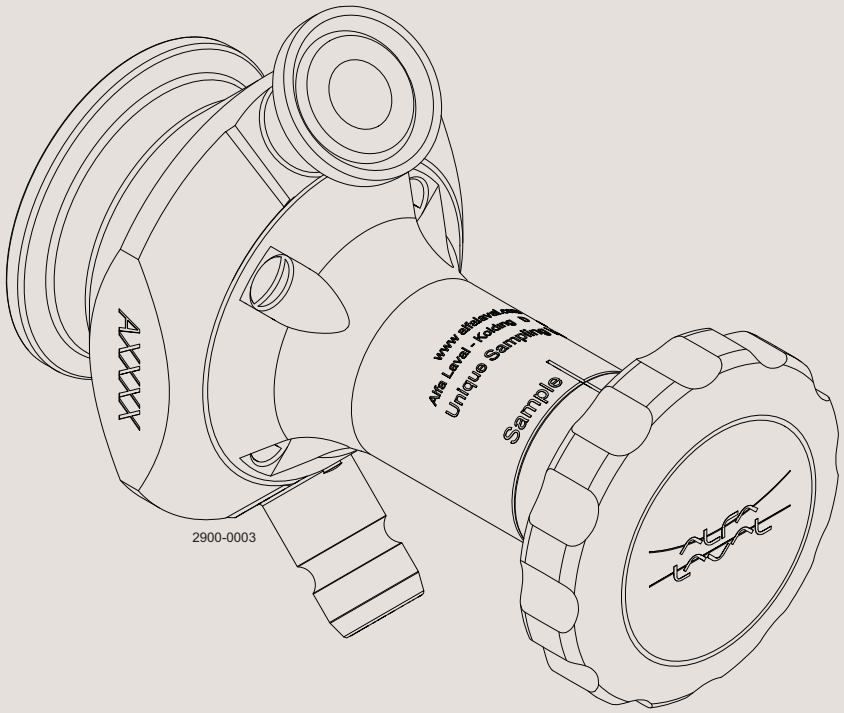
# Instruction Manual

## Unique Sampling Valve - type M - manually operated




ESE01605-EN5 2018-06

Original manual

# Table of contents

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

# 1 Safety

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

## 1.1 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.

## 1.2 Warning signs

General warning:

Caustic agents:

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

## 1.3 Safety precautions

Installation:

**Always** read the technical data thoroughly. (See chapter 6 Technical data)
**Always** release compressed air after use.
**Never** touch the moving parts if the actuator is supplied with compressed air.
**Never** touch the valve or the pipelines when processing hot liquids or when sterilising.
**Never** dismantle the valve with thevalve and pipelines under pressure.
**Never** dismantle the valve when it is hot.

Operation:

**Never** dismantle the valve with the valve and pipelines under pressure.
**Never** dismantle the valve when it is hot.
**Always** read the technical data thoroughly. (See chapter 6 Technical data)
**Always** release compressed air after use.
**Never** touch the valve or the pipelines when processing hot liquids or when sterilising.
**Never** touch the moving parts if the actuator is supplied with compressed air.
**Always** rinse well with clean water after cleaning.

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

Maintenance:

**Always** read the technical data thoroughly. (See chapter 6 Technical data)
**Always** release compressed air after use.
**Never** service the valve when it is hot.
**Never** service the valve with the valve and pipelines under pressure.
**Never** stick your fingers through the valve ports if the actuator is supplied with compressed air.
**Never** touch the moving parts if the actuator is supplied with compressed air.

Transportation:

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

# 2 Installation

*This instruction manual is part of the delivery. Study the instructions carefully.*
*The items refer to the parts list and service kits section.*

## 2.1 Unpacking/delivery

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

Check the delivery for:
1. Valve body
2. Actuator
3. Membrane
4. Plug

Step 2
Remove possible packing materials from the valve/valve parts.
Inspect the valve/valve parts for visible transport damage.
Avoid damaging the valve/valve parts.

## 2.2 General installation

Step 1

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

Always release compressed air after use.

CAUTION
Alfa Laval cannot be held responsible for incorrect installation.

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

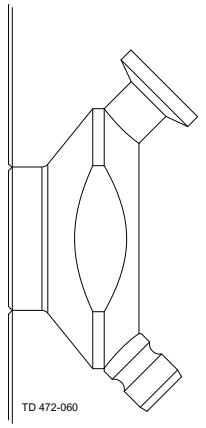
## 2.3 Valve body installation

### Fitting of valve body

The valve body can be integrated into a tank, fitted on pipes or mounted with a clamp connection.
The valve must always be fitted so that the connections are placed vertically to each other.
If the valve is fitted otherwise, the valve will not function properly.

### Tank

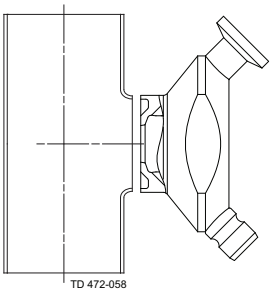
When integrated into a tank, the valve is welded from the inside of the tank.
For a size 4 valve, a hole of Ø29mm is made in the tank.
For a size 10 valve, a hole of Ø38mm is made in the tank.
The connections are fitted so that they are placed vertically.
The body flushes with the inner side of the tank.




### Pipes

#### Standard

The valve is delivered with a machined collar, which makes it possible to fit it onto a collar on a pipe.



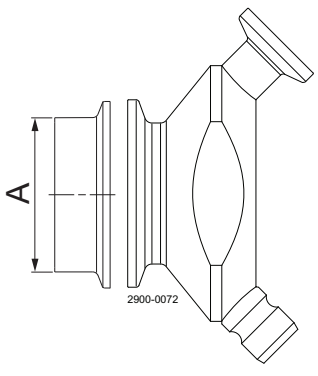

### Clamp

The valve can also be mounted using a clamp connection.

Seal ring (EPDM)

Size 25mm (A): 9611-99-1358
Size 38mm (A): 9611-99-1359

Clamp ring: 211053

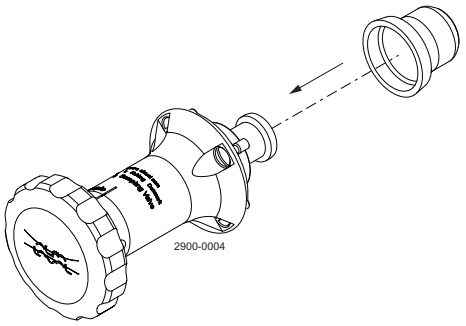


# 2 Installation

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

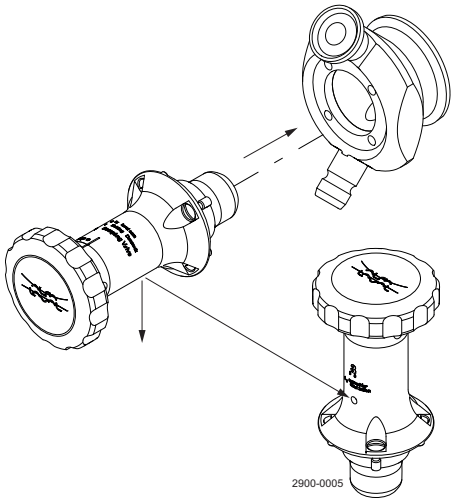
## 2.4 Fitting of actuator

Step 1
Fit the membrane on the actuator.

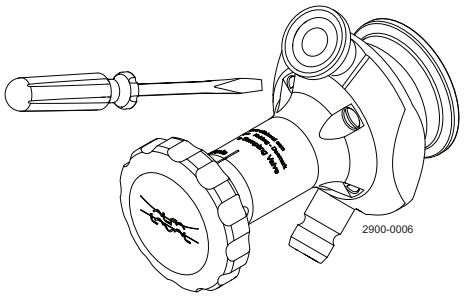



Step 2
Fit the actuator on the valve body.

⚠
Make sure that the Ø2.4mm leak detection hole is facing downwards.




Step 3
Tighten screws with a torque of 2-3 Nm.



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

## 2.5 Recycling information

• Unpacking

- Packing material consists of wood, plastics, cardboard boxes and in some cases metal straps.
- Wood and cardboard boxes can be reused, recycled or used for energy recovery.
- Plastics should be recycled or burnt at a licensed waste incineration plant.
- Metal straps should be sent for material recycling.

• Maintenance

- During maintenance, oil and wearing parts in the machine are replaced.
- All metal parts should be sent for material recycling.
- Worn or defective electronic parts should be sent to a licensed handler for material recycling.
- Oil and all non-metal wearing parts must be dealt with in accordance with local regulations.

• Scrapping

- At the end of use, the equipment should be recycled according to the relevant, local regulations. As well as 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 Operation - single seat valve

*Study the instructions carefully and pay special attention to the warnings!*
*Ensure that the valve operates smoothly.*
*The items refer to the parts list and service kits section.*

## 3.1 Operation

Step 1

**Always** read the technical data carefully.
See chapter 6 Technical data

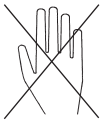
**Always** release compressed air after use.

CAUTION
Alfa Laval cannot be held responsible for incorrect operation.

Step 2

**Never** touch the valve or the pipelines when processing hot liquids or when sterilising.

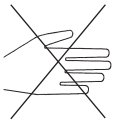
Danger of burns!



Step 3

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

Moving parts!



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

## 3.2 Sterilisation - single seat valve

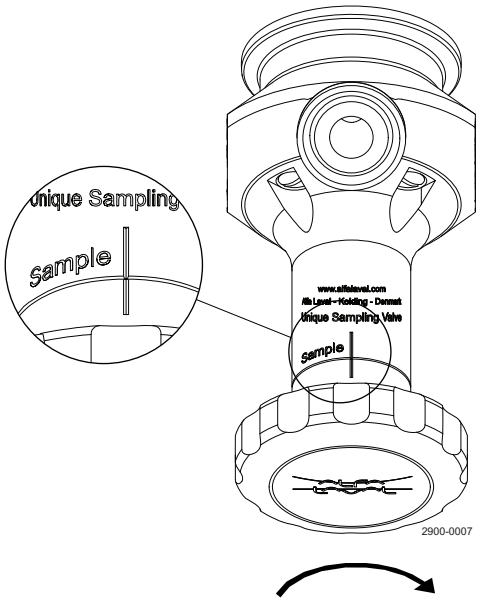
Step 1

⚠

**Always** sterilise the valve before taking a sample

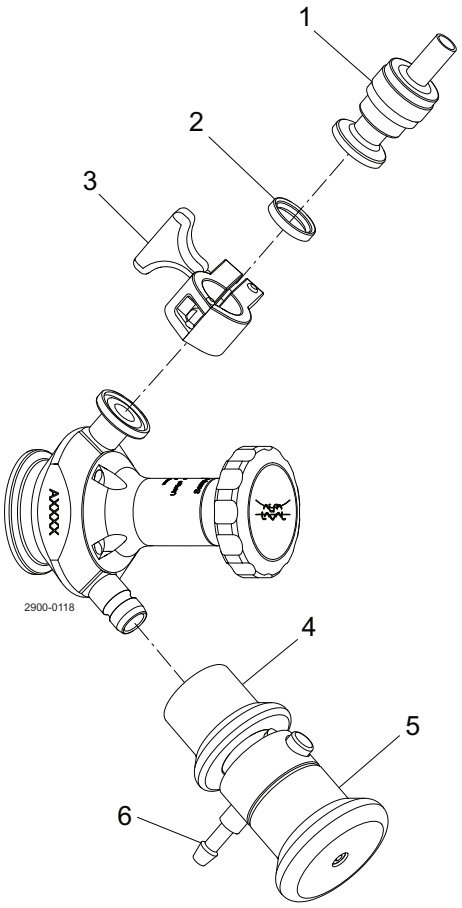
**Sterilisation procedure:**

1. Make sure that the valve is in the closed position before sterilisation.




Step 2

1. Connect steam to the upper connection. It is advisable to use a non-return valve (1) on the upper connection. This enables steaming and sampling without removal of the steam line or using an unsterile blind cap.
2. Steam the valve for 2 minutes, at a constant steam pressure of 2.5-3.5 [bar]. A pressure relief valve (4) is required. Release the enclosed steam by pulling the quick release handle before removing the pressure relief valve from the sampling valve.
3. The valve is now ready to take a representative and sterile sample.



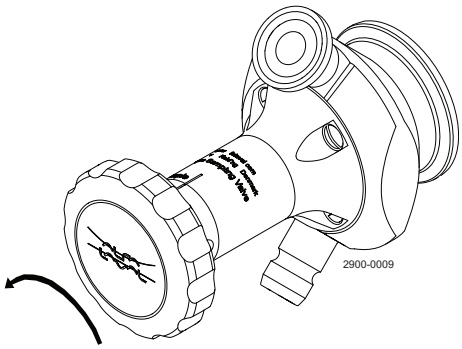

1. Non-return valve
2. Seal ring (article no. 290273) not included
3. Clamp ring (article no. 211290) not included
4. Pressure relief valve
5. Handle for quick release of steam
6. Steam outlet - be careful!

# 3 Operation - single seat valve

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

## 3.3 Sampling - single seat valve

Step 1
Taking a sample
1. Turn the handle anti-clockwise until the desired product flow is obtained.
2. Once the required sample amount has been taken, close the valve by turning the handle clockwise until the handle is in the centre closed position.




Step 2
Important!
1. Sterilise the valve after each sample.
   It is very important that the valve is properly cleaned and sterilised after a sample has been taken.
   This reduces the possibility of cross contamination in the next sample.
   Therefore, repeat the sterilisation procedure each time the valve has been used.

## 3.4 Troubleshooting

NOTE!

Study the maintenance instructions carefully before replacing worn parts.

| Problem | Cause | Repair |
|---|---|---|
| External product leakage | Worn membrane | Replace the membrane |
| | Product pressure exceeds valve specification | Reduce the product pressure |
| The valve does not open/close | Product pressure exceeds actuator specification | Reduce product pressure |
| | Actuator is worn or damaged | Replace worn or damaged parts (Remember to lubricate) |

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

## 3.5 Recommended cleaning

Step 1

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

Caustic danger!

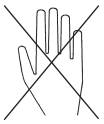
**Always** use rubber gloves!

**Always** use protective goggles!

Step 2

**Never** touch the valve or the pipelines when sterilising.

Danger of burns!



Step 3

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

Step 4

**Examples of cleaning agents:**
Use clean water, free from 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

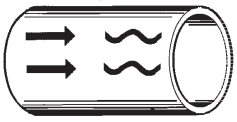
| | | | | |
|---|---|---|---|---|
| 0.7 l 53% $HNO_3$ | + | 100 l water | = | Cleaning agent. |

Step 5

1. Avoid excessive concentration of the cleaning agent.
2. Adjust the cleaning flow to the process.
3. **Always** rinse well with clean water after cleaning.

NOTE
The cleaning agents must be stored/disposed off in accordance with current regulations/directives.

Always rinse!



Clean water Cleaning agents

# 4 Operation - double seat valve

*Study the instructions carefully and pay special attention to the warnings!*
*Ensure that the valve operates smoothly.*
*The items refer to the parts list and service kits section.*

## 4.1 Operation

Step 1

**Always** read the technical data carefully.
See chapter 6 Technical data

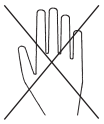
**Always** release compressed air after use.

CAUTION
Alfa Laval cannot be held responsible for incorrect operation.

Step 2

**Never** touch the valve or the pipelines when processing hot liquids or when sterilising.

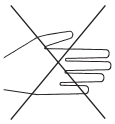
Danger of burns!



Step 3

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

Moving parts!



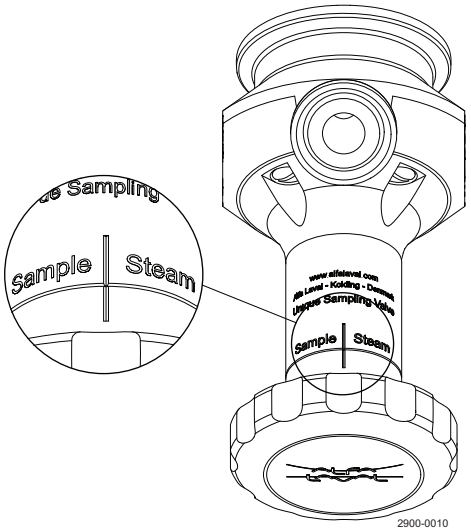
## 4.2 Sterilisation - double seat valve

Step 1

**Always** sterilise the valve before taking a sample.

**Sterilisation procedure:**

1. Make sure that the valve is in the closed position before sterilisation.

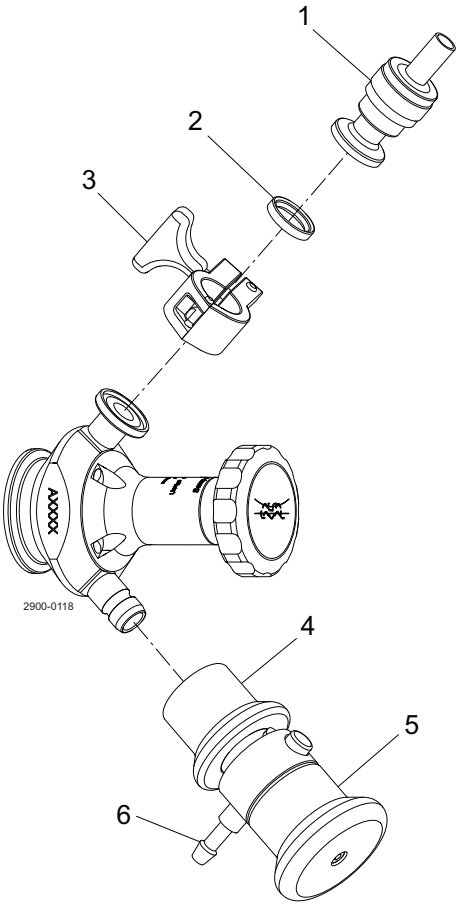


*Study the instructions carefully. The items refer to the parts list and service kits section. Handle scrap correctly.*

## Step 2

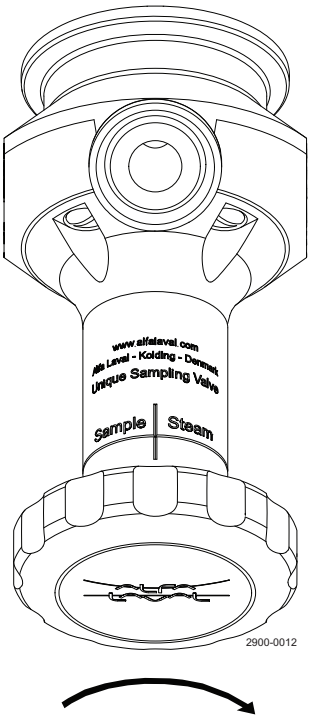
1. Connect steam to the upper connection. It is advisable to use a non-return valve (1) on the upper connection. This enables steaming and sampling without removal of the steam line or using an unsterile blind cap.

1. Non-return valve
2. Seal ring (article no. 290273) not included
3. Clamp ring (article no. 211290) not included
4. Pressure relief valve
5. Handle for quick release of steam
6. Steam outlet - be careful!




## Step 3

1. Turn the handle clockwise to steam/cleaning position.
2. Steam the valve for 2 minutes, at a constant steam pressure of 2.5-3.5 [bar]. A pressure relief valve (4) is required. Release the enclosed steam by pulling quick release handle before removing the pressure relief valve from the sampling valve.
3. The valve is now ready to take a representative and sterile sample.

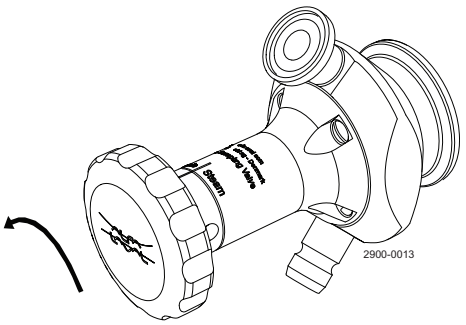


# 4 Operation - double seat valve

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

## 4.3 Sampling - double seat valve

Step 1
Taking a sample
1. Turn the handle anticlockwise until the desired product flow is obtained.
2. Once the required sample amount has been taken, close the valve by turning the handle clockwise until the valve is in the centre closed position.




Step 2
Important!
1. Sterilise the valve after each sample.
   It is very important that the valve is properly cleaned and sterilised after a sample is taken. This reduces the possibility of cross contamination in the next sample. Therefore, repeat the sterilisation procedure each time the valve has been used.

## 4.4 Troubleshooting

NOTE!

Study the maintenance instructions carefully before replacing worn parts.

| Problem | Cause | Repair |
|---|---|---|
| External product leakage | Worn membrane | Replace the membrane |
| | Product pressure exceeds valve specification | Reduce the product pressure |
| The valve does not open/close | Product pressure exceeds actuator specification | Reduce product pressure |
| | Actuator is worn or damaged | Replace worn or damaged parts (Remember to lubricate) |

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

## 4.5 Recommended cleaning

Step 1

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

Caustic danger!

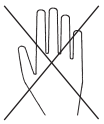
**Always** use rubber gloves!

**Always** use protective goggles!

Step 2

**Never** touch the valve or the pipelines when sterilising.

Danger of burns!



Step 3

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

Step 4

**Examples of cleaning agents:**
Use clean water, free from 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

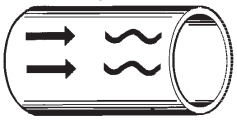
| | | | | |
|---|---|---|---|---|
| 0.7 l 53% $HNO_3$ | + | 100 l water | = | Cleaning agent. |

Step 5

1. Avoid excessive concentration of the cleaning agent.
2. Adjust the cleaning flow to the process.
3. **Always** rinse well with clean water after cleaning.

NOTE
The cleaning agents must be stored/disposed off in accordance with current regulations/directives.

Always rinse!



Clean water Cleaning agents

# 5 Maintenance

*Maintain the valve regularly.*
*Study the instructions carefully and pay special attention to the warnings!*
*Always keep spare rubber seals and lip seals in stock.*
*Check the valve for smooth operation after service.*

## 5.1 General maintenance

Step 1

**Always** read the technical data carefully.
See chapter 6 Technical data.

**Always** release compressed air after use.

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

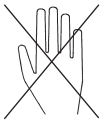
Step 2

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

**Never** service the valve with the valve and pipelines under pressure.

Atmospheric pressure required!

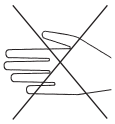
Danger of burns!



Step 3

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

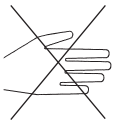
Cutting danger!



Step 4

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

Moving parts!



# 5 Maintenance

*Maintain the valve regularly.*
*Study the instructions carefully and pay special attention to the warnings!*
*Always keep spare rubber seals and lip seals in stock.*
*Check the valve for smooth operation after service.*

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

| | Membrane | Actuator |
|---|---|---|
| Preventive maintenance | Replace after 500-1000 samples (depending on working conditions) | Disassemble, clean and lubricate the actuator every 5 years (depending on working conditions) |
| Maintenance after leakage (leakage normally starts slowly) | Replace at the end of the day | Disassemble, clean and lubricate the actuator when possible |
| Planned maintenance | - Regular inspection for leakage and smooth operation<br>- Keep a record of the valve<br>- Use the statistics for inspection planning<br>**Replace after leakage** | - Regular inspection for leakage and smooth operation<br>- Keep a record of the actuator<br>- Use the statistics for inspection planning |
| Lubrication | None | **Before fitting**<br>Klüber Paraliq GTE 703 |

**Pre-use check:**
1. Open and close the valve several times to ensure that it operates smoothly.
   **Pay special attention to the warnings!**

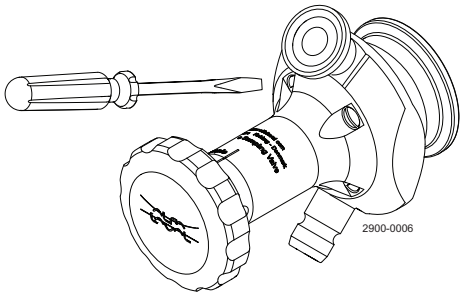
**Recommended spare parts**
Service kits (see section 7 Parts list and service kits)

# 5 Maintenance

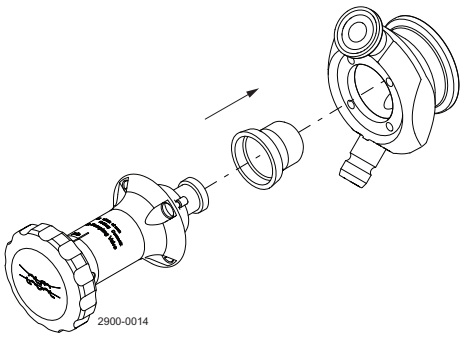
*Study the instructions carefully. The items refer to the parts list and service kits section. Handle scrap correctly.*
*NC = Normally closed.*
*NO = Normally open.*
*A/A = Air/air activated.*

## 5.2 Dismantling the valve

Step 1
1. Undo screws.




Step 2
1. Pull actuator from valve body.
2. Remove membrane.




## 5.3 Valve assembly

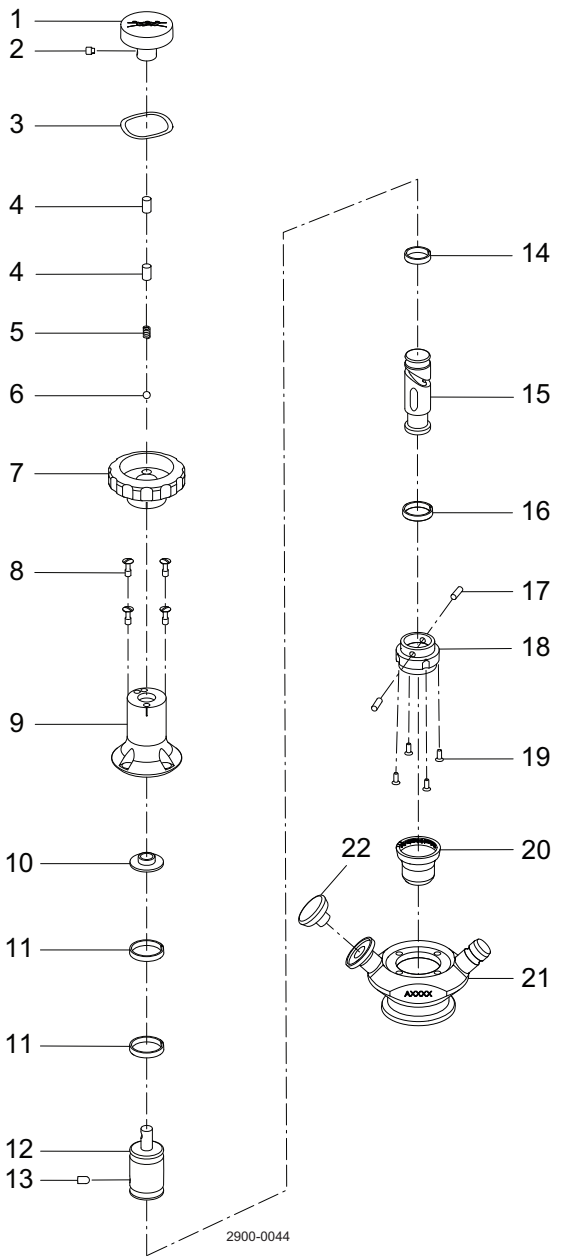
Follow the reverse order of chapter 5.2 Dismantling the valve.

*Study the instructions carefully. The items refer to the parts list and service kits section. Handle scrap correctly.*
*NC = Normally closed.*
*NO = Normally open.*
*A/A = Air/air activated.*

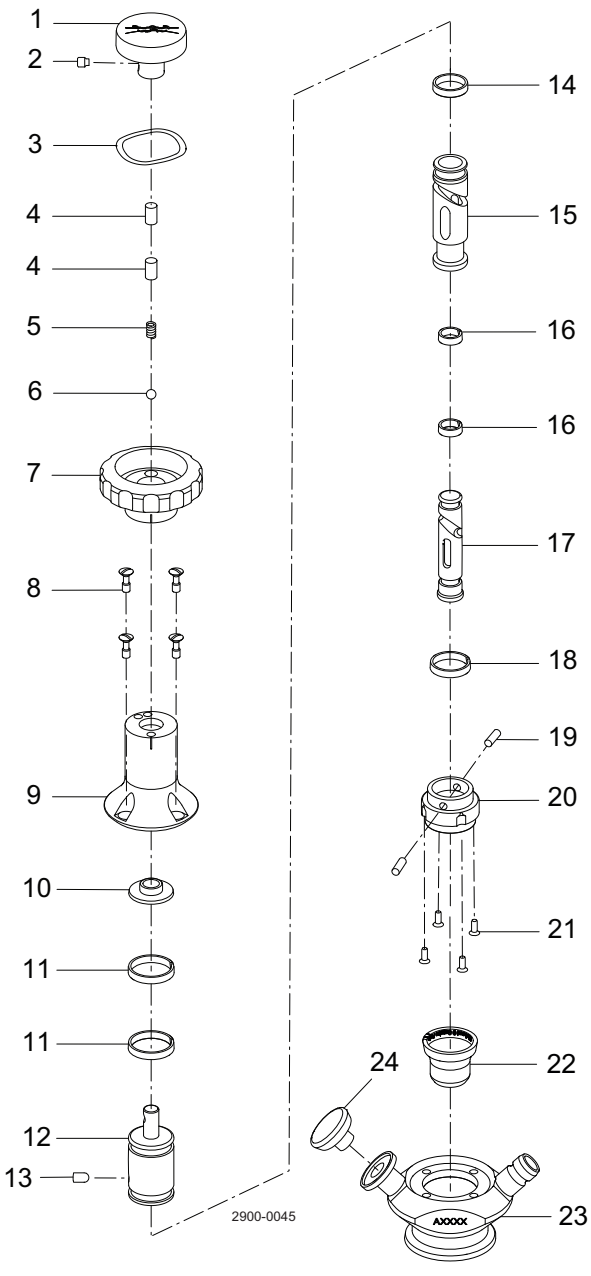
## 5.4 Dismantling the actuator

If the actuator has to be dismantled due to membrane leakage or maintenance, use the drawing below for reference. Both the single and double seat actuator can be maintained using standard tools.

Single seat actuator




Double seat actuator



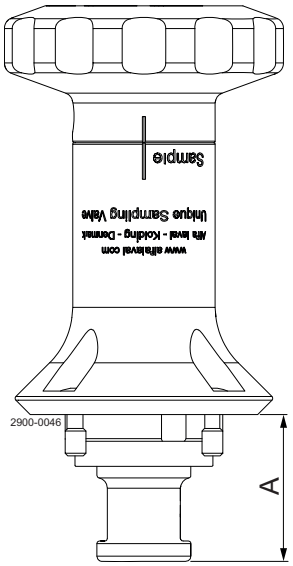
# 5 Maintenance

*Study the instructions carefully. The items refer to the parts list and service kits section. Handle scrap correctly.*
*NC = Normally closed.*
*NO = Normally open.*
*A/A = Air/air activated.*

## 5.5 Assembly of actuator

Use the drawing on the previous page to support the assembly. Don't forget to lubricate the actuator when assembling.
**Note:**
After the actuator has been assembled, it is important to measure the spindle position to ensure correct valve function.

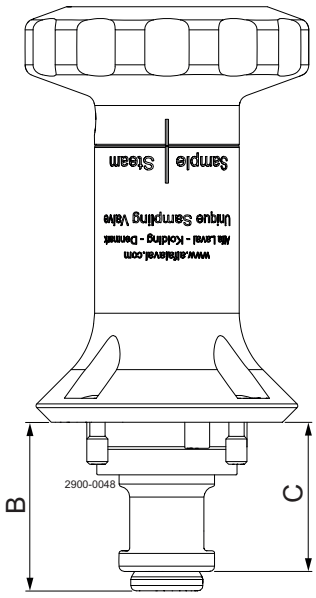
**Single seat actuator**
Closed position




A:
Size 4: 19.1 - 19.3 mm
Size 10: 27.95 - 28.2 mm

**Double seat actuator**
Closed position


**Double seat actuator**
Steam position




A:
Size 4: 19.1 - 19.3 mm
Size 10: 27.95 - 28.2 mm

B:
Size 4: 21 - 21.2 mm
Size 10: 29.9 - 30.1 mm

C:
Size 4: 17.4 - 17.6 mm
Size 10: 25.95 - 26.2 mm

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

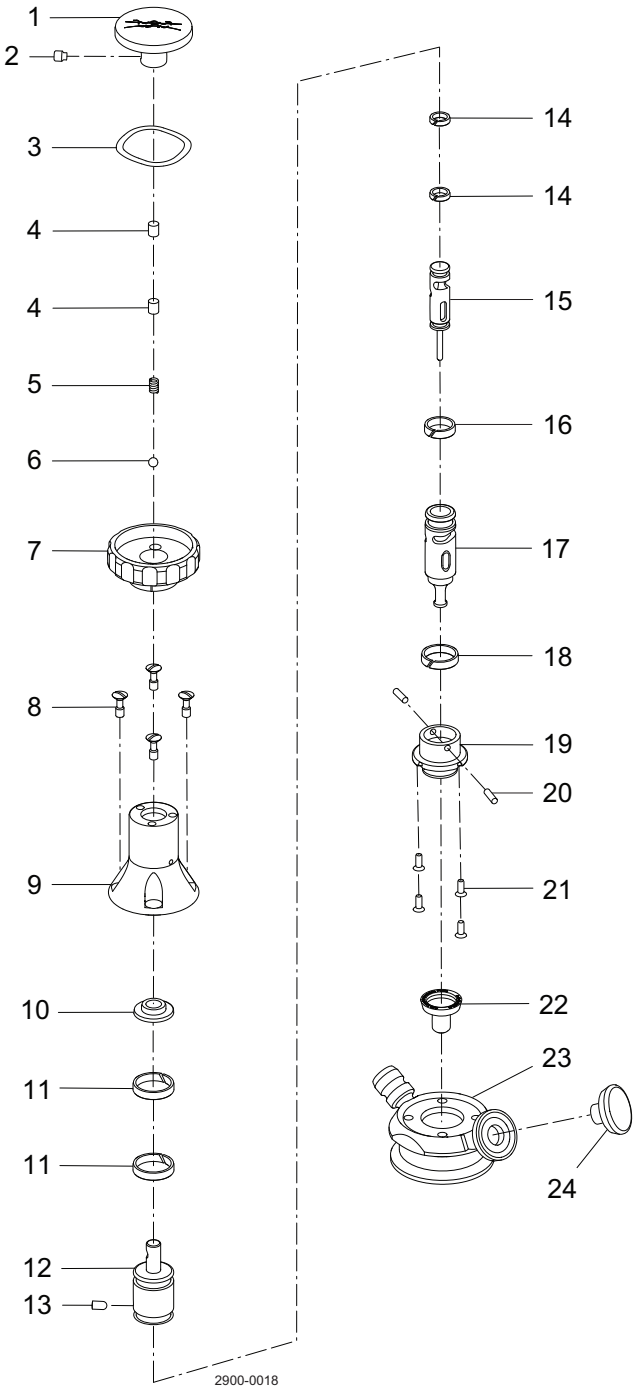
## 6.1 Technical data

| Data - valve/actuator | |
|---|---|
| Max. product pressure | 600 kPa (6 bar) |
| Max. working temperature | 121 °C (2 bar) |
| Max. working torque | 10 Nm |
| Weight: - Size 4: | 0.7 kg |
| - Size 10: | 1.1 kg |
| **Materials - valve/actuator** | |
| Product wetted steel parts | 1.4404 (316L) (internal Ra < 0.8 µm) |
| Other steel parts | 304, aluminium bronze |
| Membrane seal | EPDM |
| Optional product wetted seals | Q |

# 7 Parts list and service kits

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

## 7.1 Manual handle for USV size 4 double seat



# 7 Parts list and service kits

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

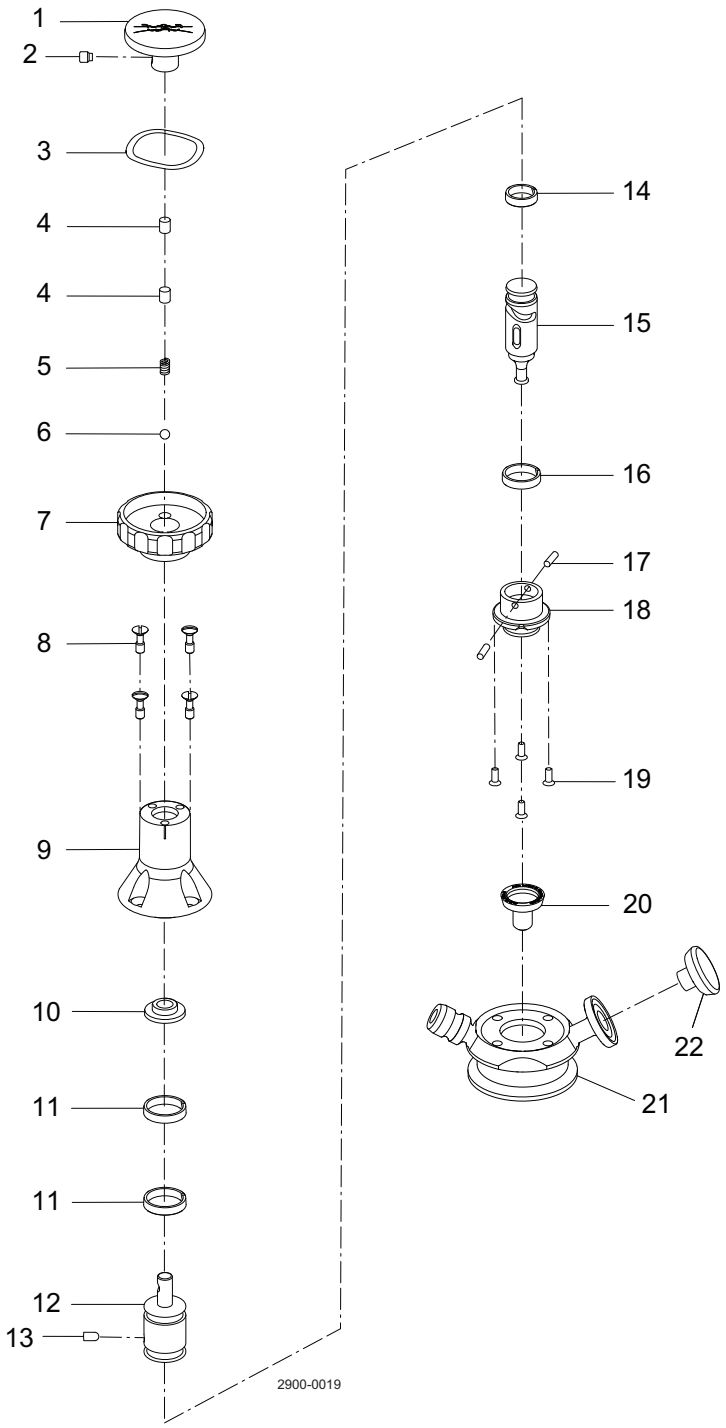
## Parts list

| Pos. | Qty | Denomination |
|---|---|---|
| | | Actuator |
| 1 | 1 | Drive handle |
| 2 | 1 | Pin screw |
| 3 | 1 | Wave spring |
| 4 | 2 | Pin |
| 5 | 1 | Spring |
| 6 | 1 | Ball |
| 7 | 1 | Handle |
| 8 | 1 | Mounting screw, set of 4 pcs. |
| 9 | 1 | Actuator body |
| 10 | 1 | Spacer |
| 11 | 2 | Guide ring |
| 12 | 1 | Piston drive |
| 13 | 1 | Guide pin |
| 14 | 2 | Guide ring |
| 15 | 1 | Inner piston |
| 16 | 1 | Guide ring |
| 17 | 1 | Outer piston |
| 18 | 1 | Guide ring |
| 19 | 1 | Actuator bottom |
| 20 | 2 | Pin |
| 21 | 4 | Screws |
| 22 | 10 | Membrane seal |
| 23 | 1 | Valve body |
| 24 | 1 | Plug for upper connection |

# 7 Parts list and service kits

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

## 7.2 Manual handle for USV size 4 single seat



# 7 Parts list and service kits

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

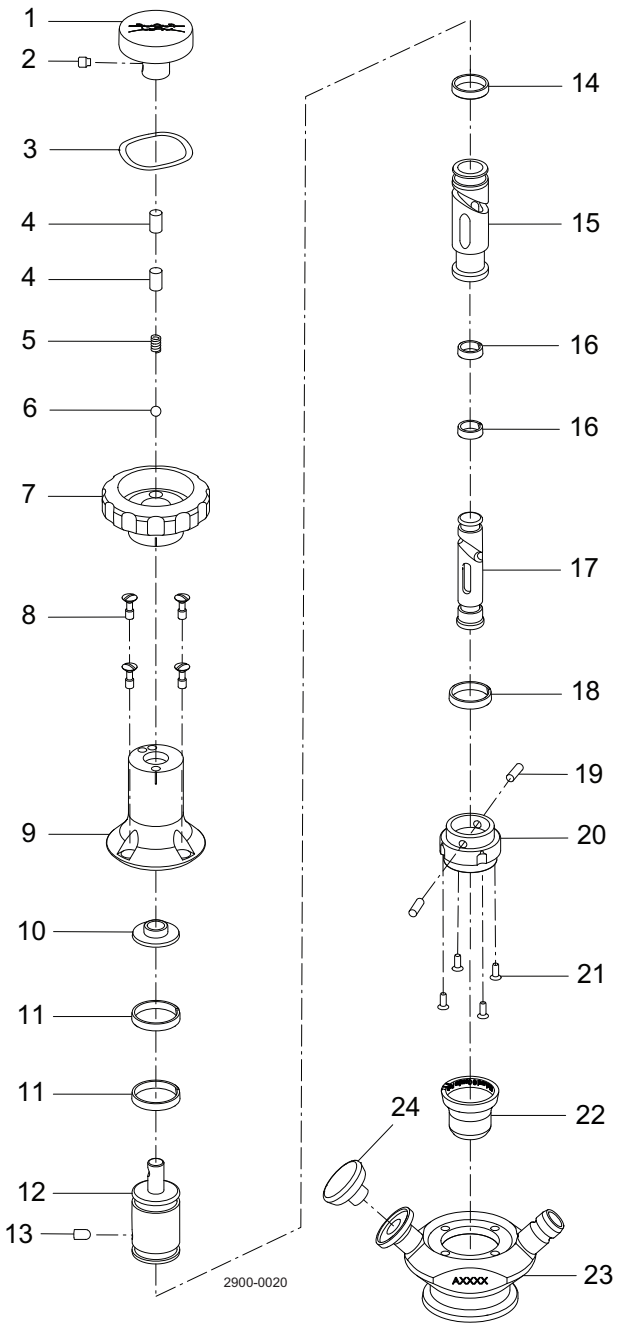
## Parts list

| Pos. | Qty | Denomination |
|---|---|---|
| | | Actuator |
| 1 | 1 | Drive handle |
| 2 | 1 | Pin screw |
| 3 | 1 | Wave spring |
| 4 | 2 | Pin |
| 5 | 1 | Spring |
| 6 | 1 | Ball |
| 7 | 1 | Handle |
| 8 | 1 | Mounting screw, set of 4 pcs. |
| 9 | 1 | Actuator body |
| 10 | 1 | Spacer |
| 11 | 2 | Guide ring |
| 12 | 1 | Piston drive |
| 13 | 1 | Guide pin |
| 14 | 1 | Guide ring |
| 15 | 1 | Piston |
| 16 | 1 | Guide ring |
| 17 | 2 | Pin |
| 18 | 1 | Actuator bottom |
| 19 | 4 | Screws |
| 20 | 10 | Membrane seal |
| 21 | 1 | Valve body |
| 22 | 1 | Plug for upper connection |

# 7 Parts list and service kits

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

## 7.3 Manual handle for USV size 10 double seat



# 7 Parts list and service kits

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

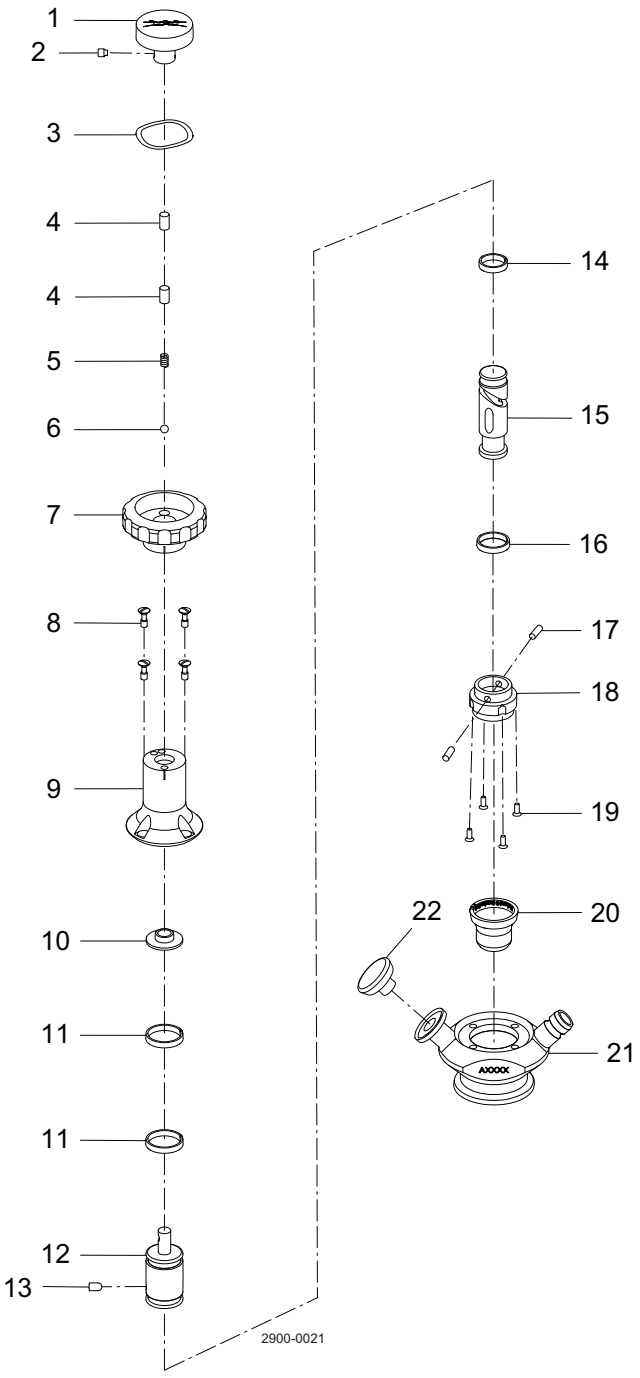
## Parts list

| Pos. | Qty | Denomination |
|---|---|---|
| | | Actuator |
| 1 | 1 | Drive handle |
| 2 | 1 | Pin screw |
| 3 | 1 | Wave spring |
| 4 | 2 | Pin |
| 5 | 1 | Spring |
| 6 | 1 | Ball |
| 7 | 1 | Handle |
| 8 | 1 | Mounting screw, set of 4 pcs. |
| 9 | 1 | Actuator body |
| 10 | 1 | Spacer |
| 11 | 2 | Guide ring |
| 12 | 1 | Piston drive |
| 13 | 1 | Guide pin |
| 14 | 1 | Guide ring |
| 15 | 1 | Outer piston |
| 16 | 2 | Guide ring |
| 17 | 1 | Inner piston |
| 18 | 1 | Guide ring |
| 19 | 2 | Pin |
| 20 | 1 | Actuator bottom |
| 21 | 4 | Screws |
| 22 | 10 | Membrane seal |
| 23 | 1 | Valve body |
| 24 | 1 | Plug for upper connection |

# 7 Parts list and service kits

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

## 7.4 Manual handle for USV size 10 single seat



# 7 Parts list and service kits

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

## Parts list

| Pos. | Qty | Denomination |
|---|---|---|
| | | Actuator |
| 1 | 1 | Drive handle |
| 2 | 1 | Pin screw |
| 3 | 1 | Wave spring |
| 4 | 2 | Pin |
| 5 | 1 | Spring |
| 6 | 1 | Ball |
| 7 | 1 | Handle |
| 8 | 1 | Mounting screw, set of 4 pcs. |
| 9 | 1 | Actuator body |
| 10 | 1 | Spacer |
| 11 | 2 | Guide ring |
| 12 | 1 | Piston drive |
| 13 | 1 | Guide pin |
| 14 | 1 | Guide ring |
| 15 | 1 | Piston |
| 16 | 1 | Guide ring |
| 17 | 2 | Pin |
| 18 | 1 | Actuator bottom |
| 19 | 4 | Screws |
| 20 | 10 | Membrane seal |
| 21 | 1 | Valve body |
| 22 | 1 | Plug for upper connection |

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