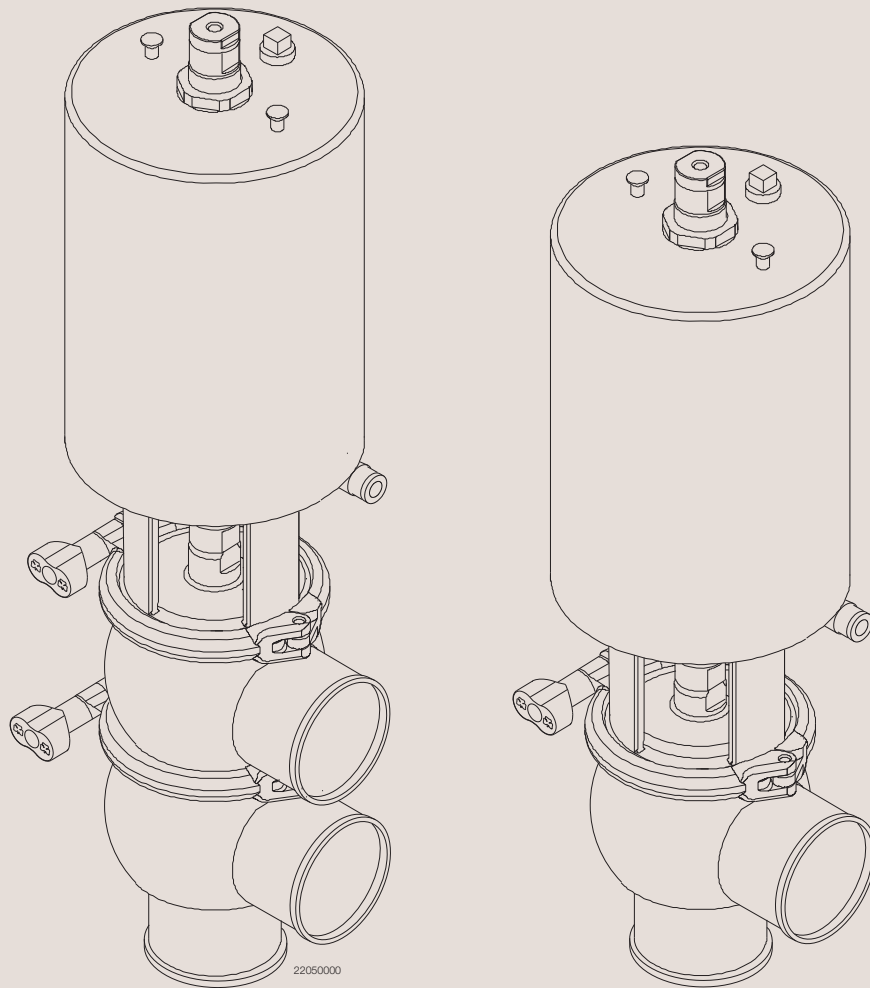




# Instruction Manual

## Unique 7710 Regulating Valve



ESE00480-ENUS2 2012-02

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 7710 Series Valve

Denomination

Regulating Valve

Type

                      
Year

is in conformity with the following directives:

- Machinery Directive 98/37/EEC
- Pressure Equipment Directive 97/23/EC category 1 and subjected to assessment procedure Module A.

Manager, Product Centres, Compact  
Heat Exchangers & Fluid Handling

Title

Bjarne Søndergaard

Name

Alfa Laval Kolding  
Company

*B. Søndergaard*  
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

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General warning:



Caustic agents:



## 2 Safety

All warnings in the manual are summarized on this page.

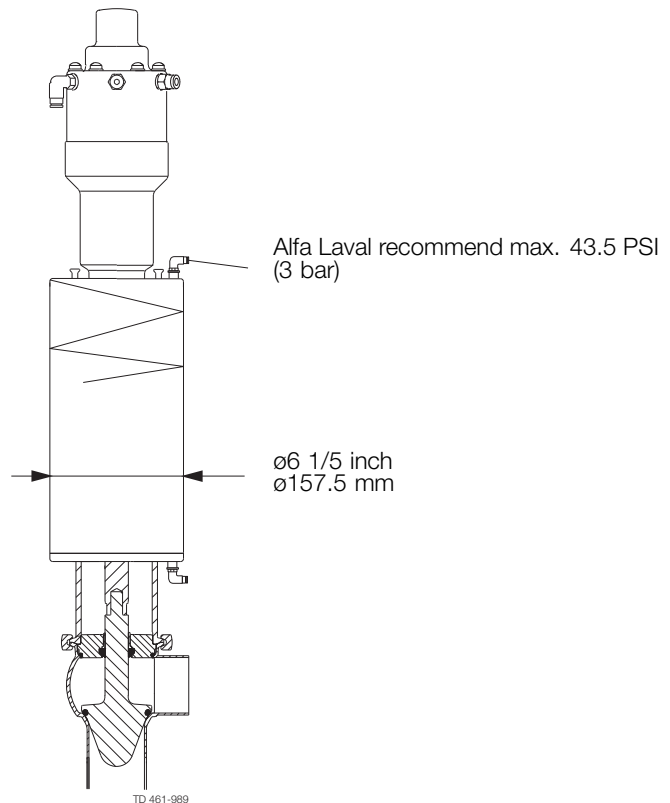
Pay special attention to the instructions below so that severe personal injury and/or damage to the valve are avoided.

### 2.3 Safety precautions

#### Actuators marked with year 2012 (New actuator design):

Alfa Laval recommend only to use 43.5 PSI (3 bar) support air on the spring side in all the Unique 7000 actuators, to ensure 145 PSI (10 bar) product pressure without leakage.

Plastic adapter is always used on the new design.



#### Actuators marked with year 2006-2011 (Old actuator design):

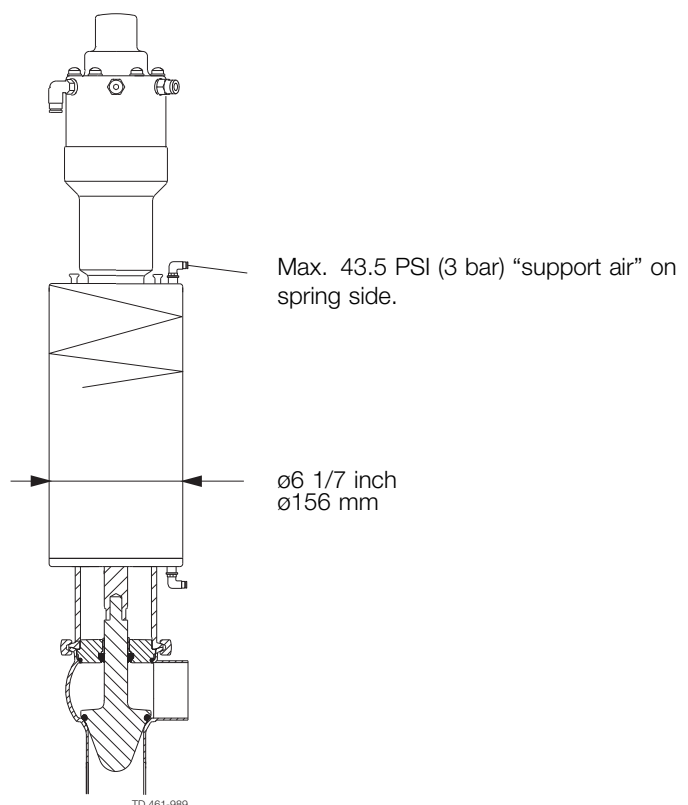


**WARNING!**

When using “support air” on spring side in all the Unique 7000 actuators, the pressure must **NOT** exceed 43.5 PSI (3 bar).

When using Unique 7000 actuators with OD156 mm with support air, **always** use the “steel adapter” (pos. 5). Tighten the “steel adapter” with torque of 21 lbf-ft (30 Nm) and use Loctite 243.

The actuator with OD156 mm is mainly used on valves ISO76/DN80 – ISO101/DN100. The outer actuator diameter = ø6 1/7 inch (156 mm).



---

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.

---

### Installation:

**Always** read the technical data thoroughly (See chapter 6 Technical data)

**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 sterilizing

**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 thoroughly (See chapter 6 Technical data)

**Always** release compressed air after use

**Never** touch the valve or the pipelines when processing hot liquids or when sterilizing

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

**Always** rinse well with clean water after the cleaning

**Always** handle lye and acid with great care



---

### Maintenance:

**Always** read the technical data thoroughly (See chapter 6 Technical data)

**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 (for welding).

The valve is assembled before delivery, if it is supplied with fittings.

### 3.1 Unpacking/delivery

#### Step 1

##### CAUTION

Alfa Laval cannot be held responsible for incorrect unpacking.

#### Check the delivery for:

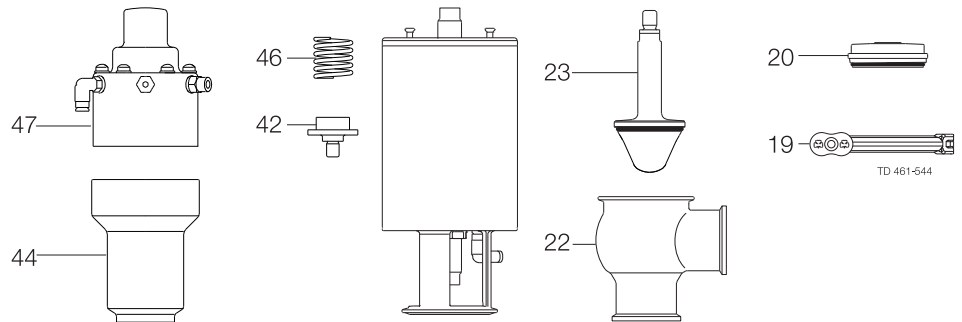
1. Complete valve, shut off valve (RA) or change-over valve (RA) (see steps 2a and 2b).
2. Delivery note.
3. Instruction manual.

#### Step 2

##### 2a

##### Shut-off valve:

1. Complete actuator.
2. Bonnet (20).
3. Clamp(19).
4. Valve plug (23).
5. Valve body (22).
6. Spring connection piece(42).
7. Positioner yoke (44).
8. Spring (46)
9. Positioner (47)



#### Step 3

Remove possible packing materials from the valve/valve parts.

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

### 3.2 General installation

#### Step 1



**Always** read the technical data thoroughly.  
**Always** release compressed air after use.

#### CAUTION

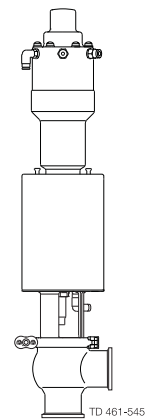
Alfa Laval cannot be held responsible for incorrect installation.

#### Step 2



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

Moving parts!



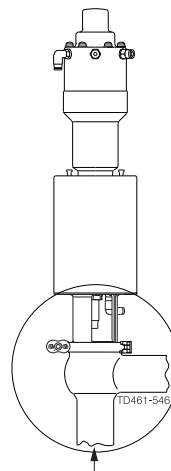
#### Step 3

Avoid stressing the valve:

**Pay special attention to:**

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

Risk of damage!



### 3 Installation

---

Study the instructions carefully.

The valve is supplied as separate parts to facilitate the welding.

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

Check the valve for smooth operation after welding.

---

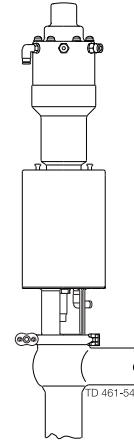
#### 3.3 Welding

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##### Step 1

Assemble the valve in accordance with the steps in section 4.4

**Pay special attention to the warnings! i**

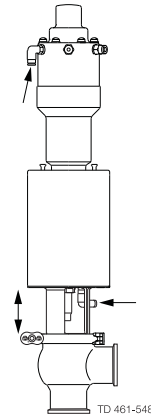


##### Step 2

###### 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!**



*Study the instructions carefully.*

*The valve is supplied as separate parts to facilitate the welding.*

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

*Check the valve for smooth operation after welding.*

---

### 3.4 Recycling information

---

- **Unpacking**

- Packing material consists 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

- **Maintenance**

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

- **Scrapping**

- At end of use, the equipment shall be recycled according to relevant, local regulations. Beside 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 the local Alfa Laval sales company
-

## 4 Operation

Study the instructions carefully and pay special attention to the warnings!  
Ensure that the valve operates smoothly.  
The items refer to the parts list and service kits section.

### 4.1 Operation

#### Step 1



**Always** read the technical data thoroughly.  
See chapter 6 Technical data



**Always** release compressed air after use.

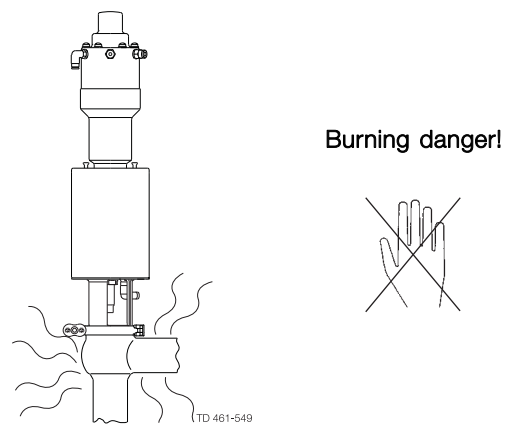
#### CAUTION

Alfa Laval cannot be held responsible for incorrect operation.

#### Step 2



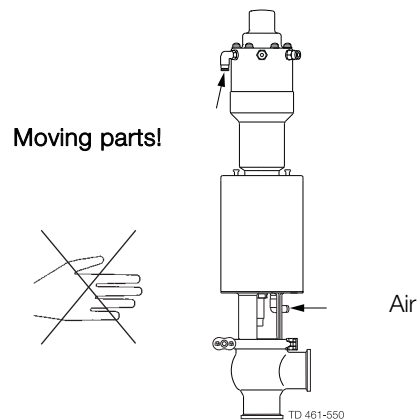
**Never** touch the valve or the pipelines when processing hot liquids or when sterilizing.



#### Step 3



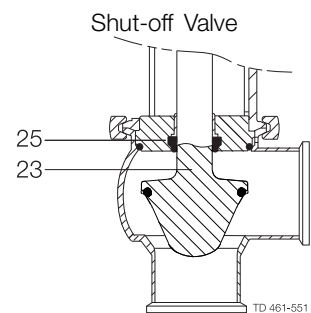
**Never** touch the moving parts if the actuator is supplied with compressed air.



#### Step 4

##### Lubrication of actuator

1. Ensure smooth movement between lip seal (25).
2. Lubricate with Klüber Paraliq GTE 703 if necessary. (See section 4.1)



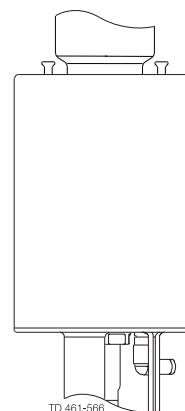
*Study the instructions carefully and pay special attention to the warnings!  
Ensure that the valve operates smoothly.  
The items refer to the parts list and service kits section.*

---

### Step 5

#### Lubrication of actuator

1. Ensure smooth movement of the actuator (the actuator is lubricated before delivery).
2. Lubricate O-ring(s) with Molykote Longterm 2 plus if necessary.



## 4 Operation

Pay attention to possible faults. Study the instructions carefully.  
The items refer to the parts list and service kits section.

### 4.2 Troubleshooting

#### NOTE!

Study the maintenance instructions carefully before replacing worn parts. - See section 5.1!

Problem	Cause/result	Repair
External product leakage	Worn or product affected diaphragm stem seal and/or seal ring	<ul style="list-style-type: none"> <li>- Replace the seals or diaphragm</li> <li>- Replace with seals of a different rubber grade</li> </ul>
Internal product leakage	<ul style="list-style-type: none"> <li>- Worn or product affected plug seal</li> <li>- Product deposits on the seat and/or plug</li> <li>- Product pressure exceeds actuator specification</li> </ul>	<ul style="list-style-type: none"> <li>- Replace the seal</li> <li>- Replace with a seal of a different rubber grade</li> <li>- Frequent cleaning</li> <li>- Replace with a high pressure actuator</li> <li>- Use auxiliary air on the spring side</li> <li>- Reduce product pressure</li> </ul>
Water hammer	The flow direction is the same as the closing direction	<ul style="list-style-type: none"> <li>- The flow direction should be against the closing direction</li> <li>- Throttle air release of solenoid in top unit</li> </ul>
The valve does not open/close	Product pressure exceeds actuator specification	<ul style="list-style-type: none"> <li>- Replace with a high pressure actuator</li> <li>- Use auxiliary air on the spring side</li> <li>- Reduce product pressure</li> </ul>
Deviation in the flow regulation	<ul style="list-style-type: none"> <li>- Mechanical parts have come loose (vibrations)</li> </ul>	<ul style="list-style-type: none"> <li>- Tighten and adjust</li> </ul>
Actuator does not regulate	<ul style="list-style-type: none"> <li>- No air</li> <li>- Actuator errors</li> <li>- Positioner errors</li> </ul>	<ul style="list-style-type: none"> <li>Check air supply</li> <li>- Return the actuator to the supplier</li> <li>- Check positioner (see positioner instruction)</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.

**Caustic danger!**



**Always** use  
rubber gloves!

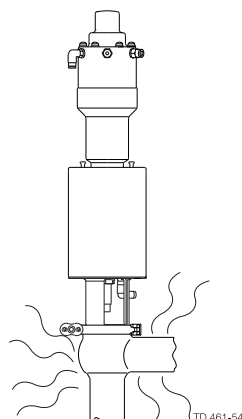


**Always** use  
protective goggles!

#### Step 2



**Never** touch the valve or the pipelines when sterilizing.



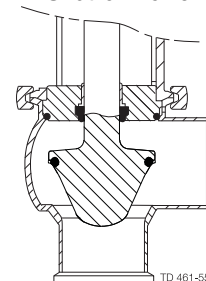
**Burning danger!**



#### Step 3

Clean the plug and the seats correctly.  
**Pay special attention to the warnings!**  
**Lift and lower valve plug momentarily!**

Shut-off valve



#### Step 4

**Examples of cleaning agents:**

Use clean water, free from chlorides.

1. 1% by weight NaOH at 158° F

2.2 lb NaOH	+	26.4 gal water	=	Cleaning agent.
----------------	---	-------------------	---	-----------------

0.6 gal 33% NaOH	+	26.4 gal water	=	Cleaning agent.
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2. 0.5% by weight HNO<sub>3</sub> at 158° F

0.2 gal 53% HNO <sub>3</sub>	+	26.4 gal water	=	Cleaning agent.
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## 4 Operation

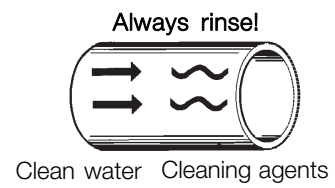
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The valve is designed for cleaning in place (CIP). CIP = Cleaning In Place.  
Study the instructions carefully and pay special attention to the warnings!  
NaOH = Caustic Soda.  
HNO<sub>3</sub> = Nitric acid.

---

### Step 5

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.



### Step 6

#### NOTE

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

---



Maintain the valve regularly.  
Study the instructions carefully and pay special attention to the warnings!  
Always keep spare rubber seals and lip seals in stock.

5.1 General maintenance

Step 1



Always read the technical data thoroughly.  
See chapter 5.



Always release compressed air after use.

NOTE

All scrap must be stored/discharged in accordance with current rules/directives.

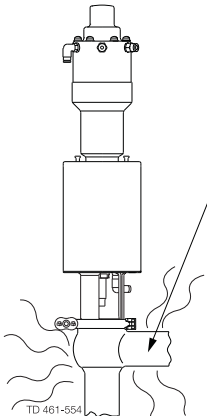
Step 2



Never service the valve when it is hot.



Never service the valve with valve and pipelines under pressure.



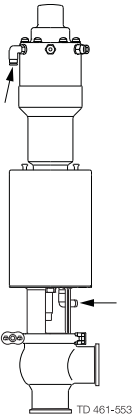
Atmospheric pressure required!



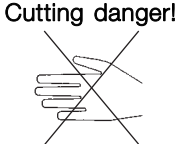
Step 3



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



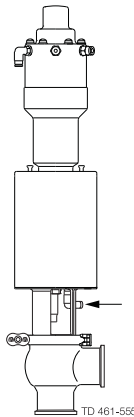
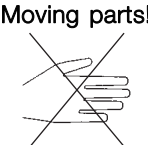
Air



Step 4



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



## 5 Maintenance

Maintain the valve regularly.

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

Always keep spare rubber seals and lip seals in stock.

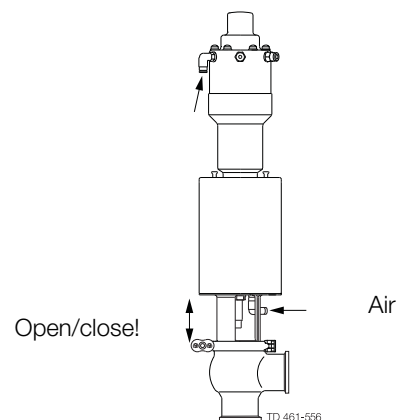
Below are some guidelines for maintenance and lubrication intervals. Please note that the guidelines are for normal working conditions in one shift.

	Product wetted seals	Actuator bushings complete
Preventive maintenance	Replace after 12 months depending on working conditions	Replace after 5 years depending on working conditions
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> Klüber Paraliq GTE 703 or similar USDA H1 approved oil/grease	<b>Before fitting</b> Molykote Longterm 2 plus

### 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 chapter 7)

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

NC = Normally closed.

NO = Normally open.

A/A = Air/air activated.

### 5.2 Dismantling of valve

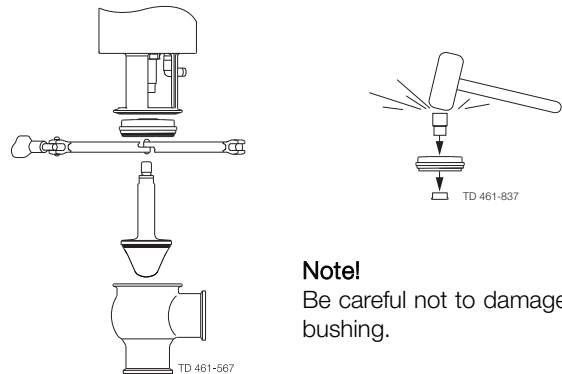
#### Step 1

##### 1a Dismantling of valve:

1. Supply compressed air to the actuator (only NC).
2. Loosen and remove clamp.
3. Replace compressed air (only NC).
4. Lift away the actuator.
5. Unscrew and remove valve plug.
6. Remove O-ring, lip seal and bushing in bonnet. (Use bushing tool and rubber mallet).

**Pay special attention to the warnings!**

**Note!** For plug seal replacement please see page 19.

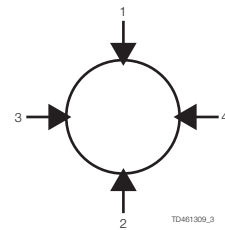


##### **Note!**

Be careful not to damage the bushing.

### 5.3 Elastomer seat ring replacement

1. Remove old seal ring using a knife, screwdriver or similar. Be careful not to damage metal parts.
2. Pre-mount plug seal without pressing it into the groove.
3. Squeeze plug seal into the groove using opposite pressure points.
4. Release compressed air behind plug seal.



### 5.4 Assembly of valve

Reverse order of 5.2, Dismantling of valve.

Lubricate O-ring (21) and lip seal (25) with Klüber Paraliq GTE 703.

Remember to tighten spindle and plug with a torque  $M = 23 \text{ lbf-ft}$  (30 Nm) (Use two 17 mm spanners)

## 5 Maintenance

Study the instructions carefully.

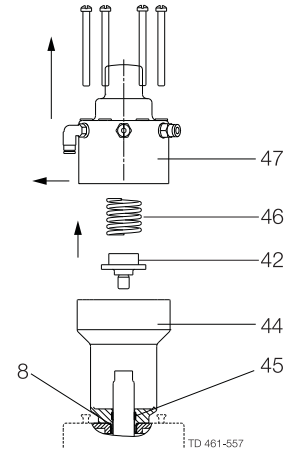
The items refer to the parts list and service kits section. Handle scrap correctly.

A/A = Air/air activated.

Service tool: See Spare Parts.

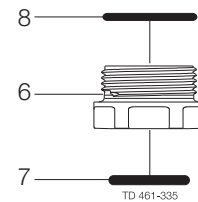
### 5.5 Positioner end

1. Remove the air hose connections of the positioner (47) and the actuator.
2. Loosen the screws and lift off the positioner from its yoke (44).
3. Remove the positioner spring (46) and unscrew the spring connection piece (42) from the actuator spindle.
4. Unscrew the positioner yoke (44) from the cylinder.
5. Remove the guide ring (45) and the O-ring (8).



### 5.6 Actuator bushing replacement

1. Unscrew and remove O-rings.
2. Lubricate O-rings with Molykote Longterm 2 plus before fitting.
3. Fit bushings and O-rings. Tighten brushing with a torque = 7 lbf-ft (10 Nm). Be careful not to overtighten.

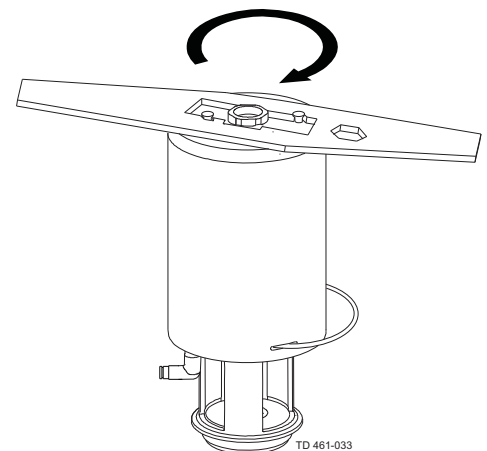


### 5.7 Dismantling of optional maintainable actuator

1. Rotate cylinder.
2. Remove lock wire (10) and pull away cylinder (1).
3. Unscrew nuts (18) and remove yoke (13).
4. Unscrew bottom bushing (6).
5. Remove stem (2) with O-ring (3) and spring assembly (14).
6. Remove O-rings and support disc.

**Note!** The A/A actuator has no spring assembly.

Rotate cylinder with service tool



Study the instructions carefully.

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

A/A = Air/air activated.

Service tool: See Spare Parts.

### 5.8 Assembly of optimal maintainable actuator

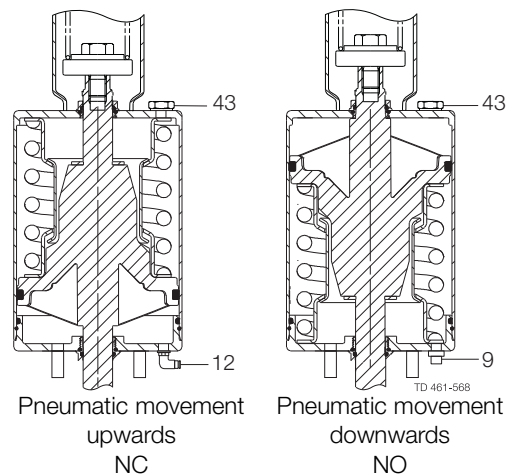
Reverse order of 5.6. Dismantling of actuator.

Lubricate O-ring (3,7,11) with Molykote Longterm 2 plus before fitting.

### 5.9 Additional equipment

NB: Require a new positioner and air fittings (12) or plug (43)

1. Rotate cylinder (1).
2. Remove lock wire (10) and pull away cylinder (1).
3. Reverse stem (2) and spring assembly (14).
4. Fit plugs (9,43) and air fitting (12) as shown on the drawing.
5. Re-assemble in reverse order (3 to 1).



## 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:	145 PSI (1000 kPa) (10 bar)
Max. product pressure:	Full vacuum 8 (depending on product specifications)
Max. sterilisation temperature (steam - short time):	14°F to +284°F (standard EPDM seal) 43 PSI (380 kPa) (3.8 bar)
Temperature range:	14°F to + 284°F (standard EPDM seal)
Air pressure, actuator:	72.5 to 101.5 PSI (500 - 700 kPa) (5 to 7 bar)

#### Materials - valve/actuator

Product wetted steel parts:	AISI 316L (internal Ra < 32 µ inch)
Other steel parts:	AISI 304
Product wetted seals:	EPDM (Standard)
Optional product wetted seals:	HNBR and FPM
Other seals:	NBR

For positioner see Positioner manual.

#### Data Positioner

##### General Specifications:

Instrument Input Pressure Range	3-15 PSI (standard). 3-9, 9-15 and 3-27 PSI (option)
Instrument Input Pressure, Maximum	15 PSI for instrument input pressure spans of 12 PSI or less and 27 PSI for instrument pressure spans of 16 PSI or greater.

##### Supply Pressure:

Minimum	3 PSI above required actuator pressure
Maximum	4"
Air Consumption	0.6 SCFM (in balance condition with 20 PSI supply and 9 PSI dead ended output)

##### Valve Travel:

Minimum	1/4"
Maximum	4"
Response Level	0.25% of scale (output sensitivity to input pressure changes)
Ambient Temperature Limits	14 °F to +284 °F (-10 °C to +82 °C)

## 7 Unique 7710 Regulating Valve

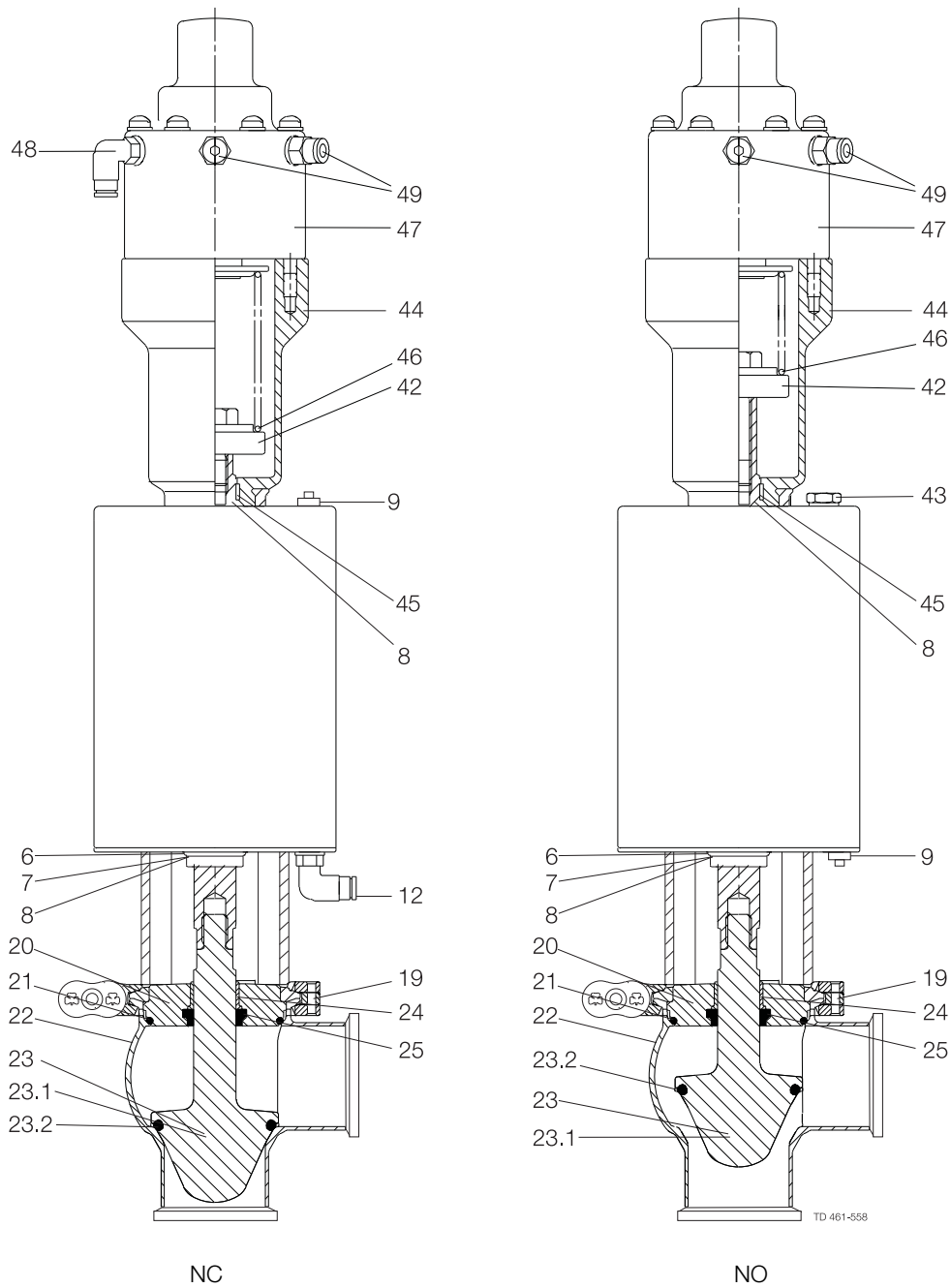
*It is important to observe the technical data during installation, operation and maintenance.  
Inform the personnel about the technical data.*

### 7.1 Unique 7710 Regulating Valve

For parts lists please see section 7.1. The drawings include items.

NC = Normally closed

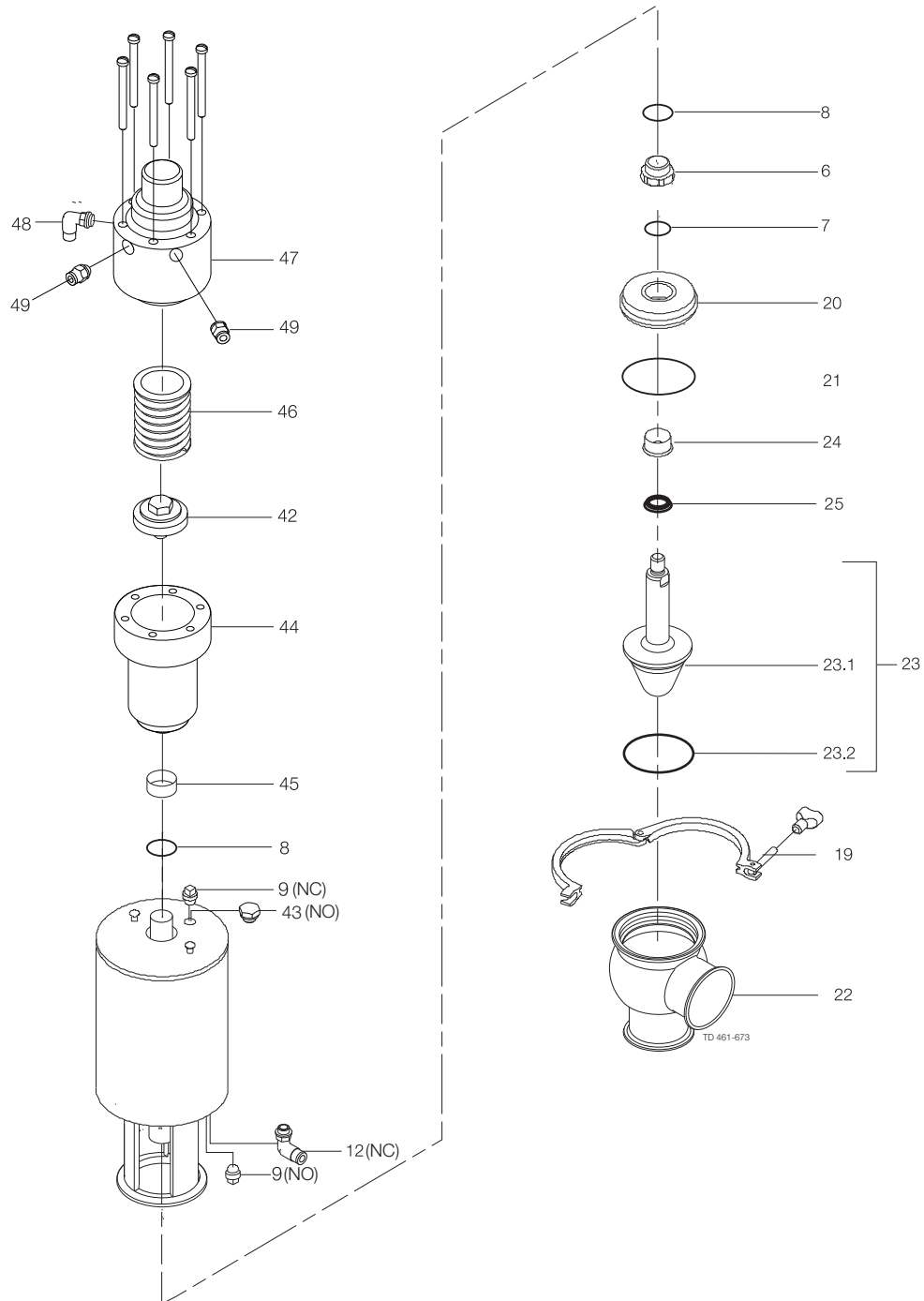
No = Normally open



## 7 Unique 7710 Regulating Valve

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

### 7.2 Unique 7710 Regulating Valve





## 7 Unique 7710 Regulating Valve

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

### Parts list

Pos.	Qty	Denomination
6	1	Actuator
7	1	Bushing
8	2	O-ring
9	1	Plug
12	1	Air fitting
19	1	Clamp
20	1	Bonnet
21	1	O-ring
22	1	Valve body
23	1	Plug, complete
23.1	1	Plug
23.2	1	Plug seal
24	1	Bushing
25	1	Lip seal
42	1	Spring connection piece
43	1	Plug (NO)
44	1	Positioner yoke
45	1	Guide ring
46	1	Spring
47	1	Positioner
48	1	Air fitting
49	2	Air fitting

### Service kits

Denomination	1½"	2"	2½"	3"	4"
□ Service kit, actuator .....	9611-92-6737	9611-92-6737	9611-92-6737	9611-92-6737	9611-92-6737
♦ Service kit, EPDM .....	9611-92-6502	9611-92-6503	9611-92-6504	9611-92-6505	9611-92-6506
♦ Service kit, HNBR .....	9611-92-6508	9611-92-6509	9611-92-6510	9611-92-6511	9611-92-6512
♦ Service kit, FPM .....	9611-92-6514	9611-92-6515	9611-92-6516	9611-92-6517	9611-92-6518

Parts marked with □♦ are included in the service kits.

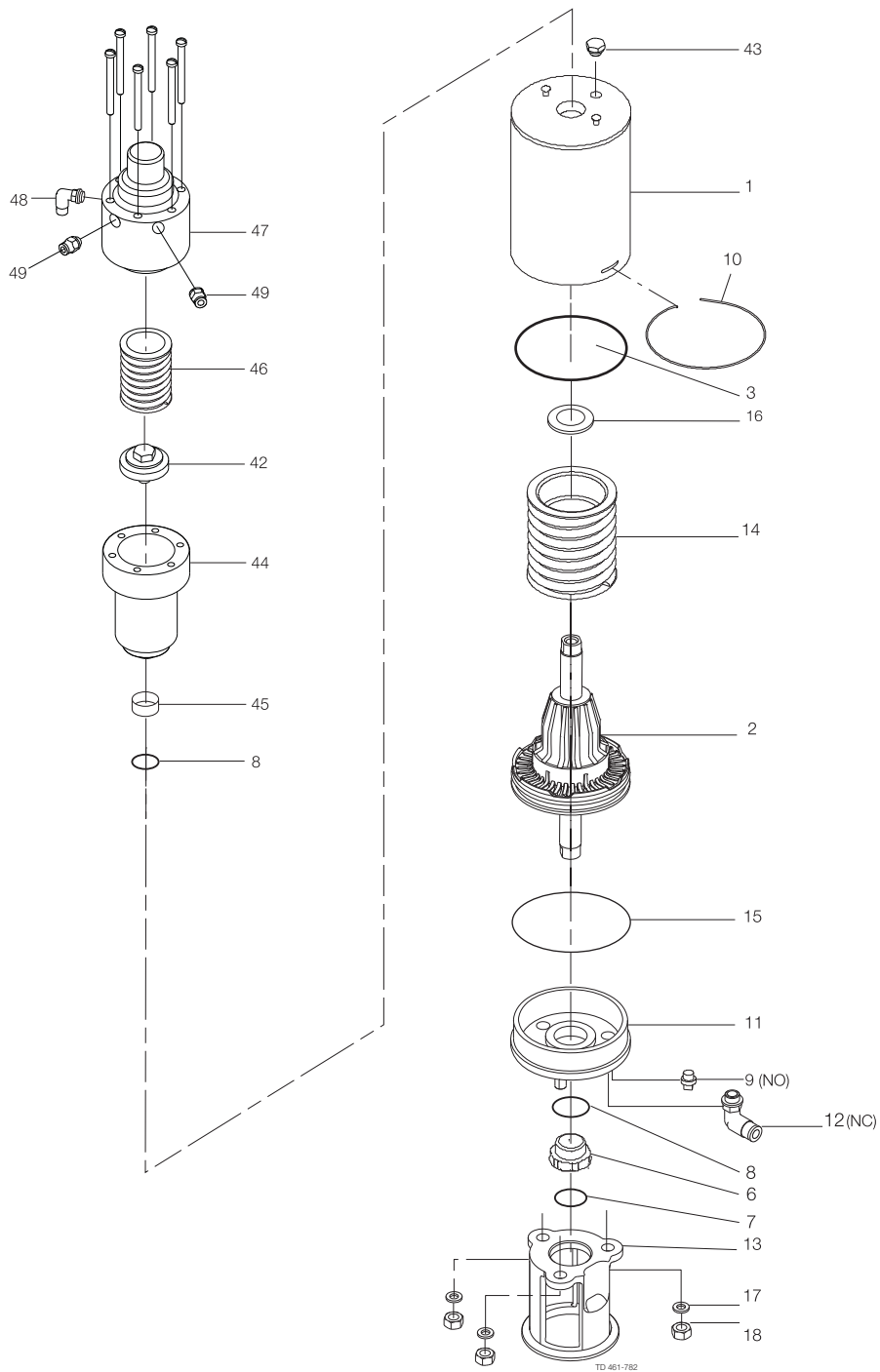
Recommended spare parts: Service kits.

TD 900-461

## 7 Unique 7710 Regulating Valve

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

### 7.3 Maintainable actuator



## 7 Unique 7710 Regulating Valve

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

### Parts list

Pos.	Qty	Denomination
1	1	Actuator
2	1	Cylinder
3	1	Piston
3	1	O-ring
5	1	Adapter
6	1	Bushing
7	1	O-ring
8	2	O-ring
9	1	Plug
10	1	Lock wire
11	1	O-ring
12	1	Air fitting
13	1	Yoke
14	1	Spring assembly
15	1	Bottom
16	1	Support disc
17	3	Washer
18	3	Nut
42	1	Spring connection piece
43	1	Plug
44	1	Positioner yoke
45	1	Guide ring
46	1	Spring
47	1	Positioner NC
	1	Positioner NO
48	1	Air fitting
49	2	Air fitting

### Service kits

Denomination	1½"	2"	2½"	3"	4"
<input type="checkbox"/> Service kit, Actuator .....	9611-92-6740	9611-92-6741	9611-92-6741	9611-92-6742	9611-92-6742

Parts marked with  are included in the service kits.

Recommended spare parts: Service kits.

TD 900-461

**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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