

Series V2001 Valves

**Type 3535 Three-way Valve for Heat
Transfer Oil**



Type 3535 Three-way Valve with bellows seal and rod-type yoke (partial view)

Mounting and Operating Instructions

EB 8135/8136 EN

Edition August 2016



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

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1 General safety instructions

- The control valve must be mounted, started up, or serviced by fully trained and qualified personnel only. 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.
- The control valves comply with the requirements of the European Pressure Equipment Directive 2014/68/EU. Valves with a CE marking have a declaration of conformity which includes information about the applied conformity assessment procedure. The declaration of conformity can be viewed and downloaded from ► <http://www.samson.de>.
- To ensure appropriate use, only use the valve in applications where the operating pressure and temperatures do not exceed the specifications used for sizing the valve 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 valve by the process medium, the operating pressure, the signal pressure or by moving parts are to be prevented by taking appropriate precautions.
- Proper shipping and storage are assumed.

Note:

- For installation and maintenance, make sure the relevant section of the pipeline is depressurized and, depending on the process medium, drained as well. Depending on the field of application, allow the valve to cool down or heat up to reach ambient temperature before starting any work on it.
- When working on the valve, make sure that the pneumatic air supply or power supply as well as the control signal are disconnected to prevent any hazards due to moving parts.
- Be particularly careful if the actuator springs of pneumatic control valves are preloaded. Such actuators are labeled correspondingly and can also be identified by three long bolts protruding from the bottom of the actuator. Before starting any work on the valve, relieve the compression from the preloaded springs.

2 Design and principle of operation

The Type 3535 Three-way Valve has a modular design and can be combined with pneumatic or electric actuators (as described in following):

Control valve		Type ... Actuator
3535-P	Pneumatic	3371-01xx
3535-IP	Electropneumatic	3372-03xx
3535-E1	Electric	5824-30
3535-E3		3374

Depending on the plug arrangement, the three-way valve can be used either as a mixing or diverting valve.

In mixing valves, the process media to be mixed enter at valve ports A and B. The combined flow exits the valve at port AB.

In diverting valves, the process medium enters at the valve port AB and the partial flows exit at ports A and B.

The flow rate from ports A or B to AB and vice versa depends on the cross-sectional area of flow between the seats and plugs.

The plug (3, 3.1, 3.2) is moved by changing the control signal applied to the actuator.

The plug stem is sealed by a bellows seal and an additional packing (4.2) and is connected to the actuator stem (8.1) by the stem connector (7).

1	Valve body	4.3	Washer	8.2	Rod-type yoke
1.1	Nuts	5	Bellows seal with plug stem	9	Nut
1.2	Gasket			10.1	Sleeve
2.1	Top seat	5.1	Coupling nut	10.2	Short sleeve
2.2	Bottom seat	5.2	Bellows housing	10.3	Sleeve
3.1	Top plug	5.3	Gasket	12	Nut
3.2	Bottom plug	5.4	Flange	12.1	Washer
4	Threaded bushing	6	Plug stem	12.2	Retaining washers
4.1	Bushing	6.1	Stem connector nut	X	Position for open-end wrench
4.2	Packing (spring-loaded for DN 65 and larger)	6.2	Lock nut		
		7	Stem connector		
		8.1	Actuator stem		

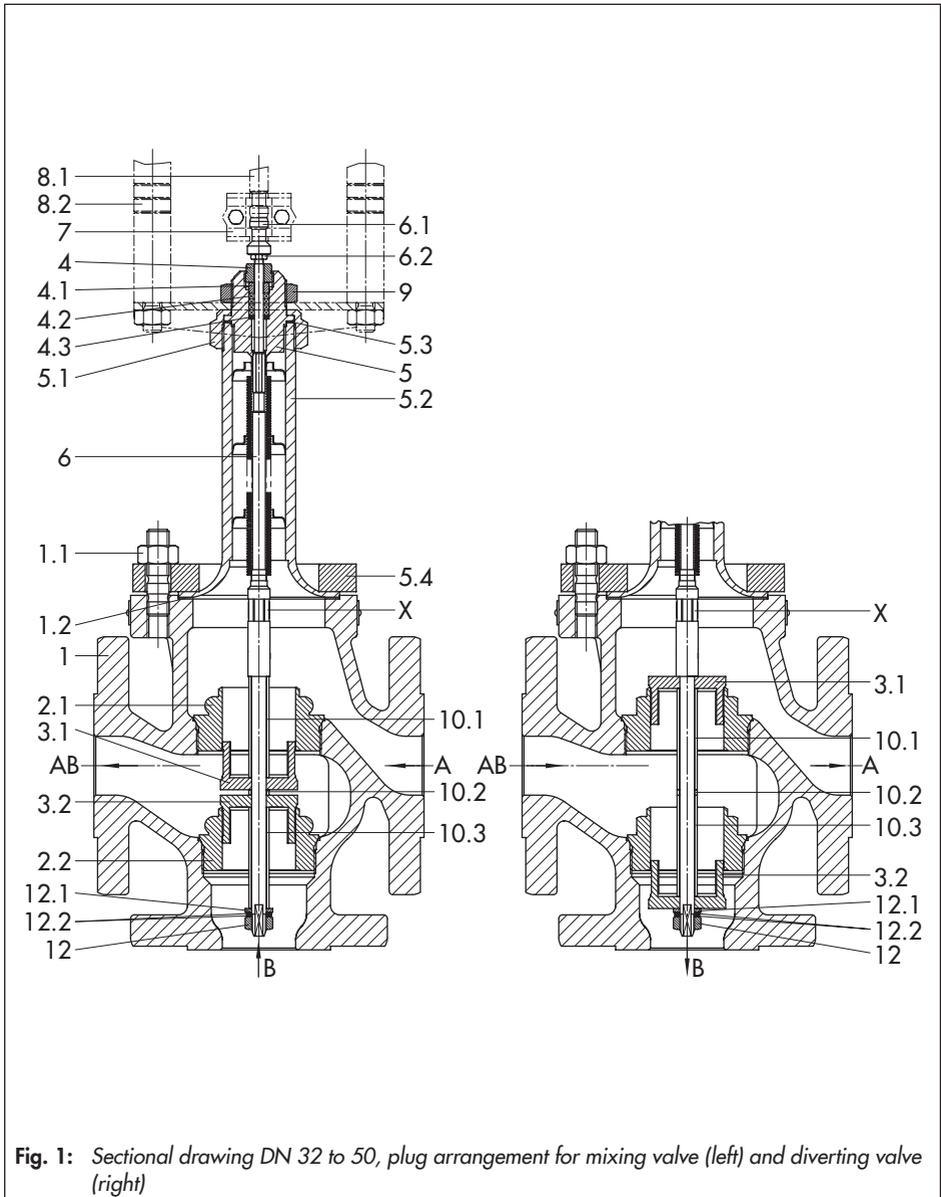


Fig. 1: Sectional drawing DN 32 to 50, plug arrangement for mixing valve (left) and diverting valve (right)

2.1 Technical data

Valve size	DN 15 to 80			NPS ½ to 3		
Material	Spheroidal graphite iron EN-JS1049	Cast steel 1.0619	Stainless steel 1.4408	Spheroidal graphite iron A 395	Cast steel A216 WCC	Stainless steel A351 CF8M
Pressure rating	PN 16 · PN 25			Class 150 · Class 300		
Connection Flanges	EN 1092-1 Form B1, Ra 3.2 to 12.5 µm EN 1092-1, groove Form D			Raised face		
Seat-plug seal	Metal seal					
Characteristic	Linear					
Rangeability	30:1 up to DN 25 (NPS 1) · 50:1 for DN 32 (NPS 1) and larger					
Temperature range	-10 to +350 °C			14 to 660 °F		
Leakage class	DIN EN 1349: 0.05 % of K_{VS}			ANSI/FCI 70-2: 0.05 % of C_V		
Compliance	CE · EAC					

2.2 Materials

Valve size	DN 15 to 80			NPS ½ to 3		
Valve body	Spheroidal graphite iron EN-JS1049	Cast steel 1.0619	Stainless steel 1.4408	Spheroidal graphite iron A 395	Cast steel A216 WCC	Stainless steel A351 CF8M
Valve bonnet	Cast steel S235JR (St 37)		1.4408	Cast steel S235JR (St 37)		1.4408
Seat	≤DN 25: 1.4305 · ≥DN 32: 1.4104			≤NPS 1: 1.4305 · ≥NPS 1½: 1.4104		
Plug	1.4305					
Bellows seal	1.4541 · 1.4301					
Packing	PTFE					
Body gasket	Graphite on metal core					

2.3 K_{VS} and C_V coefficients, seat diameters and travel

Valve size	DN	15	20	25	32	40	50	65	80
	NPS	½	¾	1	–	1½	2	2½	3
K_{VS} coefficients		4	6.3	8	16	20	32	50	80
C_V coefficients		5	7.5	9.4	–	23	37	60	94
Seat Ø	mm/in	24/0.94			40/1.57			65/2.56	
Travel	mm/in	15/0.59			15/0.59			15/0.59	

3 Installation

Valve and actuator are delivered ready mounted.

Refer to the corresponding mounting and operating instructions for more details on the actuator used.

3.1 Mounting position

The valve can be mounted in any desired position.

→ Observe the restrictions for the actuator used.



NOTICE

Install the valve free of stress and with the least amount of vibrations as possible. If necessary, support the pipelines near the connections. Do not attach supports directly to the valve or actuator.

Pipeline routing

To ensure that the control valve functions properly, the pipeline must be straight and without any manifolds or disturbances for a distance of at least 6 times the valve size (DN) upstream and downstream of the valve. Contact SAMSON if this distance cannot be observed.

Flush the pipeline thoroughly before installation of the valve.

3.2 Arrangement of the valve

Install the valve as shown in Fig. 2 depending on whether it is to be used for mixing or diverting service.

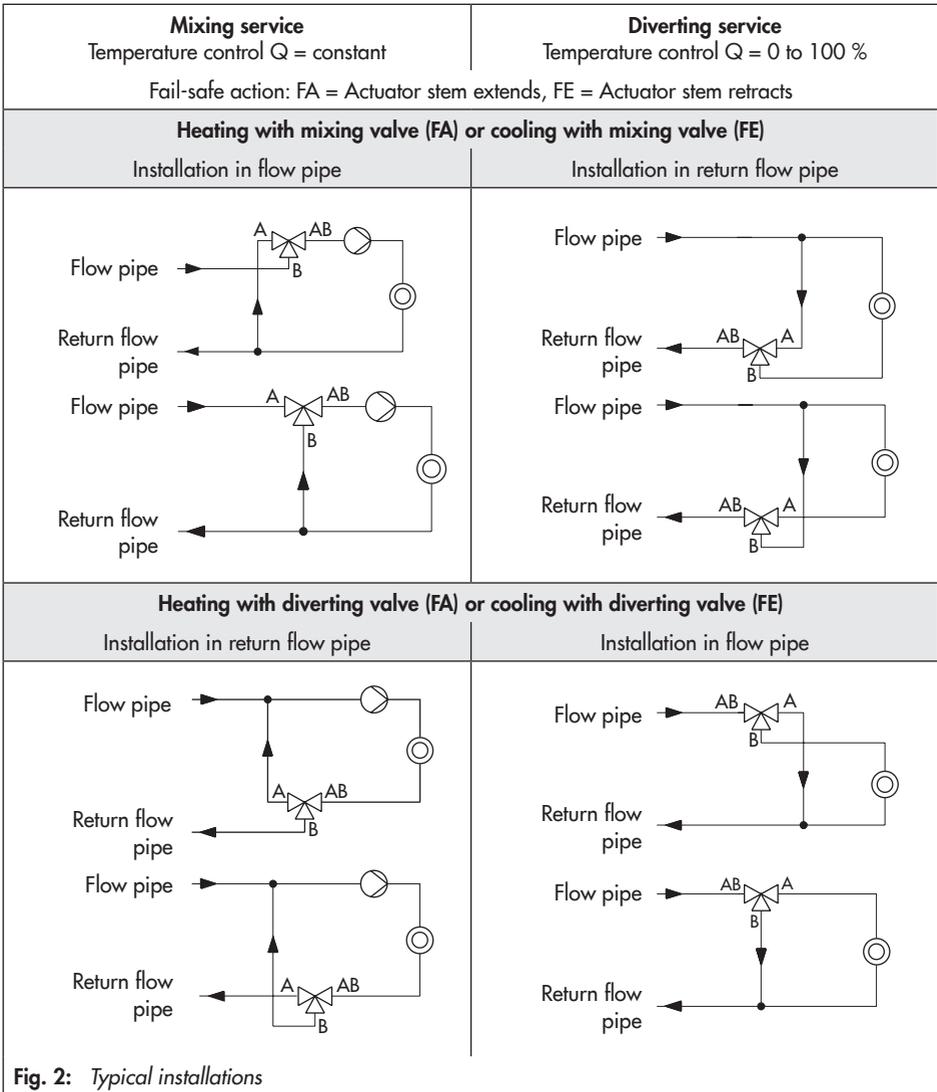
The plug arrangement (i.e. either mixing or diverting valve) is indicated on a label attached to the valve body.

Fail-safe action: the valve shuts off the flow of the heating medium or opens the flow of the cooling medium.

3.3 Strainer and bypass

We recommend installing a SAMSON Type 2 N Strainer upstream of the valve, and upstream of both inlet ports in mixing valves.

We recommend installing a shut-off valve both upstream of the strainer and downstream of the valve to ensure that the plant does not need to be shut down for maintenance. In addition, install a bypass line.



4 Operation

The operating instructions only apply in conjunction with the actuator. Refer to the corresponding mounting and operating instructions.

5 Maintenance

The control valve is subject to normal wear, especially at the seat, plug, bellows, and packing.

Depending on the operating conditions, check the valve at regular intervals to prevent possible failure before it can occur.

External leakage can indicate that the bellows seal or packing is defective.

If the valve does not close tightly, tight shut-off may be impaired by dirt stuck between the seat and plug or by damaged facings.

Valves in DN 15 to 25 have a one-pieced plug, which is used for mixing and diverting valves using the same arrangement.

In valves \geq DN 32, two V-port plugs are used. In mixing valves, the plugs are guided in the seats from the inside. Whereas, in diverting valves, they are guided into the seats from the outside.

To keep the exact position of the plug, spacer sleeves are used to keep the plug on the plug stem. The different arrangement for valves in DN 32 to 50 and for valves in DN 65 and 80 as mixing and diverting valves is described in the section on assembly.

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



WARNING!

- Before performing any work on the control valve, make sure the relevant plant section has been depressurized and, depending on the process medium, drained as well.
- When used at high temperatures, allow the plant section to cool down to ambient temperature.
- Make sure the electrical or pneumatic control signal for the actuator is switched off. Remove the signal pressure line of a pneumatic actuator.
- Valves are not free of cavities. As a result, residual process medium might still be contained in the valve.
- We recommend removing the valve from the pipeline.



NOTICE

Before performing any repair work, remove the actuator from the valve. Unscrew the screws on the stem connector (7) and the nut (9). Lift the actuator off the valve (see Fig. 1).



Note:

The required tightening torques are specified in the following instructions. Suitable seat wrenches are additionally listed in section 5.3.

5.1 Replacing the bellows seal

If the packing leaks, this is due to a defective bellows seal. In this case, the entire bellows seal assembly must be replaced together with the packing (4.2).

We recommend renewing the top gasket (5.3) and bottom gasket (1.2) at the bellows housing as well.

Mixing and diverting valves in DN 32 to 80 differ in the arrangement of their plugs and sleeves (see Fig. 1). Valves in DN 15 to 25 have the same plug and sleeve arrangement.

5.1.1 Disassembly

1. In valves \leq DN 50, unscrew the lock nut (6.2) and stem connector nut (6.1) from the plug stem.
2. Unscrew the coupling nut (5.1) from the bellows housing.
3. Remove nuts (1.1) and lift off the flange (5.4).
4. Pull out the bellows housing (5.2) and bellows seal as far as they will go. Place an open-end wrench SW 10 (\leq DN 50) or SW 13 (\geq DN 65) at the side on the hexagon (X) or at the flattened area of the plug stem to hold the stem stationary. Loosen the nut (12) and remove the wrench.
5. Unscrew the nut (12). Remove the two retaining washers (12.2) and washer (12.1).
6. **DN 15 to 25**
Carefully pull the plug stem (6) together with the bellows seal (5) and bellows

housing (5.2) out of the body from above.

DN 32 to 80

Keep hold of the bottom plug of diverting valves or the bottom sleeve of mixing valves on the plug stem. Use a long screw (M8 for DN 32 to 50 and M12 for DN 65 and 80) to keep the plugs (3.x) and sleeves (10.x) in the right position.

Carefully pull the plug stem together with the bellows seal (5) and bellows housing (5.2) out of the body from above.

Guide the screw (to hold the plugs and sleeves) into the valve body and push upwards, allowing the plugs and sleeves to slide onto the screw.

7. Carefully clean all the parts and check them for damage. Replace the plug stem together with the bellows seal and packing with new parts.

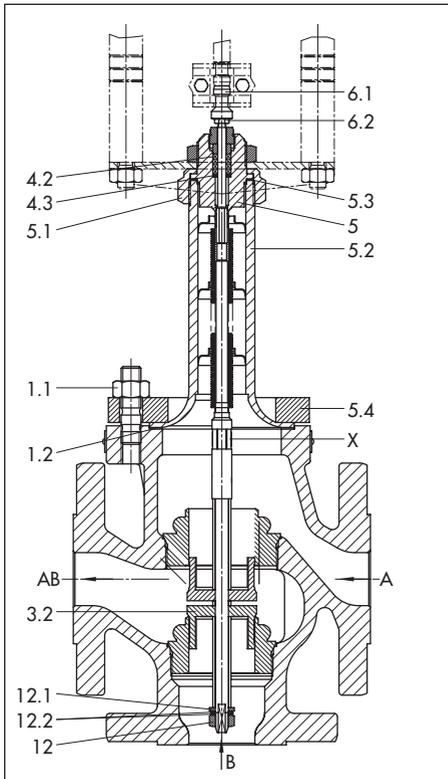


Fig. 3: Mixing valve DN 32 to 50

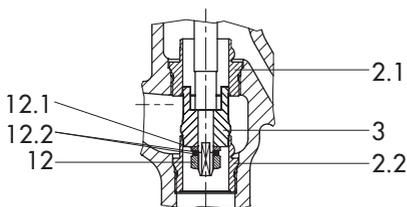


Fig. 4: Mixing valve DN 15 to 25

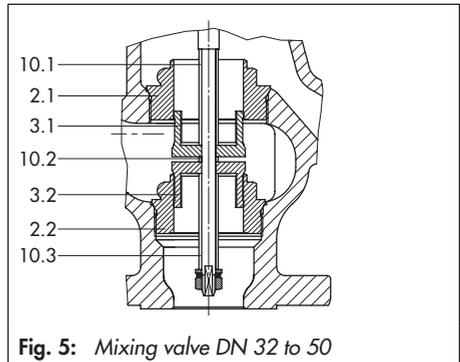


Fig. 5: Mixing valve DN 32 to 50

5.1.2 Assembly



Note:

Contact your nearest SAMSON subsidiary or the SAMSON After-sales Service department for information on suitable lubricants.

1. Apply a suitable lubricant to the gasket (5.3) and thread on the bellows housing.
2. Insert the gasket (5.3) on the bellows housing (5.2).
3. Push the bellows seal (5) together with the plug stem into the bellows housing. Tighten the coupling nut (5.1) by hand only at first.
4. Insert the gasket (1.2) into the valve body.
5. **DN 15 to 25**
Place the ready-assembled bellows seal assembly on the valve body, while guiding the plug stem through the holes in the plug.

DN 32 to 80

Gradually insert the plug stem of the ready-assembly bellows seal assembly (5) into the valve body, allowing the plugs and sleeves to slide from the screw (used to hold the plugs and sleeves) onto the plug stem.

6. First place the washer (12.1) and then the pair of serrated retaining washers (12.2) onto the plug stem, making sure the coarsely serrated surfaces of the retaining washers face each other and the radial ribs face outwards. Thread the nut (12) onto the plug stem by hand.



Note:

For valves in DN 15 to 50, a special tool designed to hold the washers (12.1 and 12.2) can be ordered (see section 5.3). Especially on valves in DN 15 to 25, it is difficult to mount the washers onto the plug stem due to insufficient space.

7. Slightly pull out the bellows housing (5.2) together with the bellows seal. Place an open-end wrench at the side on the hexagon or at the flattened area (X) of the plug stem to hold the stem stationary.



NOTICE

Do not twist the bellows.

8. Tighten the nut (12) to secure the plugs and the sleeves:

Valve size	15 to 50	65 to 80
Nut (12)	15 Nm	25 Nm

9. Remove the open-end wrench.
10. Place on the flange (5.4) and align it with the bellows housing (5.2), while making sure the gasket (1.2) is correctly positioned.
11. Fasten the nuts (1.1):

Valve size	15 to 25	32 to 50	65 to 80
Nuts (1.1)	M10 10 Nm	M12 30 Nm	M16 90 Nm

Tighten the coupling nut (5.1) with 80 Nm tightening torque.

12. For DN 15 to 50, thread the lock nut (6.2) and stem connector nut (6.1) onto the top end of the plug stem again. Adjust the stem connector nut (6.1) to keep the dimension of 50 mm from the top of the bellows seal assembly (5) to the top of the stem connector nut (6.1) after the plug stem has been pushed completely into the valve (see Fig. 15).
13. Mount the actuator onto the valve according to the associated mounting and operating instructions.

5.2 Replacing the seat and plug

When replacing the seat and/or plug, we recommend renewing the gaskets (5.3, 1.2) at the top and bottom of the bellows housing as well.

5.2.1 Mixing valve

Disassembly

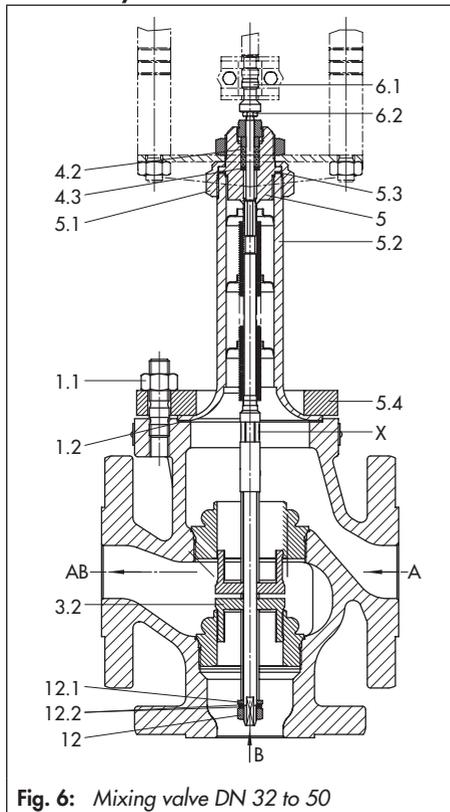


Fig. 6: Mixing valve DN 32 to 50

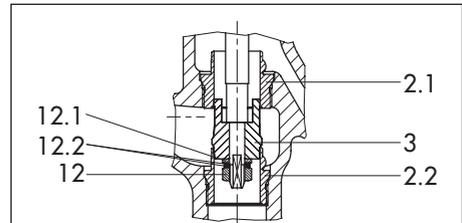


Fig. 7: Mixing valve DN 15 to 25

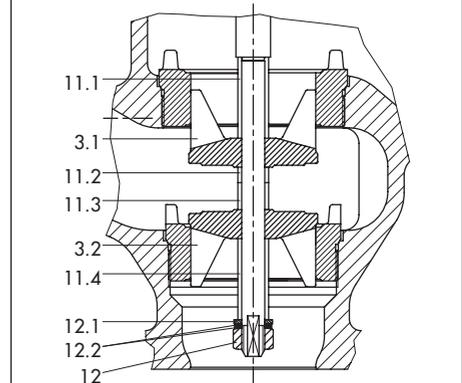


Fig. 8: Mixing valve DN 65 and 80

1. In valves \leq DN 50, unscrew the lock nut (6.2) and stem connector nut (6.1) from the plug stem.
2. Unscrew the coupling nut (5.1) from the bellows housing. Remove nuts (1.1) and lift off the flange (5.4).
3. Pull out the bellows housing (5.2) and bellows seal as far as they will go. Place an open-end wrench SW 10 (\leq DN 50) or SW 13 (\geq DN 65) at the side on the hexagon (X) or at the flattened area of the plug stem to hold the stem stationary. Loosen the nut (12) and remove the wrench.

4. Unscrew the nut (12). Remove the two retaining washers (12.2) and washer (12.1).

In mixing valves DN 32 to 80, pull bottom sleeve (10.3 or 11.4) off the plug stem.

5. Lift the bellows housing (5.2) together with the bellows seal (5) and carefully pull the plug stem (6) out of the valve body.
6. Carefully clean all the parts and check them for damage. Renew defective parts.
7. In valves \geq DN 32, remove sleeve (10.1 or 11.1).

Unscrew the top seat (2.1) using a suitable seat wrench (see section 5.3).

8. **DN 15 to 25**
Remove the plug (3) from the valve body.

DN 32 to 50

Remove the top plug (3.1), sleeve (10.2), and bottom plug (3.2) from the valve body.

DN 65/80

Remove the top plug (3.1), sleeves (11.2 and 11.3), and bottom plug (3.2) from the valve body.

9. Unscrew the bottom seat (2.2) from the valve body.
10. Carefully clean all the parts and check them. If necessary, renew or machine them.

Assembly

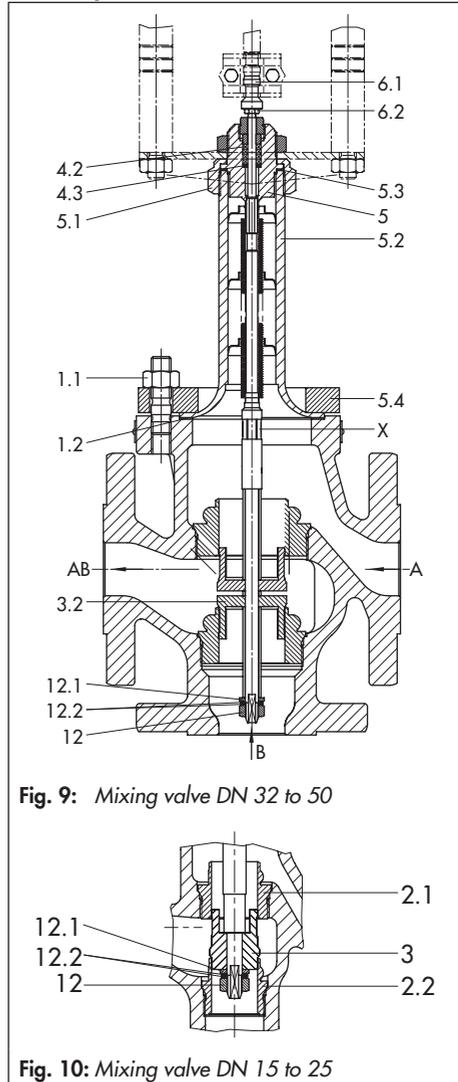


Fig. 9: *Mixing valve DN 32 to 50*

Fig. 10: *Mixing valve DN 15 to 25*

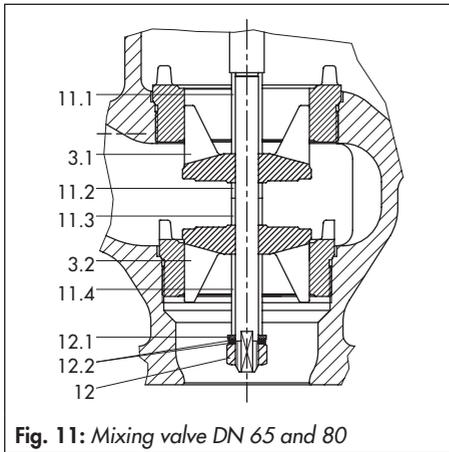


Fig. 11: Mixing valve DN 65 and 80

1. Apply a suitable lubricant to the gasket (5.3) and thread on the bellows housing.
2. Insert the gasket (5.3) on the bellows housing (5.2).
3. Push the bellows seal (5) together with the plug stem into the bellows housing. Tighten the coupling nut (5.1) by hand only at first.
4. Apply a suitable lubricant to the thread and the sealing cone of the new or machined seats.
5. Use the seat wrench to screw in the bottom seat (2.2), observing the correct tightening torques:

Valve size	15 to 25	32 to 50	65 to 80
Seat thread	M32 x 1.5	M58 x 1.5	M90 x 1.5
Tightening torque	120 Nm	500 Nm	1050 Nm

6. DN 15 to 25

Insert the plug (3) into the bottom seat (2.2).

DN 32 to 50

Insert the bottom plug (3.2) into the bottom seat (2.2).

Place the short sleeve (10.2) and top plug (3.1) one after the other onto the bottom plug. To fix them into position, insert a long M8 screw through the bottom plug.

DN 65/80

Insert the bottom plug (3.2) into the bottom seat (2.2).

Place the two short sleeves (11.3 and 11.2) and top plug (3.1) one after the other onto the bottom plug. To fix them into position, insert a long M12 screw through the bottom plug.

7. Screw the top seat (2.1) into the body, ensuring that the top plug can easily slide into the seat. Refer to table in step 5 for the correct tightening torque.
8. Insert the gasket (1.2) into the top valve flange.
9. **DN 15 to 25**
Carefully place the bonnet onto the valve, while guiding the plug stem into the plug (3).

DN 32 to 50

Slide the sleeve (10.1) over the plug stem. Carefully place on the bonnet, while guiding the plug stem through the top plug (3.1), sleeve (10.2), and bottom plug (3.2) and, at the same time, remove the M8 screw.

Slide the sleeve (10.3) onto the plug stem from underneath.

DN 65 and 80

Slide the sleeve (11.1) over the plug stem. Carefully place on the bonnet, while guiding the plug stem through the top plug (3.1), two sleeves (11.2 and 10.3), and bottom plug (3.2) into the body and, at the same time, remove the M12 screw.

Slide the sleeve (11.4) onto the plug stem from underneath.

10. First place the washer (12.1) and then the pair of serrated retaining washers (12.2) onto the plug stem, making sure the coarsely serrated surfaces of the retaining washers face each other and the radial ribs face outwards. Thread the nut (12) onto the plug stem by hand.



Note:

For valves in DN 15 to 50, a special tool designed to hold the washers (12.1 and 12.2) can be ordered (see section 5.3). Especially on valves in DN 15 to 25, it is difficult to mount the washers onto the plug stem due to insufficient space.

11. Slightly pull out the bellows housing (5.2) together with the bellows seal. Place an open-end wrench at the side on the hexagon or at the flattened area (X) of the plug stem to hold the stem stationary.



NOTICE

Do not twist the bellows.

12. Tighten the nut (12) to secure the plugs and the sleeves:

Valve size	15 to 50	65 to 80
Nut (12)	15 Nm	25 Nm

13. Remove the open-end wrench.
14. Place on the flange (5.4) and align it with the bellows housing (5.2), while making sure the gasket (1.2) is correctly positioned.

15. Fasten the nuts (1.1):

Valve size	15 to 25	32 to 50	65 to 80
Nuts (1.1)	M10 10 Nm	M12 30 Nm	M16 90 Nm

Tighten the coupling nut (5.1) with 80 Nm tightening torque.

16. For DN 15 to 50, thread the lock nut (6.2) and stem connector nut (6.1) onto the top end of the plug stem again. Adjust the stem connector nut (6.1) to keep the dimension of 50 mm from the top of the bellows seal assembly (5) to the top of the stem connector nut (6.1) after the plug stem has been pushed completely into the valve (see Fig. 15).
17. Mount the actuator onto the valve according to the associated mounting and operating instructions.

5.2.2 Diverting valve

Disassembly

1. In valves \leq DN 50, unscrew the lock nut (6.2) and stem connector nut (6.1) from the plug stem.
2. Unscrew the coupling nut (5.1) from the bellows housing. Remove nuts (1.1) and lift off the flange (5.4).
3. Pull out the bellows housing (5.2) and bellows seal as far as they will go. Place an open-end wrench SW 10 (\leq DN 50) or SW 13 (\geq DN 65) at the side on the hexagon (X) or at the flattened area of the plug stem to hold the stem stationary. Loosen the nut (1.2) and remove the wrench.
4. Unscrew the nut (1.2). Remove the two retaining washers (12.2) and washer (12.1).
5. Pull the bellows seal (5) out of the bellows housing and remove the body gasket (1.2).
6. Carefully clean all the parts and check them for damage. Renew defective parts.
7. **DN 15 to 25**
Unscrew the top seat (2.1). Remove the plug (3) from the valve body. Take out the bottom seat (2.2).

DN 32 to 50

Remove the top plug (3.1) and the three sleeves (10.1, 10.2, 10.3) from the valve body.

DN 65/80

Remove the top plug (3.1) and the four sleeves (11.1, 11.2, 11.3, 11.4) from the valve body.

8. DN 32 to 80

Unscrew the top and bottom seat (2.1, 2.2) using a suitable seat wrench (see section 5.3) from the valve body.

Remove the bottom plug (3.2) from the valve body.

9. Carefully clean all the parts and check them. If necessary, renew or machine them.

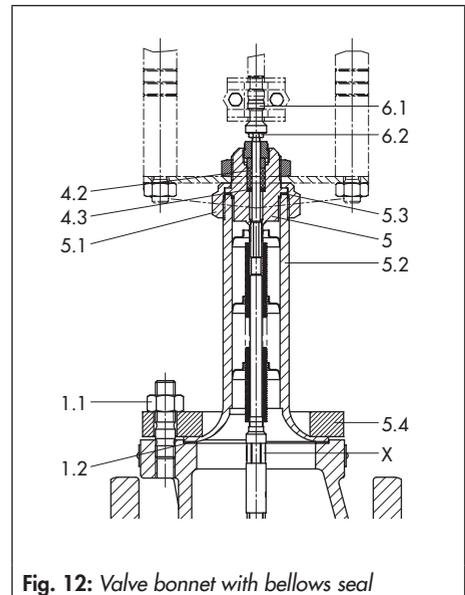


Fig. 12: Valve bonnet with bellows seal

Assembly

1. Apply a suitable lubricant to the gasket (5.3) and thread on the bellows housing.
2. Place on the gasket (5.3) and push the bellows seal (5) together with the plug stem into the bellows housing (5.2). Tighten the coupling nut (5.1) by hand at first.
3. Apply a suitable lubricant to the thread and the sealing cone of the new or machined seat.
4. **DN 15 to 25**
Screw in the bottom seat (2.2) and tighten:

Valve size	15 to 25
Seat thread	M32 x 1.5
Tightening torque	120 Nm

Place the plug (3) in the bottom seat.
Screw in the top seat (2.1), ensuring that

the plug can slide into the seat from underneath. Tighten the top seat with the same tightening torque.

DN 32 to 50

Insert the bottom seat (3.2) into the valve body. Use the seat wrench to screw in the bottom seat (2.2) and top seat (2.1) one after the other.

Valve size	32 to 50
Seat thread	M58 x 1.5
Tightening torque	500 Nm

Place the top plug (3.1) and three sleeves (10.1, 10.2, 10.3) onto the plug stem one after the other.

DN 65 and 80

Insert the bottom seat (3.2) into the valve body. Use the seat wrench to screw in the bottom seat (2.2) and top seat (2.1) one after the other:

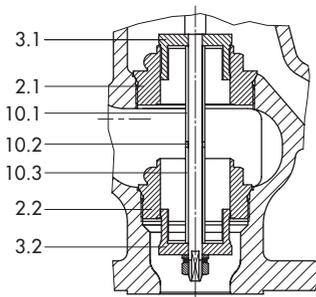


Fig. 13: Diverting valve DN 32 to 50

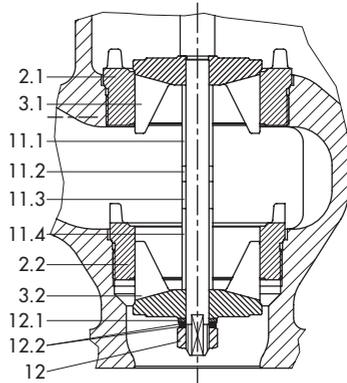


Fig. 14: Diverting valve DN 65 and 80

Valve size	65 to 80
Seat thread	M90 x 1.5
Tightening torque	1050 Nm

Place the top plug (3.1) and four sleeves (11.1, 11.2, 11.3, 11.4) onto the plug stem one after the other.

- For diverting valves in DN 32 and larger, insert the bottom plug into the bottom seat.

Insert the gasket (1.2) into the body flange. Carefully guide the plug stem (6) into the bellows housing (5.2).

Hold the bottom plug in the seat to push the plug stem in the middle through the plug bore.

- First place the washer (12.1) and then the pair of serrated retaining washers (12.2) onto the plug stem, making sure the coarsely serrated surfaces of the retaining washers face each other and the radial ribs face outwards. Thread the nut (12) onto the plug stem by hand.



Note:

For valves in DN 15 to 50, a special tool designed to hold the washers (12.1 and 12.2) can be ordered (see section 5.3). Especially on valves in DN 15 to 25, it is difficult to mount the washers onto the plug stem due to insufficient space.

- Slightly pull out the bellows housing (5.2) together with the bellows seal. Place an open-end wrench at the side on the

hexagon (X) or at the flattened area of the plug stem to hold the stem stationary.



NOTICE

Do not twist the bellows.

- Tighten the nut (12) to secure the plugs and the sleeves:

Valve size	15 to 50	65 to 80
Nut (12)	15 Nm	25 Nm

- Remove the open-end wrench.
- Place on the flange (5.4) and align it with the bellows housing (5.2), while making sure the gasket (1.2) is correctly positioned.

- Fasten the nuts (1.1):

Valve size	15 to 25	32 to 50	65 to 80
Nuts (1.1)	M10 10 Nm	M12 30 Nm	M16 90 Nm

Tighten the coupling nut (5.1) with 80 Nm tightening torque.

- For DN 15 to 50, thread the lock nut (6.2) and stem connector nut (6.1) onto the top end of the plug stem again. Adjust the stem connector nut (6.1) to keep the dimension of 50 mm from the top of the bellows seal assembly (5) to the top of the stem connector nut (6.1) after the plug stem has been pushed completely into the valve (see Fig. 15).
- Mount the actuator onto the valve according to the associated mounting and operating instructions.

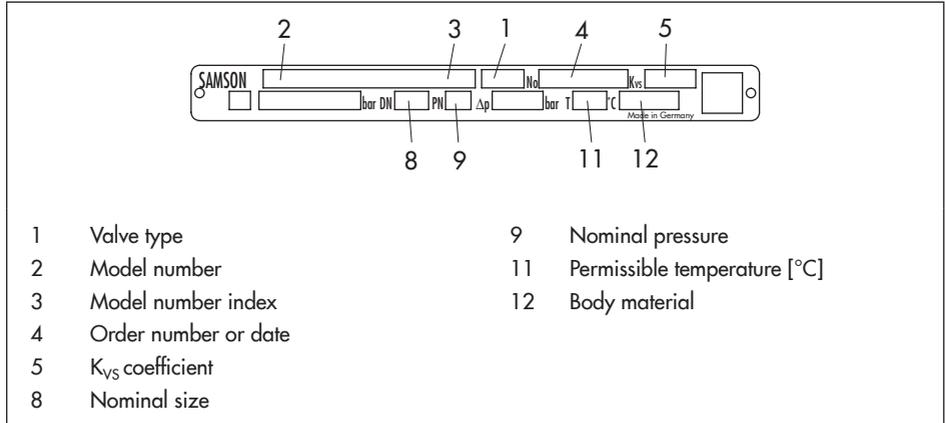
5.3 Tools and tightening torques

Valve size	DN 15 to 25 NPS ½ to 1	DN 32 to 50 NPS 1½ to 2	DN 65 to 80 NPS 2½ to 3
Seat wrench with order number	1280-3010	1280-3011	1280-0305
Holding tool	1280-3059 for washer (12.1) and anti-rotation fixture (12.2)		
Tightening torques (±10 %)			
Valve seat	120 Nm (M32 x 1.5)	500 Nm (M58 x 1.5)	1050 Nm (M90 x 1.5)
Nut (12)	15 Nm		25 Nm
Body nut (1.1)	10 Nm (M10)	30 Nm (M12)	90 Nm (M16)
Coupling nut (5.1)	80 Nm		

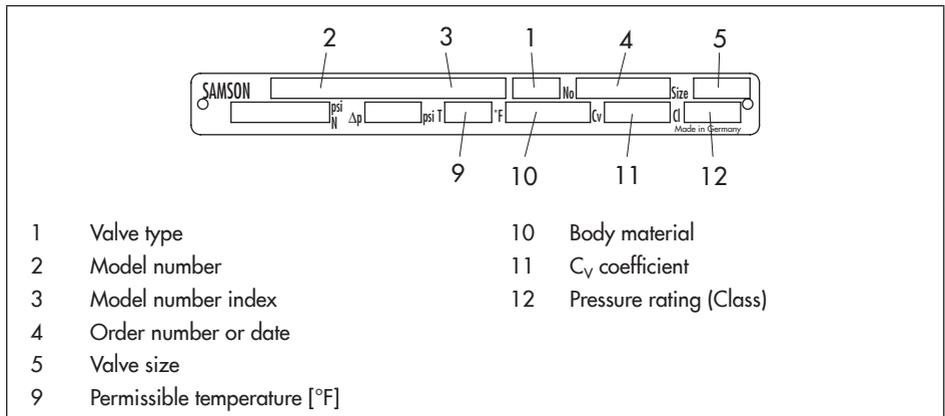
6 Description of nameplates

The DIN or ANSI versions have different specifications on the nameplates.

6.1 DIN version

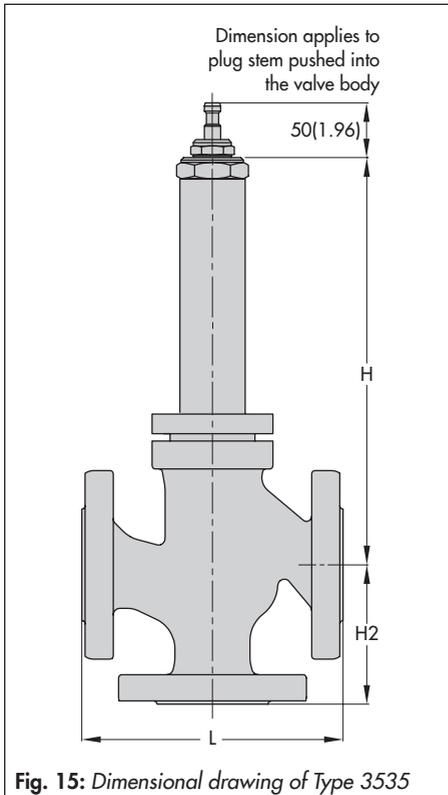


6.2 ANSI version



7 Dimensions in mm and inches

DIN version					
DN	L (mm)		H (mm)	H2 (mm)	
15	130		235	70	
20	150			80	
25	160			85	
32	180		245	100	
40	200			105	
50	230			120	
65	290		350	130	
80	310			140	
ANSI version					
NPS	L (in)		H (in)	H2 (in)	
	Class 150	Class 300		Class 150	Class 300
½	7.25	7.50	9.25	3.62	3.76
¾		7.62			3.82
2		7.75			3.88
1½	8.75	9.25	9.65	4.37	4.63
2	10.00	10.50		5.00	5.26
2½	10.78	11.50	13.78	5.43	5.75
3	11.75	12.50		5.87	6.26



8 Customer inquiries

Please submit the following details:

- Type designation (see nameplate)
- Order number (see nameplate)
- Serial number
- Version and nominal size of the valve
- Pressure and temperature of the process medium
- Flow rate in m³/h
- Bench range (signal pressure range) (e.g. 1.4 to 2.3 bar with a pneumatic actuator)
- Installation drawing



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