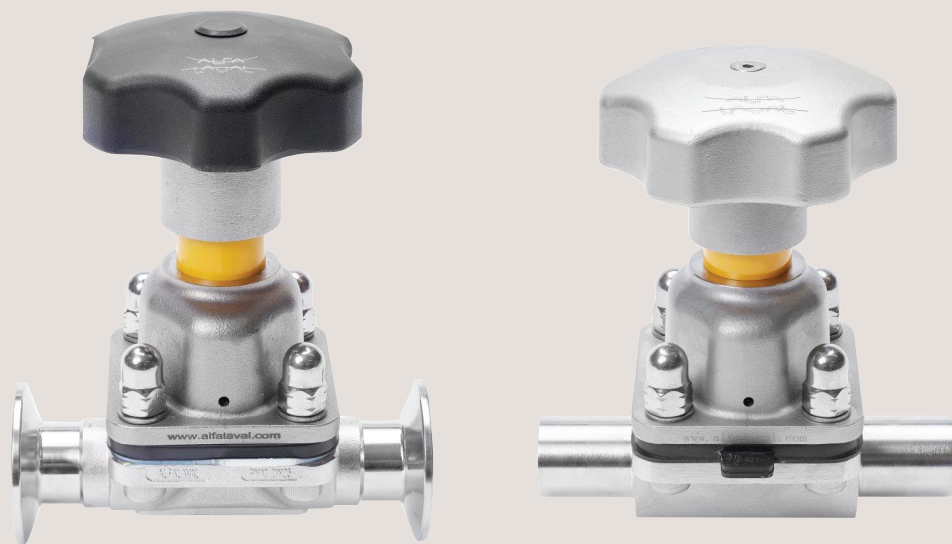




Instruction Manual

Unique DV-ST UltraPure – Manual: for valve sizes DN8 to DN100 (1/4" to 4")



ESE01752-EN12 2022-10

Original manual

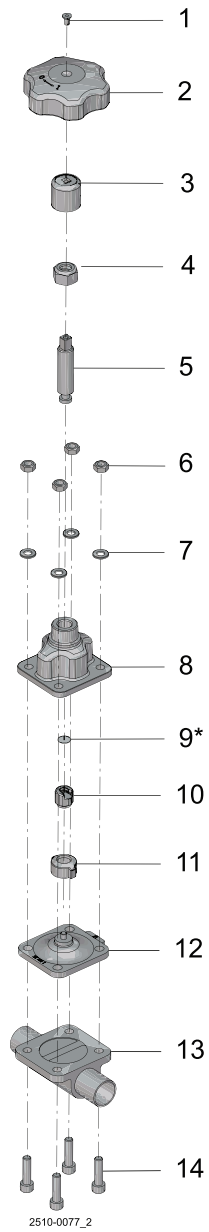
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The information herein is correct at the time of issue but may be subject to change without prior notice

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1 General information

1.1 Valve design



- 1 Countersink screw
- 2 Handwheel
- 3 Coupling
- 4 Position nut
- 5 Spindle
- 6 Nuts
- 7 Washers
- 8 Yoke
- 9 Thrust washer*
- 10 Diaphragm holder
- 11 Compressor
- 12 Diaphragm
- 13 Valve body
- 14 Fasteners

*) Remember to insert "thrust washer" (9) during installation of the diaphragm holder onto the spindle

*Unsafe practices and other important information are indicated in this manual.
Warnings are emphasised by means of special signs.*

2.1 Important information

Always read this manual before using the valve!

WARNING

Indicates that special procedures must be followed to avoid serious personal injury.

CAUTION

Indicates that special procedures must be followed to avoid damage to the valve.

NOTE

Indicates important information to simplify or clarify procedures.

2.2 Warning signs

General warning:



Caustic agents:



2 Safety

All warnings in this manual are summarised on this page.

Pay special attention to the instructions below so that serious personal injury and/or damage to the valve are avoided.

2.3 Safety precautions

Installation:



Never touch the valve or the pipelines when processing hot liquids or when sterilising

Never dismantle the valve with valve and pipelines under pressure

Never dismantle the valve when it is hot

Operation:



Never dismantle the valve with valve and pipelines under pressure

Never dismantle the valve when it is hot

Never touch the valve or the pipelines when processing hot liquids or when sterilising

Never touch moving parts if the actuator is supplied with compressed air

Always rinse well with clean water after cleaning

Always handle lye and acid with great care



Maintenance:



Never service the valve when it is hot

Never service the valve with the and pipelines under pressure

Never put your fingers through the valve ports if the actuator is supplied with compressed air

Never touch moving parts if the actuator is supplied with compressed air

Transportation:

Always check that all connections are disconnected before attempting to remove the valve from the installation

Always drain liquid from valves before transportation

Always used pre-defined lifting points if given

Always ensure that the valve is adequately secured during transportation - if specially designed packaging material is available, it must be used

*The instruction manual is part of the delivery. Study the instructions carefully.
The items refer to the parts list and the service kits section.
The valve is supplied as separate parts as standard (for welding).
The valve is assembled before delivery, if it is supplied with fittings.*

3.1 Unpacking/delivery

Step 1

CAUTION

Alfa Laval cannot be held responsible for incorrect unpacking.

Check the delivery for:

1. Complete valve.
2. Delivery note.

Step 2

1. Remove any packing materials from the valve/valve parts.
2. Inspect the valve/valve parts for visible transportation damage.
3. Avoid damaging the valve/valve parts.

3.2 General installation

Step 1



Always read the technical data thoroughly.

CAUTION

Alfa Laval cannot be held responsible for incorrect installation.



Always read the technical data thoroughly.

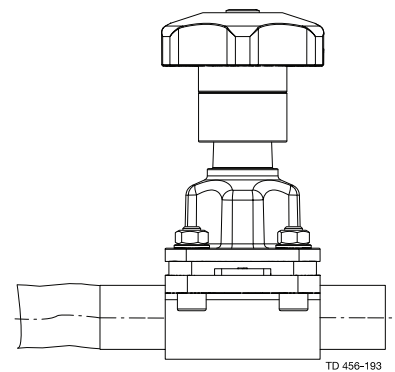
CAUTION

Alfa Laval cannot be held responsible for incorrect installation.

Avoid stressing the valve.

Pay special attention to:

- Vibrations.
 - Thermal expansion of the pipelines.
 - Excessive welding.
 - Overloading of the pipelines.
-
- For draining the diaphragm valve and pipeline, an appropriate installation position must be provided.
 - Variable installation position. For self-draining, see the data on the installation angle.
 - For diaphragm valves with weld ends, remove the bonnet and diaphragm from the valve body before welding.



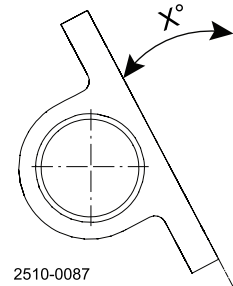
Risk of damage!

3 Installation

Study the instructions carefully and pay special attention to the warnings!

3.3 Installation angle on self-draining position

Table 1. Drain angle x



Port size		ASME BPE	ISO 2037	DIN 11866 (Series A)	ISO 1127 (Series B)
DN	Inch				
8	1/4"	37°	27°	27°	22°
10	3/4"	33°	28°	28°	31°
15	1/2"	32°	23°	23°	18°
20	3/4"	26°	23°	23°	15°
25	1"	22°	25°	21°	20°
40	1 1/2"	24°	24°	22°	18°
50	2"	24°	24°	23°	20°
65	2 1/2"	20°	22°	19°	15°
80	3"	22°	25°	22°	15°
100	4"	14°	13°	8°	8°

3.4 Drainability

Proper drainability in horizontally level installed pipes requires mounting of the valve at the correct angle. See table below.

To ensure proper drainability, the valve must be mounted at the correct angle. Proper installation is the responsibility of the system installer and/or user.

3.5 Welding

Step 1

All welding should be done by qualified personnel.

Disassemble the bonnet and the diaphragm from the valve body. See Replacing the Diaphragm for details.

Step 2

Perform the welding procedure on the body according to standard industrial practices.

Step 3

Reassemble the bonnet and the diaphragm to the valve body.

Step 4

Test the valve for proper operation before installing.

3.6 Mounting of the bonnet

For T-valves, Tandem valves, Tank outlet valves and Block valves, please note that the bonnet is mounted using studs and nuts instead of bolts and nuts.

Study the instructions carefully and pay special attention to the warnings!

3.7 Recycling information

- **Unpacking**

- Packing material consists of wood, plastics, cardboard boxes and in some cases metal straps
- Wood and cardboard boxes can be re-used, recycled or used for energy recovery
- Plastics should be recycled or burnt at a licensed waste incineration plant
- Metal straps should be sent for material recycling

- **Maintenance**

- During maintenance, oil and wear parts in the machine are replaced
- All metal parts should be sent for material recycling
- Worn out or defective electronic parts should be sent to a licensed handler for material recycling
- Oil and all non-metal wear parts must be disposed of in agreement with local regulations

- **Scrapping**

- At end of use, the equipment must be recycled according to relevant, local regulations. Besides the equipment itself, any hazardous residues from the process liquid must be taken into consideration and dealt with in a proper manner. When in doubt, or in the absence of local regulations, please contact your local Alfa Laval sales company
-

4 Maintenance

Study the instructions carefully and pay special attention to the warnings!

4.1 General maintenance

Apply Klüberpaste UH1 84-201 or an equivalent medium to the spindle during service in order to prevent galling and/or excessive wear.

Remember to insert "thrust washer" (9) during installation of the diaphragm holder onto the spindle

4.2 Diaphragm maintenance

Generally, the only routine maintenance required is the replacement of the diaphragm.

Diaphragm replacement routine

Depending on the medium, the pressure, temperature and cycle (duration and temperature) of steam sterilisation between process runs, determines the optimum change cycle of the diaphragm.

4.3 Replacing the diaphragm

Before servicing any installed valve you must:

- depressurise the system
- open the valve
- purge the valve

Note: The diaphragm can be replaced without removing the valve body.

Step 1

Only use Alfa Laval diaphragms.

Step 2

Actuate the valve to the "open" position by rotating the handwheel counter-clockwise until the valve is fully opened.

Step 3

Remove the body fasteners by using a crosswise sequence. Remove the bonnet.

Step 4

Actuate the valve to the "closed" position by rotating the handwheel clockwise.

Step 5

Remove the diaphragm from the bonnet

Button-style compressor:

- Remove the diaphragm by pulling it out slightly.

Threaded-style compressor:

- Unthread the diaphragm in a counter-clockwise direction.

Bayonet-style compressor:

- Rotate the diaphragm 90° and remove.

NOTE

see fig. 1-3, reverse action of step 9.

Step 6

Check and clean thread and bayonet of the compressor.

Step 7

Ensure, that the new diaphragm and the contact area on the valve body are clean and dry.

Study the instructions carefully and pay special attention to the warnings!

Step 8

Ensure that the bonnet compressor matches the connection of the diaphragm. Should this not be the case, replace the compressor.

Step 9

With the bonnet in the "closed" position, install the diaphragm as follows:

Button-style compressor:

- Insert diaphragm with a push and a slight rotation.
- Rotate the diaphragm until the holes match.

Threaded-style compressor:

- Thread the diaphragm into the compressor in a clockwise direction. Do not overtighten.
- Then, if necessary, turn the diaphragm in a counter-clockwise direction until the holes match.

Bayonet-style compressor:

- Insert diaphragm with bayonet into the compressor recess.
- Rotate diaphragm 90°. Holes must match.
- Ensure diaphragm holder slot is aligned with compressor guides.

Fig. 1

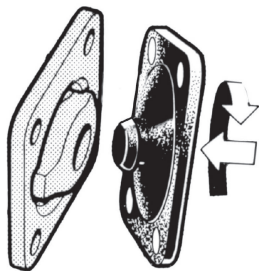


Fig. 2

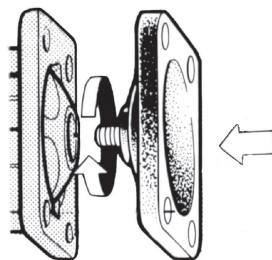
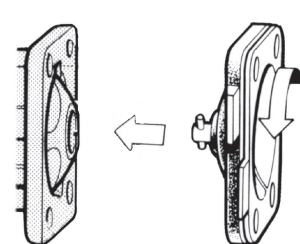


Fig. 3



Step 10

Actuate the valve to the "open" position, see step 2.

Step 11

Align the bonnet to the valve body using bonnet fasteners. Assemble the nuts and, if necessary, use washers. To secure the bonnet and body, tighten the fasteners by hand.

4 Maintenance

Study the instructions carefully and pay special attention to the warnings!

Step 12

Actuate the valve to an almost closed position. Fully closing the valve can damage the diaphragm position, so that the diaphragm does not properly fit to the weir, see step 4. Tighten the body fasteners cross-wise using a wrench.

NOTE! Proper assembly extends the life of the diaphragm. Correctly assembled diaphragms have a Crescent-shaped bulge in the diaphragm edge which can be observed from the side (Fig. 6).

Fig. 4

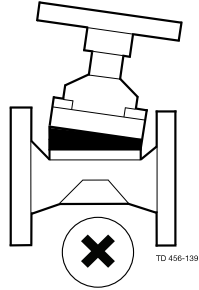


Fig. 5

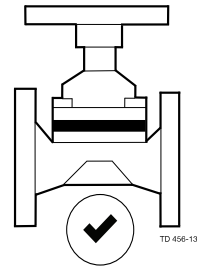
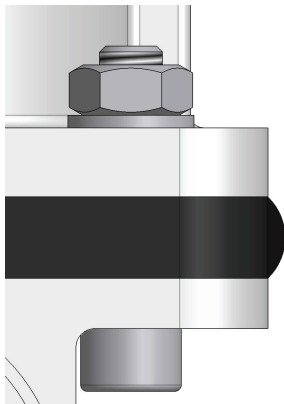


Fig. 6



Size

Rec. assembly torque

DN8	3-6 Nm
DN15	10-14 Nm
DN20	10-14 Nm
DN25	10-14 Nm
DN40	20-25 Nm
DN50	25-33 Nm
DN65	28-35 Nm
DN80/100	30-38 Nm

Note: Torque values are guidance. Fig 4 to be assessed together with torque values.

Step 13

Actuate the valve to the "open" position, see step 2. Lightly re-tighten the body fasteners cross-wise using a wrench.



NOTE

Proper assembly extends the life of the diaphragm. Correctly assembled diaphragms have a crescent-shaped bulge in the diaphragm edge which can be observed from the side.

Step 14

Test the valve for proper function.

NOTE

Check the fasteners 24 hours after operation of the valves. In case of leakage at the body, depressurise the system and, if necessary, tighten the fasteners again as described. If leakage continues, replace the diaphragm. Check the travel stop and adjust, if necessary.

Study the instructions carefully and pay special attention to the warnings!

4.4 Travel stop adjustment

Please note:

Section 5.3 is **not** valid for sizes DN8 and DN10 (1/8" and 3/8")

Step 1

CAUTION



Before servicing any installed valve, you must:

- depressurise the system
- open the valve
- purge the valve

Step 2

Make sure that the bonnet and diaphragm are properly installed. See also **Replacing the diaphragm**.

Step 3

Rotate the handwheel in a clockwise position until the valve is fully closed.

Step 4

Remove the plug from the top of the handwheel, for composite version only.

Step 5

Unscrew countersink screw by allen key.

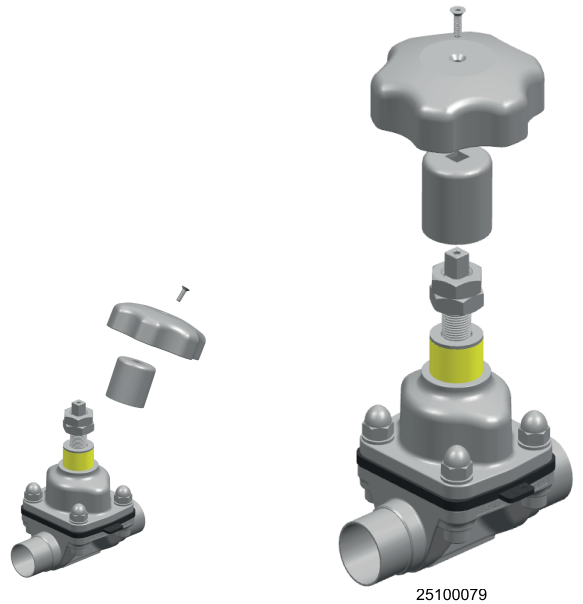


4 Maintenance

Study the instructions carefully and pay special attention to the warnings!

Step 6

Remove screw, handwheel and coupling.



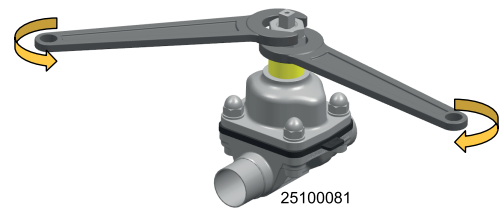
Step 7

Screw down spindle by wrench, until valve is closed..



Step 8

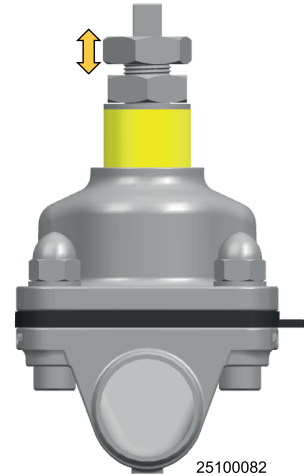
Use two wrenches to loosen the position nut and lock nut.



Study the instructions carefully and pay special attention to the warnings!

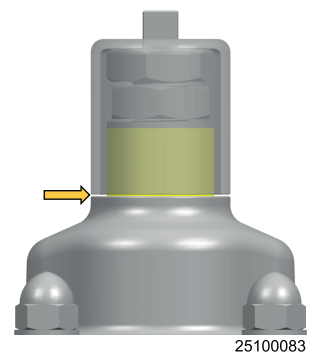
Step 9

Adjust the position of position nut.



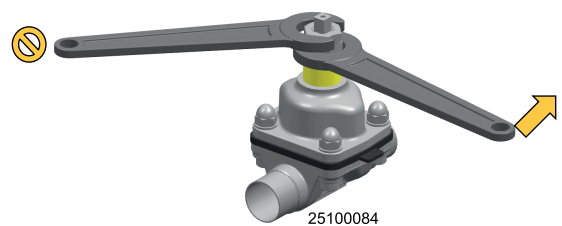
Step 10

Put coupling on, and see the gap between Yoke and coupling is adequate (~0.5mm).



Step 11

Hold position nut in place and counter screw lock nut.



Step 12

Remount coupling, handwheel and top screw.
Tighten screw.

Step 13

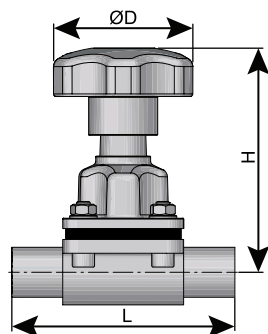
Test the valve for proper function.

Note: If the completely closed valve does not achieve a leaktight seal, repeat steps 1 to 11, with slightly more tightening of the stem as described in step 7.

5 Technical data

Study the instructions carefully and pay special attention to the warnings!

5.1 Size



DN	Size	ØD mm (in)	H mm (in)	L (weld ends) mm (in)	L (clamp) mm (in)
	Inch				
08-10	¼" - ⅜"	Ø40 (1.575)	65 (2.559)	89 (3.504)	89 (3.504)
15	½"	Ø62 (2.441)	101 (3.976)	110 (4.331)	108 (4.252)
20	¾"	Ø62 (2.441)	116 (4.567)	119 (4.685)	118 (4.646)
25	1"	Ø87 (3.425)	128 (5.039)	129 (5.079)	127 (5.000)
40	1½"	Ø108 (4.252)	165 (6.496)	161 (6.338)	159 (6.260)
50	2"	Ø108 (4.252)	195 (7.677)	192 (7.559)	191 (7.520)
65	2½"	Ø172 (6.772)	255 (10.039)	218 (8.583)	21D6 (8.504)
80	3"	Ø220 (8.661)	274 (10.787)	256 (10.079)	254 (10.000)
100	4"	Ø220 (8.661)	280 (11.024)	218 (8.583)	305 (11.961)

5.2 Temperature recommendations and service lifetime

Diaphragm properties - product wetted area

Description	Temperature recommendations		
	Liquid		Steam
	Min.	Max.	Max.
EPDM	-40°C/-40°F	130°C/266°F	150°C/302°F ¹⁾
PTFE/EPDM	-5°C/23°F	175°C/347°F	150°C/302°F ²⁾
TFM/EPDM	-5°C/23°F	175°C/347°F	150°C/302°F ²⁾

¹⁾ Continuous temperature

²⁾ 40 min. steam sterilisation

Chemical compatibility: Please contact Alfa Laval for information.

Diaphragm service lifetime

Diaphragm material	Code (marked on diaphragm)	Max. recommended service lifetime in years (stock and operation)
EPDM	S2, S3, S4	8
PTFE/EPDM	93	8
TFM/EPDM	LC	8

Note! Correct storage (e.g. in accordance with ISO 2230) is a prerequisite for achieving the specified storage time.

How to contact Alfa Laval

Contact details for all countries are continually updated on our website.

Please visit www.alfalaval.com to access the information directly.

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