

Valve Series V2001
Three-way Valve for Heat Transfer Oil
Type 3535



Fig. 1 · Type 3535 Three-Way Valve with bellows seal and rod-type yoke (partial view)

**Mounting and
Operating Instructions**

EB 8135/8136 EN

Edition August 2011





General safety instructions

- ▶ *The valve is to be mounted, started up or serviced only 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 mounting and operating instructions, particularly those concerning assembly, start-up and maintenance, must be observed.*
- ▶ *The valves 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 about the applied conformity assessment procedure. The declaration of conformity is available on request.*
- ▶ *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 which are 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.*

NOTICE

- ▶ *For installation and maintenance work on the valve, make sure the relevant section of the pipeline is depressurized and, depending on the process medium, 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.*
- ▶ *Prior to performing any work on the valve, make sure the supply air and control signal are disconnected or blocked to prevent any hazards that could be caused by moving parts.*
- ▶ *Special care is needed when the actuator springs are pretensioned. These actuators are labeled correspondingly and can also be identified by three long bolts at the bottom of the actuator. Prior to starting any work on the valve, you must relieve the compression from the pretensioned springs.*

Contents

1	Design and principle of operation	4
1.1	Technical data	5
2	Installation	6
2.1	Mounting position	6
2.2	Arrangement of control valve	6
2.3	Strainer and bypass	6
3	Operation	8
4	Maintenance—replacing parts	8
4.1	Replacing the bellows seal	10
4.1.1	Disassembly	10
4.1.2	Reassembly	11
4.2	Replacing the seat and plug	12
4.2.1	Mixing valve	13
4.2.2	Diverting valve	16
4.3	Tools and tightening torques	20
5	Nameplate descriptions	21
5.1	DIN version	21
5.2	ANSI version	21
6	Dimensions in mm and inches	22
7	Customer inquiries	23

The plug arrangement determines whether the three-way valve operates as mixing or diverting valve.

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

The amount of flow from A or B to AB and vice versa is determined by the cross-sectional area between the seats and plugs.

The position of the plugs (3, 3.1, 3.2) changes in response to changes of the control signal acting on the actuator.

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

1.1 Technical data

Nominal size	DN 15 to 80			NPS ½ to 3		
Material	Sph. graphite iron EN-JS1049	Cast steel 1.0619	Stainless steel 1.4408	Spheriodal graphite iron A 395	Cast steel A 216 WCC	Stainl. steel A 351 CF8M
Nominal pressure	PN 16 · PN 25			Class 150 · Class 300		
End connections	Flanges EN 1092-1 Form B1, Ra 3.2 to 12.5 µm EN 1092-1, groove Form D			Raised face		
Seat and plug sealing	Metal sealing					
Characteristic	Linear					
Rangeability	30:1 up to DN 25/NPS 1 · 50:1 for DN 32/NPS 1½ or larger					
Temperature range	-10 to 350 °C			14 to 660 °F		
Leakage rate	DIN EN 1349: 0.05 % of K_{VS} coefficient			ANSI/FCI 70-2: 0.05 % of C_V coefficient		

Materials

Nominal size	DN 15 to 80			NPS ½ to 3		
Valve body	Spheriodal graphite iron EN-JS1049	Cast steel 1.0619	Stainless steel 1.4408	Spheriodal graphite iron A 395	Cast steel A 216 WCC	Stainl. steel A 351 CF8M
Valve bonnet	Cast steel S235JR (St 37)		1.4408	Cast steel S235JR (St 37)		1.4408
Seat and plug	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					

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

Nominal 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 diameter	mm/in	24 mm · 0.94"			40 mm · 1.57"			65 mm · 2.56"	
Travel	mm/in	15 mm · 0.59"			15 mm · 0.59"			15 mm · 0.59"	

2 Installation

Valve and actuator are supplied already assembled by the manufacturer.

For more details on the actuator used, please refer to the appropriate mounting and operating instructions.

2.1 Mounting position

The valve can be mounted in any position. However, the limitations due to the actuator used must be strictly observed.

CAUTION!

The valve must be installed free of stress and free of excessive vibrations. If necessary, support the pipelines near the connections. Do not install supports on the valve or on the actuator. Thoroughly flush the pipeline prior to installation of the valve.

Pipeline routing

To allow the control valve to work properly, the pipeline upstream and downstream of the valve must be straight and free of obstructions for a length of at least 6 times the pipe diameter (DN). Contact SAMSON if this length cannot be met during installation.

Clean out the pipeline thoroughly prior to installing the valve.

2.2 Arrangement of control valve

Depending on the task to be performed, the control valve is arranged as illustrated in Fig. 3.

How the plugs are arranged for mixing or diverting valves is specified on the label attached to the valve body.

Fail-safe action: Valve shuts off the heating medium supply or opens the supply of cooling medium.

2.3 Strainer and bypass

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

In addition to a bypass line, shut-off valves should be installed both upstream of the strainer and downstream of the control valve so that the plant need not be shut down for maintenance routines.

Mixing service

Temperature control $Q = \text{constant}$

Fail-safe action: **FA** = Actuator stem extends, **FE** = Actuator stem retracts

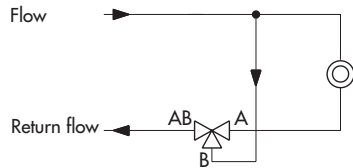
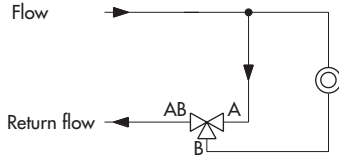
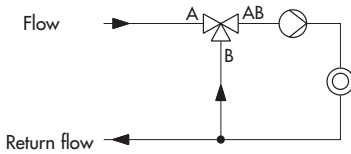
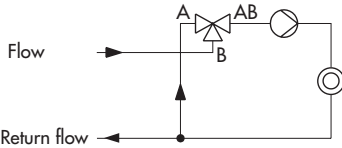
Diverting service

Flow rate control $Q = 0 \text{ to } 100 \%$

Heating using a mixing valve (FA) or cooling using a mixing valve (FE)

Installation in flow pipe

Installation in return flow pipe



Heating using a diverting valve (FA) or cooling using a diverting valve (FE)

Installation in return flow pipe

Installation in flow pipe

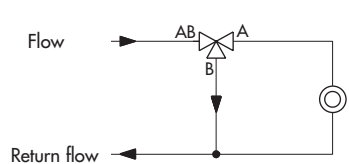
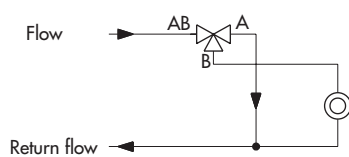
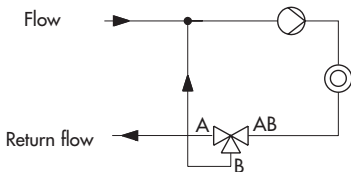
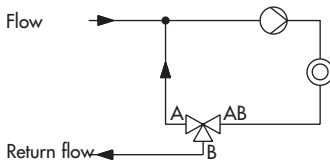


Fig. 3 · Typical applications

3 Operation

Operating instructions depend on the actuator used. Refer to the mounting and operating instructions for the appropriate actuator.

4 Maintenance—replacing parts

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

Depending on 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 leak. If the valve does not shut off properly, this may be because tight shut-off is prevented by dirt or other impurities between the seat and plug or because their facings have been damaged.

Valves in DN 15 to 25 have a one-piece plug with the same arrangement for both mixing and diverting valves.

Valves in DN 32 and larger have two V-port plugs. In mixing valves, the plugs move inwards into the seats, whereas the plugs of the diverting valves move outwards into the seats.

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 specified in the section on assembly.

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

**CAUTION!**

If you intend carrying out maintenance work on the valve, first depressurize the relevant plant section and, depending on the process medium, drain it as well. Let the plant section cool down to reach ambient temperature, if high temperatures prevail. Prior to starting any work, disconnect the electric or pneumatic control signal for the actuator. On pneumatic actuators, additionally remove the signal pressure line.

As the process medium cannot drain completely out of the valve, be aware that some of the process medium could still be trapped in the valve. We recommend that you remove the valve from the pipeline.

Note:

The tightening torques and special tools required for installing and removing the seat are listed in the table on page 20.

NOTICE

Prior to carrying out any repairs, always separate the actuator from the valve by removing screws on the stem connector (7) and undoing the nut (9). Then lift the actuator off the valve (see Fig. 2).

4.1 Replacing the bellows seal

If the packing leaks, this is due to a damaged bellows seal.

The entire bellows assembly together with the packing (4.2) must be replaced.

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

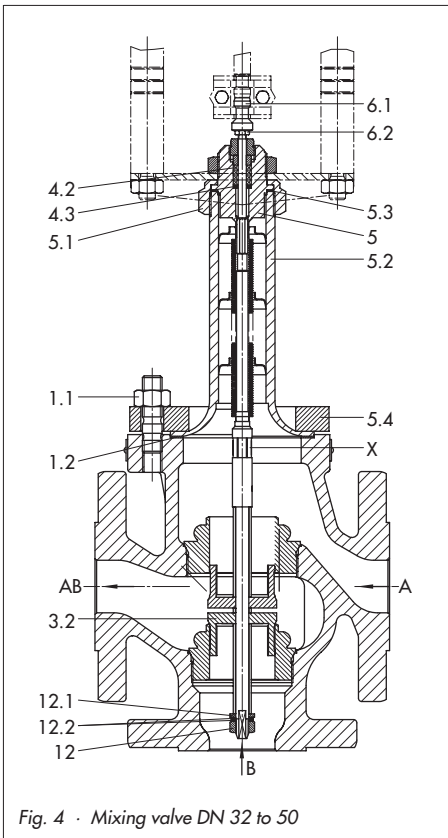


Fig. 4 · Mixing valve DN 32 to 50

Mixing and diverting valves in nominal sizes DN 32 to 80 differ from one another in the arrangement of their plugs and sleeves (see Fig. 4), whereas mixing and diverting valves in nominal sizes DN 15 to 25 have the same plug and sleeve arrangement.

4.1.1 Disassembly

1. Unscrew the stem connector nut (6.1) and lock nut (6.2) from the plug stem of valves in DN 50 or smaller.
2. Unscrew the coupling nut (5.1) from the bellows housing. Remove the nuts (1.1) and lift off the flange (5.4).
3. Pull the bellows housing (5.2) with the bellows assembly out of the body as far as they will go. Place an open-end wrench (SW 10 for \leq DN 50 or SW 13 for \geq DN 65) at the side on the hexagon (X) or at the flattened area of the plug stem to hold it stationary. Undo nut (1.2) and remove wrench.
4. Unthread nut (1.2). Remove the two lock washers (12.2) and washer (12.1).
5. **DN 15 to 25:**
Carefully pull the plug stem (6) together with the bellows assembly (5) and bellows housing (5.2) from the top out of the valve body.
DN 32 to 80:
Keep the bottom plug of diverting valves or the bottom sleeve of mixing valves on the plug stem. Use a long screw (M8 for nominal sizes DN 32 to 50 and M12 for DN 65 and 80) to keep the plugs (3.x) and sleeves (10.x) in the right order. Carefully lift the plug stem together with the bellows assembly (5) and bellows

housing (5.2) upwards out of the body. Guide the screw (to hold the plugs and sleeves) into the body and push upwards, allowing the plugs and sleeves to slide onto the screw.

6. Clean all parts thoroughly and check them for damage.
Replace the plug stem together with the bellows seal and packing.

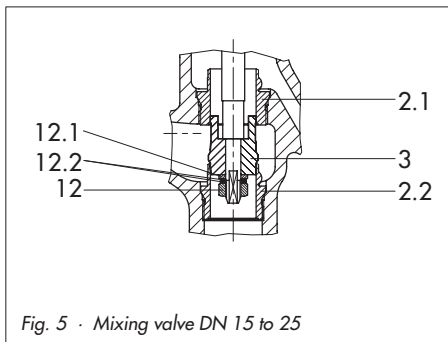
4.1.2 Reassembly

1. Apply lubricant (order no. 8150-0119) to the seal (5.3) and the threaded part of the bellows housing. Place seal (5.3) on the bellows housing (5.2).

Insert the bellows assembly (5) together with plug stem into the bellows housing. Finger-tighten the coupling nut (5.1) at first.

Insert body gasket (1.2) into the body.

2. **DN 15 to 25:**
Place ready-assembled bellows assembly on the valve body, while guiding the plug stem through the holes in the plug.



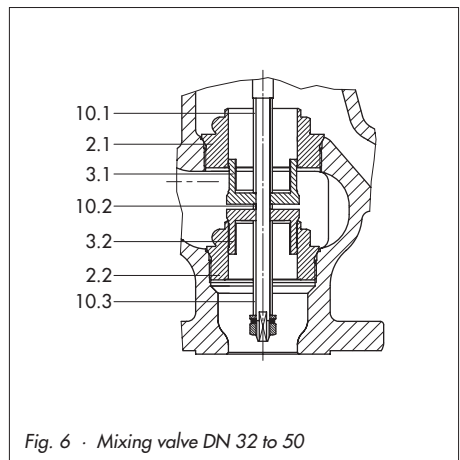
DN 32 to 80:

Gradually insert the plug stem of the ready-assembly bellows 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.

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

Note: For nominal sizes DN 15 to 50, a special tool designed to hold the washers (12.1 and 12.2) can be ordered from SAMSON (see table).

Especially on valves in nominal sizes DN 15 to 25, it is difficult to install the washers on the plug stem due to insufficient clearance.



- Slightly pull out the bellows housing (5.2) together with the bellows assembly. Place an open-end wrench at the side on the hexagon or the flattened part (X) of the plug stem to hold the stem stationary and to prevent the bellows from turning.

CAUTION!

Do not turn the bellows seal.

Firmly tighten the nut (12) to secure the plugs and the sleeves:

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

Remove the open-end wrench.

- Align flange (5.4) to the bellows housing (5.2), making sure the body gasket (1.2) is correctly positioned. Tighten nuts (1.1):

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

Firmly tighten the coupling nut (5.1) with 80 Nm.

- DN 15 to 50:**
Thread the lock nut (6.2) and stem connector nut (6.1) onto the top end of the plug stem.
Adjust the stem connector nut (6.1) to keep the dimension of 50 mm between the top of the bellows assembly (5) and the top of the stem connector nut (6.1) when the plug stem is completely in-

serted in the valve. Refer to the dimensional diagram on page 23.

Mount the actuator following the instructions in the corresponding mounting and operating instructions.

4.2 Replacing the seat and plug

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

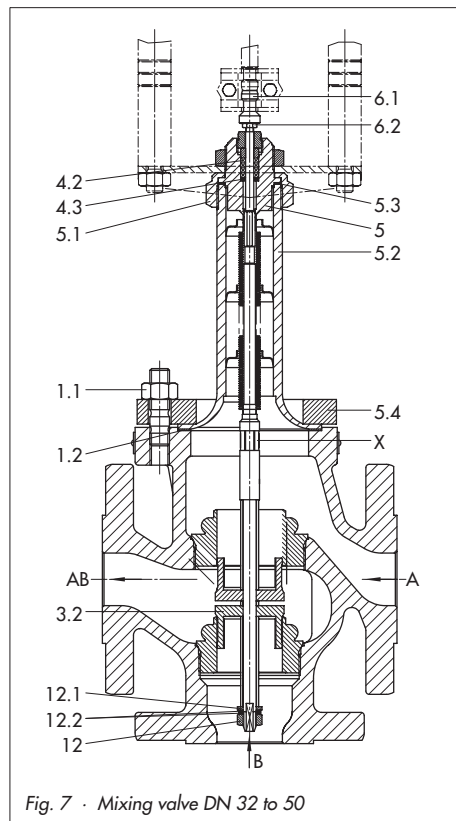


Fig. 7 · Mixing valve DN 32 to 50

4.2.1 Mixing valve

Disassembly

1. Unthread stem connector nut (6.1) and lock nut (6.2) from the plug stem of valves in DN 50 and smaller.
2. Unthread coupling nut (5.1) from the bellows housing. Remove nuts (1.1) and lift off flange (5.4).
3. Pull out bellows housing (5.2) and bellows assembly as far as they will go. Place an open-end wrench (SW 10 for valves \leq DN 50 or SW 13 for valves \geq DN 65) at the side on the hexagon (X) or at the flattened area of the plug stem to hold the stem stationary. Undo nut (12) and remove wrench.
4. Unthread nut (12). Remove the two lock washers (12.2) and washer (12.1). For valves in DN 32 to 80, pull bottom sleeve (10.3 or 11.4) off the plug stem.
5. Lift bellows housing (5.2) together with the bellows assembly (5) and carefully pull the plug stem (6) out of the valve body. Pull the bellows assembly (5) out of the bellows housing and remove the body gasket (1.2).

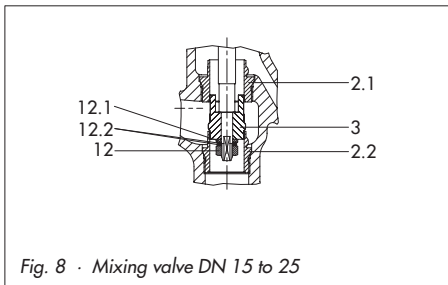


Fig. 8 · Mixing valve DN 15 to 25

Carefully clean all parts and check them for damage.

Replace defective parts with new ones.

6. For valves in DN 32 and larger, remove sleeve (10.1 or 11.1). Unscrew the top seat (2.1) using a suitable seat wrench (see table on page 20).
7. **DN 15 to 25**
Lift plug (3) out of the body.

DN 32 to 50

Lift top plug (3.1), sleeve (10.2) and bottom plug (3.2) out of the body.

DN 65 and 80

Lift top plug (3.1), sleeves (11.2 and 11.3) and bottom plug (3.2) out of the body.

8. Unscrew the bottom seat (2.2) from of the body.

Clean all parts. Check them and, if necessary, machine them or replace them with new parts.

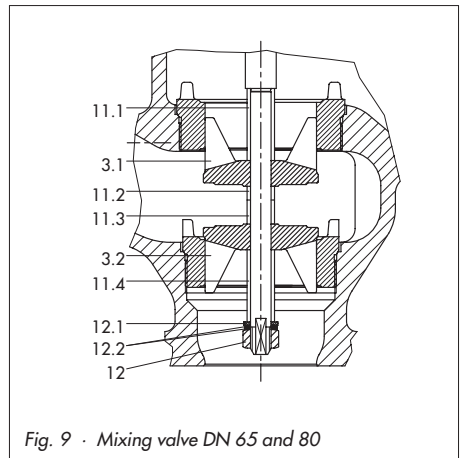


Fig. 9 · Mixing valve DN 65 and 80

Reassembly

1. Apply lubricant (order no. 8150-0119) to the seal (5.3) and the threaded part of the bellows housing. Place seal (5.3) on the bellows housing (5.2). Insert the bellows assembly (5) with plug stem into the bellows housing. Finger-tighten the coupling nut (5.1) at first.

2. Apply lubricant (order no. 8150-0119) to the thread and sealing cone of the new or machined seats.

3. Use the seat wrench to screw in the bottom seat (2.2), observing the correct tightening torques:

Valve	DN 15 to 25	DN 32 to 50	DN 65 and 80
Seat thread	M32x1.5	M58x1.5	M90x1.5
Tightening torque	120 Nm	500 Nm	1050 Nm

4. **DN 15 to 25**
Insert plug (3) into bottom seat (2.2).

DN 32 to 50
Insert bottom plug (3.2) into bottom seat (2.2). Place the short sleeve (10.2) and top plug (3.1) one after the other onto the bottom plug. To keep them in order, insert a long M8 screw through the bottom plug.

DN 65 and 80
Insert bottom plug (3.2) into bottom seat (2.2). Place two short sleeves (11.3 and 11.2) and the top plug one after the other onto the bottom plug. To keep them in order,

insert a long M8 screw through the bottom plug.

5. Screw top seat (2.1) into the body, ensuring that the top plug can easily slide into the seat. Use tightening torque listed in the table for step 3. Insert body gasket (1.2) into top valve flange.

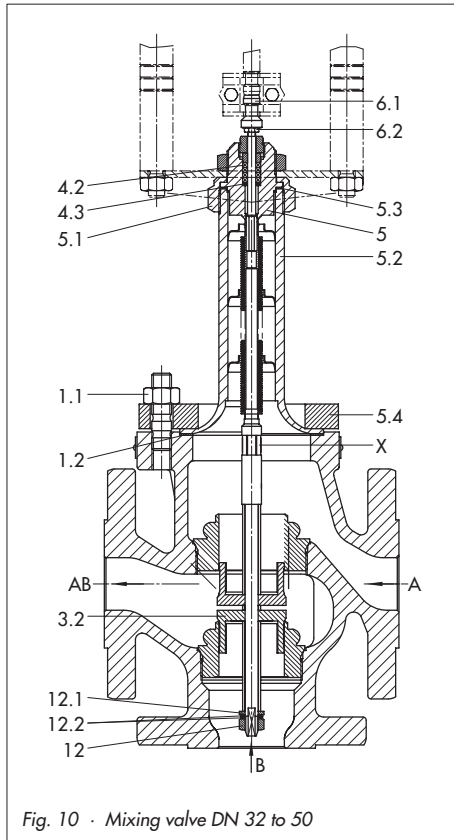


Fig. 10 · Mixing valve DN 32 to 50

6. **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 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 sleeve (10.3) from underneath onto the plug stem.

DN 65 and 80

Slide 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 11.3) and bottom plug (3.2) into the body and at the same time remove the M12 screw. Slide sleeve (11.4) from underneath onto the plug stem.

7. First place the washer (12.1) and then the pair of serrated lock washers (12.2) onto the plug stem, making sure the coarsely serrated surfaces of the lock washers face each other and the radial ribs face outwards.

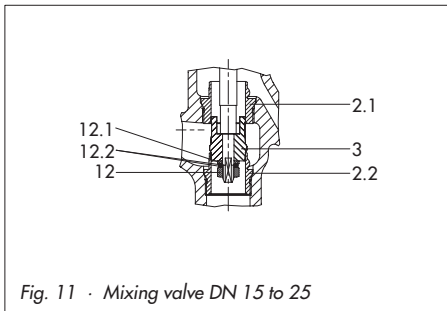


Fig. 11 · Mixing valve DN 15 to 25

Finger-tighten the nut (12) onto the plug stem.

Note: For nominal sizes DN 15 to 50, a special tool designed to hold the washers (12.1 and 12.2) can be ordered from SAMSON (see table).

Especially on valves in nominal sizes DN 15 to 25, it is difficult to install the washers on the plug stem due to insufficient clearance.

8. Slightly pull out the bellows housing (5.2) together with the bellows assembly. Place an open-end wrench at the side on the hexagon or the flattened part (X) of the plug stem to hold the stem stationary and to prevent the bellows from turning.

CAUTION!

Do not turn the bellows seal.

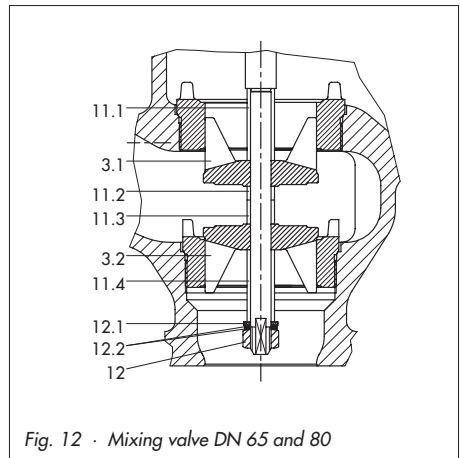


Fig. 12 · Mixing valve DN 65 and 80

Tighten nut (12) to fasten the plug and sleeves:

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

Remove the open-end wrench.

9. Align flange (5.4) to the bellows housing (5.2), making sure the body gasket (1.2) is correctly positioned.

Tighten nuts (1.1):

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

Firmly tighten the coupling nut (5.1) with 80 Nm.

10. **DN 15 to 50:**

Thread the lock nut (6.2) and stem connector nut (6.1) onto the top end of the plug stem.

Adjust the stem connector nut (6.1) to keep the dimension of 50 mm between the top of the bellows assembly (5) and the top of the stem connector nut (6.1) when the plug stem is completely inserted into the valve. Refer to the dimensional diagram on page 23.

Mount the actuator following the instructions in the corresponding mounting and operating instructions.

4.2.2 Diverting valve

Disassembly

1. Unscrew the stem connector nut (6.1) and lock nut (6.2) from the plug stem of valves in DN 50 or smaller.
2. Unscrew the coupling nut (5.1) from the bellows housing. Remove the nuts (1.1) and lift off the flange (5.4).
3. Pull the bellows housing (5.2) with the bellows assembly out of the body as far as they will go. Place an open-end wrench (SW 10 for \leq DN 50 or SW 13 for \geq DN 65) at the side on the hexagon (X) or at the flattened area of the plug stem to hold it stationary. Undo nut (12) and remove wrench.
4. Unthread nut (12). Remove two lock washers (12.2) and washer (12.1).

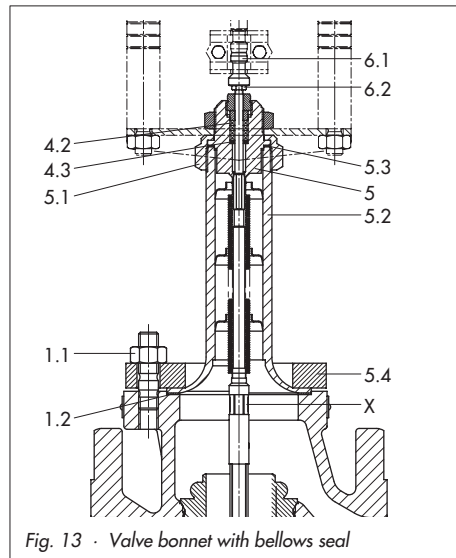


Fig. 13 · Valve bonnet with bellows seal

5. Pull the bellows assembly (5) from the bellows housing and remove body gasket (1.2).
Clean all parts thoroughly and check them for damage.
Replace defective parts.
6. **DN 15 to 25**
Unscrew top seat (2.1). Take plug (3) out of the body and remove bottom seat (2.2).
- DN 32 to 50**
Remove top seat (3.1) together with the three sleeves (10.1, 10.2, 10.3) from the body.
- DN 65 and 80**
Remove top seat (3.1) together with the four sleeves (11.1, 11.2, 11.3, 11.4) from the body.
7. **DN 32 to 80**
Use a suitable seat wrench (see page 20) to unscrew the top and bottom seat (2.1, 2.2) out of the body.
Remove bottom plug (3.2) from the body.

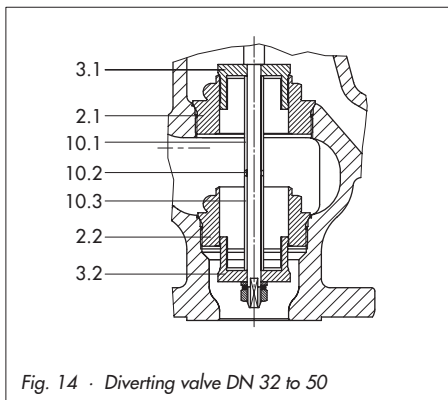


Fig. 14 · Diverting valve DN 32 to 50

Carefully clean all parts and check them for damage. If necessary, machine or replace any defective parts.

Reassembly

1. Apply lubricant (order no. 8150-0119) to the seal (5.3) and the threaded part of the bellows housing.
Place seal (5.3) on the bellows housing (5.2).
Insert the bellows assembly (5) with plug stem into the bellows housing.
Finger-tighten the coupling nut (5.1) at first.
2. Apply lubricant (order no. 8150-0119) to the thread and sealing cone of the new or machined seats.
3. **DN 15 to 25**
Screw in bottom seat (2.2) and tighten:

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

Place plug (3) in bottom seat. Screw in top seat (2.1) allowing the plug to slide into the seat from underneath. Tighten top seat with the same tightening torque.

DN 32 to 50

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

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

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

Valve	DN 65 and 80
Seat thread	M90 x 1.5
Tightening torque	1050 Nm

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

- For valves in DN 32 and larger, insert bottom plug into bottom seat. Insert body gasket (1.2) into body flange. Carefully place the bellows housing (5.2) onto the body, while guiding the plug stem (6). Hold the plug in the seat to push the

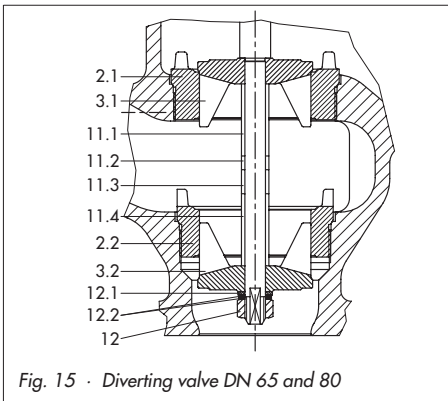


Fig. 15 · Diverting valve DN 65 and 80

plug stem in the middle through the plug bore.

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

Note: For nominal sizes DN 15 to 50, a special tool designed to hold the washers (12.1 and 12.2) can be ordered from SAMSON (see table).

Especially on valves in nominal sizes DN 15 to 25, it is difficult to install the washers on the plug stem due to insufficient clearance.

- Slightly pull out the bellows housing (5.2) together with the bellows assembly. Place an open-end wrench at the side on the hexagon or the flattened part

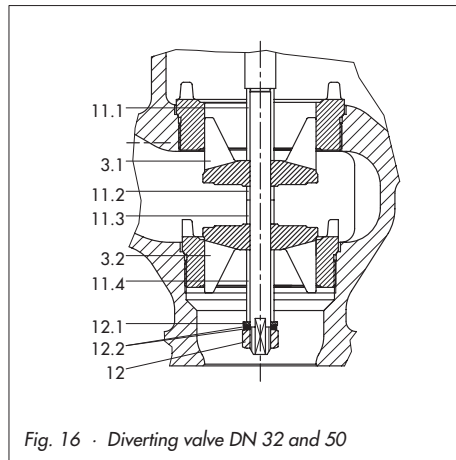


Fig. 16 · Diverting valve DN 32 and 50

(X) of the plug stem to hold the stem stationary and to prevent the bellows from turning.

Mount the actuator following the instructions in the corresponding mounting and operating instructions.

CAUTION!

Do not turn the bellows seal.

Tighten nut (12) to fasten the plug and sleeves:

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

Remove the open-end wrench.

- Align flange (5.4) to the bellows housing (5.2), making sure the body gasket (1.2) is correctly positioned.

Tighten nuts (1.1):

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

Firmly tighten the coupling nut (5.1) with 80 Nm.

- DN 15 to 50:**
Thread the lock nut (6.2) and stem connector nut (6.1) onto the top end of the plug stem.
Adjust the stem connector nut (6.1) to keep the dimension of 50 mm between the top of the bellows assembly (5) and the top of the stem connector nut (6.1) when the plug stem is inserted completely into the valve. Refer to the dimensional diagram on page 23.

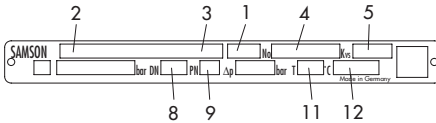
4.3 Tools and tightening torques

Valve nominal 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	1280-3010	1280-3011	1280-0305
Tool to retain	1280-3059 for washer (12.1) and lock washer (12.2)		
Tightening torque ($\pm 10\%$)			
Valve seat	120 Nm (M32x1.5)	500 Nm (M58x1.5)	1050 Nm (M90x1.5)
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		

5 Nameplate descriptions

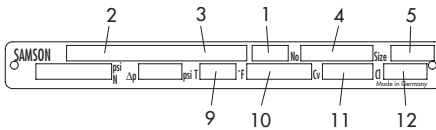
The DIN and ANSI versions have different nameplates.

5.1 DIN version



- 1 Valve type
- 2 Model number
- 3 Model number revision index
- 4 Order number or order date
- 5 K_{VS} coefficient
- 8 Nominal size
- 9 Nominal pressure
- 11 Permissible temperature ($^{\circ}\text{C}$)
- 12 Body material

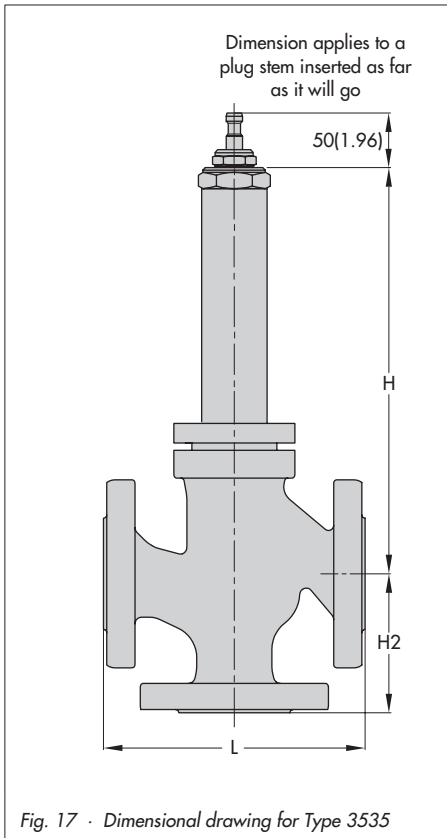
5.2 ANSI version



- 1 Valve type
- 2 Model number
- 3 Model number revision index
- 4 Order number or order date
- 5 Valve size
- 9 Permissible temperature ($^{\circ}\text{F}$)
- 10 Body material
- 11 C_v coefficient
- 12 Pressure rating

6 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
1/2	7.25	7.50	9.25	3.62	3.76
3/4		7.62			3.82
2		7.75			3.88
1 1/2	8.75	9.25	9.65	4.37	4.63
2	10.00	10.50		5.00	5.26
2 1/2	10.78	11.50	13.78	5.43	5.75
3	11.75	12.50		5.87	6.26



7 Customer inquiries

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

- ▶ Type designation and order no. (see nameplate)
- ▶ Order number (see nameplate)
- ▶ Serial number
- ▶ Nominal size and valve version
- ▶ Pressure and temperature of process medium
- ▶ Flow rate in m³/h
- ▶ Bench range (signal pressure range), e.g. 1.4 to 2.3 bar, when a pneumatic actuator is used
- ▶ Installation drawing



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>

EB 8135/8136 EN

2011-09