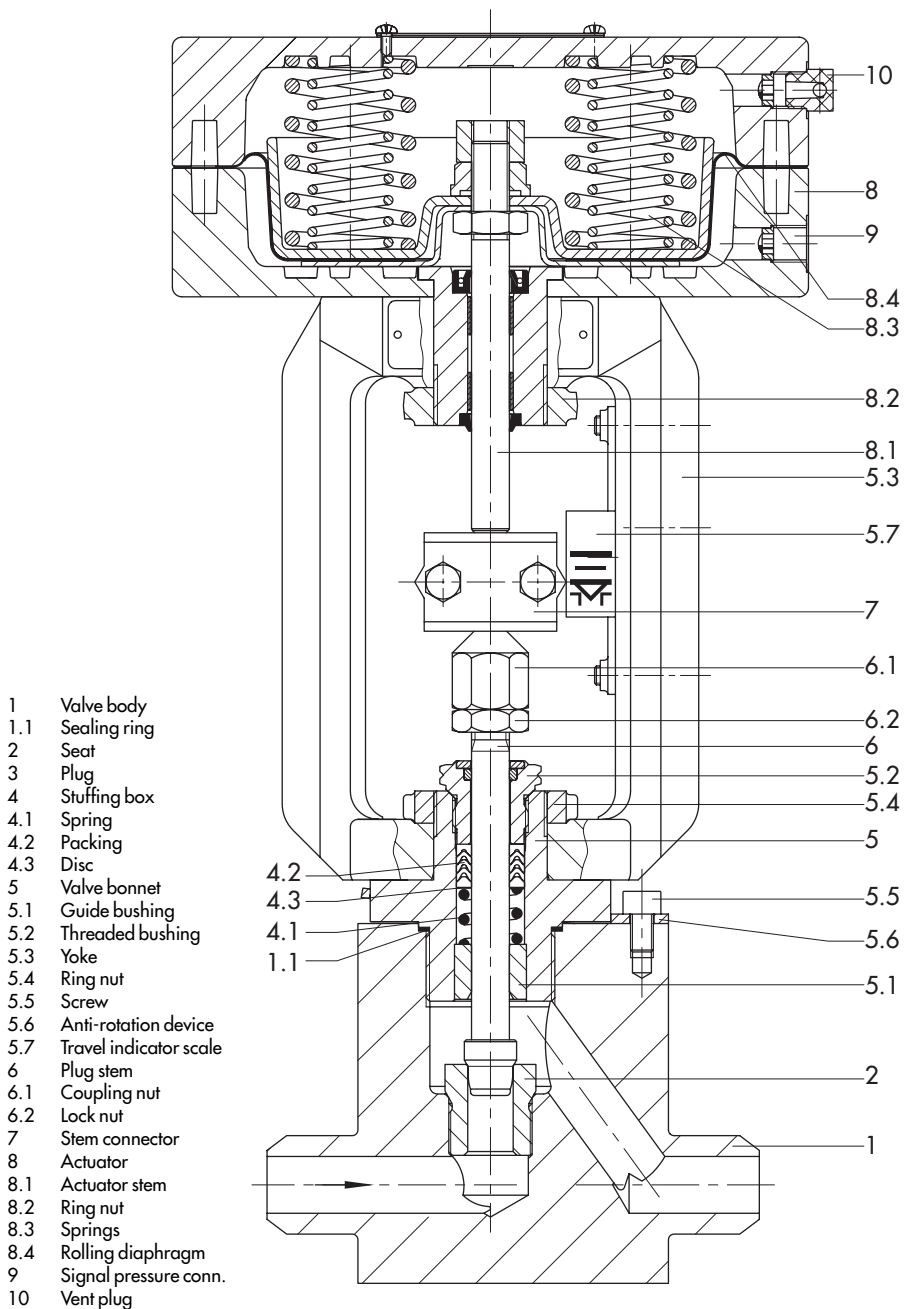


Fig. 2 · Sectional view of Type 3252 with Type 3271 Actuator (120 cm²)

2. Assembling the valve and actuator, adjustment

When the valve and actuator are not already assembled by the manufacturer or you intend to exchange the original actuator for an actuator of different type or size, then proceed as described below:

1. Unscrew the lock nut (6.2) and coupling nut (6.1) of the valve.
To do this, press the plug with the plug stem into the seat while threading down the lock and coupling nut.
2. Remove the stem connector (7) and the ring nut (8.2) from the actuator (8). Slide the ring nut on the plug stem.
3. Place the actuator on the valve bonnet (5) and secure with the ring nut (8.2).
4. Read off the bench range (or signal range with pre-loaded springs) and the fail-safe position of the actuator indicated on the actuator's nameplate.

The fail-safe positions "Actuator stem extends" or "Actuator stem retracts" are indicated by means of the letters FA or FE for the Type 3271 Actuator and by means of a symbol for the Type 3277 Actuator.

The lower signal range value corresponds to the lower bench range value to be adjusted, whereas the upper signal range value corresponds to the lower bench range value.

5. **For "Actuator stem extends"**, pressurize the bottom diaphragm chamber connection with a pressure corresponding to the lower signal range value (e.g. 0.6 bar for a range of 0.6 to 1 bar).
For "Actuator stem retracts", pressurize the top diaphragm chamber connection with a pressure corresponding to the upper signal range value (e.g. 0.6 bar for a range of 0.2 to 0.6 bar).
6. Turn the coupling nut (6.1) by hand until it contacts the actuator stem (8.1). Then turn another 1/4 turn and secure this position with the lock nut (6.2).

7. Attach the stem connector (7) and screw tight.

Align the travel indicator scale (5.7) with the tip of the stem connector

Note on disassembly:

The signal pressure connection must be pressurized before disassembling the actuator.

2.2 Pre-loaded actuator springs

Actuators whose springs are pre-loaded by the manufacturer typically have three extended bolts with nuts. They allow to uniformly relieve the spring preloading upon disassembly.

3. Installation

3.1 Mounting position

The valve can be mounted in any position. The process medium must flow through the valve in the direction indicated by the arrow.

In case of valves with weld-on fittings, remove the valve-actuator extension before welding the valve into the pipeline.

The valve must be installed free of stress.

If necessary, support the pipelines near the connections.

Thoroughly flush the pipeline prior to assembly of the valve.

3.2 Signal pressure line

For valves with "Actuator stem extends", connect the signal pressure line to the bottom diaphragm chamber, whereas valves with "Actuator stem retracts" need the signal pressure line to be connected to the top diaphragm chamber.

For the Type 3277 Actuator, the bottom connection is located at the side of the yoke of the lower diaphragm case.

4. Operation

4.1 Reversing the operating direction (fail-safe position) of the pneumatic actuator

To do this, please refer to the mounting and operating instructions of the actuators.

EB 8310 EN for Type 3271 and

EB 8311 EN for Type 3277

5. Troubleshooting

Should the medium leak towards the exterior, this could be caused by a defective stuffing box or, for versions with metal bellows, by a defective metal bellows.

If the valve does not seal properly, this could be caused by dirt or impurities caught up between the seat and plug, or else by damaged sealing edges.

We recommend that you disassemble the parts and thoroughly clean them. If need be, replace them.



Before servicing or disassembling the control valve, you are required to relieve the corresponding part of the plant from pressure and drain it. It is recommended to remove the valve or, for versions with weld-on fittings, the entire valve-actuator extension.

Before working on the valve body, you have to remove the actuator.

Disassembling the actuator

1. Loosen the stem connector (7) linking the actuator and plug stem and unscrew the ring nut (8.2).

For fail-safe position "Actuator stem extends", pressurize the actuator with pressure higher than the lower signal range value (see nameplate).

2. Lift the actuator off the valve yoke.

5.1 Replacing the stuffing box of standard valves (Fig. 2)

If the stuffing box is damaged and causes leakage, proceed as described below:

1. Unscrew the ring nut (5.4) and lift the yoke (5.3) off the valve bonnet.
2. Remove the nuts (6.1 and 6.2) and unthread the screw (5.5) holding the anti-rotation device. Remove the latter.
3. Unscrew the valve bonnet (5) and remove it together with the plug stem (6).
4. Loosen the threaded bushing (5.2) and pull the plug and plug stem out of the valve bonnet.
5. Turn out the threaded bushing (5.2) and push out the packing rings (4.2), disc (4.3) and spring (4.1) using an appropriate tool.
6. Thoroughly clean the packing chamber.
7. Apply lubricant (order no. 8150-0111) to the plug stem and some new packing rings (4.2).
8. Slide the plug and plug stem in the valve bonnet.
Push the spring (4.1), disc (4.3) and the new packing rings over the plug stem and into the packing chamber.
9. Put the threaded bushing (5.2) into place and screw tight as far as it will go.
10. Screw the lock nut (6.2) and the nut (6.1) on the plug stem (6) but do not tighten them.
11. Insert a new sealing ring (1.1) in the body.
12. Secure the valve bonnet in the body with screws, heeding the tightening torque of 500 Nm.
13. Place the anti-rotation device (5.6) on the valve bonnet so that the fastening screw (5.5) rests in the slot. Screw tight.

14. Place the yoke (5.3) on the valve body and secure with the ring nut (5.4).
15. Attach the actuator to the valve and adjust the upper and lower signal range valve as described in chap. 2.

5.2 Replacing the seat and plug

When installing a new seat and a new plug, we recommend that you also exchange the stuffing box (4.2).

5.2.1 Plug

Carry out the same steps as described in chap. 5.1 except that you install a new plug instead of the old one.

Apply lubricant (order no. 8150-0111) to the plug stem prior to assembly.

5.2.2 Seat

Carry out the same steps as described in chap. 5.1, but also screw out the seat (2).

Apply lubricant (order no. 8150-0119) to the thread and the sealing conus of the new seat (or the old one if it has been reworked or thoroughly cleaned) and screw it in again with a tightening torque of 180 Nm.

5.3 Replacing the packing, plug, seat and bellows of valves with insulating section or metal bellows seal

5.3.1 Packing

1. Unscrew the ring nut (5.4) and lift off the yoke (5.3).
2. Remove the nuts (6.1 and 6.2) and loosen the threaded bushing (5.2).
3. Unthread the bolt (16) and remove the anti-rotation device.
4. Unscrew the valve bonnet (5) and pull it over the plug stem extension (12).
5. Replace the packing as described in chap. 5.1.

5.3.2 Plug

1. Unscrew the ring nut (5.4) and lift off the yoke (5.3).
2. Unthread the screw (5.5) and remove the anti-rotation device.
3. Unscrew the valve bonnet (5) along with the insulating section or bellows intermediate piece (11) and lift them off the valve body.

To screw the plug stem (6) out of the plug stem extension (12), fasten the coupling nut and lock nut (6.1 and 6.2) against each other so that you can use them as counter hold for the wrench.

Damages on the bellows must be absolutely avoided, therefore, make sure that no torque is transmitted to the bellows connected to the intermediate piece.

4. Apply lubricant (order no. 8150-0111) to the plug stem (6) of the either new or reworked plug (3).
5. Check that both washers (12.1) are still in the plug stem extension (12). If so, screw the plug stem tightly into the plug stem extension, applying a tightening torque of 50 Nm.

5.3.3 Metal bellows

1. Screw the plug stem (6) and plug out of the plug stem extension (12) as described in chap. 5.3.2.
2. Unscrew the nut (14) using the Samson socket wrench (order no. 93252-0000-085).
3. Pull the bellows seal (13) and the plug stem extension welded to it out of the intermediate piece (11).
4. Clean the sealing surfaces of the intermediate piece.
5. Slide the new bellows seal into the intermediate piece and secure with nut (14). (Tightening torques: up to PN 160 = 85 Nm, up to PN 400 on request).

6. Check that both washers (12.1) are still in the plug stem extension.
7. Apply lubricant (order no. 8150-0119) to the thread of the plug stem. Screw the latter tightly into the plug stem extension (12), heeding the tightening torque of 50 Nm.

Re-assembly

To re-assemble the control valve after having replaced the plug, seat and metal bellows, replace the sealing rings (1.1 and 11.1) of the intermediate piece (11) first.

1. Place the intermediate piece (12) on the valve body and screw tight in the body, applying a tightening torque of 500 Nm.
2. Place the anti-rotation device (5.6) on the valve body so that the fastening screw (5.5) rests in the slot. Screw tight.
3. Push the valve bonnet (5) over the plug stem extension and place it on the intermediate piece (11). Screw tight, applying a tightening torque of 120 Nm.
4. Place the second anti-rotation device (15) on the valve bonnet so that the fastening screw (16) rests in the slot. Then, screw tight.
5. Apply lubricant (order no. 8150-0111) to the new plug stem and packing rings. Push the spring (4.1), disc (4.3) and packing rings (4.2) over the plug stem into the packing chamber.
6. Put the threaded bushing (5.2) into place and thread down as far as it will go.

- | | |
|--------------------------|-------------------------|
| 1.1 Sealing ring | 6.2 Lock nut |
| 5 Valve bonnet | 11 Intermediate piece |
| 5.2 Threaded bushing | 11.1 Sealing ring |
| 5.3 Yoke | 12 Plug stem extension |
| 5.4 Ring nut | 12.1 Washers |
| 5.5 Screw | 13 Bellows seal |
| 5.6 Anti-rotation device | 14 Nut |
| 6 Plug stem | 15 Anti-rotation device |
| 6.1 Coupling nut | 16 Bolt |

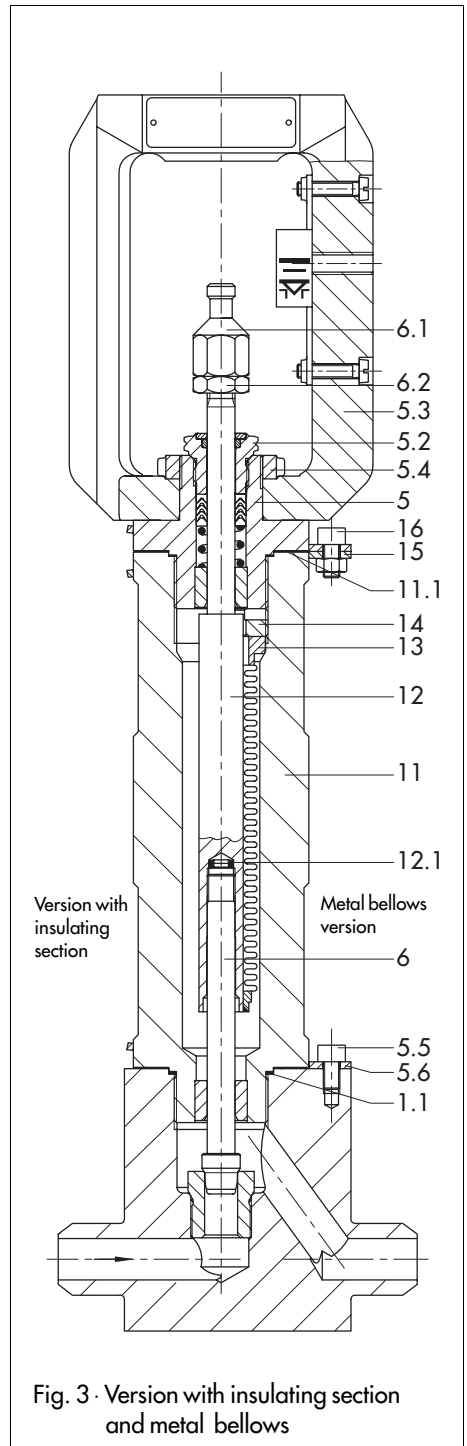
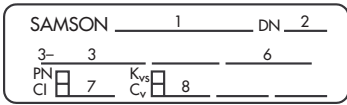


Fig. 3 · Version with insulating section and metal bellows

7. Screw the lock nut (6.2) and nut (6.1) on the plug stem extension (12) but do not tighten them.
8. Place the yoke on the valve bonnet and secure with ring nut (5.4).
9. Attach the actuator and adjust the lower and upper signal range value as described in chap. 2.

6. Nameplate



The nameplate is a rectangular label with a rounded top. It contains the following text and fields:

SAMSON _____ 1 _____ DN _____ 2 _____

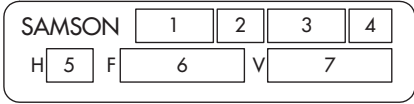
3- 3 _____ 6 _____

PN 7 K_{vs} 8 _____

CI C_v

- 1 Type designation
- 2 Nominal size
- 3 Order number with modification index
- 6 Material
- 7 Nominal pressure
- 8 K_{vs}/C_v value

Fig. 6 · Nameplate of valve



The nameplate is a rectangular label with a rounded top. It contains the following text and fields:

SAMSON 1 2 3 4

H 5 F 6 V 7

- 1 Type designation
- 2 Modification index
- 3 Effective area
- 4 Fail-safe position:
 - FA** Actuator stem extends
 - FE** Actuator stem retracts
- 5 Travel
- 6 Bench range (spring range)
- 7 Bench range with pre-loaded springs

Fig. 7 · Nameplate of Type 3271 Actuator

7. Customer inquiries

Should you have any inquiries, please submit the following details:

1. Type designation and order number (written on the nameplate)
2. Nominal size and version of the valve
3. Pressure and temperature of the process medium
4. Flow rate in m^3/h
5. Bench range (signal pressure range) (e.g. 0.6 to 1 bar) of the actuator
6. Installation drawing

