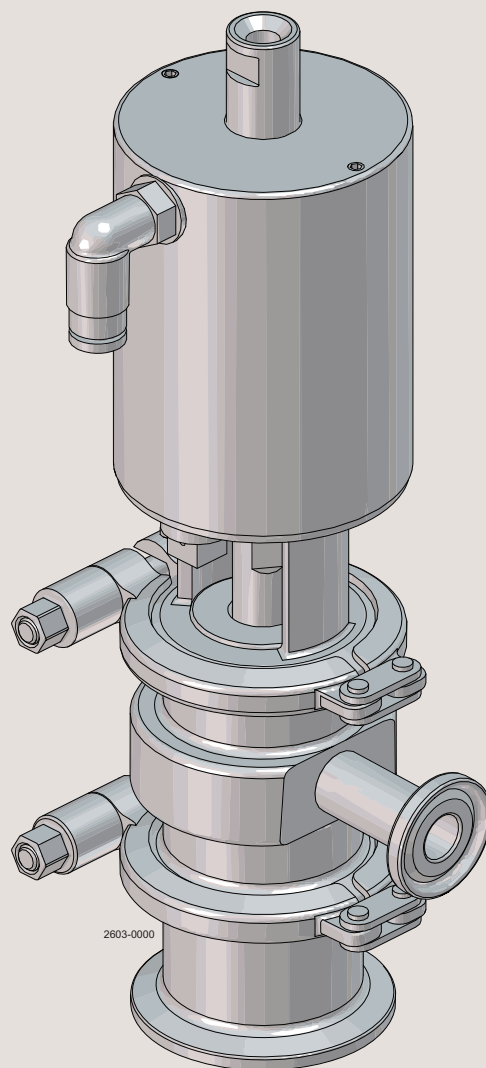




Instruction Manual

Unique Vacuum Breaker Valve



ESE01525-EN2 2020-09

Original manual

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

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1 EC Declaration of Conformity

The designating company

Alfa Laval

Company Name

Albuen 31, DK-6000 Kolding, Denmark

Address

+45 79 32 22 00

Phone No.

hereby declare that

Unique Valve

Denomination

Vacuum Breaker

Type

Year

Was manufactured in conformity with the provisions in the COUNCIL DIRECTIVE on mutual approximation of the laws of the Member States on the safety of machines (98/37/EC) with special reference to Annex 1 of the directive on essential safety and health requirements in relation to the construction and manufacture of machines.

Global Product Quality Manager
Pumps, Valves, Fittings and Tank Equipment

Title

Lars Kruse Andersen

Name

Alfa Laval Kolding
Company

Signature

Designation



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

2.1 Important information

Always read the 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 the manual are summarized on this page.

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

2.3 Safety precautions

Installation

Always read the technical data carefully.



Always release compressed air after use.



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



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.



Always read the technical data carefully.



Always release compressed air after use.



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



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



Always handle lye and acid with great care.



Maintenance

Always read the technical data carefully.



Always release compressed air after use.



Never service the valve when it is hot.



Never service the valve with valve and pipelines under pressure.



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



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



The instruction manual is part of the delivery. Study the instructions carefully.
 The items refer to parts list and service kits section.
 The valve is supplied as separate parts as standard.
 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.

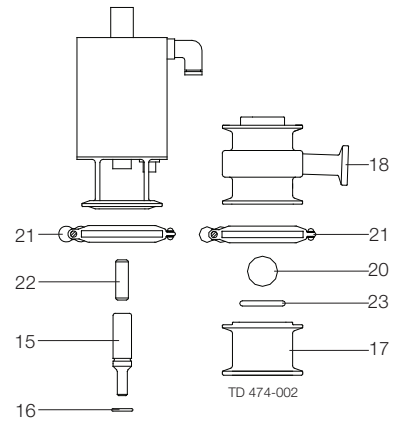
Check the delivery for:

1. Complete valve.
2. Delivery note.

Step 2

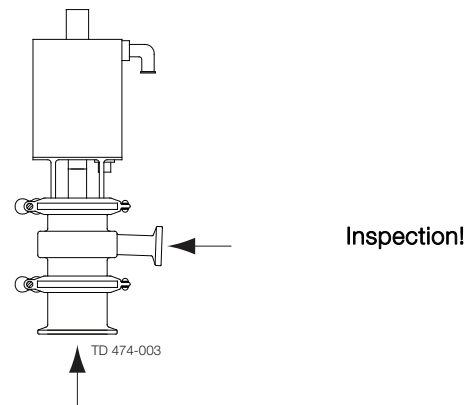
Stop valve:

1. Complete actuator.
2. Ball (20).
3. 2 x clamp (21).
4. Stem (15).
5. Valve body (18).
6. O-ring (16).
7. Base (17).
8. Studt (22).
9. O-ring (23).



Step 3

Inspect the valve/valve parts for visible transport damages.
 Avoid damaging the valve/valve parts.



3 Installation

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

3.2 General installation

Step 1



Always read the technical data carefully.
See chapter 6 Technical data



Always release compressed air after use.

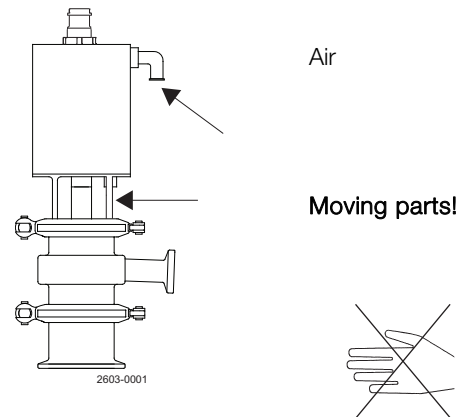
CAUTION

Alfa Laval cannot be held responsible for incorrect installation.

Step 2



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

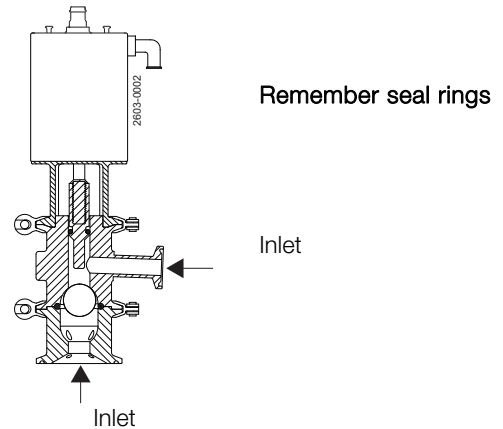


Step 3

It is necessary to install the valve in the vertical position with the actuator on top.

Fittings:

Ensure that connections are tight.

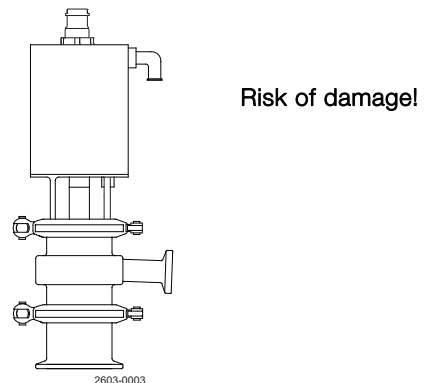


Step 4

Avoid stressing the valve.

Pay special attention to:

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

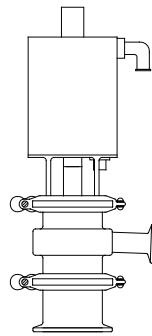


3 Installation

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

Step 5

Air connections at actuator 1/4" Poly-Flow tubing or equivalent.



Air used only to pulse valve during CIP

TD 474-003_1

3 Installation

Read the instructions carefully and pay special attention to the warnings.

The installation variation below is ONLY A SUGGESTION. It is important that you contact your local regulatory agency for acceptance of your installation.

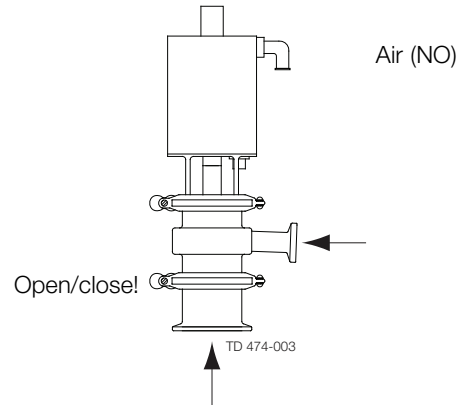
3.3 Important Installation Information

Step 1

Pre-use check:

1. Supply compressed air to the actuator.
2. Open and close the valve several times to ensure that it operates smoothly.

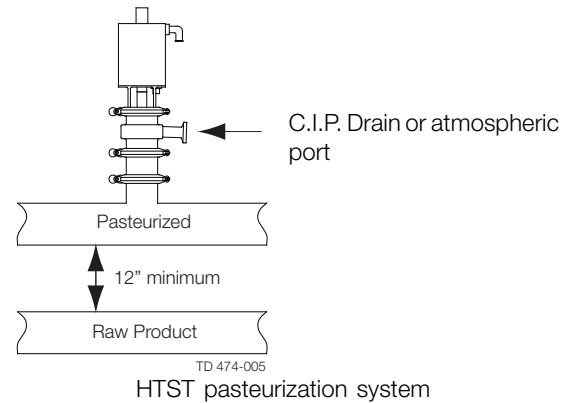
Pay special attention to the warnings!



Step 2

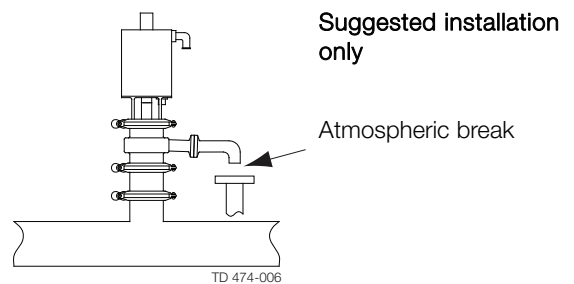
NOTE!

When installing C.I.P. drain pipe on the Vacuum Breaker discharge port, ensure that an atmosphere break exists no lower than the lowest point of the Vacuum Breaker. Ensure that the Vacuum Breaker is situated 12" above the highest point of the raw product pipeline on the pasteurized side.



Step 3

During product process, port acts as an atmospheric break in case of power loss/failure. During C.I.P, the port acts as a C.I.P. drain port.



Study the instructions carefully and pay special attention to the warnings!
The vacuum breaker is automatically operated by means of an actuator.

4.1 Operation

Step 1



Always read the technical data carefully.
See chapter 6 Technical data



Always release compressed air after use.

CAUTION

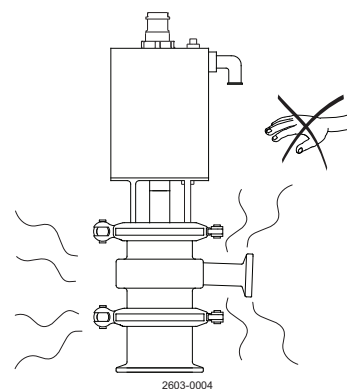
Alfa Laval cannot be held responsible for incorrect operation.

Step 2



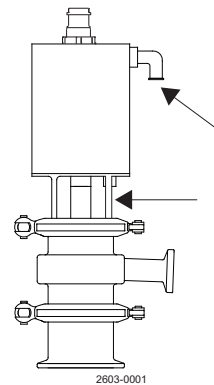
Never touch the vacuum breaker or the pipelines when processing hot liquids or when sterilising.

Burning
danger!



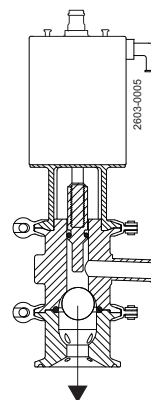
Step 3

When pipelines are pressurized, the internal ball is forced upward, closing the port.



Step 4

When internal pressure drops, the ball is drawn down, allowing air to enter and relieve the vacuum.



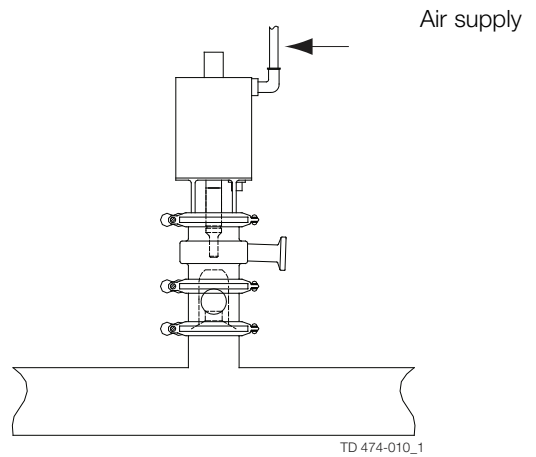
4 Operation

Study the instructions carefully and pay special attention to the warnings!
The vacuum breaker is automatically operated by means of an actuator.

Step 5

Operation by means of actuator: (C.I.P. only)

Automatic on/off operation by means of compressed air for pulsing the actuator during C.I.P.

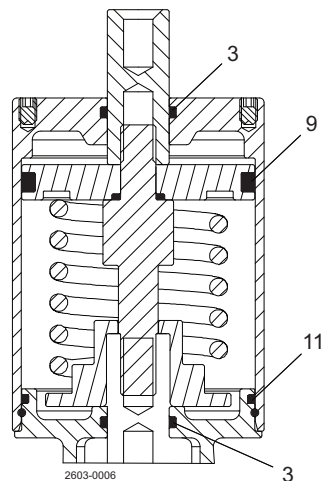


Pay attention to possible faults. Study the instructions carefully.

4.2 Troubleshooting

Lubrication of actuator:

1. Ensure smooth movement of the actuator (the actuator is lubricated before delivery).
2. Lubricate with grease if necessary.



NOTE!

Study the maintenance instructions carefully before replacing worn parts. - See page 16!

Problem	Cause/result	Repair
<ul style="list-style-type: none"> - External product leakage - Internal leakage by closed valve (normal wear) 	<ul style="list-style-type: none"> - Worn seal ring/O-rings - Worn ball 	Replace the seal ring, O-rings and ball
<ul style="list-style-type: none"> - External leakage - Internal leakage by closed valve (too early) 	<ul style="list-style-type: none"> - High pressure - High temperature - Aggressive liquids - Many activations 	<ul style="list-style-type: none"> - Replace by a seal ring of a different rubber grade - Change the operation conditions
Difficult to open/close	<ul style="list-style-type: none"> - Worn O-rings - Worn stem 	<ul style="list-style-type: none"> - Replace O-rings - Replace stem
Difficult to open/close	The sealings seize	Lubricate actuator parts: <ul style="list-style-type: none"> - O-rings (3) - O-rings (9) at inside of cylinder (1)

4 Operation

The valve is designed for cleaning in place (CIP). CIP = Cleaning In Place.
Study the instructions carefully and pay special attention to the warnings!
NaOH = Caustic Soda.
HNO₃ = Nitric acid.

4.3 Recommended cleaning

Step 1



Always handle lye and acid with great care.

NOTE

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

Caustic danger!



Always use rubber gloves!

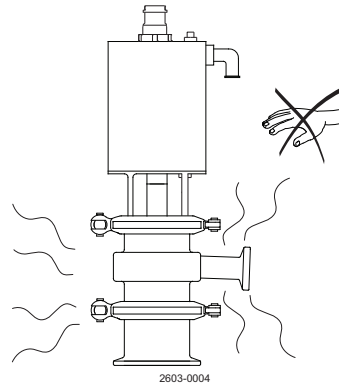


Always use protective goggles!

Step 2



Never touch the vacuum breaker or the pipelines when processing hot liquids or when sterilising.



Burning danger!

Step 3

Examples of cleaning agents:

Use clean water, free from chlorides.

1. 1% by weight NaOH at 158° F

1 kg NaOH + 100 l water = Cleaning agent.

2.2 l 33% NaOH + 100 l water = Cleaning agent.

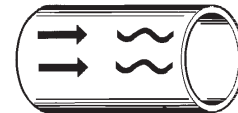
2. 0.5% by weight HNO₃ at 158° F

0.7 l 53% HNO₃ + 100 l water = Cleaning agent.

Step 4

1. Avoid excessive concentration of the cleaning agent.
2. Adjust the cleaning flow to the process.
3. **Always** rinse well with clean water after the cleaning.

Always rinse!



Clean water Cleaning agents

Step 5

NOTE

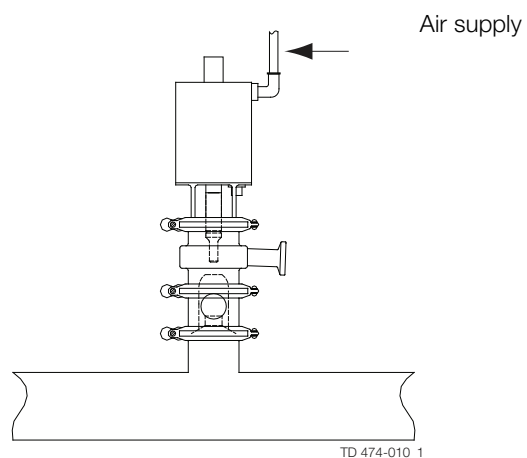
The cleaning agents must be stored/disposed off in accordance with current regulations/directives.

The valve is designed for cleaning in place (CIP). CIP = Cleaning In Place.
Study the instructions carefully and pay special attention to the warnings!
NaOH = Caustic Soda.
HNO₃ = Nitric acid.

Step 6

Operation by means of actuator: (C.I.P. only)

Automatic on/off operation by means of compressed air for pulsing the actuator during C.I.P.



5 Maintenance

Maintain the valve regularly.

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

Always keep spare rubber seals in stock.

Check the valve for smooth operation after service.

5.1 General maintenance

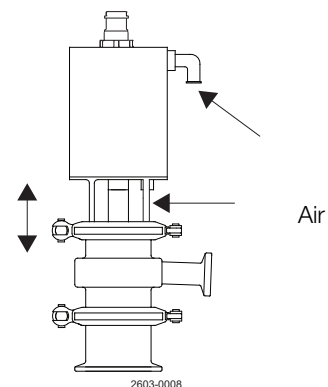
Below are some guidelines for maintenance and lubrication intervals. Please note that the guidelines are for normal working conditions in one shift.

	Valve rubber seals	Actuator rubber seals
Preventive maintenance	Replace after 12 months	Replace after 5 years
Maintenance after leakage (leakage normally starts slowly)	Replace at the end of the day	Replace when possible
Planned maintenance	<ul style="list-style-type: none"> - Regular inspection for leakage and smooth operation - Keep a record of the valve - Use the statistics for planning of inspections Replace after leakage	<ul style="list-style-type: none"> - Regular inspection for leakage and smooth operation - Keep a record of the actuator - Use the statistics for planning of inspections Replace after leakage
Lubrication	Before fitting USDA grade lubricant	Before fitting Oil or grease (USDA H1 approved oil/grease)

Pre-use check:

1. Supply compressed air to the actuator.
2. Open and close the valve several times to ensure that it operates smoothly.

Pay special attention to the warnings!



Recommended spare parts

Service kits (see page 22)

Study the instructions carefully. The items refer to the parts list and service kits section. Handle scrap correctly.

5.2 Dismantling of Unique Vacuum Breaker Valve

Step 1



Always read the technical data carefully.



Always release compressed air before dismantling.

Step 2



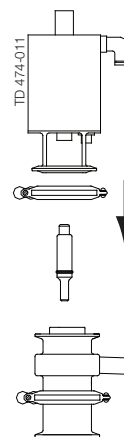
The vacuum breaker must **never** be serviced while hot.



The vacuum breaker and the pipelines must **never** be serviced while pressurized.

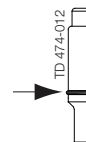
Step 3

1. Remove clamp from actuator/body.
2. Remove stem from actuator.



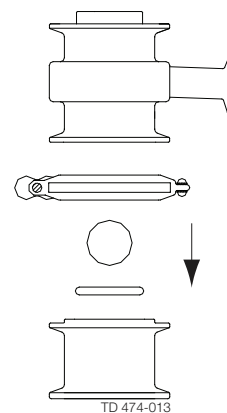
Step 4

Remove O-ring.



Step 5

1. Remove clamp from base/body.
2. Remove body, ball and gasket from the base.



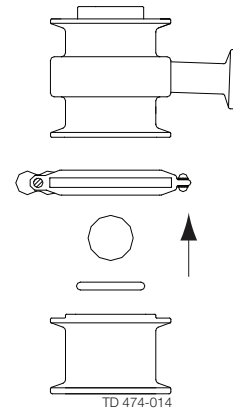
5 Maintenance

Study the instructions carefully. The items refer to the parts list and service kits section. Handle scrap correctly.

5.3 Assembly of Unique Vacuum Breaker Valve

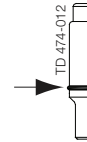
Step 1

1. Assemble ball, gasket and body to the base.
2. Assemble the clamp and tighten.



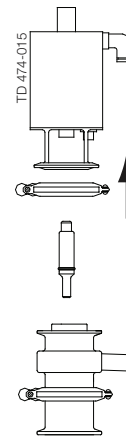
Step 2

1. Apply USDA grade lubricant to O-ring.
2. Assemble O-ring to stem.
3. Assemble stem to actuator.



Step 3

Assemble actuator and stem to body.



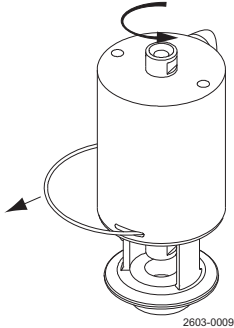
Study the instructions carefully.
The items refer to the parts list and service kits section. Handle scrap correctly.

5.4 Dismantling of actuator

Step 1

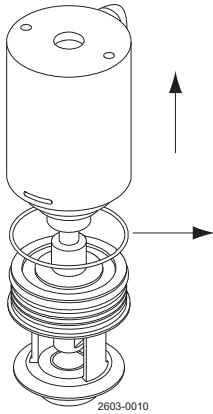
- 1. Rotate cylinder (1).
- 2. Remove lock wire (12).

Rotate by hand or with filter strap!



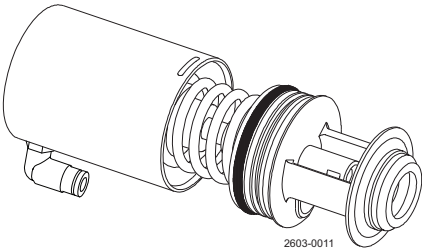
Step 2

- 1. Remove cylinder (1).
- 2. Remove O-rings (3, 11) from bonnet (13) and O-ring (3) from cylinder (1).



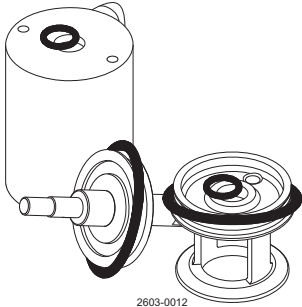
Step 3

- 1. Remove piston/spring package.
- 2. Remove O-ring (9) from the piston (10).



Step 4

Replace the rubber seals.



5 Maintenance

Study the instructions carefully.

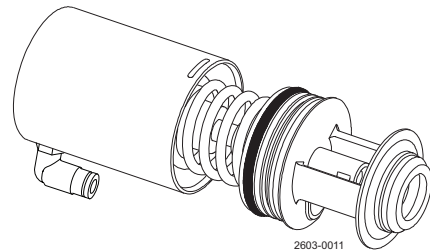
The items refer to the parts list and service kits section.

Lubricate the rubber seals before fitting them.

5.5 Assembly of actuator

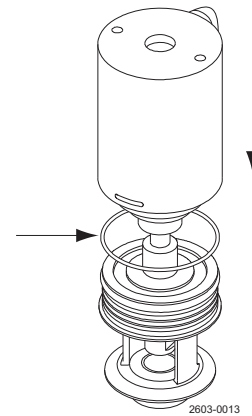
Step 1

1. Fit O-ring (9) on piston (10).
2. Fit the piston/spring package.



Step 2

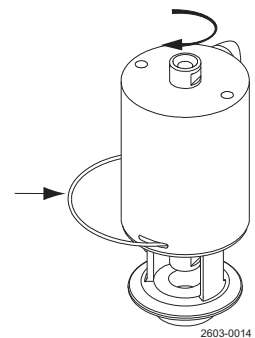
1. Fit O-rings (3, 11) in bonnet (13) and O-ring (3) on cylinder (1).
2. Fit the cylinder.



Step 3

1. Fit lock wire (12) through the slot in cylinder (1) into the hole in bonnet (13).
2. Rotate the cylinder 360° (see step 4).

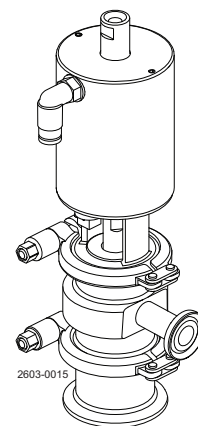
Rotate by hand or with filter strap!



Step 4

NOTE!

It is recommended to rotate cylinder (1) further 180° in relation to bonnet (13) so that the top and bottom air connections are fixed on the same side.



*It is important to observe the technical data during installation, operation and maintenance.
Inform the personnel about the technical data.*

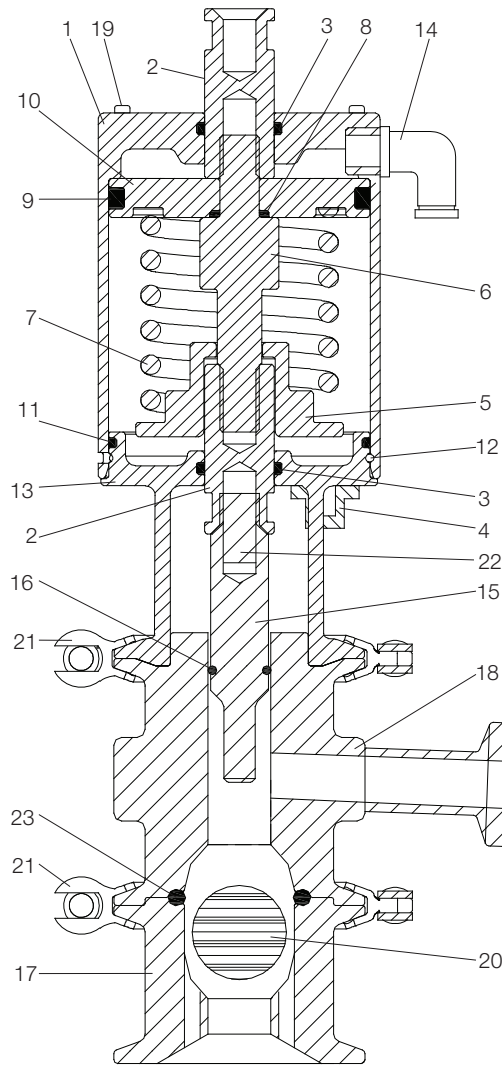
6.1 Technical data

Data - valve/actuator	
Max. product pressure	1000 kPa 145 psi (10 bar)
Min. product pressure	Full vacuum
Temperature range	14° F to 194° F (-10° C to +90° C) (EPDM)
Air pressure, actuator	100 to 700 kPa (73 to 101.5 psi) (1 to 7 bar)
Materials - valve/actuator	
Product wetted steel parts	Acid-resistant steel 1.4404 (AISI 316L)
Finish, outside	Semi-bright
Finish, inside	32 Ra
Other steel parts	Stainless steel 1.4307 (AISI 304L)
Stem	316L
Product wetted seals	EPDM
Actuator seals	Nitrile (NBR)
Ball	Polypropylene

7 Parts list and service kits

The parts includes all items.

7.1 Unique Vacuum Breaker Valve



TD 474-016

7 Parts list and service kits

The parts includes all items.

Parts list

Pos.	Qty	Denomination
1	1	Cylinder
2	2	Middle piece
3	2	O-ring
4	1	Plug
5	1	Guide pin
6	1	Piston rod
7	1	Spring
8	1	O-ring
9	1	O-ring
10	1	Piston
11	1	O-ring
12	1	Lock wire
13	1	Bonnet
14	1	Air fitting
15	1	Stem
16	1	O-ring
17	1	Base
18	1	Body
19	2	Screw
20	1	Ball
21	2	Clamp
22	1	Stud
23	1	O-ring

Service kits

Denomination

Actuator

DN/OD 12.7-19 mm 9611-92-6323

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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