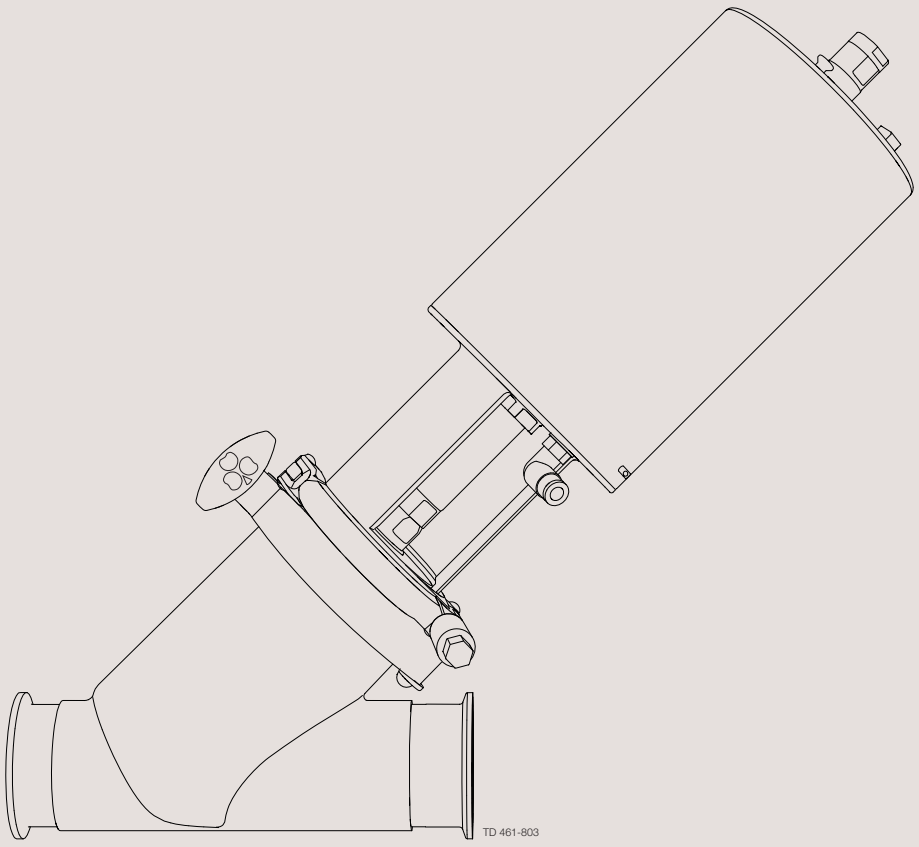
Instruction Manual

Unique 7000 Series Valve Y-body



ESE00690-ENUS4 2014-12

Original manual

Tri-Clover®

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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

Revision of Declaration of Conformity 2009-12-29

The Designated Company

Alfa Laval Kolding A/S
Company Name

Albuen 31, DK-6000 Kolding, Denmark
Address

+45 79 32 22 00
Phone No.

hereby declare that

Valve
Designation

Unique 7000 PN10
Type

From serial number 5099880 to 29999999999

is in conformity with the following directive with amendments:

- Machinery Directive 2006/42/EC
- Regulation (EC) No 1935/2004
- Pressure Equipment Directive 97/23/EC category 1 and subjected to assessment procedure Module A.

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

QHSE Manager, Quality, Health and safety & Environment	Annie Dahl
Title	Name
Kolding	2013-12-03
Place	Date

Signature

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:

2 Safety

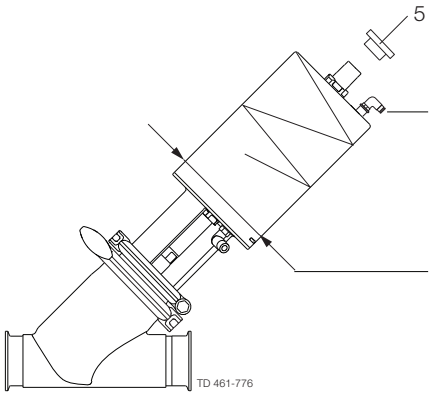
All warnings in the manual are summarized on this page.
Pay special attention to the instructions below so that severe personal injury and/or damage to the valve are avoided.

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 (Pos. 5) is always used on the new design.

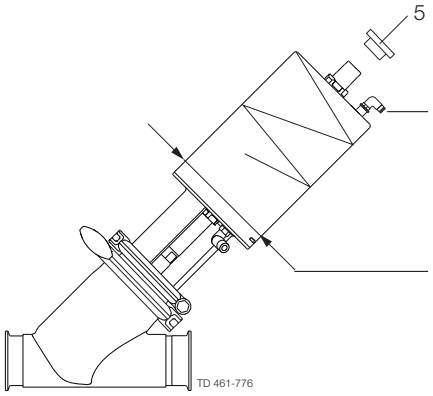


Actuators marked with year 2006-2011 (old actuator design):

⚠
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.

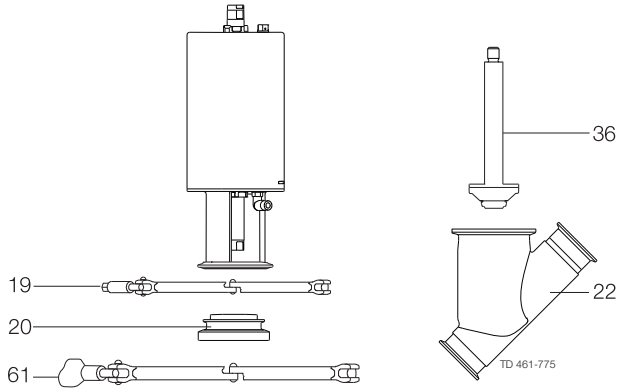
3.1 Unpacking/delivery

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

Complete actuator
1. Bonnet (20).
2. upper clamp (19).
3. Valve plug (36).
4. Valve body (22).
5. Lower clamp (61)



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

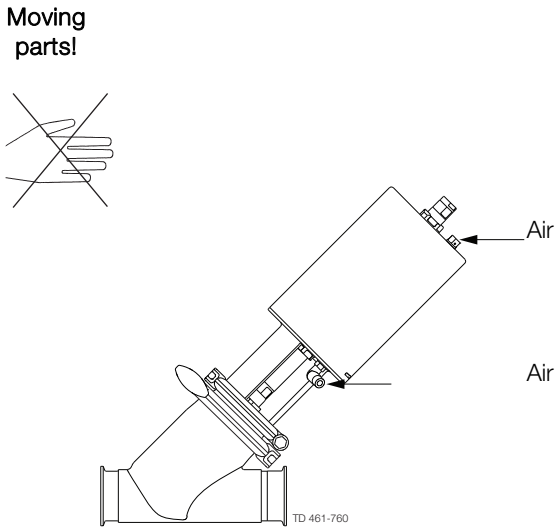
Always read the technical data thoroughly.
See chapter 6 Technical data

Always release compressed air after use.

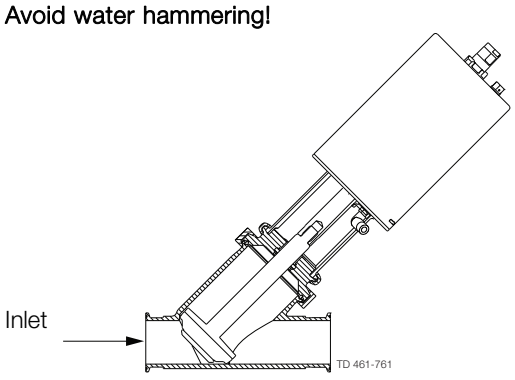
CAUTION
Alfa Laval cannot be held responsible for incorrect installation.

Step 2

Never touch 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.

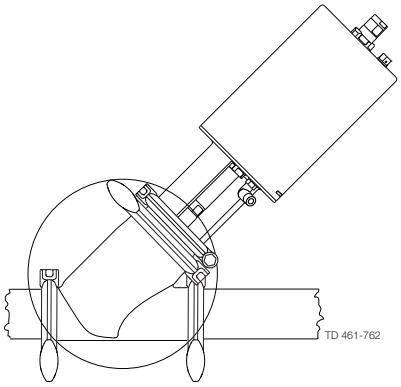


3 Installation

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.

Step 4
Avoid stressing the valve.
Pay special attention to:
- Vibrations.
- Thermal expansion of the pipelines.
- Overloading of the pipelines.

Risk of damage!

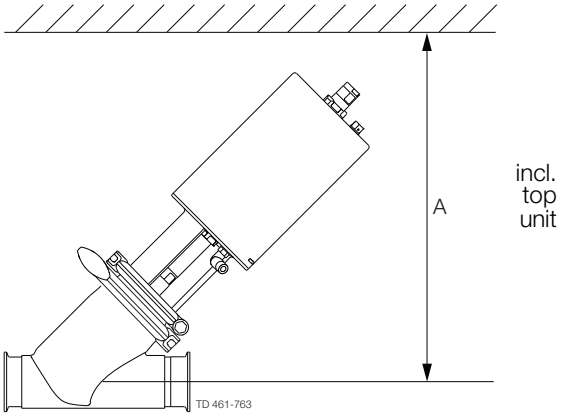


3.3 Welding

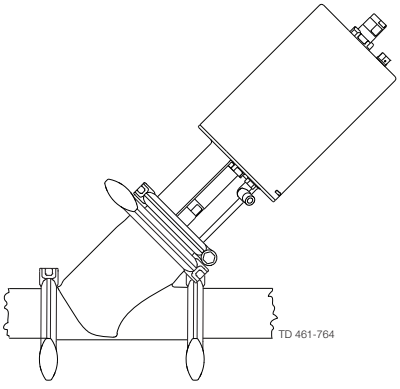
Step 1
Always install valves with more than one valve body so that the seals between the valve bodies can be replaced. Do not weld more than one valve body into the system.

Valve size	A (inch)	B (inch)
2”	*	18.8
2 ½”	*	19.3
3”	*	22.2
4”	*	23.8

* Depending on body combination and piping solution.



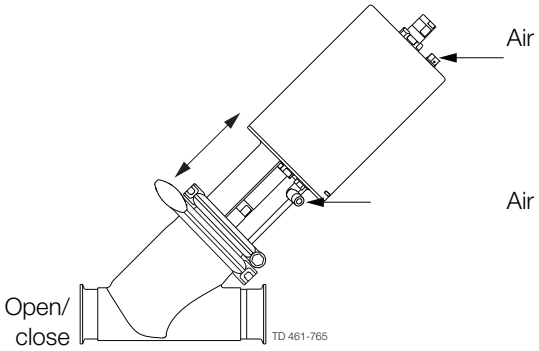
Step 2
Assemble the valve in accordance with the steps on page .
Pay special attention to the warnings!



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.

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!



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.

3.4 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

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

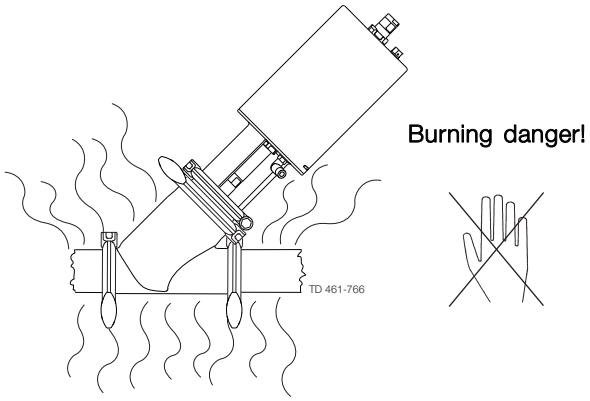
Always read the technical data thoroughly.
See chapter 6 Technical data

Always release compressed air after use.

CAUTION
Alfa Laval cannot be held responsible for incorrect operation.

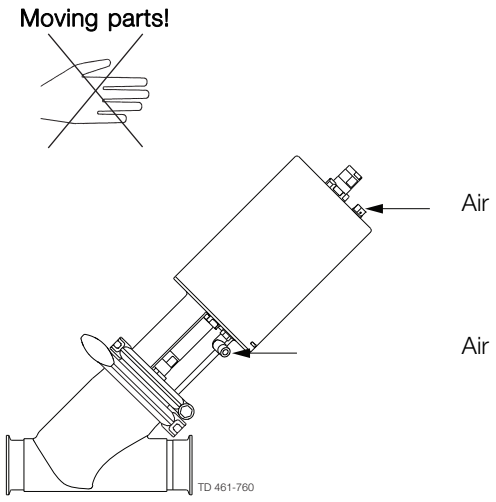
Step 2

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.

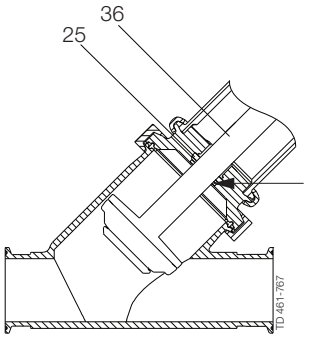


4 Operation

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.

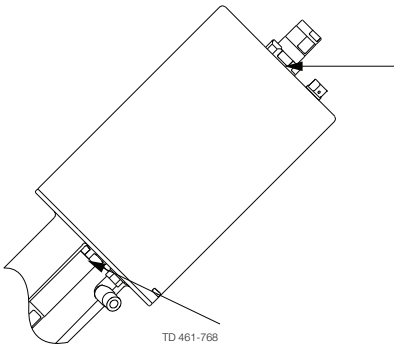
Step 4
Lubrication of valves:

1. Ensure smooth movement between lip seal (25) and plug stem (36).
2. Lubricate with Klüber Paraliq GTE 703 if necessary (see section 5.1).



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.

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 lip seal and/or O-ring	- Replace the seals - Replace with seals of a different rubber grade
Internal product leakage	- Worn or product affected plug seal	- Replace the seal
	- Product deposits on the seat and/or plug	- Frequent cleaning
	- Product pressure exceeds actuator specification	- Use auxiliary air on the spring side - Reduce product pressure
Water hammer	The flow direction is the same as the closing direction	- The flow direction should be against the closing direction - Throttle air release of solenoid in top unit
The valve does not open/close	Product pressure exceeds actuator specification	- Use auxiliary air on the spring side - Reduce product pressure

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_3 = Nitric acid.

4.3 Recommended cleaning

Step 1

Always handle lye and acid with great care.

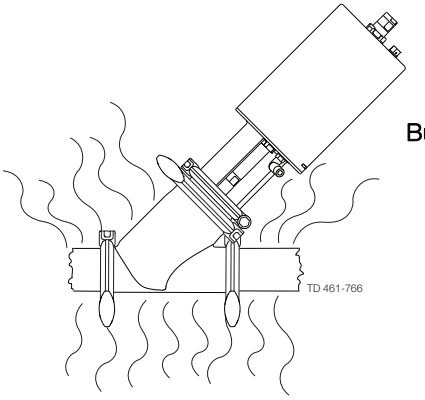
Caustic danger!

Always use rubber gloves!

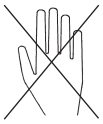
Always use protective goggles!

Step 2

Never touch the valve or the pipelines when sterilizing.

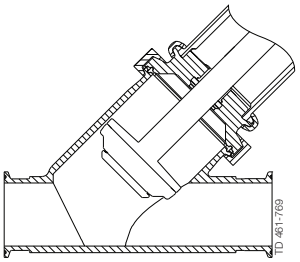


Burning danger!



Step 3

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



Step 4

Examples of cleaning agents:
Use clean water, free from clorides.

1. 1% by weight NaOH at 158°F

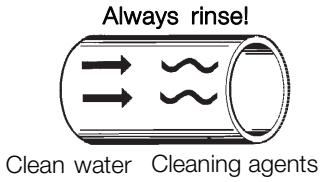
2.2 lb NaOH	+	26.4 gal water	=	Cleaning agent.
0.6 gal 33% NaOH	+	26.4 gal water	=	Cleaning agent.

2. 0.5% by weight HNO_3 at 158°F

0.2 gal 53% HNO_3	+	26.4 gal water	=	Cleaning agent.

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_3 = 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.

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.

5.1 General maintenance

Step 1

Always read the technical data thoroughly.
See chapter 6.

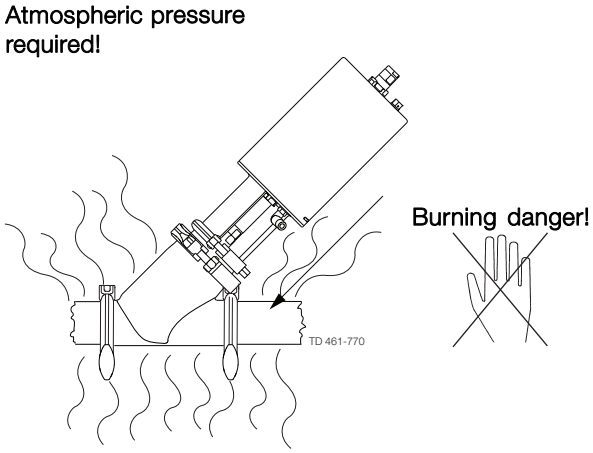
Always release compressed air after use.

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

Step 2

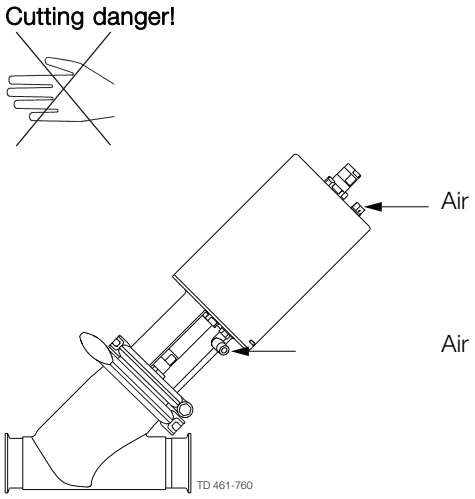
Never service the valve when it is hot.

Never service the valve with valve and pipelines under pressure.



Step 3

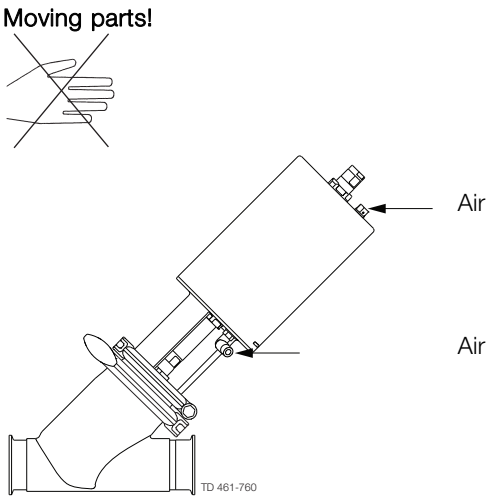
Never stick your fingers through the valve ports if the actuator is supplied with compressed air.



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 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.

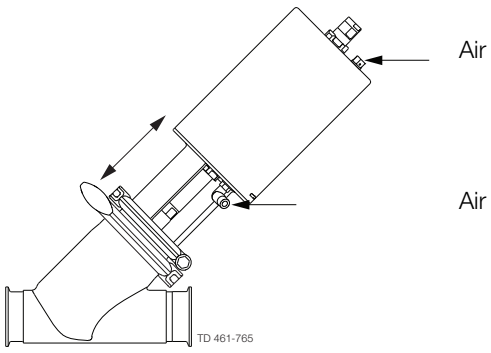
Below are some guidelines for maintenance and lubrication intervals. Please note that the guidelines are for normal working conditions in one shift.

	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	- Regular inspection for leakage and smooth operation - Keep a record of the valve - Use the statistics for planning of inspections **Replace after leakage**	- 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!

Open/close!



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.

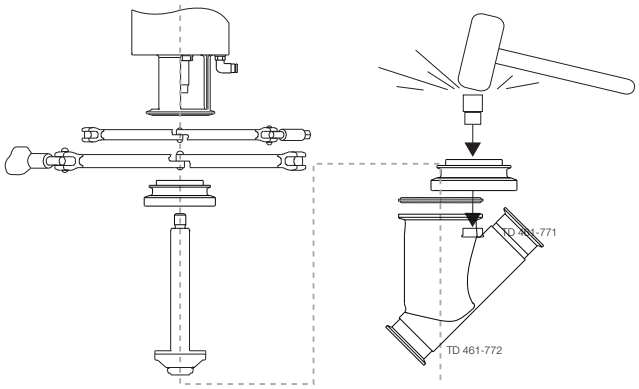
5.2 Dismantling of valve

Step 1

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. Remove body gasket.
6. Unscrew and remove valve plug.
7. Loosen and remove upper clamp.
8. Remove O-ring, lip seal and bushing in bonnet.
   (Use bushing tool and rubber mallet. See drawing).

Pay special attention to the warnings!

Note! For plug seal replacement please see section 5.3.



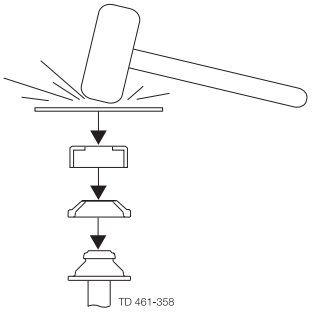
Note!
Be careful not to damage the bushing.

5.3 Plug Seal replacement

TR2 seal 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 an 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.



5 Maintenance

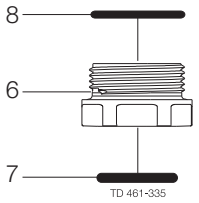
Study the instructions carefully.
The items refer to the parts list and service kits section. Handle scrap correctly.
A/A = Air/air activated.
Service tool: See Spare Parts.

5.4 Assembly of valve

Reverse order of 5.2, Dismantling of valve.
Lubricate O-ring (62) and lip seal (25) with Klüber Paraliq GTE 703.
Remember to tighten spindle and plug with a torque M = 23 lbf-ft (30 Nm) (Use two 17 mm spanners)
If there are vibrations in the pipeline Alfa Laval recommend to use loctite nr. 243.

5.5 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. Tighten brushing with a torque = 7 lbf-ft (10Nm). Be careful not to overtighten.



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

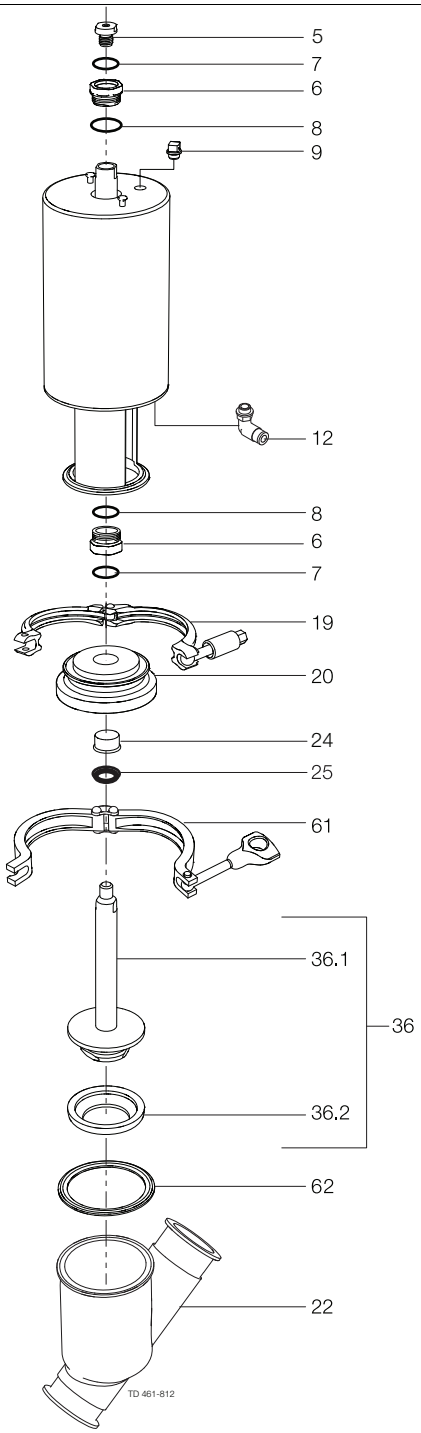
6.1 Technical data

Data - valve/actuator	
Max. product pressure	145 PSI (1000 kPa) (10 bar)
Min. product pressure	Full vacuum (depending on product specifications)
Temperature range	14°F to + 284°F (standard EPDM seal)
Air pressure, actuator	72.5 to 101.5 PSI (500 to 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
Plug seal	EPDM / PTFE (TR2)
Other product wetted seals	EPDM (standard)
Optional product wetted seals	HNBR/NBR and FPM
Other seals	NBR

7 Parts list and Service Kits

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

7.1 Unique 7000 Series Valve - Y-body



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
			Actuator
5		1	Adapter
6	□	2	Bushing
7	□	2	O-ring
8	□	2	O-ring
9		1	Plug
12		1(2)	Air fitting
19		1	Clamp
20		1	Bonnet
22		1	Valve body
25	♦	1	Lip seal
36		1	Plug
36.1		1	Plug
36.2	♦	1	Plug seal
61		1	Clamp
62	♦	1	Gasket

Service kits

	Denomination	2"	2½"	3"	4"
Actuator					
□	Service kit	9611926500	9611926500	9611926500	9611926500
Product wetted parts					
♦	Service kit, EPDM	9611926815	9611926816	9611926817	9611926818
♦	Service kit, HNBR/NBR	9611926819	9611926820	9611926821	9611926822
♦	Service kit, FPM	9611926823	9611926824	9611926825	9611926826

Recommended spare parts: Service kits
Parts marked with □♦ are included in the service kits.

TD900479/2

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.