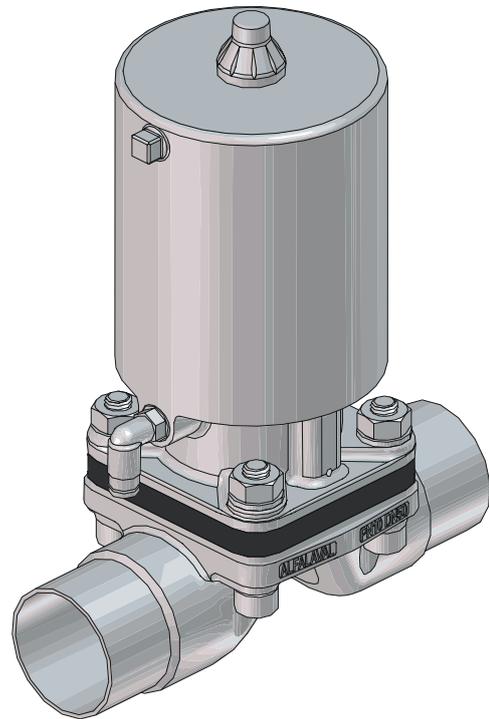
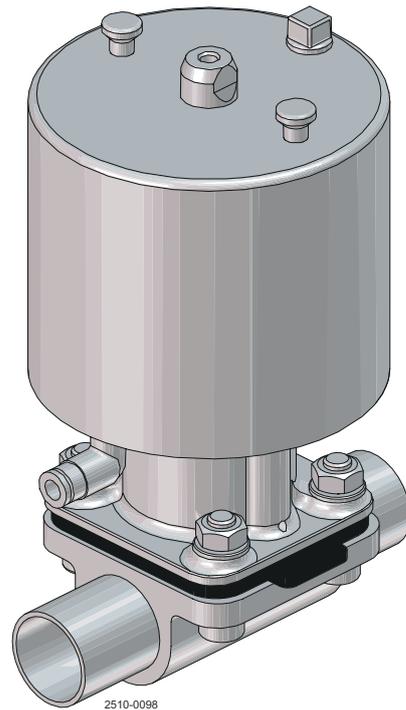


Alfa Laval Unique DV-ST UltraPure - pneumatic, valve sizes DN8-DN100 (1/4" to 4")

Diaphragm valves



Lit. Code

200008002-2-EN-GB

Instruction Manual

Published by
Alfa Laval Kolding A/S
Albuen 31
DK-6000 Kolding, Denmark
+45 79 32 22 00

The original instructions are in English

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1 Declarations of Conformity

1.1 EU Declaration of Conformity

The designated company

Alfa Laval Kolding A/S, Albuen 31, DK-6000 Kolding, Denmark, +45 79 32 22 00

Company name, address and phone number

Hereby declare that

Valve

Designation

Unique DV-ST UltraPure

Type

Serial number for actuator: from KS1827400000 to KS9936524595

Serial number from Q 000001 to 999999, AAB000000001 to AAB999999999, E 000001 to 999999, 100700000001 to 100799999999 and AAX000000001 to AAX999999999

is in conformity with the following directives with amendments:

- Machinery Directive 2006/42/EC
- ATEX Directive 2014/34/EU

Marking:



II 2G Ex h IIB T4 Gb (-10 °C ≤ tamb ≤ 80 °C)

II 3D Ex h IIIB T100 °C Dc (-10 °C ≤ tamb ≤ 80 °C)

The valve technical file is stored with: Danish Technological Institute, Kongsvang Allé 29, 8000 Aarhus C, Denmark

Notified Body no.: 0396

Certificate. no.: DTI 17ATEX0067X

The person authorised to compile the technical file is the signer of this document.

Vice President BU Hygienic Fluid Handling

Head of Product Management

Title

Mikkel Nordkvist

Name

Kolding, Denmark

Place

2024-09-01

Date (YYYY-MM-DD)

Signature

DoC Revison_ 01_092024 / This Declaration of Conformity replaces Declaration of Conformity dated 2022-10-01



1.2 UK Declaration of Conformity

The designated company

Alfa Laval Kolding A/S, Albuen 31, DK-6000 Kolding, Denmark, +45 79 32 22 00

Company name, address and phone number

Hereby declare that

Valve

Designation

Unique DV-ST UltraPure

Type

Serial number for actuator: from KS1827400000 to KS9936524595

Serial number from Q 000001 to 999999, AAB000000001 to AAB999999999, E 000001 to 999999, 100700000001 to 100799999999 and AAX000000001 to AAX999999999

is in conformity with the following directives with amendments:

- The Supply of Machinery (Safety) Regulations 2008
- The Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations 2016

Marking:



II 2G Ex h IIB T4 Gb (-10 °C ≤ tamb ≤ 80 °C)

II 3D Ex h IIIB T100 °C Dc (-10 °C ≤ tamb ≤ 80 °C)

The valve technical file is stored with: Danish Technological Institute, Kongsvang Allé 29, 8000 Aarhus C, Denmark

Notified Body no.: 0396

Certificate. no.: DTI 17ATEX0067X

Signed on behalf of: Alfa Laval Kolding A/S.

Vice President BU Hygienic Fluid Handling
Head of Product Management

Title

Mikkel Nordkvist

Name

Kolding, Denmark

Place

2024-09-01

Date (YYYY-MM-DD)

Signature

DoC Revison_ 02_092024



1.3 ATEX Directive 2014/34/EU

ATEX Directive 2014/34/EU

The ATEX Directive 2014/34/EU covers equipment and protective systems that will be used in areas endangered by potentially explosive atmospheres created by the presence of flammable gases, vapours and dusts. Pneumatic diaphragm valves supplied with an ATEX symbol are classified for use in potentially explosive atmospheres under ATEX Directive 2014/34/EU Group II, Categories 2 and 3.

Technical File Ref	Unique DV-ST UltraPure - Document reference no. 9612960801.
Equipment Group and Category	Group II (Zone 1), category 2 G and 3 D
Standards used	EN 80079-36:2016, EN 80079-37:2016

WARNING

For utilization in ATEX Environment:

- May not be used with extremely ignition sensitive dusts such as Sulphur.
- May not be used with ignition sensitive gas/air mixtures as ethylene, carbon monoxide and ethylene oxide.
- The valve body shall be mounted to a conductive and grounded system, either by welding or clamping.
- The actuator has a lifetime for 250,000 activations. The actuator shall be replaced after the number of activations. Repair is not allowed.
- Only for liquids with high conductivity above 1000 pS/m can be used.

1.4 ATEX Marking

The laser marking is found on the external surface of the actuators.

Example of marking:

	
Manufacturer	
Alfa Laval Kolding A/S, Albuen 31, DK-6000	
Valve type: Unique DV-ST UltraPure	
Serial No. xxxxxxxxxx	Year YYYY-MM ²
Cert. No. DTI 17ATEX0067X	
 II 2G EX h IIB T4 Gb	
	II 3D EX h IIIB T100°C Dc
Specification: DNXX ¹	ZZZZZ ³ PN10
Recommended air pressure: Min. x.x bar ⁴	
Service enquiries www.alfalaval.com	

2510-0099

1. Actuator size stated e.g. DN25.
2. Year and month stated e.g. 2017-05.
3. Actuator type: NC, NO or air/air.
4. See table for recommended air pressure.

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2 Safety

Read this first



This Instruction Manual is designed for operators and service engineers working with the supplied Alfa Laval product.

Operators must read and understand the **Safety, Installation and Operating** instructions of the supplied Alfa Laval product before carrying out any work or before you put the supplied Alfa Laval product into service!

Not following the instructions can result in serious accidents.

This documentation describes the authorized way to use the supplied Alfa Laval product. Alfa Laval will take no responsibility for injury or damage if the equipment is used in any other way.

This Instruction Manual is designed to provide the user with the information to perform tasks safely for all phases in the lifetime of the supplied Alfa Laval product.

The operator shall always read the chapter **Safety** first. Hereafter the operator can skip to the relevant section for the task to be carried out or for the information needed.

Always read the chapter **Technical Data** thoroughly.

This is the complete Instruction Manual for the supplied Alfa Laval product.

NOTE

The illustrations and specifications in this Instruction Manual were effective at the date of printing. However, as continuous improvements are our policy, we reserve the right to alter or modify the Instruction Manual without prior notice or any obligation.

The English version of the Instruction Manual is the original manual. Alfa Laval cannot be held responsible for incorrect translations. In case of doubt, the English version applies.

2.1 Safety Signs

Mandatory Action Signs

	General mandatory action sign.
	Refer to instruction manual.
	Use eye protection - safety glasses.
	Use protective hand wear - safety gloves.
	Wear protective equipment - safety helmet.
	Use ear protection in noisy environments - noise protector.
	Wear protective equipment - safety shoes.

Warning Signs

	General warning.
	Corrosive substance.
	Hot surface and burning danger.
	Cutting danger.
	Crushing of hands.

	<p>Transportation with forklift truck or other industrial vehicles if heavy.</p>
	<p>Danger of injury (lasermarked on the actuator). Do not attempt to disassemble the actuator due to spring under load danger! (The lock wire opening is blocked).</p>
	<p>Danger of injury (lasermarked on the actuator). Do not attempt to cut open actuator due to spring under load danger! (The lock wire opening is blocked).</p>
	<p>Danger of injury (label marked on actuator). Do not attempt to cut the actuator open due to spring under load (the lock wire opening is locked).</p>

2.2 Safety Precautions

All warnings in the Instruction Manual are summarised on these pages. Pay special attention to the instructions below so that severe personal injury and/or damage to the supplied Alfa Laval product is avoided.

General

	<p>To prevent unexpected start and contact with electrical live and moving parts.</p> <p>Always disconnect the power supply safely:</p> <ul style="list-style-type: none"> The power supply disconnecting device must be disconnected (in off position) and locked.
---	---

Transportation and Lifting

     	<p>Always ensure that compressed air is released.</p> <p>Always ensure that all connections are disconnected before attempting to remove the valve from the installation.</p> <p>Always drain liquid out of the valves before transportation.</p> <p>Always ensure sufficient fixing of the valve during transportation - if specially designed packaging material is available, it must be used.</p> <p>Never lift or elevate in any way other than described in this manual.</p> <p>Always use the original packaging or similar during transportation.</p> <p>Always use suitable transport device ie. forklift or pallet lifter.</p> <p>Always ensure that personnel must have experience with lifting operations.</p> <p>Always ensure that no leakage of lubricants can occur.</p> <p>Always use predesigned lifting points if defined. Ensure that the lifting equipment is suitable for the supplied Alfa Laval product.</p> <p>Always ensure that the unit is securely fixed during transportation.</p> <p>Always ensure the lifting point to be in line with center of gravity. Adjust lifting point if necessary.</p> <p>Always use appropriate lifting equipment for heavy parts when relevant. Use lifting logs when available.</p> <p>Always keep an eye on the load and stay clear during the lifting operation.</p>
---	---

Installation



Always read *Technical Data* on page 45 thoroughly.

Always release compressed air after use.

Never work on the valve or touch moving parts if the actuator is supplied with compressed air.

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

Never dismantle the valve with valve and pipelines under pressure.

Connect air supply hose to push-in fitting. Make sure that air supply hose is fitted properly

Do **not** pressurise spring side of actuator

If the local safety regulations prescribe that the installation has to be inspected and approved by responsible authorities before the valve is put into service, consult with such authorities before installing the equipment and have the projected installation approved by them.

Always ensure all pipe lines (product, air, and water) are depressurized and emptied before installation, inspection, assembling and disassembling.

Always assemble the valve completely before start and make sure everything is in place and properly tightened.

Do **NOT** attempt to disassemble the actuator due to spring under load danger!

Do **NOT** attempt to cut the actuator open due to spring under load.

Operation



For utilization in ATEX Environment:

- May not be used with extremely ignition sensitive dusts such as Sulphur.
- May not be used with ignition sensitive gas/air mixtures as ethylene, carbon monoxide and ethylene oxide.
- The valve body shall be mounted to a conductive and grounded system, either by welding or clamping.
- The actuator has a lifetime for 250,000 activations. The actuator shall be replaced after the number of activations. Repair is not allowed.
- Only for liquids with high conductivity above 1000 pS/m can be used.

Never dismantle the valve with valve and pipelines under pressure.

Never dismantle the valve when it is hot

Always read *Technical Data* on page 45 thoroughly.

Always release compressed air after use.

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

Never work on the valve or touch moving parts if the actuator is supplied with compressed air.

Always rinse well with clean water after cleaning.

Connect air supply hose to push-in fitting. Make sure that air supply hose is fitted properly.

Do **not** pressurise spring side of actuator.

Always handle lye and acid with great care.

Necessary precautions must be taken if leakage occurs as this can lead to hazardous situations.

Never operate the valve unless it is properly mounted or installed.

Always follow the instructions in the safety data sheets from the suppliers of cleaning agents, detergents, oils etc.

Maintenance

	<p>Always read <i>Technical Data</i> on page 45 thoroughly.</p> <p>Always release compressed air after use.</p> <p>Never service the valve when it is hot.</p> <p>Never service the valve with valve and pipelines under pressure.</p> <p>Never put your fingers through the valve ports if the actuator is supplied with compressed air</p> <p>Never touch moving parts if the actuator is supplied with compressed air</p> <p>NON-MAINTAINABLE actuator: Never disassemble the actuator</p> <p>Connect air supply hose to push-in fitting. Make sure that air supply hose is fitted properly</p> <p>Do not pressurise spring side of actuator.</p> <p>In order to optimise the operation of the supplied Alfa Laval product and to minimize the down time due repair activities, the maintenance should consist of:</p> <ul style="list-style-type: none"> • Inspection and maintenance of the supplied Alfa Laval product: strictly follow the technical documentation • Preventive maintenance: visual inspection of the supplied Alfa Laval product followed by necessary adjustments and planned periodic replacement of wear and tear parts • Repairs: unscheduled break-down of a component, often causing the system to stop. Damaged components shall be replaced or repaired • Stock of Alfa Laval genuine spare parts: Alfa Laval recommend keeping a stock of genuine spare parts facilitating preventive maintenance and reducing down time in case of unplanned break-downs <p>Always use Alfa Laval genuine spare parts.</p> <p>Never work on the valve or touch moving parts if the actuator is supplied with compressed air.</p> <p>Never dismantle or touch the valve or pipelines when processing hot liquids or when sterilising.</p> <p>Never pressurize the valve/actuator when the valve is serviced unless specifically prescribed.</p> <p>Do NOT attempt to disassemble the actuator due to spring under load danger!</p> <p>Do NOT attempt to cut the actuator open due to spring under load.</p>
--	--

Storage



Alfa Laval recommend:

- Store the supplied Alfa Laval product as supplied in original packaging
- Port opening(s) should be protected against any ingress
- Bare steel (not stainless) should be lightly oiled/greased
- Store in a clean, dry place without direct sunlight or UV light
- Temperature range -5 °C to 40 °C (23 °F - 104 °F)
- Relative humidity less than 60%
- No exposure to corrosive substances (including contained air)

Noise



- One metre away from and 1.6 metres above the exhaust, the noise level of a valve actuator will be approximately 77db (A) without noise damper and approximately 72 db (A) with damper - measured at 7 bar air-pressure

Hazards



Burn Hazard

- Lubrication oil, machine parts and various machine surfaces can be hot and cause burns. Wear protective gloves



Corrosive Hazard

- Always handle cleaning liquids, lye and acid with great care and in accordance with separate instructions for those fluids
- When using chemical cleaning agents and lubricants, make sure you follow the general rules and suppliers recommendation regarding ventilation, personnel protection etc.



Cut Hazard

- Sharp edges, especially on bowl discs and threads, can cause cuts. Wear protective gloves
- Avoid placing hands into valve orifice pinch points

Health Hazard

	<p>Danger of injury: (an extra yellow label marked on the actuator from June 2016). Do NOT attempt to cut the actuator open due to spring under load. (The lock wire opening is locked).</p>
	<p>Danger of injury (laser marked on the actuator). Do NOT attempt to disassemble the actuator due to spring under load danger! (The lock wire opening is locked).</p>
	<p>Danger of injury (label marked on actuator). Do NOT attempt to cut the actuator open due to spring under load. (The lock wire opening is locked).</p>

Safety check

	<p>A visual inspection of any protective device (shield, guard, cover or other) on the supplied Alfa Laval product shall be carried out at least every 12 months. If the protective device is lost or damaged, especially when this leads to deterioration of safety performance, it shall be replaced. The fixing of the protective device should only be replaced with fixings of the same or an equivalent type.</p> <p>Inspection acceptance criteria:</p> <ul style="list-style-type: none"> • It should not be possible to reach moving parts originally protected by a protective device • The protective device must be securely mounted • Ensure that screws for the protective device are securely tightened <p>Procedure in case of non-acceptance:</p> <ul style="list-style-type: none"> • Fix and/or replace the protective device
---	--

2.3 Warning Signs in Text

Pay attention to the safety instructions in this Instruction Manual.

Below are definitions of the four grades of warning signs used in the text where there is a risk for injury to personnel or damage to the supplied Alfa Laval product.

 **DANGER**

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

 **WARNING**

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

 **CAUTION**

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate damage to the supplied Alfa Laval product.

 **NOTE**

Indicates important information to simplify or clarify procedures.

2.4 Requirements of Personnel

Operators

The operators shall read and understand this Instruction Manual.

Maintenance personnel

The maintenance personnel shall read and understand this Instruction Manual. The maintenance personnel or technicians shall be skilled within the field required to carry out the maintenance work safely.

Trainees

Trainees can perform tasks under the supervision of an experienced employee.

People in general

The public shall not have access to the supplied Alfa Laval product.

In some cases, specially skilled personnel may need to be hired (i.e. electricians, welders). In some cases the personnel has to be certified according to local regulations with experience of similar types of work.

2.5 Recycling Information

Unpacking

Packing material may consist of wood, plastics, cardboard boxes and in some cases metal straps.



- Wood and cardboard boxes can be reused, 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



WARNING

If the actuator is marked with one of the below warnings, do **NOT** attempt to disassemble it.

The spring inside is under load — any type of breakage of the actuator can lead to severe injury or even death!



Maintenance

During maintenance, oil (if used) and wear parts in the supplied Alfa Laval product should be replaced.

- Oil and all non-metal wear parts must be disposed of in accordance with local regulations
- Rubber and plastics should be burnt at a licensed waste incineration plant. If not available they should be disposed of in accordance with local regulations
- Bearings and other metal parts should be sent to a licensed handler for material recycling
- Seal rings and friction linings should be disposed of to a licensed land fill site. Check your local regulations
- All metal parts should be sent for material recycling
- Worn out or defected electronic parts should be sent to a licensed handler for material recycling

Scrapping

At end of use, the equipment must be recycled in accordance with the relevant local regulations. Besides the equipment itself, any hazardous residues from the process liquid must be considered 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.

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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3 Introduction

The Alfa Laval Unique DV-ST UltraPure Diaphragm Valve is an aseptic diaphragm valve used to shut off, divert and/or regulate the flow of fluids through hygienic, high-purity and aseptic processing lines.

3.1 General Information

The compact diaphragm valve requires low maintenance, has a non-maintainable pneumatic actuator and is available in normally closed, normally open and air/air modes of operation.

The pneumatic actuator is only available in stainless steel. The actuator has been reduced in size, without compromising on strength or endurance, making it especially suited to applications where space is limited.

A wide range of accessories such as an electrical feedback unit, positioner, BUS systems, allow optimal adaption to all types of control tasks.

Selection of the diaphragm with regard to the medium and temperature is the responsibility of the customer.

We highly recommend additional test(s) for any known special operating conditions. The customer is responsible for carrying out these tests.

The hazards caused by chemical reactions between parts of the valve and the chemical mediums used must be clarified between the manufacturer and customer.

These valves are intended to close the medium (on/off or control) after installation into a pipeline.

Where defects appear on the product during the warranty period, Alfa Laval will take back the product and correct the problem. Should the equipment be modified or not kept in the manner prescribed within this manual, the warranty will become null and void.

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4 Installation

4.1 Unpacking/delivery

NOTE

The instruction manual is part of the delivery. Study the instructions carefully.

The valve is supplied as separate parts as standard (for welding).

If it is supplied with fittings, the valve is assembled before delivery.

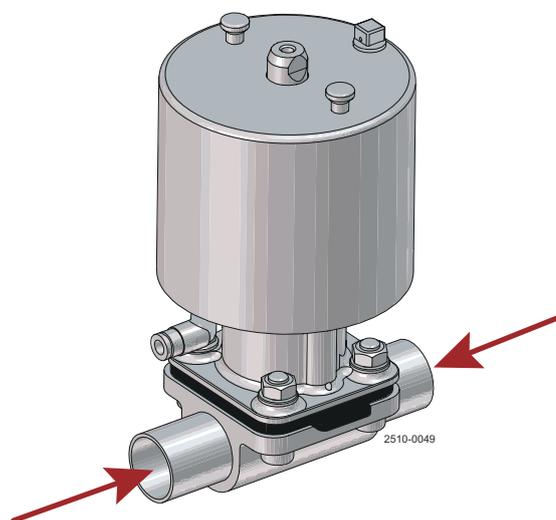
Alfa Laval cannot be held responsible for incorrect unpacking.

Check the delivery for:

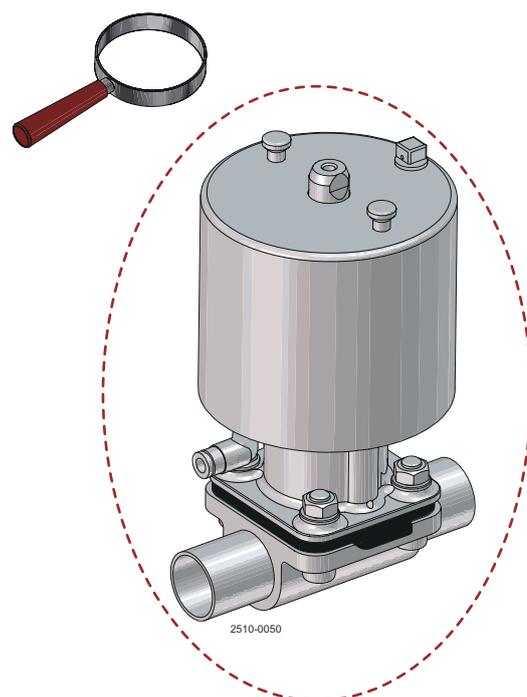
1. Complete valve.
2. Delivery note.

1

- a) Remove any packing materials from the valve/valve parts.



- b) Inspect the valve/valve parts for visible transportation damage.
- c) Avoid damaging the valve/valve parts.



4.2 Unpacking/intermediate storage

NOTE

Always read the *Technical Data* on page 45 thoroughly.

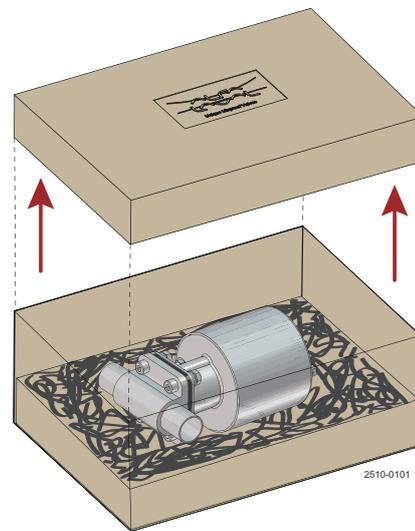
Alfa Laval cannot be held responsible for incorrect unpacking.

Applies to both actuator versions.

Check the delivery for:

1. Complete valve.
2. Delivery note.
3. Warning label.

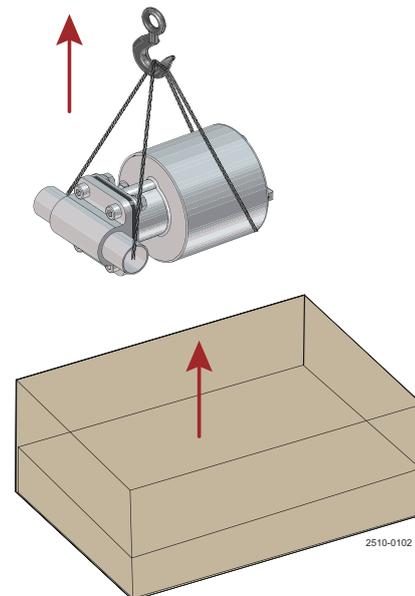
- 1 Remove upper support.



- 2 Lift out the valve.

NOTE

Please note weight of valve as printed on box.



- 3 Remove any packing materials from the valve ports.

4.3 General Installation

NOTE

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

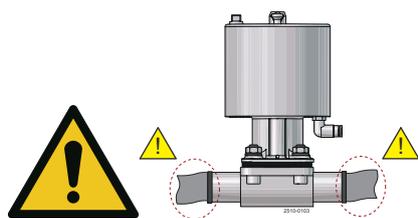
The valve has welding ends as standard but can also be supplied with fittings.

CAUTION Risk of damage!

Always read the technical data thoroughly.

Alfa Laval cannot be held responsible for incorrect installation.

Avoid stressing the valve.



- When draining the diaphragm valve and pipeline, ensure that there is a suitable installation position
- For diaphragm valves with weld ends, remove the actuator and diaphragm from the valve body before welding
- For applications in ex-proof areas, the composite actuator should only be wiped with a moist cloth
- 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

Pay special attention to:

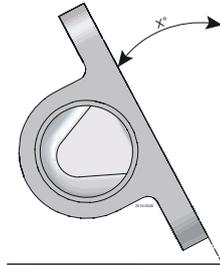
- Vibrations
- Thermal expansion of the pipelines
- Excessive welding
- Overloading of the pipelines

4.4 Drainability

Proper drainability in horizontally 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.

4.5 Installation angle on self-draining position



Forged, Cast ST and Block

DN	inch	ASME	ISO 2037	DIN 11850	ISO 1127
DN8	1/4"	37.0°	23.0°	28.5°	22.0°
DN10	3/8"	29.0°	21.5°	23.0°	27.5°
DN15	1/2"	35.2°	25.0°	23.0°	19.0°
DN20	3/4"	30.0°	26.0°	25.0°	20.0°
DN25	1"	29.0°	28.0°	25.0°	20.0°
DN32	1 1/4"	-	-	21.0°	-
DN40	1 1/2"	26.0°	25.5°	24.0°	19.0°
DN50	2"	24.0°	23.0°	22.0°	18.0°
DN65	2 1/2"	21.0°	21.0°	19.0°	15.0°
DN80	3"	25.5°	25.0°	22.0°	21.0°
DN100 ¹	4"	14.0°	14.0°	13.0°	8.0°

¹ Only block

Cast OP

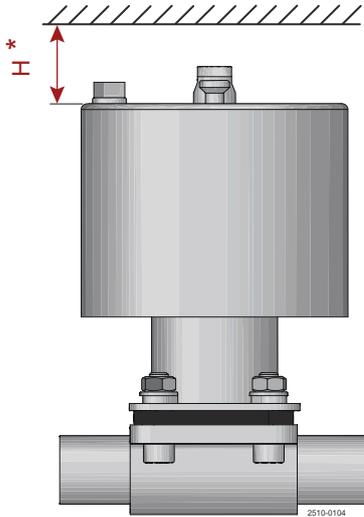
DN	inch	ASME	ISO 2037	DIN 11850
DN8	1/4"	-	-	-
DN10	3/8"	-	-	-
DN15	1/2"	25.5°	7.0°	4.5°
DN20	3/4"	20.0°	14.0°	13.0°
DN25	1"	22.0°	22.0°	16.4°
DN32	1 1/4"	-	-	7.0°
DN40	1 1/2"	13.0°	12.0°	9.0°
DN50	2"	15.5°	15.0°	14.0°
DN65	2 1/2"	14.0°	14.0°	10.6°
DN80	3"	14.5°	14.5°	9.4°
DN100	4"	14.0°	14.0°	13.0°

Forged mini

DN	inch	ASME
DN8	1/4"	38.0°
DN10	3/8"	29.9°
DN15	1/2"	26.0°

4.6 Minimum free space above actuator

When installing an actuator without indication unit (for example a Thinktop unit), a minimum distance above the actuator is required to ensure no pinching of a hand placed on top of the actuator.



Size	H ¹ mm (in)
DN8/DN10 (1/4"/3/8")	119 (4.685)
DN15 (1/2")	122 (4.803)
DN20 (3/4")	128 (5.039)
DN25 (1")	131 (5.167)
DN40 (1 1/2")	149 (5.866)
DN50 (2")	149 (5.866)
DN65 (2 1/2")	168 (6.614)
DN80 (3")	174 (6.850)
DN100 (4")	174 (6.850)

¹ Clearance according to ISO13854

*) Only applicable for high pressure version

¹ Clearance according to ISO13854

4.7 Welding

NOTE

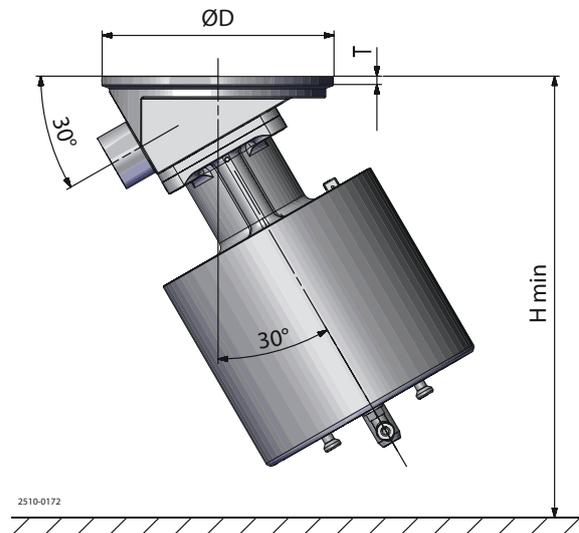
- Study the instructions thoroughly.
- All welding should be done by qualified personnel.
- The valve is supplied as separate parts to facilitate the welding.
- Check the valve for smooth operation after welding.

Before welding the flange into the tank please note:

Maintain the minimum clearances "H" to ensure that the actuator and the internal valve parts can be removed - please see information later in this section.

If there is a risk of foot damage, Alfa Laval recommends leaving a distance of 120 mm (4.7") below the valve (lowest point of actuator spindle).

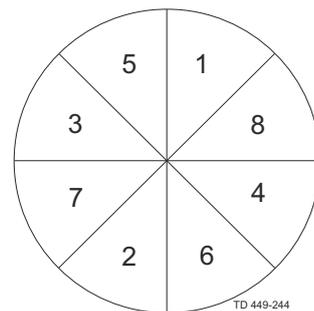
	D	T	H
DN15	90	5.5	145
DN20	100	5.5	180
DN25	120	5.5	195
DN40	150	5.5	275
DN50	180	5.5	285
DN65	200	5.5	410
DN80	250	5.5	425
DN100	250	5.5	425



Only use pulsed arc welding and remember no gap between flange and tank plate.

Tack weld **always** on the opposite side (8 segments with filler metal). Weld root if possible without filler metal.

Welding of the final run must be carried out in 8 segments to avoid cracking.



- 1 Disassemble the actuator from the valve body. See [Replacing the diaphragm](#) on page 38 for details.
- 2 Perform the welding procedure on the body according to standard industrial practices.
- 3 Reassemble the actuator to the valve body.
- 4 Test the valve for correct operation before installing.

4.8 Mounting of the actuator

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.

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5 Operation

5.1 Operation

NOTE

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

Pay attention to possible faults.

Always read *Technical Data* on page 45 thoroughly.

CAUTION

Alfa Laval cannot be held responsible for incorrect operation.

WARNING

Always release compressed air after use.

Connect air supply hose to push-in fitting. Make sure that the air supply hose is fitted properly.

Do **NOT** pressurise the spring side of the actuator (applies to high pressure version only).

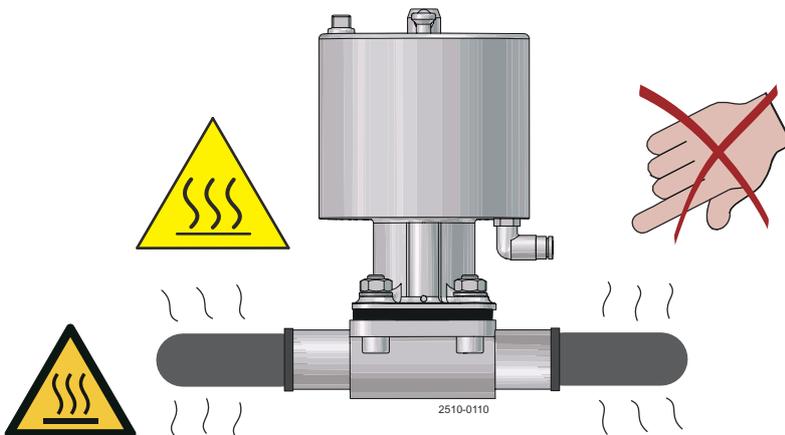
Alfa Laval cannot be held responsible for incorrect operation.

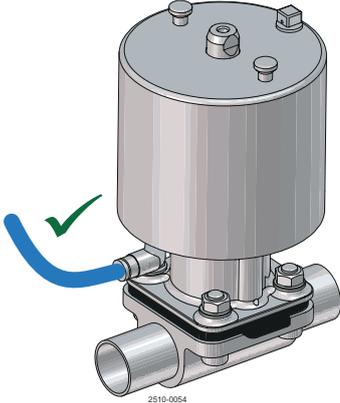
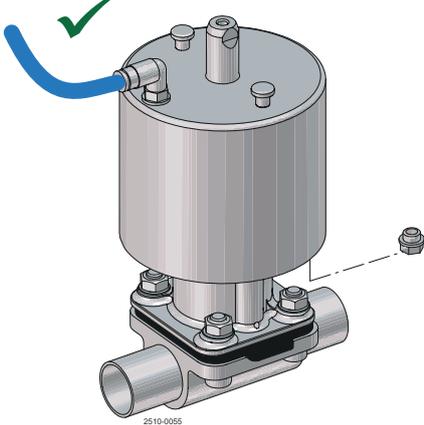
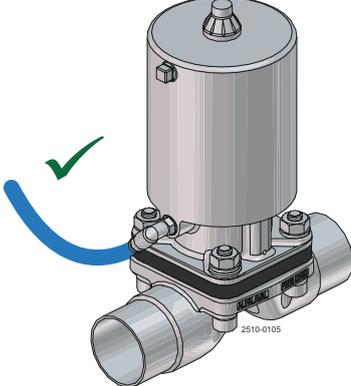
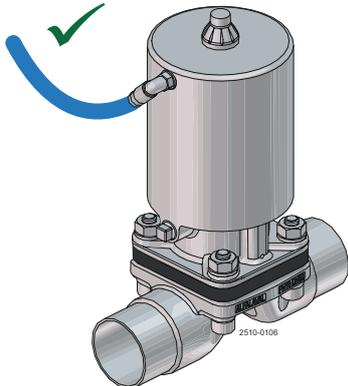
For utilization in ATEX Environment: Liquid flow might produce an electrostatic charge. Liquids with high conductivity ($< 1000 \text{ pS/m}$) can be used. User should make measures according to IEC TS 60079-32-1.



WARNING

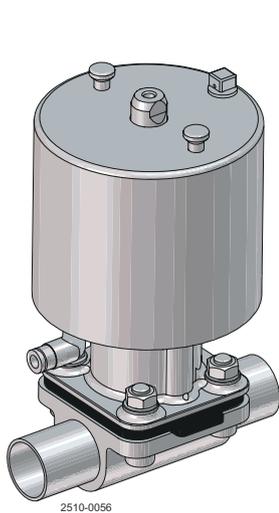
Never touch the valve or the pipelines when processing hot liquids or when sterilising.



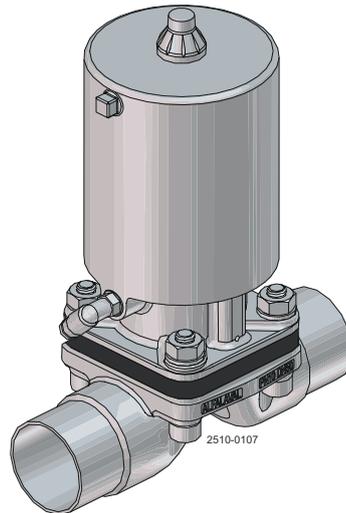
Actuator type	Normally closed (NC)	Normally open (NO)
<p>High pressure (SS/HP)</p>		
<p>Slim (SS/SL)</p>		

Function NC: Normally Closed

In de-energised status, the valve is closed by spring force. When the control medium is admitted to the actuator (connection below), the valve opens; when the control medium escapes, the valve is closed via spring force.



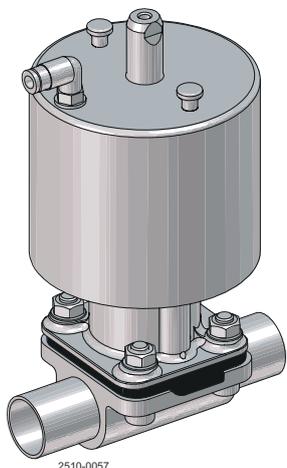
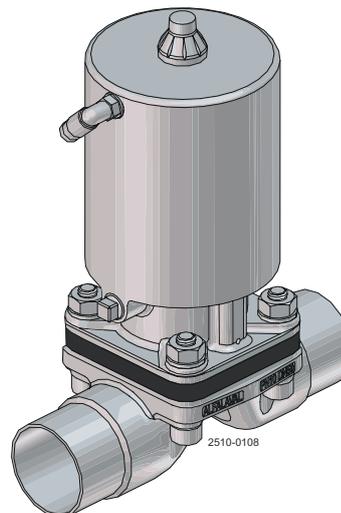
High pressure actuator (SS/HP)



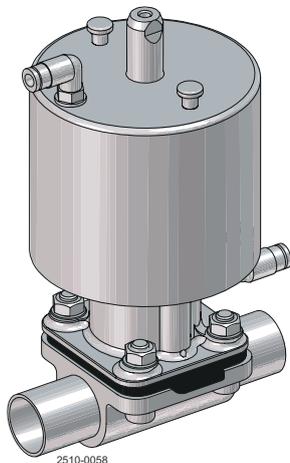
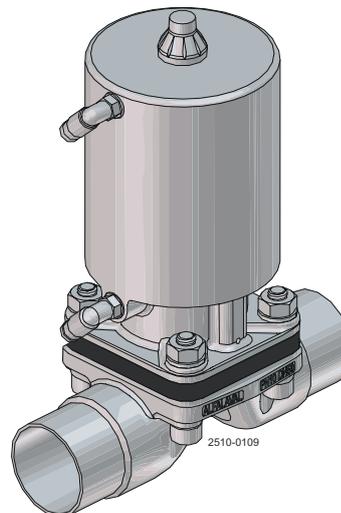
Slim actuator (SS/SL)

Function NO: Normally open

In de-energised status, the valve is opened by spring force. When the control medium is admitted to the actuator (connection above), the valve closes; when the control medium escapes, the valve is opened via spring force.

**High pressure actuator (SS/HP)****Slim actuator (SS/SL)****Function AA: Air/Air (double acting)**

The valve has no defined basic position. The valve is opened and closed by applying control pressure to the corresponding control connection. Connection below: open, connection above: close.

**High pressure actuator (SS/HP)****Slim actuator (SS/SL)**

5.2 Recommended Cleaning

NOTE

The supplied product is designed for cleaning in place (CIP).

NaOH = Caustic soda.

HNO₃ = Nitric acid.

The cleaning agents must be stored/disposed of in accordance with current regulations/directives.

CAUTION

Never touch the supplied product or the pipelines when sterilizing.

Always handle lye and acid with great care.

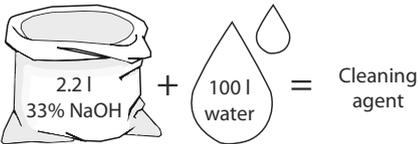
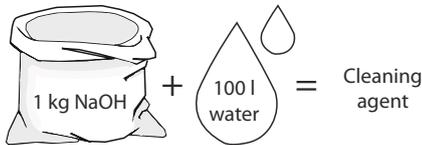


Examples of cleaning agents

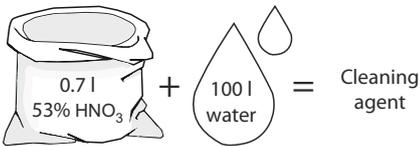
Use clean water free from chlorides

Metric System

1. 1% by weight NaOH at 70°C

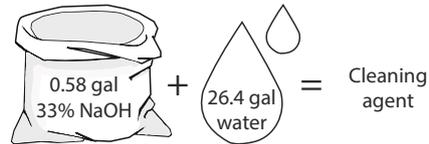
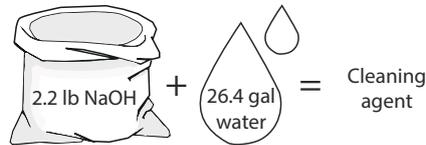


2. 0.5% by weight HNO₃ at 70°C

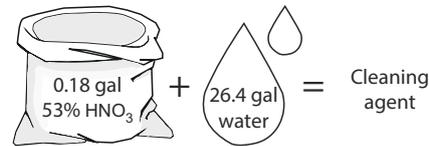


Imperial System

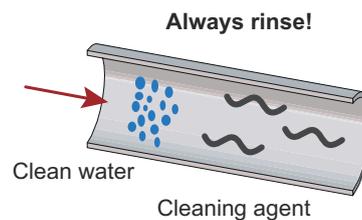
1. 1% by weight NaOH at 158°F



2. 0.5% by weight HNO₃ at 158°F



1. Avoid excessive concentration of the cleaning agent ⇒ **Dose gradually!**
2. Adjust the cleaning flow to the process
Milk sterilization/viscous liquids ⇒ Increase the cleaning flow!



CAUTION

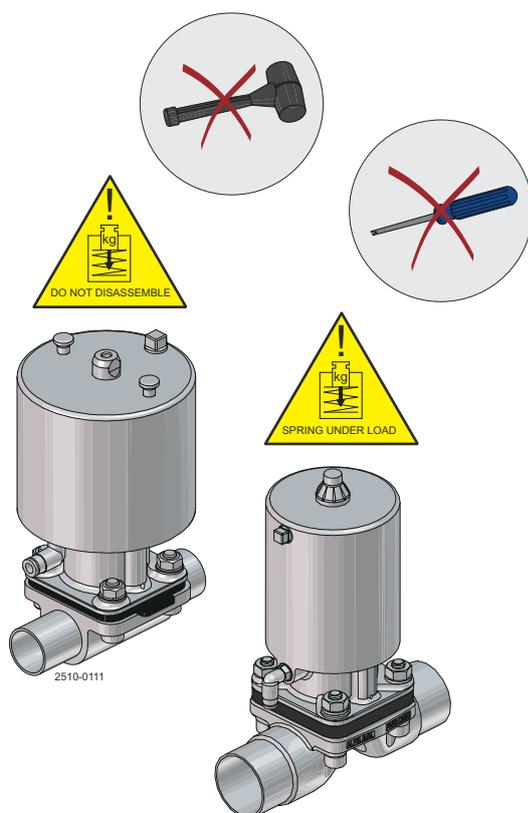
Always rinse well with clean water after the cleaning.

6 Maintenance

6.1 Replacing the diaphragms and seals

Generally, the only routine maintenance required is the replacement of the diaphragm. The diaphragm replacement routine, depending on the medium, pressure, temperature and cycle (duration and temperature) of steam sterilisation between process runs, determines the optimum change cycle of the diaphragm.

As with all diaphragm valves, the diaphragm itself is the component most exposed to wear. In addition to mechanical stress and temperature range, the diaphragm is subject to wear resulting from the media. Alfa Laval recommend that the diaphragm is replaced once a year or more frequently depending on operating conditions and media. See [Replacing the diaphragm](#) on page 38.



NOTE

The high pressure and slim actuators are both non-serviceable. In case of malfunction the complete actuator must be replaced.

NOTE

**DO NOT DISASSEMBLE OR BY ANY MEANS OPEN THE ACTUATOR.
PRE-COMPRESSED SPRINGS INSIDE!**

6.2 Replacing the diaphragm



Risk of pinching fingers during mounting of diaphragm

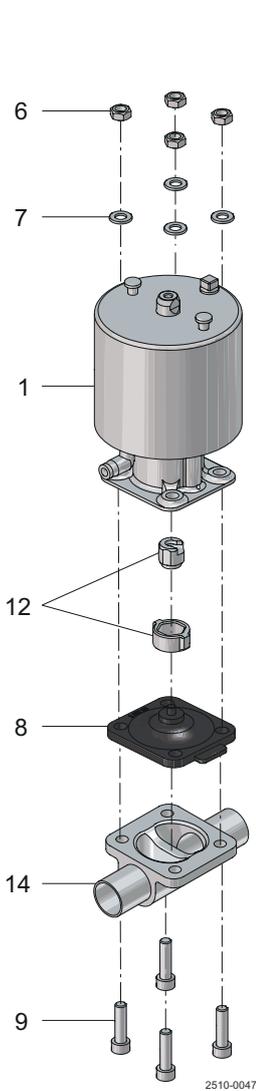


Before servicing any installed valve, you must:

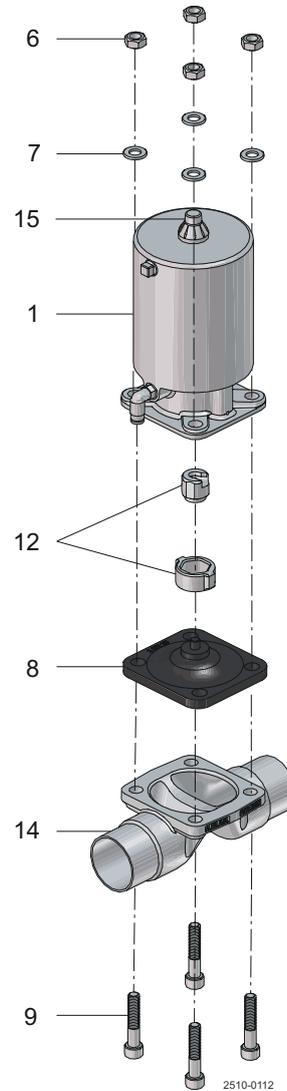
- depressurise the system
- open the valve
- purge the valve



The diaphragm can be replaced without removing the valve body.



High pressure actuator (SS/HP)

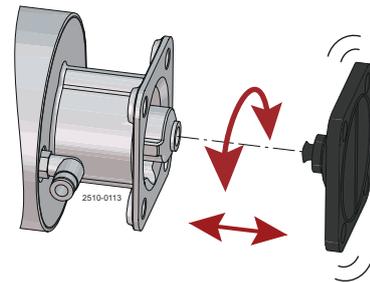


Slim actuator (SS/SL)

- 1 Only use Alfa Laval diaphragms.
- 2 Actuate the valve to its "opened" position for:
 - Normally closed and air/air actuators, add control air pressure to the lower actuator port
 - Normally open actuators, disconnect control air pressure
- 3 Remove the body fasteners (6, 7 & 9) using a cross-wise pattern.
- 4 Actuate the valve to its "closed" position for:
 - Normally closed actuators, disconnect control air pressure
 - Normally open and air/air actuators, apply control air pressure to the upper actuator port
- 5 Remove the diaphragm from the actuator

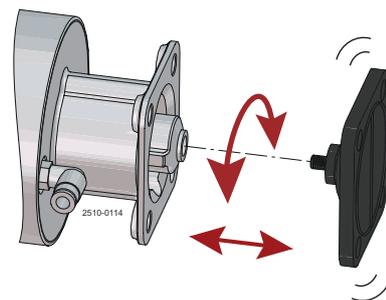
Button-style compressor:

Remove the diaphragm (8) by pulling it out.



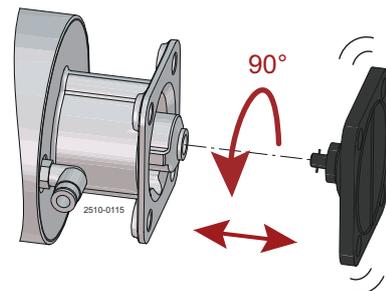
Threaded-style compressor:

Rotate the diaphragm (8) counter-clockwise until removal is possible.



Bayonet-style compressor:

Rotate the diaphragm 90° and remove.



-
- 6 Check and clean threads and bayonets (12) of the diaphragm holder.

 - 7 Make sure that the new diaphragm (8) and the contact area on the valve body (14) are clean and dry.

 - 8 Make sure the diaphragm holder (12) matches the connection on the diaphragm (8). Should this not be the case, replace the diaphragm holder.

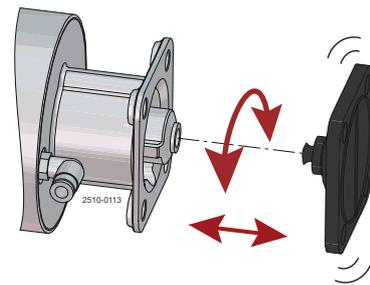
9

With the actuators in “closed” position, install diaphragm as follows:

Button-style compressor:

For button-style diaphragm holder, insert the diaphragm with a push rotation.

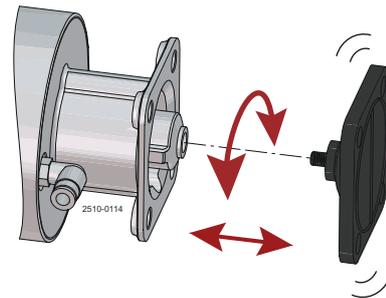
Rotate the diaphragm until the flange holes match.



Threaded-style compressor:

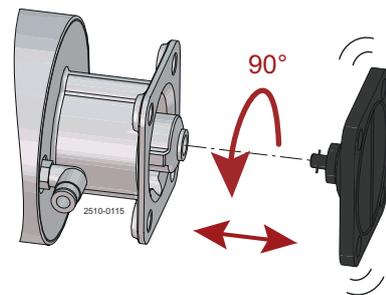
For threaded-style compressors, thread the diaphragm into the diaphragm holder in a clockwise direction.

Do **not** overtighten! If necessary, turn the diaphragm in a counter-clockwise direction until the flange holes match.



Bayonet-style compressor:

For bayonet-style diaphragm holder insert the diaphragm with bayonet into the cavity of the diaphragm holder. Rotate the diaphragm 90°. Flange holes must match.



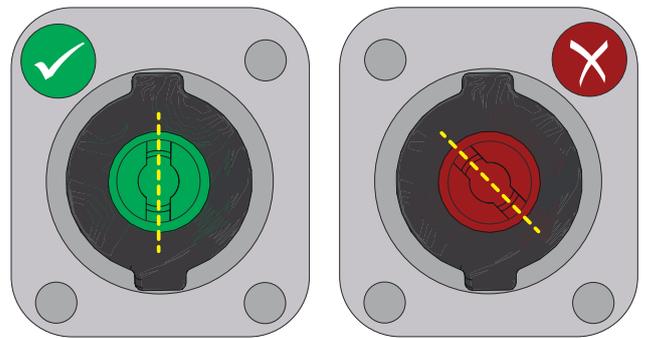
Important!

Prior mounting a bayonet-type diaphragm – Ensure the two ends of the bayonet slot in the diaphragm holder are pointing towards the two protrusions on the compressor.

WARNING

Do **not** overtighten!

Risk of pinching fingers during mounting of diaphragm.



10

Actuate the valve to the “open” position - see [Step 2](#)

- 11 Align the actuator yoke to the valve body (14) using fasteners (9). Assemble the nuts and washers (6 & 7). To secure the actuator and body, tighten the four fasteners (6) by hand loosely.

Ensure all four bolts (9) are used. Lubricating the threads with an anti-seizing grease is required prior to mounting!

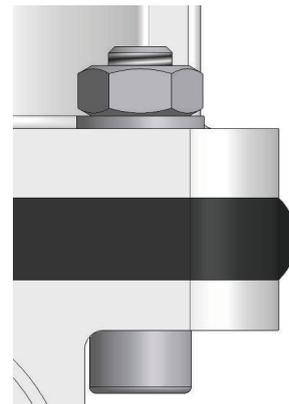
- 12 Actuate the valve to the "closed" and "open" position several times, so that the diaphragm can properly fit to the weir prior tightening - see [Step 2](#) and [Step 4](#). In valve closed position initiate tightening of the four fasteners (6) in a cross-wise pattern using a torque wrench and to the listed torque values.

- 13 Actuate the valve to the "open" and "closed" position several times and verify none of the nuts are loose. Otherwise [Step 12](#) must be followed again.

Recommended torque values for assembly

DN	inch	Nm
DN8/DN10	1/4"/3/8"	2.5 Nm
DN15	1/2"	2.5 Nm
DN20	3/4"	2.5 Nm
DN25	1"	5 Nm
DN40	1 1/2"	14 Nm
DN50	2"	14 Nm
DN65	2 1/2"	16 Nm
DN80/ DN100	3"/ 4"	36 Nm

Torque values should be followed in order to achieve a prolonged lifetime of the diaphragms. Make sure to tighten with an even distribution and in a cross-wise pattern until the listed torque values are obtained on each fastener.



Primarily refers to assembly of EPDM diaphragms.

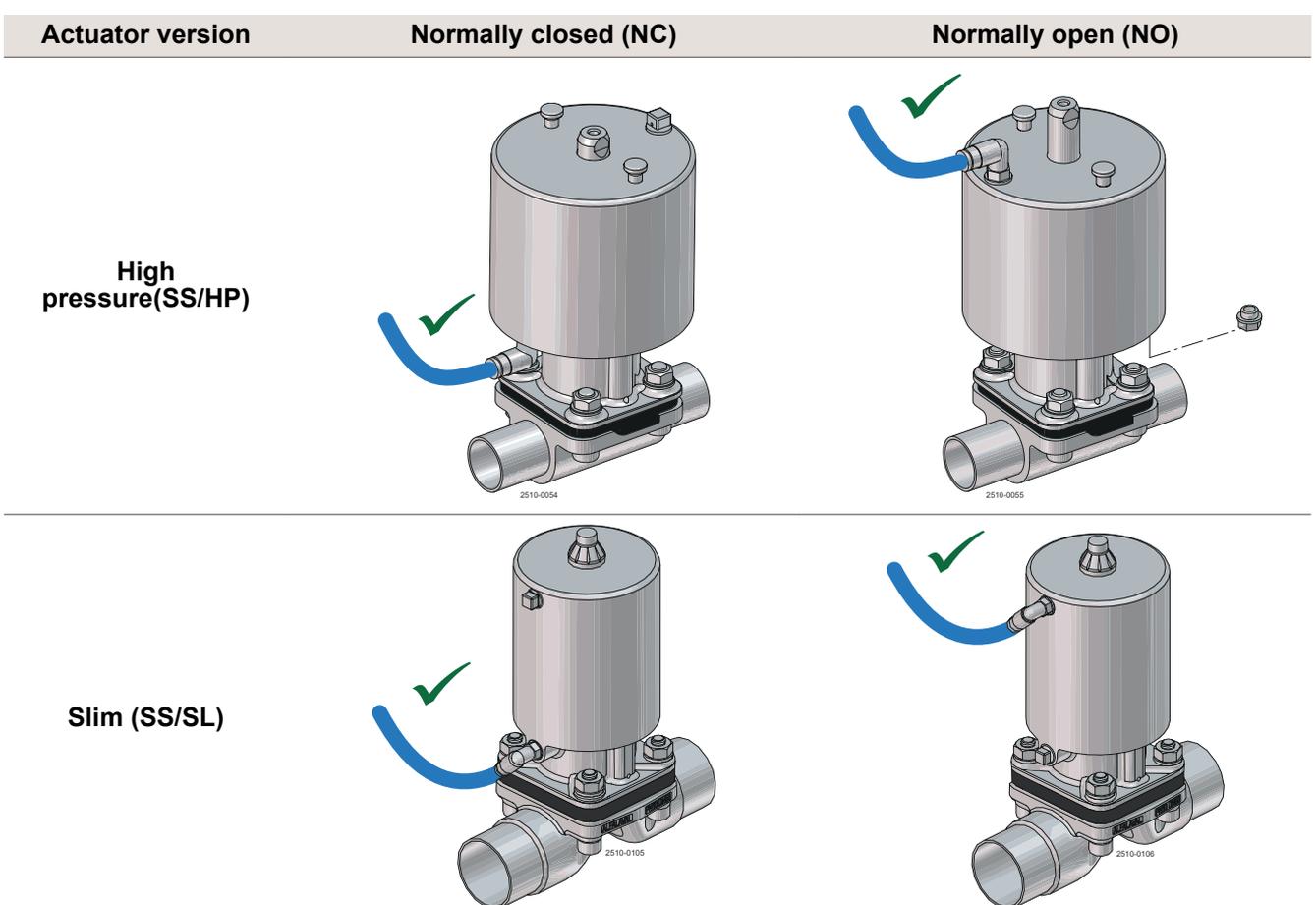
- 14 Test the valve for proper function.

NOTE

For diaphragms based on a combination of polymer and elastomer a lower holding pressure performance prior the first heat cycle can be experienced. This is due to settling of temperature dependent factors such as compression-set, rebound etc.

If seat leakage is persistent after the first heat cycle and re-tightening to specified torque values is with no effect. Loosen the fasteners and re-tighten to the specified torque again. Otherwise replace diaphragm.

- 15 Connect air supply hose to push-in fitting. Make sure that the air supply hose is fitted properly. Do not pressurise the spring side of the actuator.



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7 Technical Data

NOTE

Technical data must be observed during installation, operation and maintenance.
All personnel should be informed about the technical data.

7.1 Technical data

Actuator

Temperature range	-10 °C to 80 °C / 14 °F to 176 °F
Air quality	ISO 8573-1, Class 0.2.4
Control air pressure	Max. 7 bar / 102 psi ¹

¹ Maximum control air pressure for actuator. For maximum control air pressure in regards to diaphragm endurance, please refer to tables 2 to 4

Product wetted area

Table 1: Diaphragm properties

Description	Temperature recommendations		
	Min.	Liquid Max.	Steam 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	Max. recommended service life-time in years
	(marked on diaphragm)	(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.

7.2 Physical Data

Table 2: Materials

Body types	Cast CF3M (316L)	Forged 1.4435 (316L)	Block ¹ 1.4404 (316L)
2-way	✓	✓	✓
T			✓
Tank outlet			✓
Tandem / IAV solutions	✓	✓	✓
Multi-port			✓

¹ Other alloys on request.

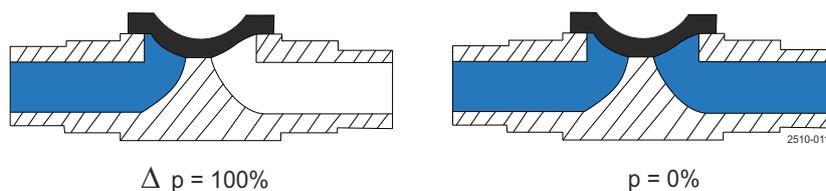
	Cast	Forged	Block
Material	CF3M (316L)	1.4435 (316L)	1.4404 (316L)
Delta ferrite	< 5.0%	< 0.5%	< 0.5%
Sulphur content	0.005%-0.017%	0.005-0.017%	0.005-0.017%
Internal surface finish	SF1 Ra < 0.51 µm / Ra < 20 µin	Ra < 0.51 µm / Ra < 20 µin	Ra < 0.51 µm / Ra < 20 µin
	SF4 Ra < 0.38 µm / Ra < 15 µin EP ¹	Ra < 0.38 µm / Ra < 15 µin EP ¹	Ra < 0.38 µm / Ra < 15 µin EP ¹
External surface finish	Blasted	Blasted	Machined

¹ Electro Polished

0.51 µm / 20 µin = SF1

0.38 µm / 15 µin = SF4

7.3 Maximum working pressure for actuator type: high pressure (SS/HP)


 $\Delta p = 100\%$
 $p = 0\%$

High pressure actuator NC (Normally closed): Product pressures and recommended control air pressures

Size		Control air pressure ¹	EPDM		PTFE/EPDM		TFM/EPDM	
DN	Inch		$\Delta p = 100\%^2$	$\Delta p = 0\%^3$	$\Delta p = 100\%^2$	$\Delta p = 0\%^3$	$\Delta p = 100\%^2$	$\Delta p = 0\%^3$
		Bar (PSI)	Bar (PSI)	Bar (PSI)	Bar (PSI)	Bar (PSI)	Bar (PSI)	Bar (PSI)
8-10	1/4"-3/8"	Min. 3.1 (45)	10 (145)	10 (145)	10 (145)	10 (145)	6 (87)	6 (87)
15	1/2"	Min. 5.5 (80)	10 (145)	10 (145)	10 (145)	10 (145)	6 (87)	6 (87)
20	3/4"	Min. 3.2 (47)	10 (145)	10 (145)	10 (145)	10 (145)	6 (87)	6 (87)
25	1"	Min. 5.7 (83)	10 (145)	10 (145)	10 (145)	10 (145)	6 (87)	6 (87)
40	1 1/2"	Min. 3.1 (45)	10 (145)	10 (145)	10 (145)	10 (145)	6 (87)	6 (87)
50	2"	Min. 5.1 (74)	10 (145)	10 (145)	10 (145)	10 (145)	6 (87)	6 (87)
65	2 1/2"	Min. 4.1 (59)	10 (145)	10 (145)	10 (145)	10 (145)	6 (87)	6 (87)
80	3"	Min. 5.1 (60)	10 (145)	10 (145)	10 (145)	10 (145)	6 (87)	6 (87)
100	4"	Min. 5.1 (60)	10 (145)	10 (145)	10 (145)	10 (145)	6 (87)	6 (87)

¹ Minimum air pressure at product pressure 0 bar. See [Parts Lists and Exploded Views](#) on page 61 for further information.

² See diagram below for further information.

³ See diagram below for further information.

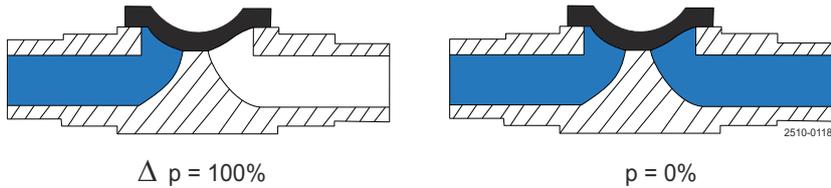
High pressure actuator NO (Normally open): Product pressures and recommended control air pressures

Size		Control air pressure ¹	EPDM		PTFE/EPDM		TFM/EPDM	
DN	Inch		$\Delta p = 100\%^2$	$\Delta p = 0\%^3$	$\Delta p = 100\%^2$	$\Delta p = 0\%^3$	$\Delta p = 100\%^2$	$\Delta p = 0\%^3$
		Bar (PSI)	Bar (PSI)	Bar (PSI)	Bar (PSI)	Bar (PSI)	Bar (PSI)	
8-10	1/4"-3/8"	Max. 5.7 (83)	10 (145)	10 (145)	10 (145)	10 (145)	6 (87)	6 (87)
15	1/2"	Max. 5.5 (80)	10 (145)	10 (145)	10 (145)	10 (145)	6 (87)	6 (87)
20	3/4"	Max. 5.5 (80)	10 (145)	10 (145)	10 (145)	10 (145)	6 (87)	6 (87)
25	1"	Max. 5.2 (76)	10 (145)	10 (145)	10 (145)	10 (145)	6 (87)	6 (87)
40	1 1/2"	Max. 5.2 (76)	10 (145)	10 (145)	10 (145)	10 (145)	6 (87)	6 (87)
50	2"	Max. 5.2 (76)	10 (145)	10 (145)	10 (145)	10 (145)	6 (87)	6 (87)
65	2 1/2"	Max. 4.5 (65)	10 (145)	10 (145)	10 (145)	10 (145)	6 (87)	6 (87)
80	3"	Max. 4.4 (64)	10 (145)	10 (145)	10 (145)	10 (145)	6 (87)	6 (87)
100	4"	Max. 4.4 (64)	10 (145)	10 (145)	10 (145)	10 (145)	6 (87)	6 (87)

¹ Maximum air pressure at product pressure 10 bar. See [Parts Lists and Exploded Views](#) on page 61 for further information.

² See diagram below for further information.

³ See diagram below for further information.



High pressure actuator AA (Air/Air): Product pressures and recommended control air pressures

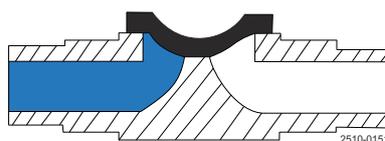
Size		Control air pressure ¹	EPDM		PTFE/EPDM		TFM/EPDM	
DN	Inch		$\Delta p = 100\%^2$	$\Delta p = 0\%^3$	$\Delta p = 100\%^2$	$\Delta p = 0\%^3$	$\Delta p = 100\%^2$	$\Delta p = 0\%^3$
		Bar (PSI)	Bar (PSI)	Bar (PSI)	Bar (PSI)	Bar (PSI)	Bar (PSI)	Bar (PSI)
8-10	¼"-¾"	Max. 3.2 (46)	10 (145)	10 (145)	10 (145)	10 (145)	6 (87)	6 (87)
15	½"	Max. 4.0 (59)	10 (145)	10 (145)	10 (145)	10 (145)	6 (87)	6 (87)
20	¾"	Max. 2.1 (31)	10 (145)	10 (145)	10 (145)	10 (145)	6 (87)	6 (87)
25	1"	Max. 2.9 (42)	10 (145)	10 (145)	10 (145)	10 (145)	6 (87)	6 (87)
40	1½"	Max. 2.1 (31)	10 (145)	10 (145)	10 (145)	10 (145)	6 (87)	6 (87)
50	2"	Max. 3.1 (45)	10 (145)	10 (145)	10 (145)	10 (145)	6 (87)	6 (87)
65	2½"	Max. 2.1 (31)	10 (145)	10 (145)	10 (145)	10 (145)	6 (87)	6 (87)
80	3"	Max. 3.3 (48)	10 (145)	10 (145)	10 (145)	10 (145)	6 (87)	6 (87)
100	4"	Max. 3.3 (48)	10 (145)	10 (145)	10 (145)	10 (145)	6 (87)	6 (87)

¹ Maximum air pressure at product pressure 10 bar. See [Parts Lists and Exploded Views](#) on page 61 for further information.

² See diagram below for further information.

³ See diagram below for further information.

7.4 Maximum working pressure for actuator type: slim (SS/SL)



$$\Delta p = 100\%$$

Slim actuator NC (Normally closed): Product pressures and recommended control air pressures

Size		Control air pressure ¹	EPDM $\Delta p = 100\%^2$	PTFE/EPDM $\Delta p = 100\%^2$	TFM/EPDM $\Delta p = 100\%^2$
DN	Inch	Bar (PSI)	Bar (PSI)	Bar (PSI)	Bar (PSI)
8-10	¼"-¾"	Min. 4.5 (65.3)	10 (145)	6 (87)	6 (87)
15	½"	Min. 4.6 (66.7)	10 (145)	6 (87)	6 (87)
20	¾"	Min. 3.9 (56.6)	10 (145)	6 (87)	6 (87)
25	1"	Min. 4.2 (61)	10 (145)	6 (87)	6 (87)
40	1½"	Min. 4.3 (62.4)	10 (145)	6 (87)	6 (87)
50	2"	Min. 4.5 (65.3)	8 (116)	5 (72.5)	5 (72.5)
65	2½"	Min. 5.3 (76.9)	8 (116)	5 (72.5)	5 (72.5)
80	3"	Min. 5.5 (79.8)	8 (116)	5 (72.5)	5 (72.5)
100	4"	Min. 5.5 (79.8)	8 (116)	5 (72.5)	5 (72.5)

¹ Minimum air pressure at product pressure 0 bar. See [Parts Lists and Exploded Views](#) on page 61 for further information.

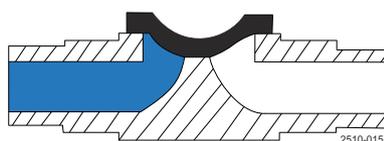
² See diagram below for further information.

Slim actuator NO (Normally open): Product pressures and recommended control air pressures

Size		Control air pressure ¹	EPDM $\Delta p = 100\%^2$	PTFE/EPDM $\Delta p = 100\%^2$	TFM/EPDM $\Delta p = 100\%^2$
DN	Inch	Bar (PSI)	Bar (PSI)	Bar (PSI)	Bar (PSI)
8-10	¼"-¾"	Min.4.2 (60.9)	10 (145)	6 (87)	6 (87)
15	½"	Min. 5.6 (81.2)	10 (145)	6 (87)	6 (87)
20	¾"	Min. 4.6 (66.7)	10 (145)	6 (87)	6 (87)
25	1"	Min. 4.9 (71.1)	10 (145)	6 (87)	6 (87)
40	1½"	Min. 4.5 (65.3)	10 (145)	6 (87)	6 (87)
50	2"	Min. 5 (72.5)	8 (116)	5 (72.5)	5 (72.5)
65	2½"	Min. 5 (72.5)	8 (116)	5 (72.5)	5 (72.5)
80	3"	Min. 5.8 (84.1)	8 (116)	5 (72.5)	5 (72.5)
100	4"	Min. 5.8 (84.1)	8 (116)	5 (72.5)	5 (72.5)

¹ Maximum air pressure at product pressure 10 bar. See [Parts Lists and Exploded Views](#) on page 61 for further information.

² See diagram below for further information.



$$\Delta p = 100\%$$

Slim actuator AA (Air/Air): Product pressures and recommended control air pressures

Size		Control Air pressure ¹	EPDM $\Delta p = 100\%^2$	PTFE/EPDM $\Delta p = 100\%^2$	TFM/EPDM $\Delta p = 100\%^2$
DN	Inch	Bar (PSI)	Bar (PSI)	Bar (PSI)	Bar (PSI)
8-10	1/4"-3/8"	Max. 1.7 (24.7)	10 (145)	6 (87)	6 (87)
15	1/2"	Max. 3.1 (45)	10 (145)	6 (87)	6 (87)
20	3/4"	Max. 3.0 (43.5)	10 (145)	6 (87)	6 (87)
25	1"	Max. 3.1 (45)	10 (145)	6 (87)	6 (87)
40	1 1/2"	Max. 3.3 (47.9)	10 (145)	6 (87)	6 (87)
50	2"	Max. 3.4 (49.3)	8 (116)	5 (72.5)	5 (72.5)
65	2 1/2"	Max. 3.5 (50.8)	8 (116)	5 (72.5)	5 (72.5)
80	3"	Max. 4.1 (59.5)	8 (116)	5 (72.5)	5 (72.5)
100	4"	Max. 4.1 (59.5)	8 (116)	5 (72.5)	5 (72.5)

¹ Maximum air pressure at product pressure 10 bar. See [Parts Lists and Exploded Views](#) on page 61 for further information.

² See diagram below for further information.

7.5 Weight

kg (lbs)

Actuator type: high pressure (SS/HP)

	DN8/ DN10 (1/4"/3/8")	DN15 (1/2")	DN20 (3/4")	DN25 (1")	DN40 (1 1/2")	DN50 (2")	DN65 (2 1/2")	DN80 (3")	DN100 (4")
2-way forged	0.9 (2.0)	1.0 (2.2)	3.5 (7.5)	3.9 (8.6)	10.3 (22.7)	12.7 (28.0)	31.5 (69.4)	38.7 (85.3)	-
2-way cast	0.9 (2.0)	1.0 (2.2)	3.3 (7.3)	3.8 (8.4)	10.0 (22.0)	11.7 (25.8)	29.9 (65.9)	36.2 (79.8)	-
2-way block	-	-	-	-	-	-	-	-	37 (82.2)
T-block equal port sizes	0.9 (2.0)	1.1 (2.4)	3.5 (7.5)	4.2 (9.3)	11.3 (24.9)	14.4 (31.7)	34.0 (75.0)	45.0 (99.2)	-
Tank outlet block	-	1.2 (2.6)	3.6 (7.9)	4.2 (9.3)	11.3 (24.9)	13.0 (28.7)	32.5 (71.7)	42.1 (92.8)	-

Actuator type: slim (SS/SL)

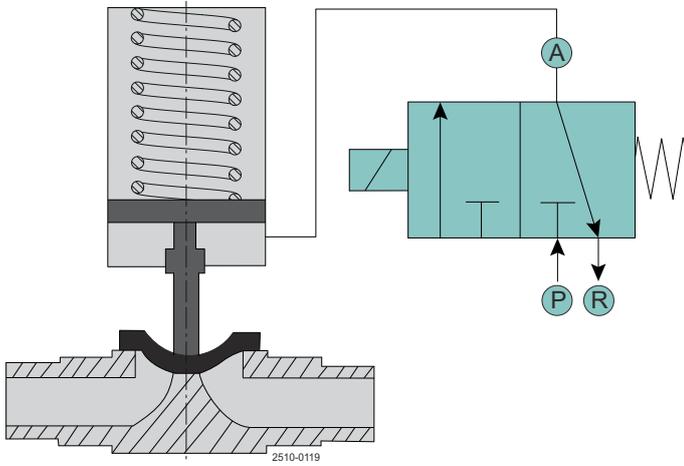
	DN8/ DN10 (1/4"/3/8")	DN15 (1/2")	DN20 (3/4")	DN25 (1")	DN40 (1 1/2")	DN50 (2")	DN65 (2 1/2")	DN80 (3")	DN100 (4")
2-way forged	0.8 (1.76)	0.9 (1.98)	2.5 (5.5)	3.3 (7.26)	2.6 (5.72)	7.3 (16.06)	9.2 (20.24)	16.1 (35.42)	-
2-way cast	0.8 (1.76)	0.9 (1.98)	2.3 (5.06)	3.2 (5.06)	2.3 (7.04)	6.3 (13.86)	7.6 (16.72)	13.6 (29.92)	-
2-way block	-	-	-	-	-	-	-	-	14.4 (31.68)
T-block equal port sizes	0.8 (1.76)	1 (2.2)	2.5 (5.5)	3.6 (7.92)	3.6 (7.92)	9 (19.8)	11.7 (25.74)	22.4 (49.28)	-
Tank outlet block	-	1.1 (2.42)	2.6 (5.72)	3.6 (7.92)	3.6 (7.92)	7.6 (16.72)	10.2 (22.44)	19.5 (42.9)	-

7.6 Automatic operation

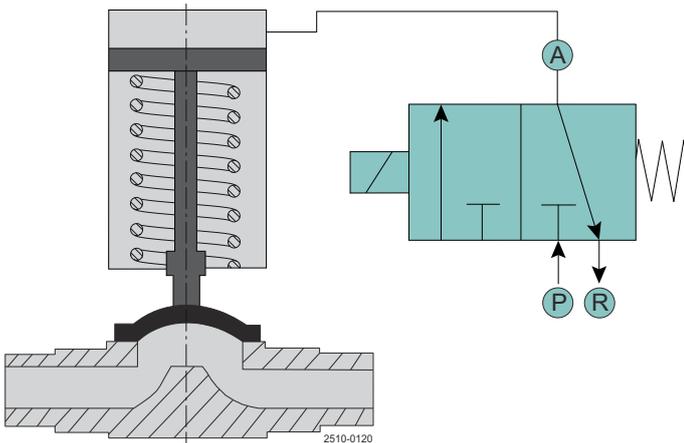
The actuator controls the axial movement of a piston, thereby opening or closing the valve depending on the actuator function. Closing the valve will push the compressor downwards onto the diaphragm, pressing the diaphragm against the weir of the valve body thereby closing the valve.

7.7 Control diagram/modes

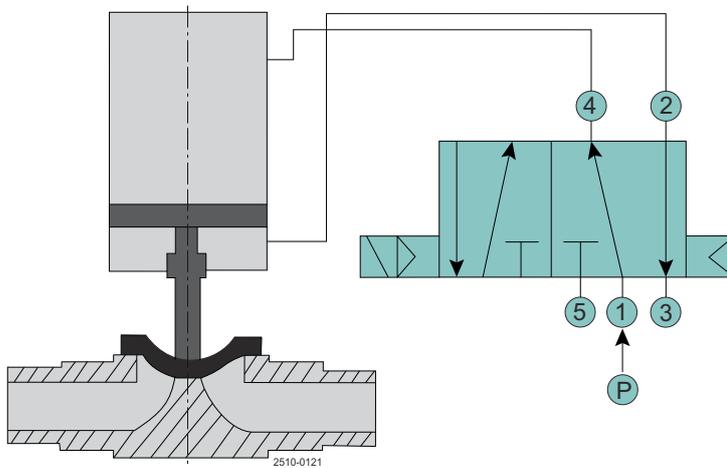
Function NC: normally closed with a solenoid valve 3/2 way for connection below



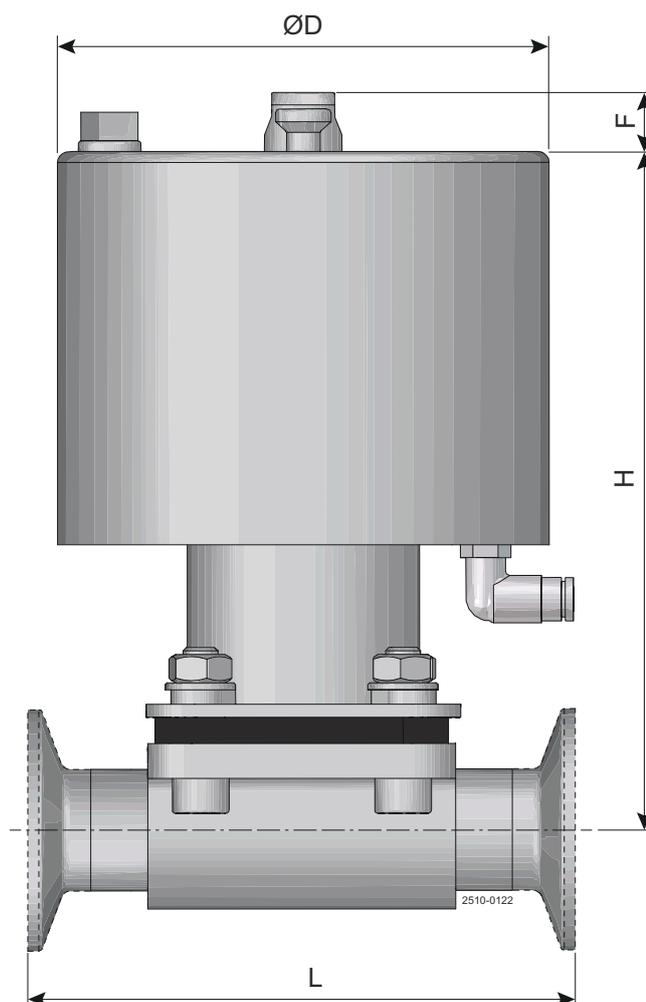
Function NO: normally open with a solenoid valve 3/2 way for connection above



Function AA: air/air with a solenoid valve 4/2 and 5/2 way for connection below and above

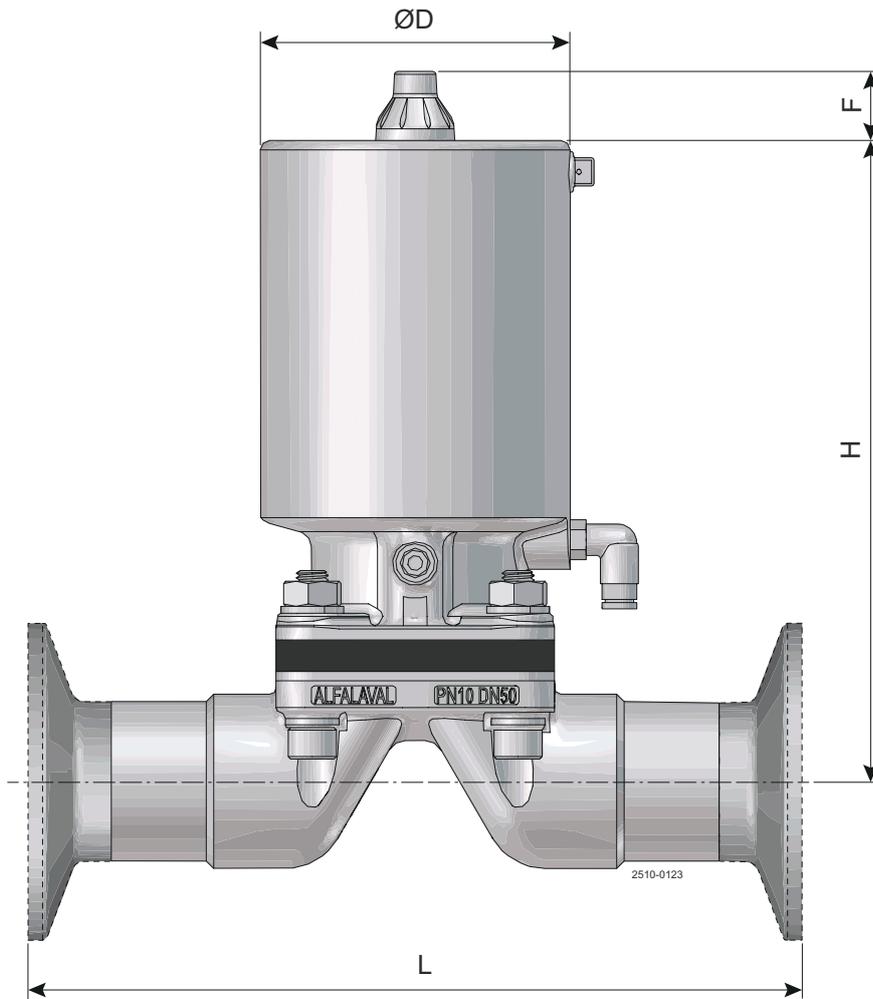


7.8 Size



Actuator type: high pressure (SS/HP)

DN	Size inch	$\varnothing D$ mm (in)	H mm (in)	Max. F mm (in)	L (weld end) mm (in)	L (clamp end) mm (in)
8-10	1/4"-3/8"	54 (2.125)	105 (4.134)	19 (0.748)	89 (3.504)	89 (3.504)
15	1/2"	54 (2.125)	118 (4.646)	22 (0.866)	110 (4.331)	108 (4.252)
20	3/4"	102 (4.000)	151 (5.937)	28 (1.102)	119 (4.685)	118 (4.646)
25	1"	102 (4.000)	159 (6.260)	31 (1.220)	129 (5.079)	127 (5.000)
40	1 1/2"	156 (6.142)	231 (9.091)	49 (1.929)	161 (6.339)	159 (6.260)
50	2"	156 (6.142)	236 (9.291)	49 (1.929)	192 (7.559)	191 (7.520)
65	2 1/2"	222 (8.740)	360 (14.173)	68 (2.677)	218 (8.583)	216 (8.504)
80	3"	222 (8.740)	368 (14.488)	74 (2.913)	256 (10.079)	254 (10.000)
100	4"	222 (8.740)	382 (15.039)	74 (2.913)	250 (9.843)	250 (9.843)



Actuator type: slim (SS/SL)

DN	Size inch	ØD mm (in)	H mm (in)	Max. F mm (in)	L (weld end) mm (in)	L (clamp end) mm (in)
8-10	¼"-¾"	49 (1.929)	91 (3.575)	22 (0.866)	89 (3.504)	89 (3.504)
15	½"	49 (1.929)	95 (3.740)	22 (0.866)	110 (4.331)	108 (4.252)
20	¾"	69 (2.717)	127 (5.008)	22 (0.866)	119 (4.685)	118 (4.646)
25	1"	79 (3.110)	152 (5.996)	22 (0.866)	129 (5.079)	127 (5.000)
40	1½"	98 (3.858)	194 (7.638)	22 (0.866)	161 (6.339)	159 (6.260)
50	2"	121 (4.764)	233 (9.173)	22 (0.866)	192 (7.559)	191 (7.520)
65	2½"	138 (5.433)	267 (10.512)	22 (0.866)	218 (8.583)	216 (8.504)
80	3"	158 (6.220)	301 (11.842)	22 (0.866)	256 (10.079)	254 (10.000)
100	4"	158 (6.220)	307 (12.079)	22 (0.866)	250 (9.843)	250 (9.843)

7.9 Pneumatic actuators - Air consumption

SS/SL

Size	NC and A/A (open)		NC and A/A (close)	
	Value	Unit	Value	Unit
DN8	0.02	L x air pressure (bar)	0.04	L x air pressure (bar)
DN15	0.01	L x air pressure (bar)	0.04	L x air pressure (bar)
DN20	0.06	L x air pressure (bar)	0.15	L x air pressure (bar)
DN25	0.11	L x air pressure (bar)	0.23	L x air pressure (bar)
DN40	0.23	L x air pressure (bar)	0.54	L x air pressure (bar)
DN50	0.46	L x air pressure (bar)	0.93	L x air pressure (bar)
DN65	0.74	L x air pressure (bar)	1.50	L x air pressure (bar)
DN80	1.11	L x air pressure (bar)	2.20	L x air pressure (bar)
DN100	1.11	L x air pressure (bar)	2.20	L x air pressure (bar)

SS/HP

Size	NC and A/A (open)		NO and A/A (close)	
	Value	Unit	Value	Unit
DN8	0.02	L x air pressure (bar)	0.07	L x air pressure (bar)
DN15	0.03	L x air pressure (bar)	0.07	L x air pressure (bar)
DN20	0.12	L x air pressure (bar)	0.39	L x air pressure (bar)
DN25	0.14	L x air pressure (bar)	0.41	L x air pressure (bar)
DN40	0.51	L x air pressure (bar)	1.52	L x air pressure (bar)
DN50	0.52	L x air pressure (bar)	1.52	L x air pressure (bar)
DN65	1.41	L x air pressure (bar)	6.25	L x air pressure (bar)
DN80	1.55	L x air pressure (bar)	6.25	L x air pressure (bar)
DN100	1.55	L x air pressure (bar)	6.25	L x air pressure (bar)

7.10 Product pressure versus control pressure

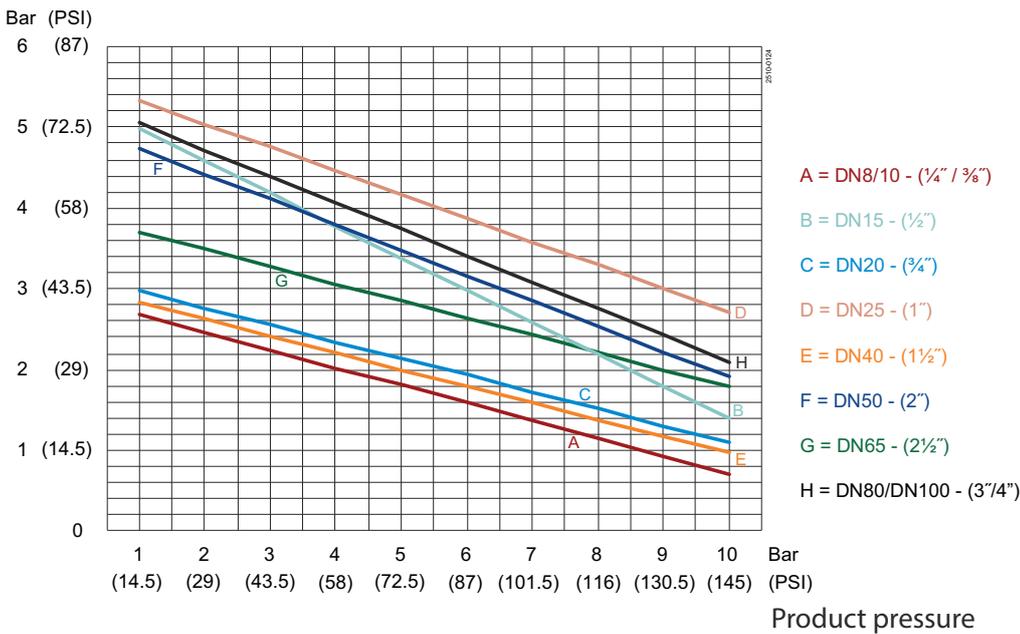
The diagrams state the required control pressure on the actuator at a given product pressure in the system.

NC (Normally Closed)

Control pressure is used for opening the valve. Here the required control pressure is reduced when the product pressure is increased. At interruption of air supply the actuator will close the valve.

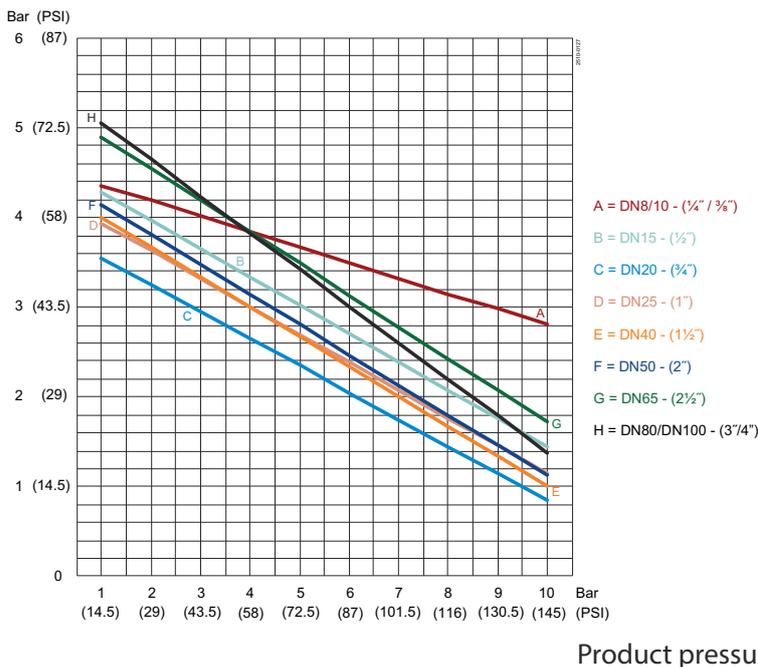
Actuator type: high pressure (SS/HP)

Air pressure



Actuator type: slim (SS/SL)

Air pressure



NO (Normally Open)

Control pressure is used for closing the valve. Here the required control pressure is increased when the product pressure is increased. With interruption of air supply, the actuator will open the valve.

Actuator type: high pressure (SS/HP)

Air pressure

Bar (PSI)

6 (87)

5 (72.5)

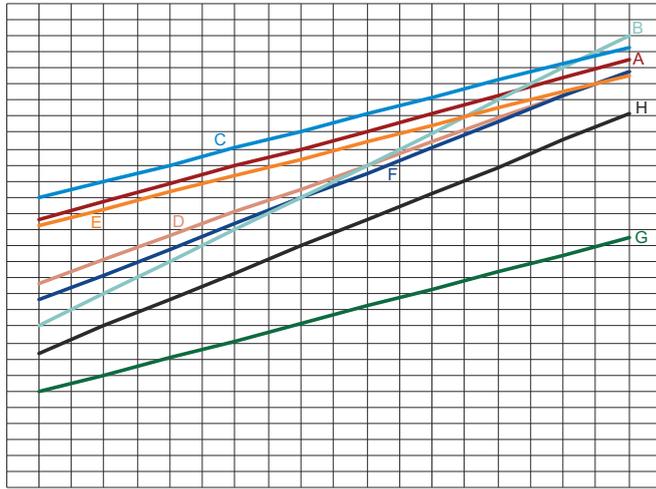
4 (58)

3 (43.5)

2 (29)

1 (14.5)

0



A = DN8/10 - (1/4" / 3/8")

B = DN15 - (1/2")

C = DN20 - (3/4")

D = DN25 - (1")

E = DN40 - (1 1/2")

F = DN50 - (2")

G = DN65 - (2 1/2")

H = DN80/DN100 - (3 3/4")

1 2 3 4 5 6 7 8 9 10 Bar
(14.5) (29) (43.5) (58) (72.5) (87) (101.5) (116) (130.5) (145) (PSI)

Product pressure

Actuator type: slim (SS/SL)

Air pressure

Bar (PSI)

7 (101.5)

6 (87)

5 (72.5)

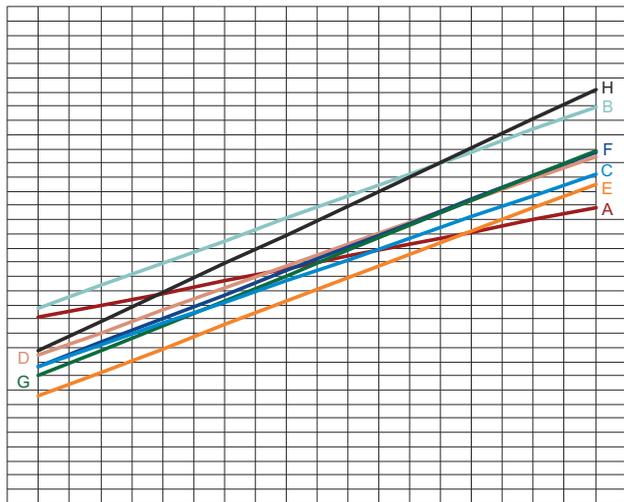
4 (58)

3 (43.5)

2 (29)

1 (14.5)

0



A = DN8/10 - (1/4" / 3/8")

B = DN15 - (1/2")

C = DN20 - (3/4")

D = DN25 - (1")

E = DN40 - (1 1/2")

F = DN50 - (2")

G = DN65 - (2 1/2")

H = DN80/DN100 - (3 3/4")

1 2 3 4 5 6 7 8 9 10 Bar
(14.5) (29) (43.5) (58) (72.5) (87) (101.5) (116) (130.5) (145) (PSI)

Product pressure

A/A (Air/Air)

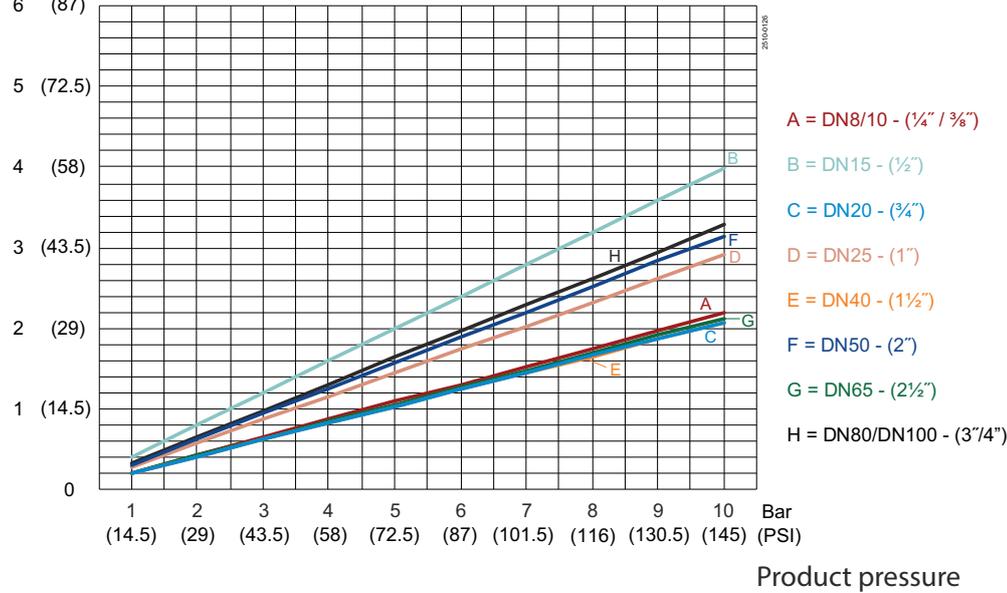
Control pressure is used for both opening and closing of the valve. Here the required control pressure is Increased when the product pressure is increased.

With interruption of air supply, the valve will open at positive product pressure and close at negative product pressure.

Actuator type: high pressure (SS/HP)

Air pressure

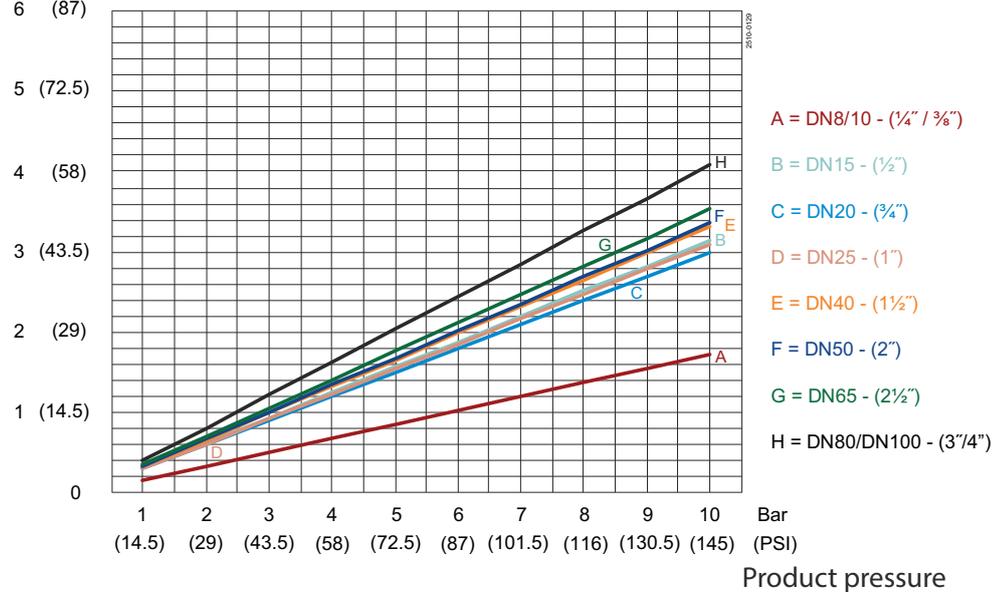
Bar (PSI)
6 (87)



Actuator type: slim (SS/SL)

Air pressure

Bar (PSI)
6 (87)



8 Spare Parts

For every delivered Alfa Laval Product, a spare part list is available.

This spare part list contains a range of the most common wear parts for the machinery. If any component not mentioned is required, please contact your local Alfa Laval representative for availability.

You can find our spare part catalogue at <https://hygienicfluidhandling-catalogue.alfalaval.com>.

Always use Alfa Laval genuine spare parts. The warranty of Alfa Laval products is dependent on use of Alfa Laval genuine spare parts.

8.1 Ordering Spare Parts

When ordering spare parts, please always state:

1. Serial number (if available)
2. Item number/spare part number (if available)
3. Capacity or other relevant identification

8.2 Alfa Laval Service

Alfa Laval is represented in all larger countries of the world.

Do not hesitate to contact your local Alfa Laval representative, with any questions or requirement of spare parts for Alfa Laval equipment.

8.3 Warranty - Definition



The rules of Intended use are absolute. Use of the supplied Alfa Laval product is allowed only when in compliance with the technical data supplied with the Intended use.

Differing utilisation, other than agreed with Alfa Laval Kolding A/S, exclude any liability and warranty.

No modification or alteration of the supplied Alfa Laval product is allowed, unless explicit permission is granted by Alfa Laval Kolding A/S.



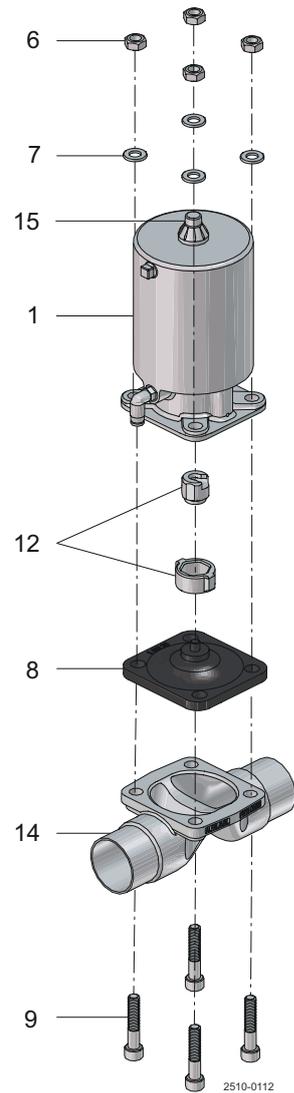
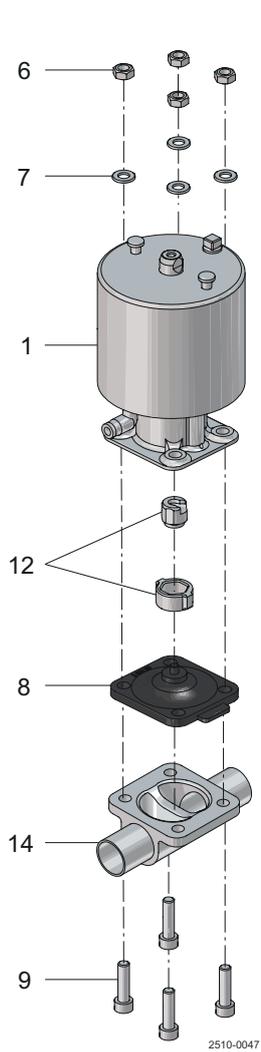
Liability and warranty are excluded:

- If advice and instruction of operating instructions are ignored
- For incorrect operation or for insufficient maintenance of the supplied Alfa Laval product
- For any kind of change of function of the supplied Alfa Laval product without prior written agreement by Alfa Laval Kolding A/S
- If supplied Alfa Laval product is modified by non-authorized persons
- If using the supplied Alfa Laval product without attention of appropriate safety regulations, (see [Safety](#) on page 9)
- If protection equipment is not used and vessel process / ancillary equipment is not brought to a standstill
- If the supplied Alfa Laval product and ancillary parts are not properly maintained (to be executed in intervals and including fitting of prescribed replacement parts)

When exchanging parts, only original replacement parts, released from the manufacturer, must be used.

9 Parts Lists and Exploded Views

9.1 Actuator DN8-DN100 (1/4"-4")



Pos.	Qty.	Denomination
1	1	Actuator
8	1	Diaphragm
6+7+9	1	Nut, washer, screw set
14	1	Valve body
15	1	Indication cap kit for SS/SL