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TRANSLATION OF ORIGINAL - en

Overhaul instructions

Keep for future use!

Version: 1.1

DV VN8-D

Dosing valve VN8

Scope

Assembly: Dosing valve VN8

Item Number	Product Version
3HDAK0100064887	DV VN8-D 12 AL 20 630
3HDAK0100064889	DV VN8-D 12 AL 100 630
3HDAK0100064890	DV VN8-D 12 VA 20 615
3HDAK0100064891	DV VN8-D 12 VA 100 615
3HDAK0100073390	DV VN8-D 12 AL 100 630 HM

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1 General information

1.1 Purpose of these instructions

These instructions describe the repair of the dosing valve.

IMPORTANT

Follow these instructions!

- These instructions must be assessable to everybody that handles this module in any way.
- The operating company must ensure that these instructions are read and understood by everybody that handles this module in any way.

The components connected to this module are covered in separate instruction manuals.

DOCUMENTS REFERENCE

Observe reference documents!

- Read the instruction manual for the module in its entirety before operating the equipment for the first time!
- Also note the corresponding chapter of the provided sub-contractor documentation of purchased parts! If you have any questions please contact our Customer Service or the manufacturers directly.

1.2 Target readership of these instructions

These instructions must be observed and used by maintenance and repair personnel.

Persons working with the assembly must have been suitably trained by the manufacturer or plant owner.

The repair personnel must be suitably trained.

Personnel	Prerequisites
Briefed personnel	Operating personnel are people who have been instructed by the plant owner or trained persons to carry out tasks relating to the operation of the plant. They must provide instruction about possible dangers arising from incorrect behaviour and about the required protective equipment and safety measures.
Trained personnel	Has received in-depth subject education and training, is cable to assess the plant's safety status and is familiar with the applicable accident prevention and health and safety regulations and with the acknowledged rules of technology.

Table 1: Personnel skills requirements

The table below outlines what work each of these user groups is authorised to perform:

Activity	Briefed personnel	Trained personnel
Operating the plant	X	X
Perform maintenance and repair work and tooling		X

Table 2: Personnel and their activities

1.3 Legal Notice / Liability

The manufacturer assumes warranty and liability claims only under the conditions specified in the contract and in compliance with the warranty periods.

The warranty expires:

- In the event of errors and damages that can be attributed to the fact that instructions in the manual have not been observed,
- In the event of complaints that can be attributed to the fact that others then the original parts specified in the documentation were used when replacing components,
- When changing the module (function, operating parameters) disregarding the conditions specified in the order and without prior consent of the manufacturer.

The content of the technical documentation has been prepared with the utmost care. However no liability is assumed for possible errors or incompleteness. This also applies to the content of the technical documentation of all sub-contractors.

Technical changes and errors are not impossible.

1.4 Information symbols used in these instructions

The entire documentation contains notes about workplace safety that are intended to prevent injury.

These notes are labelled with the following signs and symbols:

DANGER

This box indicates an immediate danger.
Unless prevented, this situation can lead to severe injury or death.

WARNING

This box indicates a potentially dangerous situation.
Unless prevented, this situation can lead to severe injury or death.

CAUTION

This box indicates a potentially dangerous situation.
Unless prevented, this situation can cause minor injury or material damage.

IMPORTANT

This box indicates a potentially dangerous situation.
Unless avoided, this situation can lead to material or product damage.

NOTE

This box contains important notes that require special attention.
Notes without a specific sequence are given with bullet points. If a specific order is necessary, these notes are numbered.

DOCUMENTS REFERENCE

This box contains cross-references to associated documents.
References without a specific sequence are given with bullet points. If a specific order is necessary, these references are numbered.

ENVIRONMENTAL PROTECTION

This box contains information about environment-conscious procedures and behaviour.
It may indicate environment protection measures.

1.5 Safety Notes

When working on or with the assembly, observe the following general safety instructions:

1. The safety instructions must be observed at all times to prevent accidents.
2. The regulations and information in the operating instructions and in the user documentation of third-party products as well as all safety instructions must be observed to ensure safe and reliable operation of the assembly.
   - Observing this information helps identify hazards and prevent dangerous situations.
   - Observing these safety instructions is a precondition for workplace design.
   - They must be made available to all users before performing any action on the plant and the plant components and must, in part, be contained in the personnel briefing and training.
3. The Occupational Safety Provisions and Accident Prevention Regulations of the relevant country are applicable in which the component is operated.
   - The operating company of the system is responsible for implementing these provisions.
4. Only trained and instructed expert staff may undertake conversion of the component.
5. For work on the assembly, the personnel has to have access to personal protective equipment such as protective work wear, safety gloves, helmet and safety goggles.
6. In the event of a fault, the assembly has to be switched off and a fault message has to be displayed.
   - Please inform the manufacturer about the fault if the fault cannot be eliminated easily.
   - If necessary, it has to be ensured that the master switch and the shut-off valves on the maintenance units are switched off and secured against accidental start before any work on the assembly is carried out.
   - Troubleshooting and elimination of faults may only be carried out by trained expert staff.
7. Persons can be injured severely, even die, due to moving plant parts (e.g. robot) and components (e.g. gripper).
   - Working in the cell (protected area) is only allowed with secured lockout bar/padlocks.
   - All work within the cell must be performed only by trained, briefed specialists.

DANGER

Never override the safety devices! They are intended to protect your life.

IMPORTANT

The work described here must be carried out only with the plant depressurized and isolated from mains power.

1.6 Risks in Using the Module

DANGER

Danger through electric current!

Risk of serious or fatal injury through incorrect handling.

Only qualified electricians must operate or work on the electrical installation. The plant must be isolated from mains power and secured against restarting during this work. Observe all information about machine parts that remain live when the plant is switched off at the main switch.

WARNING

Risk of injury through sudden plant startup!

When re-establishing the energy supply after an interruption, the plant can unexpectedly restart. This can cause severe injuries.

During maintenance work, switch off the plant and secure it against restarting (main switches and shut-off valves). Observe the safety instructions in the plant documentation. The plat operating personnel must receive regular training in operation and handling of the plant and its components.

WARNING

Pressurized material!

Technical defects or incorrect handling can cause pressurized material to escape. Splashing or spraying material can cause severe eye injuries!

Carry out regular visual inspections of the material supply lines. Relieve the working pressure before starting work. Wear your personal protective clothing.

WARNING

Contact with solvents, adhesives and sealants!

Contact with eyes or skin causes injury.

Place the relevant safety data sheets in a clearly visible place on the plant and instructor the personnel. All work on the material supply lines and adjacent components must be carried out only by trained, briefed specialists and with sufficient ventilation. Within the area of the plant, eating, drinking, smoking, snuffing tobacco etc. is prohibited. Dispose of spilt or escaped material immediately and according to regulations. The specified protective clothing must be worn when working on the material supply lines and adjacent components.

1.7 Safety Measures

When working within the machine, the following protective equipment must be provide:

- Always wear protective clothing and safety shoes according to accident prevention and industrial safety regulations.

- If necessary, use protective gloves or disposable gloves when working on the material and hydraulic system.

- When working on the material, compressed air and hydraulic system also wear protective goggles.

- When working within the machine wearing a head protection (protection against bumping) is required.

NOTE

Check your protective clothing before each use!

2 Tools and accessories

The following tools and accessories are required for assembly and disassembly of the module:

Tools

- ► Set of Allen keys
- ► Screwdriver Set
- ► Open-end spanner, 8 mm
- ► Vice with aluminium vice clamps
- ► Pin punch, 3 to 8 mm
- ► Torque spanner
- ► Dosing valve assembly aid

Operating and auxiliary substances	Manufacturer
► White special Vaseline	Reiff (www.reiff-tp.de)
► Multipurpose grease LGHB 2 for high loads and high temperatures	SKF (www.skf.com)
► Paper cleaning tissues (roll) Type "Advanced 420"	Tork (www.tork.de)
► Cleaning cloths WYPALL 7722	Kimberly-Clark (www.kcprofessional.com)
► Sealant remover (cleaning spray)	Liqui Moly (www.liqui-moly.de)
► Brake cleaner (spray)	Gerhard Sprügel GmbH (www.spruegel.com)
► Screw locking adhesive, medium-strength	WÜRTH (www.wuerth.de)

3 Removing

3.1 Disassembling the (optional) heater

- Release the M3x12 hexagon socket screws and remove the connector housing with pin insert, disconnecting all cables.
- Release the set screws and pull them out.
- Carefully knock out the heating cartridge and RTD using a pin punch.

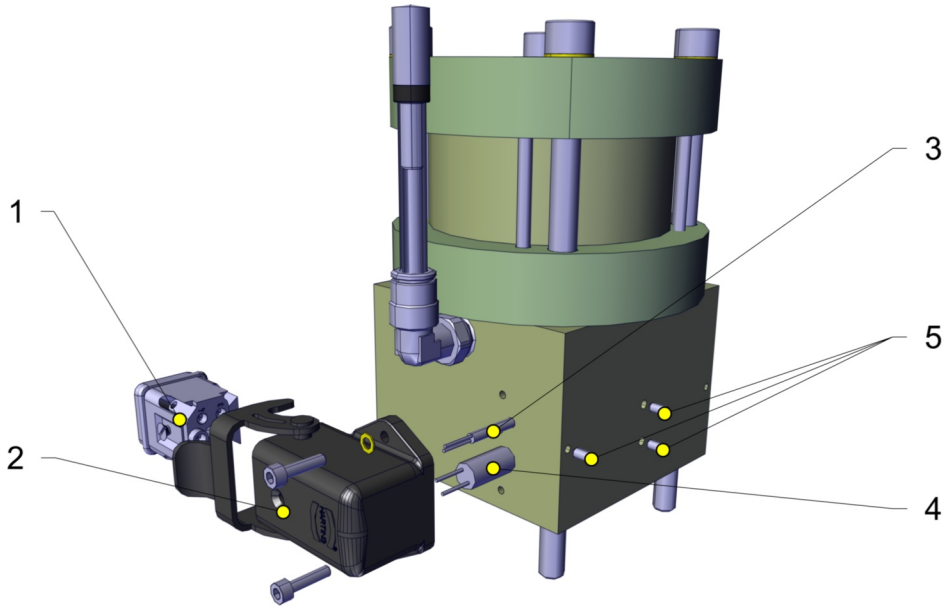

Figure 1: Disassembling the heater

No.	Designation
1	Pin insert
2	Connector housing incl. screw connection
3	Resistance temperature detector (RTD)
4	Heating cartridge
5	Set screw M3x6

3.2 Disassembling the dosing valve

- Unscrew the push-in fitting.
- Remove the leakage indicator and grease nipple.

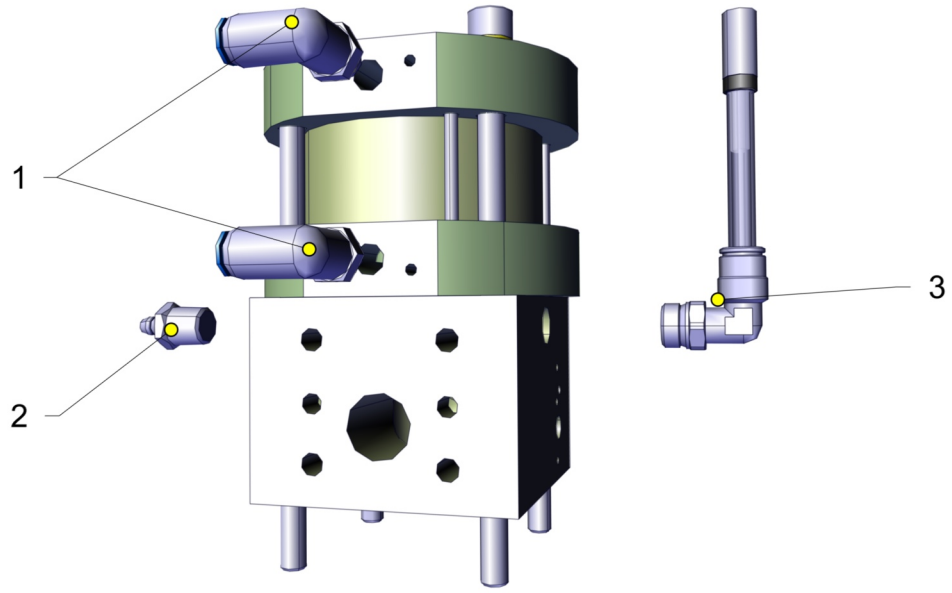

Figure 2: Disassembling the connections

No.	Designation
1	Connector
2	Grease nipple
3	Leakage indicator

- Unscrew the four M8x150 hexagon socket screws.
- Unscrew the M4x60 hexagon socket screw.
- You can now pull the dosing valve apart.

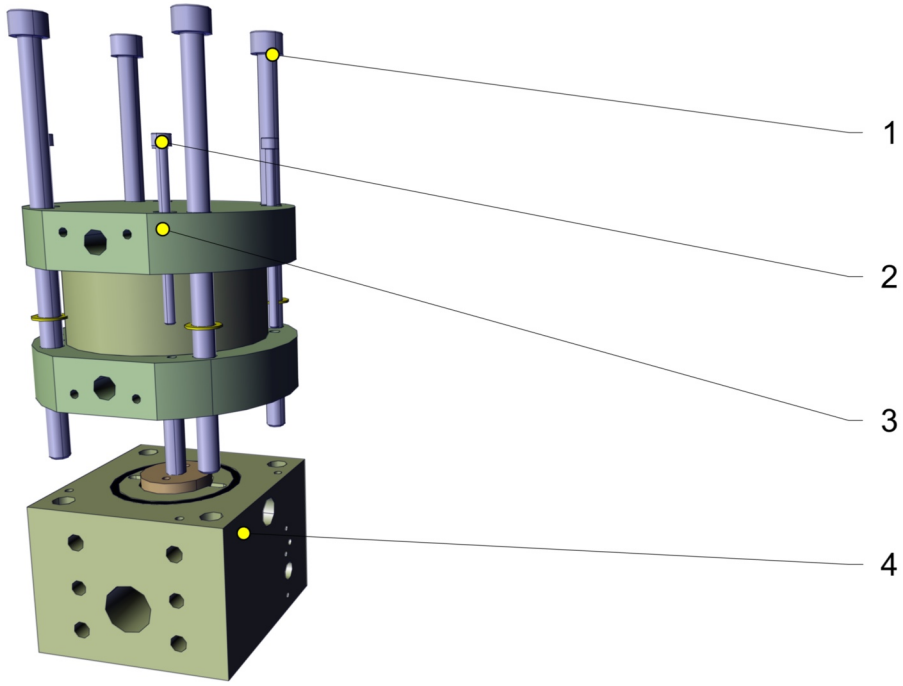

Figure 3: Disassembling the actuator and valve body

No.	Designation
1	M8x150 socket head screw
2	M4x60 socket head screw
3	Actuator
4	Valve body

3.3 Disassembling the actuator

- Release the M4x60 hexagon socket screws.
- Take off the cover.
- Remove the shaft spring and the O-ring from the cover.
- Also remove the O-ring and rod seal from the base.
- Take the piston of the cylinder barrel.
- Release the O-ring from the piston and, if necessary, unscrew the needle, which is secured with a medium-strength screw locking adhesive.

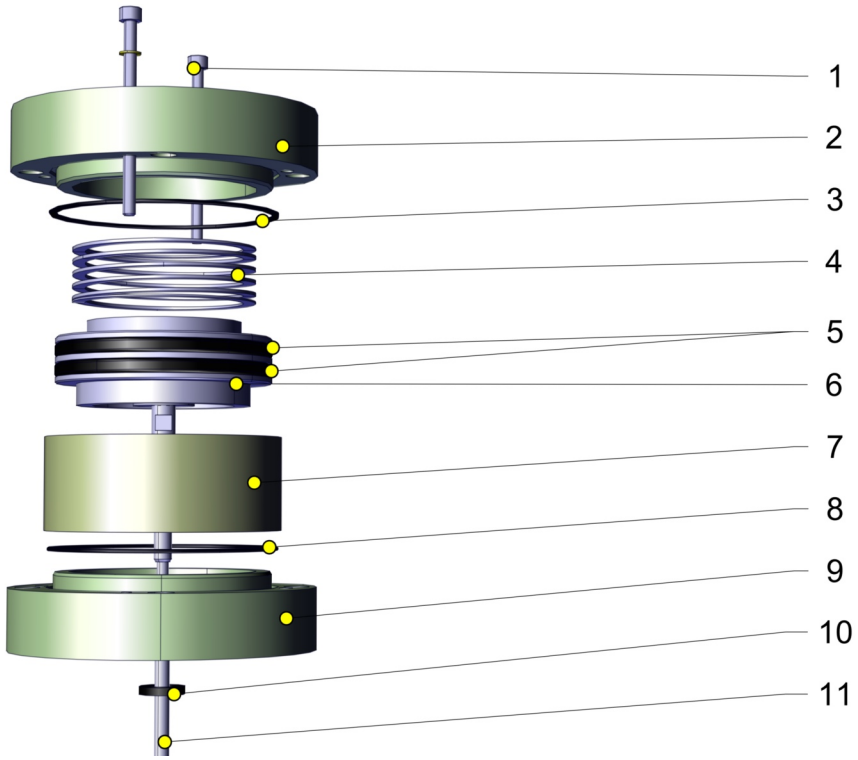

Figure 4: Disassembling the actuator

No.	Designation
1	M4x60 socket head screw
2	Cover
3	O-ring
4	Shaft spring
5	O-ring
6	Piston

No.	Designation
7	Cylinder barrel
8	O-ring
9	Base
10	Rod seal
11	Needle

3.4 Disassembling the valve body

- Pull the seal carrier out of the valve body. M3 holes are provided for this purpose, into which you can screw screws in order to pull out the seal carriers more easily.
- Remove the O-rings from the bore of the valve body.
- Knock the nozzle plate out of the valve body. Pull the O-rings off the nozzle plate.
- Press the rod seals out of the seal carriers.

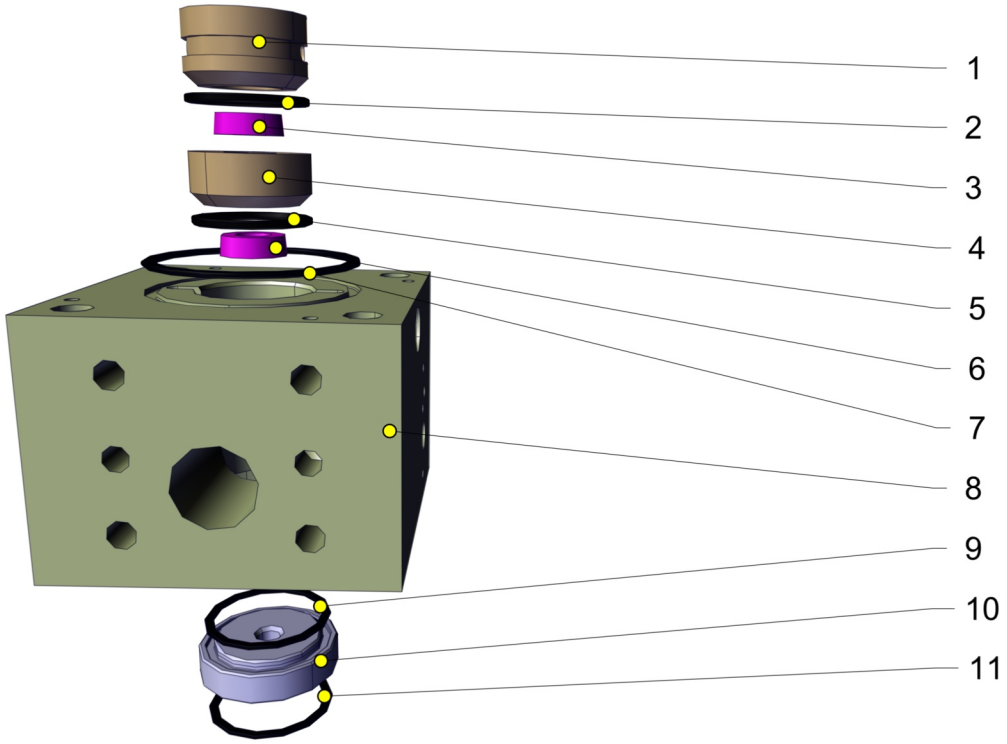

Figure 5: Disassembling the valve body

No.	Designation
1	Seal carrier
2	O-ring
3	Rod seal
4	Seal carrier
5	O-ring
6	Rod seal

No.	Designation
7	O-ring
8	Valve body
9	O-ring
10	Nozzle plate
11	O-ring

4 Cleaning and assembly preparation

All parts are cleaned with commercially available industrial cleaners and checked for wear.

Only new wear parts are installed.

Seals and bearing surfaces must be lubricated with petroleum jelly or a high-quality rolling bearing grease before assembly.

IMPORTANT

Use Vaseline to lubricate the seals and running surfaces.
Recommended: White special-purpose Vaseline from Reiff
You can replace this with a higher-grade bearing grease (e.g. SKF LGEP 2).

The bearing surfaces of the screw heads and threads are treated as well.

The following tightening torques must be observed:

M1,7 (SMC SYJ3…)	0,12 Nm	M8-12.9	25 Nm
M3 (SMC SYJ7…)	0,8 Nm	M10	40 Nm
M4	2,1 Nm	M10-12.9	45 Nm
M5	4,3 Nm	M12	45 Nm
M6	8,6 Nm	M12-12.9	50 Nm
M8	21 Nm	M16-10.9	60 Nm

Table 3: Tightening torques

5 Installation

5.1 Assembling the valve body

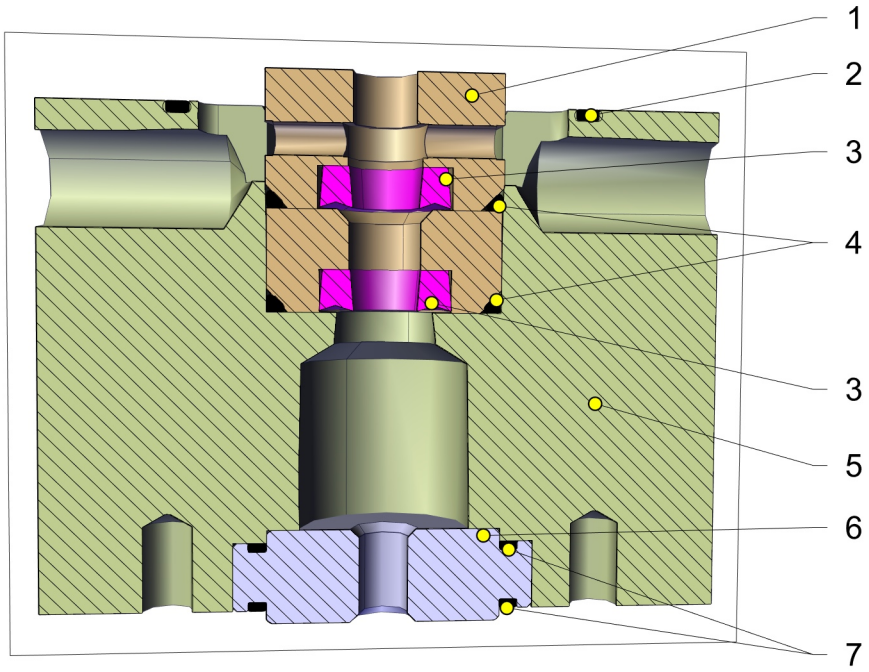

Figure 6: Sectional view of the valve body

No.	Designation
1	Seal carrier
2	O-ring
3	Rod seal
4	O-ring
5	Valve body
6	Nozzle plate
7	O-ring

- Press the rod seals into the seal carriers. Place the open side of the seals in the direction of pressure.
- Fit O-rings and seal carriers in the valve body as illustrated.
- Fit the O-rings in the nozzle plate. Push them into the valve body.
- Fit the grease nipples and the leakage indicator.

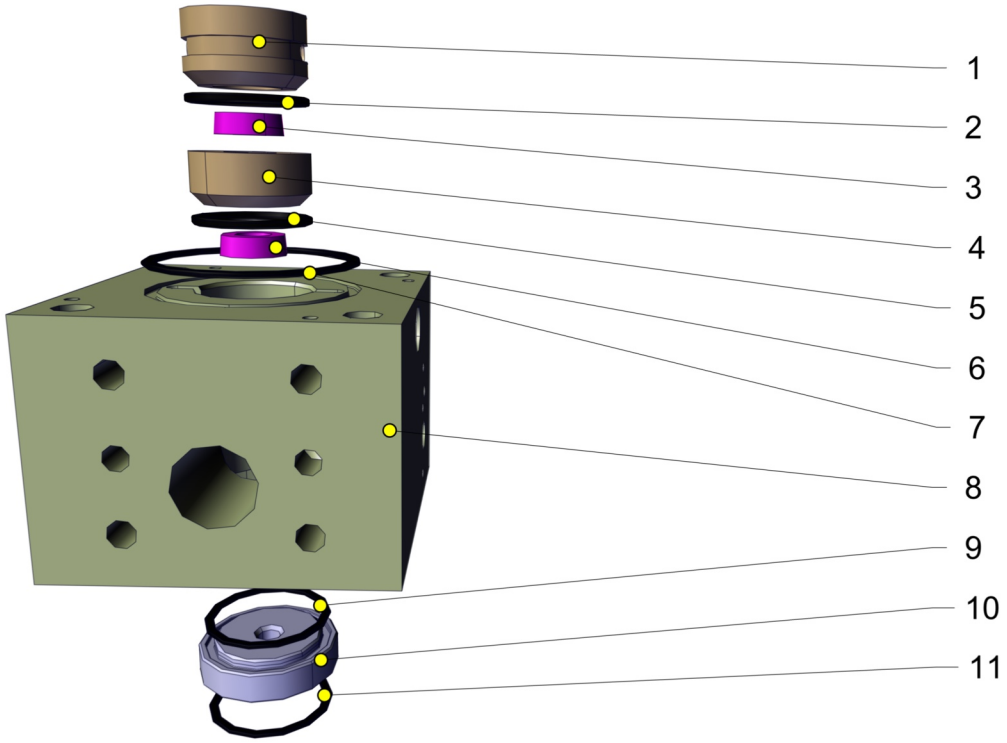

Figure 7: Assembling the valve body

No.	Designation
1	Seal carrier
2	O-ring
3	Rod seal
4	Seal carrier
5	O-ring
6	Rod seal

No.	Designation
7	O-ring
8	Valve body
9	O-ring
10	Nozzle plate
11	O-ring

5.2 Assembling the actuator

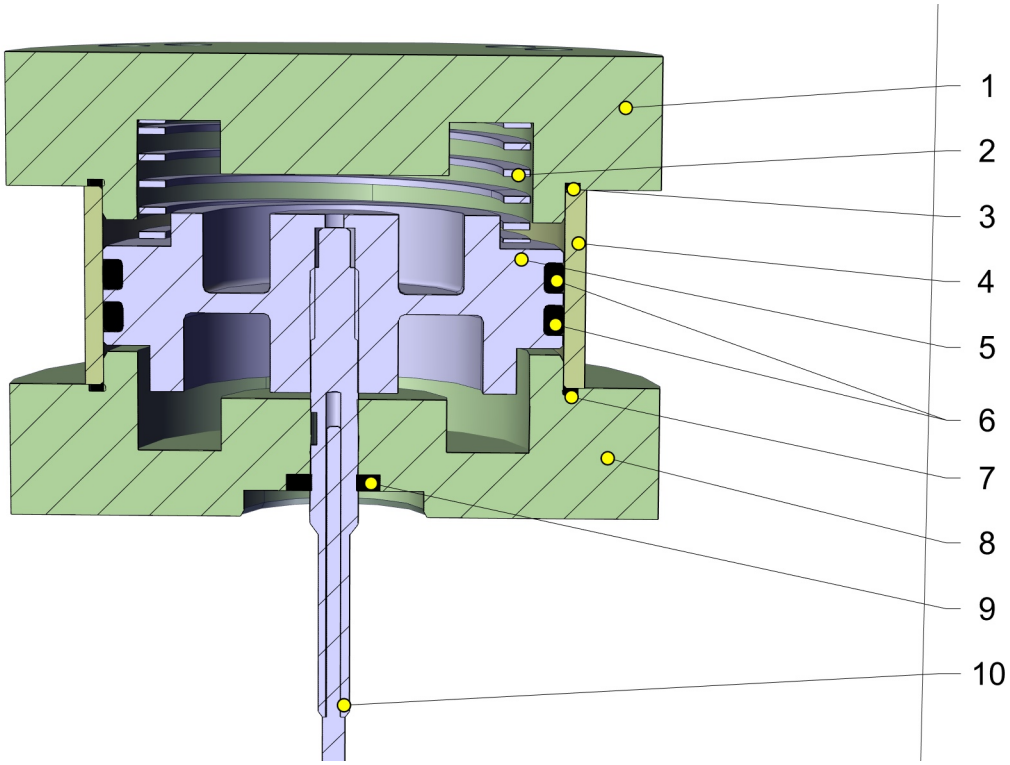

Figure 8: Sectional view of the actuator

No.	Designation
1	Cover
2	Shaft spring
3	O-ring
4	Cylinder barrel
5	Piston

No.	Designation
6	O-ring
7	O-ring
8	Base
9	Rod seal
10	Needle

- Screw the needle into the piston as far as it will go using medium-strength screw locking adhesive.
- Fit the O-rings into the grooves in the piston.
- Lubricate the piston generously and place it in the cylinder barrel. Use an assembly aid to do this.
- Fit the rod seal and the O-ring in the base.
- Remove the shaft spring and the O-ring from the cover.
- Assembling and aligning the components in the arrangement shown. Secure with two M4x60 hexagon socket screws.

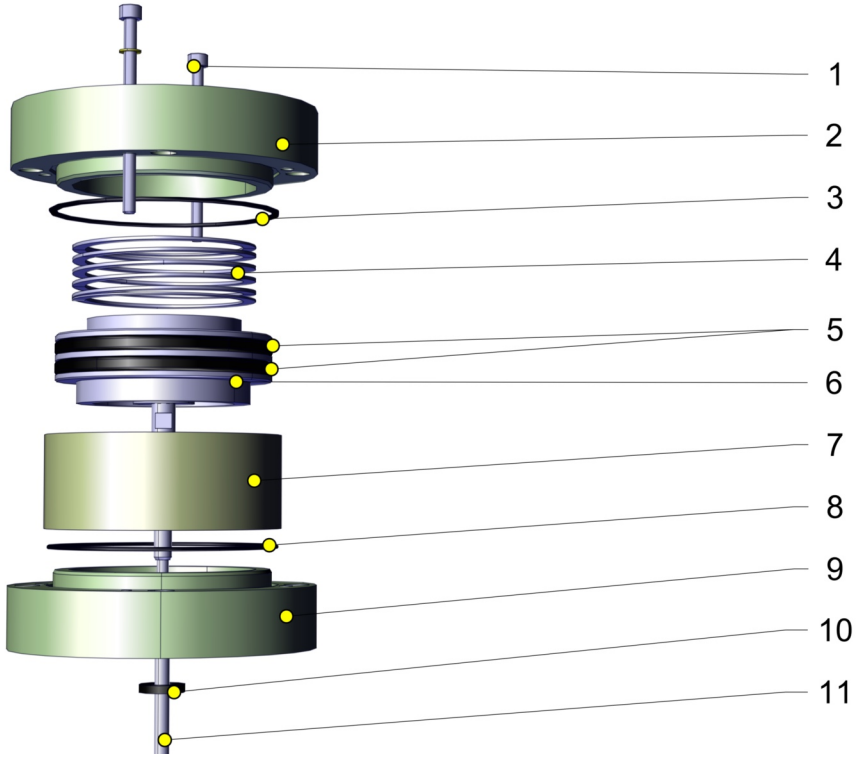

Figure 9: Assembling the actuator

No.	Designation
1	M4x60 socket head screw
2	Cover
3	O-ring
4	Shaft spring
5	O-ring
6	Piston

No.	Designation
7	Cylinder barrel
8	O-ring
9	Base
10	Rod seal
11	Needle

5.3 Installing the dosing valve

- Connect the actuator and valve body with four M4x60 hexagon socket screws.
- **Important**! The actuator can be mounted on the valve body in 4 positions (each with a 90° offset).
- Insert the four M8x150 hexagon socket screws.

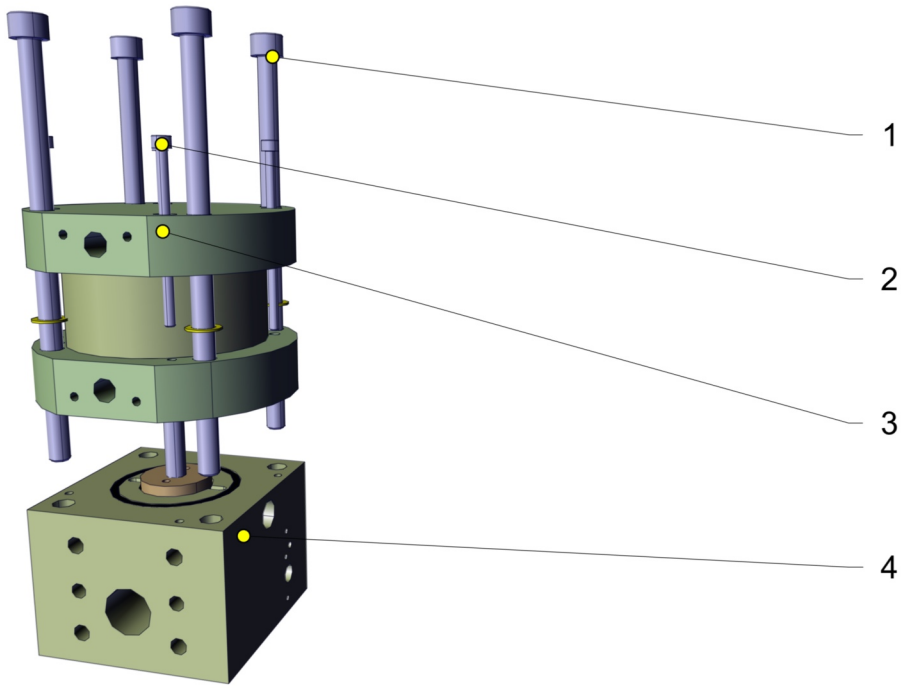

Figure 10: Assembling the actuator and valve body

No.	Designation
1	M8x150 socket head screw
2	M4x60 socket head screw
3	Actuator
4	Valve body

- Screw on the push-in fitting. The sealing surfaces must be free of grease.
- Fit the leakage indicator and grease nipple.

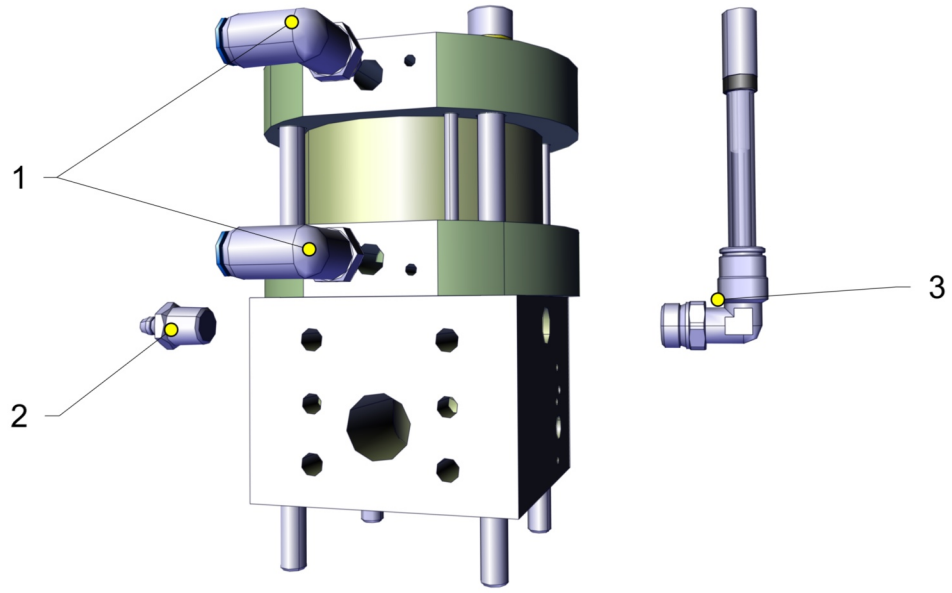

Figure 11: Assembling the connections

No.	Designation
1	Connector
2	Grease nipple
3	Leakage indicator

5.4 Assembling the (optional) heater

- Slide the heating cartridge and resistance temperature detector into the valve housing and secure with M3x6 set screws.
- Fit the connector housing and pin insert with M3x12 screws.
- Connect the cable according to the circuit diagram.

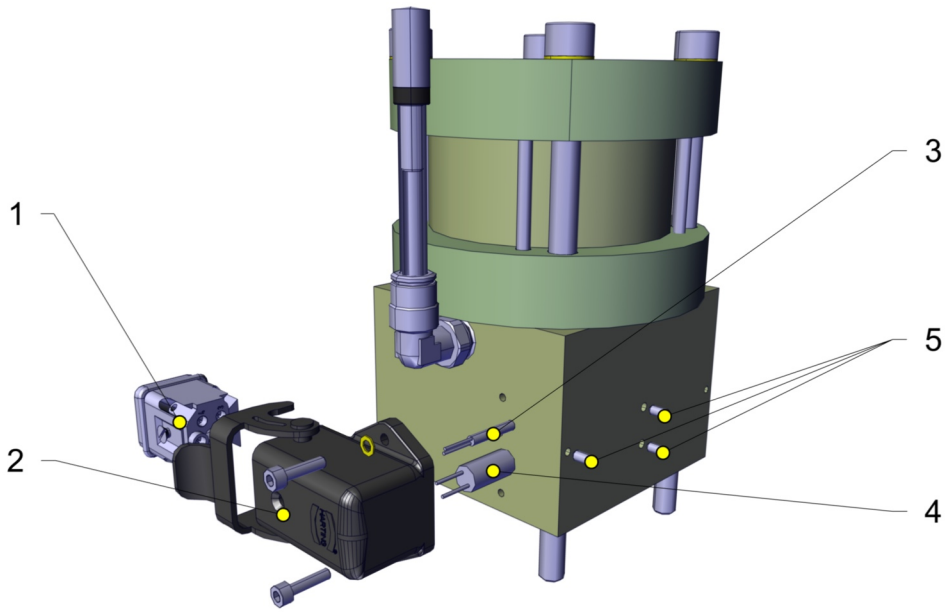

Figure 12: Assembling the heater

No.	Designation
1	Pin insert
2	Connector housing incl. screw connection
3	Resistance temperature detector (RTD)
4	Heating cartridge
5	Set screw M3x6