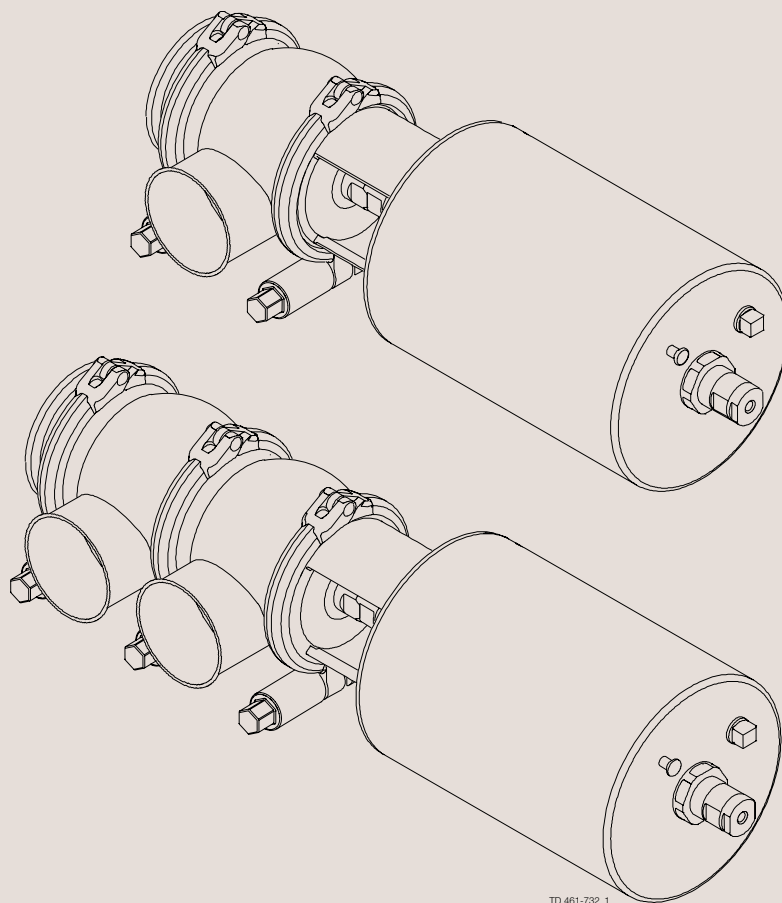




Instruction Manual

Unique Single Seat - Tangential



TD 461-732_1

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 Single Seat Valve

Denomination

Tangential

Type

2008

Year

is in conformity with the following directive:

- 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**

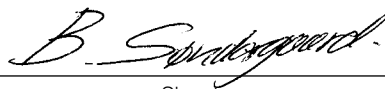
Title

Bjarne Søndergaard

Name

Alfa Laval Kolding

Company



Signature

Designation



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

1. Safety	6
1.1 Important information.....	6
1.2 Warning signs	6
1.3 Safety precautions	7
 2. Installation	 8
2.1. Unpacking/Delivery	8
2.2. General installation.....	9
2.3. Welding.....	10
 3. Operation	 11
3.1 Operation.....	11
3.2 Trouble shooting	13
3.3 Recommended cleaning	14
 4. Maintenance	 16
4.1 General maintenance	16
4.2 Dismantling of valve	18
4.3 Plug seal replacement.....	18
4.4 Assembly of valve	18
4.5 Actuator bushing replacement	19
4.6 Dismantling of optional maintainable actuator	19
4.7 Assembly of optional maintainable actuator	19
4.8 Reversing optional maintainable actuator operation.....	19
 5. Technical data.....	 20
5.1 Technical data.....	20
 6. Parts List and Service Kits.....	 21
6.1 Unique Single Seat Valve.....	21
6.2 Maintainable actuator.....	26

1.1 Important information

1.2 Warning signs

1. Safety

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

Always read the manual before using the valve!

WARNING!

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

CAUTION!

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

NOTE!

Indicates important information to simplify or clarify practices.

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.

Installation

- **Always** read the technical data thoroughly (see chapter 5).
- **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 5).
- **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 5).
- **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 (for welding).
 The valve is assembled before delivery, if it is supplied with fittings.

Step 1**CAUTION!**

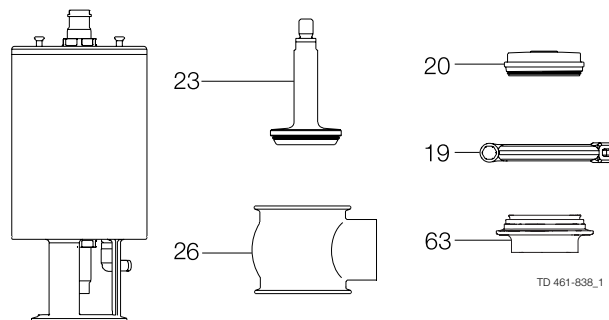
Alfa Laval cannot be held responsible for incorrect unpacking.

Check the delivery for:

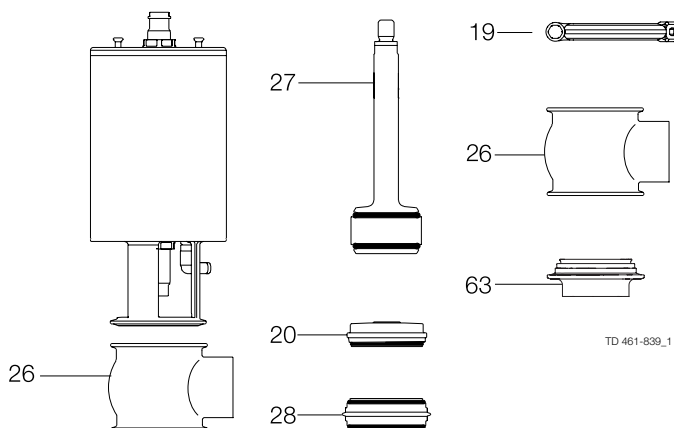
1. Complete valve, shut off valve or change-over valve (see steps 2a and 2b).
2. Delivery note.
3. Instruction Manual.

Step 2a**Shut-off valve:**

Complete actuator.
 Bonnet (20).
 2 x clamp (19).
 Valve plug (23).
 Valve body (26).
 Port seal element (63).

**Step 2b****Change-over valve:**

Complete actuator.
 Bonnet (20).
 3 x clamp (19).
 Valve plug (27).
 Valve seat (28).
 2 x upper valve body (26).
 Port seal element (63).

**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.

Step1

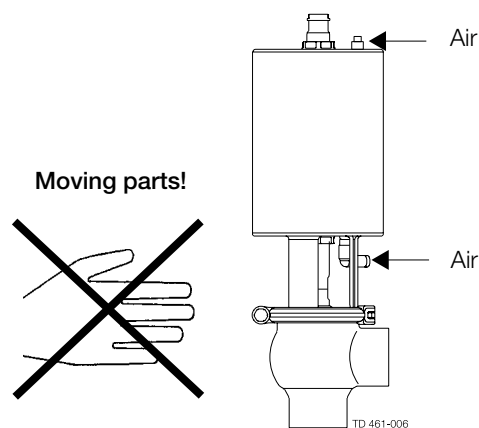
- **Always** read the technical data thoroughly (see chapter 5).
- **Always** release compressed air after use.

CAUTION!

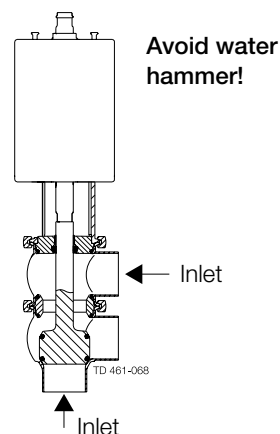
Alfa Laval cannot be held responsible for incorrect installation.

Step 2

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

**Step 3**

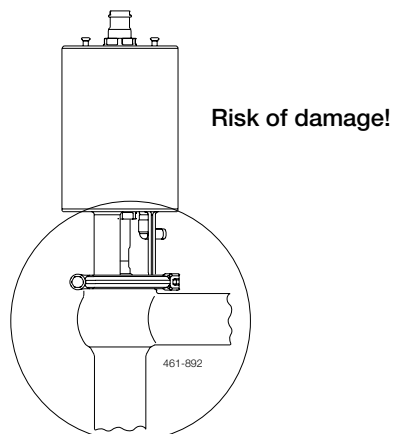
It is recommended to install the valve so that the flow is against the closing direction to avoid water hammer.

**Step 4**

Avoid stressing the valve.

Pay special attention to:

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



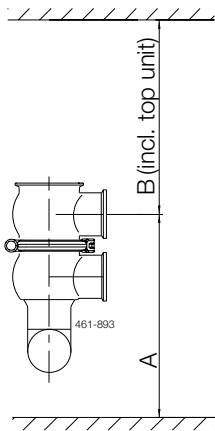
Study the instructions carefully.
The valve is supplied as separate parts to facilitate the welding.
The items refer to the parts list and service kits section.
Check the valve for smooth operation after welding.

Step 1

Always install valves with more than one valve body so that the seals between the valve bodies can be replaced.
Do not weld more than one valve body into the system.

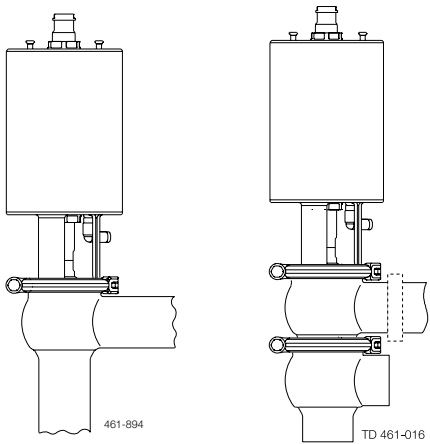
Valve size	A (mm)	B (mm)
DN50/51 mm	*	750
DN65/63.5 mm	*	740
DN80/76 mm	*	800
DN100/101.6 mm	*	790

* Depending on body combination and piping solution.



Step 2

Assemble the valve in accordance with the steps in section 4.4.
Pay special attention to the warnings!

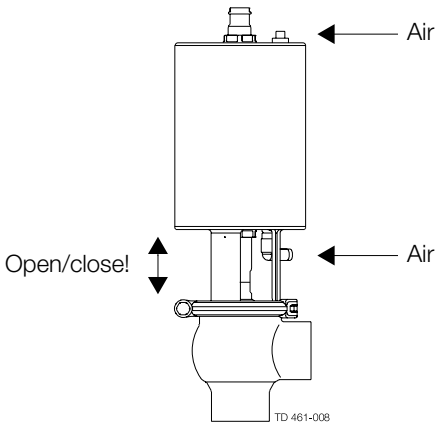


Step 3

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 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 1

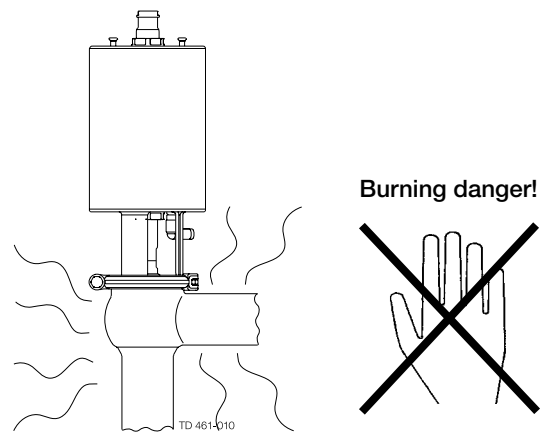
- **Always** read the technical data thoroughly (see chapter 5).
- **Always** release compressed air after use.

CAUTION!

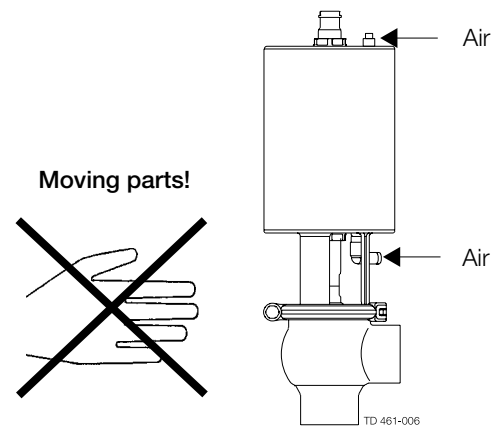
Alfa Laval cannot be held responsible for incorrect operation.

Step 2

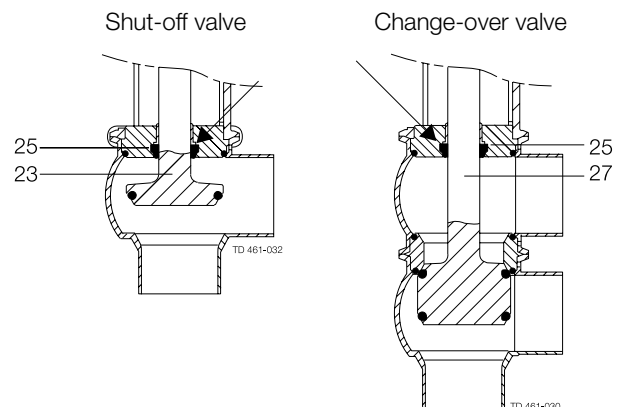
Never touch the valve or the pipelines when processing hot liquids or when sterilizing.

**Step 3**

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

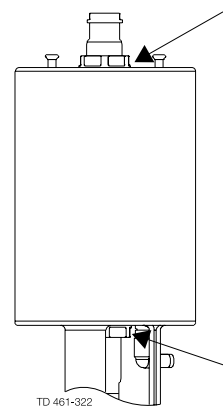
**Step 4****Lubrication of valves:**

1. Ensure smooth movement between lip seal (25) and plug stem (23, 27).
2. Lubricate with Klüber Paraliq GTE 703 if necessary. (see section 4.1)



Step 5**Lubrication of actuator**

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



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

NOTE!

Study the maintenance instructions carefully before
replacing worn parts. - See section 4.1!

Problem	Cause/result	Repair
External product leakage	Worn or product affected lip seal and/or O-ring	<ul style="list-style-type: none"> - Replace the seals - Replace with seals of a different rubber grade
Internal product leakage	<ul style="list-style-type: none"> - Worn or product affected plug seal - Product deposits on the seat and/or plug - Product pressure exceeds actuator specification 	<ul style="list-style-type: none"> - Replace the seal - Replace with a seal of a different rubber grade - Frequent cleaning - Replace with a high pressure actuator - Use auxiliary air on the spring side - Reduce product pressure
Water hammer	The flow direction is the same as the closing direction	<ul style="list-style-type: none"> - The flow direction should be against the closing direction - Throttle air release of solenoid in top unit
The valve does not open/close	<ul style="list-style-type: none"> - Product pressure exceeds actuator specification 	<ul style="list-style-type: none"> - Replace with a high pressure actuator - Use auxiliary air on the spring side - Reduce product pressure

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 1

Always handle lye and acid with great care.

Caustic danger!



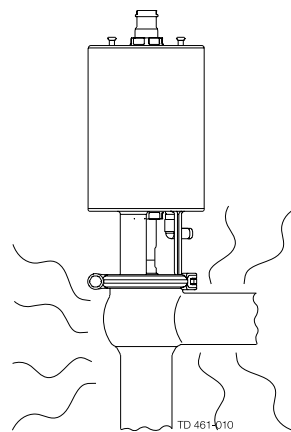
Always use
rubber gloves!



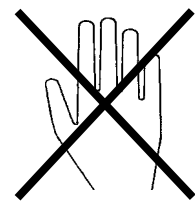
Always use
protective goggles!

Step 2

Never touch the valve or the pipelines when sterilizing.

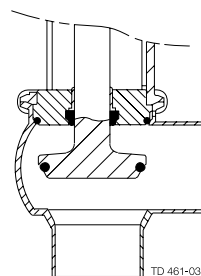


Burning danger!

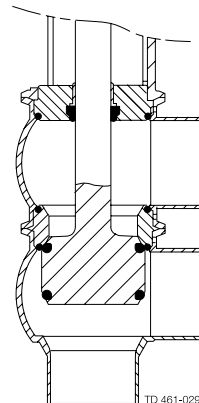
**Step 3**

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

Shut-off valve



Change-over valve

**Step 4****Examples of cleaning agents:**

Use clean water, free from chlorides.

1. 1% by weight NaOH at 70° C

1 kg NaOH	+	100 l water	= Cleaning agent.
--------------	---	----------------	-------------------

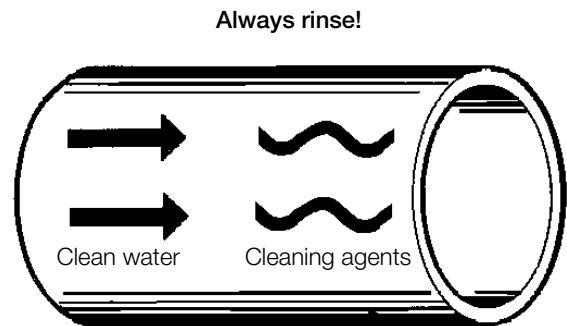
2.2 l 33% NaOH	+	100 l water	= Cleaning agent.
-------------------	---	----------------	-------------------

2. 0.5% by weight HNO₃ at 70° C

0.7 l 53% HNO ₃	+	100 l water	= Cleaning agent.
-------------------------------	---	----------------	-------------------

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 rules/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.

Step 1

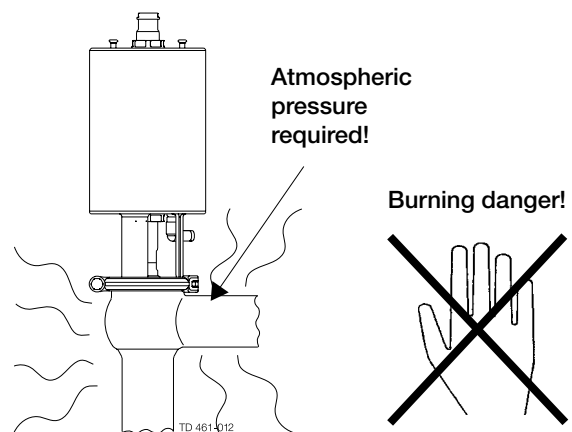
- **Always** read the technical data thoroughly (see chapter 5).
- **Always** release the compressed air after use.

CAUTION!

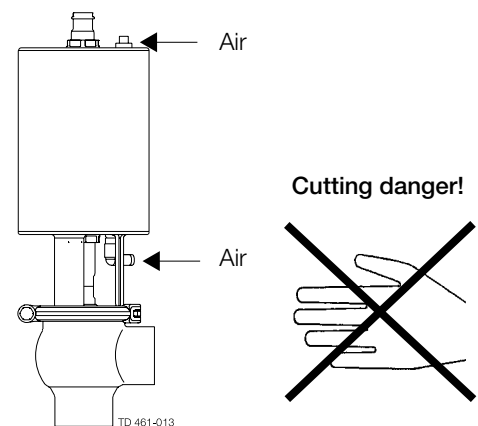
All scrap must be stored/disposed of in accordance with current rules/directives.

Step 2

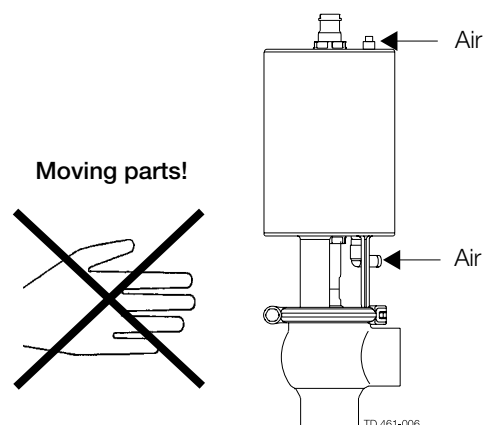
- **Never** service the valve when it is hot.
- **Never** service the valve with valve and pipelines under pressure.

**Step 3**

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

**Step 4**

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



Maintain the valve regularly.
 Study the instructions carefully.
 Always keep spare rubber seals and lip seals stock.
 Check the valve for smooth operation after service.

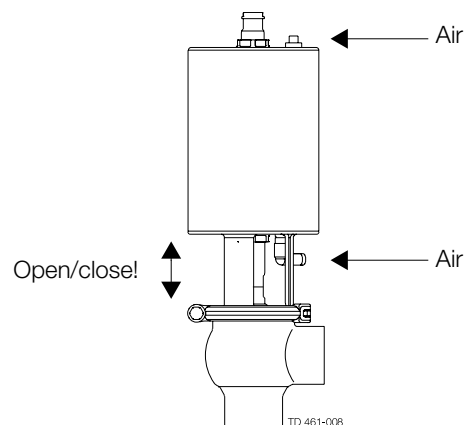
Below are some guidelines for maintenance and lubrication intervals. Please note that the guidelines are for normal working conditions in one shift.

	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"> - 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 Klüber Paraliq GTE 703 or similar USDA H1 approved oil/grease	Before fitting 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 6)

4.2 Dismantling of valve

4.3 Plug seal replacement

4.4 Assembly of valve

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.

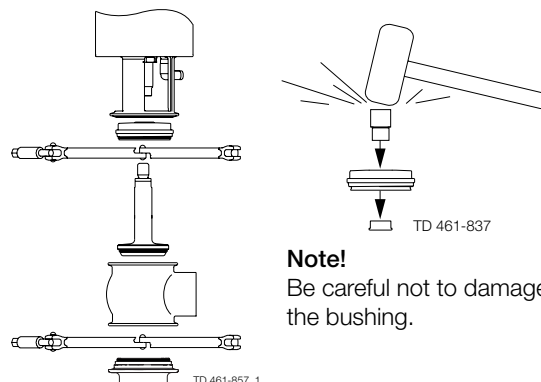
Step 1a

Shut-off valve:

1. Supply compressed air to the actuator (only NC).
2. Loosen and remove upper clamp.
3. Release 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).
7. Loosen and remove lower clamp.
8. Remove valve body.
9. Remove O-ring in port seal element.

Note! Be careful not to damage the bushing.

Pay special attention to the warnings!



Note!

Be careful not to damage the bushing.

Note! For plug seal replacement please see section 4.3.

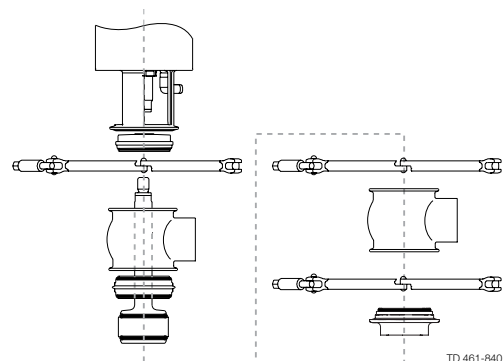
Step 1b

Change-over valve:

1. Supply compressed air to the actuator (only NC).
2. Loosen and remove middle clamp.
3. Release compressed air (only NC).
4. Lift away the actuator and upper valve body.
5. Supply compressed air to the actuator (only NO).
6. Unscrew and remove valve plug.
7. Release compressed air (only NO).
8. Remove seat and O-rings.
9. Loosen and remove upper clamp.
10. Remove upper valve body.
11. Remove O-ring, lip seal and bushing in bonnet.
(Use bushing tool and rubber mallet. See drawing, step 1a).
12. Loosen and remove lower clamp.
13. Remove valve body.
14. Remove O-ring in port seal element.

Note! Be careful not to damage the bushing.

Pay special attention to the warnings!



Note! For plug seal replacement please see section 4.3.

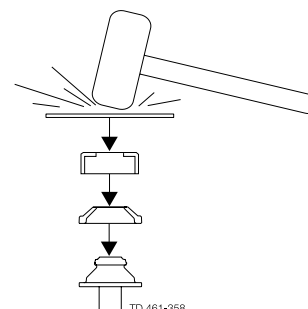
4.3.a Elastomer seat ring replacement

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.

Note! For plug seal replacement please read instruction in service kit.

4.3.b TR2 seat ring replacement

1. Place the plug element on a firm support.
2. Using a utility knife, partially AND CAREFULLY cut through the upper ring portion of the TR2 plug avoiding contact with stainless steel stem.
3. Force apart both cut ends of the plug for removal from stem.
4. TR2 plugs are installed by applying uniform pressure on all sides.
(Pressure can be applied by using the seat assembly tool.)
5. Using a piece of metal and a rubber mallet, place a precise tab to make the TR2 plug snap on to the stem. Reverse the tool and tab again to secure proper fit.
6. Examine seat assembly to be sure the TR2 plug is properly mounted, holding the seat assembly in one hand - rotate the TR2 plug.
(For proper CIP cleaning the TR2 plug should turn freely on the stem.)



For more explicit instructions, please refer to the maintenance video.

4.4 Assembly of valve

Reverse order of 4.2, Dismantling of valve.

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

4. Maintenance

4.5 Actuator bushing replacement - 4.6 Dismantling of optional maintainable actuator

4.7 Assembly of optional maintainable actuator

4.8 Reversing optional maintainable actuator operation

Study the instructions carefully.

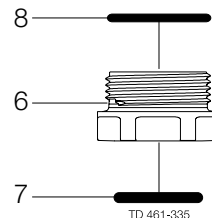
The items refer to the parts list and service kits section. Handle scrap correctly.

A/A = Air/air activated.

Service tool: See Spare Parts

4.5 Actuator bushing replacement

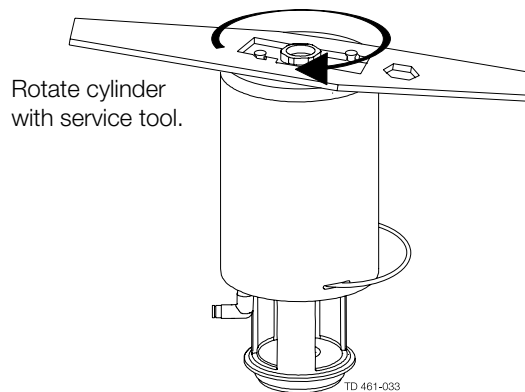
1. Unscrew and remove top and bottom bushings with O-rings.
2. Lubricate O-rings with Molykote Longterm 2 plus before fitting.
3. Fit bushings and O-rings. Be careful not to overtighten.



4.6 Dismantling of optional maintainable actuator

1. Rotate cylinder.
2. Remove lock wire and pull away cylinder.
3. Unscrew nuts and remove yoke.
4. Unscrew top and bottom bushings.
5. Remove piston with O-ring and spring assembly.
6. Remove O-rings and support disc.

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



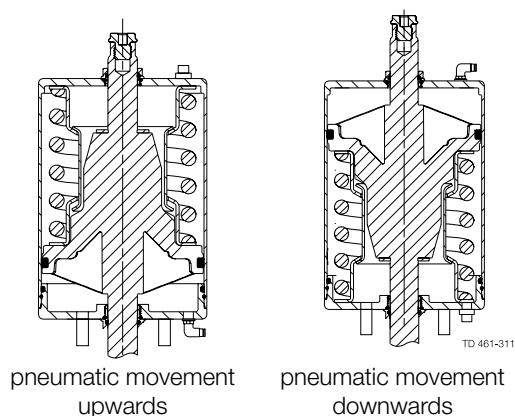
4.7 Assembly of optional maintainable actuator

Reverse order of 4.6. Dismantling of actuator.

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

4.8 Reversing optional maintainable actuator operation

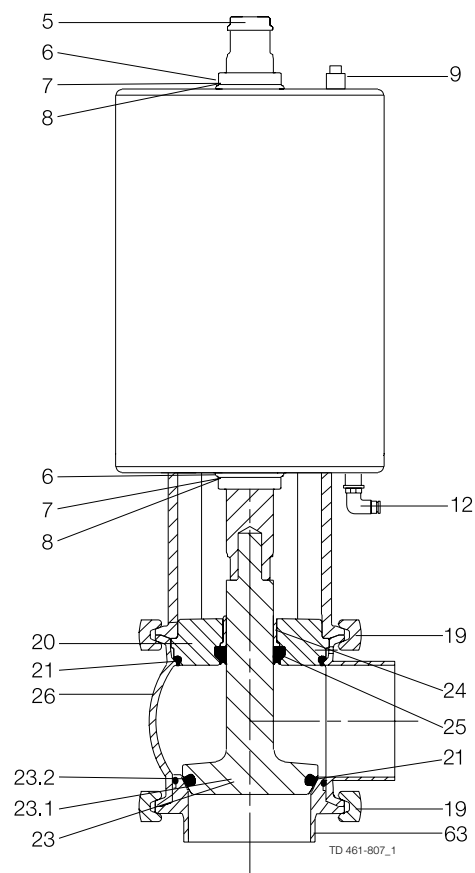
1. Rotate cylinder.
2. Remove lock wire and pull away cylinder.
3. Reverse piston and spring assembly.
4. Reverse adapter, airfitting and plug to opposite end.
5. Re-assemble in reverse order (3 to 1).



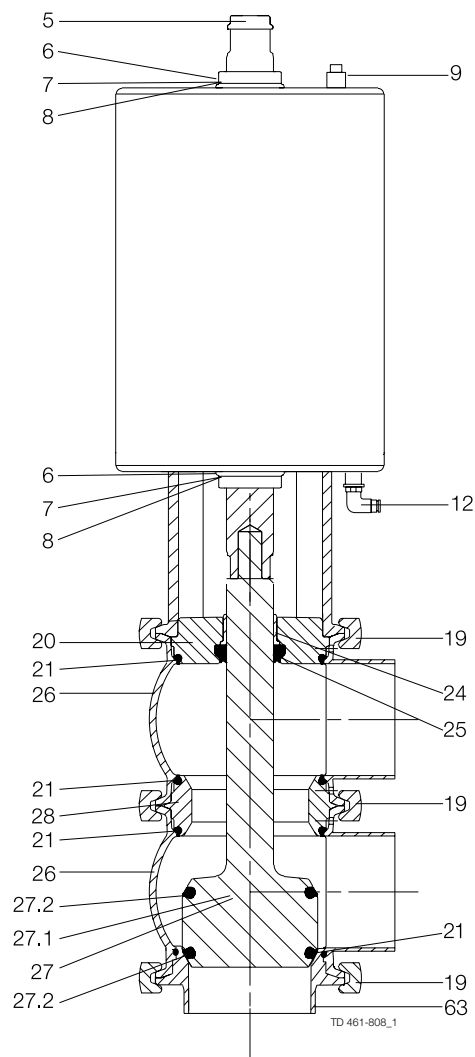
It is important to observe the technical data during installation, operation and maintenance.
Inform the personnel about the technical data.

Data - valve/actuator	
Max. product pressure.....	1000 kPa (10 bar)
Min. product pressure.....	Full vacuum (depending on product specifications)
Temperature range	-10° C to + 140° C (standard EPDM seal)
Air pressure, actuator	500 to 700 kPa (5 to 7 bar)
Materials - valve/actuator	
Product wetted steel parts.....	AISI 316L (internal Ra < 0.8 µm)
Other steel parts	AISI 304
Plug seal.....	EPDM / PTFE (TR2)
Other product wetted seals	EPDM (standard)
Optional product wetted seals	HNBR and FPM
Other seals	NBR

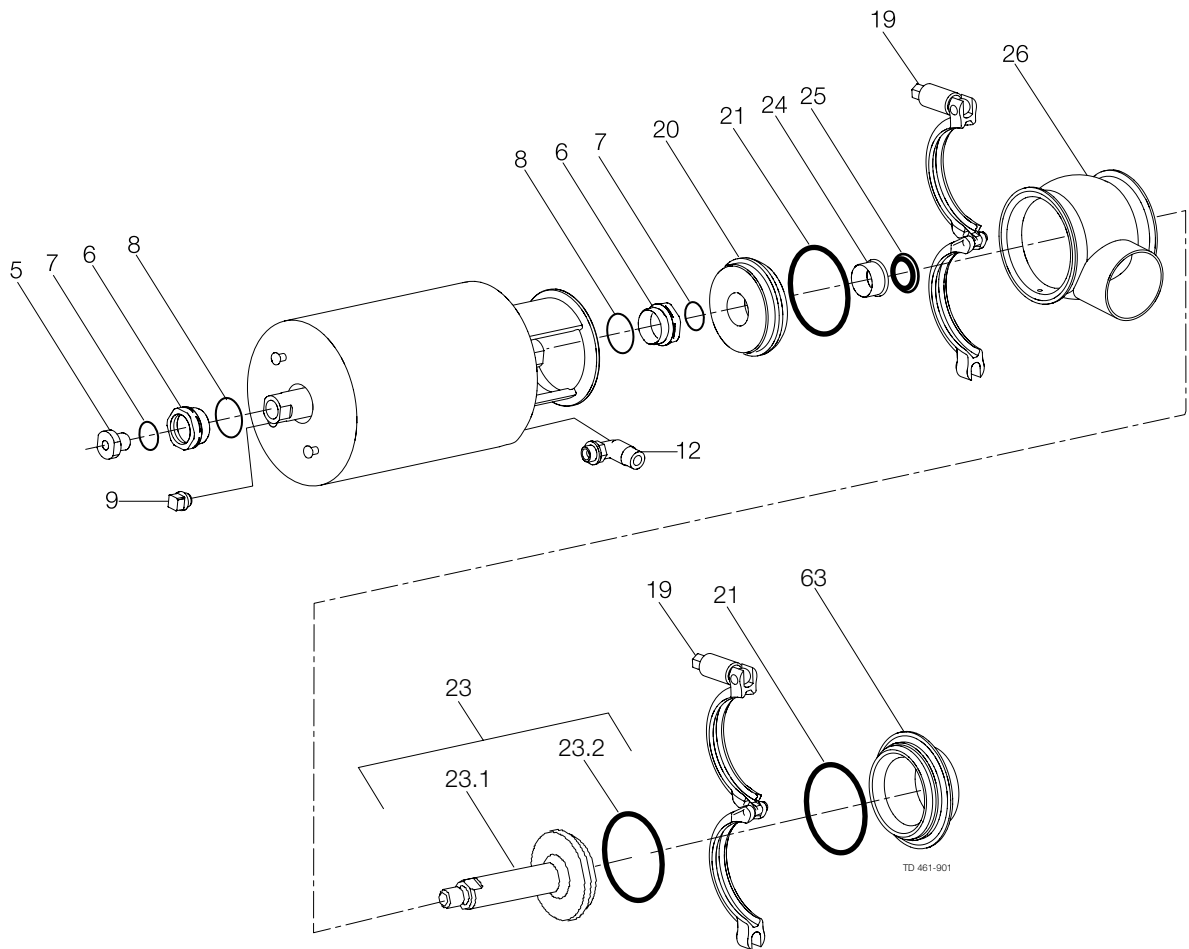
For parts lists please see section 6.1. The drawings include all items.



Shut-off valve



Change-over valve



The parts list includes all items.

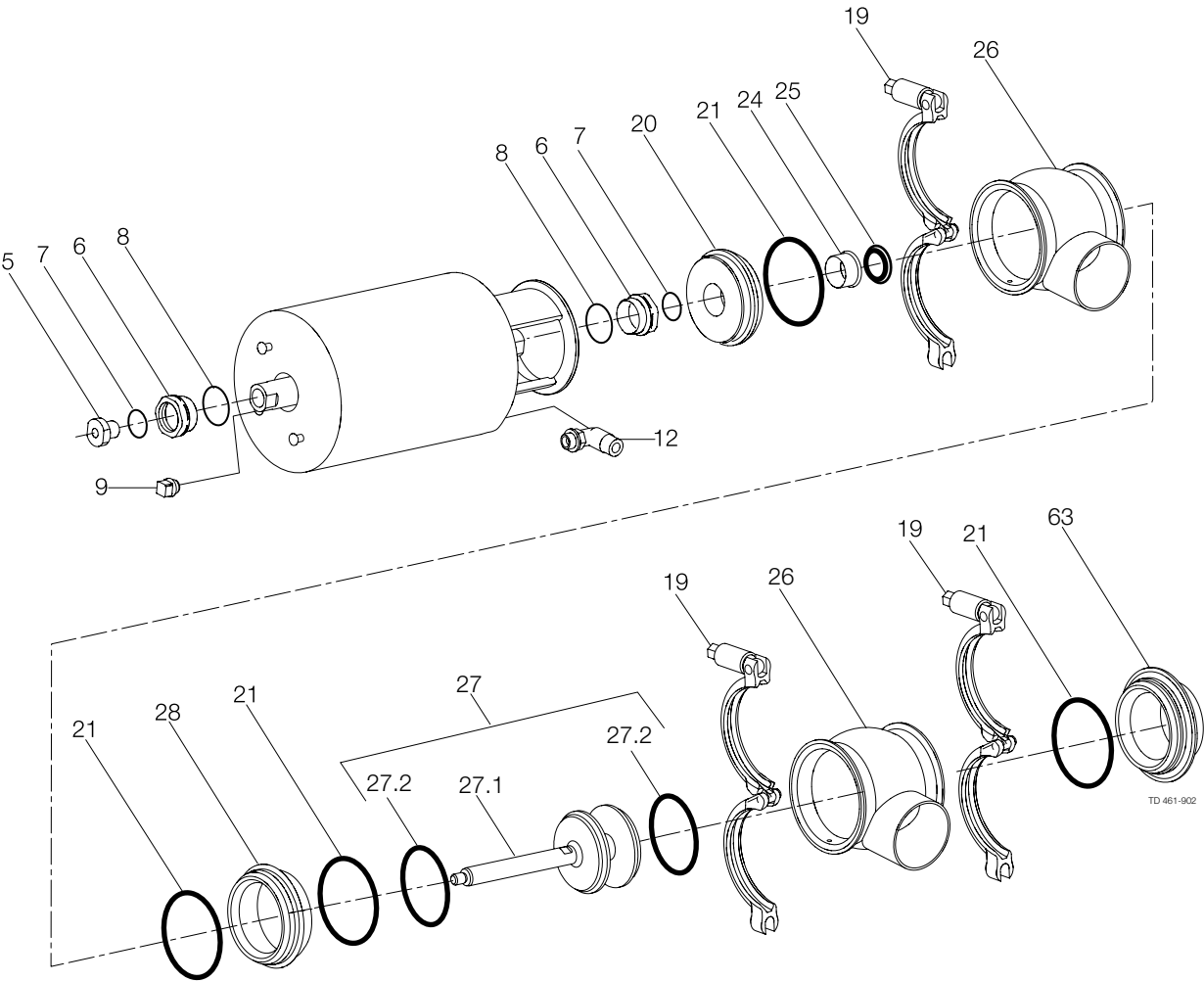
Parts List			Service Kits/Product wetted parts (shut-off)	
Pos.	Qty.	Denomination	DenominationItem number	
5	1	Actuator, complete	Actuator9611-92-6500	
6 ●	2	Adapter		
7 ●	2	Bushing		
8 ●	2	O-ring		
9	1	Plug		
12	1(2)	Air fitting		
19	2	Clamp		
20	1	Bonnet		
21 Δ	2	O-ring		
23	1	Plug, shut off, complete		
23.1	1	Plug, shut off		
23.2 Δ	1	Plug seal		
24	1	Bushing		
25 Δ	1	Lip seal		
26	1	Valve body, 1 port		
26	1	Valve body, 2 ports		
63	1	Port seal element		
			DN40/38 mm	
			EPDM.....9611-92-6743	
			HNBR.....9611-92-6747	
			FPM9611-92-6751	
			DN50/51 mm	
			EPDM.....9611-92-6744	
			HNBR.....9611-92-6748	
			FPM9611-92-6752	
			DN65/63.5 mm	
			EPDM.....9611-92-6745	
			HNBR.....9611-92-6749	
			FPM9611-92-6753	
			DN100/101.6 mm	
			EPDM.....9611-92-6746	
			HNBR.....9611-92-6750	
			FPM9611-92-6754	

●: Service kits - Actuator

Δ: Service kits - EPDM

Δ: Service kits - HNBR

Δ: Service kits - FPM



The parts list includes all items.

Parts List			Service Kits/Product wetted parts (Change-over)	
Pos.	Qty.	Denomination	DenominationItem number	
5	1	Actuator, complete	Actuator9611-92-6500	
6 ●	2	Adapter		
7 ●	2	Bushing		
8 ●	2	O-ring		
9	1	O-ring		
12	1(2)	Plug		
19	3	Air fitting		
20	1	Clamp		
21 Δ	4	Bonnet		
24	1	O-ring		
25 Δ	1	Bushing		
26	2	Lip seal		
26	2	Valve body, 1 port		
26	2	Valve body, 2 ports		
27	1	Plug, change-over, ISO complete		
27.1	1	Plug, change-over, ISO		
27.2 Δ	2	Plug seal		
28	1	Seat		
63	1	Port seal element		
			DN40/38 mm	
			EPDM.....9611-92-6755	
			HNBR.....9611-92-6759	
			FPM9611-92-6763	
			DN50/51 mm	
			EPDM.....9611-92-6756	
			HNBR.....9611-92-6760	
			FPM9611-92-6764	
			DN65/63.5 mm	
			EPDM.....9611-92-6757	
			HNBR.....9611-92-6761	
			FPM9611-92-6765	
			DN100/101.6 mm	
			EPDM.....9611-92-6758	
			HNBR.....9611-92-6762	
			FPM9611-92-6766	

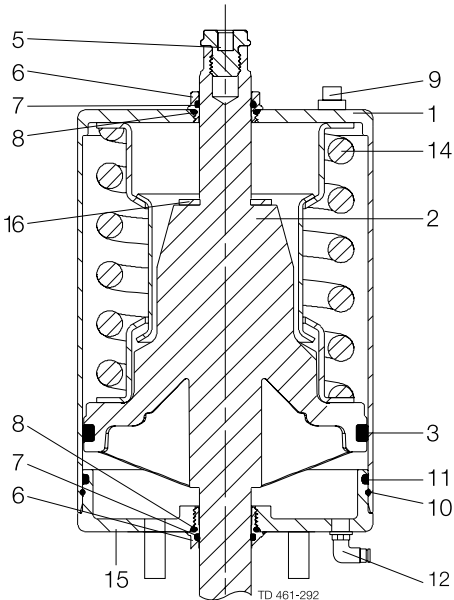
●: Service kits - Actuator
Δ: Service kits - EPDM
Δ: Service kits - HNBR
Δ: Service kits - FPM

The parts list includes all items.
NC = Normally closed.
NO = Normally open.
A/A = Air/air activated.

Parts List

Pos.	Qty.	Denomination
		Actuator, complete
1	1	Cylinder
2	1	Stem
3 ●*	1	O-ring
5	1	Adapter
6 ●*	2	Bushing
7 ●*	2	O-ring
8 ●*	2	O-ring
9	1	Plug
10	1	Lock wire
11	1	O-ring
12	1(2)	Air fitting (2 only for A/A)
13	1	Yoke (not shown in drawing)
14	1	Spring assembly
15	1	Bottom
16 *	1(2)	Support disc (2 only for A/A)
17	3	Washer (not shown in drawing)
18	3	Nut (not shown in drawing)

●: Service kits - Actuator, NO, NC
*: Service kits - Actuator, A/A



Service Kits

Denomination	Item number
Service kit, actuator	
DN/OD 25 mm / DN 25 - DN/OD 38 mm / DN 40	
NO, NC	9611-92-6497
A/A	9611-92-6519
DN/OD 51 mm / DN 50 - DN/OD 63.5 mm / DN 65	
NO, NC	9611-92-6498
A/A	9611-92-6520
DN/OD 76 mm / DN 80 - DN/OD 101.6 mm / DN 100	
NO, NC	9611-92-6499
A/A	9611-92-6521

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 direct.