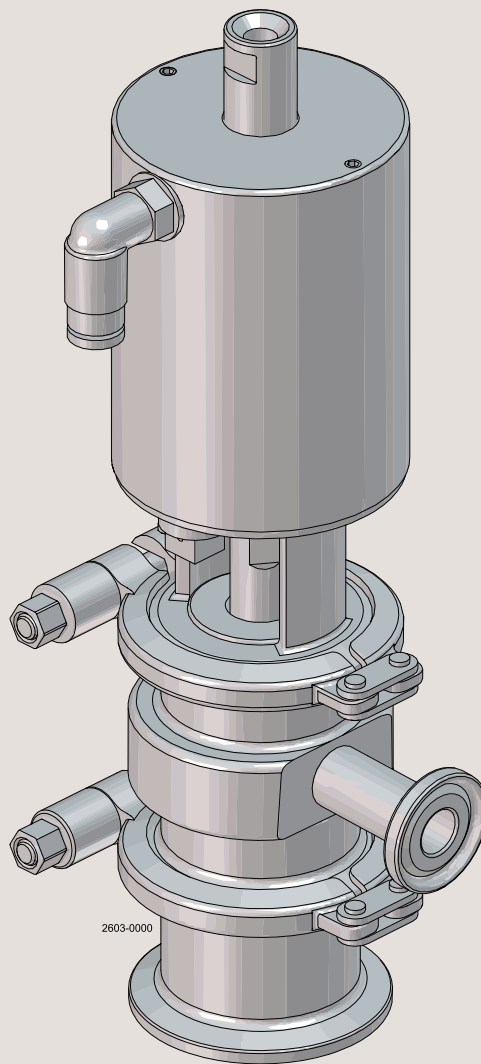




# Instruction Manual

## Unique Vacuum Breaker Valve



2603-0000

ESE01525-EN3

2022-11

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 Declarations of Conformity

## 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

Unique Valve  
Designation

Vacuum Breaker  
Type

is in conformity with the following directives with amendments:  
- Machinery Directive 2006/42/EC

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

Global Product Quality Manager <small>Title</small>	Lars Kruse Andersen <small>Name</small>
Kolding, Denmark <small>Place</small>	2022-11-30 <small>Date (YYYY-MM-DD)</small>
	 <small>Signature</small>

This Declaration of Conformity replaces previous version of Declaration of Conformity



# 1 Declarations of Conformity

## 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

Unique Valve

Designation

Vacuum Breaker

Type

is in conformity with the following directives with amendments:

- The Supply of Machinery (Safety) Regulations 2008

Signed on behalf of: Alfa Laval Kolding A/S

Global Product Quality Manager

Title

Lars Kruse Andersen

Name

Kolding, Denmark

Place

2022-11-30

Date (YYYY-MM-DD)



Signature

DoC Revison\_01\_112022

UK  
CA



## 2 Safety

---

*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:



*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.



## 3 Installation

*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.

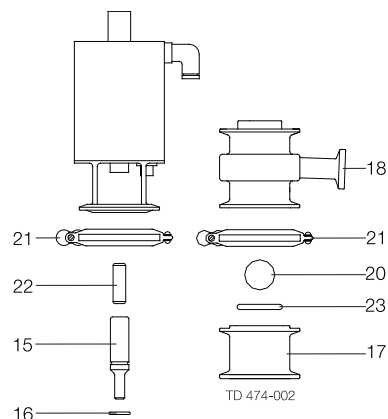
#### Check the delivery for:

1. Complete valve.
2. Delivery note.

#### Step 2

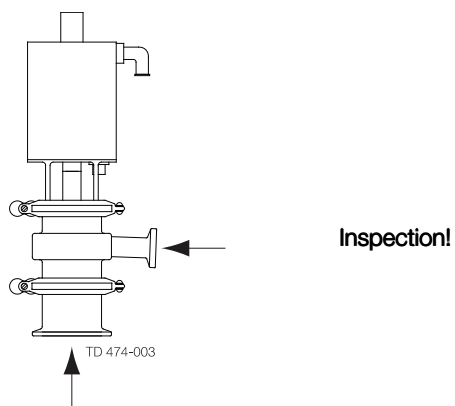
##### Stop valve:

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.



*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.

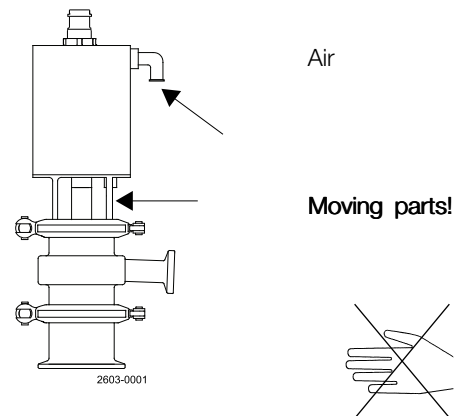
#### CAUTION

Alfa Laval cannot be held responsible for incorrect installation.

#### Step 2



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

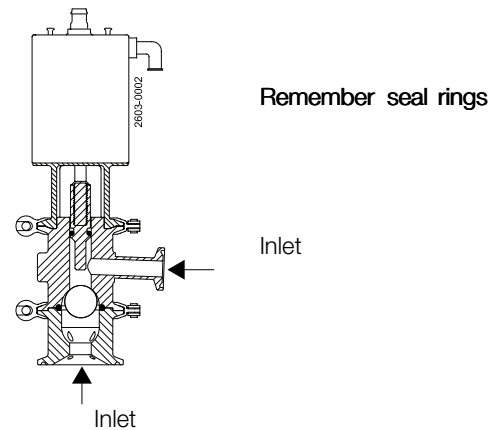


#### Step 3

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

#### Fittings:

Ensure that connections are tight.



### 3 Installation

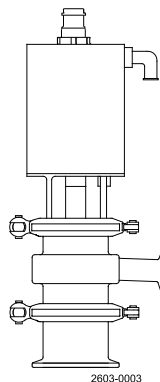
*Study the instructions carefully and pay special attention to the warnings!*

#### Step 4

Avoid stressing the valve.

**Pay special attention to:**

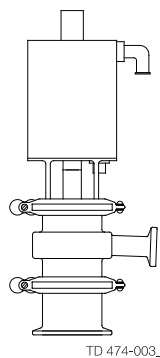
- Vibrations.
- Thermal expansion of the pipelines.
- Excessive welding.
- Overloading of the pipelines.



**Risk of damage!**

#### Step 5

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



**Air used only to pulse  
valve during CIP**

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.

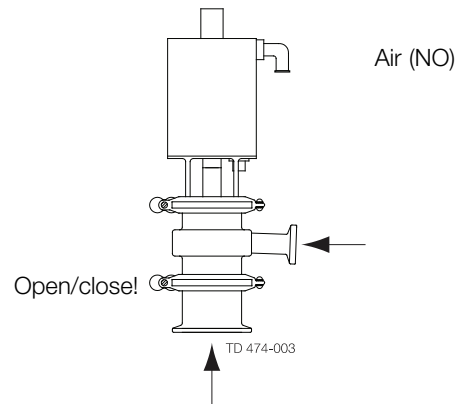
### 3.3 Important Installation Information

#### 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.

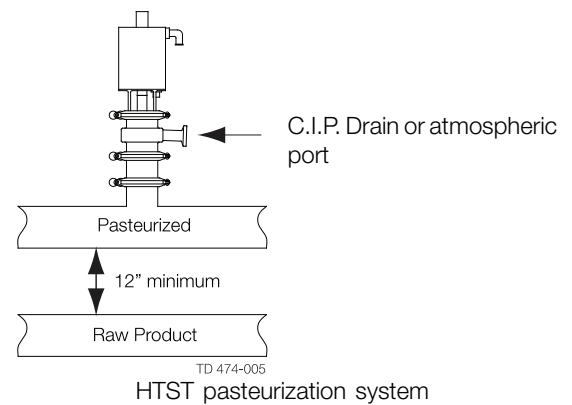
**Pay special attention to the warnings!**



#### Step 2

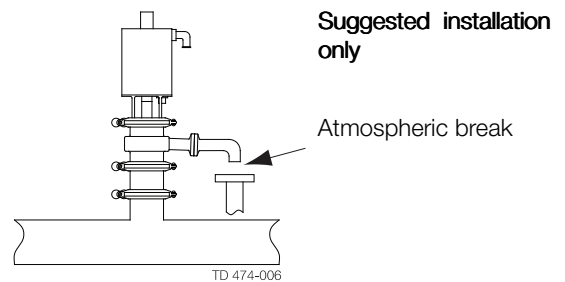
##### NOTE!

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.



## 4 Operation

*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

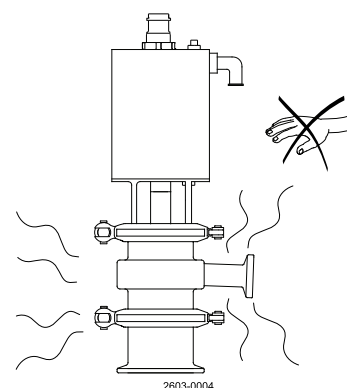
Alfa Laval cannot be held responsible for incorrect operation.

#### Step 2



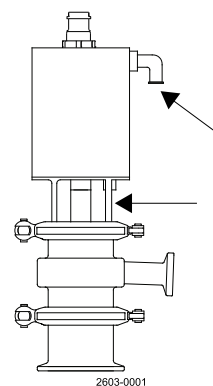
**Never** touch the vacuum breaker or the pipelines when processing hot liquids or when sterilising.

Burning  
danger!



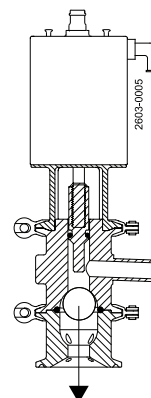
#### Step 3

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.



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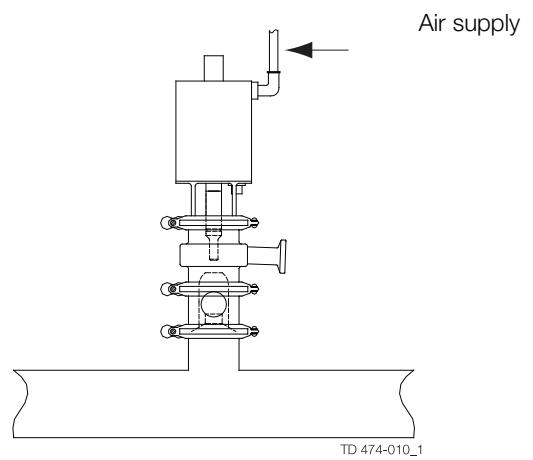
*Study the instructions carefully and pay special attention to the warnings!*  
*The vacuum breaker is automatically operated by means of an actuator.*

---

### 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.



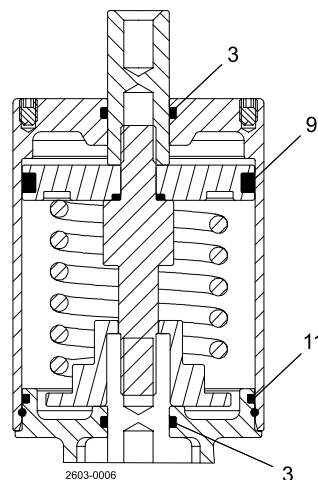
## 4 Operation

*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 17!

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

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.  
HNO<sub>3</sub> = 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!

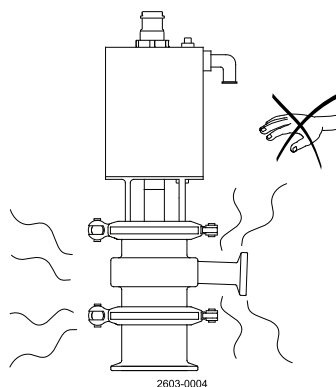


**Always** use  
protective goggles!

#### 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.

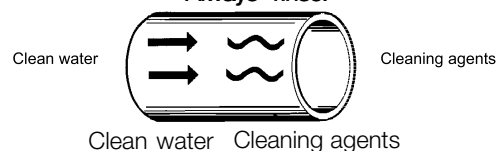
2. 0.5% by weight HNO<sub>3</sub> at 158° F

0.7 l  
53% HNO<sub>3</sub> + 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!**



#### Step 5

#### NOTE

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

## 4 Operation

---

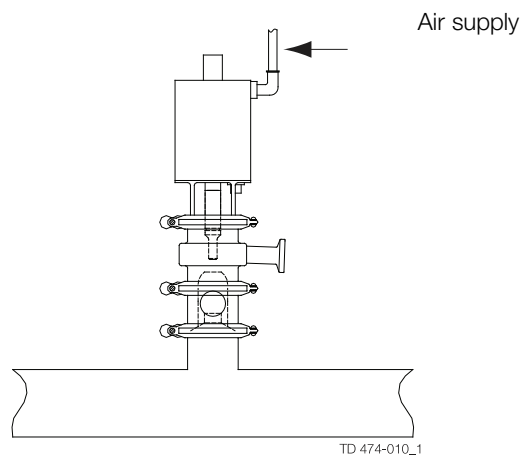
*The valve is designed for cleaning in place (CIP). CIP = Cleaning In Place.  
Study the instructions carefully and pay special attention to the warnings!  
NaOH = Caustic Soda.  
HNO<sub>3</sub> = Nitric acid.*

---

### 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.



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

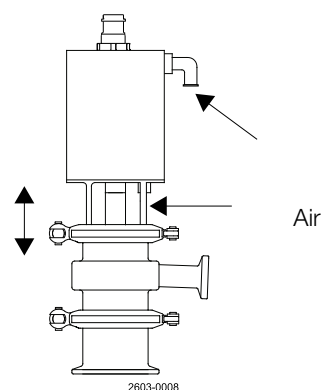
Below are some guidelines for maintenance and lubrication intervals. Please note that the guidelines are for normal working conditions in one shift.

	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"> <li>- Regular inspection for leakage and smooth operation</li> <li>- Keep a record of the valve</li> <li>- Use the statistics for planning of inspections</li> </ul> <b>Replace after leakage</b>	<ul style="list-style-type: none"> <li>- Regular inspection for leakage and smooth operation</li> <li>- Keep a record of the actuator</li> <li>- Use the statistics for planning of inspections</li> </ul> <b>Replace after leakage</b>
Lubrication	<b>Before fitting</b> USDA grade lubricant	<b>Before fitting</b> 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 24)

## 5 Maintenance

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



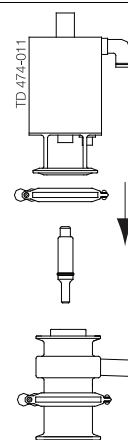
The vacuum breaker must **never** be serviced while hot.



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

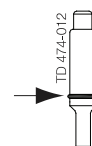
#### Step 3

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



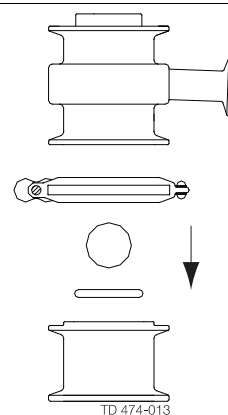
#### Step 4

Remove O-ring.



#### Step 5

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

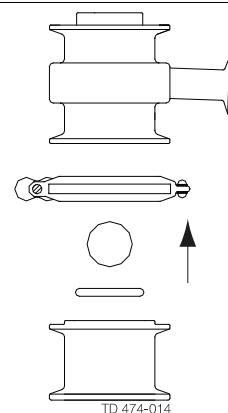


Study the instructions carefully. The items refer to the parts list and service kits section. Handle scrap correctly.

### 5.3 Assembly of Unique Vacuum Breaker Valve

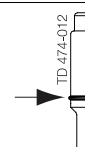
#### Step 1

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



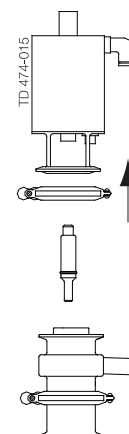
#### Step 2

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.



## 5 Maintenance

---

*Study the instructions carefully.*

*The items refer to the parts list and service kits section. Handle scrap correctly.*

---

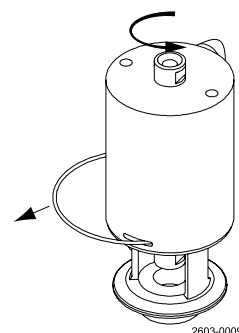
### 5.4 Dismantling of actuator

---

#### Step 1

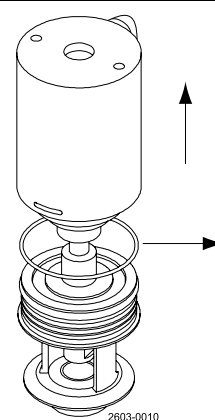
1. Rotate cylinder (1).
2. Remove lock wire (12).

Rotate by hand or with  
filter strap!



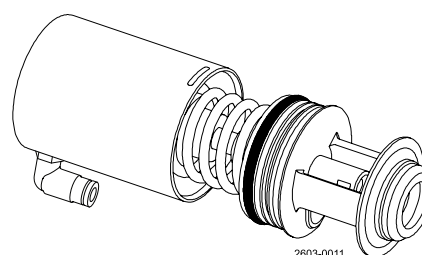
#### Step 2

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



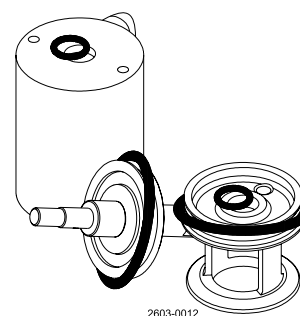
#### Step 3

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



#### Step 4

Replace the rubber seals.

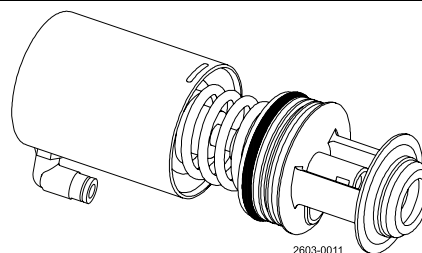


*Study the instructions carefully.  
The items refer to the parts list and service kits section.  
Lubricate the rubber seals before fitting them.*

### 5.5 Assembly of actuator

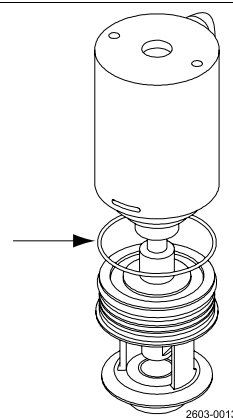
#### Step 1

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



#### Step 2

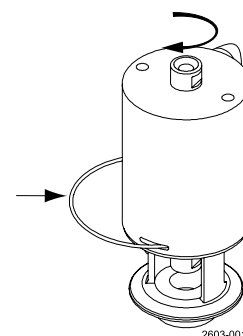
1. Fit O-rings (3, 11) in bonnet (13) and O-ring (3) on cylinder (1).
2. Fit the cylinder.



#### 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).

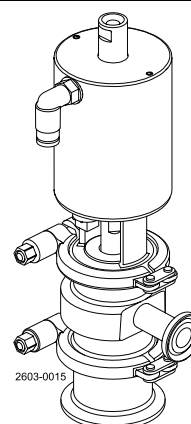
Rotate by hand or with  
filter strap!



#### 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.



## 6 Technical data

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

### 6.1 Technical data

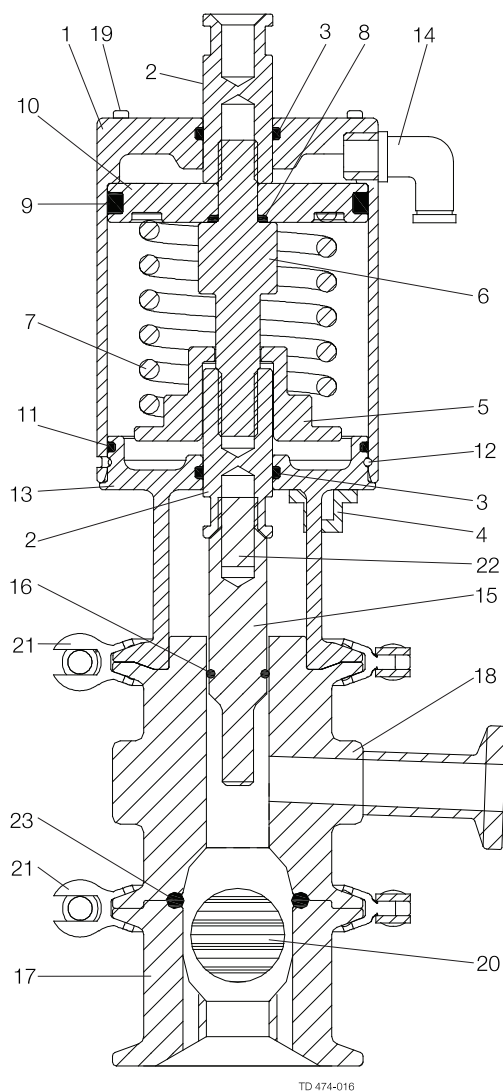
Data - valve/actuator	
Max. product pressure	1000 kPa 145 psi (10 bar)
Min. product pressure	Full vacuum
Temperature range	14° F to 194° F (-10° C to +90° C) (EPDM)
Air pressure, actuator	100 to 700 kPa (73 to 101.5 psi) (1 to 7 bar)
Materials - valve/actuator	
Product wetted steel parts	Acid-resistant 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



## 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](http://www.alfalaval.com) to access the information directly.

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