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1 General

1.1 General information

The Minidisc series consists of various versions

The standard Minidisc Valve - MS series
Range 1,5" - 6"



The Double disc Valve – MD series
Range 2" - 3"



Standard valve Features.

- Grade 316 stainless steel.
- Seat options: Silicone, EPDM, BUNA, FKM, PTFE
- O-ring options: Silicone, EPDM, BUNA, FKM
- Suitable for Liquid, Powder, Slurries and in aggressive environments.
- 3-A Sanitary Standards.
- Connections options: any combination of clamp, weld or thread ends.
- Visible operating position with 'Open - Close' sticker.
- Disassembles without tools.
- Easy maintenance.
- Operation options: Manual, Actuated or Regulating.

2 Safety

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

2.1. Important information

Always read the manual before using the valve!

Expressions used in this manual.

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.

Symbols used in this manual.



General warning



Cutting danger



Caustic agents

2.2. Safety precautions

Installation:

Before installing always read the technical data thoroughly (see chapter 6 Technical data)



Never install the valve with connected compressed air
With a connected airline there is a chance that the actuator will be activated during installation and risk of injury.

During operation:



Never touch the valve or the pipes while processing hot liquids.
there is a risk of injury if the product consists of aggressive or hot liquid.
Never remove the air line during operation, if a loose airline is activated, there is a risk of injury from a swishing line.

Performing maintenance:



Before starting, maintenance, disconnect compressed air line.
If present, disconnect wiring from status report.
Never pressurize the valve when servicing the valve.
The warranty for TMG Minidisc products depends on the use of original TMG Minidisc spare parts.

During transport:



Always ensure that all connections are removed before you remove the valve from the installation.
Check the weight of the valve before removing it from the installation.
Always ensure that the valve is properly secured during transport.
If specially designed packaging material is available, it must be used.



Residual fluid that flows out of valve and pipelines can contain acid or lye.
Dispose of spilled liquid according to the rules.

3 Installation

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

3.1. Unpacking / intermediate storage



TMG Holland BV cannot be held responsible for incorrect unpacking.

Check the delivery for:

1. Complete valve
 2. Instruction manual
 3. Valve for damage
 4. Delivery note
- Remove packaging material
Use the right tools to remove staples and / or straps.
 - Carefully lift the valve out of the package, use lifting equipment if necessary.
 - Remove possible packing materials from the valve ports.
 - Inspect the valve for any transport damage.
 - The valve is packed completely assembled during transport.
 - When the body of the valve is delivered as a welding version, the complete valve must be disassembled.
 - If the valve is equipped with an actuator and indicator, it is recommended to install the valve without an actuator and indicator.

Recycling information

Unpacking

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

Maintenance

- During maintenance, oil and wearing parts in the machine are replaced
- All metal parts should be sent for material recycling
- Worn out or defective electronic parts should be sent to a licensed handler for material recycling
- Oil and all non-metal wear parts must be disposed of 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.

3.2 Welding instructions for body and ferrule.

The valve body and ferrule can be equipped with a welding end.
Always disassemble the complete valve before welding.
The weld ends are not equipped with weld edge chamfer.
Body and ferrule must be welded into the pipe system according to ISO 3834 certification.



3.3 Installation of valve.

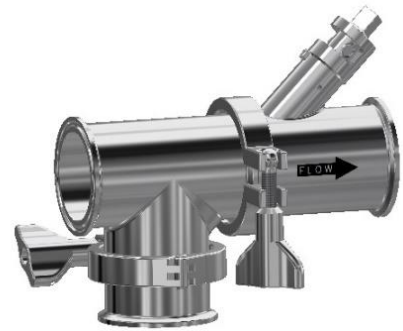
When installing, observe the flow direction as shown indicated on the valve by an arrow.

Check that the valve is suitable for the application being installation parameters (pressure, temperature, medium).

The pipe network is used for mounting the valve thoroughly cleaned.
Before installation, check that the valve is functioning properly by to open and close it.

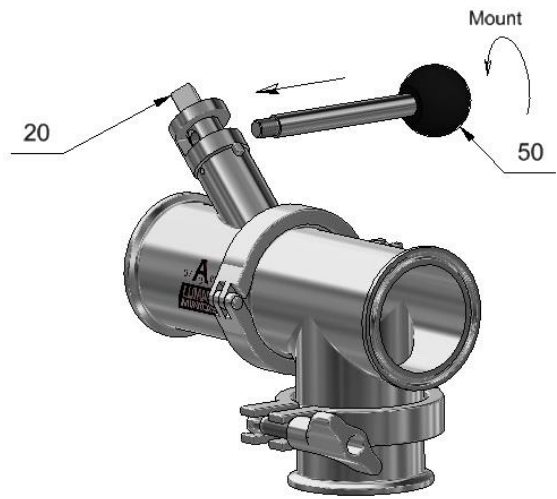
No special tools are required to install the valve.

If the try-clamp version is used, no tools are required. Try-clamp fasteners should only be hand tightened without using any tools



3.4. Manual operated valves

Handles for manual operated valves can be arranged in type H, HL and HLL.



3.4.1 Standard handle type H

Disc and Stem (20) can be supplied with or without square when mounting handle type H.

Handle type H can be mounted during valve mounting.

The handle (50) can only be mounted on the flat side of the threaded hole of stem.

Always tighten the handle properly.

The disc is not blocked when using handle type H

3.4.2 Handle with lock type HL

Disc and Stem (20) can be supplied with or without square when mounting handle type HL.

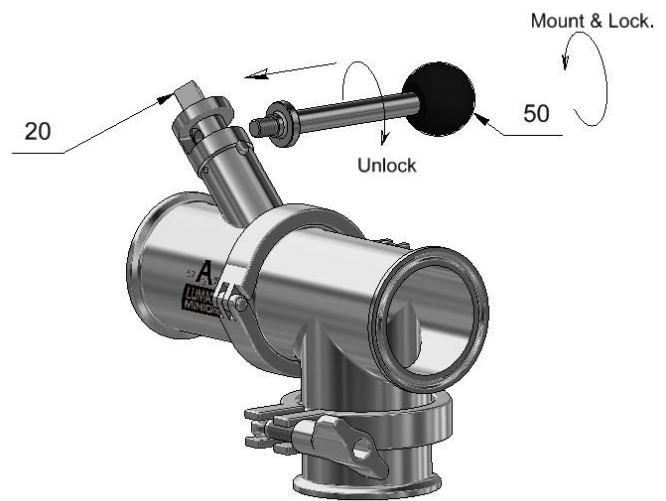
Handle type HL (50) can be mounted during valve mounting.

The handle can only be mounted on the flat side of the threaded hole of stem.

To lock the position of the disc, turn the handle firmly clockwise.

To change the position of the disc, loosen the handle by turning counterclockwise, and turn the disc.

The disc can be locked in any position by using handle type HL.



3.4.3. Handle with lift and lock type HLL

If handle with lift and lock is used, the following facilities must be present.

- body (10) equipped with blocking point (12)
- Stem (20) with internal thread on top of square.

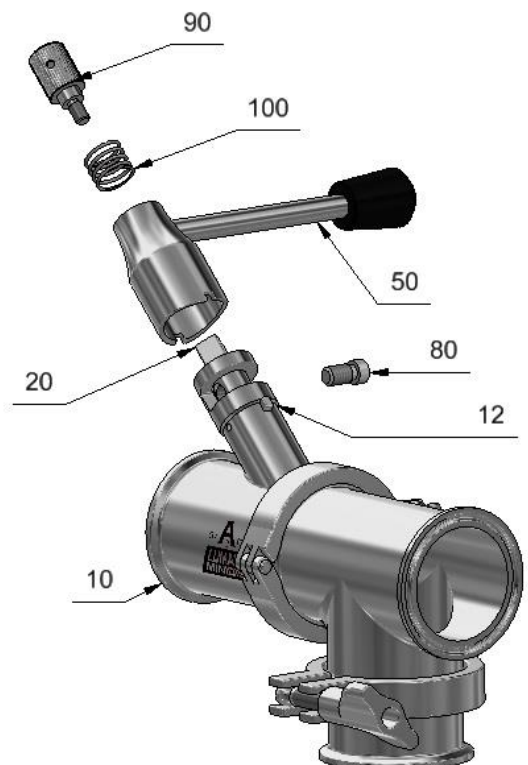
Mount Set screw (80), it can only be mounted on the flat side of the threaded hole of stem.

Mount the handle (50) over the neck of the body (10) the recess slides over the block (12).

Place the spring (100) in the handle, resting the spring on the neck of body (10).

Mount the release button (90) through the spring (100) onto the Stem (20). Tighten the release button securely.

When mounting the handle, be sure that the direction of the handle matches with the position of setscrew (80)



3.5. Air operated valves.

3.5.1 Actuator type AS

When the valve is designed as type AS for the upper disc, make sure the upper disc is closed before mounting the actuator.

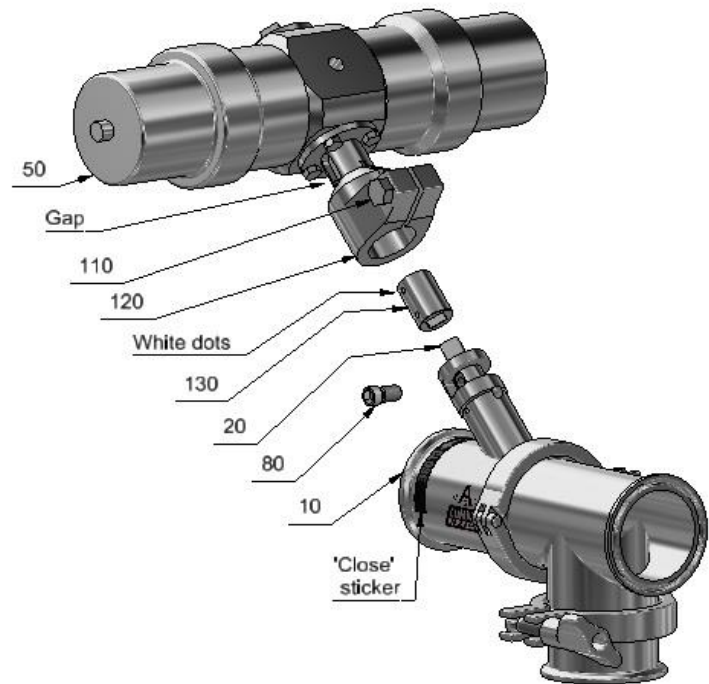
Make sure the Stem (20) is locked with set screw (80)

Make sure the coupling (130) is correctly positioned on the stem (20). For type AS, the white dots on the coupling (130) must match the 'close' side of the sticker.

Then push the actuator with the shaft (120) over the body as far as possible. Turn the actuator 10 degrees to position it correctly on the valve.

This sets the preload of the springs, it will take some force.

After then firmly tighten the bolt (110)



Check.

The marking on the top square of the Gear will be on 90 degrees relative to the centerline of the Actuator. The white dot visible through the gap now corresponds to the closed side of the 'Open <-> Close' sticker.

3.5.2 Actuator type AA

For mounting type AA actuator on valve, the same procedure can be followed as for type AS.

Before mounting the actuator, the position of the pistons must be checked.

To put the pistons in the correct position, an airline must be connected to port P2.1 or P2.2.

Make sure the upper disc is in the closed position.

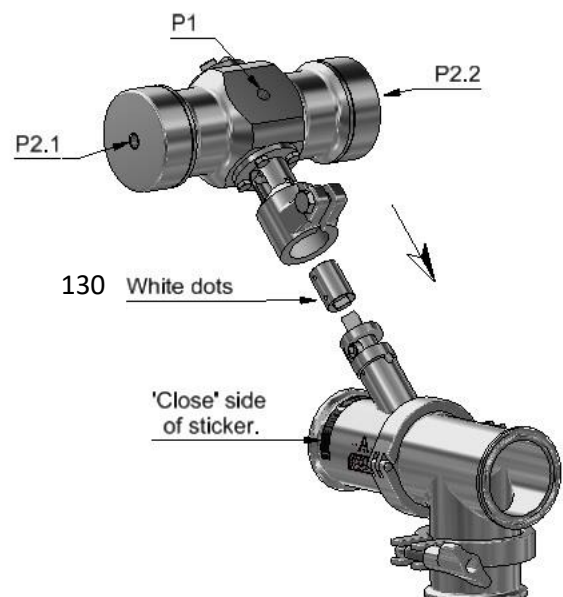
Coupling (130) must match the 'close' side of the sticker.

Mount the actuator type AA as described for type AS actuator

Connect the airlines to P1 and P2 (P2.1 & P2.2)

P1 for opening the upper valve.

P2 for closing the upper valve.



4 Operation

The valve is tested before delivery.

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

Pay attention to possible faults.

4.1. General



- Always read the technical data thoroughly
- Never loosen the clamp screw (110) during the process.
- Never loosen or tighten the Tri-clamp during the process.



- Never touch the valve or the pipelines during the processing of hot liquids or during cleaning.

When the valve is installed, check whether the existing air system corresponds to the values stated in the technical data. (chapter 6.1)

When the first product passes through the pipe system, check the valve for leaks.

A leak detection has been applied in the neck of the body.

Regularly check the valve for leaks.

When the first product passes through the pipe system, check that the valve opens and closes when the actuator is operated.

Do not operate the valve unnecessarily without product.

The seal is more likely to wear in a dry valve.

4.2. Fault finding and repair.

Disc (20) does not close completely due to spring pressure

Defect in actuator (50)

Seat (70) is swollen

Consider revision actuator

Wrong type of Seat applied, replace Seat

Seat (70) and Disc (20) are heavily contaminated

Disassemble valve body with Stem and Disc according to instruction and clean the parts

Defect in actuator (50)

Consider revision actuator

5 Maintenance

Maintain the valve/actuator regularly.

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

Always use genuine TMG Minidisc spare parts and keep spare rubber seals and guide rings in stock. Store seals in closed bag.

The items numbers refer to the parts list and maintenance kits section.

5.1. General maintenance

Recommended spare parts: Maintenance kits (see 6 Technical data)

Order service kits from the service kits section (see 6 Technical data)

Ordering spare parts: Contact the Sales Department.

5.1.1 Maintenance schedule

	Valve rubber seals	Actuator seals
Preventive maintenance	Replace after 12 months (*)	Replace after 24 months (*)
Maintenance after leakage (leakage normally starts slowly)	Replace after production cycle	Replace after production cycle
Planned maintenance	Regular inspection for leakage and smooth operation. Keep a record of the valve. Use the statistics for planning of inspections	Regular inspection for leakage and smooth operation. Keep a record of the valve. Use the statistics for planning of inspections
Lubrication	When assembling Klüber Paraliq GTE 703 or similar USDA H1 approved oil/grease (**) (suitable for EPDM) Do not lubricate the seat (70)	When assembling, Molykote Longterm 2 (black)

5.1.2 Required tools

Wrench 10 mm

O-ring remover

Lubrication



5.2. Dismantling of valve



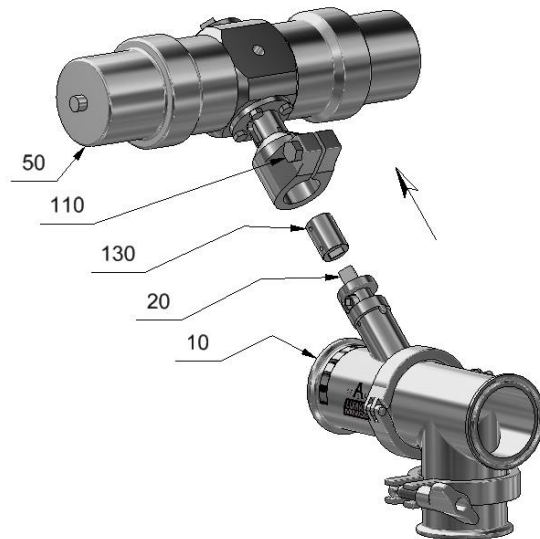
Always ensure that all connections are removed before you remove the valve from the installation. Be convinced that the product line is empty. Never carry out maintenance on the valve when the airline is still connected!

5.2.1 Disassemble the actuator:

Loosen bolt (110) a few turns.
Be careful, the actuator can twist slightly due to the spring tension when the bolt (110) is loosened.
Carefully pull the actuator (50) off the valve.

WARNING!

The coupling (130) is loose between the actuator and valve. The coupling may fall during dismantling.



5.3. Valve maintenance



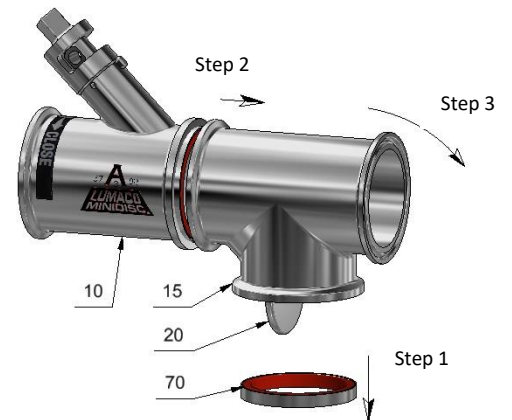
Maintain the valve in a dust-free place on the workbench!

5.3.1 Disassembly of the valve

Turn the upper disc to the closed position

Remove the lower seat (70)

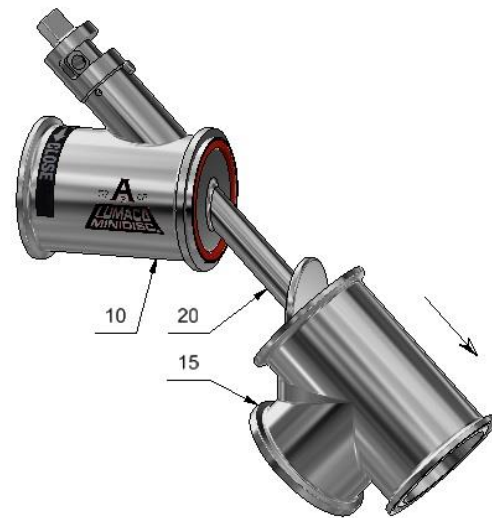
Pull the MD body (15) approx. 4 mm so that it is free from the seat.



Rotate the MD body (15) down about 45 degrees

And carefully remove the MD body (15)

from the Stem (20)



Turn the upper disc to the open position

Remove the Seat (70)

Carefully pull the Disc (20)

out of the MS body (10)

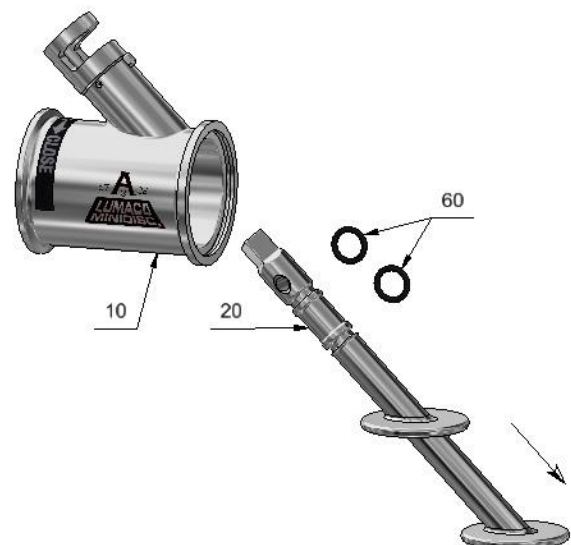
Remove the disc with a

twisting motion.



Remove the O-rings (60) from

the Stem (20)



Thoroughly clean the

MS body (10),

MD body (15).

Stem with disc (20)

Check the sealing surfaces for damage.

Damaged parts must be replaced.

5.3.2. Assemble the maintenance kit



Always use original TMG Minidisc parts!
Be convinced that the right maintenance kit is used

Mount the O-rings (60) from the maintenance kit on the Stem (20).
Use a little grease for the O-rings. (see technical data 6).

WARNING!

Be convinced that the grease is not harmful to the product.
Do not use grease for the Seat (70)

Mount Disc (20) in the upper body (10) in the open stand with a circular motion.

Secure the disc with the set screw (80)

For manually operated valves, assemble the handle (50)

Carefully place the Seat (70) over the Disc (20) in the sealing space with the disc in the open position.

Turn the upper disc (20) to the closed position.

Slide the lower body (15) over the stem and then rotate it against the seat. Then slide the lower body (15) over the seat (70)

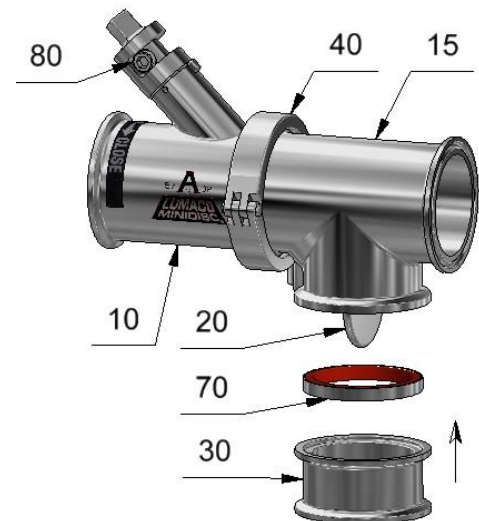
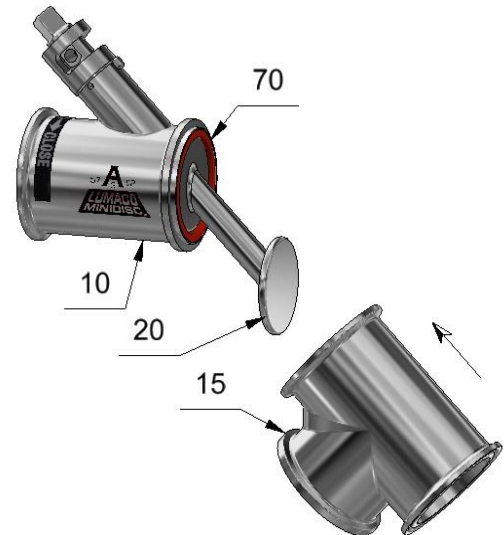
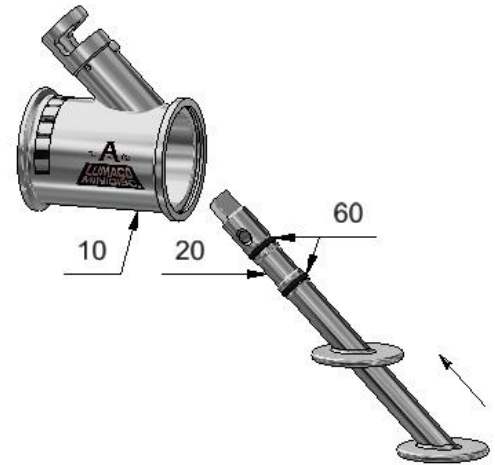
Mount the lower body (15) to the upper body (10) with clamp (40). Tighten the clamp loosely.

Now open the upper disc and tighten the clamp a few more turns.

Then close the upper disc (20) again.

Install the seat (70) in the lower body (15) then install the ferrule (30)

Close and open the valve several times to check that the disc closes smoothly in the seat.



5.4. Actuator maintenance

Maintain the actuator in a dust-free place on the workbench

5.4.1 Disassembly of cylinder parts

Disassembling the Actuator (type AS) from valve according to chapter 5.2.1.

Remove the Air vents (190) from the Caps (210).

Clamp the actuator in a vertical position with the Cap (200) in a Vise.

CAUTION!



Clamp the Actuator softly to prevent scratches on the surface of Cap (200).

clamp the actuator with the bottom side of cap flush with the bottom of vise clamp to prevent deforming of cap.

Tighten the Vise gently to prevent deforming of the Cap (200).

Turn the Actuator counterclockwise to loosen the Cylinder (160).

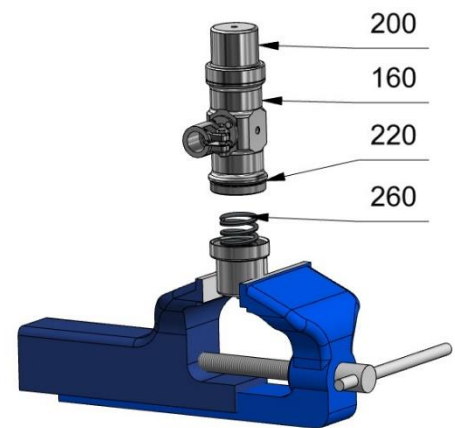
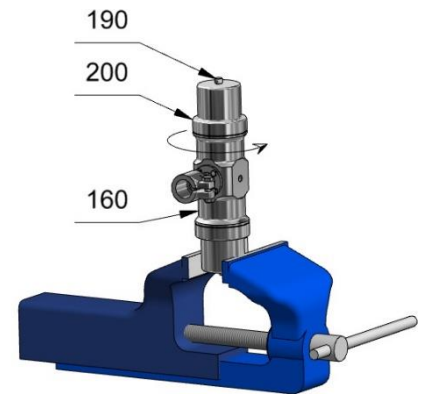
Beware there is some tension left on the Springs (260).

Put some physical counter pressure on the Caps (200) when finally releasing them from the Cylinder.

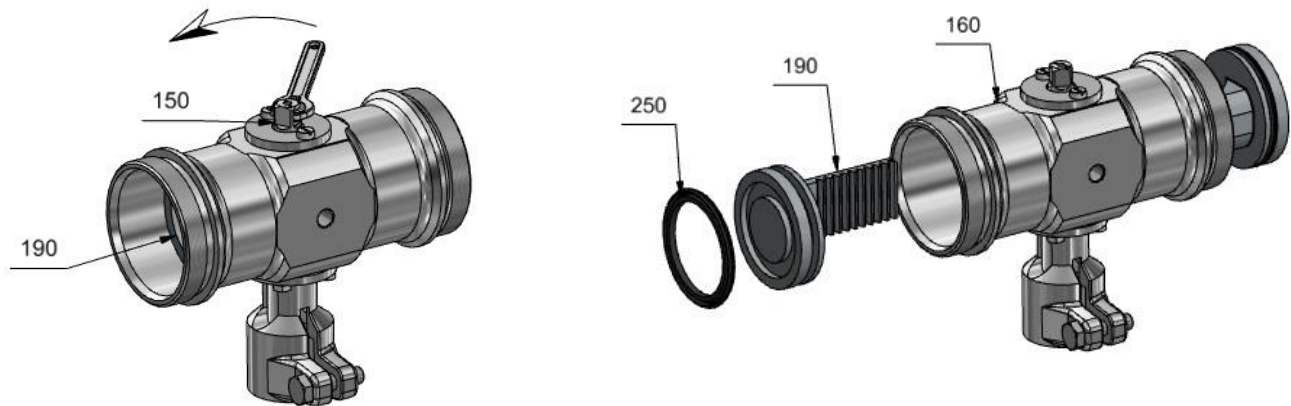
Remove the spring (260)

Remove the O-ring (220) from the Cylinder (160)

Open the Vise and turn the actuator to disassemble the second cap in the same way.



Turn the Gear (150) counterclockwise to remove the 2 Pistons (190).
 Use a wrench □10mm to turn the Gear (150).
 Remove the Seals (250) from the Pistons (190).



5.4.2 Disassemble the gear.

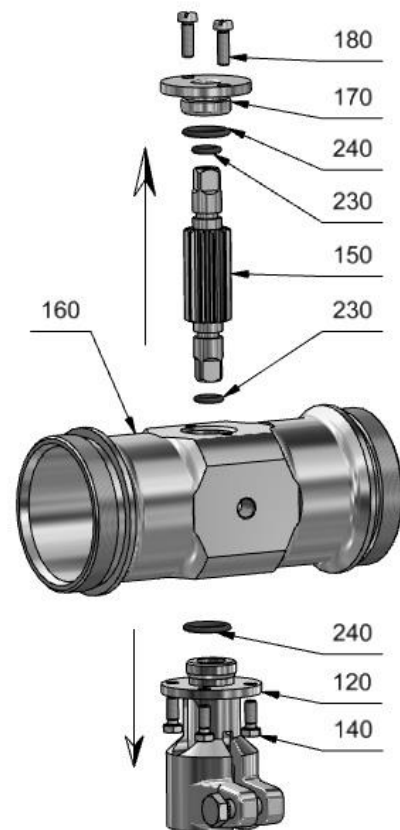
Unscrew the Bolts (180) to remove the Top Cap (170).
 Remove the O-ring (240) from the Top Cap (170).
 Unscrew the Bolts (140) to remove the Adaptor (120).
 Remove the O-ring (240) from the Adaptor (120).
 Pull out the Gear (150).
 Remove the O-rings (230) from the Gear (150).

Clean the actuator parts and inspect it for damage or wear.
 Points of attention are.

- Threads of the Cylinder (160) and Caps (200)
- The top and bottom hole of the Cylinder (160) for wear.
- The Pistons (190) and Gear (150) for wear.
- The Springs (260) for wear.



Replace damaged parts!
 Always use original TMG Minidisc parts!



5.4.3 Assembly of the maintenance kit.

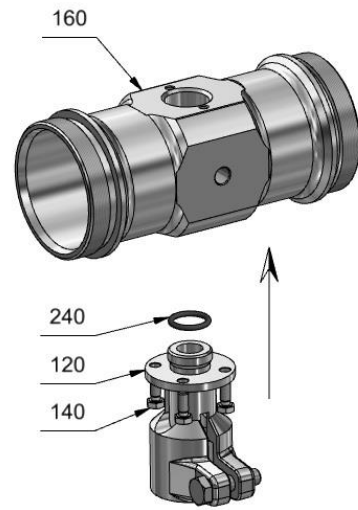
General: Use some lubricant for a smooth assembly of all the parts.



Make sure that the right maintenance kit is used. see chapter 7.1 for the various maintenance kits.

Place the adapter

Mount the O-ring (240) on the Adaptor (120).
Mount the Adaptor (120) with the Bolts (140) on the Cylinder (160).

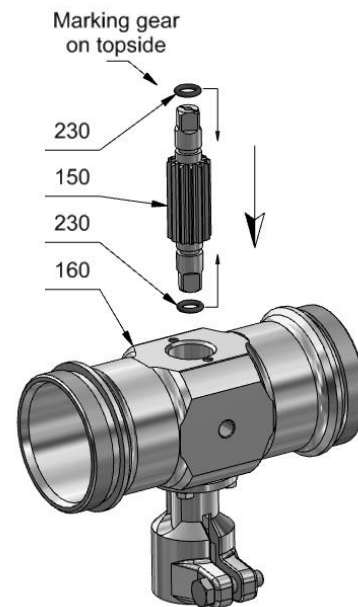


Place the gear

Mount the O-rings (230) on the Gear (150).
Push the Gear (150) into the Cylinder (160)

NOTE!

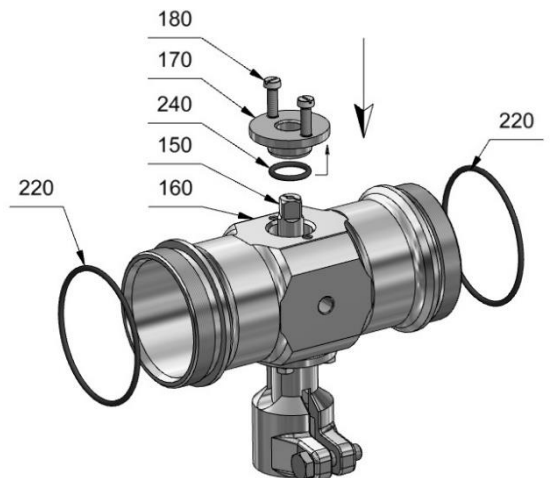
Make sure the marking on the top square of the Gear is visible on top!



Place the top cap

Mount the O-ring (240) on the Top Cap (170).
Gently slide the Top Cap (170) over the square of the gear (150).
Mount the Top Cap (170) with the Bolts (180) on the Cylinder (160).

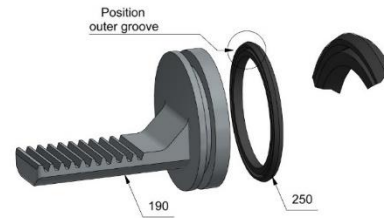
Mount the O-rings (220) on the Cylinder (160).



5.4.4. Assembly of cylinder parts.

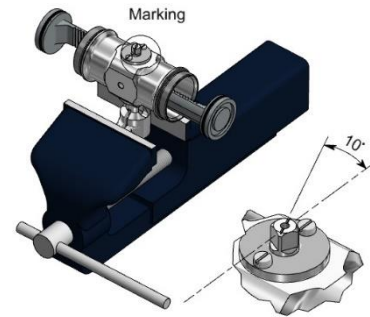
NOTE!

The Seals (250) are double acting with an inner and outer groove. For the best result mount, the Seals with the outer groove facing the rack of the piston. Mount the Seals (250) on the Pistons (190).

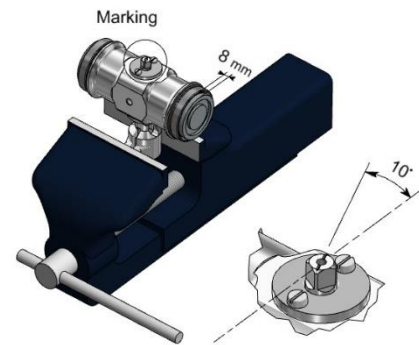


To make sure the Gear (150) is in the right position follow Step 1 to 4.

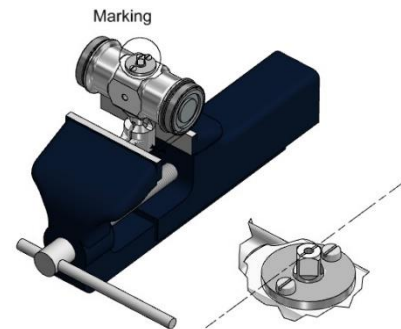
Step 1 Place the Cylinder on the workbench as shown. Turn the Gear in the position as shown: The marking on the gear must about 10 degrees before the center line. Place both pistons in the cylinder in the position as shown, Left piston with rack to the rear of cylinder. Right piston with rack to front of cylinder.



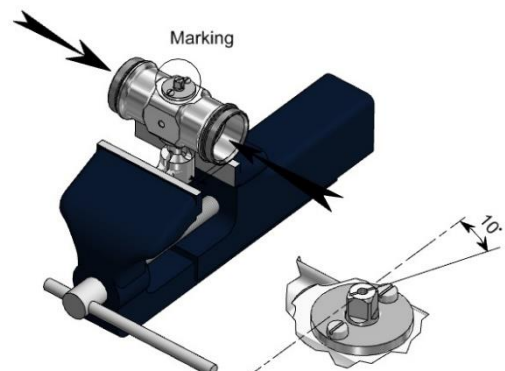
Step 2 Push both pistons into the cylinder at the same time until they touch the gear. The Pistons will stick out about 8 mm at the moment when they touch the Gear.



Step 3 To check the right position of the Gear: Push in the Pistons till they're flat with the Cylinder. The marking on the Gear is in line with the center line.



Step 4 Push in the Pistons to the end. The marking on the Gear will turn clockwise 190 degrees. This is the end position before mounting the Actuator on the Minidisc® valve.



5.4.5 Mounting the springs and caps.

Place the Springs (260) into the Cylinder (160)

Make sure the Springs (260) are into the grooves of the Pistons (190)

Screw the Caps (200) on the Cylinder Item (160)

NOTE!

There has to be some force exerted to overcome the resilience of the springs.

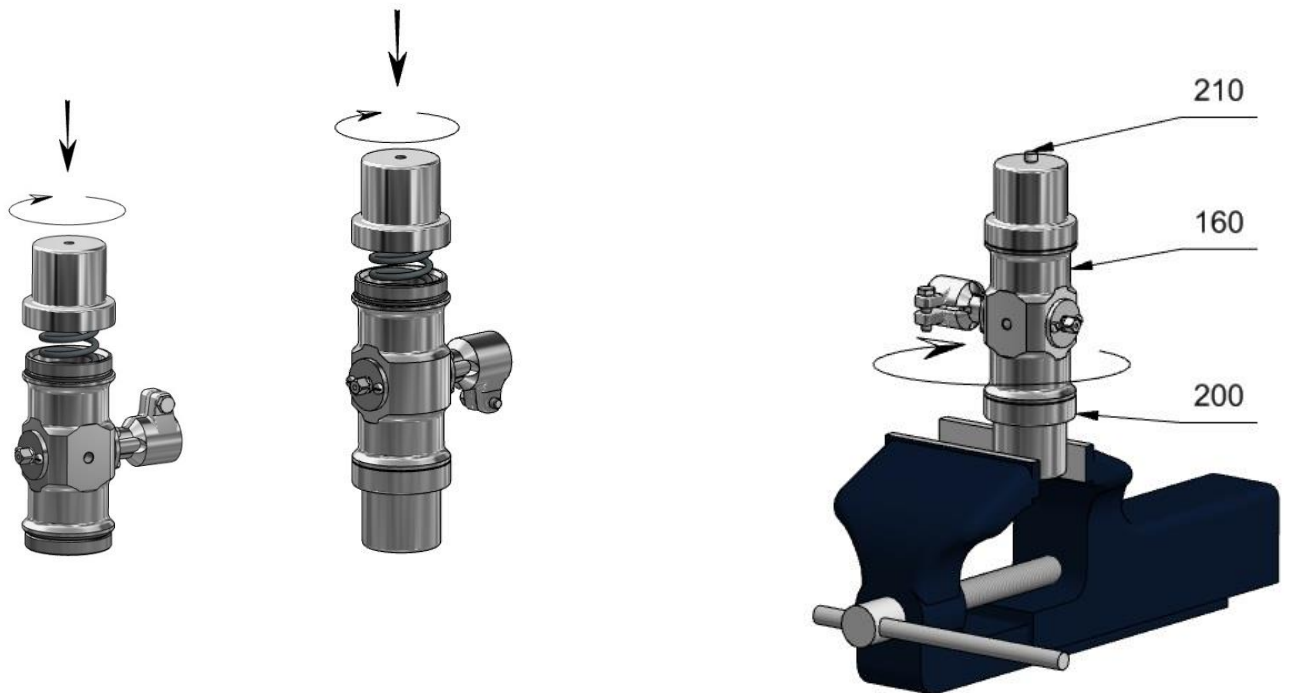
Push down the Caps (200) till it reaches the thread of the Cylinder (160).

And turn it clockwise till it holds.

For final tightening of the caps, place the cap in a vise in a vertical position.

Turn the Cylinder (160) clockwise to fasten it on the Cap (200).

Mount the Air vents (210) in the Caps (200).



6 Technical data

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

6.1. Technical data

Technische gegevens	<i>min.</i>	<i>max.</i>
Product pressure	atm.	60 PSI
Temperature range	-5 °C	125 °C
Air pressure	0 PSI	75 PSI

Materialen

Product wetted steel parts AISI 316L

Other steel parts	AISI 304	or equal
Product wetted seals	PTFE, EPDM	
Other seals	EPDM	
Surface finish		
Inside product side	Ra<0,8	
outside	Polish	

6.2. Noise

The noise level of a valve actuator will be approximately 77 dB (A) without noise damper and approximately 72 dB (A) with damper.

- Measured at 6 bar air-pressure.
- Measured at 1 meter distance and 1,6-meter height.








6.3. Weights

Valve weights without tank bottom flange



Valve type	Valve	Actuator AS	Actuator AA	Handle
MD-002-FFF-S	1,36 kg	3,16 kg	2,89 kg	0,08 kg
MD-212-FFF-S	2,42 kg	3,16 kg	2,89 kg	0,08 kg

7 Parts list and maintenance kits

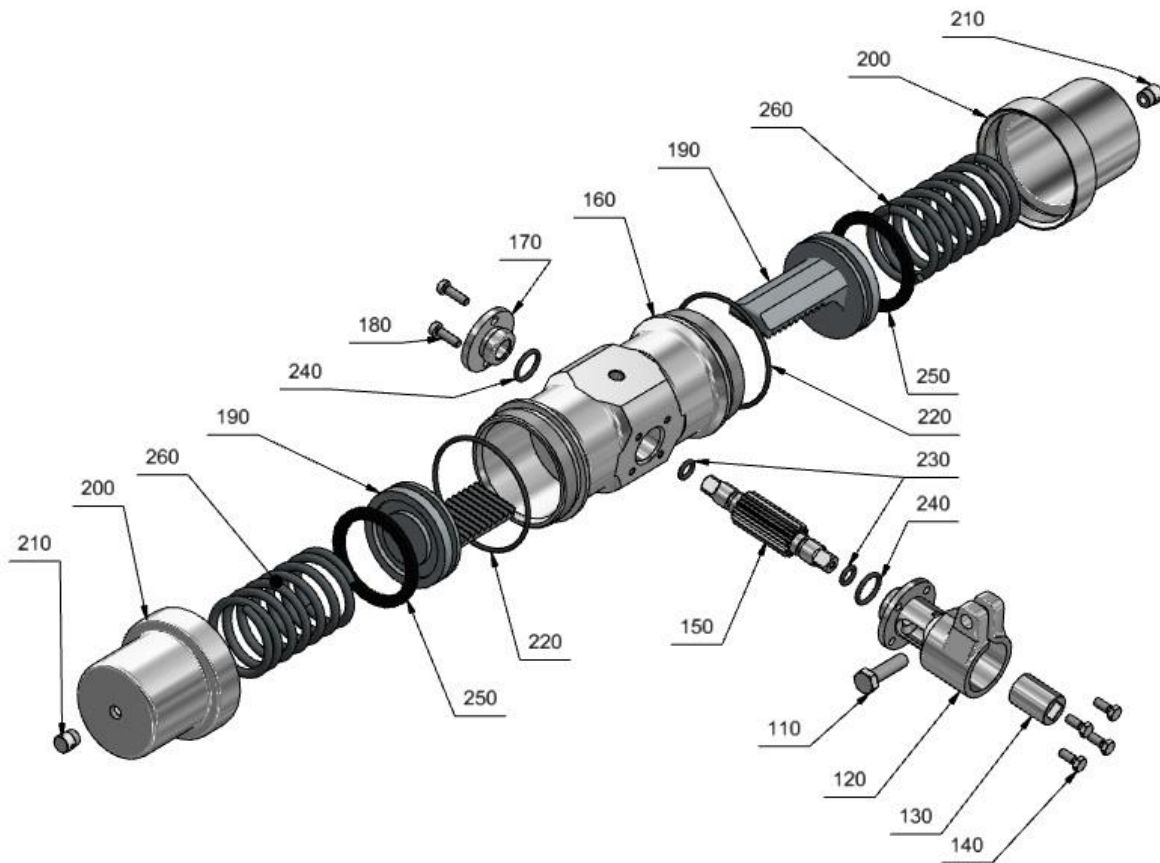
7.1. Valve parts

Item number	Part number	Description	Quantity	Part Figure
10	MS-B-002-F MS-B-212-F	Body MS 2" Body MS 2 1/2"	1	
20	MD-DS-002 MD-DS-212	Disc & Stem 2" Disc & Stem 2 1/2"	1	
50	MS-H-002 MS-H-212	Handle Handle	1	
30	MS-F-002 MS-F-212	Ferrule adaptor Ferrule adaptor	1	
40	CL-002-F CL-212-F	Clamp 2" Clamp 2 1/2"	2	
15	MD-B-002 MD-B-212	Body MD 2" Body MD 2 1/2"	1	
80	MS-SS-112 MS-SS-112	Setscrew 2" Setscrew 2 1/2"	1	

7.2 Maintenance parts.

Item	Description	Seat FKM	Seat Siliconen	Seat Buna	Seat EPDM	Qty	Part Figure
70	Seat 2" Seat 2 1/2"	MS-S-002-F MS-S-212-F	MS-S-002-S MS-S-212-S	MS-S-002-N MS-S-212-N	MS-S-002-E MS-S-212-E	2	
60	O-ring 2" O-ring 2 1/2"	MS-OR-002-060-F MS-OR-002-060-F	MS-OR-002-060-S MS-OR-002-060-S	MS-OR-002-060-F MS-OR-212-060-F	MS-OR-002-060-E MS-OR-212-060-E	2	

7.3. Actuator type AS



Maintenance kits:

Item	Quantity	Description
110	1	bolt
120	1	Adapter
130	1	Coupling
140	4	Bolt
150	1	Gear
160	1	Body
170	1	Topcap
180	2	Screw
190	2	Piston
200	2	Cap
210	2	Air vent
220	2 *	O-ring
230	2 *	O-ring
240	2 *	O-ring
250	2 *	Piston seal
260	2	Spring

Actuator	Type	NBR
A60-002	AS	MS-MK-A60
A60-002	AA	MS-MK-A60
A70-004	AS	MS-MK-A70
A70-004	AA	MS-MK-A70

* - Parts for maintenance kits.