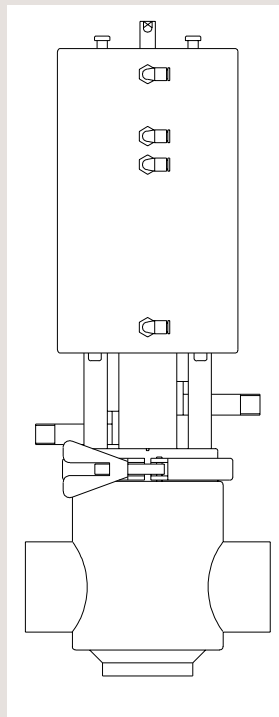




Instruction Manual

AMP Aseptic Mixproof Valve



Declaration of Conformity

The designating company

Alfa Laval

Company Name

6000 Kolding

Address

+45 79 32 22 00

Phone No.

hereby declare that

Aseptic Mixproof Valve

Denomination

AMP

Type

Year

Was manufactured in conformity with the provisions in the COUNCIL DIRECTIVE of 14 June 1989 on mutual approximation of the laws of the Member States on the safety of machines (89/392/EEC as amended by directives 91/368/EEC and 93/44/EEC) with special reference to Annex 1 of the directive on essential safety and health requirements in relation to the construction and manufacture of machines.

Bjarne Søndergaard

Name

Vice President, R & D

Title

Alfa Laval

Company



Signature

Designation



Table of contents

This manual is divided into main sections. - See below.

Safety

1. Important information	2
2. Warning signs	2
3. Safety precautions	3

Installation

1. Unpacking/Delivery	4
2. General installation	5
3. Welding	6
4. Fitting of indication unit (optional)	7
5. Before operation	8

Operation

1. Operation	9
2. Fault finding and repair	9
3. Recommended cleaning	10
4. Valve positions	11

Maintenance

1. General maintenance	12
2. Tools list	12
3. Torques	12
4. Preparation	13
5. Dismantling of valve	14
6. Reassembly of valve	16
7. Dismantling of actuator	18
8. Reassembly of actuator	20

Technical data

1. Technical data	22
-------------------------	----

Drawing/Parts list

1. Parts list	24
2. Drawings	
- AMP valve and actuator	25

Safety

Unsafe practices and other important information are emphasized in this manual.

Warnings are emphasized by means of special signs.

1. Important information

Always read the manual before using the valve!

2

- 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 practices or to make them clearer.

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.

3. Safety precautions

Installation:



- : - **Always** read the technical data thoroughly (see page 22).
- **Always** release compressed air after use.
- **Never** touch the actuator piston rod or other moving parts if the actuator is supplied with compressed air (see the warning label).



- : **Never** stick your fingers through the valve ports or touch the moving parts if the actuator is supplied with compressed air.



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



- : - **Never** touch the valve, pipelines or steam or condensate connection pipe after opening the steam valve.
- After opening the steam valve there will be steam pressure in the steam and condensate hoses and the barrier chamber.

Operation:



- : - **Always** read the technical data thoroughly (see page 22).
- **Never** touch the valve or the pipelines when processing hot liquids or when sterilizing.
- When the steam valve is open, there will be steam pressure in the steam and condensate hoses and the barrier chamber.
- **Always** keep the steam valve open when the valve is operating.



- : - **Never** touch the moving parts if the actuator is supplied with compressed air.
- **Never** pressurise the following air connections simultaneously:
 - * AC2 and AC1 or AC2 and AC4.
 - * AC3 and AC1 or AC3 and AC4.



- : - **Always** release compressed air after use.
- **Never** touch the valve or the pipelines when sterilizing.



- : **Always** handle lye and acid with great care.

Maintenance:



- : **Never** service the valve when it is hot.



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



- : **Never** service the valve with valve/actuator under pressure.



- : **Never** loosen the clamp without compressed air on AC3 since it is exposed to the actuator closing force.

Installation

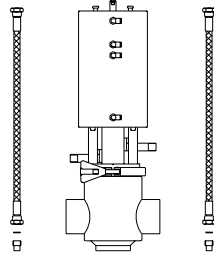
The instruction manual is part of the delivery.
Study the instructions carefully.

1. Unpacking/Delivery

1

Check the delivery for:

1. Complete valve, including one steam, and one condensate connection pipe with two welding ends and O-ring.
2. Delivery note.

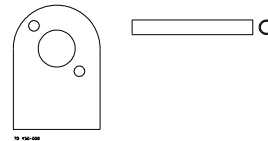


CAUTION!

We cannot be held responsible for incorrect unpacking.

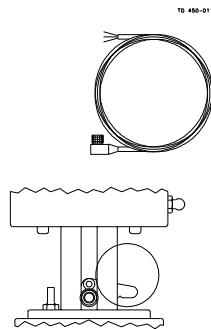
2

Optional - Maintenance tool for valve plug



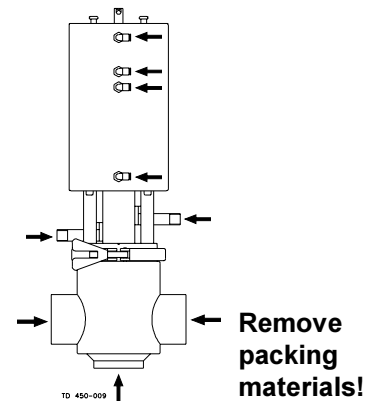
3

Optional - Indication unit



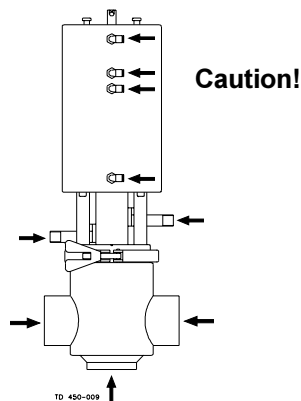
- The indication unit is used to indicate upper seat cleaning if the valve is equipped with a *ThinkTop*® control unit.
- It consists of a bracket (51), sensor (54) and cable (55).

4



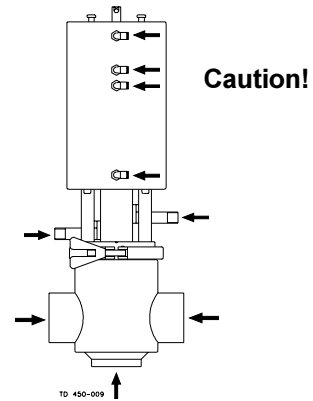
Remove possible packing materials from the pipe connection.

5



Inspect the valve for visible transport damages.

6



Avoid damaging the air, thread and pipe connections.

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

2. General installation

1



- **Always** read the technical data thoroughly (see page 22).
- **Always** release compressed air after use.
- **Never** touch the actuator piston rod or other moving parts if the actuator is supplied with compressed air (see the warning label).

CAUTION!

- Fit the supplied warning label on the valve so that it is normally visible.
- We cannot be held responsible for incorrect installation.

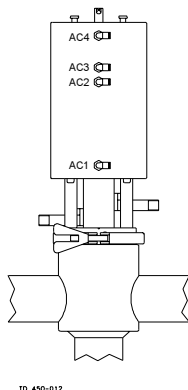
3



The following components are necessary for a safe function of the valve and are **not** part of the delivery:

- 1 hand-operated shut-off valve DN15.
- 1 pneumatic shut-off valve DN10.
- 1 temperature sensor e.g. PT-100.
- 1 steam trap min. 10kg/h.

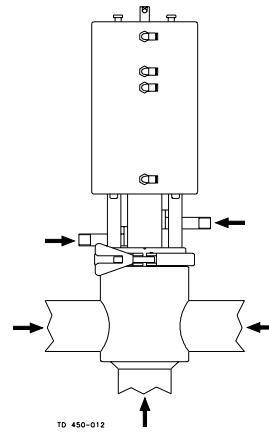
5



TD 450-012

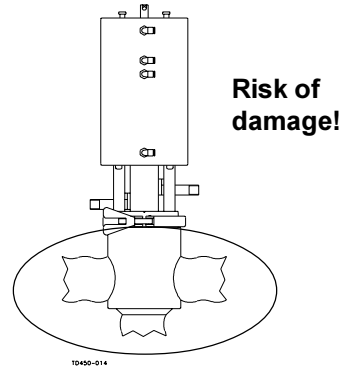
- Air connection:** R 1/8" (BSP).
- AC1: Cleaning of upper seat.
 - AC2: Intermediate position (short stop).
 - AC3: Open valve.
 - AC4: Cleaning of lower seat.

2



Always install the valve vertically.

4

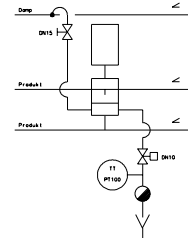


Avoid stressing the valve.

Pay special attention to:

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

6



Steam supply line:

The steam supply line should be sloped and drainable and always be placed above the AMP as shown on the sketch. This ensures a steam or condensate buffer between the AMP and the steam line and minimises the risk of pressure shocks in the steam and condensate circuit. If product with particles or high solids content is processed it might be considered to increase the dimension of the steam supply line, to increase the condensate volume that is used for valve seat cleaning.

Installation

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

Check the valve for smooth operation after welding.

3. Welding

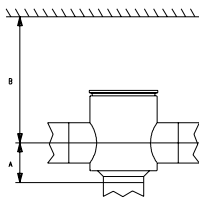
1

The valve body should be welded in accordance with given standards and guidelines. Product lines should be self draining to avoid steam and condensate shocks and thereby extend lifetime of the steel bellows.

3

NOTE!

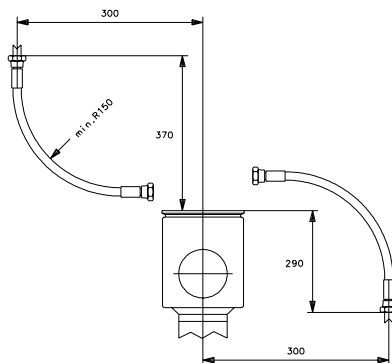
Maintain the minimum clearances (A and B) so that the actuator with the internal valve parts can be removed.



DN	51 mm	DN50	63.5 mm	DN65
A	60	60	66	69
B	590	590	630	630

NOTE! With *ThinkTop*® fitted: B + 172 mm.

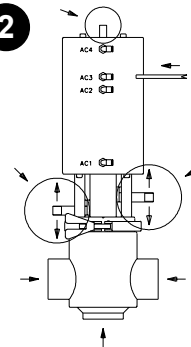
5



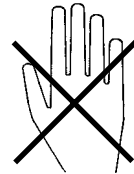
TD 450-020

Mounting of steam and condensate connection pipes.

2



Cutting danger!



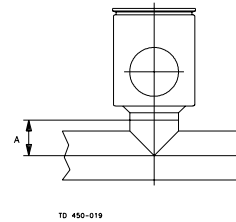
Moving parts!



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

1. Dismantle the valve in accordance with instructions 1-3 on page 14.
2. Keep the actuator in a safe place.

4



TD 450-019

Recommended clearance when welding a T-piece

DN	51 mm	DN50	63.5 mm	DN65
A	35	36	44	48

CIP cleaning!

The mentioned clearances ensure a good CIP cleaning of the pipe connection.

6

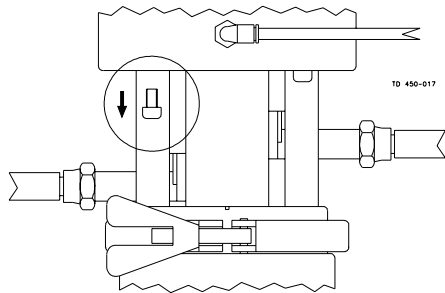
Reassemble the valve in accordance with instructions 5-7 on pages 16-17, after welding.

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

Please follow the Operating Manual delivered with the ThinkTop®, when mounting the top unit.

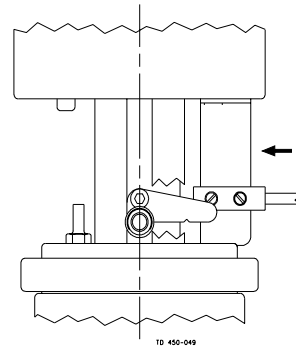
4. Fitting of indication unit (optional)

1



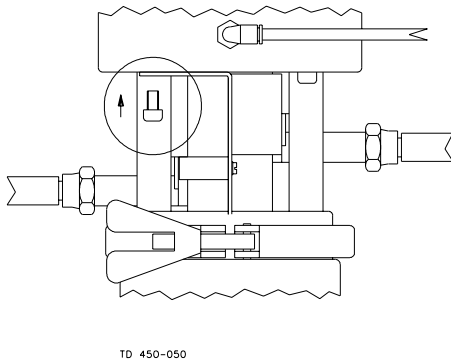
When fitting the indication unit, loosen screw (37) placed on the left side of the bonnet (32).

2



Slide bracket (51) with sensor (55) into the groove in the bonnet.

3

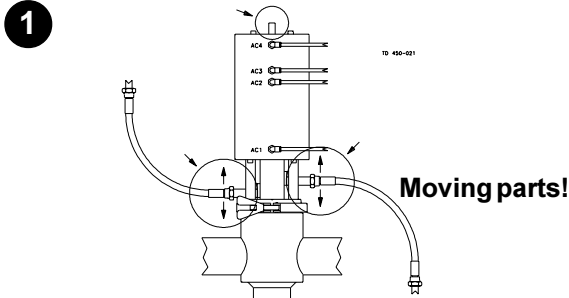


Tighten screw (37).

Installation

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

5. Before operation

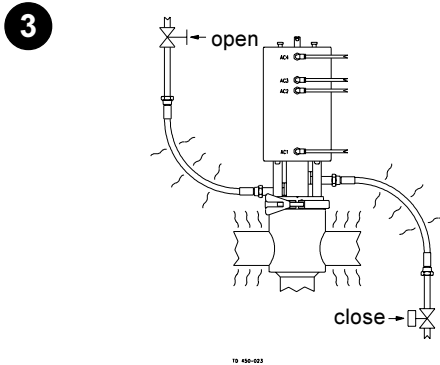


1. Supply compressed air to AC1, AC2, AC3 and AC4 one by one.
2. Operate the valve several times to ensure that it operates smoothly.

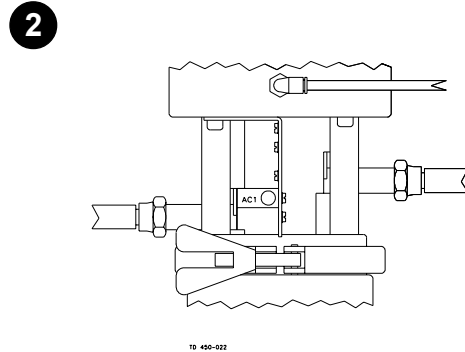
Pay special attention to the warnings!



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



1. Close condensate valve.
2. Open steam valve slowly.
3. Supply AC1 with compressed air for 5 seconds (upper seat cleaning).
4. Supply AC4 with compressed air for 5 seconds (lower seat cleaning).



If indication unit (optional) is fitted, check and if necessary adjust the sensor position to proper indication of upper seat cleaning position (on=yellow LED, off=green LED).
Adjust the *ThinkTop*[®] (optional) according to manual, if fitted.

4



- **Never** touch the valve, pipelines or steam or condensate connection pipe after opening the steam valve.
- After opening the steam valve there will be steam pressure in the steam and condensate hoses and the barrier chamber.

NOTE!

Always clean and sterilize the valve before operation.

The valve is adjusted and tested before delivery. Study the instructions carefully and pay special attention to the warnings!

Pay attention to possible faults. The items refer to the drawings and parts list on page 23.

1. Operation

1

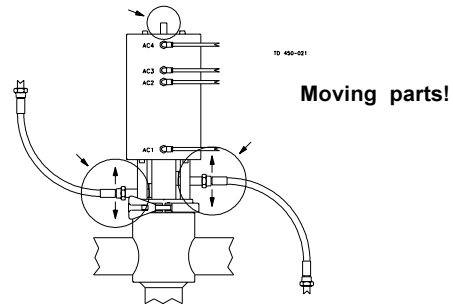


- **Always** read the technical data thoroughly (see page 22).
- **Never** touch the valve or the pipelines when processing hot liquids or when sterilizing.
- When the steam valve is open, there will be steam pressure in the steam and condensate hoses and the barrier chamber.
- **Always** keep the steam valve open when the valve is operating.

CAUTION!

We cannot be held responsible for incorrect operation.

2



- **Never** touch the moving parts if the actuator is supplied with compressed air.
- **Never** pressurise the following air connections simultaneously:
 - * AC2 and AC1 or AC2 and AC4.
 - * AC3 and AC1 or AC3 and AC4.
- **Always** release compressed air after use.

2. Fault finding and repair

NOTE!

Study the maintenance instructions carefully before replacing worn parts.
- See page 12!

Problem	Cause/result	Repair
Condensate connection pipe is always hot	Condensate valve is leaking	Replace the lip seal
Steam connection pipe is always hot	<ul style="list-style-type: none"> - Particles between valve seats and valve plugs - Upper plug seal (26) or lower plug seal (25) worn 	<ul style="list-style-type: none"> - Remove the particles, carry out a number of seat cleanings - Replace the O-rings
Leakage at external bellows vent hole (on bonnet)	External bellows (21) is damaged	Replace external bellows (21)
Leakage at internal bellows vent hole (at condensate connection)	Internal bellows (20) is damaged	Replace internal bellows (20)
Leakage at clamp	Loose clamp (31), worn O-ring (18)	Tighten clamp (31), replace the O-ring (18)
Air leakage	Worn O-rings in actuator	Replace the actuator O-ring(s)

Operation

10

The valve is designed for cleaning in place (CIP) and sterilisation in place (SIP).
CIP = Cleaning In Place.
SIP = Sterilisation In Place.

Study the instructions carefully and pay special attention to the warnings!
NaOH = Caustic Soda.
HNO₃ = Nitric acid.

3. Recommended cleaning

1

Caustic danger!



Always use rubber gloves!



Always use protective goggles!



Always handle lye and acid with great care.

3

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.
----------------------------	---	-------------	-------------------

5

Valve positions during CIP/SIP phases:

(see drawings on page 11)

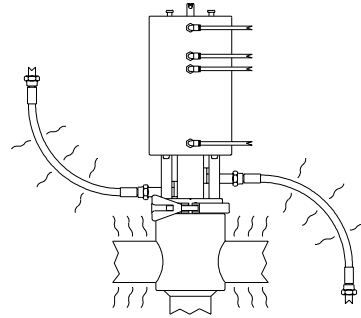
Cleaning with water: Closed valve (drawing 1).
Condensate will build up in the barrier chamber.

Cleaning with cleaning agent: Closed valve.
Every 15 minutes sterilise the barrier chamber for 10 seconds (drawing 4).

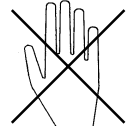
Heating with saturated steam: Closed valve.
Every 15 minutes sterilise the barrier chamber for 10 seconds (drawing 4).

Sterilising with saturated steam: Closed valve.
Every 15 minutes sterilise the barrier chamber for 10 seconds (drawing 4).

2



Burning danger!



Never touch the valve or the pipelines when sterilizing.

4

CIP/SIP phases:

The CIP/SIP procedures should always be adapted to the application. An example is shown below.

- **Cleaning with water:** 10 min.
- **Cleaning with lye at 70° C:** 30 min.
- **Cleaning with water:** 10 min.
- **Cleaning with acid at 70° C:** 30 min.
- **Cleaning with water:** 10 min.
- **Heating with saturated steam at 130° C:** until temperature is reached
- **Sterilizing with saturated steam 130° C:** 20 min.

6

Valve positions during production:

The valve should be cleaned and sterilised before operation.

Opening procedure: Activate AC2 (Intermediate/short stop position for 5 seconds. There after activate AC3, while AC2 is still activated, to open valve. If short stop function is not used, we recommend to connect AC2 and AC3 and open valve by simultaneous activation.

Short stop: For short production stops the short stop position can be used. Thereby barrier chamber sterilisation can be avoided.

The initial position is open valve. For short stop position pressure is released from AC3 while AC2 is still activated).

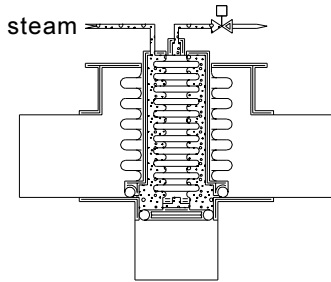
To open the valve after a short stop reactivate AC3.
Closing procedure: Release compressed air from AC3 and AC 2 to move the valve plug to closed position. After the valve is closed, sterilise the barrier chamber for 10 seconds (drawing 4).

Internal leakage in the valve is externally visible by means of the leakage outlet.

Study the instructions carefully.

4. Valve positions

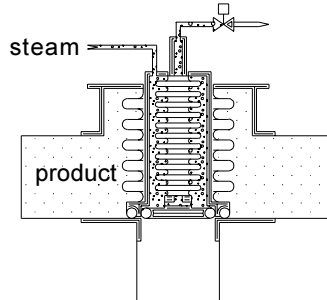
1



Closed valve:

A condensate buffer will build up in the barrier chamber to ensure sterile separation of the two product lines. The condensate valve is closed.

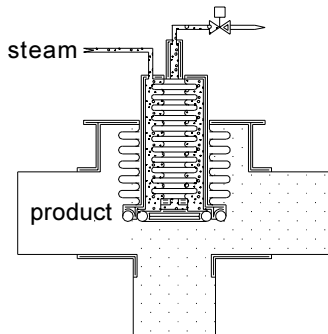
2



Valve in intermediate/short stop position (AC2):

This is recommended as first step in the opening procedure and can also be used for closing the valve during short production stops. In this position AMP act as a single seat valve. The condensate valve is closed.

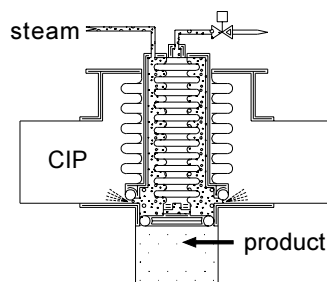
3



Valve open (AC3 (and AC2)):

If the intermediate position is not used it is recommended to connect AC3 and AC2 with each other (activation of AC2 ensures optimum safety against condensate leakage from the barrier in case of pressure shocks in the steam circuit).

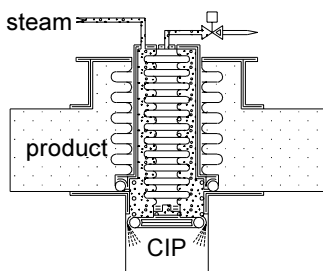
4



Upper seat cleaning (AC1):

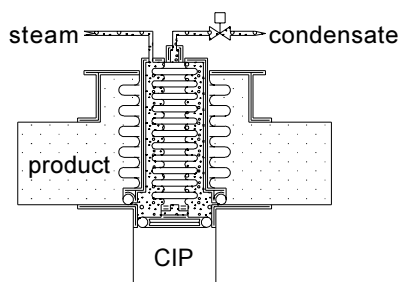
Condensate and steam from the sterile barrier flush and clean the upper seal and valve seat surfaces. We recommend upper seat cleaning for 5 secs after each cleaning phase. The condensate valve is closed.

5



Lower seat cleaning (AC4):

Condensate and steam from the sterile barrier flush and clean the lower seal and valve seat surfaces. We recommend lower seat cleaning for 5 secs after each cleaning phase. The condensate valve is closed.



Barrier chamber sterilisation (closed valve):

The condensate valve is open and the barrier chamber is sterilised by the steam flow. We recommend 10 min's holding time after the desired steam outlet temperature is reached.

Maintenance

Maintain the valve/actuator 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.
The items refer to the drawing and the parts list on page 24-25.

1. General maintenance

Ordering spare parts

- Contact the Sales Department.
- Order from the Spare Parts List.

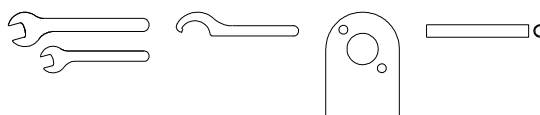
Recommended spare parts: Service kits (see Spare Parts List).

Maintenance	Valve rubber seals	Internal bellows External bellows	Actuator seals
After 1 week	Visual inspection	Visual inspection	
Weekly	Please comply with fault finding and repair on page 9		
Half-yearly	Replace	Visual inspection	
Every third year or after 200,000 activations	Replace	Replace	Replace
Lubrication	Before fitting Apply a thin layer of Klüber Paraliq GTE 703 or similar USDA H1 approved silicone oil/grease (suitable for EPDM). Do not lubricate valve plug seals pos. 25-26. Do not use mineral oil or grease!		Before fitting Lubricate with Klüber Paraliq GTE 703 or similar grease (suitable for EPDM). Do not use mineral grease!

2. Tools list

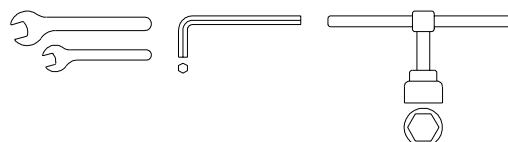
For maintenance of the valve (product part)

- 1 spanner 22 mm
- 1 spanner 17 mm
- 1 hook spanner 45 mm
- 1 tool set for valve plug maintenance



For maintenance of the actuator

- 1 spanner 17 mm
- 1 spanner 10 mm
- 1 Allen key 5 mm
- 1 socket spanner 24 mm



3. Torques

All threads are right-hand ISO threads. Please follow the below table for the correct torques appropriate for the screws and threads.

Item	Counter item	Thread size	Torque
Lower plug, external (24)	Stem (19)	M16	40 Nm
Upper plug (30)	Main piston (39)	M42 x 1.5	15 Nm
Bellows, external (21)	Upper plug (30)	M48 x 1.5	15 Nm
Stem (19)	Piston rod (7)	M12	80 Nm
Upper piston rod (48)	Piston rod (7)	M6	10 Nm
Nut (3)	Piston rod (7)	M16	140 Nm
Screws (14, 36, 37, 42, 49)	Various threads	M6	15 Nm

Maintain the valve/actuator 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.
The items refer to the drawing and the parts list on page 24-25.

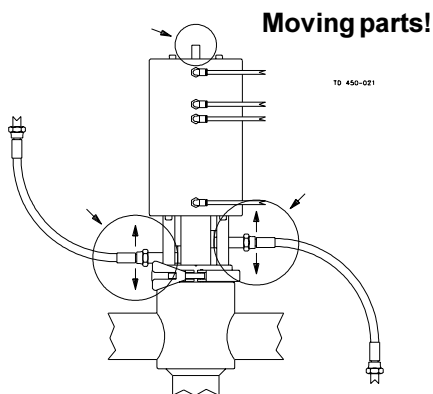
4. Preparation

1

Prepare:

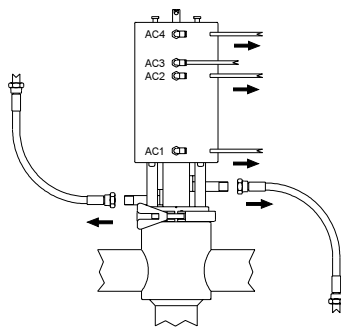
1. The delivered operating manual.
2. The recommended spare parts according to the parts list.
3. The recommended tools.

3



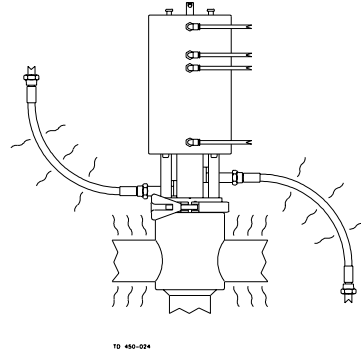
Never touch the moving parts if the actuator is supplied with compressed air.

5



1. Release compressed air from AC1, AC2 and AC4.
2. Loosen steam hose (46).
3. Loosen condensate hose (46).
4. Disconnect cable (54).

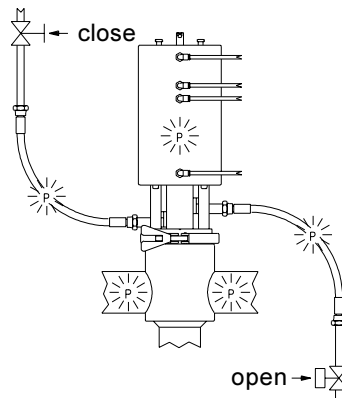
2



Never service the valve when it is hot.

1. End the production process.
2. Await the CIP-cleaning to finish.

4



Never service the valve with valve/actuator under pressure.

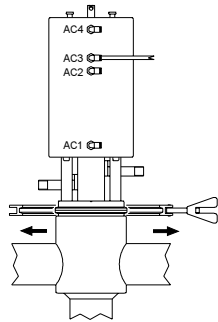
1. Close steam valve.
2. Open condensate valve.

Maintenance

Study the instructions carefully.
The items refer to the drawings and the parts list on page 24-25.

5. Dismantling of valve

1



1. Supply compressed air to AC3.
2. Loosen and remove clamp (31).
3. Release compressed air.

Pay special attention to the warnings!



Never loosen the clamp without compressed air on AC3 since it is exposed to the actuator closing force.

3

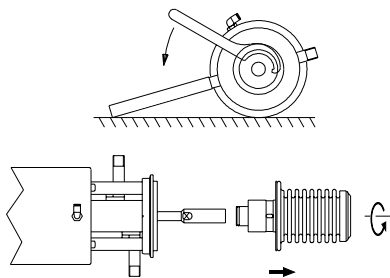
CAUTION!

- Be careful not to damage the sealing surfaces and steel bellows during valve maintenance.
- Do not supply compressed air to the actuator when it is removed from the valve.

NOTE!

The special tool set for the valve plug is highly recommended for valve maintenance.

5



TD 450-032

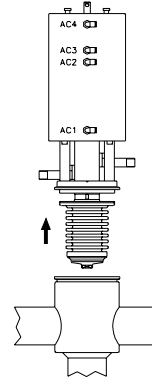
Unscrew and remove upper plug (30) together with external bellows (21).

Note !

See table on page 12 for recommended mounting torques. If tightened correctly, the threads are self securing.

Handle scrap correctly.

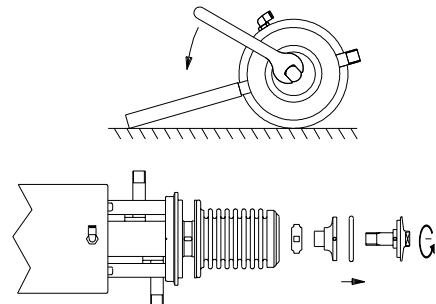
2



TD 450-030

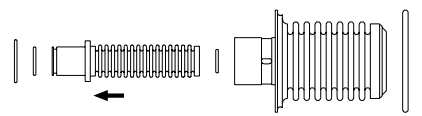
Carefully lift out the actuator and valve plug from the valve body (53).

4



1. Mount the "counterhold" rod on steam or condensate connection pipes. Loosen lower external plug (24) and remove it from inner stem (19).
2. Pull out lower external plug (24) from lower internal plug (28).
3. Remove O-ring (25) and guide (22).

6



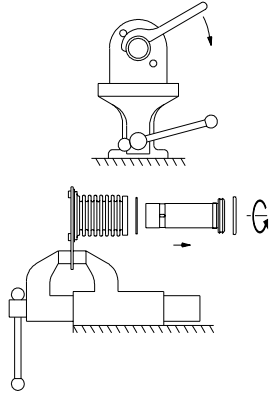
TD 450-033

1. Remove internal bellows (20) together with O-ring (16) from upper plug (30).
2. Remove O-rings (18, 29 and 33).

Study the instructions carefully.
The items refer to the drawings and the parts list on page 24-25.

5. Dismantling of valve

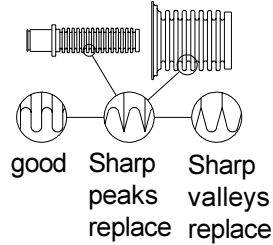
7



TD 450-034

1. Mount the upper plug on the bracket for easy maintenance. Loosen upper plug (30) and remove from external steel bellows (21).
2. Remove O-rings (26, 27).

8



CAUTION!

- Visual inspection of the steel bellows during each valve maintenance is highly recommended.
- Sharp peaks indicate the presence of excessive pressure or pressure shocks in the process.
- Sharp valleys indicate the presence of vacuum or cavitation in the process.
- Adjust process conditions and replace bellows if necessary.

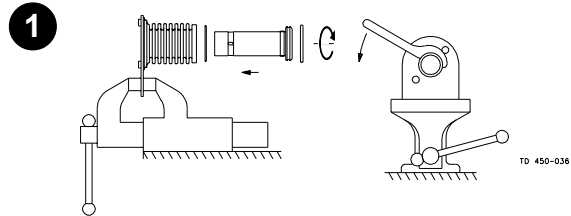
Maintenance

16

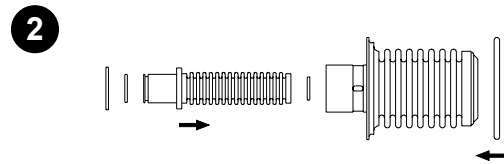
Study the instructions carefully.

The items refer to the drawings and the parts list on page 24-25.

6. Reassembly of valve

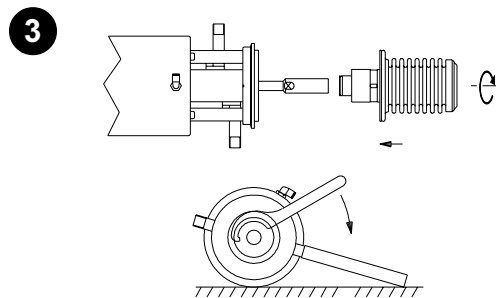


1. Fit O-ring (27) in the front end of the external bellows (21).
2. Fit O-ring (26) in the front end of the upper plug (30).
3. Lubricate gently both threads in the upper plug (30).
4. Fit upper plug (30) into external bellows (21) and tighten with the recommended torque. Make sure there is metallic contact between the parts.



TD 450-033

1. Fit O-ring (33) in the back end of the internal bellows (20).
2. Fit O-ring (29) in the front end of the internal bellows (20).
3. Fit O-ring (18) in the front end of the external bellows (21).
4. Slide internal bellow (20) into upper plug (30).
5. Fit O-ring (16) in the back end of the upper plug (30).

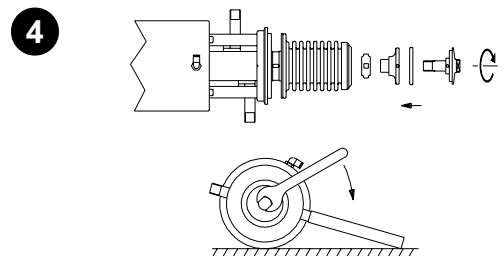


TD 450-037

Fit upper plug unit (30+21) into bonnet (32) and tighten with the recommended torque. Make sure there is metallic contact between the parts.

CAUTION!

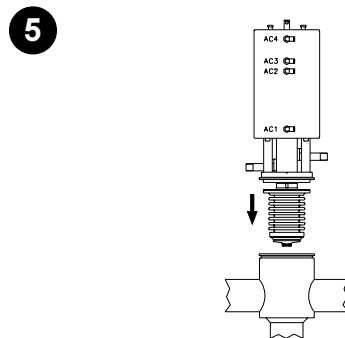
Check the position of the O-ring (17).



1. Fit guide (22) into lower internal plug (28).
2. Fit O-ring (25) into lower external plug (24).
3. Slide lower internal plug (28) into lower external plug (24) and tighten to stem (19) with the recommended torque. Make sure there is metallic contact between the parts.

CAUTION!

Before fitting the lower plug unit, check position of the O-ring (29).



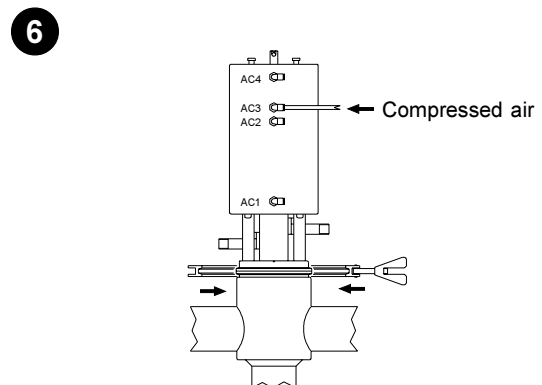
TD 450-030

Lift the actuator and internal valve parts carefully into the valve body (23).

CAUTION!

Check position of O-ring (18).

Be careful not to damage sealing surfaces in the valve body and valve plug.



TD 450-029

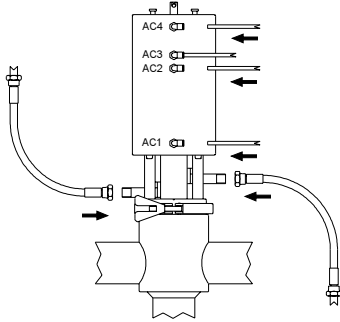
1. Supply compressed air to AC3.
2. Fit clamp (31).
3. Release compressed air.

Pay special attention to the warnings!

Study the instructions carefully.
The items refer to the drawings and the parts list on page 24-25.

6. Reassembly of valve

7

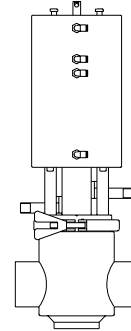


1. Reconnect compressed air hoses.
2. Reconnect steam and condensate hoses.

CAUTION!

Check the position of O-rings (34) on steam and condensate hoses before connection.

8



1. Prepare the valve for operation
2. Check the valve and indication units for smooth operation and correct adjustment after reassembly.

NOTE!

See instructions on page 8.

Pay special attention to the warnings !

Maintenance

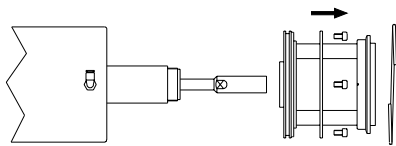
Study the instructions carefully.
The items refer to the drawings and the parts list on page 24-25.

7. Dismantling of actuator

1

1. Dismantle the valve in accordance with instructions on pages 14-15.
Pay special attention to the warnings!
2. The actuator is now ready for service.

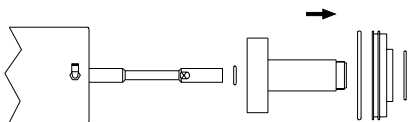
3



TD 450-041

1. Remove screws (37).
2. Pull back loose bonnet ring.
3. Push bonnet (32) into actuator until retaining ring (12) is free.
4. Release and remove retaining ring (12) by pushing through the small bore in the cylinder face.
5. Remove bonnet (32) from the actuator.

5



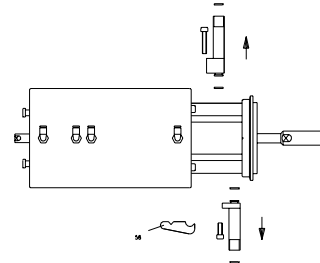
TD 450-043

1. Pull out main piston (39) together with lower piston (38).
2. Slide lower piston (38) out of main piston (39).
3. Remove O-rings (4, 5, 10).

Note !

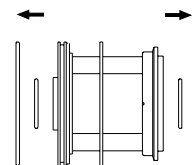
See table on page 12 for recommended mounting torques. If tightened correctly, the threads are self securing.
Handle scrap correctly.

2



1. Remove screws (14, 36).
2. Pull out steam and condensate connection pipes (35, 15).
3. Remove O-rings (34).
4. Dismantle indication bracket (51) if fitted, see instructions on page 7. The position indicator (53) can be removed when screw (14) is loosened.

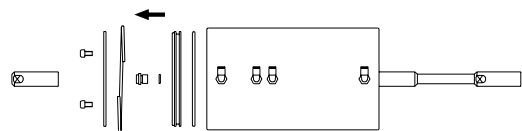
4



TD 450-042

Remove O-rings (11, 13 and 17) from the bonnet (32).

6



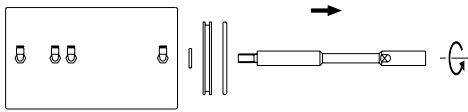
TD 450-044

1. Unscrew and remove upper piston rod (48).
2. Remove screws (49) and top plate (1).
3. Push cylinder lid (2) into actuator until retaining ring (12) is free.
4. Release and remove retaining ring by pushing through the small bore in the cylinder face.
5. Use two M6 screws (i.e pos. 47) to pull out cylinder lid (2). Remove O-rings (11, 50).

Study the instructions carefully.
The items refer to the drawings and the parts list on page 24-25.

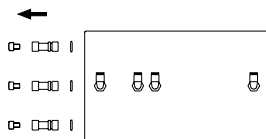
7. Dismantling of actuator

7



1. Loosen stem(19). Counterhold on nut(3).
2. Pull out piston (8).
3. Remove O-rings (5, 9).

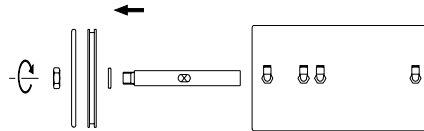
9



TD 450-047

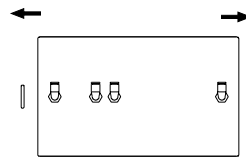
1. Loosen and remove screws (42).
2. Pull out pins (41).
3. Remove O-rings (34).

8



1. Remove piston rod (7) by pushing from below.
2. Unscrew and remove nut (3).
3. Remove upper piston (43) from piston rod (7).
4. Remove O-rings (4, 5).

10



TD 450-048

Remove O-rings (5) from both ends of the actuator.

WARNING!

The actuator **must not** be any further dismantled beyond this point !!

Any attempt to do so is **extremely dangerous** and may cause serious injuries as it releases the main actuator spring.

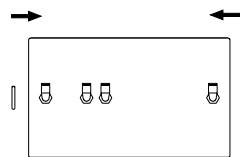
Maintenance

Study the instructions carefully.
The items refer to the drawings and the parts list on pages 24-25.

Note!
See table on page 12 for recommended mounting torques. If tightened correctly, the threads are self securing. See special note for screws (49).
Lubricate seals before fitting. Pay attention to the instruction on page 12.

8. Reassembly of actuator

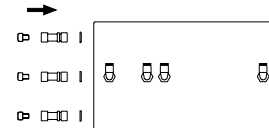
1



TD 450-048

Lubricate and fit O-rings (5) from both ends of the actuator.

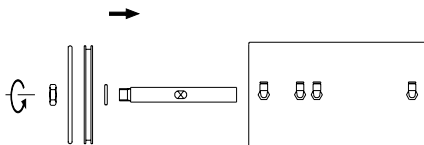
2



TD 450-047

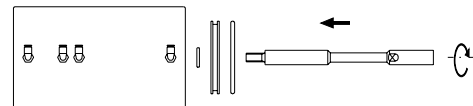
1. Lubricate and fit o-rings (34) on the three pins (41).
2. Mount pins (41) from top of actuator. Insert screws (42) and tighten with the recommended torque.

3



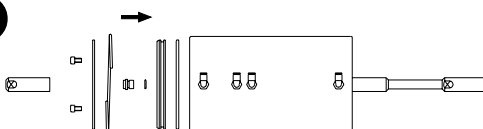
1. Lubricate and fit O-rings (4, 5) in upper piston (43).
2. Fit piston (43) onto piston rod (7). Fit nut (3) and tighten with the recommended torque.
3. Push upper piston unit into the actuator until it hits the pins (41).

4



1. Lubricate and fit o-rings (5, 9) into piston (8).
2. Install piston (8) onto the piston rod (7) (inside the actuator). Be careful not to damage O-ring (5).
3. Insert stem (19) into piston rod (7) and tighten with the recommended torque. Counterhold on nut (3).

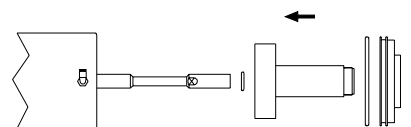
5



1. Insert and tighten upper piston rod (48) with the recommended torque.
2. Lubricate and fit O-rings (11, 50) on cylinder lid (2).
3. Push cylinder lid into actuator until groove for retaining ring (12) is free.
4. Fit retaining ring (12) into groove.
5. Fit top plate on actuator.
6. Insert screws (49) in cylinder lid (2) and tighten with the recommended torque.

NOTE!
Secure screws (49) with a small amount of **LOCTITE 243** or similar threadlocking agent before mounting.

6

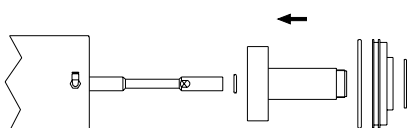


1. Lubricate and fit O-ring (5) into main piston (39).
2. Slide main piston (39) on stem (19) until stop. Be careful not to damage O-ring (9).
3. Lubricate and fit O-rings (4, 10) on lower piston (38).
4. Slide lower piston (38) into actuator.

Study the instructions carefully.
The items refer to the drawings and the parts list on page 24-25.

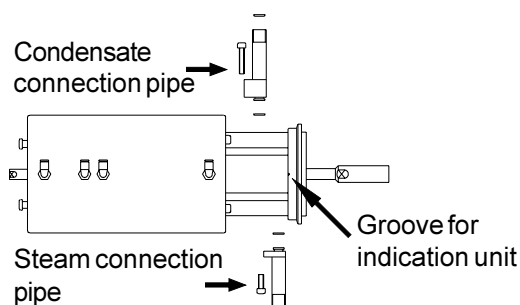
8. Reassembly of actuator

7



1. Lubricate and fit O-rings (11, 13) into bonnet (32).
2. Fit O-ring (17) into bonnet (32).

9



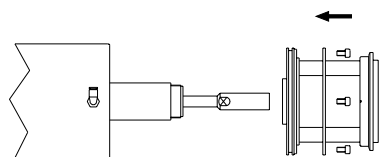
1. Turn the bonnet (32) so that the mounting surface in main piston (39) for the steam connection pipe (15) is positioned between the two columns on the left side of the groove for the external indication unit (see sketch)
2. Fit O-rings (34) in steam connection pipe (15). If external position sensors are used mount position indicator (56) so that it points towards the groove. Insert and tighten screw (14) with

10

Note!

See table on page 12 for recommended mounting torques. If tightened correctly, the threads are self securing. See special note for screws (49).
Lubricate seals before fitting. Pay attention to the instruction on page 12.

8



TD 450-041

1. Push the bonnet (32) into the actuator until the groove for retaining ring (12) is free.
2. Insert the retaining ring (12).
3. Fit the loose bonnet ring. Insert screws (37), do not tighten.

3. Turn bonnet (32) to align the groove for external indication unit with the air fittings on the actuator (see sketch).
4. Tighten screws (37) with the recommended torque.
5. Rotate stem (19) to position the mounting surface for the condensate pipe (35) between the two columns on the right side of the groove for the external indication unit. (visible through hole in main piston (39)).
6. Fit O-rings (34) in condensate pipe (35) and mount it with screw (36). Tighten screw with the recommended torque.
7. If external indication unit is used mount bracket (51) with sensor according to the instructions on page 7.

Reassemble the valve according to the instructions 3-9 on page 16-17.

Pay special attention to the warnings.

Technical data

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

Inform the personnel about the technical data.

22

1. Technical data

Pressure and temperature

Max. product pressure	600 kPa (6 bar)
Min. product pressure	Full vacuum (see note)
Max. steam pressure in barrier chamber	400 kPa (4 bar) ~ 152° C
Temperature range	-10 to 150° C
Max. temperature in actuator	100° C
Air pressure	600-700 kPa (6-7 bar)

NOTE!

Vacuum is not recommended in aseptic applications.

We recommend steam pressure in sterile barrier > product or CIP pressure if possible.

Air consumption (litres free air)		
Compressed air consumption per operation	Seat cleaning, upper	0.09 NL x air press. (bar)
	Seat cleaning, lower	0.47 NL x air press. (bar)
	Ready position	0.08 NL x air press. (bar)
	Valve, open	0.47 NL x air press. (bar)
Steam consumption by saturated steam 2.5 bar 130° C	Seat cleaning	35 - 40 kg/h
	Barrier chamber sterilization	4 - 8 kg/h

Materials

Product wetted steel parts	AISI 316L, AISI 316Ti
Other steel parts	AISI 304
Other parts	Sintered bronze, PEEK
Product wetted seals	EPDM
Other seals	EPDM, PTFE

Position sensor (optional)

Signal output	PNP
Voltage	10-36 VDC
Current rating (max.)	250 mA
Current consumption (max.)	15 mA
Voltage drop (max.)	2,5 V
Protection class	IP 65
Cable	10 m, 3-wire



Drawing/Parts list

The drawing and the parts list include all items.

The items are identical with the items in the Spare Parts List.

When ordering spare parts, please use the Spare Parts List!

Parts list AMP

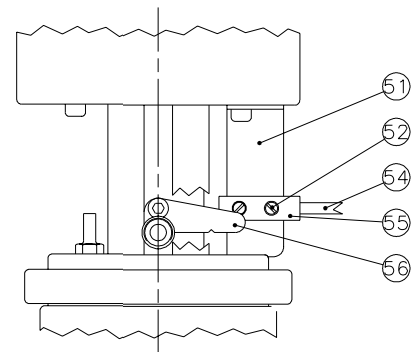
24

Item	Qty.	Denomination
1	1	Top plate
2	1	Cylinder lid
3	1	Nut
4 ■	1	O-ring
5 ■	2	O-ring
6	4	Air fitting
7	1	Piston rod
8	1	Piston
9 ■	1	O-ring
10 ■	1	O-ring
11 ■	1	O-ring
12	1	Lock ring
13 ■	1	O-ring
14	1	Screw
15	1	Steam connection pipe
16 ●	1	O-ring
17 ■	1	O-ring
18 ●	1	Valve body seal
19	1	Stem
20	1	Bellows, internal
21	1	Bellows, external
22	1	Guide
23	1	Valve body
24	1	Lower plug, external
25 ●	1	Lower plug seal
26 ●	1	Upper plug seal
27 ●	1	O-ring
28	1	Lower plug, internal
29 ●	1	O-ring
30	1	Upper plug
31	1	Clamp
32	1	Bonnet
33 ●	1	O-ring
34 ●■*	1	O-ring
35	1	Condensate connection pipe
36	1	Screw
37	4	Screw
38	1	Lower piston
39	1	Main piston
40	1	Cylinder assembly
41	3	Pin
42	3	Screw
43	1	Upper piston
45 *	2	Welding connector
46 *	2	Flexible hose
48	1	Upper piston rod
49	2	Screw
50 ■	1	O-ring
51	1	Bracket

Item	Qty.	Denomination
52	2	Screw
54	1	Cable
55	1	Sensor
56	1	Position indicator

- : Service kit A for actuator
(includes 9 pcs O-ring pos. 34)
- : Service kit B for valve
(includes 4 pcs O-ring pos. 34)
- *: Service kit C for installation
(includes 4 pcs O-ring pos. 34)

(See Spare Parts List)

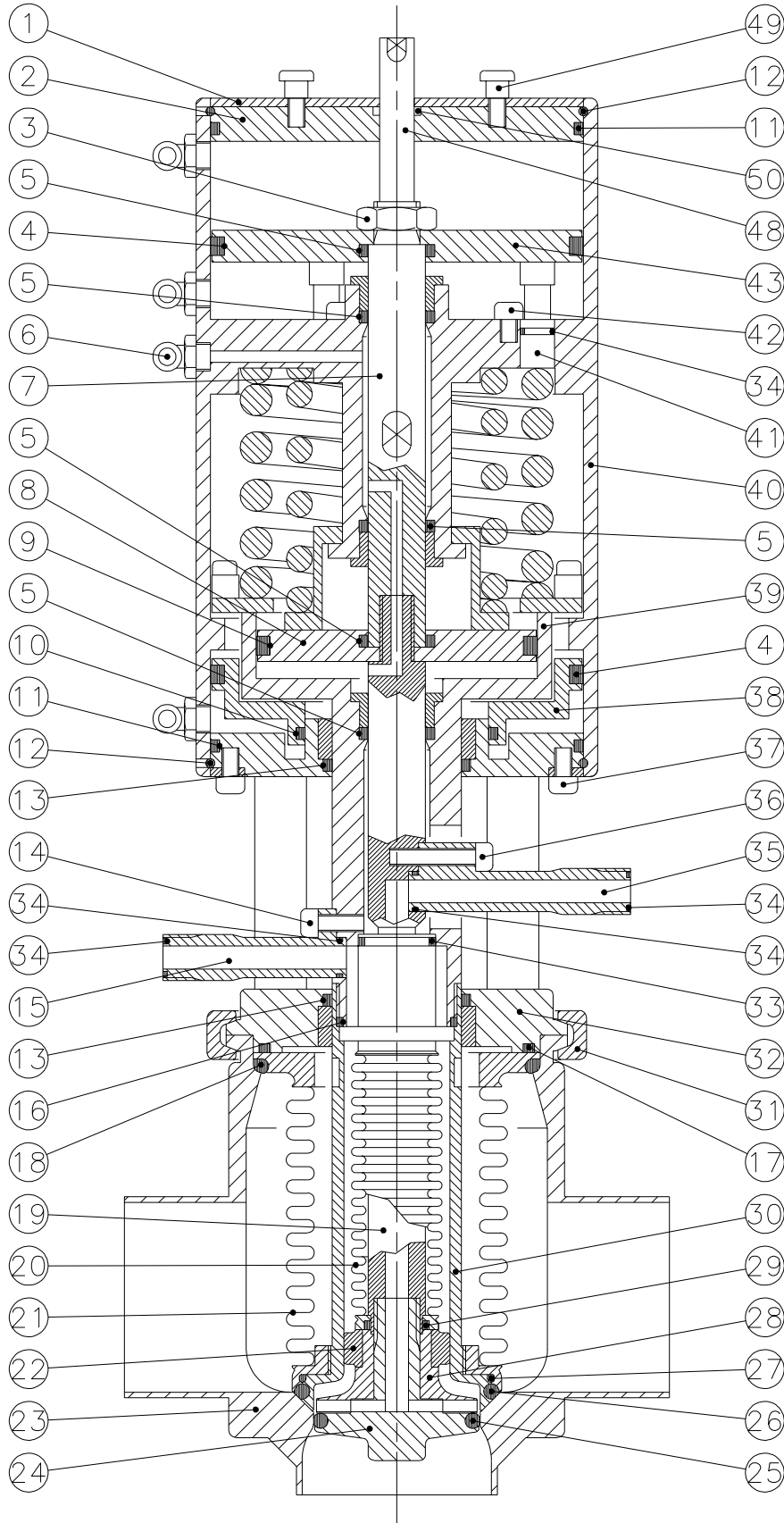


Optional side indication unit

The drawing below shows AMP, Aseptic Mixproof Valve.

The items refer to the parts list on the opposite part of the page.

Drawings



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.