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1 General

1.1 General information

The minidisc consists of various versions

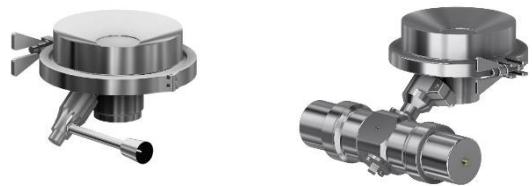
The standard minidisc

- Type MS



The minidisc Tankbottom Valve

- Type MT



The Double disc Valve

- Type MD



The minidisc valve can be manual and air operated.

The connections of all types of valves can be supplied in different versions.

- Tri-clamp BS 4825-3
- Thread - various types of thread
- Weld on

or a combination of these versions.

Both manual and air operated valves can be equipped with different types of feedback units or indicators.

Air operated valves can also be designed as a process controller.

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 Holland products depends on the use of original TMG Holland 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 pipe lines 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 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 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.

3.2 Welding instructions of 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.

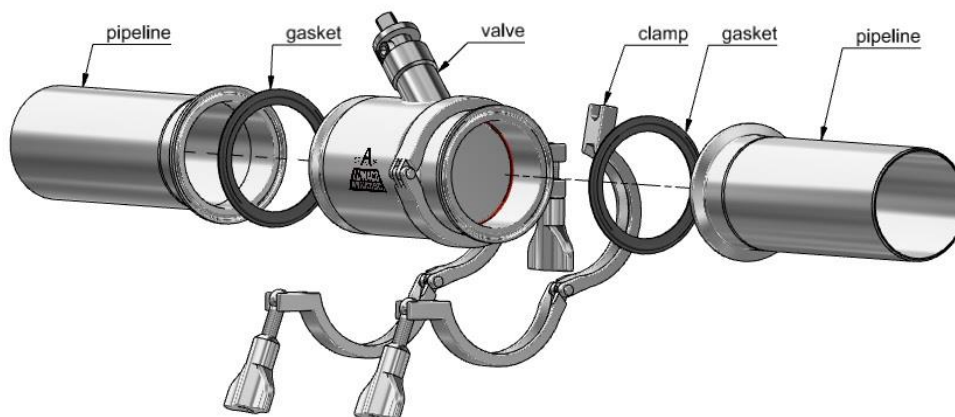


The valve is direction-sensitive,
Make sure that the arrow on the body corresponds
to the flow direction of the product.
Install the valve in closed position between the pipework.



Preparation for mounting with Tri-clamp connection;

To mount the valve in the pipe system,
the ends of pipe system must be fitted
with Tri-clamp ferrule with accompanying
clamp and gasket as shown below.
Always install the complete valve without actuator in the pipe system.



3.4. Manual operated valves

Handles for manual operated valves can be arranged in;

3.4.1 Standard handle

Standard handles can be mounted during valve mounting.

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

Secure Disc with handle (50).

Carefully place the Seat (70) over the Disc in the sealing space.

Turn the disc to closed position.

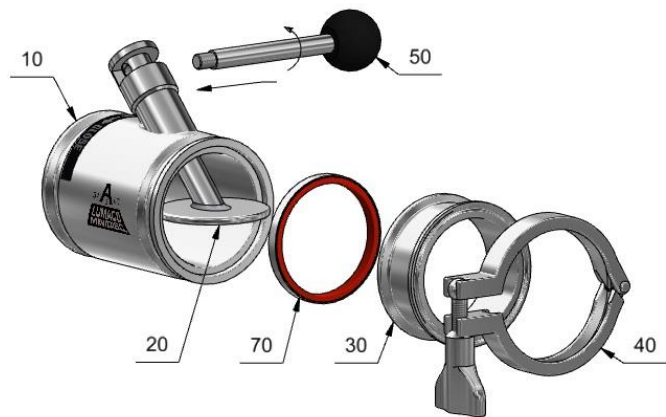
Now place the ferrule (30) over the Seat (70), and mount the ferrule to the body (10) with clamp (40)

Tighten the clamp loosely.

Now open the disc.

After opening and closing the valve a few times, the clamp can be tightened further.

It is important to open and close the valve a few times, so that the seat and valve are adjusted to each other



3.4.2. Handle with lift and lock

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 square, for fixing Release button (90)

When mounting the handle, be sure that the direction of the handle matches the text of the sticker and the position of the disc.

Handles with lift and lock can be mounted during valve mounting.

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

Secure Disc with screw (80).

Carefully place the Seat (70) over the Disc in the sealing space.

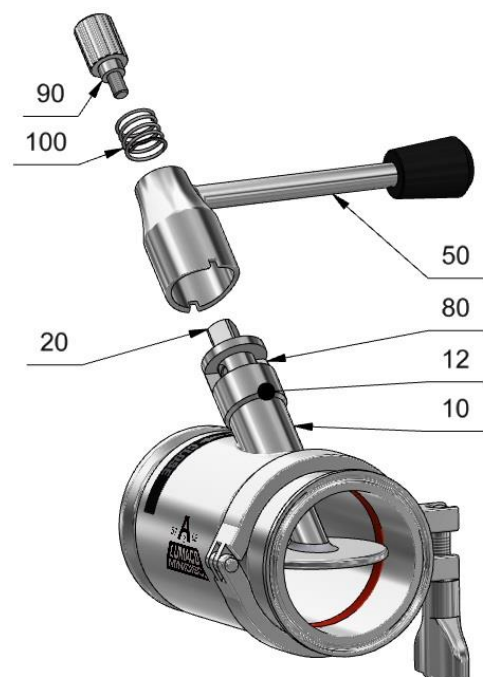
Turn the disc (20) to closed position.

Now place the ferrule (30) over the Seat (70), and mount the ferrule to the body (10) with clamp (40)

Tighten the clamp loosely.

Now open the disc.

After opening the disc, firmly tighten the clamp.

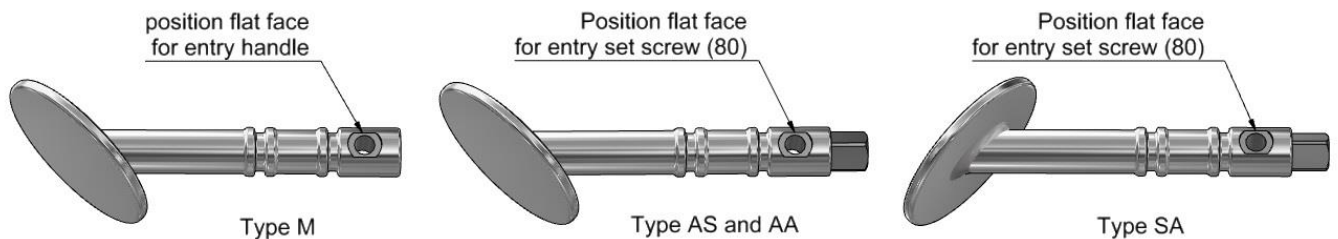


3.5. The various versions of the valve

There are various options for the valve;

- | | |
|---|----|
| - manual operation | M |
| - air operated -> air open - spring closing | AS |
| - air operated -> spring open - air closing | SA |
| - air operated -> air open - air closing | AA |

It is necessary to mount different Disc and Stem for the different types.

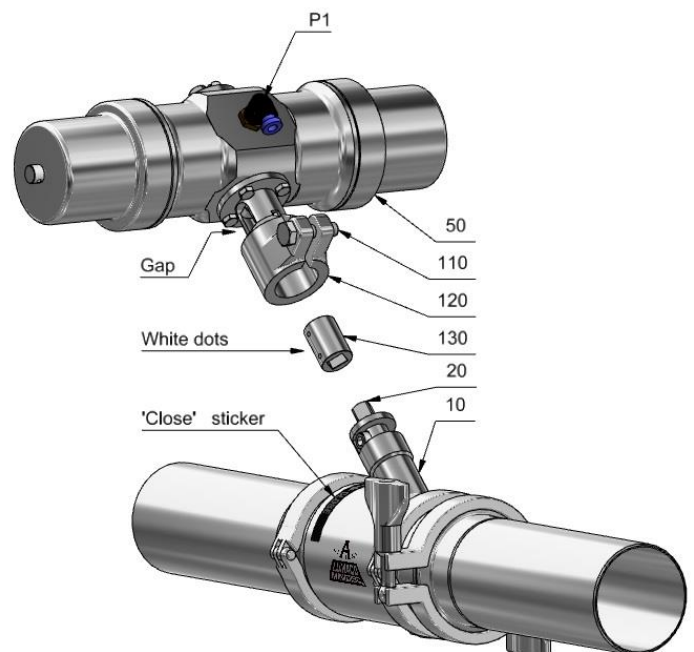


3.6. Installing the actuator to valve;

3.5.1 Actuator type AS

When the valve is designed as AS, make sure the disc is closed before mounting the actuator

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 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.

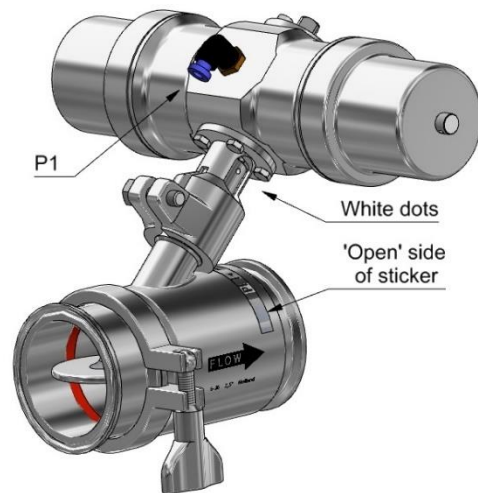
The white dot visible through the gap now corresponds to the closed side of the 'Open <-> Close' sticker.

To install the Seat, please refer to chapter 3.4.1.

3.5.2 Actuator type SA

For Actuator type SA;
Turn the disc (20) open with a wrench 10 mm
Install the coupling (130).
The white dots on the coupling (130)
must match the 'Open' side of the sticker.

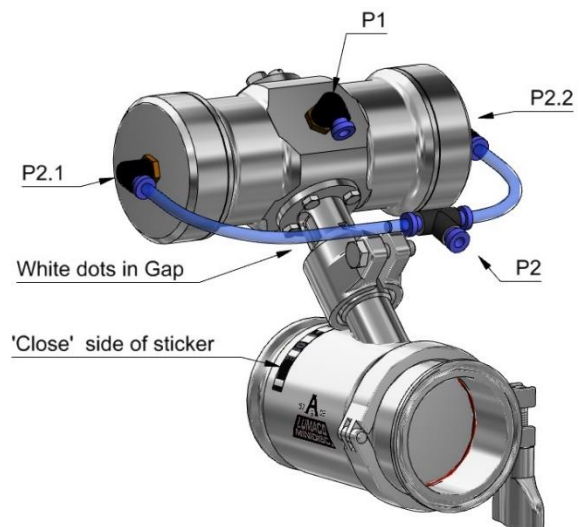
Use an air coupling with G1/8" thread (P1) for
mounting in actuator.
Recommended line diameter 6mm
Connect the airline to P1.



3.5.3 Actuator type AA

For mounting type AA actuator on valve,
the same procedure can be followed as for
type AS.
But before mounting the actuator, it must
be checked whether the pistons are in the
innermost position.
Check this by connecting air to port P2.1
or P2.2

Use 3x an air coupling with G1/8" thread
for mounting in actuator.
Recommended pipe diameter 6mm
Use a T connector (P2) to connect ports
P2.1 and P2.2
Connect the airlines to P1 and P2.
P1 for opening the valve
P2 for closing the 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 (40) during the process.



- Never touch the valve or the pipe lines 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.

<i>Problem</i>	<i>Cause / result</i>	<i>Repair</i>
Leakage at the leakage detection	O-ringen (60) in valve body (10) worn or damaged by product	Disassemble valve body with Disc and Stem according to instruction, and replace O-rings (60)
	Valve body with Disc and Stem(10) heavily contaminated.	Disassemble valve body with Disc and Stem according to instruction and clean the parts
	Wrong type O-rings (60) mounted	Use the prescribed original O-rings.
Leakage between Seat and Disc	Seat (70) shows wear	Replace Seat
	Seat (70) is affected by product	Use Seat type that is resistant to used product and temperature
	Seat (70) mounted incorrectly	Assemble Seat according to Instruction
	Stem en Disc onjuist gemonteerd	Assemble Disc and Stem according to Instruction
Leakage at Tri-clamp	Seat (70) shows wear	Replace Seat
	Seat (70) is affected by product	Use Seat type that is resistant to used product and temperature
	Seat (70) mounted incorrectly	Assemble Seat according to Instruction
	Clamping ring parts (35) and Tank bottom flange (30) contaminated	Disassemble valve according to instruction and clean Tank bottom flange, Clamping ring parts and valve body
Disc (20) does not open when closing the valve	No or insufficient air pressure in the system	Check the air pressure in the system and ensure that it meets the prescribed system pressure
	Seat (70) is swollen	Wrong type of Seat applied, replace Seat
	Seat (70) en Disc (20) zijn sterk verontreinigd	Disassemble valve body with Disc and Stem according to instruction and clean the parts
	Defect in actuator (50)	Consider revision actuator
Disc (20) does not close completely due to spring pressure	Seat (70) is swollen	Wrong type of Seat applied, replace Seat
	Seat (70) and Disc (20) are heavily contaminated	Disassemble valve body with Voice 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 Holland 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



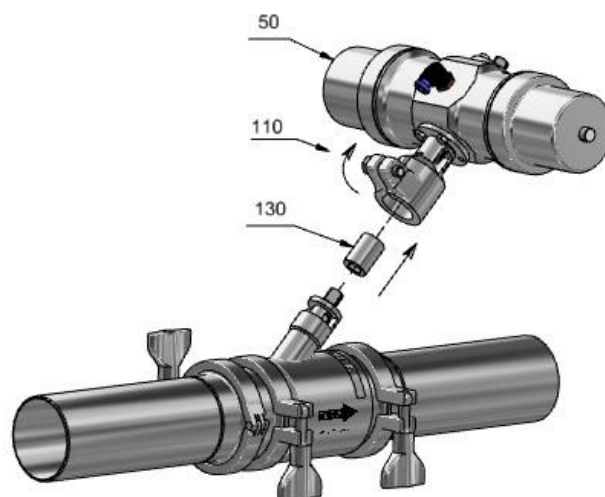
5.2. Dismantling of valve



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.

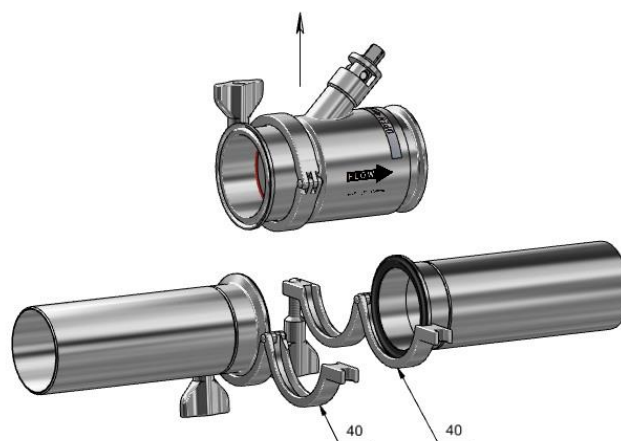


WARNING!

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

5.2.2. Disassemble the valve from pipeline.

Carefully loosen and remove the tri-clamps (40).
Carefully remove the complete valve between the two pipe sections.



5.3. Valve maintenance



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

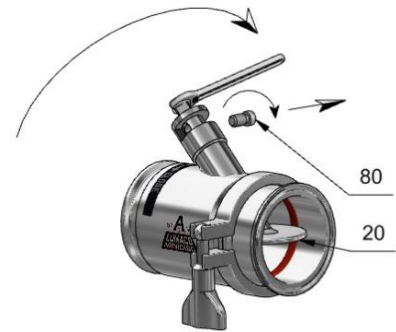
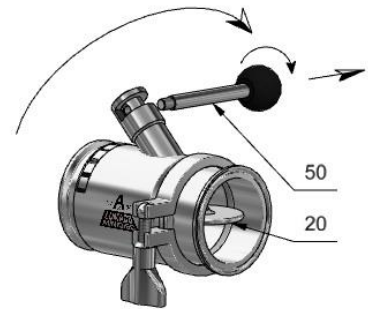
5.3.1 Disassembly of the valve

For manual operated valve;

Open the valve and remove the handle (50) by rotating it out of the disc and stem (20).

For air operated valves;

Open the disc (20) with a wrench 10mm
Disassemble the setscrew (80) out of the disc and stem (20).

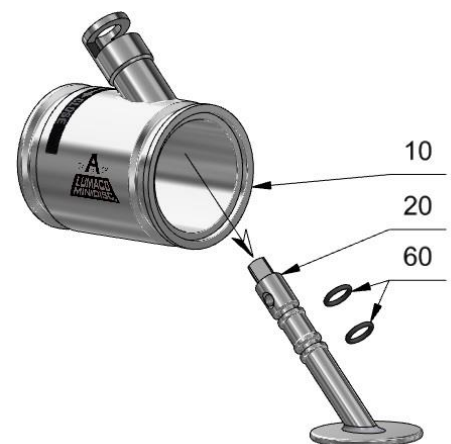
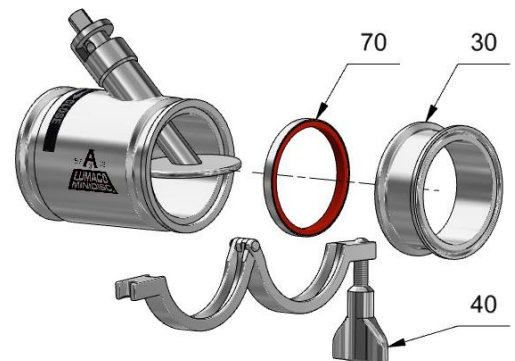


Open and remove the clamp (40)
Remove the ferrule (30)
Remove the Seat (70)

Carefully pull the Disc (20) out of the valve body (10)
Remove the disc with a twisting back and forth motion.

Remove the O-rings (60) from the Stem (20)

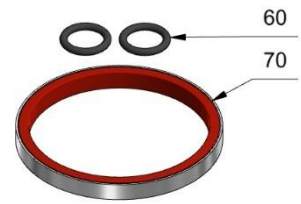
Thoroughly clean the body (10),
Disc and stem (20) and ferrule (30).
Check the sealing surfaces for damage.
Damaged parts must be replaced.



5.3.2. Assemble the maintenance kit



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



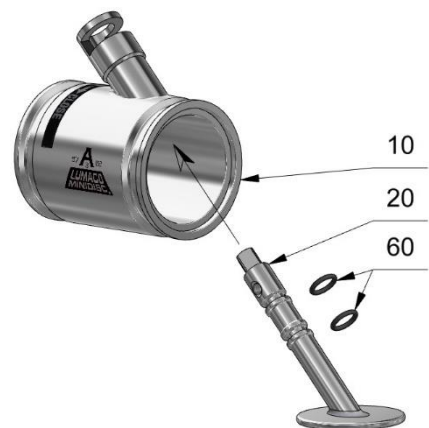
Place the new O-rings (60) from the maintenance kit.
use a little grease for the O-rings. (see technical data 6)

WARNING!

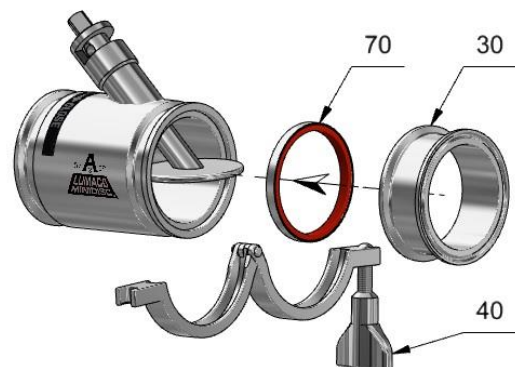
Be convinced that the grease is not harmful to the product.

Do not use grease for the Seat (70)

Mount Disc (20) in the valve body (10) in the open stand with a circular motion.
Secure the disc with the set screw (80) Or for manually operated valves, assemble the handle (50)



Carefully place the Seat (70) over the Disc in the sealing space with the disc in the open position.
Turn the disc to closed position and place the ferrule (30) carefully over the Seat (70),
Mount the ferrule to the body (10) with clamp (40)
Tighten the clamp loosely.



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

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

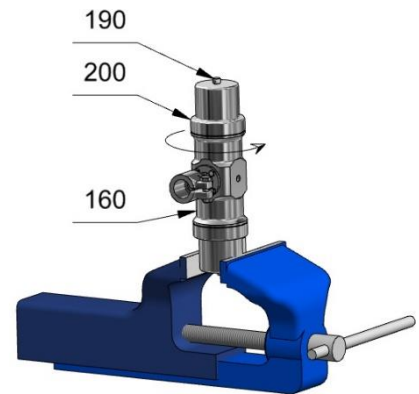
5.4. Actuator maintenance

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 counter clockwise to loosen the Cylinder (160).

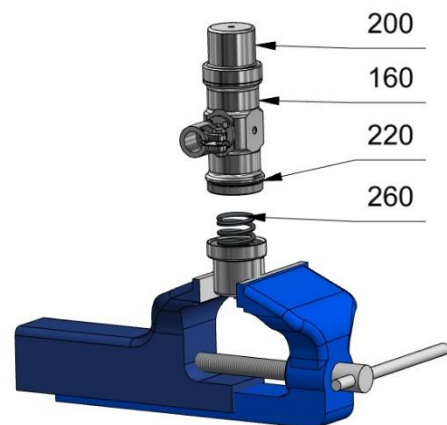
Beware there is some tension left on the Springs (260).

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

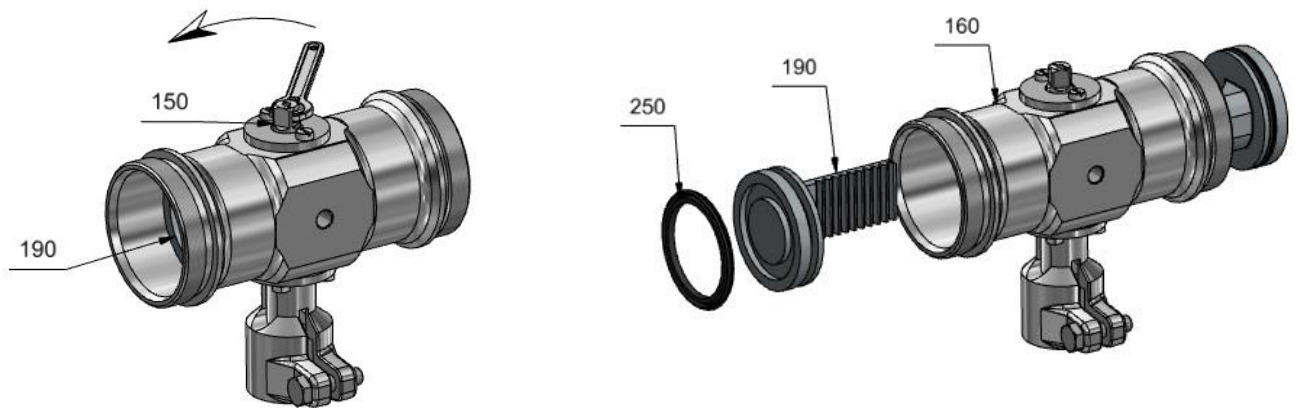
Remove the spring (260)

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) counter clockwise 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;

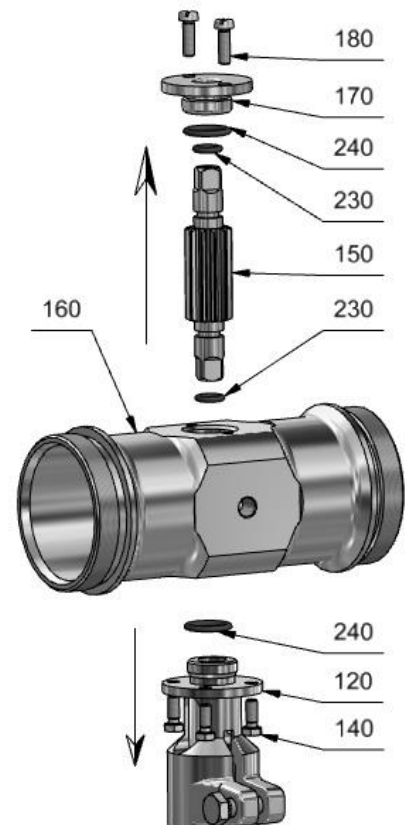
Unscrew the Bolts (180) to remove the Top Cap (170).
 Remove the O-ring (240) from the Top Cap (170).
 Unscrew the Bolts (140) to remove the Adaptor (120).
 Remove the O-ring (240) from the Adaptor (120).
 Pull out the Gear (150).
 Remove the O-rings (230) from the Gear (150).

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 Holland parts!



5.4.3 Assembly of the maintenance kit.

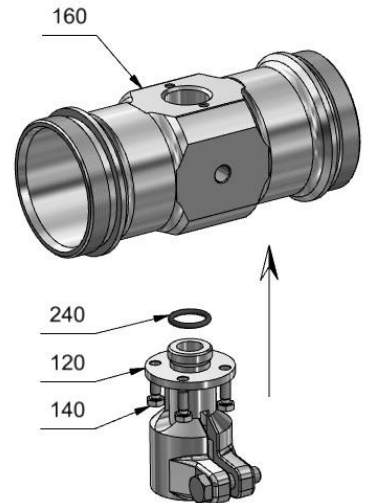
General : Use some lubricant for a smooth assembly of all the parts.



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).

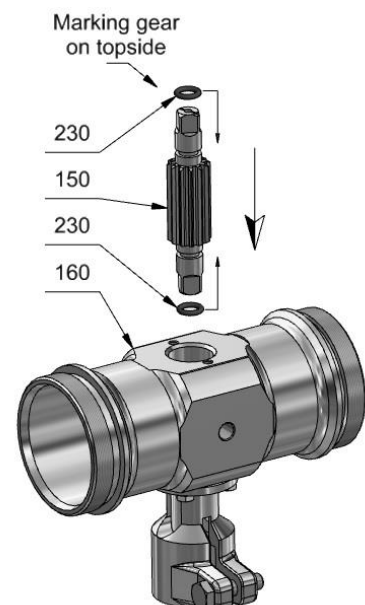


Place the gear

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

NOTE !

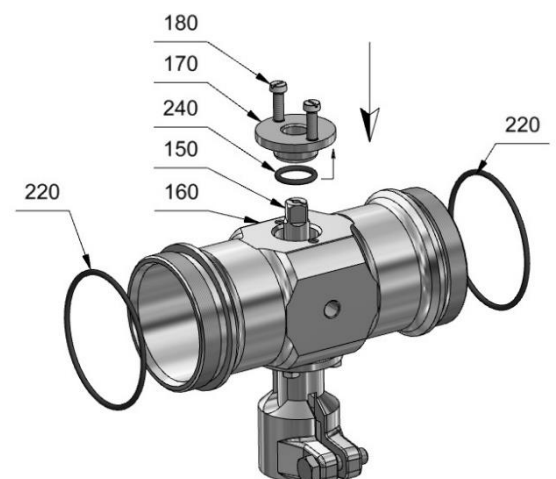
Make sure the marking on the top square of the Gear
is visible on top!



Place the topcap

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).

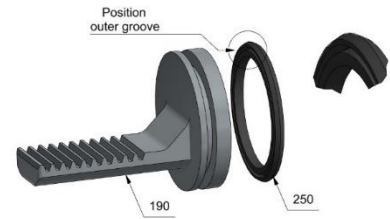


5.4.4. Assembly of cylinder parts.

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.

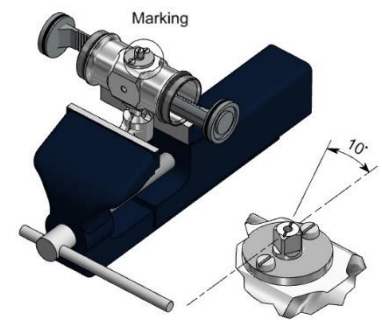
Turn the Gear in the position as shown:

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.

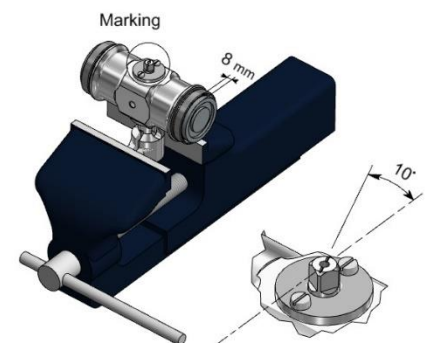
Right piston with rack to front of cylinder.



Step 2

Push both pistons into the cylinder at the same time until they touch the gear.

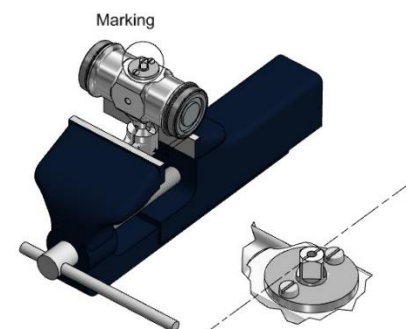
The Pistons will stick out about 8 mm at the moment when they touch the Gear.



Step 3 To check the right position of the Gear :

Push in the Pistons till they're flat with the Cylinder.

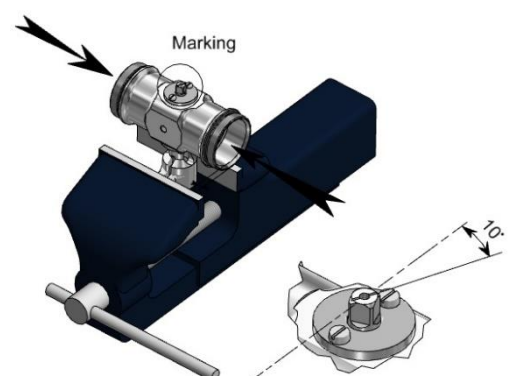
The marking on the Gear is in line with the center line.



Step 4 Push in the Pistons to the end

The marking on the Gear will turn clock wise 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.

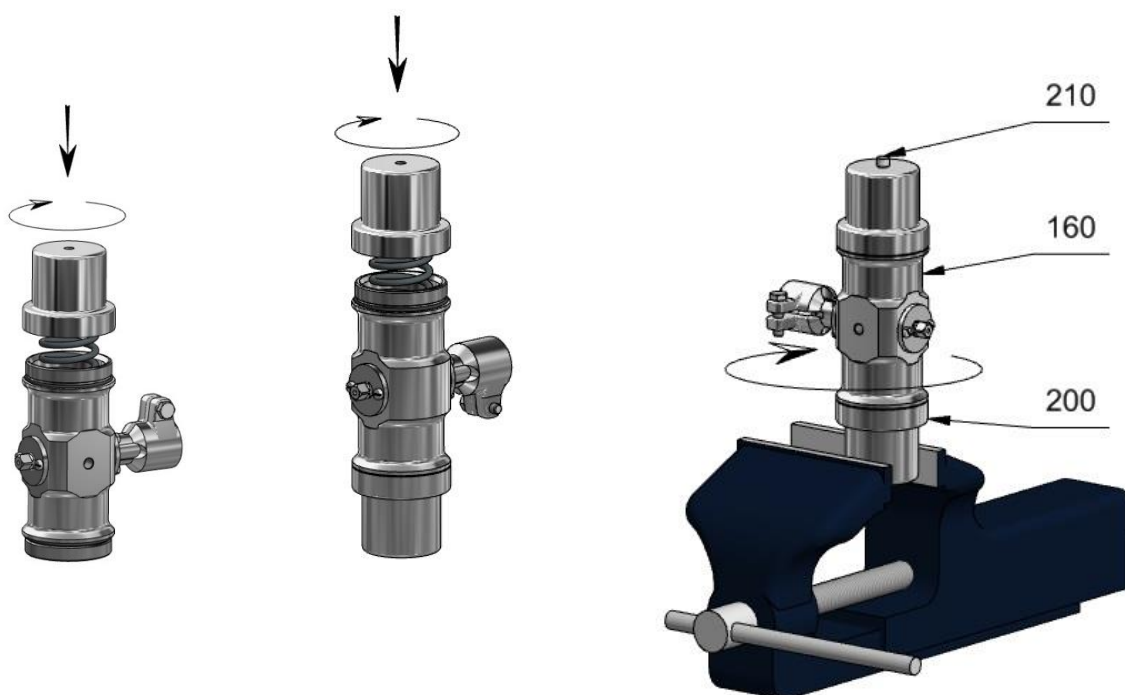
Push down the Caps (200) till it reaches the thread of the Cylinder (160).

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.	4 bar		
Temperature range	-5 °C	125 °C		
Air pressure	6 bar	8 bar		
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 77db(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
MS-112-	0,71 kg		2,56 kg	0,08 kg
MS-002-	0,78 kg	3,16 kg	2,89 kg	0,08 kg
MS-212-	1,61 kg	3,16 kg	2,89 kg	0,08 kg
MS-003-	2,11 kg	3,16 kg	2,89 kg	0,151 kg
MS-004-	3,92 kg	3,38 kg	3,69 kg	0,151 kg
MS-006-	6,53 kg			0,804 kg

7 Parts list and maintenance kits

Always use TMG Holland genuine spare parts.

The warranty of TMG Holland products is dependent on the use of TMG Holland genuine spare parts.

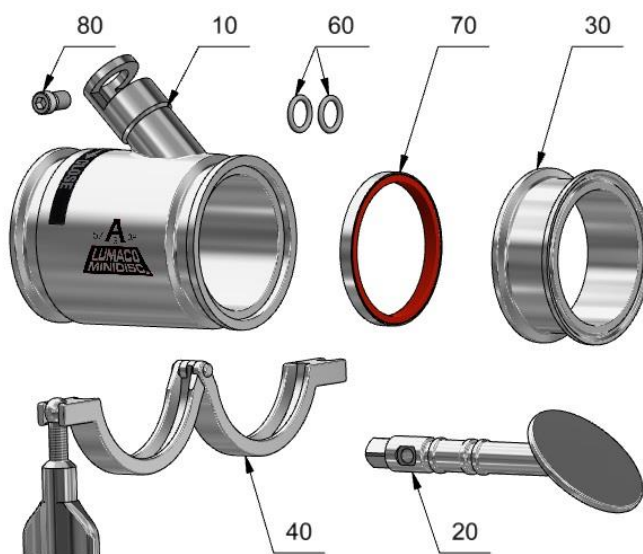
7.1. Valve

Part list:

Item	Quantity	Description
10	1	Body
20	1	Disc en Stem
30	1	Ferrule
40	1	Clamp
60	*	O-ring
70	*	Seat
80	**	Set Screw

* - Part for maintenance kit.

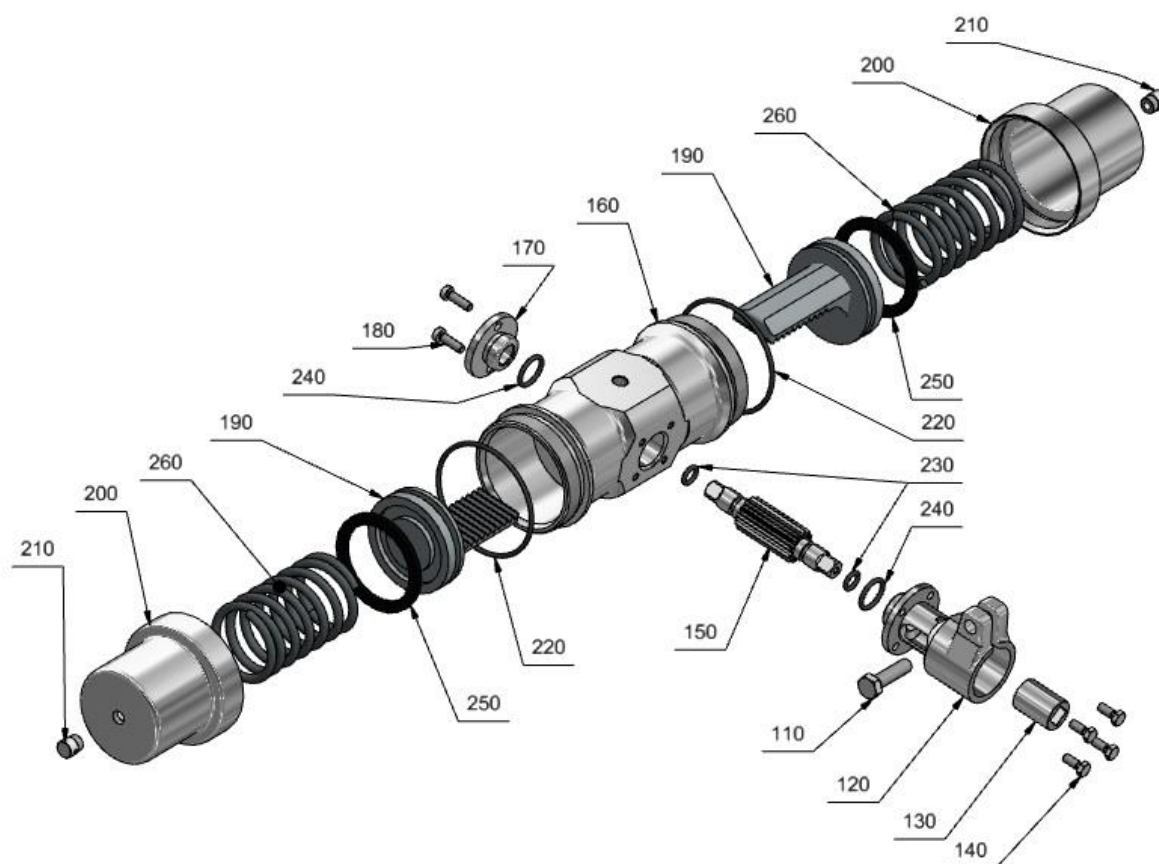
** - Only for air operated valves



Maintenance kits:

Valve type		PTFE	Viton	Siliconen	EPDM
MS-112-	1 1/2"	MS-MK-112-P	MS-MK-112-F	MS-MK-112-S	MS-MK-112-E
MS-002-	2"	MS-MK-002-P	MS-MK-002-F	MS-MK-002-S	MS-MK-002-E
MS-212-	2 1/2"	MS-MK-212-P	MS-MK-212-F	MS-MK-212-S	MS-MK-212-E
MS-003-	3"	MS-MK-003-P	MS-MK-003-F	MS-MK-003-S	MS-MK-003-E
MS-004-	4"	MS-MK-004-P	MS-MK-004-F	MS-MK-004-S	MS-MK-004-E
MS-006-	6"	MS-MK-006-P	MS-MK-006-F	MS-MK-006-S	MS-MK-006-E

7.2. Actuator



Part list:

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

Maintenance kits:

Actuator	Type	NBR
A50-112	AA	MS-MK-A50
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.

8. Positioners

8.1. Positioner NBN4



8.2 Positioner SFU



8.3 Positioner N09



9 Controllers

9.1 Controller SFU



9.2 Controller N11



9.3 Controller PO-8792

