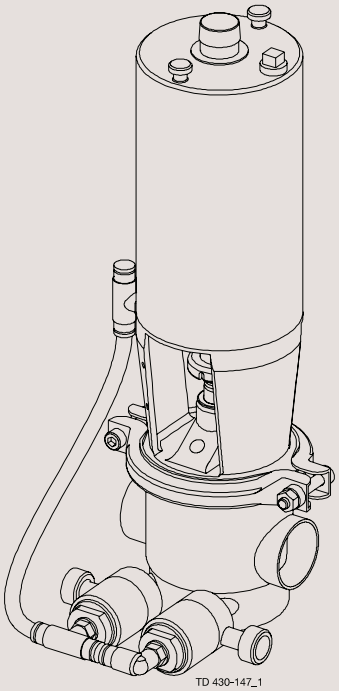
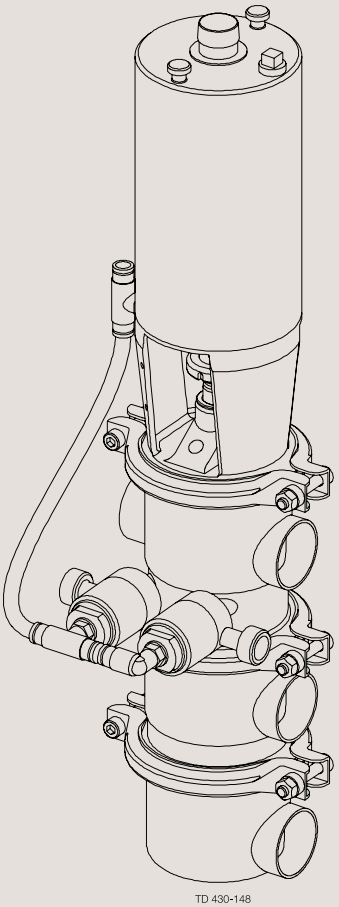
Instruction Manual

SMP-BC Sanitary Mixproof Valve





ESE02255-EN10 2022-10

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

1 Declarations of Conformity

EU Declaration of Conformity

The Designated Company

Alfa Laval Kolding A/S, Albuen 31, DK-6000 Kolding, Denmark, +45 79 32 22 00
Company name, address and phone number

Hereby declare that

Sanitary Mixproof Valve
Designation

SMP-BC PN10
Type

is in conformity with the following directives with amendments:
- Machinery Directive 2006/42/EC
- The valve is in compliance with the Pressure Equipment Directive 2014/68/EC and was subjected to the following assessment procedure Module A. Diameters ≥ DN125 may not be used for fluids group 1.

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

Global Product Quality Manager		Lars Kruse Andersen
Title		Name
Kolding, Denmark	2022–10–01	
Place	Date (YYYY-MM-DD)	Signature

This Declaration of Conformity replaces Declaration of Conformity dated 2016-06-01

UK Declaration of Conformity

The Designated Company

Alfa Laval Kolding A/S, Albuen 31, DK-6000 Kolding, Denmark, +45 79 32 22 00
Company name, address and phone number

Hereby declare that

Sanitary Mixproof Valve
Designation

SMP-BC PN10
Type

is in conformity with the following directives with amendments:
- The Supply of Machinery (Safety) Regulations 2008
- The Pressure Equipment (Safety) Regulations 2016 category 1 and subjected to assessment procedure Module A.
Diameters ≥ DN125 may not be used for fluids group 1

Signed on behalf of: Alfa Laval Kolding A/S

Global Product Quality Manager		Lars Kruse Andersen
Title		Name
Kolding, Denmark	2022–10–01	
Place	Date (YYYY-MM-DD)	Signature

DoC Revison_01_102022

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

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: 

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 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 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 keep the cleaning pressure lower than the product pressure
Never throttle the outlet of the detecting valve

Always handle lye and acid with great care

Maintenance:

Always read the technical data thoroughly (see chapter 6 Technical data)
Always release compressed air after use
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 use 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

3 Installation

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

3.1 Unpacking/delivery

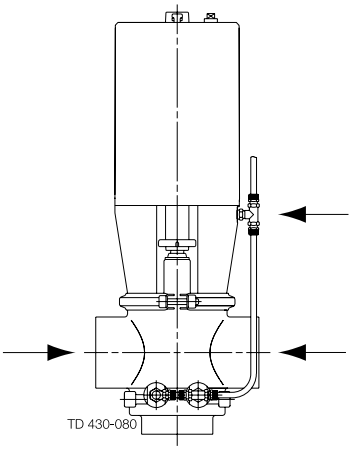
Step 1
CAUTION!
Alfa Laval cannot be held responsible for incorrect unpacking.

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, the valve ports, the detecting valve and the CIP valve.

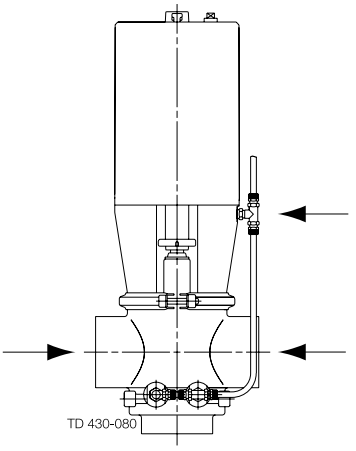
Caution!

Remove packing materials!



Step 3
Inspect the valve for visible transport damage.

Inspection!



3.2 Recycling

- **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 Installation

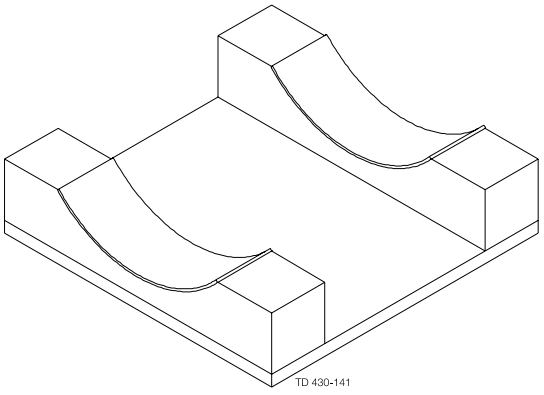
The valve sizes DN125-150 are very heavy.
Therefore Alfa Laval recommends manufacturing and usage of auxiliary equipment. A proposal is given below.
Please note that the auxiliary equipment ***cannot*** *be supplied by Alfa Laval.*
The items refers to the drawings, parts list and service kits, see chapter 7 Parts list and service kits

3.3 Recommended auxiliary equipment (DN125/150)

Step 1
For lifting the valve:
Screw an eye bold (6 mm/0.25 inch) into top pin (10). Using a small hook crane or similar, lift the valve by an eye bolt.

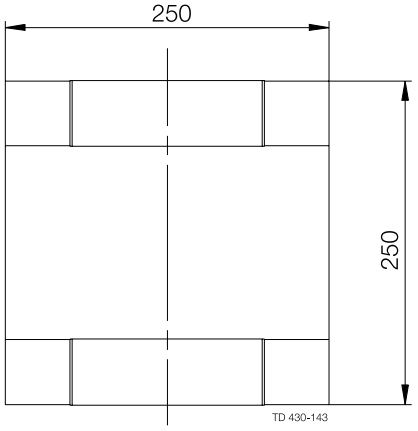
Trestle:
- The purpose of the trestle is to support the valve during dismantling and assembly.
- The trestle is made of a base plate, two support plates, two rubber linings and four bolts.
- The rubber linings are attached to the support plates so that the valve/actuator will rest on these.
- To prevent the valve from turning during dismantling and reassembly the trestle must be made with the correct measurements (see drawings below - all measurements are in mm.)

Trestle

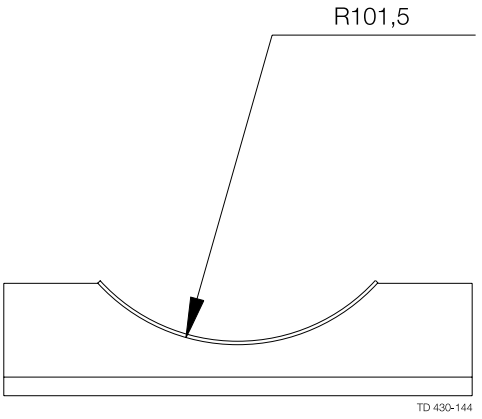


Side view

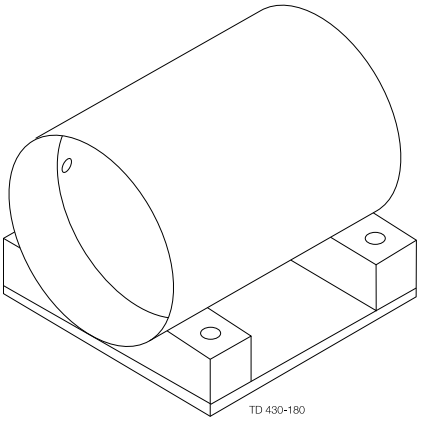
Top view



End view



Step 2
1. Place the valve in the trestle.
2. Make sure that the actuator rests on the rubber linings on the trestle support plates.
3. Dismantle/assemble the valve



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

3.4 General installation

Step 1

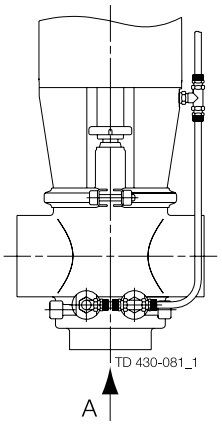
- Always read the technical data thoroughly (see 6 Technical data).
- Always release compressed air after use.
- Never touch the clip assembly or the actuator piston rod if the actuator is supplied with compressed air.

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

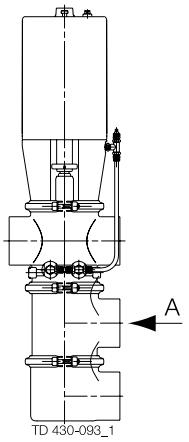
Step 2
Install the valve so that:
- The actuator is turned to the uppermost point.
- The detecting valve is self-draining.
- The flow is against the closing direction to avoid water hammer.

A = Inlet

Stop valve



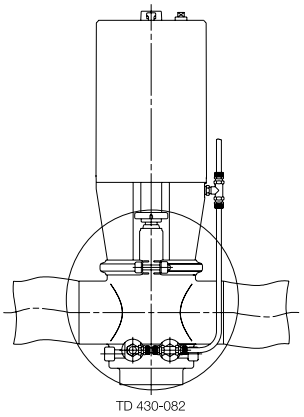
Change-over valve



Avoid water hammer!

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

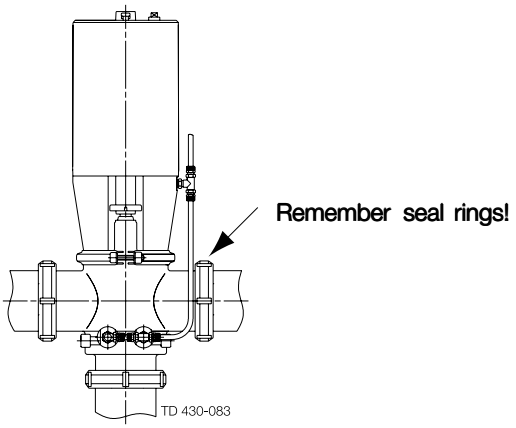
Risk of damage!



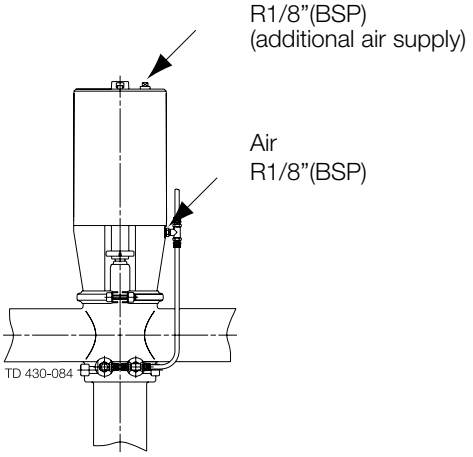
3 Installation

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

Step 4
Fittings :
Ensure that the connections are tight.

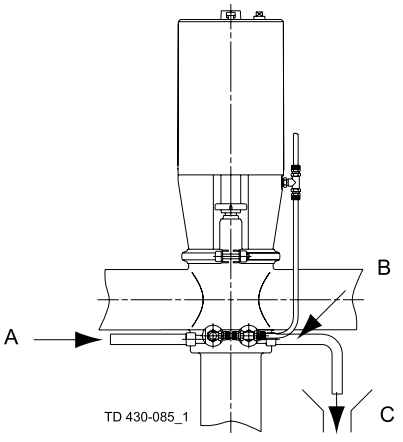


Step 5
Air connection :
If actuator is supported by air on spring side;
max allowable pressure is 300 kPa (3 bar)



Step 6
CIP connection :
1. See description of cleaning and optional extras see sections 4.3 Recommended cleaning and 4.4 Cleaning equipment (optional extra)
2. Connect CIP correctly.

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

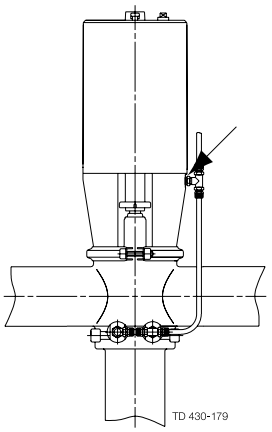


3.5 Welding

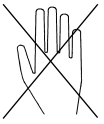
Study the instructions carefully and pay special attention to the warnings.
The valve has welding ends as standard.
Weld carefully.
Check the valve for smooth operation after welding.

Step 1

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



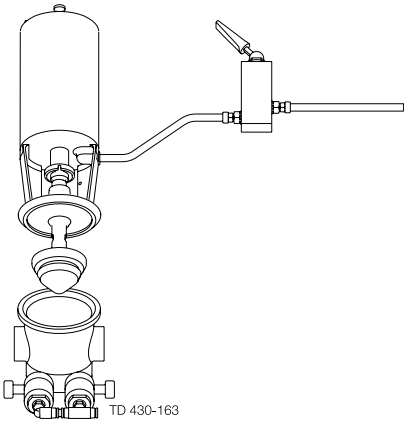
Cutting danger!



Step 2

Dismantle the valve in accordance with steps 1-3, section 5.2 Dismantling of valve

Pay special attention to the warnings!



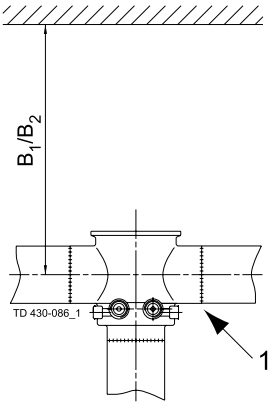
Step 3

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.

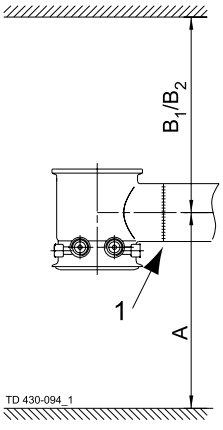
Valve size	A	B_1	B_2 (Incl. top unit)
	mm (figures in ( ) = inches)		
DN40/38mm	280 (11)	550 (22)	730 (29)
DN50/51 mm	305 (12)	550 (22)	730 (29)
DN65/63.5mm	360 (14)	550 (22)	730 (29)
DN80/76mm	410 (16)	600 (24)	780 (31)
DN100/101.6mm	470 (19)	650 (26)	830 (33)
DN125	- (-)	750 (30)	930 (37)
DN150	- (-)	790 (31)	970 (38)

Stop valve



1 = CAUTION!

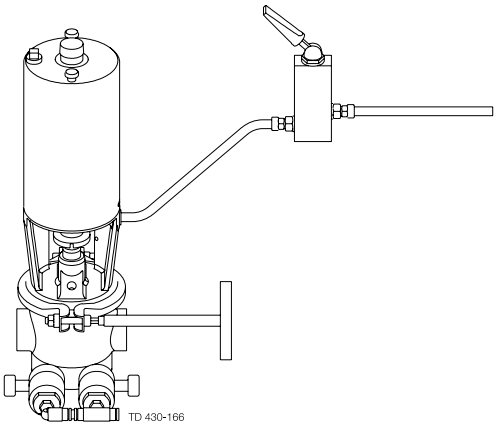
Change-over valve
(upper valve body)



3 Installation

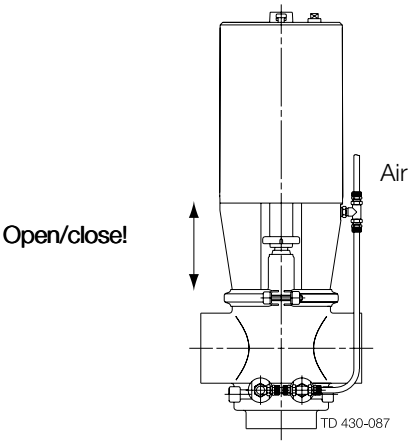
Study the instructions carefully and pay special attention to the warnings.
The valve has welding ends as standard.
Weld carefully.
Check the valve for smooth operation after welding.

Step 4
Assemble the valve in accordance with steps 4-6, section 5.3
Assembly of valve
Pay special attention to the warnings!



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

Pay special attention to the warnings!



The valve is adjusted and tested before delivery.
Study the instructions carefully and pay special attention to the warnings! Pay attention to possible faults.
CIP = Cleaning In Place
The items refer to the drawing and parts liste, see section 7 Parts list and service kits.

4.1 Operation

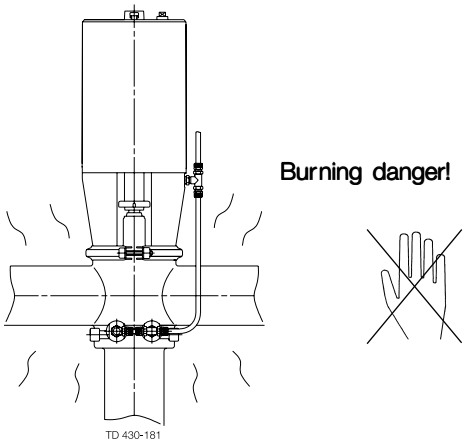
Step 1

Always read the technical data thoroughly (see chapter 6 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 stem and/or clamp	- Worn/product affected lip seal (22a) and/or seal rings (22c, 27)	- Replace the seal rings - 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

4 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.
CIP = Cleaning In Place
The items refer to the drawing and parts liste, see section 7 Parts list and service kits.

- Air leakage through the CIP and detecting valve - Air leakage at the actuator	Worn seal rings	Replace the seal rings

The valve is designed for cleaning in place (CIP)
Study the instructions carefully and pay special attention to the warnings!
NaOH = Caustic soda
HNO_3 = Nitric acid

4.3 Recommended cleaning

Step 1

Always handle lye and acid with great care.

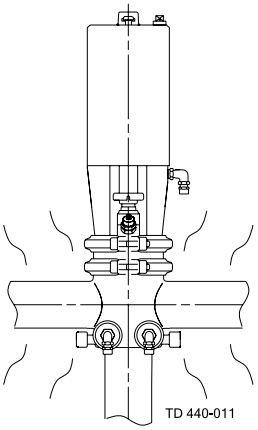
Caustic danger!

Always use rubber gloves!

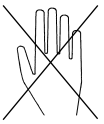
Always use protective goggles!

Step 2

Never touch the valve or the pipelines when sterilizing.



Burning danger!

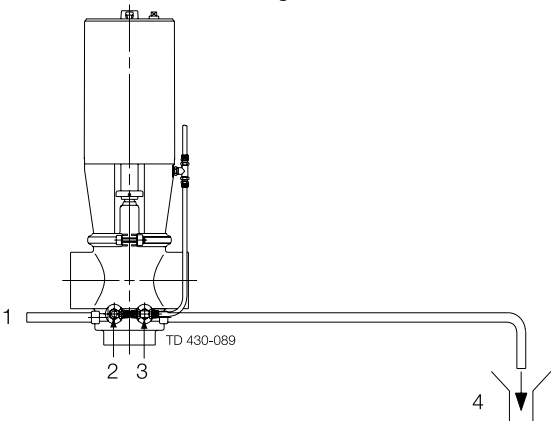


Step 3

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

1 = CIP in
2 = CIP valve
3 = Detecting valve
4 = CIP out

Leakage chamber: **60-100 kPa**



4 Operation

The valve is designed for cleaning in place (CIP)
Study the instructions carefully and pay special attention to the warnings!
NaOH = Caustic soda
HNO_3 = Nitric acid

Step 4
Examples of cleaning agents:
Use clean water, free from chlorides.

1. 1% by weight NaOH at 70° C (158° F)

1 kg (2.2 lbs) NaOH	+	100 l (26.4 gal) water	=	Cleaning agent.
2.2 l (0.6 gal) 33% NaOH	+	100 l (26.4 gal) water	=	Cleaning agent.

2. 0.5% by weight HNO_3 at 70° C (158° F)

0.7 l (0.2 gal) 53% HNO_3	+	100 l (26.4 gal) water	=	Cleaning agent.

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

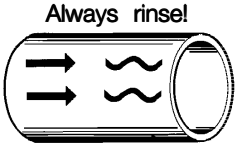
Recommended cleaning flow rates:
(For special processes, see Step 6).
Leakage chamber: 12-15 l/min (3.2 - 4.0 gpm).

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

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!

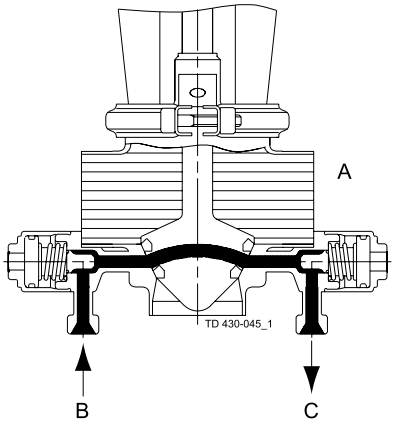


Clean water Cleaning agents

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

Closed stop valve:
Cleaning of the leakage chamber

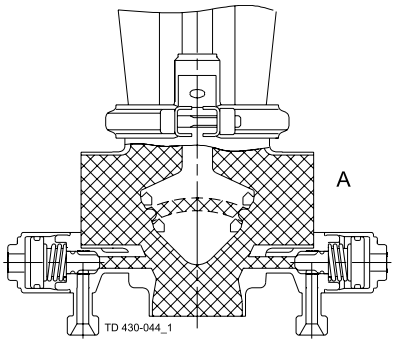
A = Product
B = CIP in
C = CIP out



The valve is designed for cleaning in place (CIP)
Study the instructions carefully and pay special attention to the warnings!
NaOH = Caustric soda
HNO_3 = Nitric acid

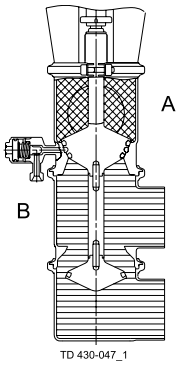
Step 9
Open stop valve:
Cleaning of the valve body and the leakage chamber

A = CIP



Step 10
Closed change-over valve:
Cleaning of the upper valve body

A = CIP
B = Product



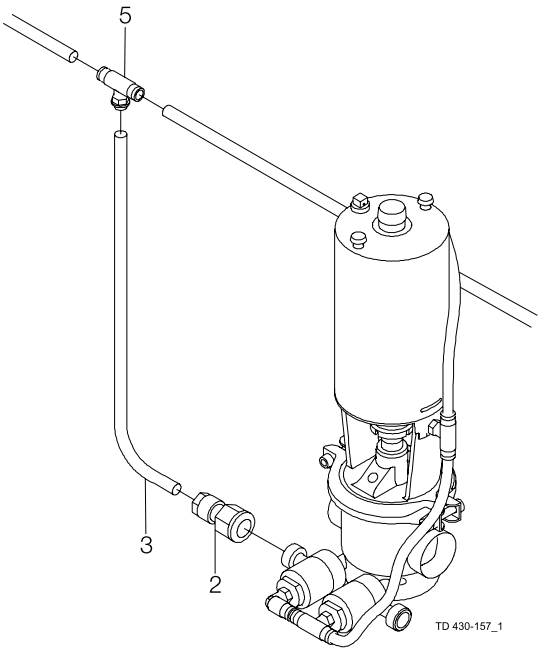
4 Operation

The installation kits are for cleaning of the leakage chamber when the valve is closed.
The combination of the different kits depends on the actual applications.
CIP = Cleaning In Place

4.4 Cleaning equipment (optional extra)

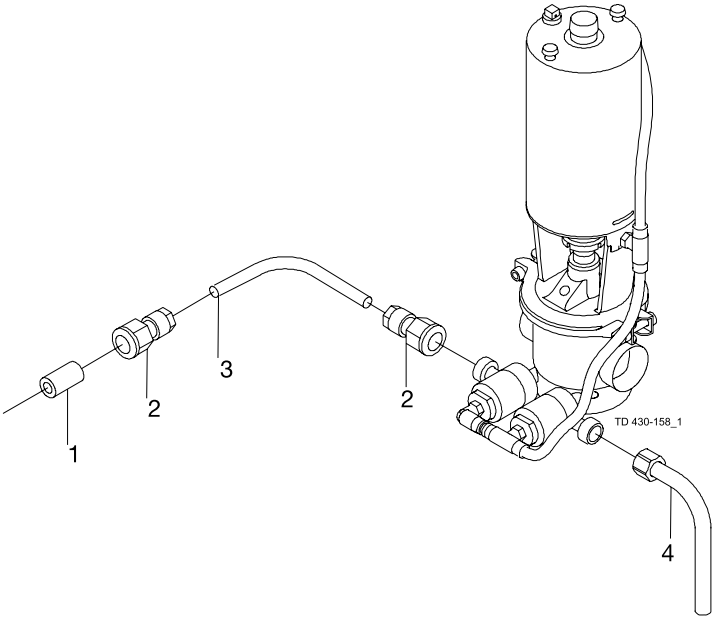
Step 1
Installation kit A (inlet) for parallel connection of CIP (PVDF tubes)

Contents :
Pos. 2 - Fitting PVDF female
Pos. 3 - Tube PVDF
Pos. 5 - Fitting PVDF



Step 2
Installation kit B for CIP and leakage connections of a single valve (PVDF/stainless steel tubes)

Contents :
Pos. 1 - Welding male part
Pos. 2 - Fitting PVDF female
Pos. 3 - Tube PVDF
Pos. 4 - Leakage tube AISI 316

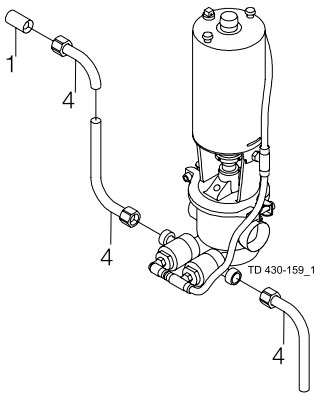


The installation kits are for cleaning of the leakage chamber when the valve is closed.
The combination of the different kits depends on the actual applications.
CIP = Cleaning In Place

Step 3
Installation kit C for CIP and leakage connection of a single valve (stainless steel tubes)

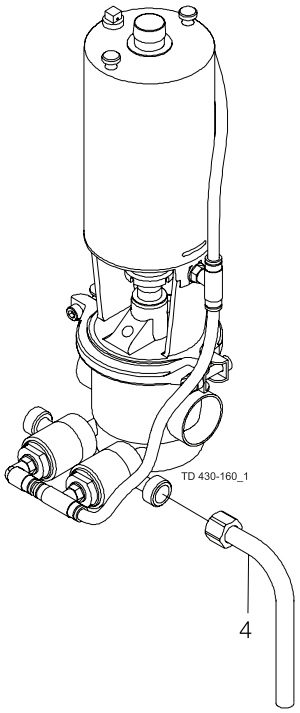
Contents:
Pos. 1 - Welding part
Pos. 4 - CIP leakage tube AISI 316

* Adjust and weld during installation.



Step 4
Installation kit D for leakage connection (stainless steel tubes)

Contents:
Pos. 4 - Leakage tube AISI 316



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.

5.1 General maintenance

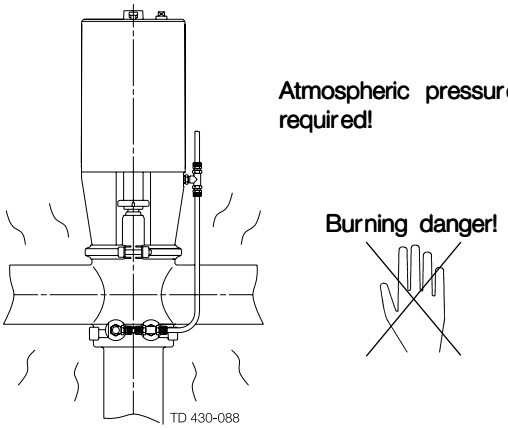
Step 1

- **Always** read the technical data thoroughly (see 6 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.

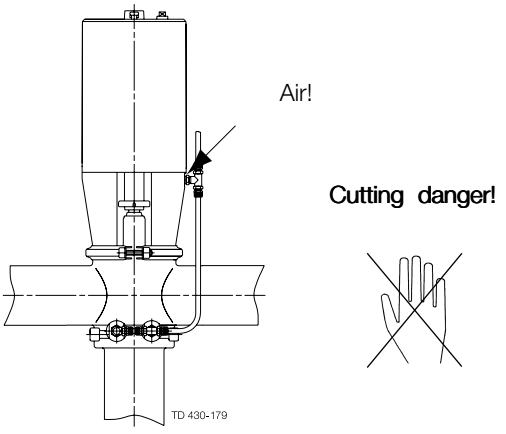
Step 2

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



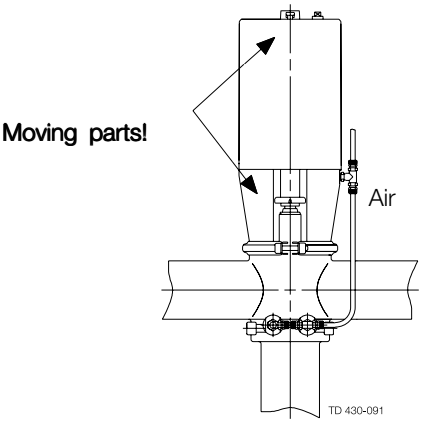
Step 3

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.



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 result in the products becoming mixed.
Internal leakage in the valve is externally visible.
Check the valve for smooth operation after service.

	Valve rubber seals	Valve lip seal	Valve guide rings (for DN125 and DN150 only)	Actuator rubber seals	Bonnet guide ring
Preventive maintenance	**Replace after 12 month**	Replace when replacing the valve rubber seals	Replace when required	**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 valve rubber seals	Replace when required	**Replace when possible**	
Planned maintenance	- Regular inspection for leakage and smootth operation - Keep a record of the valve - Use the statistics for planning of inspections **Replace after leakage**	Replace when replacing the valve rubber seals	Replace when required	- Regular inspection for leakage and smooth operation - Keep a record of the actuator - Use the statistics for planning of inspections **Replace after air leakage**	Replace when replacing the actuator rubber seals (*)
Lubrication (USDAH1 approved oil/grease)	**Before fitting**: Silicone oil or silicone grease	**Before fitting**: Silicone oil or silicone grease	None	**Before fitting**: Silicone oil or silicone grease	None

(*) = **IMPORTANT**
Check that the guide ring is fitted if replacing the bonnet (except on DN125 and DN150).

Recommend spare parts
Service kits see chapter 7 Parts list and service kits .
Order service kits from the service kits list see chapter 7 Parts list and service kits .

Ordering spare parts
Contact the sales department.

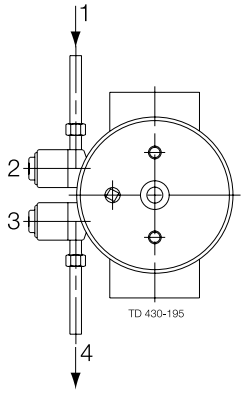
5 Maintenance

Stude the instructions carefully.
The items refer to the parts list and service kits section - see chapter 7 Parts list and service kits .
Handle scrap correctly.
Removal of plug seals, please see the special instructions, section 5.6 Replacement of plug seals.

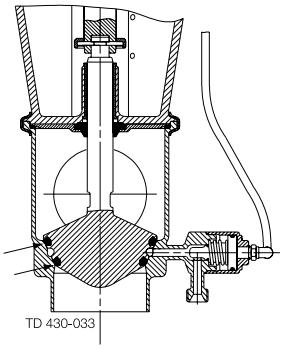
Pre-use check

1. Ensure that the valve plug seals against the seat.
   Pay special attention to the warnings!
2. Pressurise the leakage 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 several times to ensure that it operates smoothly.
   Pay special attention to the warnings!

Top view
Water 3-4 bar



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

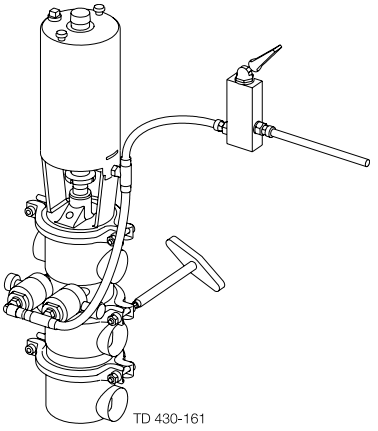


Inspection!

5.2 Dismantling of valve

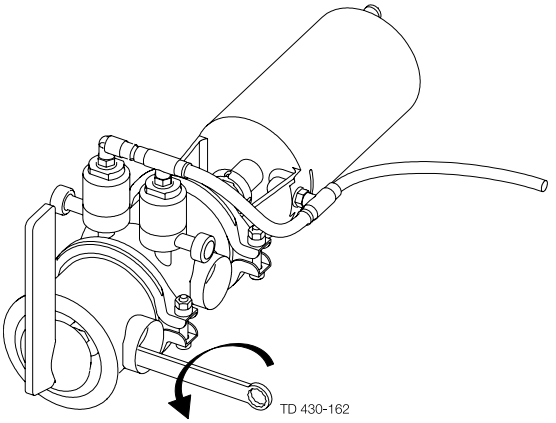
Step 1
Change-over valve:

1. Loosen and remove lower clamp (24).
2. Remove lower valve body (32).
3. Pull out lower seal ring (27).



Step 2
Change-over valve:

1. Remove lower plug (31b).
2. Pull off lower o-ring (29) from the plug.
3. Loosen and remove middle clamp (24).
4. Remove middle valve body (24).
5. Pull out upper seal ring (27).



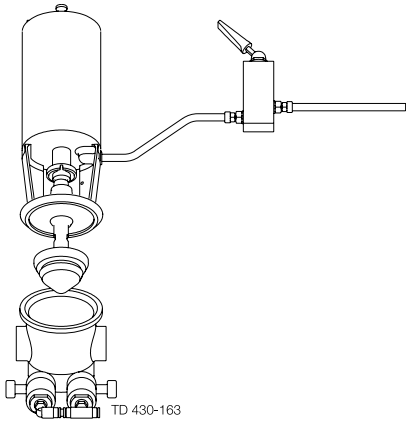
Use a piece of 5-6 mm (0.2 inch) flat bar!

Counterhold with a spanner

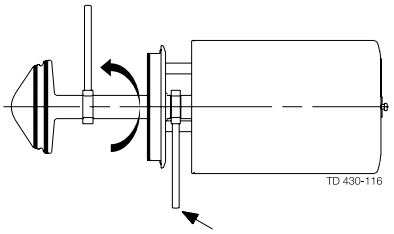
Stude the instructions carefully.
The items refer to the parts list and service kits section - see chapter 7 Parts list and service kits .
Handle scrap correctly.
Removal of plug seals, please see the special instructions, section 5.6 Replacement of plug seals.

Step 3
1. Supply compressed air to the actuator.
2. Loosen and remove upper clamp (24).
3. Lift out the actuator together with plug (23).
4. Release compressed air.

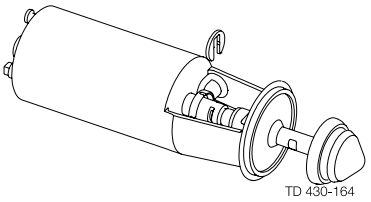
Pay special attention to the warnings!



Step 4
1. Remove clip assembly (12), (not for DN125/DN150: see illustration)
2. Pull out plug (23).
3. Remover stem seal (22), (not DN125/DN150: see illustration)

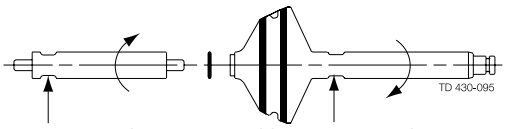


DN125/DN150 **Counterhold!**

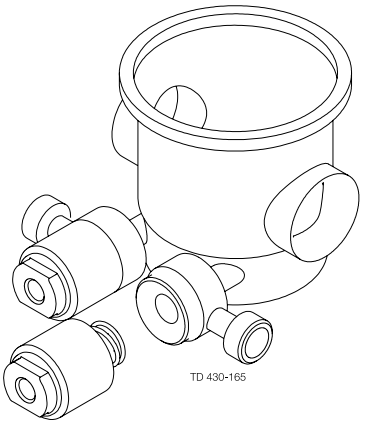


Turn plug anticlockwise with a spanner

Step 5
Change-over valve:
1. Remove stem (30) from plug (23a).
2. Pull off upper o-ring (29) from the plug.



Step 6
1. Remove air fittings (26g, 26h).
2. Unscrew plugs (26f).
3. Remove the internal parts.

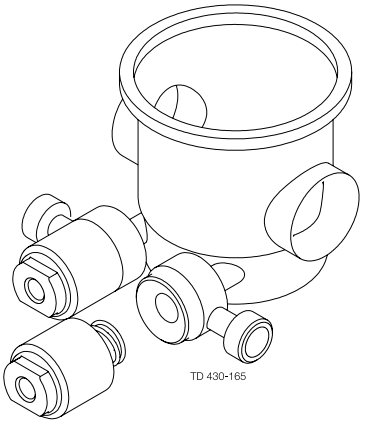


5 Maintenance

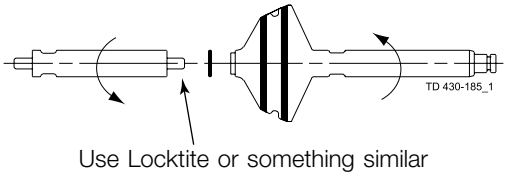
Study the instructions carefully.
The items refer to the parts list and service kits section.
Lubricate the rubber seals and the lip seal before fitting them.
Fitting of plug seals, please see the special instructions, see section 5.6 Replacement of plug seals

5.3 Assembly of valve

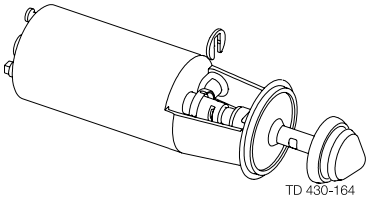
Step 1
1. Fitting internal parts.
2. Screw in plugs (26f).
3. Fit air fittings (26g, 26h).



Step 2
Change-over valve
1. Slide upper o-ring (29) onto plug (23a).
2. Fit stem (30) in the plug - use Loctite or similar on thread.

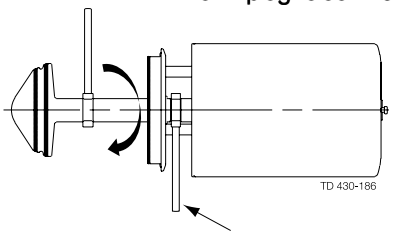


Step 3
1. Push stem seal (22) onto plug (23), (not DN125/DN150: see illustration).
2. Fit the plug in piston (11).
3. Fit clip assembly (12), (not DN125/DN150: see illustration).



DN125/DN150

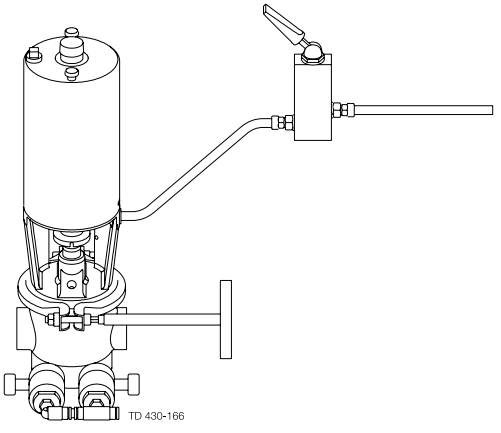
Turn plug clockwise with a spanner



Counterhold!

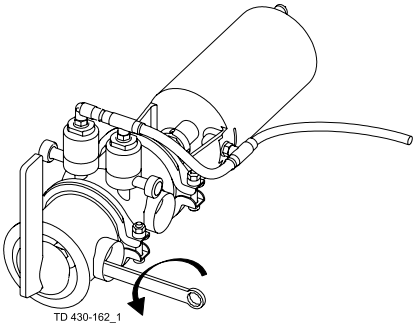
Step 4
1. Supply compressed air to the actuator.
2. Lift in the actuator together with plug (23).
3. Fit and tighten upper clamp (24).
4. Release compressed air.

Pay special attention to the warnings!



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

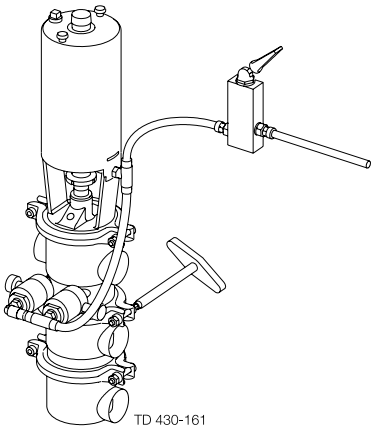
Step 5
Change-over valve:
1. Fit upper ring (27) in middle valve body (28).
2. Position the middle valve body on upper valve body (25).
3. Fit and tighten middle clamp (24).
4. Slide lower o-ring (29) onto lower plug (31b).
5. Fit the lower plug - use Loctite or similar.



Use a piece of 5-6 mm (0.2 inch) flat bar!

Counterhold with a spanner!

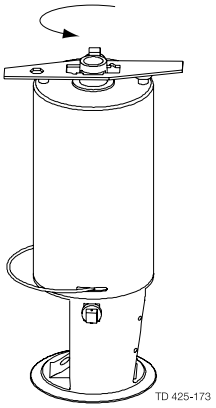
Step 6
Change-over valve:
1. Fit lower seal ring (27) in lower valve body (32).
2. Position the lower valve body on middle valve body (28).
3. Fit and tighten lower clamp (24).



5.4 Dismantling of actuator

Step 1
1. Rotate cylinder (5) to unlock lock wire (7).
2. Remove the lock wire.

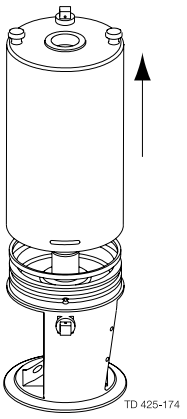
Rotate by hand or with the service tool!



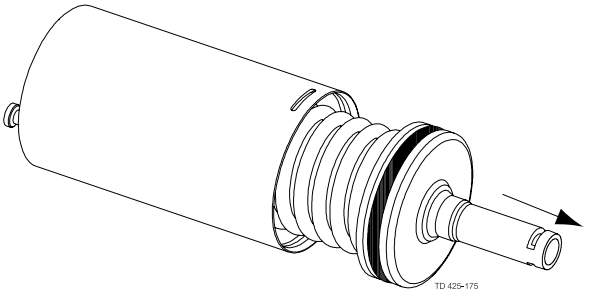
5 Maintenance

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

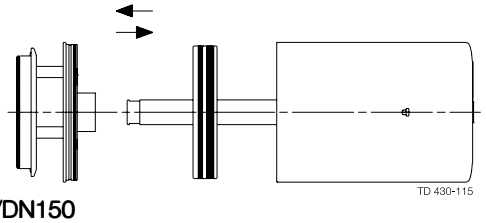
Step 2
1. Disconnect cylinder (5) from bonnet (16).
2. Pull off o-ring (13) from the bonnet.



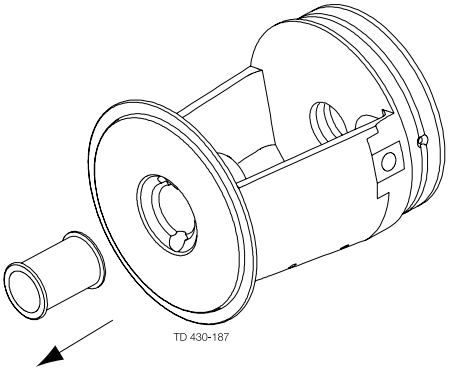
Step 3
1. Pull out piston (11) and spring packet (6).
2. Pull off o-rings (2, 9) from the piston.
3. Remove guide ring (8) from the piston (DN125/DN150).



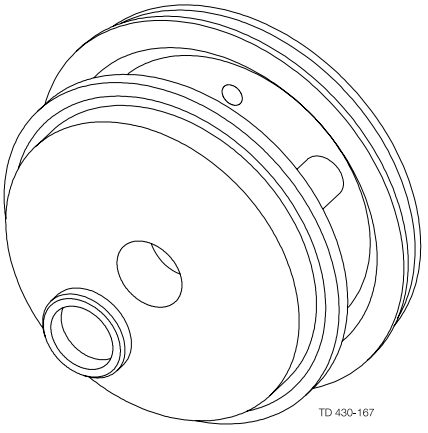
Step 4
- Remove guide ring (17) from bonnet (16).
- Remove guide rings (18, 19) from bonnet (16) (DN125/DN150)



DN125/DN150



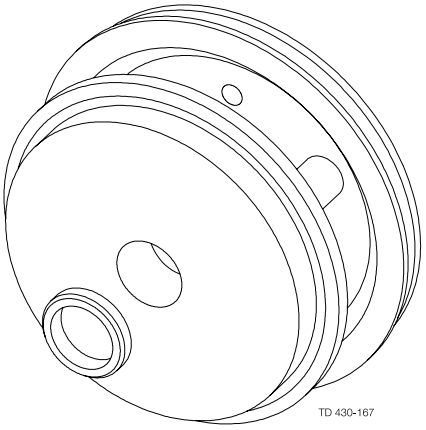
Step 5
Remove lip seal (20) from bonnet (16), (DN125/DN150).



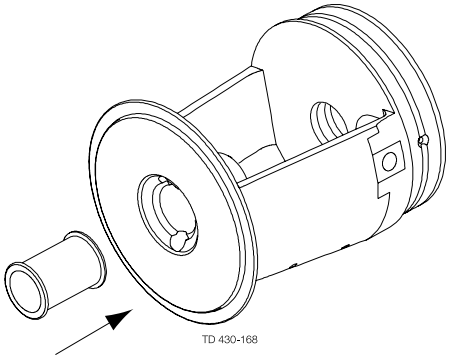
Study the instructions carefully.
The items refer to the parts list and service kits section.
Lubricate the rubber seals before fitting them.

5.5 Assembly of actuator

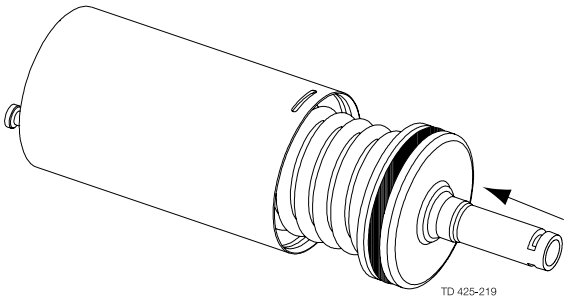
Step 1
Fit lip seal (20) in bonnet (16) (DN125/DN150).



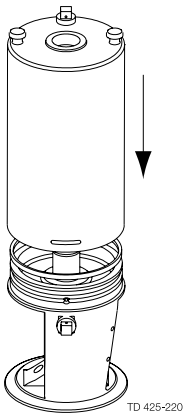
Step 2
Fit guide ring (17) in bonnet (16).
Fit guide rings (18, 19) in bonnet (16) (DN125/DN150).



Step 3
1. Fit guide ring (8) on piston (11) (DN125/DN150).
2. Fit o-rings (2, 9) on the piston.
3. Push the piston and spring packet (6) into cylinder (5).



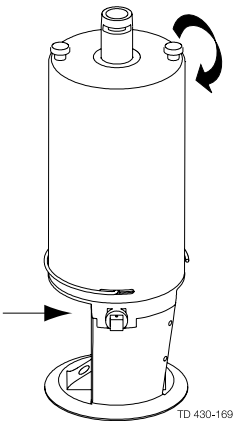
Step 4
1. Slide o-ring (13) onto bonnet (16).
2. Fit cylinder (5) on the bonnet.



5 Maintenance

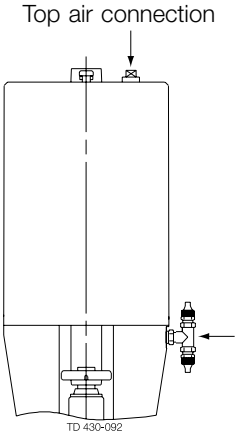
Study the instructions carefully.
The items refer to the parts list and service kits section.
Lubricate the rubber seals before fitting them.

Step 5
1. Rehook lock wire (7) through the slot in cylinder (5) in the hole in bonnet (16).
2. Rotate the cylinder 360° (see illustration).



Rotate by hand or with the service tool!

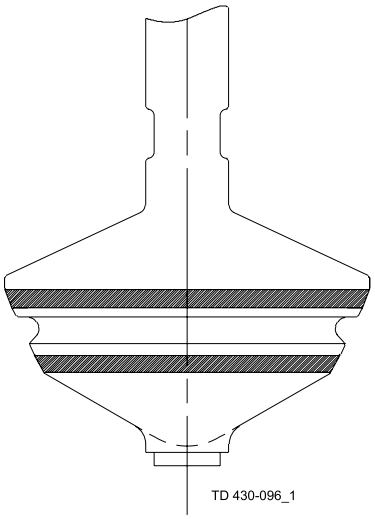
NOTE!
Rotate cylinder (5) further 180° in relation to bonnet (16) so that the top and bottom air connections are fixed on the same side.



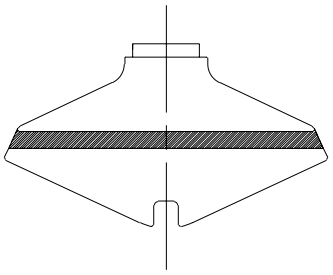
Study the instructions carefully.
The items refer to the parts list and service kits section.
Handle scrap correctly.
*Do **not** lubricate the rubber seals or the tool parts before fitting the seals.*

5.6 Replacement of plug seals

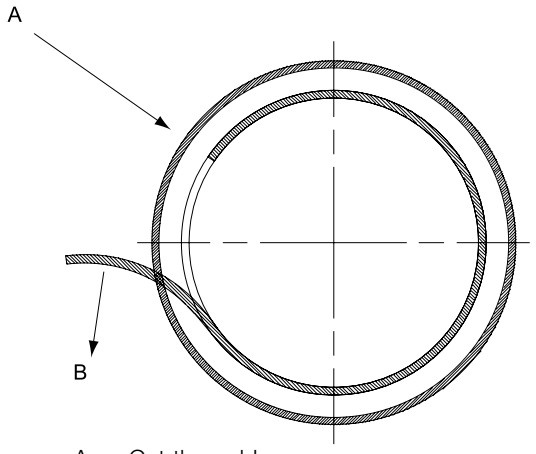
Step 1
Removing the seal rings
Remove the old seal rings by cutting them through and pulling them out of the grooves.



Upper valve plug



Lower valve plug



A. = Cut through!
B. = Pull

IMPORTANT! Before reading step 2-4, please see section 7.5 Tools for plug seals

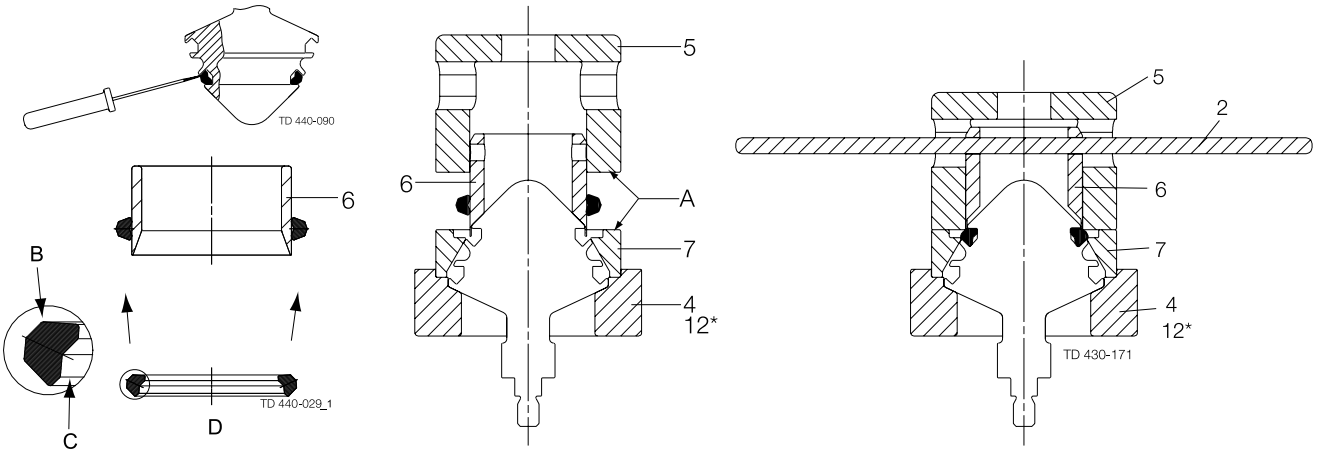
5 Maintenance

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

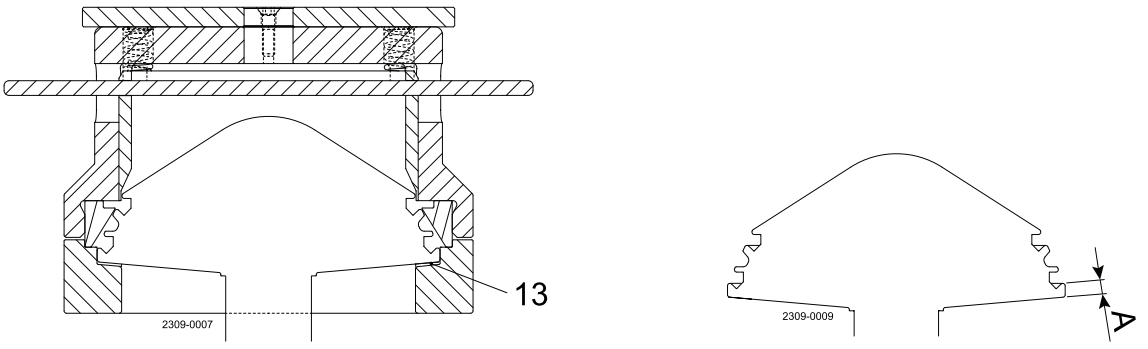
Upper valve plug:
(Stop valve and change-over valve)



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

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

DN125/150 only



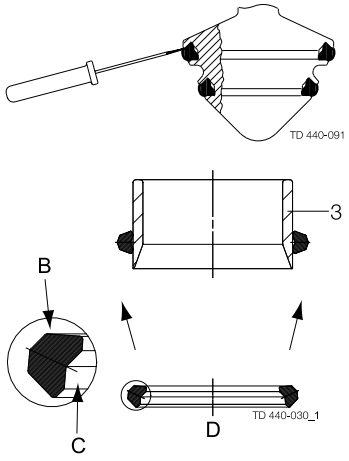
Spacer (13) is only used when A is between 5.5-5.9 mm

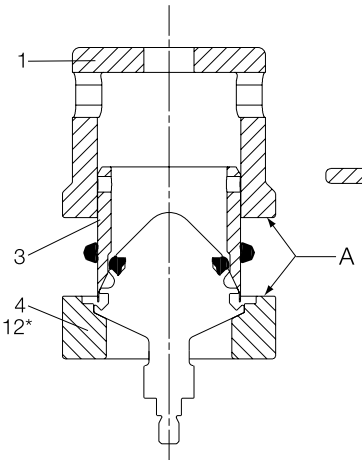
Study the instructions carefully.
The items refer to the parts list and service kits section.
Handle scrap correctly.
*Do **not** lubricate the rubber seals or the tool parts before fitting the seals.*

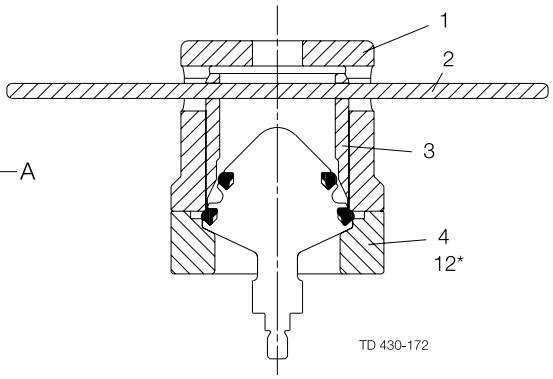
Step 3
Fitting the seal rings (for stop and change-over valves)

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 support part (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 suport part (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)



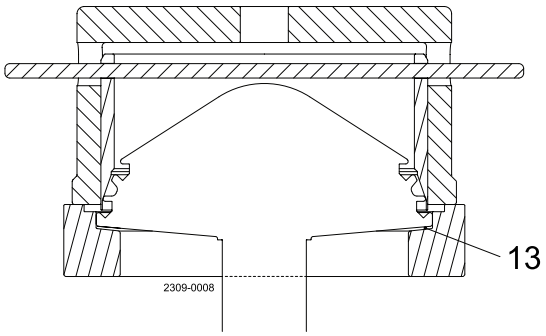


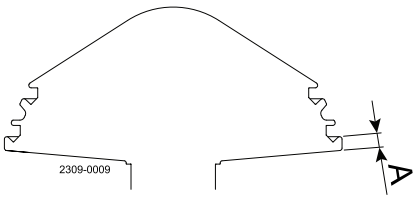


B = Grease
C = No grease
D = **NOTE!** Flat side up!

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

DN125/150 only





Spacer (13) is only used when A is between 5.5-5.9 mm

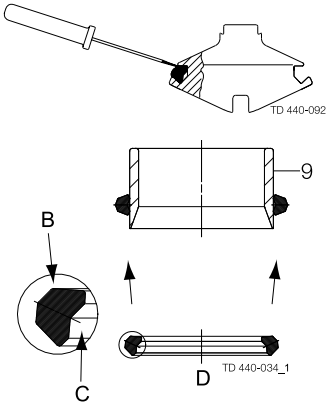
5 Maintenance

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

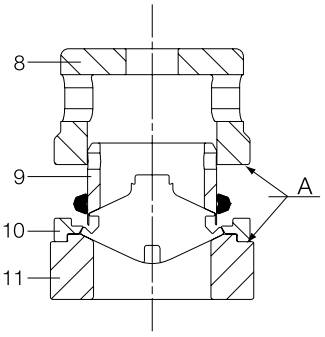
Step 4
Fitting the seal rings (for change-over valves)

1. Carefully grease the seal with Klüber Paraliq GTE 703 (USDA H1).
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.

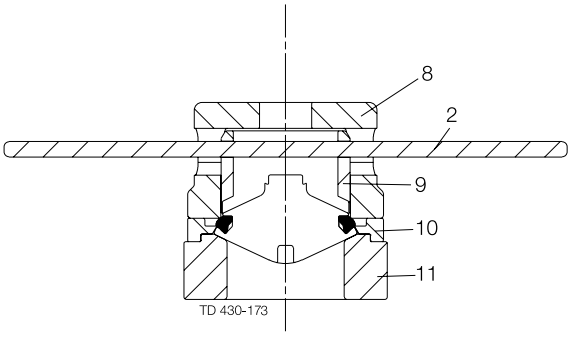
Lower valve plug:
(Change-over valve)



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-BC is remote-controlled by means of compressed air. The valve is a normally closed (NC) valve.

The valve is fitted with two small pneumatic normally open (NO) valves, a detecting valve and a CIP-valve. The valve plug (the upper plug in a change-over valve) has two seals, forming a leakage chamber under atmospheric pressure between them.

Data	
Max. product pressure	1000 kPa (10 bar/145 psi)
Min. product pressure	Full vacuum
Temperature range	-10°C to 140°C (EPDM) (14°F to 284°F)
Air pressure, actuator	500 to 800 kPa (5-8 bar) (72.5 to 116 psi)
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
DN125/DN150, NC	
- for opening the valve	1.5 x air pressure in bar
- support air for closing the valve	3.6 x air pressure in bar
DN125/DN150, NO	
- for opening the valve	2.2 x air pressure in bar
- support air for closing the valve	2.9 x air pressure in bar
Materials	
Product wetted steel parts	AISI 316L
Finish	Semi bright
Other steel parts	AISI 304
Product wetted seals	EPDM (standard)
Other seals	Nitrile (NBR)
Alternative product wetted seals	Nitrile (NBR) and Fluorinated rubber (FPM)

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.

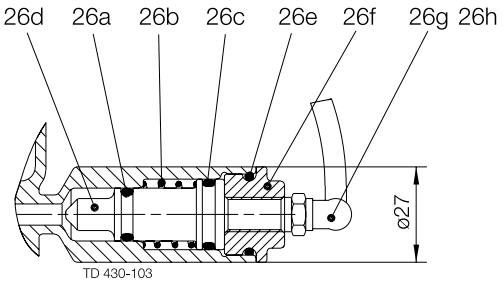
Weight (kg)

Size	38 mm	51 mm	63.5 mm	76.1 mm	101.6 mm	40 DN	50 DN	65 DN	80 DN	100 DN	125 DN	150 DN
Weight (kg) - Stop valve	6.0	6.3	12.8	13.3	16.6	6.0	6.3	12.8	14.0	16.6	43.4	44.5
Weight (kg) - Change-over valve	7.7	8.1	15.0	17.0	23.0	7.7	8.1	15.0	18.0	23.0		

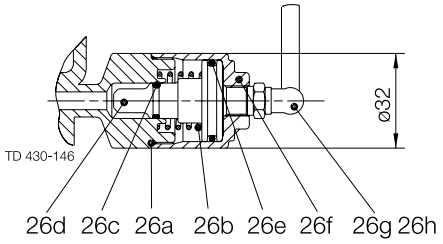
7 Parts list and service kits

The items refer to the parts lists in the following sections.

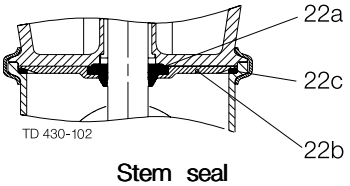
7.1 Drawings



CIP/detecting valve (period 9304-9504)
The drawing show SMP-BC stop valve, change-over valve



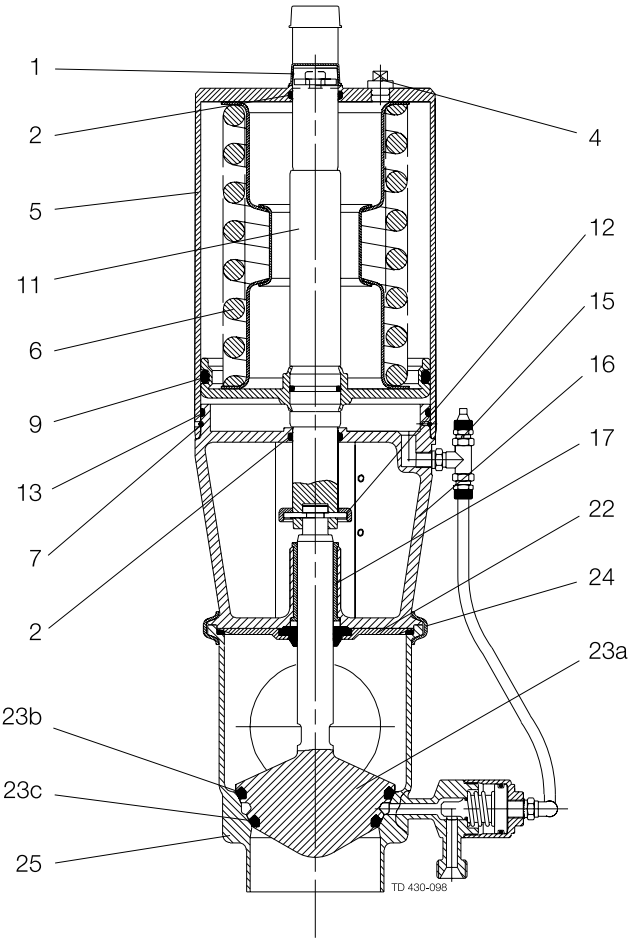
CIP/detecting valve (period 9505-)
The drawing show SMP-BC stop valve, change-over valve and stop valve sixes DN125/DN150



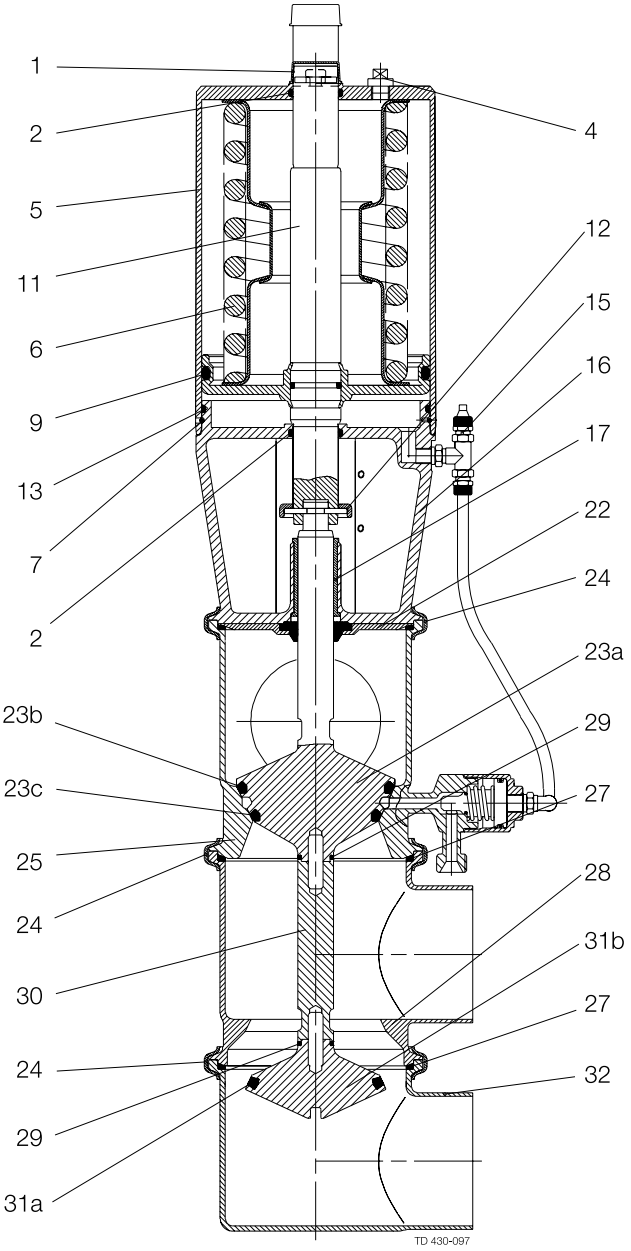
Stem seal
The drawing show SMP-BC stop valve, change-over valve

The items refer to the parts lists in the following sections.

Stop valve



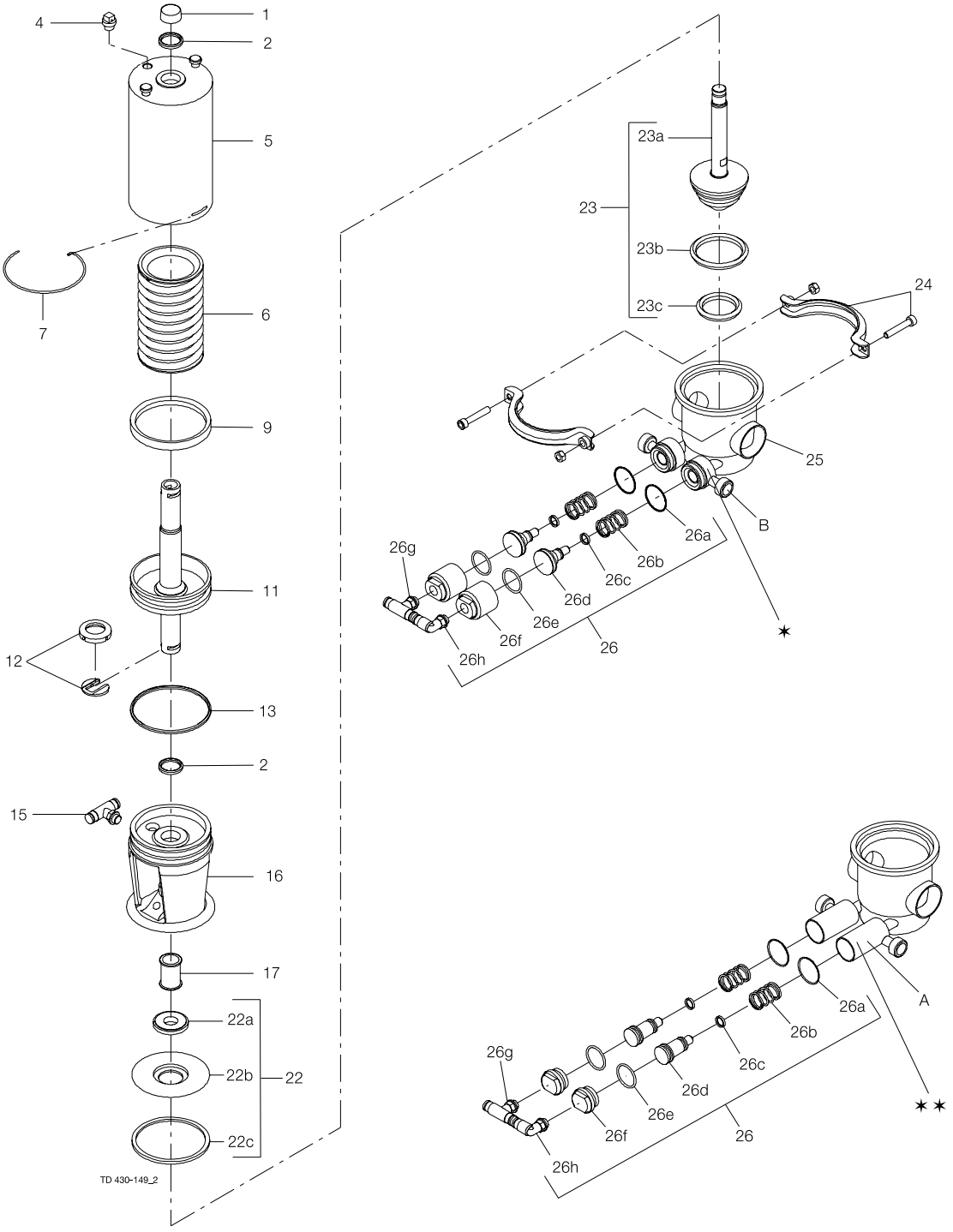
Change-over valve



7 Parts list and service kits

The items refer to the parts lists in the following sections.

7.2 SMP-BC stop valve



* = CIP/detecting valve.
Diam. ø32.
(Period 9505-)

** = CIP/detecting valve.
Diam. ø27.
(Period 9304-9504)

The items refer to the parts lists in the following sections.

Parts list

Pos.	Qty	Denomination
1	1	Cap
2 □	2	O-ring
4	1	Plug
5	1	Cylinder
6	1	Spring packet
7 □	1	Lock wire
9 □	1	O-ring
11	1	Piston
12 □	1	Clip, complete
13 □	1	O-ring
15	1	Air fitting, swivel tee
16	1	Bonnet
17 □	1	Guide ring
22	1	Lip seal kit
22a ◆○	1	Lip seal
22b	1	Plate
22c ◆○	1	Seal ring
23	1	Plug
23a	1	Plug
23b ◆○	1	Seal ring
23c	1	Seal ring
24	1	Clamp complete
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 ★	1	Air fitting, swivel tee
26h	1	Air fitting, swivel bend

Service kits

	Denomination	DN 40 38 mm	DN 50 51 mm	DN65 63.5 mm	DN 80 76 mm	DN 100 101.6 mm
Service Kits for Actuator, detecting/CIP -valve ø32						
□	**Service Kit**	9611920149	9611920149	9611920150	9611920151	9611920151
Product wetted parts For detecting / CIP-valve ø32						
◆	**Service kit EPDM**	9611920272	9611920272	9611920273	9611920274	9611920275
◆	**Service kit NBR**	9611920276	9611920276	9611920277	9611920278	9611920279
◆	**Service kit FPM**	9611920280	9611920280	9611920281	9611920282	9611920283
Product wetted parts Service kit for valve with ø27 detecting/CIP -valve						
○	**Service kit EPDM**	9611920164	9611920164	9611920165	9611920166	9611920167
○	**Service kit NBR**	9611920168	9611920168	9611920169	9611920170	9611920171
○	**Service kit FPM**	9611920172	9611920172	9611920173	9611920174	9611920175

Parts marked with □◆○★△ are included in the service kits.
Recommended spare parts: Service kits.

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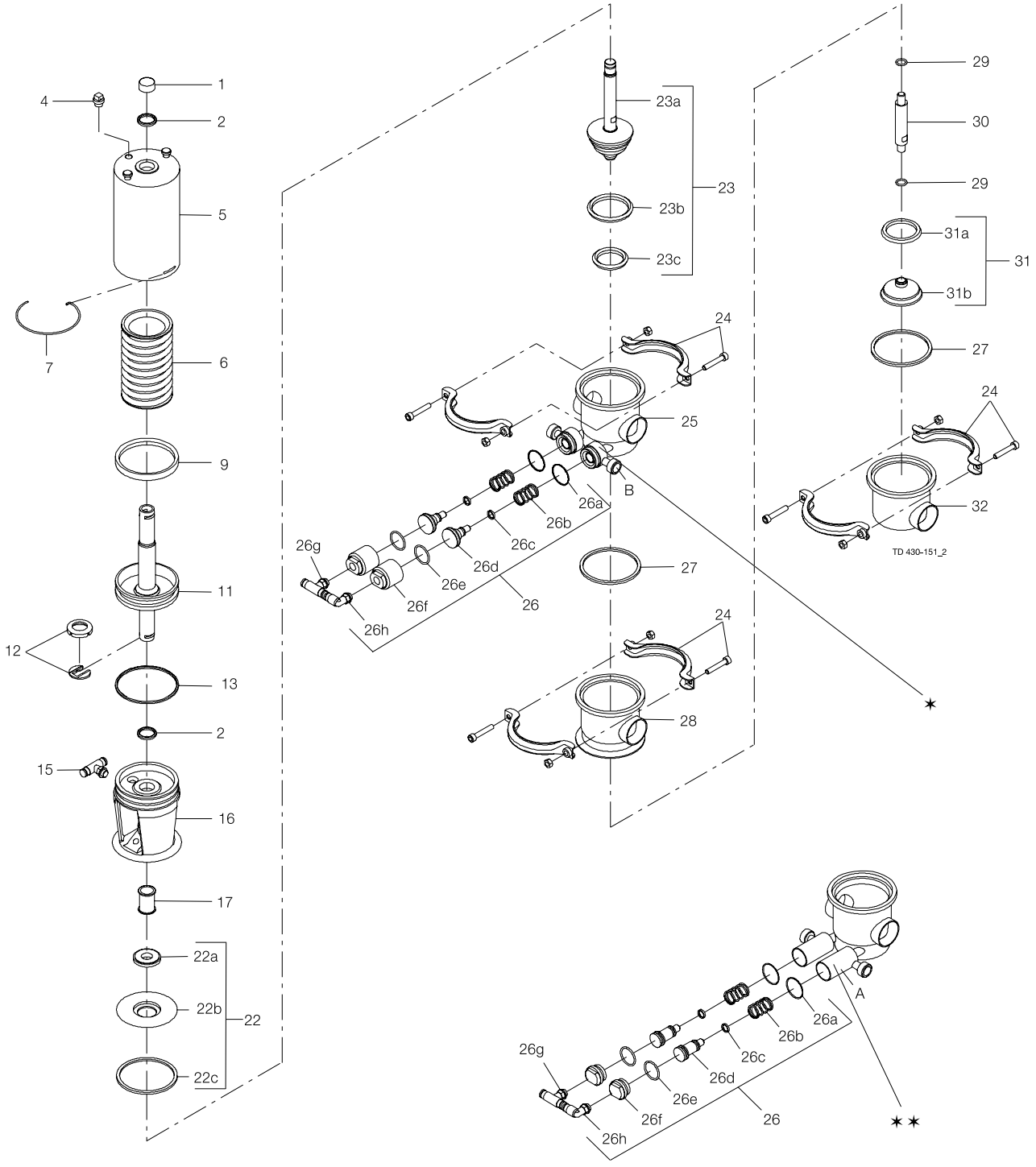
7 Parts list and service kits

The items refer to the parts lists in the following sections.

7.3 SMP-BC change-over valve



✶ CIP/detecting valve.
Diam. ø32.
(Period 9505-)

✶✶ CIP/detecting valve.
Diam. ø27.
(Period 9304-9504)

The items refer to the parts lists in the following sections.

Parts list

Pos.	Qty	Denomination
1	1	Cap
2 □	2	O-ring
4	1	Plug
5	1	Cylinder
6	1	Spring packet
7 □	1	Lock wire
9 □	1	O-ring
11	1	Piston
12 □	1	Clip, complete
13 □	1	O-ring
15	1	Air fitting, swivel tee
16	1	Bonnet
17 □	1	Guide ring
22	1	Lip seal kit
22a ◆○	1	Lip seal
22b	1	Plate
22c ◆○	1	Seal ring
23	1	Plug
23a	1	Plug, upper
23b ◆○	1	Seal ring
24	3	Clamp complete
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 ★	1	Air fitting, swivel tee
26h	1	Air fitting, swivel bend
27 ◆○	2	Seal ring
28	1	Valve body
29 ◆○	2	O-ring
30	1	Stem, lower
31	1	Plug
31a ◆○	1	Seal ring
31b	1	Plug, lower
32	1	Valve body

7 Parts list and service kits

The items refer to the parts lists in the following sections.

Service kits

	Denomination	DN 40 38 mm	DN 50 51 mm	DN65 63.5 mm	DN 80 76 mm	DN 100 101.6 mm
Service Kit for Actuator, detecting / CIP-valve ø32						
□	Service kit	9611920149	9611920149	9611920150	9611920151	9611920151
Service Kit for Product wetted parts - detecting / CIP-valve ø32						
◆	Service kit EPDM	9611920284	9611920284	9611920285	9611920286	9611920287
◆	Service kit NBR	9611920288	9611920288	9611920289	9611920290	9611920291
◆	Service kit FPM	9611920292	9611920292	9611920293	9611920294	9611920295
Service Kit for Product wetted parts - valve with ø27 detecting/CIP -valve						
○	Service kit EPDM	9611920152	9611920152	9611920153	9611920154	9611920155
○	Service kit NBR	9611920156	9611920156	9611920157	9611920158	9611920159
○	Service kit FPM	9611920160	9611920160	9611920161	9611920162	9611920163

Parts marked with □◆○★△ are included in the service kits.

Recommended Spare Parts: Service kits.

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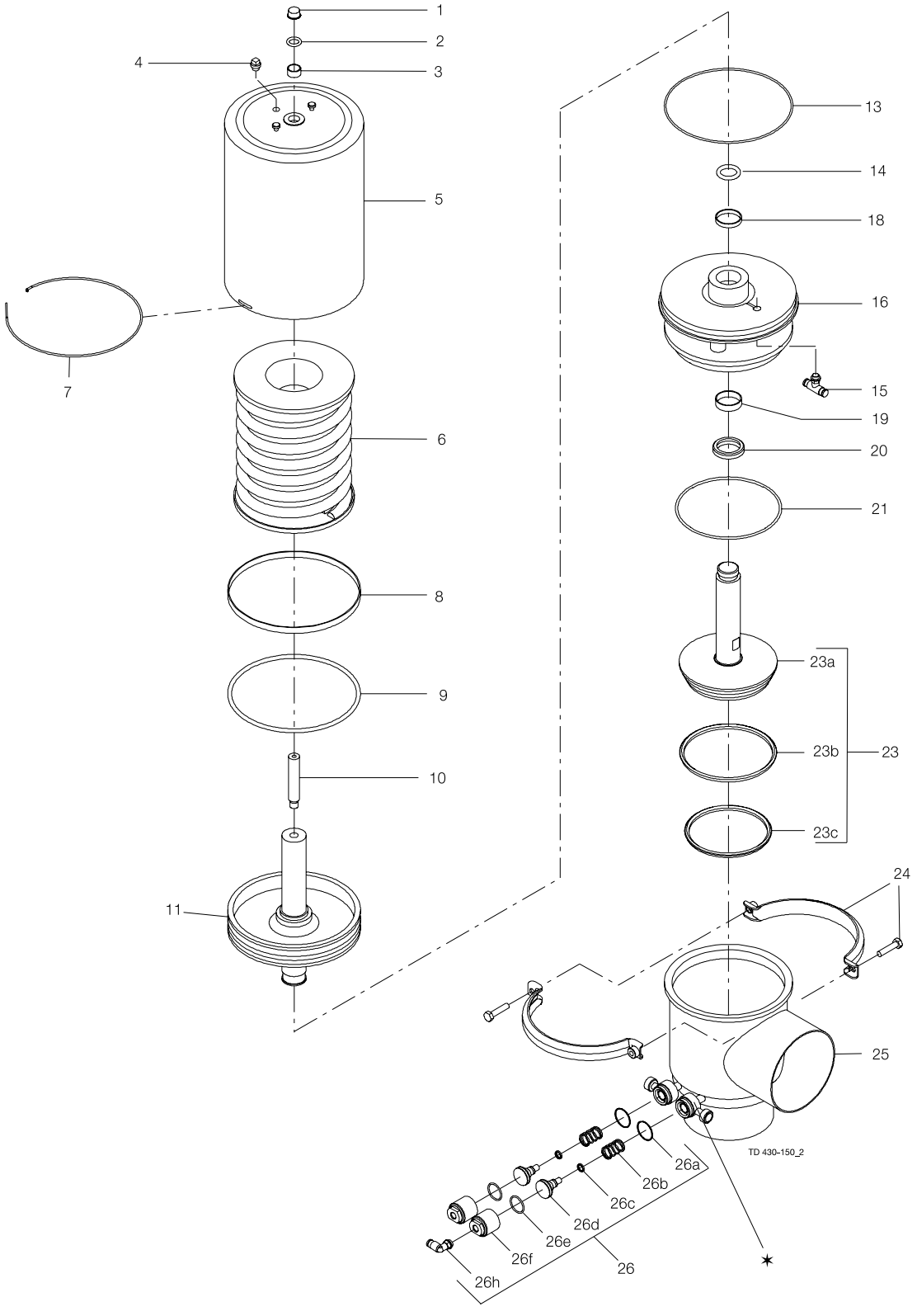
7 Parts list and service kits

The items refer to the parts lists in the following sections.

7.4 SMP-BC stop valve - size DN125/DN150



✶ CIP/detecting valve.
Diam. ø32.

The items refer to the parts lists in the following sections.

Parts list

Pos.		Qty	Denomination
			Actuator, complete
1		1	Cap
2	□	1	O-ring
3	□	1	Guide ring
4		1	Plug
5		1	Cylinder
6		1	Spring packet
7	□	1	Lock wire
8	□	1	Guide ring
9	□	1	O-ring
10		1	Top pin
11		1	Piston
13	□	1	O-ring
14	□	1	O-ring
15		1	Air fitting
16		1	Bonnet
18	□	1	Guide ring
19	□	1	Guide ring
20	◆	1	Lip seal
21	◆	1	Valve body seal ring
23		1	Plug
23a		1	Plug
23b	◆	1	Seal ring
23c	◆	1	Seal ring
24		1	Clamp complete
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
26h		1	Air fitting, swivel bend

Service kits

	Denomination	NC
Service Kit for Actuator		
□	**Service kit**	**9611920296**
Service kit for valve with ø32 detecting / CIP-valve		
◆	**Service kit EPDM**	**9611920297**
◆	**Service kit NBR**	**9611920298**
◆	**Service kit FPM**	**9611920299**

Parts marked with □◆○★△ are included in the service kit.
Recommended spare parts: Service kits.

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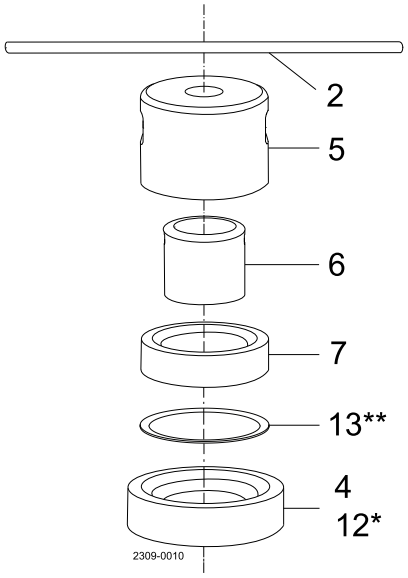
7 Parts list and service kits

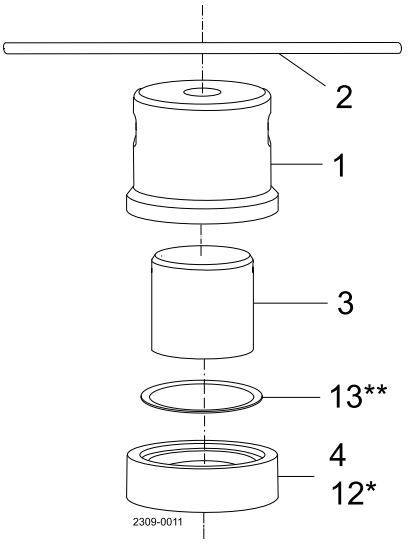
The items refer to the parts lists in the following sections.

7.5 Tools for plug seals

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



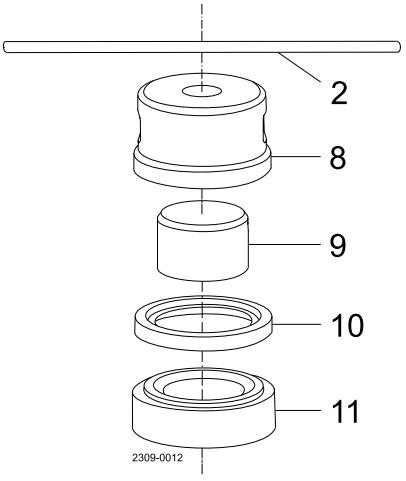
Small seal ring



Large seal ring

* = Only for 38-51 mm/DN40-50 upper change-over plug (marking C8)
** = Only for DN125/150

Tool for change-over valve (lower plug).



Lower valve plug

The items refer to the parts lists in the following sections.

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
13	1	Spacer (DN125/150)

How to contact Alfa Laval
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continually updated on our website.
Please visit www.alfalaval.com to access the information directly.