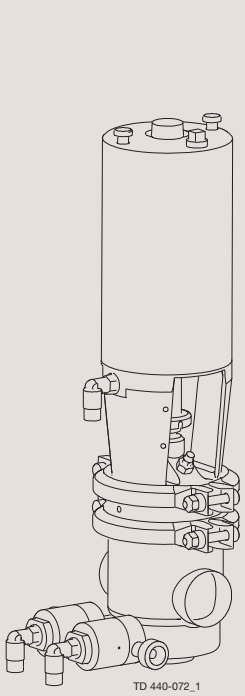
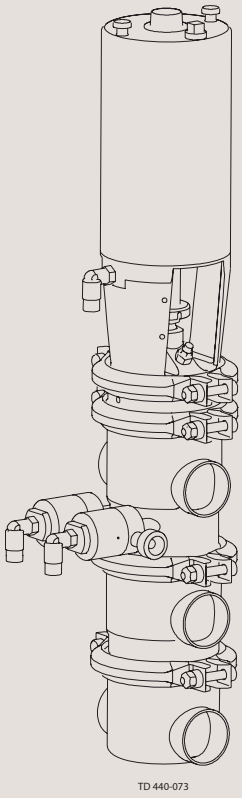
Instruction Manual

SMP-BCA Aseptic Mixproof Valve with PTFE Diaphragm





ESE02251-EN3 2016-06

Original manual

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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

Sanitary Mixproof Valve
Designation

SMP-BC PN10
Type

is in conformity with the following directive with amendments:

- Machinery Directive 2006/42/EC
- Pressure Equipment Directive 2014/68/EU category 1 and subjected to assessment procedure Module A.

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

Global Product Quality Manager
Pumps, Valves, Fittings and Tank Equipment
Title

Lars Kruse Andersen
Name

Kolding
Place

2016-06-15
Date

Signature

2 Safety

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

2.1 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:

Cutting danger:

2 Safety

Unsafe practices and other important information are emphasized in this manual. Warnings are emphasized by means of special signs. All warnings in the manual are summarized on this page. Pay special attention to the instructions below so that severe personal injury and/or damage to the valve are avoided.

2.3 Safety precautions

Installation:

Always read the technical data thoroughly (see chapter 6.1 Technical data).
Always release compressed air after use.
Never touch the clip assembly or the actuator piston rod if the actuator is supplied with compressed air.
Never stick your fingers through the valve ports if the actuator is supplied with compressed air.

Operation:

Always read the technical data thoroughly (see chapter 6.1 Technical data).
Always release compressed air after use.
Never touch the clip assembly or the actuator piston rod when the actuator is supplied with compressed air.
Never touch the valve or the pipelines when processing hot liquids or when sterilizing.

Always handle lye and acid with great care.
Always keep the cleaning pressure lower than the product pressure.
Never throttle the outlet of the detecting valve.

Maintenance:

Always read the technical data thoroughly (see chapter 6.1 Technical data).
Always release compressed air after use.
Always remove the CIP connections before service.
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 clip assembly or the actuator piston rod if the actuator is supplied with compressed air.

Transportation:

Always ensure that compressed air are released.
Always ensure that all connections is disconnected before attempting to remove the valve from the installation.
Always drain liquid out of valves before transportation.
Always used predesigned lifting points if defined.
Always ensure sufficient fixing of the valve during transportation - if specially designed packaging material is available, it must be used.

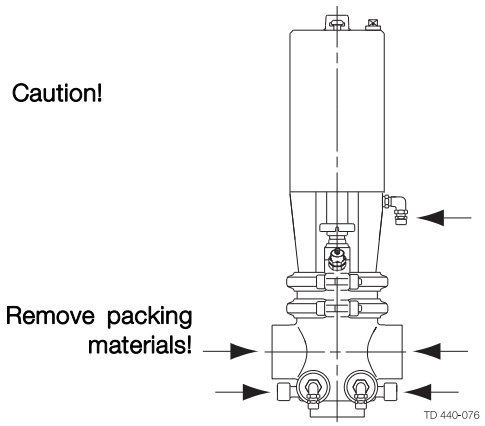
The instruction manual is part of the delivery.
Study the instructions carefully.
Stop valve: With one valve body. Change-over valve: With three valve bodies.
CIP = Cleaning In Place (see 4.3 Recommended cleaning).

3.1 Unpacking/delivery

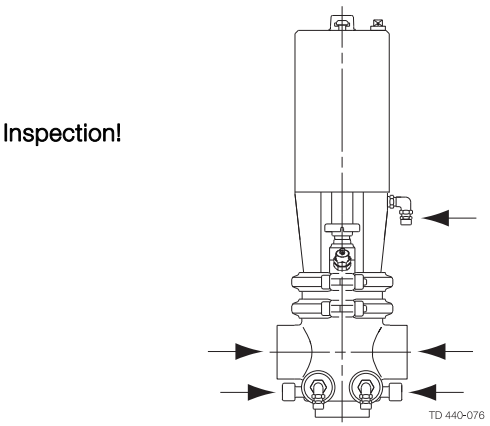
Step 1
CAUTION!
Alfa Laval cannot be held responsible for incorrect unpacking.

Check the delivery for:
1. Complete valve, standard or three-bodied valve.
2. Delivery note.
3. Instruction manual.

Step 2
Remove possible packing materials from the valve ports. Avoid damaging the air connection and the valve ports, the detecting valve and the CIP valve.



Step 3
Inspect the valve for visible transport damage.



3 Installation

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.
CIP = Cleaning In Place (see section 4.3 Recommended cleaning).

3.2 Recycling information

• Unpacking

- Packing material consists of wood, plastics, cardboard boxes and in some cases metal straps.
- Wood and cardboard boxes can be re-used, 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 wearing 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 disposed off in agreement with local regulations.

• Scrapping

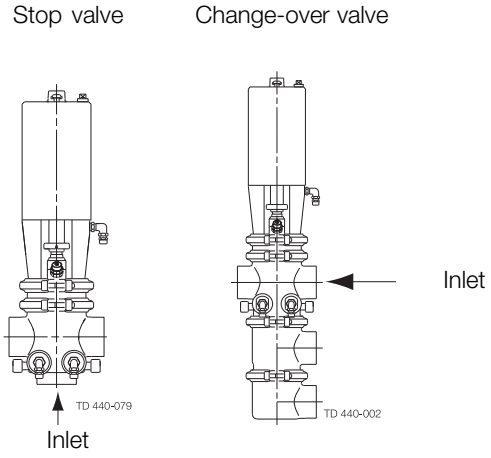
- At end of use, the equipment must be recycled according to the relevant, local regulations. Besides the equipment itself, any hazardous residues from the process liquid must be considered and dealt with in a proper manner. When in doubt, or in the absence of local regulations, please contact your local Alfa Laval sales company.

3.3 General installation

Step 1
- Always read the technical data thoroughly (see 6.1 Technical data).
- Always release compressed air after use.
- Never touch the clip assembly or the actuator piston rod if the actuator is supplied with compressed air.

CAUTION!
Alfa Laval cannot be held responsible for incorrect installation.

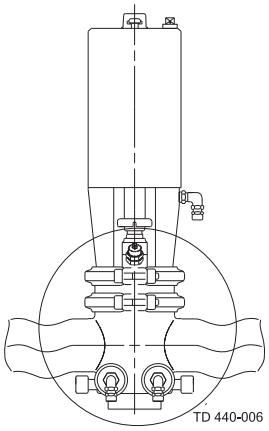
Step 2
Install the valve so that:
- The actuator is turned to the uppermost point.
- The detecting valve is self-draining.
- The flow is against the closing direction to avoid water hammer.



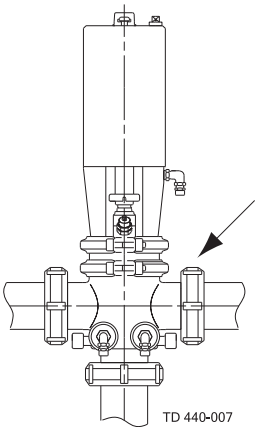
Study the instructions carefully and pay special attention to the warnings!
The valve has welding ends as standard but can also be supplied with fittings.
CIP = Cleaning In Place (see section 4.3 Recommended cleaning).

Step 3
Avoid stressing the valve. Pay special attention to:
- Vibrations.
- Thermal expansion of the tubes.
- Excessive welding
- Overloading of the pipelines

Risk of damage!

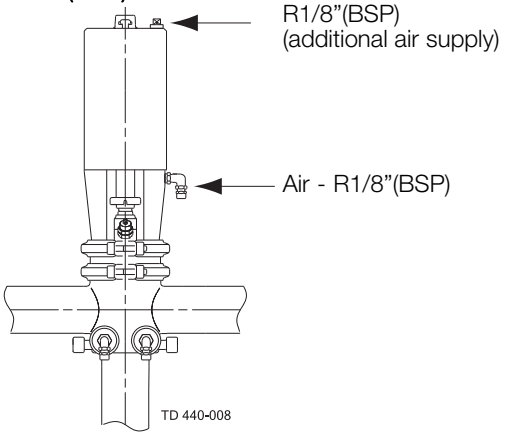


Step 4
Fittings:
Ensure that the connections are tight.



Step 5
Drain connection:
The drain hose on the bonnet should always be connected to a tube so that no personal injury can occur in case of a leakage.

Air connection
R1/8"(BSP)

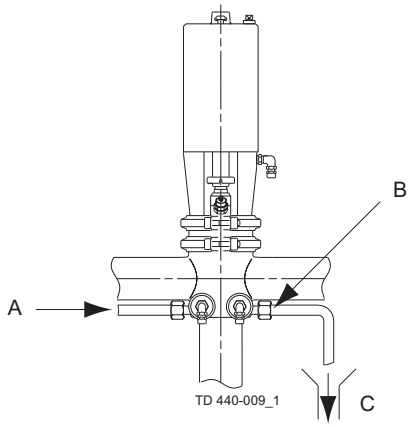


3 Installation

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.
CIP = Cleaning In Place (see section 4.3 Recommended cleaning).

Step 6
CIP/Steam connection:
1. See the description of cleaning and optional extras in section 4.3 Recommended cleaning.
2. Connect CIP correctly.
3. Internal steam pressure must not exceed 120°C/200 kPa (2 bar).

A = CIP/Steam in
B = R3/8" (BSP), external thread
C = CIP/Steam out or leakage drain

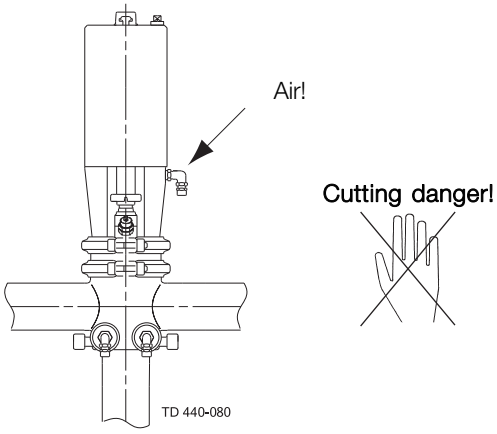


Study the instructions carefully and pay special attention to the warnings!
The valve has welding ends as standard.
Weld carefully.
Check the valve for smooth operation after welding.

3.4 Welding

Step 1

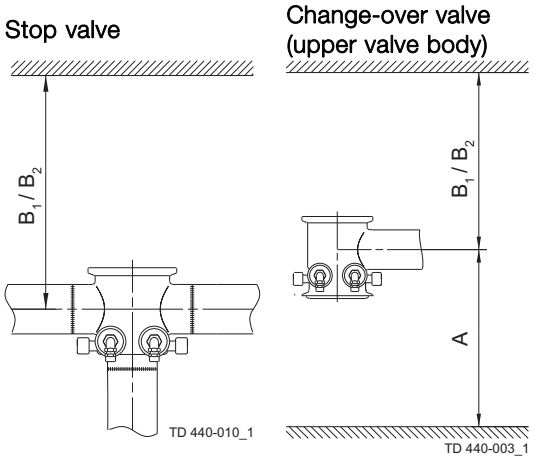
Never stick your fingers through the valve ports if the actuator is supplied with compressed air.



Step 2
Dismantle the valve in accordance with Step 1- Step 3 in section 5.2 Dismantling of valve .
Pay special attention to the warnings!

Step 3
NOTE!
Always weld the valve body into the pipelines so that the valve body seal rings can be replaced (change-over valve). Maintain the minimum clearances (A and B) so that the lower valve plug (change-over valve) and the actuator with the internal parts can be removed.

Valve size	A	B1	B2 (incl. top unit)
		mm/inch	
DN40/38 mm	280/11	580/22.8	760/30
DN50/51 mm	305/12	580/22.8	760/30
DN65/63.5 mm	360/14	580/22.8	760/30
DN80/76 mm	410/16	630/24.8	810/31.9
DN100/101.6 mm	470/19	630/24.8	860/33.9



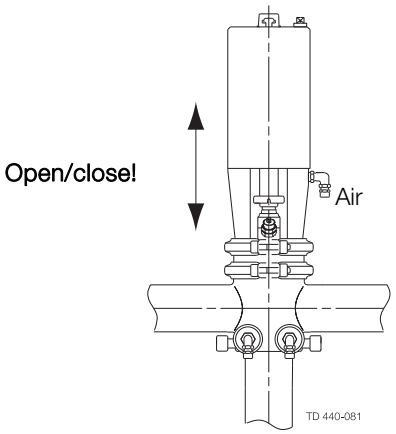
Step 4
Assemble the valve in accordance with Step 4 - Step 9 in section 5.3 Assembly of valve.
Pay special attention to the warnings!

3 Installation

Study the instructions carefully and pay special attention to the warnings!
The valve has welding ends as standard.
Weld carefully.
Check the valve for smooth operation after welding.

Step 5
Pre-use check:
1. Supply compressed air to the actuator.
2. Open and close the valve a few times to ensure that it operates smoothly.

Pay special attention to the warnings!



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 - see section 7 Parts list and service kits
CIP = Cleaning In Place (see section 4.3 Recommended cleaning).

4.1 Operation

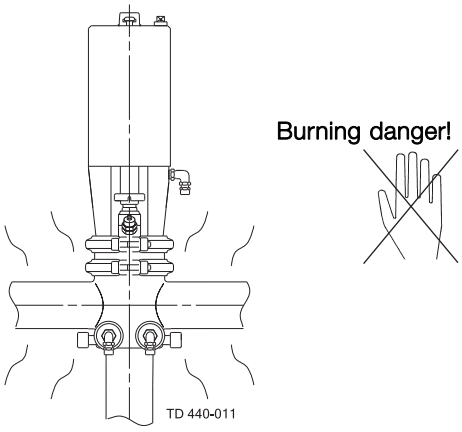
Step 1

- Always read the technical data thoroughly (see 6.1 Technical data).
- Always release compressed air after use.
- Never touch the clip assembly or the actuator piston rod when the actuator is supplied with compressed air.

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.



4.2 Fault finding

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

Problem	Cause/result	Possible solution
Product leakage through the detecting valve (closed valve)	- Worn seal rings - The two seal rings affected by different products - Incorrect fitting of seal rings - Product deposits on the seat and/or plug	- Replace the seal rings - Select a different rubber grade - Frequent cleaning
Product leakage through the detecting valve (open valve)	- Worn O-ring (26a) - Worn spindle (26d) - Product deposits on the seat and/or plug	- Replace the O-ring - Replace the spindle - Frequent cleaning
Product leakage at drain tube and/or clamp	Worn/product affected diaphragm set (22) and/or seal rings (17)	- Replace the seal rings or diaphragm set - Select a different rubber grade
Product leakage through middle or lower valve body (closed lower plug)	- Worn/product affected plug seal ring - Loose parts (vibrations) - Product deposits on the seat and/ or plug	- Replace the seal ring - Select a different rubber grade - Tighten the loose parts - Frequent cleaning
- Air leakage through the CIP and detecting valve - Air leakage at the actuator	Worn seal rings	Replace the seal rings

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.
HNO3 = Nitric acid.

4.3 Recommended cleaning

Step 1

Always handle lye and acid with great care.

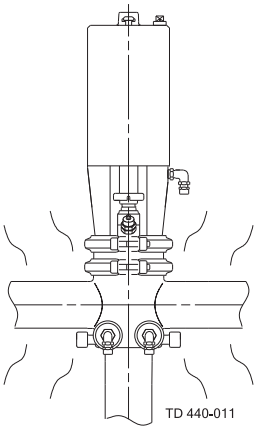
Caustic danger!

Always use rubber gloves!

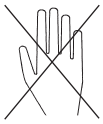
Always use protective goggles!

Step 2

Never touch the valve or the pipelines when sterilising.



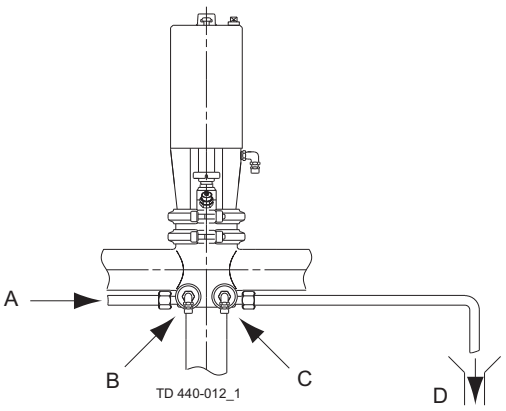
Burning danger!



Step 3

Always keep the cleaning pressure lower than the product pressure.
Never throttle the outlet of the detecting valve (risk of mixing because of overpressure).

Sterile barrier chamber:
Max. CIP press. 60-100 kPa (0.6-1 bar)
Max. steam press. 200 kPa (2 bar)/120oC



A = CIP/steam in
B = CIP/steam valve
C = Detecting valve
D = CIP out

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 HNO_3 at 70° C

0.7 l 53% HNO_3	+	100 l 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.
HNO3 = Nitric acid.

Step 5
Recommended cleaning periods:
Cleaning periods of 10-15 seconds for the leakage chamber.

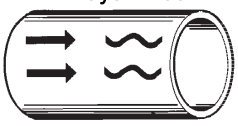
Product	Periods
Milk	1-2
Yoghurt	3-5
Beer	2-5
Cold wort	5-10

Recommended cleaning flow rates:
(For special processes, see Step 6).
Leakage chamber: 12-15 l/min (3.2 - 4.0 gpm).

Step 6
1. Avoid excessive concentration of the cleaning agent
   ⇒ Dose gradually!
2. Adjust the cleaning flow to the process Milk sterilization/viscous liquids
   ⇒ Increase the cleaning flow!

Step 7
Always rinse well with clean water after the cleaning.
NOTE!
The cleaning agents must be stored/disposed of in accordance with current rules/directives.

Always rinse!

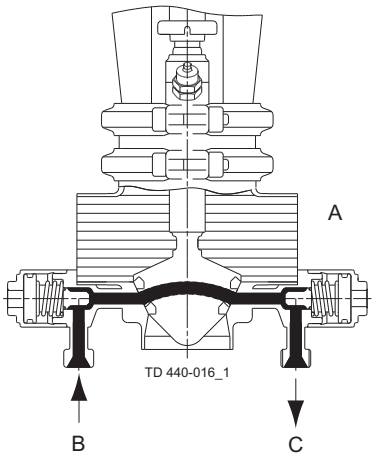


Clean water Cleaning agents

Step 8
Cleaning cycle:
Pay special attention to the warnings!

Step 9
Closed Stop valve:
Cleaning of sterile barrier chamber

A = Product
B = CIP/steam in
C = CIP/steam out

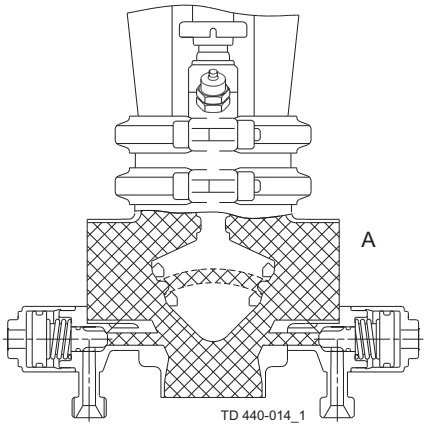


4 Operation

The installations kits are for cleaning/sterilizing of the leakage chamber when the valve is closed.
The stainless steel tubes must be cut and welded during installation.
CIP = Cleaning In Place.

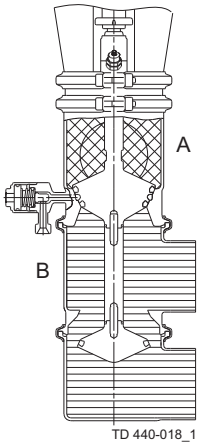
Step 10
Open Stop valve:
Cleaning of the valve body and the leakage chamber

A = CIP



Step 11
Change-over valve:
Cleaning of the upper valve body

A = CIP
B = Product

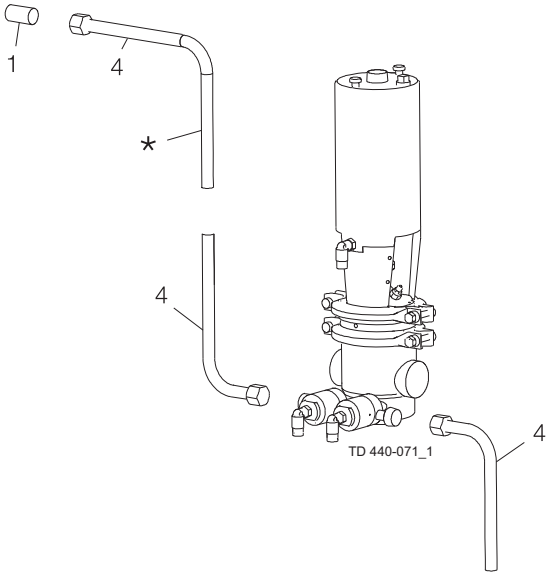


4.4 Cleaning and sterilization equipment (optional extra)

Step 1
Installation kit C for CIP/steam and leakage connection of a single valve (stainless steel tubes).

Contents:
Pos. 1 Welding male part
Pos. 4 CIP leakage tube AISI 316

* Adjust and weld during installation.



Step 2
To ensure aseptic processing and mixproof function certain rules must be followed:
- After the valve is closed the leakage chamber must be cleaned and sterilized.
- The leakage chamber must be kept sterile until the valve is opened again.

Maintain the valve regularly.
Study the instructions carefully and pay special attention to the warnings!
CIP = Cleaning In Place.
Always keep spare rubber seals, lip seals and guide rings in stock.

5.1 General maintenance

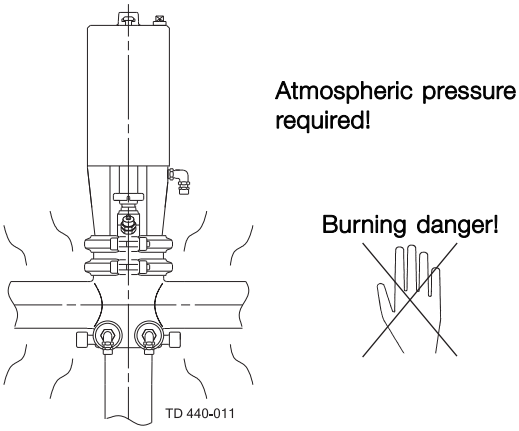
Step 1

- **Always** read the technical data thoroughly (see 6.1 Technical data).
- **Always** release compressed air after use.
- **Always** remove the CIP connections before service.

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

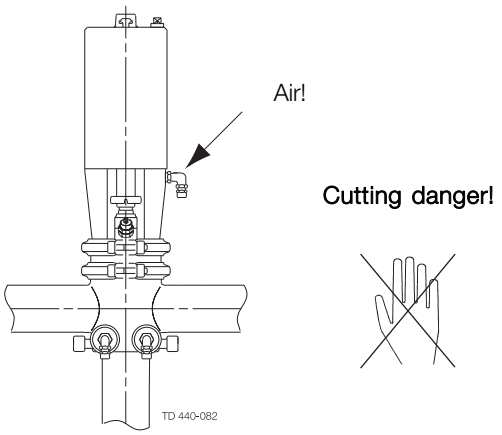
Step 2

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



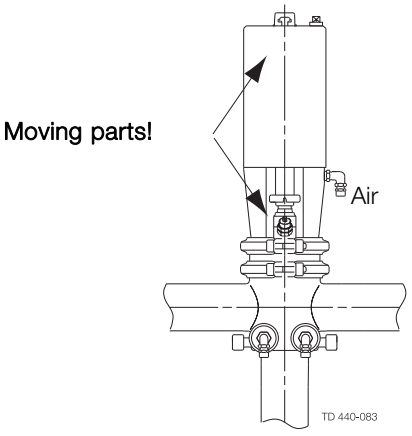
Step 3

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



Step 4

Never touch the clip assembly or the actuator piston rod 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!
CIP = Cleaning In Place.
Always keep spare rubber seals, lip seals and guide rings in stock.

The valve is designed so that single internal leakages do not resolve in the products becoming mixed.
Internal leakage in the valve is externally visible.
Check the valve for smooth operation after service.

Ordering spare parts

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

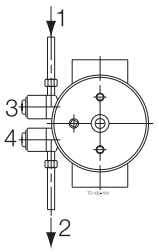
Recommended spare parts: Service kits (see Spare Parts List - see section 7 Parts list and service kits).

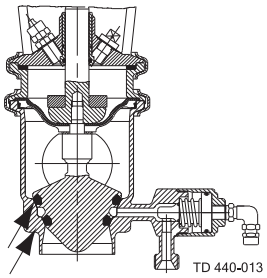
	Valve diaphragm unit	Valve rubber seals	Actuator rubber seals	Bonnet guide ring and O-rings
Preventive maintenance	**Replace after 12 months (depending on working conditions)**	Replace when replacing the diaphragms	**Replace after 5 years**	Replace when replacing the actuator rubber seals (*)
Maintenance after leakage (leakage normally starts slowly)	**Replace by the end of the day**	Replace when replacing the diaphragms	**Replace when possible**	Replace when replacing the actuator rubber seals (*)
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**	Replace when replacing the diaphragms	- Regular inspection for leakage and smooth operation - Keep a record of the actuator - Use the statistics for planning of inspections **Replace after air leakage**	
Lubrication (USDAH1 approved oil/grease)	**Before fitting** Silicone oil or silicone grease	**Before fitting** Silicone oil or silicone grease	**Before fitting** Silicone oil or silicone grease	Lubricate O-rings before fitting. Silicone oil or silicone grease

(*) IMPORTANT!
Check that the guide ring is fitted if replacing the bonnet.

Pre-use check:
1. Ensure that the valve plug seals against the seat.
   Pay special attention to the warnings!
2. Pressurise the sterile barrier chamber by means of water.
3. Check that the plug seals are tight (no water leakage through the valve ports).
4. Supply compressed air to the actuator
5. Open and close the valve a few times to ensure that it operates smoothly.
   Pay special attention to the warnings!

Water: 3-4 bar





Inspection

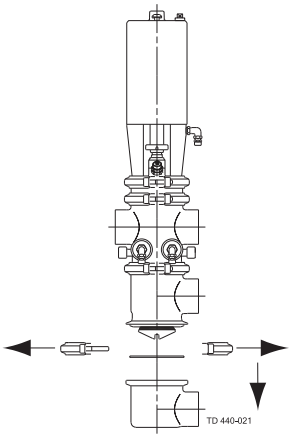
1 = In
2 = Out
3 = CIP valve
4 = Detecting valve

Study the instructions carefully.
The items refer to the drawings and the parts list in chapter 7 Parts list and service kits.
Lubricate the rubber seals and the diaphragms before fitting them.

5.2 Dismantling of valve

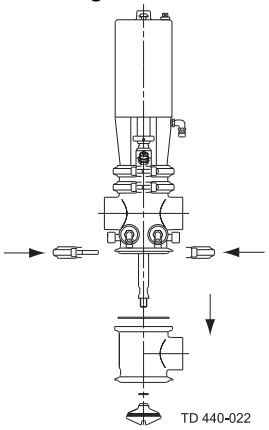
Step 1
1. Loosen and remove lower clamp (19).
2. Take away lower valve body (31).
3. Pull out seal ring (17).

Change-over valve



Step 2
1. Unscrew lower plug (30).
2. Pull off seal ring (30a) (see special instruction in section 5.6 Replacement of plug seals).
3. Loosen and remove upper clamp (19).
4. Take away middle valve body (27).
5. Pull off O-ring (28) and seal ring (17).

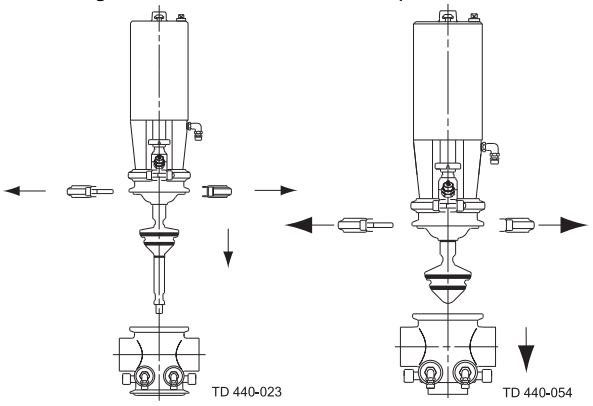
Change-over valve



Step 3
1. Loosen and remove lower diaphragm clamp(19).
2. Take away upper valve body (25).

Change-over valve

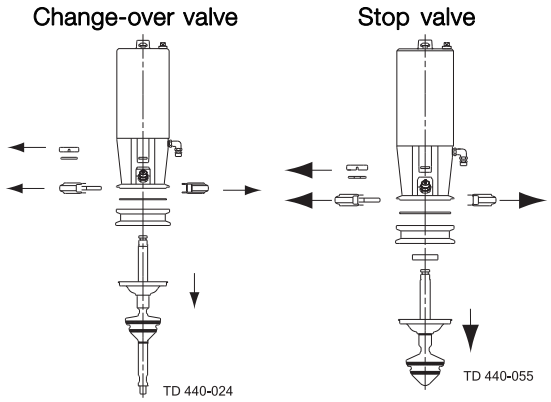
Stop valve



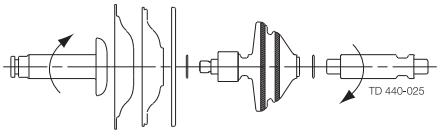
5 Maintenance

Study the instructions carefully.
The items refer to the drawings and the parts list in chapter 7 Parts list and service kits.
Lubricate the rubber seals and the diaphragms before fitting them.

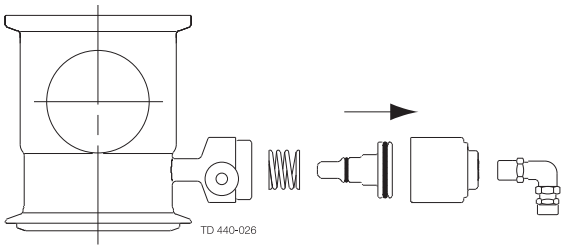
Step 4
1. Remove clip assembly (9).
2. Remove upper plug with complete diaphragm/stem unit.
3. Remove washer (20) (stop valves only).
4. Loosen and remove upper diaphragm clamp (19).
5. Take away intermediate piece (18).
6. Remove seal ring (17) from the intermediate piece.



Step 5
1. In sequence, turn lower and upper stem (29,21) anticlockwise (for stop valve: only upper stem) to separate them from upper plug (24) (counterhold with a spanner).
2. Remove diaphragms (22a, 22b), L-seal (22c) and stem seal (22d) from the upper plug.
3. Remove diaphragm ring (23) and seal ring (17) from upper valve plug (25) (only for valve sizes 76-101.6mm/ DN80-100).

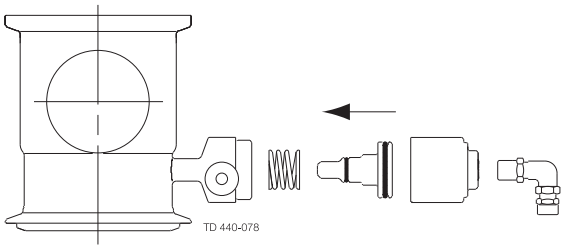


Step 6
1. Remove air fitting (26g).
2. Unscrew CIP valve housing (26f).
3. Pull out CIP valve plug (26d).
4. Remove CIP valve spring (26b).

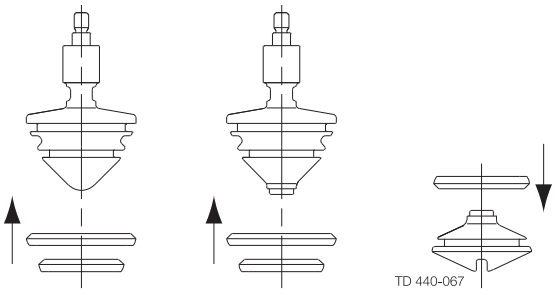


5.3 Assembly of valve

Step 1
1. Fit CIP valve spring (26b) on CIP valve plug (26d).
2. Insert the CIP valve plug with spring in the CIP valve body.
3. Screw CIP valve housing (26f) onto the CIP valve body.
4. Screw air fitting (26g) into the CIP valve housing.



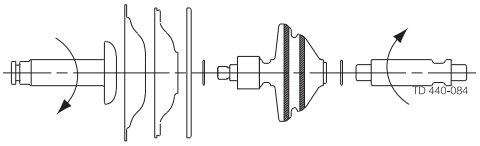
Step 2
Fit seal rings (24b, 24c) and seal ring (30a) on plugs (see special instructions in section 5.6 Replacement of plug seals).



Study the instructions carefully.
The items refer to the drawings and the parts list in chapter 7 Parts list and service kits.
Lubricate the rubber seals and the diaphragms before fitting them.

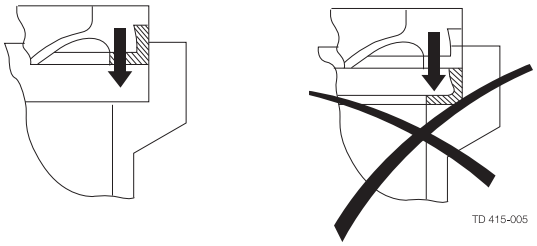
Step 3

1. Fit stem seal (22d), L-seal (22c) and diaphragms (22a, 22b) on upper plug (24). (For L-seal: see Step 4 on page 21).
2. Fit diaphragm ring (23) between upper stem (21) and the upper plug (only for valve sizes 76-101.6 mm/ DN80-100)
3. In sequence, screw the upper and lower stem (29) clockwise (for stop valve: only upper stem onto upper plug). Counterhold with a spanner. (Use loctite on threads of stems).



Step 4

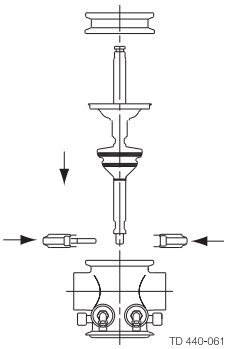
CAUTION!
Ensure that L-seal (22c) is fitted on diaphragm (22a) before placing the diaphragm unit in upper valve body (25).



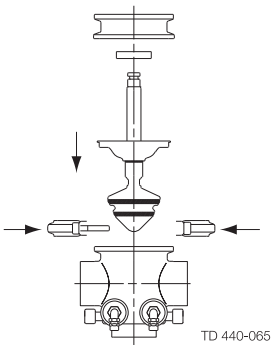
Step 5

1. Slide seal ring (17) into upper valve body (25) (only valve sizes 76-101.6 mm/DN80-100).
2. Fit diaphragm/stem unit in the upper valve body.
3. Position intermediate piece (18) on the upper valve body.
4. Fit and tighten lower diaphragm clamp.
5. Position washer (20) on upper stem (stop valve only).

Change-over valve



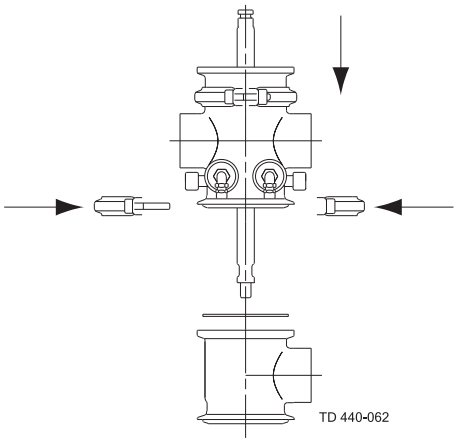
Stop valve



Step 6

1. Slide seal ring (17) into middle valve body (27).
2. Position the middle valve body on upper valve body (25).
3. Fit and tighten upper clamp (19).

Change-over valve



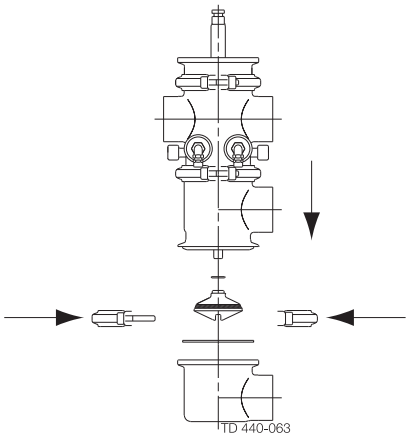
5 Maintenance

Study the instructions carefully.
The items refer to the drawings and the parts list in chapter 7 Parts list and service kits.
Lubricate the rubber seals and the diaphragms before fitting them.

Step 7

1. Slide O-ring (28) onto lower plug (30).
2. Screw the lower plug onto lower stem (29). (Use loctite).
3. Slide seal ring (17) into lower valve body (31).
4. Position the lower valve body on middle valve body (27).
5. Fit and tighten lower clamp (19).

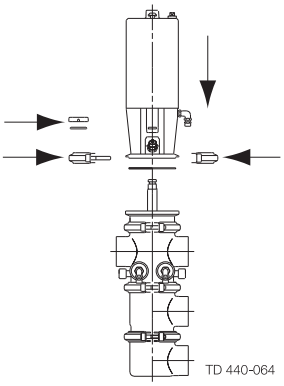
Change-over valve



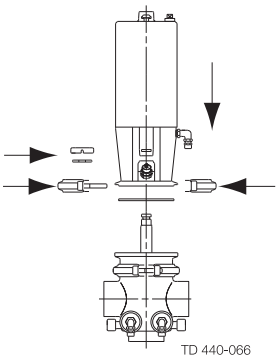
Step 8

1. Slide seal ring (17) into intermediate piece.
2. Supply compressed air to the actuator.
3. Lift actuator onto mounted intermediate piece (18).
4. Reassemble clip assembly (9).
5. Release compressed air.
6. Fit and tighten upper diaphragm clamp (19).

Change-over valve

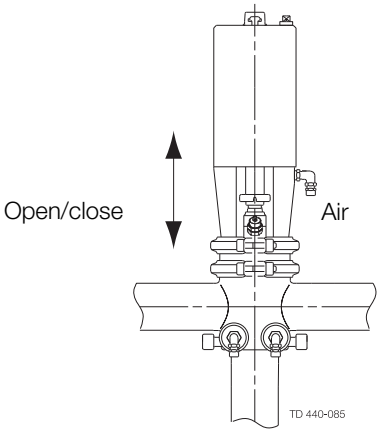


Stop valve



Step 9

1. Supply compressed air to the actuator.
2. Operate the valve a few times to ensure that it runs smoothly.
   Pay special attention to the warnings.

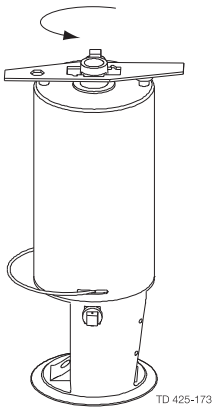


Study the instructions carefully.
The items refer to the drawings and the parts list in chapter 7 Parts list and service kits.
Handle scrap correctly.

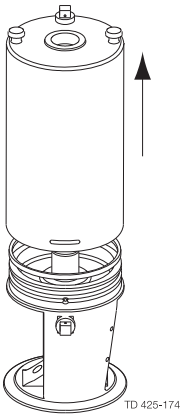
5.4 Dismantling of actuator

Step 1
1. Rotate cylinder (4) to unhook lock wire (10).
2. Remove the lock wire.

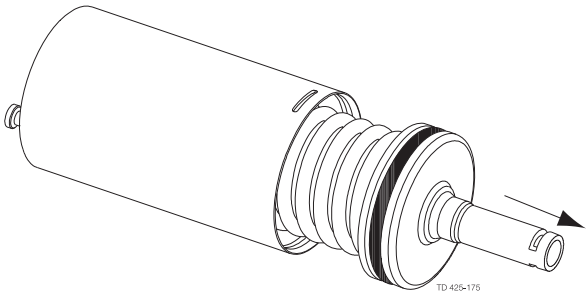
Rotate with the service tool!



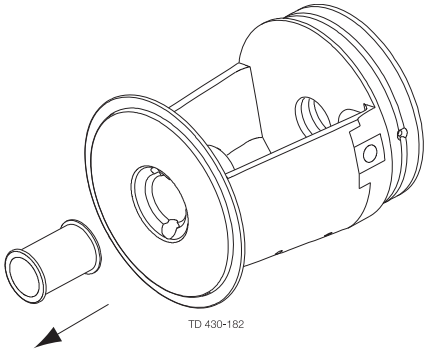
Step 2
1. Disconnect cylinder (4) from bonnet (11
2. Pull off O-rings (2,10) from the bonnet.



Step 3
1. Pull out piston (8) and spring assembly (5).
2. Pull off O-ring (7) from the piston.



Step 4
1. Remove guide ring (15) from bonnet (11).
2. Remove O-rings (14,16) from guide ring (15).

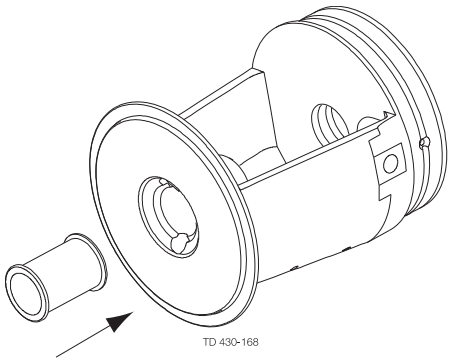


5 Maintenance

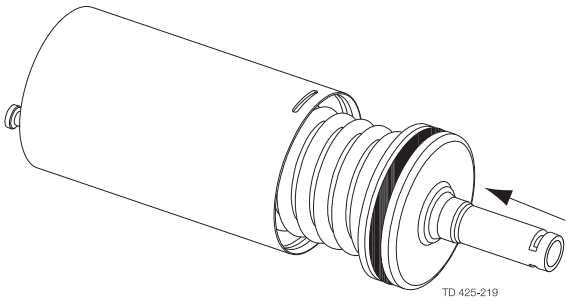
Study the instructions carefully.
The items refer to the drawings and the parts list in chapter 7 Parts list and service kits.
Lubricate the rubber seals before fitting them.

5.5 Assembly of actuator

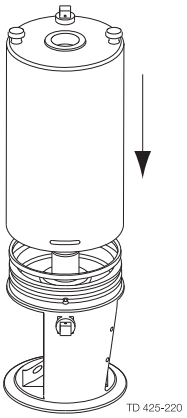
Step 1
1. Fit O-rings (14, 16) on guide ring (15)
2. Fit guide ring (15) in bonnet (11).



Step 2
1. Fit O-ring (7) on the piston.
2. Push the piston and spring packet (5) into cylinder (4).

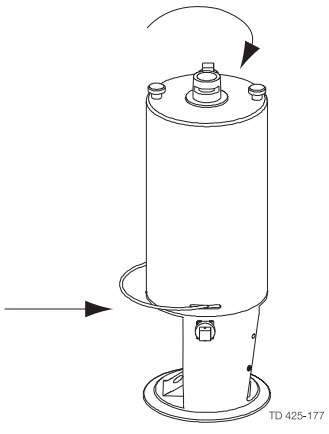


Step 3
1. Slide O-rings (2,10) onto bonnet (11).
2. Fit cylinder (4) on the bonnet.



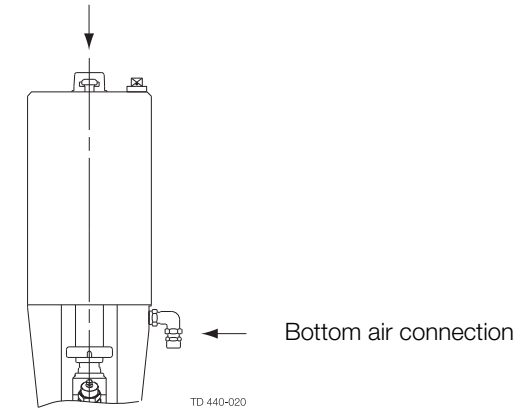
Step 4
1. Rehook lock wire (10) through the slot in cylinder (4) in the hole in bonnet (11).
2. Rotate the cylinder 360o (see illustration above).

Rotate with the service tool!



Study the instructions carefully.
The items refer to the parts list and service kits - see section 7 Parts list and service kits.
Handle scrap correctly.
*Do **not** lubricate the rubber seals or the tool parts before fitting the seals.*

Step 5
NOTE! Rotate cylinder (4) further 180° in relation to bonnet (11) so that the top and bottom air connections are fixed on the same side.

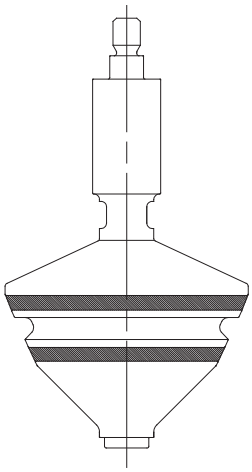


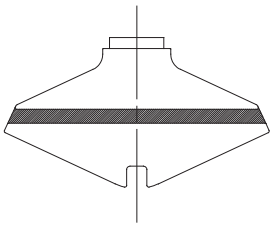
5.6 Replacement of plug seals

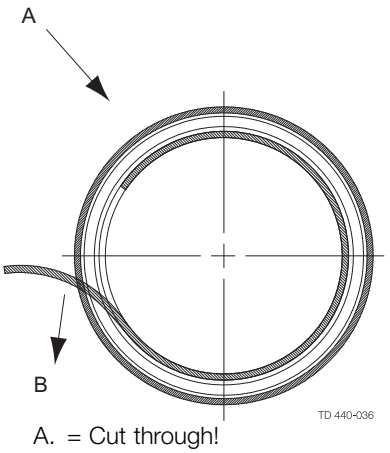
Step 1
Remove the old seal rings by cutting them through and pulling them out of the grooves.

CAUTION!
Do not damage the seal ring grooves.

Removing the seal rings


Upper valve plug


Lower valve plug



A. = Cut through!
B. = Pull

IMPORTANT!
Before reading step 2-4, please see section 6.4

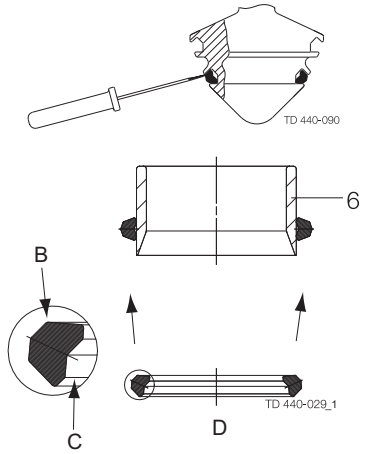
5 Maintenance

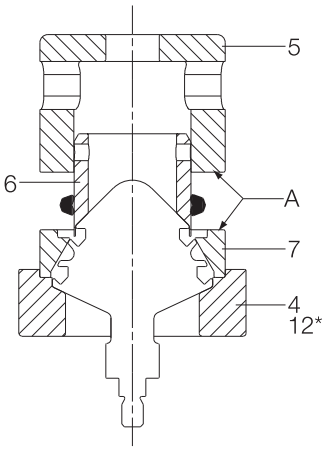
Study the instructions carefully.
The items refer to the parts list and service kits - see section 7 Parts list and service kits.
Handle scrap correctly.
*Do **not** lubricate the rubber seals or the tool parts before fitting the seals.*

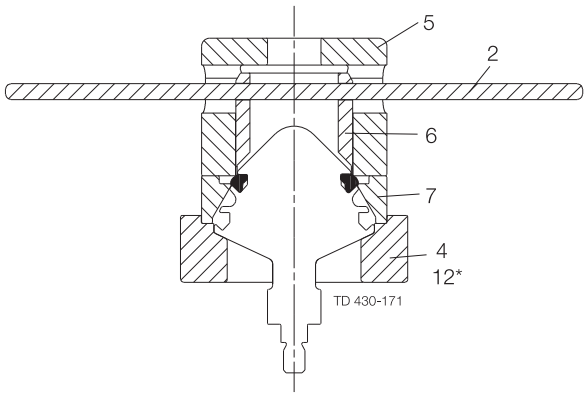
Step 2
Fitting the seal rings (For stop and change-over valves).
Lower (small) seal ring.

1. Carefully grease the seal with Klüber Paraliq GTE 703 (USDA H1) - do NOT grease on back of seal!
2. Fit the small seal on the inner guide ring (6). Remember to mount the flat side of seal upwards as shown on figure.
3. Fit support part (7) for smaller seal.
4. Lubricate the ends (A) of the support part (7) and the outer guide ring (5) with Klüber Paraliq GTE 703 (USDA H1) and assemble the tool.
5. In a hydraulic press, the outer guide ring (5) is pressed downwards so that the seal is fitted in the groove of the valve plug. **IMPORTANT!** The outer guide ring (5) must be closed quickly until metal contact with the support part (7). Normally, the inner guide ring (6) is moved upwards during closing; otherwise lift the pin (2) while fixture is still closed.
6. If the seal is not fitted correctly in the groove this can be fixed with a screwdriver.
7. Always remember to release air behind the seal after fitting.

Upper valve plug:
(Stop valve and change-over valve)







B = Grease
C = No grease
D = **NOTE!** Flat side up!

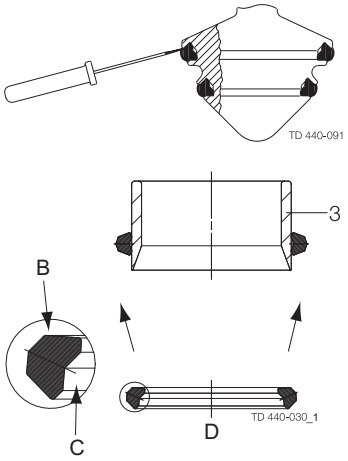
A = Lubricate ends
* = Only for 38-51 mm/DN40-50 upper change-over plug.

Study the instructions carefully.
The items refer to the parts list and service kits - see section 7 Parts list and service kits.
Handle scrap correctly.
*Do **not** lubricate the rubber seals or the tool parts before fitting the seals.*

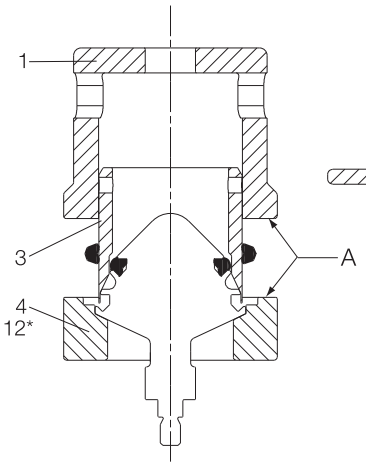
Step 3
Fitting the seal rings (For stop and change-over valves)
Upper (large) seal ring:

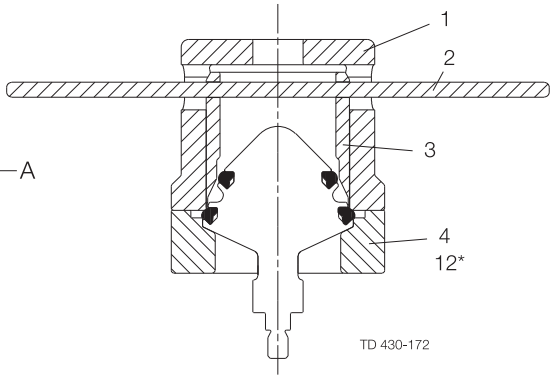
1. Carefully grease the seal with Klüber Paraliq GTE 703 (USDA H1) - Do NOT grease on back of seal!
2. Fit the large seal on the inner guide ring (3). Remember to mount the flat side of seal upwards as shown on figure.
3. Lubricate the ends (A) of the tool housing (4) and the outer guide ring (1) with Klüber Paraliq GTE 703 (USDA H1) and assemble the tool.
4. In a hydraulic press, the outer guide ring (1) is pressed downwards so that the seal is fitted in the groove of the valve plug. **IMPORTANT!** The outer guide ring (1) must be closed quickly until metal contact with the tool housing (4). Normally, the inner guide ring (3) is moved upwards during closing; otherwise lift the pin (2) while fixture is still closed.
5. If the seal is not fitted correctly in the groove this can be fixed with a screwdriver.
6. Always remember to release air behind the seal after fitting.

Upper valve plug:
(Stop valve and change-over valve)



B = Grease
C = No grease
D = **NOTE!** Flat side up!





A = Lubricate ends
* = Only for 38-51 mm/DN40-50 upper change-over plug.

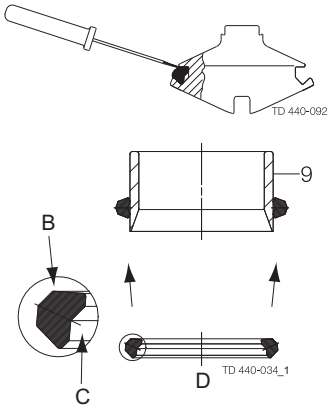
5 Maintenance

Study the instructions carefully.
The items refer to the parts list and service kits - see section 7 Parts list and service kits.
Handle scrap correctly.
*Do **not** lubricate the rubber seals or the tool parts before fitting the seals.*

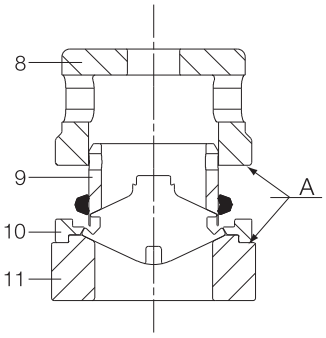
Step 4
Fitting the seal rings (For change-over valves)

1. Carefully grease the seal with Klüber Paraliq GTE 703 (USDA H1) - Do NOT grease on back of seal!
2. Fit the seal on the inner guide ring (9). Remember to mount the flat side of seal upwards as shown on figure.
3. Fit support part (10)
4. Lubricate the ends of the support part (10) and the outer guide ring (8) with Klüber Paraliq GTE 703 (USDA H1) and assemble the tool.
5. In a hydraulic press, the outer guide ring (8) is pressed downwards so that the seal is fitted in the groove of the valve plug. **IMPORTANT!** The outer guide ring (8) must be closed quickly until metal contact with the support part (10). Normally, the inner guide ring (9) is moved upwards during closing; otherwise lift the pin (2) while fixture is still closed
6. If the seal is not fitted correctly in the groove this can be fixed with a screwdriver.
7. Always remember to release air behind the seal after fitting.

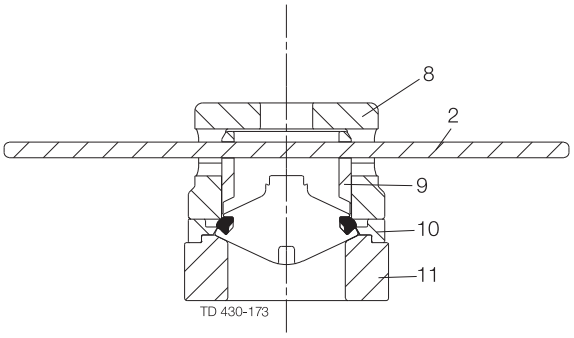
Lower valve plug:
(Change-over valve)



B = Grease
C = No grease
D = **NOTE!** Flat side up!



A = Lubricate ends



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

6.1 Technical data

SMP-BCA is operated by means of compressed air. The valve is a normally closed (NC) valve.

Sterile stem sealing towards the atmosphere is ensured by a special designed PTFE/rubber diaphragm unit. The PTFE diaphragm does not allow product residues to build up on the product contact surface.

The product lines are separated by two sealings and a sterile barrier chamber to avoid mixing of product and to ensure immediate indication in case of a leak from one of the plug seals. Two small pneumatic normally open (NO) valves control flow to and from the sterile barrier chamber.

Technical data	
Pressure range	0 - 800 kPa (0-8 bar)
Temperature range	-10°C to 140°C (EPDM)
Optimum process conditions	>50 kPa (0,5 bar), > 20°C
Max. sterilisation temperature (steam - short time)	150°C – 380kPa (3,8 bar)
Air pressure	500 – 800 kPa (5-8 bar)
Air consumption (litres free air)	
38mm, 51mm, DN40, DN50	0.2 x air pressure in bar
63.5mm, 76mm, 101.6mm, DN65, DN 80, DN100	0.7 x air pressure in bar
NOTE! Vacuum is not recommended in aseptic applications.	

Expected lifetime of diaphragm unit under normal conditions:
(no pressure shocks or cavitation)

Size/type	**Stop valve** activations	**Change-over valve** activations
38mm/DN40	12,000	10,000
51mm/DN510	12,000	10,000
63.5mm/DN65	12,000	5,000
76.1mm/DN80	5,000	5,000
101mm/DN100	5,000	5,000

NOTE! Activating the valve without internal product pressure reduces life time of diaphragm unit.

Materials	
Product wetted steel parts	Acid resistant steel AISI 316L
Other steel parts	Stainless steel AISI 304
Finish	Semi bright
Product wetted seals	EPDM, PTFE
Other seals	NBR, EPDM

Noise
One meter away from - and 1.6 meter above the exhaust the noise level of a valve actuator will be approximately 77db(A) without noise damper and approximately 72 db(A) with damper - measured at 7 bars air-pressure.

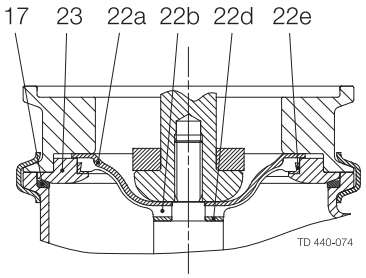
6 Technical data

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

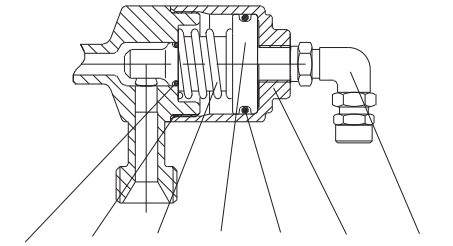
Weight (kg)

Size	38 mm	51 mm	63.5 mm	76.1 mm	101.6 mm	40 DN	50 DN	65 DN	80 DN	100 DN
Weight - Stop valve	6.5	6.8	13.3	14.9	18.2	6.5	6.8	13.3	15.6	18.2
Weight - Divert valve	8.2	8.6	15.5	18.6	24.6	8.2	8.6	15.5	19.6	24.6

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



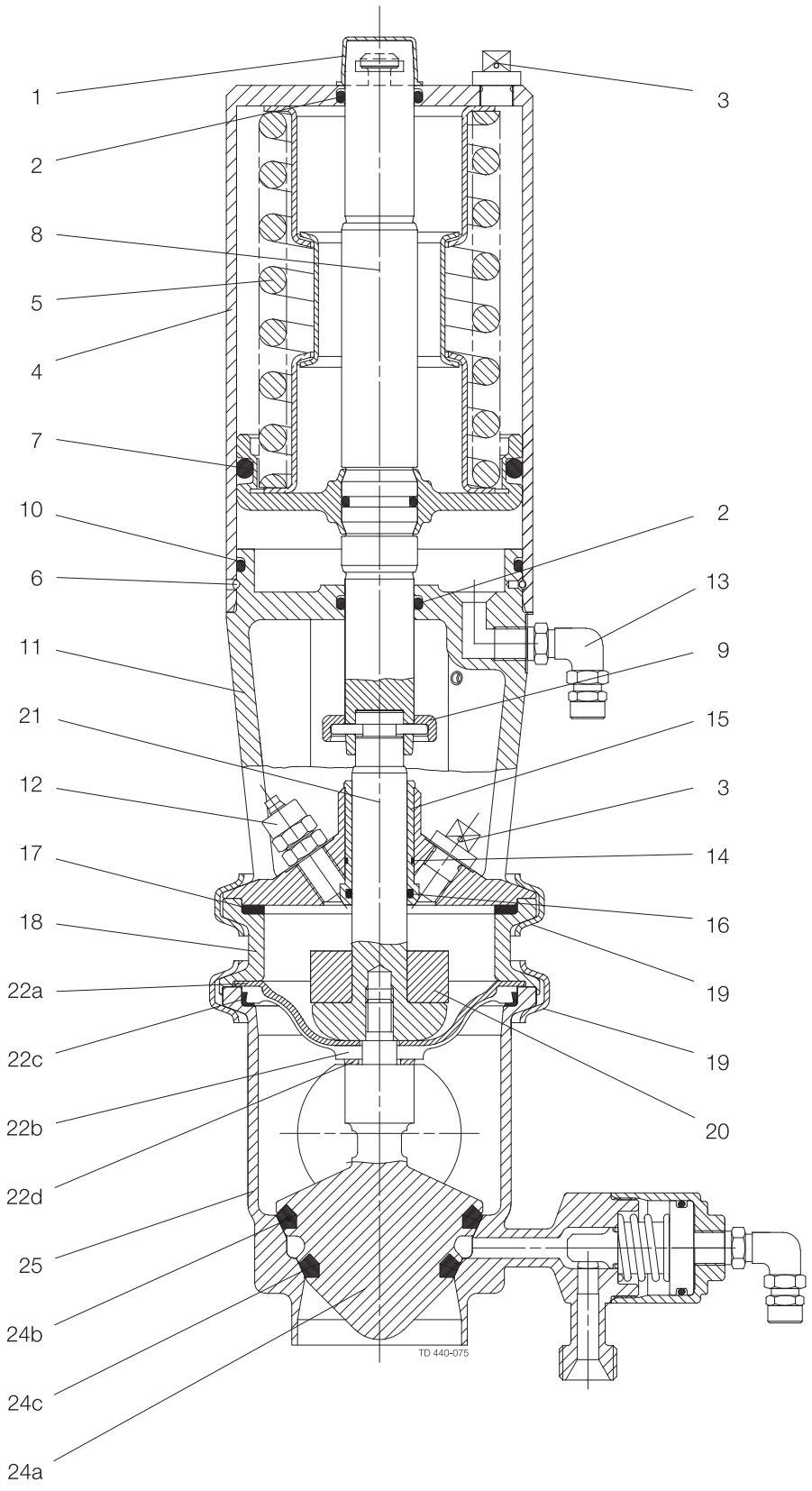
(76-101.6mm/DN80-100)



CIP/detecting valve

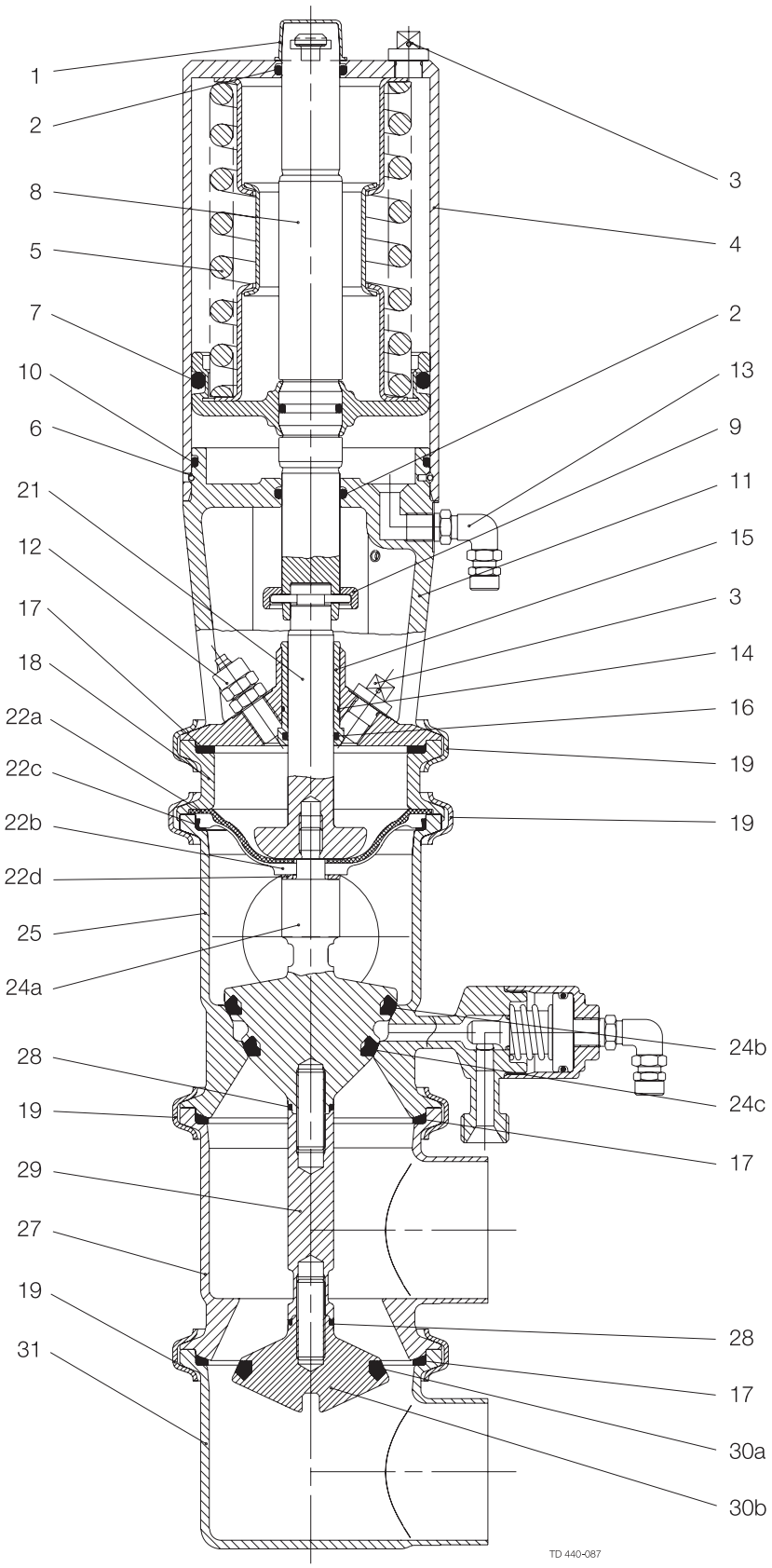
7 Parts list and service kits

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



Stop valve

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

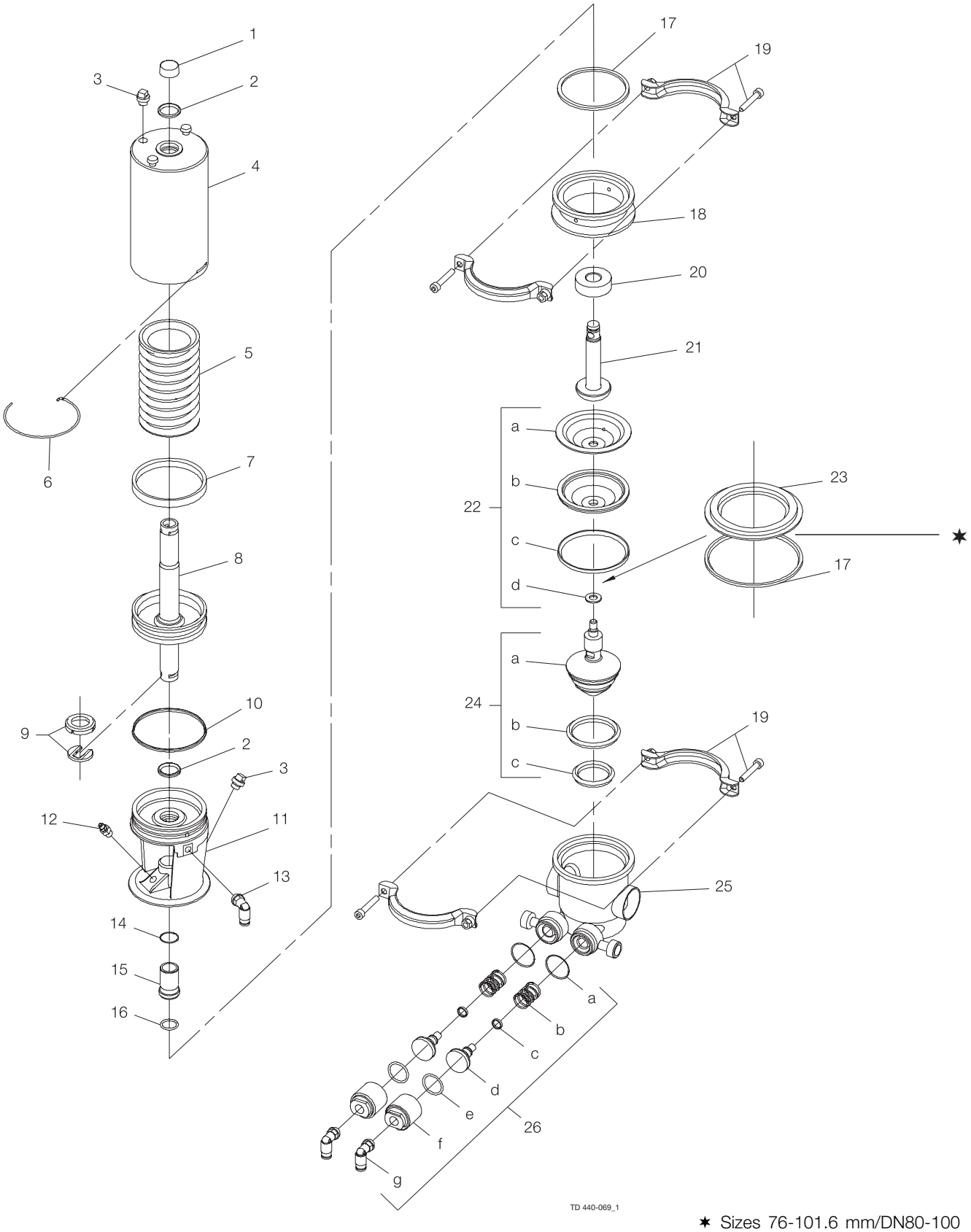


Change-over valve

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 Stop valve



✶ Sizes 76-101.6 mm/DN80-100

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 complete
1		1	Cap
2	□	2	O-ring
3		2	Plug
4		1	Cylinder
5		1	Spring assembly
6	□	1	Lock wire
7	□	1	O-ring
8		1	Piston
9	□	1	Clip, complete
10	□	1	O-ring
11		1	Bonnet
12		1	Drain tube
13		1	Air fitting, swivel bend
14	□	1	O-ring bonnet
15	□	1	Guide ring
16	□	1	O-ring stem
17	♦	1	Seal ring
18		1	Intermediate piece
19		2	Clamp and screws
20		1	Washer
		1	Washer (period 9605-9909)
21		1	Stem upper
22	♦	1	Diaphragm set
22a		1	Diaphragm support, EPDM.
22b		1	Diaphragm, PTFE
22c		1	L-seal
22d		1	Stem seal
23		1	Diaphragm ring
24		1	Plug complete
24a		1	Plug
24b	♦	1	Seal ring
24c	♦	1	Seal ring
25		1	Valve body
26	○		Internal parts
26a	♦○	2	O-ring, NBR
26b	○	2	Spring
26c	♦○	2	O-ring
26d	○	2	Spindle
26e	♦○	2	O-ring, HNBR
26f	○	2	Plug
26g		2	Air fitting, swivel bend

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.

Service kits

	Denomination	38 mm DN40	51 mm DN50	63.5 mm DN65	76.1 mm DN80	101.6 mm DN100
Service Kit for Actuator						
□	Service Kit	9611920362	9611920362	9611920363	9611920364	9611920364
Service Kit for Product wetted parts						
♦	Service kit, EPDM	9611920371	9611920371	9611920373	9611920374	9611920375
♦	Service kit, NBR	9611920376	9611920376	9611920378	9611920379	9611920380
♦	Service kit, FPM	9611920381	9611920381	9611920383	9611920384	9611920385
Service Kit for Detecting/CIP valve complete						
○	Service kit, EPDM	9611920354	9611920354	9611920354	9611920354	9611920354
○	Service kit, NBR	9611920270	9611920270	9611920270	9611920270	9611920270
○	Service kit, FPM	9611920271	9611920271	9611920271	9611920271	9611920271

Parts marked with □♦○ are included in the service kits.
Recommended Spare Parts: Service Kits.

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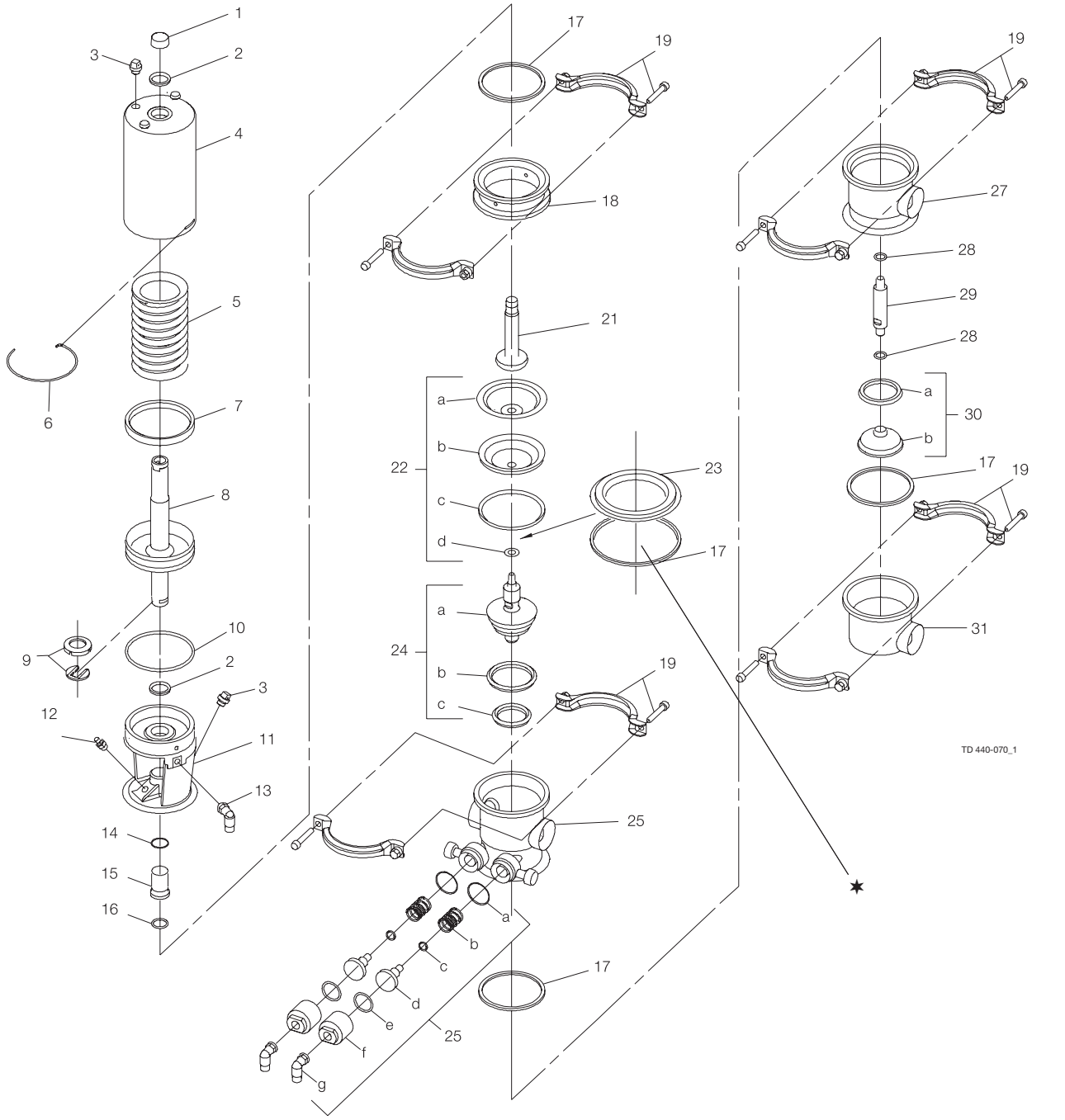
7 Parts list and service kits

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

7.2 Change-over valve



✶ Sizes 76-101.6 mm/DN 80-100

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 complete
1		1	Cap
2	□	2	O-ring
3		2	Plug
4		1	Cylinder
5		1	Spring assembly
6	□	1	Lock wire
7	□	1	O-ring
8		1	Piston
9	□	1	Clip, complete
10	□	1	O-ring
11		1	Bonnet
12		1	Drain tube
13		1	Air fitting, swivel bend
14	□	1	O-ring bonnet
15	□	1	Guide ring
16	□	1	O-ring stem
17	♦	3	Seal ring
18		1	Intermediate piece
19		4	Clamp and screws
21		1	Stem upper
22	♦	1	Diaphragm set
22a		1	Diaphragm support, EPDM
22b		1	Diaphragm, PTFE
22c		1	L-seal
22d		1	Stem seal
23		1	Diaphragm ring
24		1	Plug upper complete
24a		1	Plug upper
24b	♦	1	Seal ring
24c	♦	1	Seal ring
25		1	Valve body
26	○	1	Internal parts
26a	♦○	2	O-ring, NBR
26b	○	2	Spring
26c	♦○	2	O-ring
26d	○	2	Spindle
26e	♦○	2	O-ring HNBR
26f	○	2	Plug
26g		2	Air fitting, swivel bend
27		1	Valve body
28	♦	2	O-ring
29		1	Stem lower
		1	Stem lower
30		1	Plug lower complete
30a	♦	1	Seal ring
30b		1	Plug lower
31		1	Valve body

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.

Service kits

	Denomination	38 mm DN40	51 mm DN50	63.5 mm DN65	76 mm DN80	101.6 mm DN100
Service Kit for Actuator						
□	Service Kit	9611920362	9611920362	9611920363	9611920364	9611920364
Service Kit for Product wetted parts						
♦	Service kit, EPDM	9611920386	9611920386	9611920387	9611920388	9611920389
♦	Service kit, NBR	9611920390	9611920390	9611920391	9611920392	9611920393
♦	Service kit, FPM	9611920394	9611920394	9611920395	9611920396	9611920397

Parts marked with □♦○ are included in the service kits.
Recommended Spare Parts: Service Kits.

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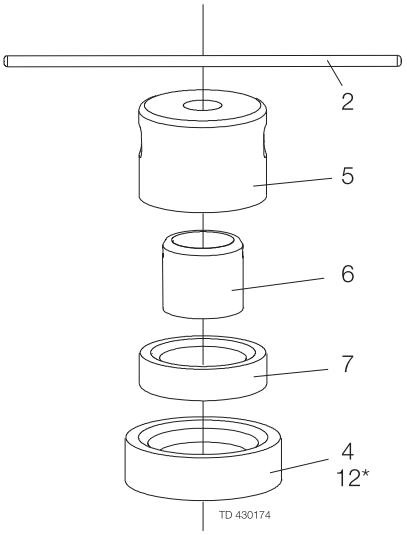
7 Parts list and service kits

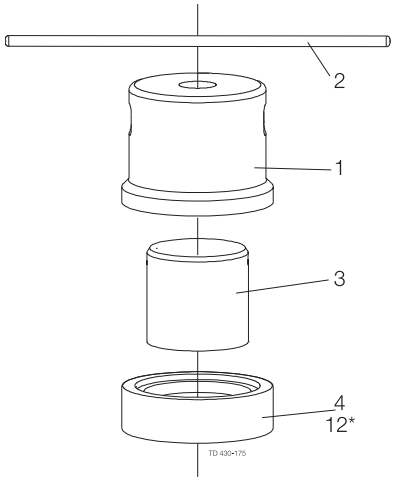
It is important to observe the technical data during installation, operation and maintenance.
Inform the personnel about the technical data.

7.3 Tool for plug seals

Tool for shut-off valve and change-over valve (upper plug)



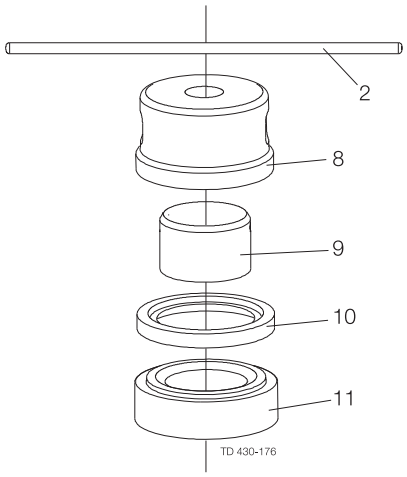
Small seal ring



Large seal ring

* Only for 38-51 mm/DN40-50 upper change-over plug (markingC8)

Tool for change-over valve (lower plug)



Lower valve plug

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.

Parts list

Pos.	Qty	Denomination
1	1	Outer guide ring for large seal
2	1	Pin for tool
3	1	Inner guide ring for large seal
4	1	Tool housing, upper plug
5	1	Outer guide ring for small seal
6	1	Inner guide ring for small seal
7	1	Support part, upper plug
8	1	Outer guide ring, lower plug
9	1	Inner guide ring, lower plug
10	1	Support part, lower plug
11	1	Tool housing, lower plug
12	1	Tool housing, ch/o upper plug

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