

VARICOOL - V901

Injection Nozzle Valve

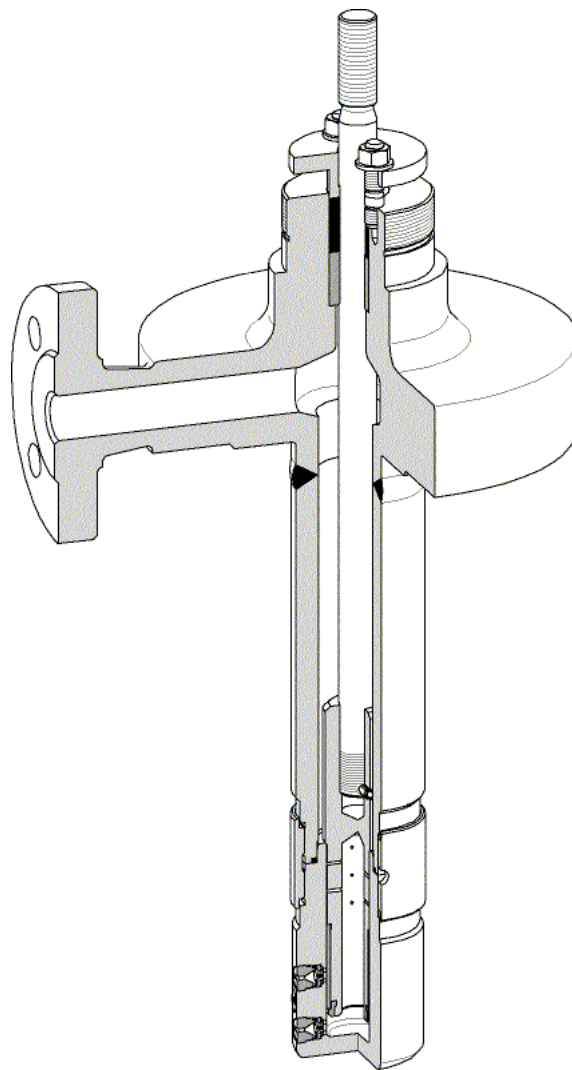


Fig. 1

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Application

Injection control valve for direct steam cooling applications. In combination with a SCHMIDT multispring or central spring pneumatic actuator, optionally also with an electrical linear or rotary actuator, can be controlled. Suitable for a wide range of applications due to simple design and adaptability to different processes.

1 VARICOOL operating instructions

1.1 Installation

The device may only be assembled and put into service by qualified personnel. Qualified personnel are persons who are familiar with the assembly, commissioning and operation of this product and have the respective qualifications to perform these activities.

1.2 Delivery status

The SCHMIDT injection nozzle valves are delivered with assembled and calibrated actuators. They are provided with a protective coating, any shiny parts are greased and the body openings are provided with blanking plugs. The greatest care must be taken against knocks or sudden movements during loading and transport, as the lifting appliances must be attached without pressure on the stem and the position indicator by means of a rope sling below the actuator mounting flange. Any damage of the corrosion protection during transport must be remedied immediately. At the construction site, the injection nozzle valves must be protected against the effects of weather, grime and other damaging influences by being placed on a firm base in a closed room until required for installation. The blanking plugs attached for protection of the flange and interior of the control valve may only be removed at the installation site.

1.3 Installation recommendation

The successful employment of the injection nozzle valve depends directly on a suitable design of the converting station. As the function of the converting station depends greatly on the consideration of the physical possibilities, it is recommended to observe the stated standard values. Deviations may lead to considerable fluctuations in the control loop for which the nozzle valve manufacturer rejects any liability whatsoever. In borderline cases, an expensive conversion of the steam converting station should be expected. Even though the complex physical processes may in individual cases justify a deviation from the standard values, this requires, however comprehensive system knowledge and the express approval of the manufacturer.

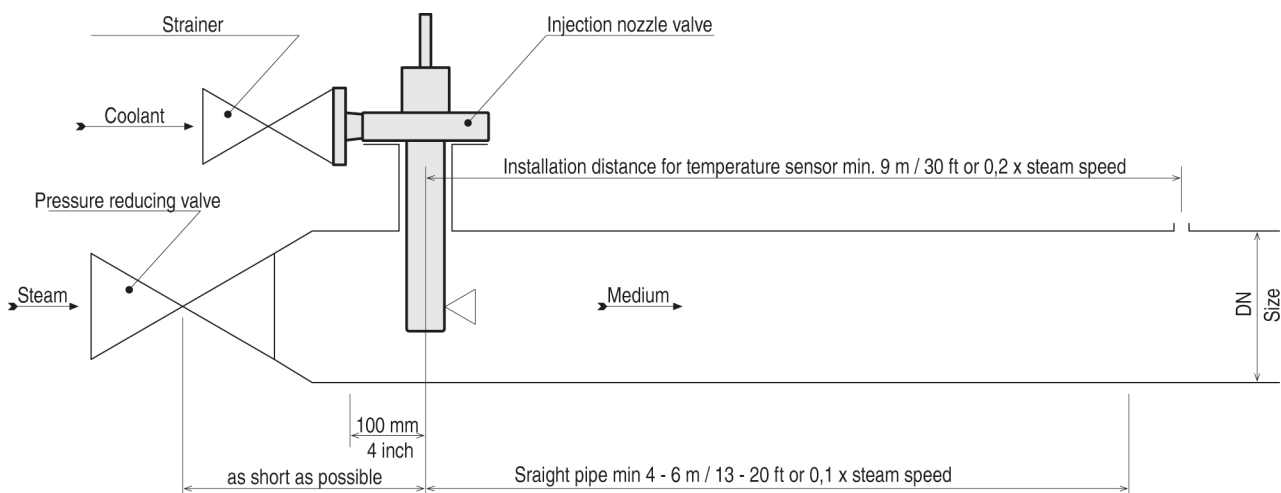
1.4 Physical requirements

- For an optimal operation, the steam speed should be 10 to 100 m/s / 30 to 300 ft/s
- To avoid condensate the set temperature should be 5 to 10 °C / 41 to 50 °F above the saturated steam temperature.
- Max. operating temperature 530 °C / 986 °F
- Recommended cooling media temperature 120 °C / 248 °F
- Cooling media pressure 5 to 10 bar / 76 to 145 psi (see nozzle table) up to max. 90 bar / 1300 psi above steam pressure.
- We recommend the installation of a strainer into the cooling media pipe (mesh size 0,1mm / 0.004 inch)
- Minimum steam pipe diameter 150 mm / 6 inch
- Recommended straight pipe after injection nozzle valve: 0,1 x steam speed min. 4 to 6 m / 13 to 20 ft
- The distance of the temperature sensor should be 0,2 x steam speed or min. 9 m / 30 ft
- The position of the temperature sensor is important for the measuring quality

Pay attention to the mounting instruction of the sensor supplier

1.5 System requirements

- System drawing with design recommendation Experience shows that deviations result in considerable problems. A stratification of temperature zones is a frequent phenomenon in large steam piping networks. We recommend the installation of 2 to 3 temperature sensors with average value calculation.



Ensure that the central nozzle and the atomisation cone correspond to the axis of the piping. The cooling medium must always be injected in the direction of flow of the medium !

1.6 Preparation for installation in the pipeline

The sealing and functional check as well as the quality assurance checks carried out in the factory ensure the version of the control valve fully corresponds with the version specified in the supply contract. The model number and data required for operating the valve and drive are noted on the nameplate. The achievable stroke can be read on the driving starting pillar/yoke.

Before the installation, the pipelines must be carefully cleaned.

1.7 Installation of the SCHMIDT valve

Checklist:

- Does the name plate agree with the operating data of the system?
Non-agreement can lead to considerable damage of the injection nozzle valves, for which the manufacturer accepts no liability !
- Is sufficient space available at the installation location for problem-free installation and removal?
- Have the pipelines been cleaned before the installation?
Carefully remove any foreign bodies !
- Has the control valve been depreserved and cleaned before installation?
- Does the direction arrow attached to the body agree with the direction of flow?
- Do any unallowed voltages occur during installation and operation of the control valve?
Perpendicularity of the flange required !
- Does the spacing of the pipe ends correspond to the overall valve length?

If the aforementioned points are fulfilled, the control valve can be inserted in the pipeline and screwed together with the connecting material (seals, screws, nuts - provided by the builder). Afterwards, the piping of the drive with the plant air in pneumatic actuators or the wiring of the electrical actuators can be carried out according to the electrical block diagram located in the removable drive hood or in the drive manufacturer documentation.

2 Commissioning

Increase the load on the operational parameters gradually and continuously.

Do not suddenly subject the control valve to full operational pressure and operational temperature !

After the initial load (trial run), **while the system is in a pressure-free and cool state:** tighten up the screw connections of the sealing components evenly across the diagonal.

Do not damage the high-quality stem surface !

It is forbidden to work between the pillar / yoke during operation because of the risk of injury !

3 Maintenance

| Maintenance activities | Maintenance interval |
|---|---|
| Clean the valve spindle with a soft cloth. <i>Do not damage the high-quality spindle surface !</i> | Depending on the amount of grime. <i>The spindle surface must always retain its metallic shine !</i> |
| Tighten up the valve spindle seal if any leakages occur. | Regular check |

If any defects or faults occur, contact the manufacturer, his authorized repairers, customer service or, in special cases, with the express permission of the manufacturer, the operating company. Any repair activities on the part of third parties invalidate the warranty of the manufacturer.

Service hotline:

0043 (0) 664 3418616

4 Trouble shooting

| Defect | No. | Possible cause | Remedy |
|--|-----|---|---|
| Spindle does not move | 1.1 | <ul style="list-style-type: none"> no aux. energy supply (pneumatic air or electrical power) to actuator and accessories (solenoid valve, filter reducing station, positioner, limit switch and special accessories) | <ul style="list-style-type: none"> pneumatic actuators: check supply line for leaks; check pressure (usually 6 bar) electrical actuators: check power supply (connections, circuit breakers, voltage) see maintenance and operating instructions of accessories manufacturer contact customer service departement or contract partner see maintenance and operating instructions of actuator manufacturer loosen stuffing box packing nuts until valve operates properly <p>Caution: make sure there are no leaks !</p> <ul style="list-style-type: none"> contact customer service departement or contract partner |
| | 1.2 | <ul style="list-style-type: none"> the fitted accessories do not work | |
| | 1.3 | <ul style="list-style-type: none"> the pneumatic actuator is defective | |
| | 1.4 | <ul style="list-style-type: none"> the electrical actuator is defective | |
| | 1.5 | <ul style="list-style-type: none"> excessive tightening of the stuffing box packing | |
| | 1.6 | <ul style="list-style-type: none"> Valve trim worn, stuck | |
| Jolting spindle movement | 2.1 | <ul style="list-style-type: none"> dirty spindle | <ul style="list-style-type: none"> clean spindle with suitable cleaning agent contact customer service department or a contract partner compare actuator specs on the rating plate with operation specifications of the facility - if incompatible, contact customer service department or contract partner |
| | 2.2 | <ul style="list-style-type: none"> damaged spindle | |
| | 2.3 | <ul style="list-style-type: none"> actuator not powerful enough | |
| Spindle travel less than full stroke (0 to 100% stroke) | 3.1 | <ul style="list-style-type: none"> air supply pressure too low | <ul style="list-style-type: none"> provide air at the pressure stated on the rating plate take hand wheel to limit position readjust limit switch to actuator manufacturer's specifications readjust positioner to positioner manufacturer's specifications contact customer services department or contract partner |
| | 3.2 | <ul style="list-style-type: none"> pneumatic actuators: bad hand wheel position (hand wheel emergency operation) | |
| | 3.3 | <ul style="list-style-type: none"> electrical actuators: limit switch misadjusted | |
| | 3.4 | <ul style="list-style-type: none"> badly adjusted or defective positioner | |
| | 3.5 | <ul style="list-style-type: none"> foreign particles in valve seat, damaged trim | |

| Defect | No. | Possible cause | Remedy |
|------------------------------|-----|---|---|
| Excessive valve seat leakage | 4.1 | <ul style="list-style-type: none"> damaged sealing edges at valve seat or plug | <ul style="list-style-type: none"> contact customer services department or contract partner |
| | 4.2 | <ul style="list-style-type: none"> foreign particles in seat area | <ul style="list-style-type: none"> contact customer services department or contract partner |
| | 4.3 | <ul style="list-style-type: none"> plug does not close fully | <ul style="list-style-type: none"> refer to 3.1 to 3.5 |
| Leaking stuffing box system | 5.1 | <ul style="list-style-type: none"> compression force on packing too low | <ul style="list-style-type: none"> slightly re-tighten stuffing box packing <p>Caution: make sure the valve spindles can still move !</p> |
| | 5.2 | <ul style="list-style-type: none"> worn packing | <ul style="list-style-type: none"> slightly re-tighten stuffing box packing <p>Caution: make sure the valve spindles can still move !</p> |
| | 5.3 | <ul style="list-style-type: none"> dirty spindle | <ul style="list-style-type: none"> if the packing does not stop leaking, contact customer service department or contract partner clean spindle with suitable cleaning agent |
| | 5.4 | <ul style="list-style-type: none"> damaged spindle | <ul style="list-style-type: none"> contact customer services department or contract partner |
| Leaking top or lid seal | 6.1 | <ul style="list-style-type: none"> pressing force on seal(s) too low | <ul style="list-style-type: none"> properly re-tighten top or lid nuts crosswise |
| | 6.2 | <ul style="list-style-type: none"> seal(s) defective | <ul style="list-style-type: none"> contact customer services department or contract partner |
| Leaking housing | 7.1 | <ul style="list-style-type: none"> medium or flow related damage | <ul style="list-style-type: none"> contact customer service department or contract partner |
| No limit switch signal | 8.1 | <ul style="list-style-type: none"> power supply to limit switch interrupted | <ul style="list-style-type: none"> check power supply (voltage, circuit breakers, connections) |
| | 8.2 | <ul style="list-style-type: none"> limit switch misadjusted | <ul style="list-style-type: none"> readjust limit switch; operating distance see limit switch data sheet |
| Vibrating positioner | 9.1 | <ul style="list-style-type: none"> defective positioner | <ul style="list-style-type: none"> see maintenance and operating instructions of positioner manufacturer |

If the problem is not solved by taking the above measures, contact the customer services department or contract partner.

5. Repair

If a fault or defect occurs which, according to the list of measures before, requires the customer services department or contract partner to be contacted, the manufacturer's guarantee shall be rendered null and void - and the manufacturer released from any responsibility - unless the customer services department or contract partner is duly notified.

Service hotline Austria:

+43 (0)664 341 8 616

6. Assembly

These procedure assumes that the Injection Nozzle Valve is completely disassembled. If it is not, start the instructions at the appropriate step.

6.1 Cleaning

Carefully clean all valve parts before beginning assembly!

6.2 Lubrication

Lightly grease all guide pieces

For lubricant to be used, see table 1

| |
|--|
| LUBRICANT |
| Klüber Wolfracoat C – Item no.: 089032 |

Tab.: 1

Lightly grease all screw threads

For lubricant to be used, see table 2

| |
|--|
| LUBRICANT |
| Klüber Wolfracoat C – Item no.: 089032 |

Tab.: 2

6.3 Assembly component “Nozzle body”

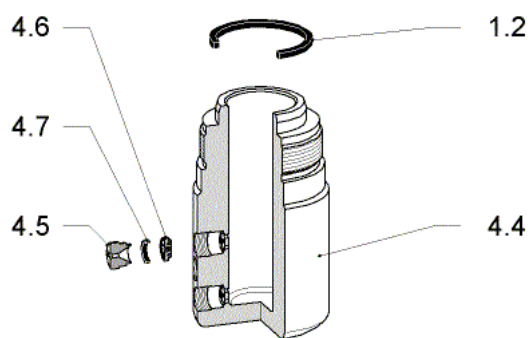
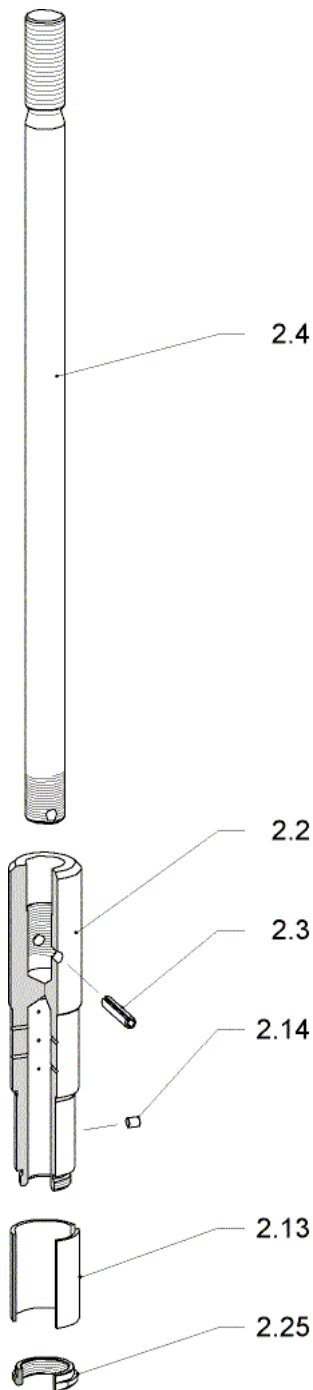


Fig. 2

- Fixation of the nozzle body (4.4)
- Insert the rotary disk (4.6) and profile ring (4.7) into the nozzle body (4.4) and then screw in the nozzle (4.5)
- Place the profile ring (1.2) on the nozzle body (4.4)

6.4 Assembly component "Plug"



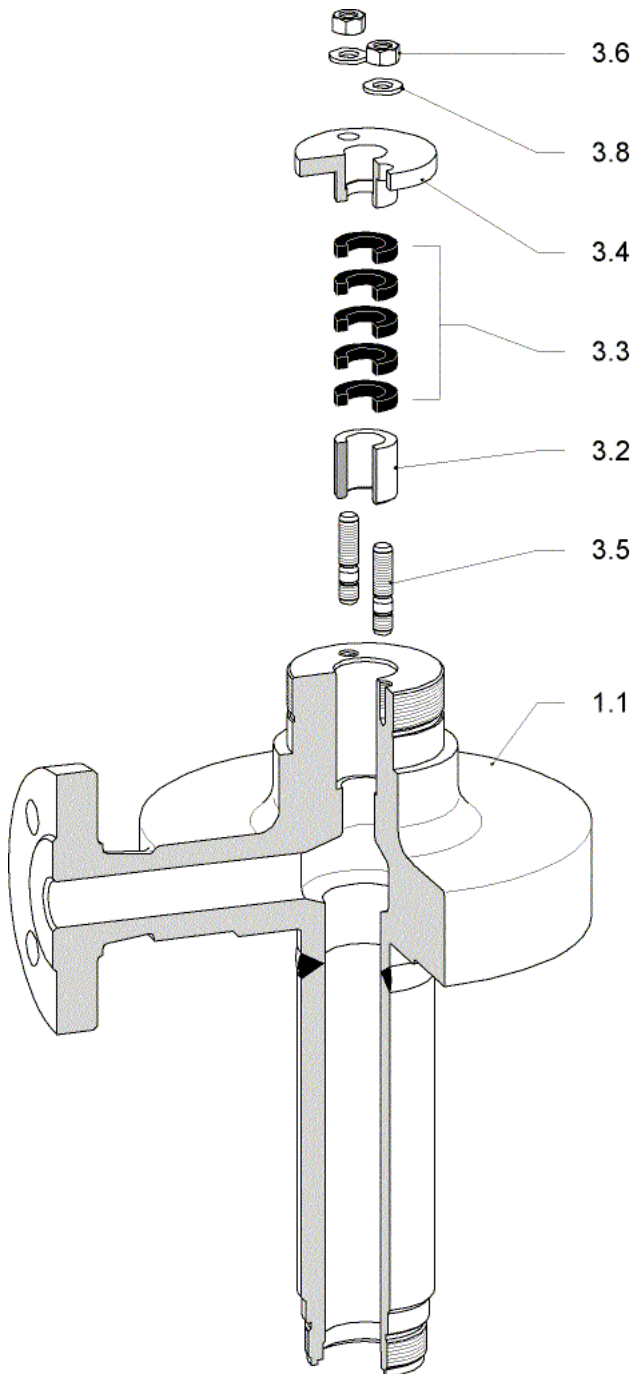
- Fixation of the plug (2.2)
- Screw the stem (2.4) into the plug (2.2)
- Drill both plug (2.2) and stem (2.4) together
- Press the spring pin (2.3) into the drilled hole

After pressing in the dowel pin, the plug and stem must be aligned to one another !

- Insert the fuse carrier (2.14) in the plug (2.2)
- Put the piston sleeve (2.13) onto the plug (2.2)
- Screw the lock nut (2.25) onto the plug (2.2) (for tightening torques, see page 9)
- The lock nut (2.25) must be secured by welding spots against automatic loosening !

Fig. 3

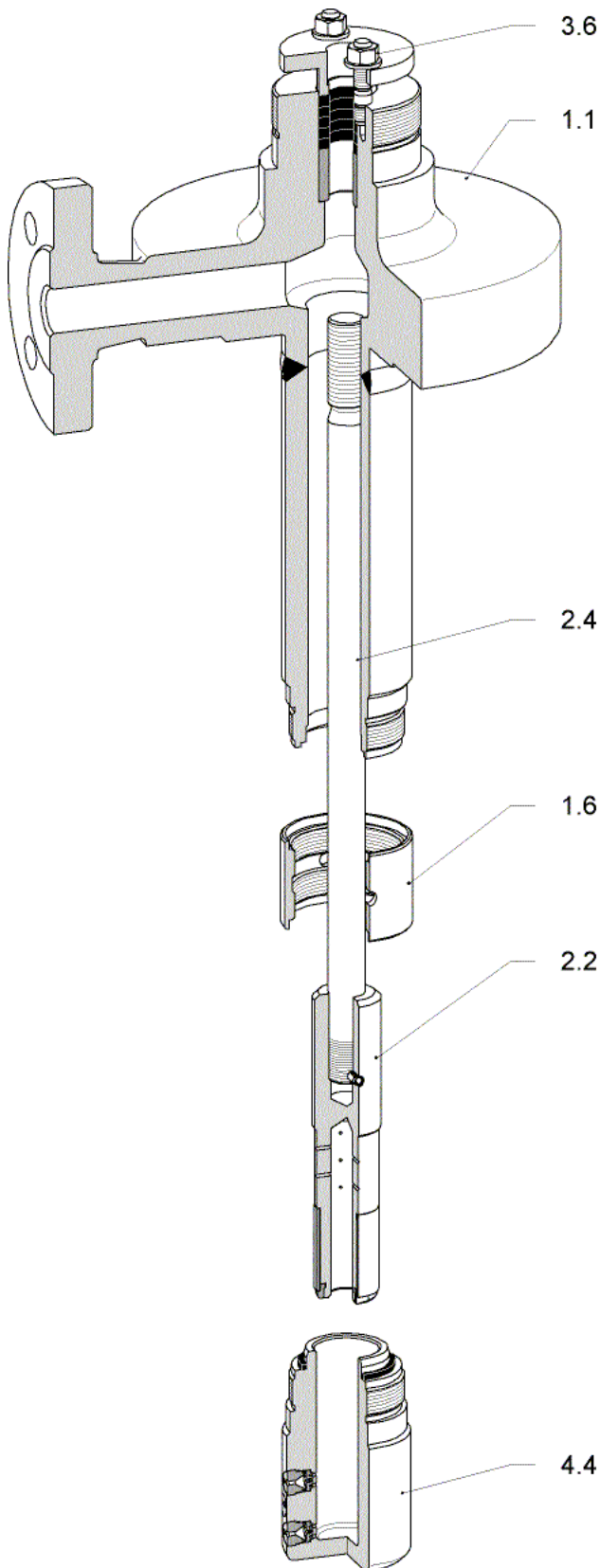
6.5 Assembly component "Packing"



- Insert the guide sleeve (3.2) in the body (1.1)
- Insert the packing (3.3) on the guide bush (3.2)
- Screw the stud bolts (3.5) into the body (1.1)
- Place the packing box (3.4) on the packing (3.3)
- Place the disk (3.8) on the packing box (3.4)
- Screw the hexagonal nuts softly (3.6) onto the stud bolts (3.5)

Fig. 4

6.6 Assembly "VariCool"

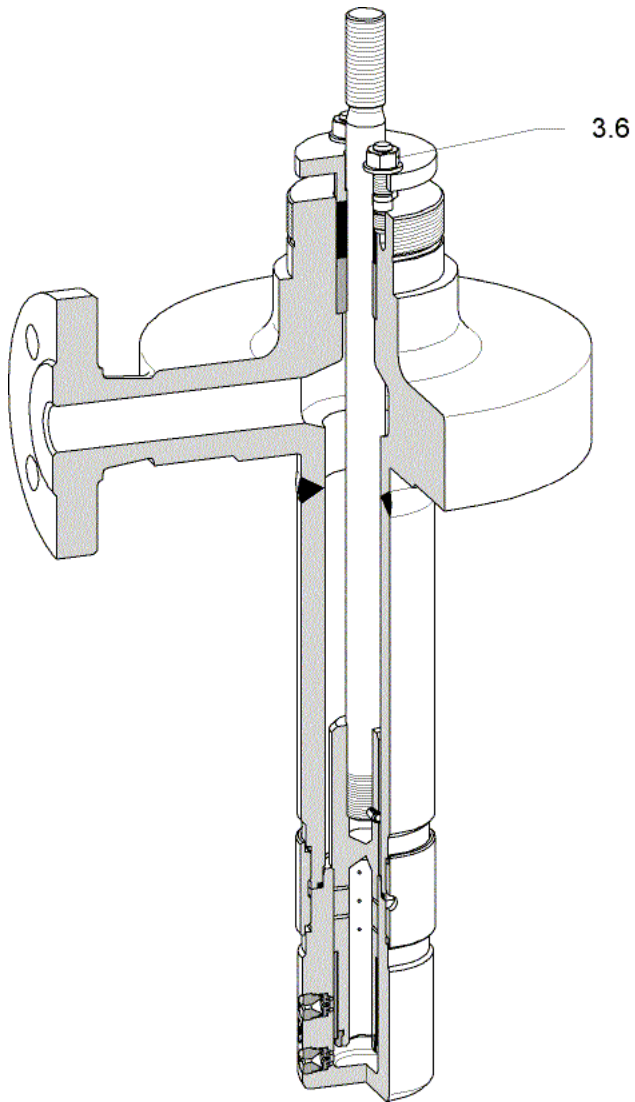


- Insert the plug (2.2) in the nozzle body (4.4)
- Place the LR nut (1.6) onto the nozzle body (4.4)
- Fixation of the body (1.1)
- Insert the stem (2.4) in the body (1.1)
- Connect the body (1.1) and nozzle body (4.4) with one another by turning the LR nut (1.6) (for tightening torques, see

After assembly, the LR nut (1.6) must be secured by welding spots against automatic loosening !

Fig. 5

6.7 Assembly "Finish"



- Tighten the hexagonal nuts (3.6) evenly

The stem must move smoothly !

Fig. 6

7 Parts list

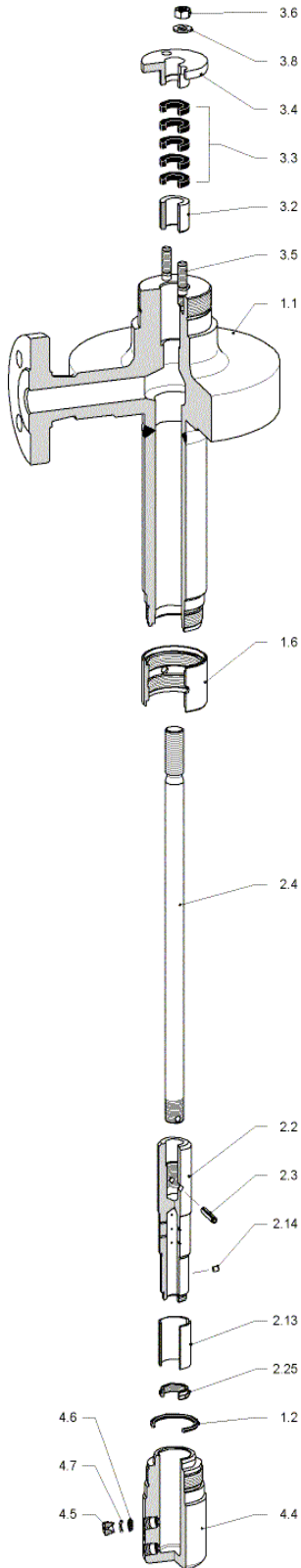


Fig. 7

| Name | Part | Materials | Spare parts |
|----------------------------|------|--------------------------|-------------|
| Body | 1.1 | 1.4581/1.4571 | |
| Profile ring | 1.2 | Pure graphite | D |
| LR nut | 1.6 | 1.4922 | |
| Plug | 2.2 | 1.4922 | K |
| Spring pin | 2.3 | A2 | K |
| Stem | 2.4 | 1.4922 | K |
| Piston sleeve | 2.13 | 1.4122 tenifer treatment | K |
| Protection against torsion | 2.14 | 1.4122 | K |
| Lock nut | 2.25 | 1.4922 | K |
| Guide bush | 3.2 | 1.4034 hardened | |
| Packing | 3.3 | Graphite rings | D |
| Packing box | 3.4 | 1.4571 | |
| Stud bolt | 3.5 | A2-70 | |
| Hexagonal nut | 3.6 | A2-70 | |
| Disk | 3.8 | A2 | |
| Nozzle body | 4.4 | 1.4922 | |
| Nozzle | 4.5 | 1.4571 tenifer treatment | S |
| Rotary disk | 4.6 | 1.4571 tenifer treatment | S |
| Profile ring | 4.7 | Pure graphite | S |

K plug, stem, piston sleeve
S nozzle-set
D seal-set

SAEEIMV901 03.08

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