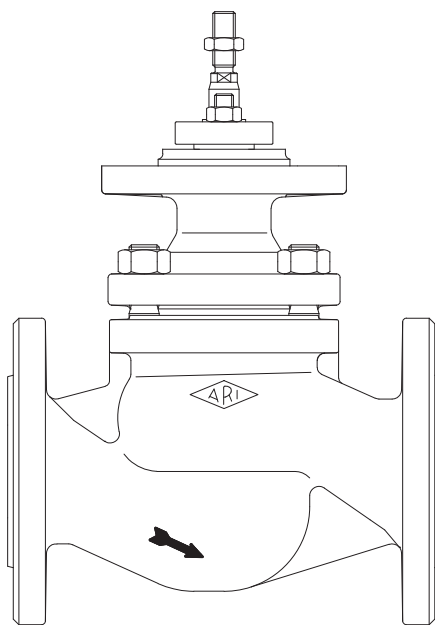
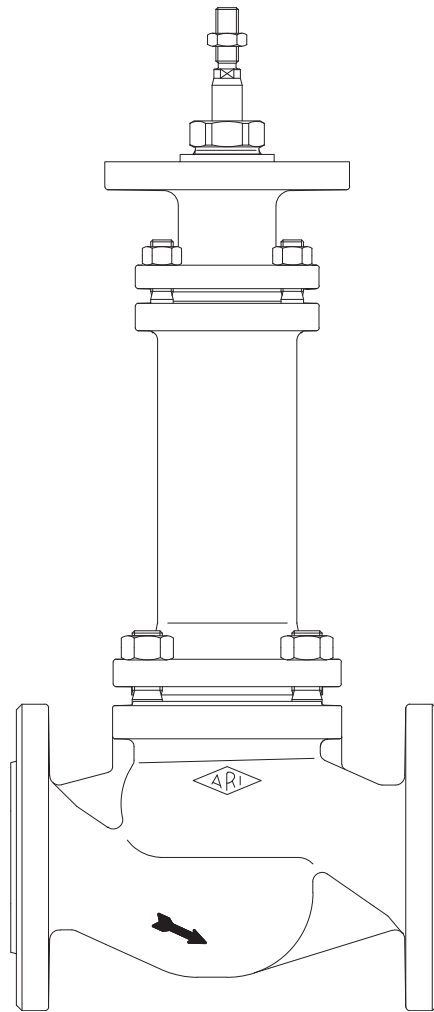


Operating and installation instructions

Straight through control valves - STEVI® 470 / 471



Series 470



Series 471

Contents

1.0 General information on operating instructions	2-2	7.0 Care and maintenance	2-10
2.0 Notes on possible dangers.....	2-2	7.1 Replacement of stem sealings	2-11
2.1 Significance of symbols	2-2	7.1.1 PTFE V-ring unit design	2-11
2.2 Explanatory notes on safety information	2-2	7.1.2 EPDM sealing design	2-11
3.0 Storage and transport	2-3	7.1.3 Stuffing box packing design	2-12
4.0 Description	2-4	7.1.4 Bellows seal design	2-13
4.1 Scope of applications	2-4	7.2 Replacement of internal parts	2-15
4.2 Operating principles	2-4	7.2.1 Replacement of plug and stem	2-15
4.3 Diagram	2-5	7.2.2 Replacement of seals of pressure balanced plugs (PTFE V-ring)	2-15
4.4 Technical data	2-6	7.2.3 Replacement of seals of pressure balanced plugs (lamellar rings)	2-16
4.5 Marking	2-6	7.2.4 Replacement of the seat ring	2-16
5.0 Installation	2-7	7.3 Tightening torques	2-17
5.1 General notes on installation	2-7	7.3.1 Tightening torques for nuts	2-17
5.2 Requirements at the place of installation	2-8	7.3.2 Tightening torques for seat rings	2-17
5.3 Installation requirements for fitting the valve to the pipeline	2-8	8.0 Troubleshooting	2-17
5.4 Installation instructions concerning actuators	2-9	9.0 Disposal	2-17
6.0 Putting the valve into operation	2-9	10.0 Troubleshooting table	2-18
		11.0 Dismantling the valve or the top part ...	2-19
		12.0 Warranty / Guarantee	2-19

1.0 General information on operating instructions

These operating instructions provide information on mounting and maintaining the fittings. Please contact the supplier or the manufacturer in case of problems which cannot be solved by reference to the operating instructions.

They are binding on the transport, storage, installation, start-up, operation, maintenance, repair, disposal.

The notes and warnings must be observed and adhered to.

- Handling and all work must be carried out by expert personnel or all activities must be supervised and checked.

It is the owner's responsibility to define areas of responsibility and competence and to monitor the personnel.

In addition, regional safety requirements must be applied and observed when working on the valve.

- In addition, current regional safety requirements must be applied and observed when taking the fittings out of service as well as when maintaining and repairing them.

The manufacturer reserves the right to introduce technical modifications at any time.

These Operating Instructions comply with the requirements of EU Directives.

2.0 Notes on possible dangers

2.1 Significance of symbols



Warning of general danger.

2.2 Explanatory notes on safety information

In these operating and installation instructions dangers, risks and items of safety information are highlighted to attract special attention.

Information marked with the above symbol and "**ATTENTION !**" describe practices, a failure to comply with which can result in serious injury or danger of death for users or third parties or in material damage to the system or the environment. It is vital to comply with these practices and to monitor compliance.

All other information not specifically emphasised such as transport, installation, operating and maintenance instructions as well as technical data (in the operating instructions, product documentation and on the device itself) must also be complied with to the fullest extent in order to avoid faults which in turn can cause serious injury to persons or damage to property.

3.0 Storage and transport



ATTENTION !

- *Protect against external force (like impact, vibration, etc.).*
- *Valve mountings such as actuators, handwheels, hoods must not be used to take external forces, e.g. they are not designed for use as climbing aids, or as connecting points for lifting gear.*
- *Suitable materials handling and lifting equipment should be used. See catalog sheet for weights.*
- *The valve, and especially its connection parts, must be protected from damage whenever it is set down or placed in storage.*
- *Proper storage is essential to ensure that the valve functions correctly, particularly the sealing elements.*

- The paint is a base coat to protect against corrosion during transportation and storage. Do not damage paint protection (for more information on protection against weathering and corrosion, see 5.1)
- Suitable valve lifting equipment should be used. This should be attached to the valve body as shown in Abbildung 1 and not to the stem or the actuator. Ensure that the control valve is secured against falling, toppling over and shifting.
- The corrosion protection of the final control element must not be damaged. Any damage that occurs must be repaired immediately.
- At -20°C to +65°C.



ATTENTION !

Do not stand underneath the valve while installing it! There is a risk of injury if it topples over!

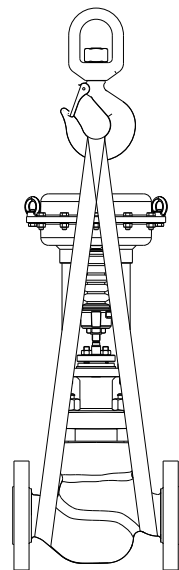


Bild 1: Lifting equipment

4.0 Description

4.1 Scope of applications

Valves are used for „controlling the flow of liquids, gases and vapours in chemical and other processing plants and for plant engineering“.



ATTENTION !

- *Refer to the data sheet for applications, limits on use and possibilities.*
- *For limits on use, refer mainly to the information on the valve itself. Supplementary information can be found in the order confirmation as well as on the data sheet.*
- *Certain media require or preclude the use of special materials. You must check the material stability. It is the responsibility of the planner / owner to ensure that suitable materials are used.*
- *The valves are designed for standard operating conditions. If conditions exceed these requirements, e.g. aggressive or abrasive media or use in EX areas, the operator should state the higher requirements when ordering.*
- *Valves made from grey cast iron are not authorised for use in systems subject to TRD 110.*
- *Careful selection and sizing of the valve based on the anticipated operating conditions is essential for low-noise, low-vibration operation.*
- *Do not operate the valve unless it is in proper working order.*
- *Dangerous substances should be handled in accordance with the relevant safety regulations.*

The information complies to the Pressure Equipment Directive 2014/68/EU.

It is the responsibility of the machine planner to ensure compliance.

The special markings on the valve must be taken into account.

Refer to the catalogue sheet to see which materials are used in standard versions.

Please contact the supplier or the manufacturer if you have any questions.

4.2 Operating principles

The control valves are especially suitable for actuation by pneumatic or electrical actuators.

The plug type depends on the application. For information on the plug type, refer to the order confirmation, the nameplate or the data sheet. The flow direction is indicated by an arrow on the valve body.

The medium flows through the plug against the closing direction as standard. In certain applications the medium may need to flow in the closing direction, in which case additional forces are produced. The actuator design should take account of this.

4.3 Diagram

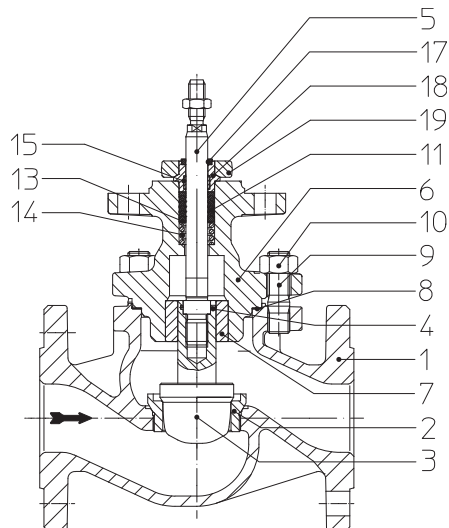


Fig. 2: Series 470 DN15-150

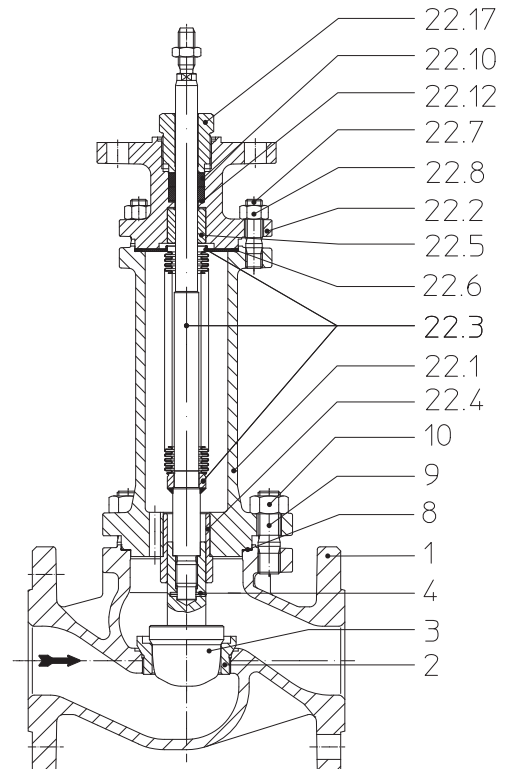


Fig. 3: Series 471 DN15-150

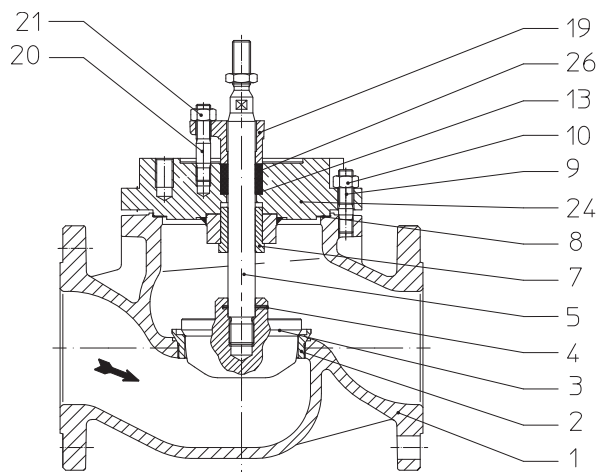


Fig. 4: Series 470 DN125v-150v

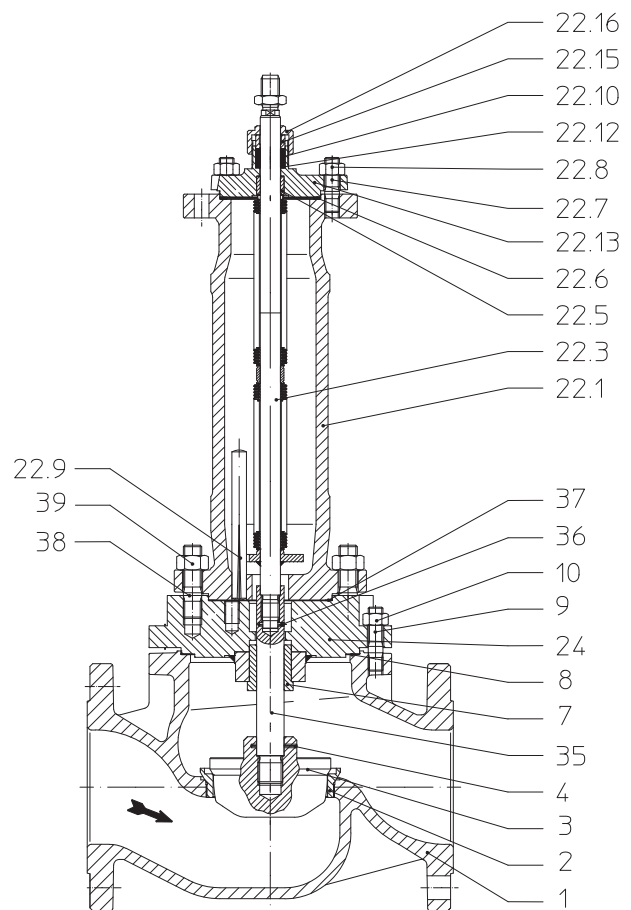


Fig. 5: Series 471 DN125v-150v

4.4 Technical data

for

- **Principal dimensions**

- **Pressure-temperature-ratings, etc.** refer to data sheet.

4.5 Marking

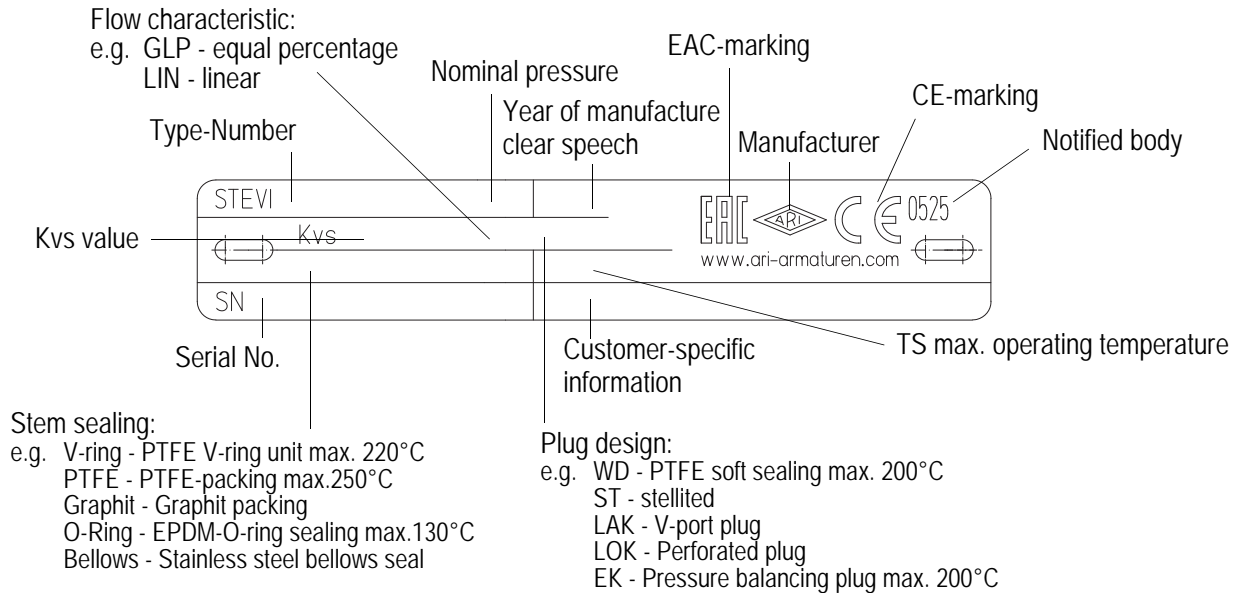


Fig. 6

Address of manufacturer: refer to item 12.0 Warranty / Guarantee

According to the Pressure Equipment Directive table 6, annex II valves without safety function are only allowed to bear the CE-marking DN32 onwards.

5.0 Installation

5.1 General notes on installation

The following items should be taken into account besides the general principles governing installation work:



ATTENTION !

- *With actuators mounted, you must disconnect the power supply before starting work and secure it against reconnection, to prevent any risk of injury from moving parts. Crushing hazard!*
- *Remove flange covers if present.*
- *The interior of valve and pipeline must be free from foreign particles.*
- *Note installation position with reference to flow, see mark on valve.*
- *Steam line systems should be designed to prevent water accumulation.*
- *Lay pipelines so that damaging transverse, bending and torsional forces are avoided.*
- *Protect valves from dirt during construction work.*
- *Connection flanges must mate exactly.*
- *Connecting bolts for pipe flanges should be mounted preferably from the counter flange side (hexagon nuts from the valve side).*
At DN15-32: If valves should be mounted directly to valves, the upper flange connecting bolts should be preferably executed with studs and hexagon nuts on both sides.
- *Valve mountings such as actuators, handwheels, hoods must not be used to take external forces, e.g. they are not designed for use as climbing aids, or as connecting points for lifting gear.*
- *Suitable materials handling and lifting equipment should be used.*
Refer to data sheet for weights.
- *Keep the thread and shaft of the stem free from paint.*
- *Centre gaskets between the flanges.*
- *Strainers or filters should be installed before the valves.*

- *Planners / construction companies or operators are responsible for positioning and installing products.*
- *The valves are designed for application, not influenced from weather.*
- *For application outside or in adverse environments like corrosion-promoting conditions (sea water, chemical vapours, etc.), special constructions or protective measures are recommended.*

5.2 Requirements at the place of installation

The place of installation should be easily accessible and provide ample space for maintenance and removing the actuator. Stop valves should be installed before and after the control valve to enable maintenance working without draining the piping system. The valve should preferably installed vertically with the actuator at the top. Inclined or horizontal installation without supports is permissible only with light actuators.

For this installation position, the two distance columns (or joke) have to be above each other in the vertical plane.

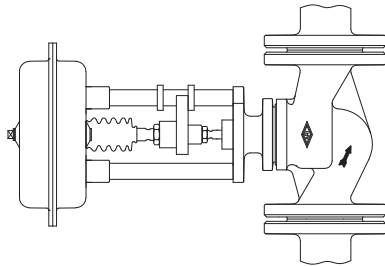


Fig. 7: Pipeline vertically

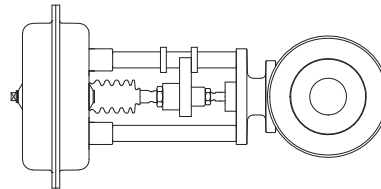


Fig. 8: Pipeline horizontally

Permissible actuator weights for valves with unsupported horizontal stems:

- 20 kg for DN 15 - 32
- 25 kg for DN 40 - 65
- 35 kg for DN 80-100
- 40 kg for DN 125-150
- 55 kg for DN125v-150v

The pipes must be lagged to protect the actuators from excessive heat. Sufficient space must be left for the maintenance of the stem packing.

To ensure that the control valves function correctly, the pipe run should be straight for at least 2 x n.d. upstream and 6 x n.d. downstream of the valve.

5.3 Installation requirements for fitting the valve to the pipeline

Please note that only qualified persons using appropriate equipment and working in accordance with the generally accepted rules of sound engineering practice are allowed to fit the valve to the pipeline. The responsibility for this lies with the system owner.

For information on the type of valve connection, refer to the order confirmation or the data sheet.

Valves with butt weld ends must be welded in the closed position.



ATTENTION !

If the valve is installed in a hazardous area, it must be properly earthed (e.g. with cable bridges).

Regional safety and explosion protection regulations must be adhered to.

Protective measures must be in place if the valve is operated in a hazardous area.

The responsibility for this lies with the system owner.

5.4 Installation instructions concerning actuators

Normally, control valves are supplied complete with actuator fitted.

During assembly work, the plug is not be turned on its seating at closing pressure.

When retrofitting actuators, the maximum permissible force for valve actuation must be taken into account. The maximum permissible actuation forces are:

	Series 470		Series 471
	PN16-40 ANSI150-300	PN63-160 ANSI600	PN16-40 ANSI150-300
DN 15-32	12 kN	12 kN	18 kN
DN 40-65	18 kN	25 kN	18 kN
DN 80-100	40 kN	40 kN	29 kN
DN 125-150	40 kN	40 kN	37 kN
DN 152v-150v	59 kN	-	37 kN



ATTENTION !

- It is not permitted to set up or dismantle actuators with valves operating at the service temperature and pressure.
- The actuators must be installed as described in the operating instructions for conversion or maintenance.
- The actuator and any peripheral devices must be properly connected in conformity with all applicable regulations.
- For valve-specific restrictions, refer to the order confirmation and the data sheet.
- Actuator-specific restrictions are described in the actuator documentation and must be observed.

6.0 Putting the valve into operation



ATTENTION !

- Before putting the valve into operation, check material, pressure, temperature and direction of flow.
 - Regional safety instructions must be adhered to.
 - Residues in piping and valves (dirt, weld beads, etc.) inevitably lead to leakage.
 - Touching the valve when it is operating at high ($> 50\text{ }^{\circ}\text{C}$) or low ($< 0\text{ }^{\circ}\text{C}$) media temperatures can cause injury.
- Affix warning notice or protective insulation as appropriate!

Before putting a new plant into operation or restarting a plant after repairs or modification, always make sure that:

- All works has been completed!
- The valve is in the correct position for its function.
- Safety devices have been attached.
- Avoid inadmissible temperature or pressure increases (thermal shock) when putting a new valve into operation or restarting an existing valve.
- Water or steam hammer must be prevented when putting a new valve into operation or restarting an existing valve, as well as during operation, because this could cause a valve malfunction.
- Avoid extreme changes in the temperature of the medium during operation (thermal shock).

7.0 Care and maintenance

Maintenance and maintenance intervals have to be defined by the operator according to the service conditions.



ATTENTION !

- *With actuators mounted, you must disconnect the power supply and secure it against accidental reconnection, to prevent any risk of injury from moving parts. Crushing hazard!*
- *Valves and valve parts should only ever be cleaned using agents which do not corrode or otherwise damage the material, coatings and sealing elements.*

Maintenance activity	Remarks	Maintenance interval
Clean the valve stem with a soft cloth	Depending on the degree of fouling	Every 10,000 strokes
Check the gland seal	Non-spring loaded gland seals and "normal" conditions	Every 10,000 strokes
	Non-spring loaded gland seals and "difficult" conditions - Problematic media - Large temperature changes during operation - Vibration - Unfavourable installation position	Every 5,000 strokes
	Spring-loaded gland seals and "normal" conditions	Every 100,000 strokes
	Spring-loaded gland seals and "difficult" conditions - Problematic media - Large temperature changes during operation - Vibration - Unfavourable installation position	Every 10,000 strokes
Actuators		As specified by the manufacturer
Peripheral devices		As specified by the manufacturer

7.1 Replacement of stem sealings

7.1.1 PTFE V-ring unit design

PTFE V-ring unit (pos. 11) consisting of: backing ring
sealing rings
cover ring

Owing to the installed compression spring (pos. 14), this stem packing is self-adjusting. If the stem starts leaking, the ring pack is worn out and must be replaced.

Replacement of PTFE V-ring unit:



ATTENTION !

Refer to item 11.0 and 12.0 before dismantling the valve.

- Remove actuator.
(Refer to operating instructions for actuator!)
- When replacing PTFE V-ring unit (pos. 11), make sure that the parts are installed in the correct order and positions (refer to Fig. 9).

Damaged stems must also be replaced (refer to item 7.2 for instructions) since a new ring pack will soon start leaking again if the stem is damaged.

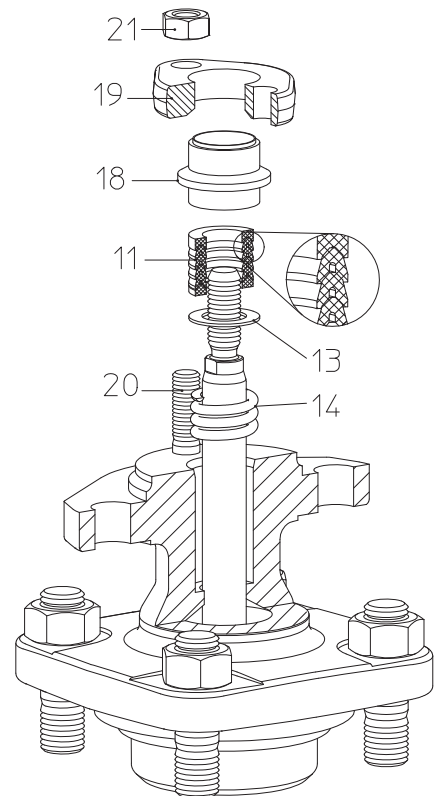


Fig. 9: V-ring unit
DN15-150

7.1.2 EPDM sealing design

Owing to the elastomer material, the sealing rings are self-sealing and therefore maintenance free. If the stem starts leaking, the seal is worn out and must be replaced.

Replacement of EPDM sealing rings:



ATTENTION !

Before dismantling the valve, refer to sections 11.0 and 12.0.

DN15-150:

- Remove actuator (refer to operating instructions for actuator!).
- Loosen nuts (21).
- Remove upper part (19).
- To replace the sealing elements, you must replace the complete stem seal (120) including the integral seals.

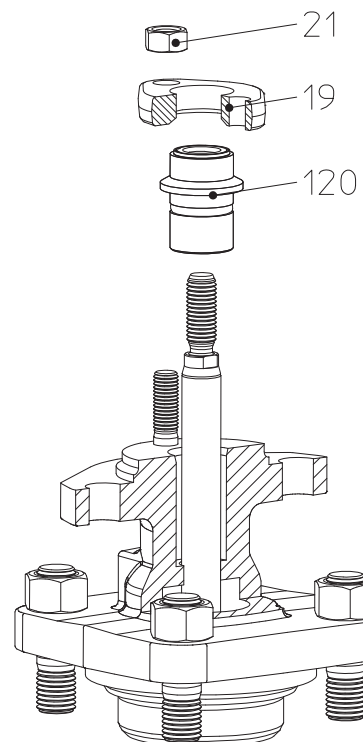


Fig. 10: EPDM sealing
DN15 - DN150

DN125v, DN150v, DN200:

- Remove actuator together with universal adapter flange (34) by loosening socket screws (35) (refer to operating instructions for actuator!).
- Loosen nuts (38).
- Remove upper part (19).
- To replace the sealing elements, you must replace the complete stem seal (120) including the integral seals.

Damaged stems must also be replaced (for a description, refer to section 7.2) because a new ring pack will soon start leaking again if the stem is damaged. Assemble in reverse order.

7.1.3 Stuffing box packing design

The stuffing box packing (pos. 26) requires maintenance.

If leaks develop, immediately tighten the hexagon nuts (pos. 21) gradually until the packing (pos. 26) stops leaking.

The service life of stuffing box packings (pos. 26) can be increased by checking regularly leakage.

If leaks can no longer be stopped by tightening the nuts (pos. 21), a new packing ring (pos. 26) must be inserted into the gland.

Replacement of stuffing box packing:



ATTENTION !

Refer to item 11.0 and 12.0 before dismantling the valve.

- Remove actuator. (Refer to operating instructions for actuator!)
- Insert the new packing ring (pos. 26) as shown in Fig. 12 and Fig. 13.

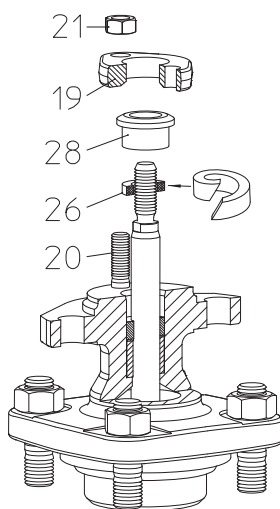


Fig. 12: Stuffing box packing DN15-150

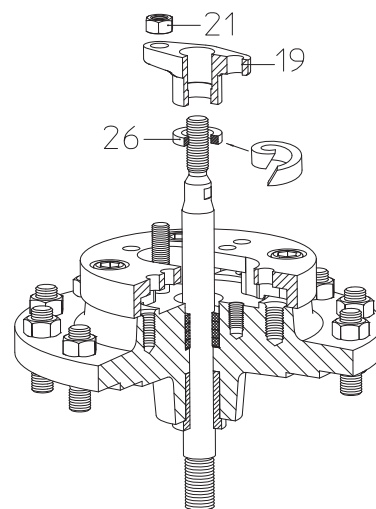


Fig. 13: Stuffing box packing DN125v-150v

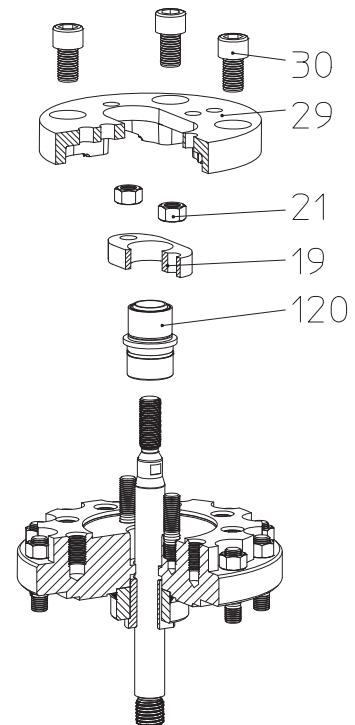


Fig. 11 EPDM sealing
DN125, DN150v, DN200

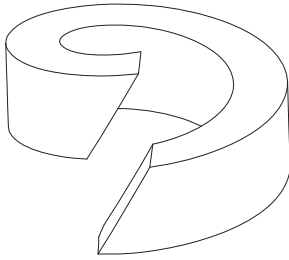


Fig. 14: Split packing ring

If a split packing ring is used, cut with a chamfer as shown in Fig. 14.

Damaged stems must also be replaced (refer to item 7.2 for instructions) since a new ring pack will soon start leaking again if the stem is damaged.

7.1.4 Bellows seal design

If the stem leaks the bellows seal (pos. 22.2) is defective. The leak can initially be stopped by tightening the screw joint (pos. 22.17) respectively the sleeve nut (pos. 22.16).

Stem and bellows (pos. 20.3) can only be replaced together.

Replacement of bellows seal:



ATTENTION !

Refer to item 11.0 and 12.0 before dismantling the valve.

- Remove actuator.
(Refer to operating instructions for actuator!)

DN15-150

- Loose nuts (pos. 10).
- Detach bellows assembly (pos. 22).
- Slacken screw joint (pos. 22.17) by about one turn.
- Press stem-/bellows unit (pos. 22.3) down.
- Drive pin (pos. 4) out with a drift.
- Unscrew plug (pos. 3).
- Loose nuts (pos. 22.8).
- Detach mounting bonnet (pos. 22.2).
- Extract stem-/bellows unit (pos. 22.3) from the bellows housing (pos. 22.1).
- Bolt new parts together and drill them.
- Replace 2 gaskets (pos. 22.6) and 1 gasket (pos. 8).
- Assemble in reverse order.

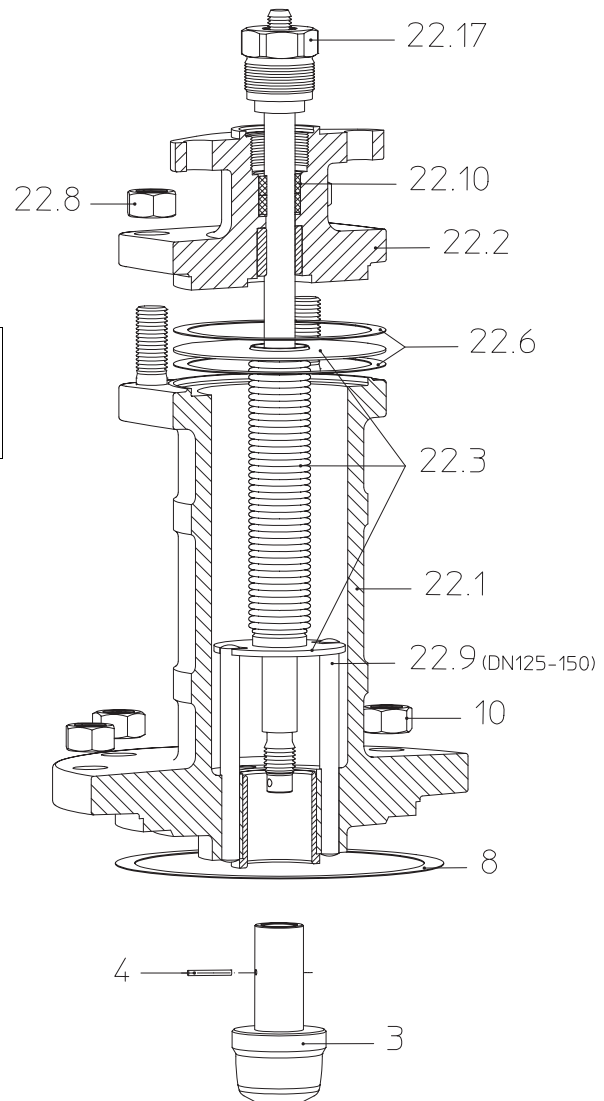


Fig. 15: Series 471 DN 15-150



ATTENTION at DN125-150!

- Ensure that the torsion lock is correctly positioned when inserting new stem/bellows unit. Introduce the grooved pin (pos. 22.9) into the torsion lock groove. Make sure it runs smoothly!

- Secure with nuts (pos. 10 and 22.8) and tighten them crosswise.
(For tightening torques refer to item 7.3.1)
- Tighten screw joint (pos. 22.17) resp. sleeve nut (pos. 22.16) gradually up to tightness of the stuffing box packing (pos. 22.10).

DN125v-150v

- Loose nuts (pos. 11).
- Detach bellows assembly (pos. 22) incl. stuffing box housing (pos. 24).
- Slacken sleeve nut (pos. 22.16) by about one turn.
- Loose nuts (pos. 39).
- Lift bellows housing (pos. 22.1).
- Drive spring pin (pos. 36) out with a drift.
- Unscrew stem adapter (pos. 35) with plug (pos. 3).
- Loose nuts (pos. 22.8).
- Detach stuffing box housing (pos. 22.13).
- Extract stem/bellows-unit (pos. 22.3) from the bellows housing (pos. 22.1).
- Bolt new parts together and drill them.
- Replace 2 gaskets (pos. 22.6), 1 gasket (pos. 37) and 1 gasket (pos. 8).
- Assemble in reverse order.



ATTENTION !

- Ensure that the torsion lock is correctly positioned when inserting new stem/bellows unit. Introduce the grooved pin (pos. 20.9) into the torsion lock groove. Make sure it runs smoothly!

- Secure with nuts (pos. 10, 39 and 22.8) and tighten them crosswise.
(For tightening torques refer to item 7.3.1)
- Tighten sleeve nut (pos. 22.16) gradually up to tightness of the stuffing box packing (pos. 22.10).

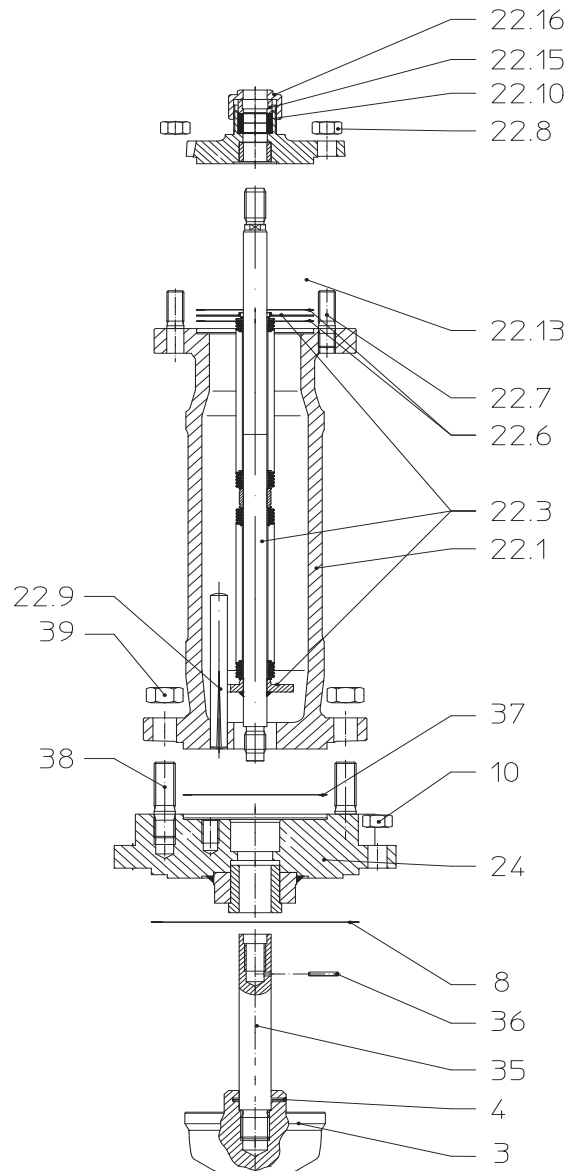


Fig. 16: Series 471
DN125v-150v

7.2 Replacement of internal parts

7.2.1 Replacement of plug and stem



ATTENTION !

Refer to item 11.0 and 12.0 before dismantling the valve.

Series 470

- Loose nuts (pos. 10).
- Detach the mounting bonnet (pos. 6) resp. stuffing box housing (pos. 24).
- Slacken nuts (pos. 21) by about 2-3 turns.
- Extract plug (pos. 3) and stem (pos. 5).
- Drive pin (pos. 4) out with a drift.
- Unscrew plug (pos. 3).
- Bolt new parts together, drill and pin them.
- Replace the gasket (pos. 8).
- Assemble in reverse order
- Secure with nuts (pos. 10) and tighten them crosswise.
(For tightening torques refer to item 7.3.1)

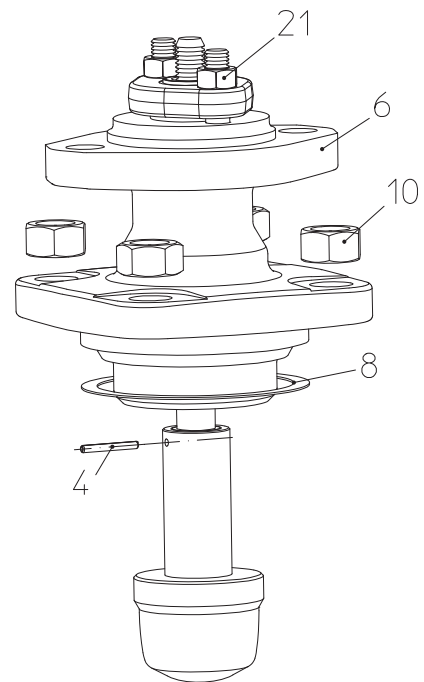


Fig. 17: Series 470

Series 471:

For replacement of plug and stem with bellows sealing (Series 470) refer to item 7.1.4.

7.2.2 Replacement of seals of pressure balanced plugs (PTFE V-ring)



ATTENTION !

Refer to item 11.0 and 12.0 before dismantling the valve.

- Remove actuator. (Refer to operating instructions for actuator!)
- Remove plug as described in item 7.2.1.
- Prise worn piston seal (pos. 34) out of groove in plug with suitable tool (e.g. screwdriver).
- Insert new piston seal (pos. 34), taking care that it is in the correct position (refer to Fig. 18).
- Replace guide ring (pos. 33).
- Clean sliding surface of guide bush (pos. 32); smooth with fine abrasive if necessary.
- If sliding surface is badly damaged, replace guide bush.
- Replace 2 gaskets (pos. 8).
- Assemble in reverse order.
- Secure with nuts (pos. 10) and tighten them crosswise.
(For tightening torques refer to item 7.3.1)

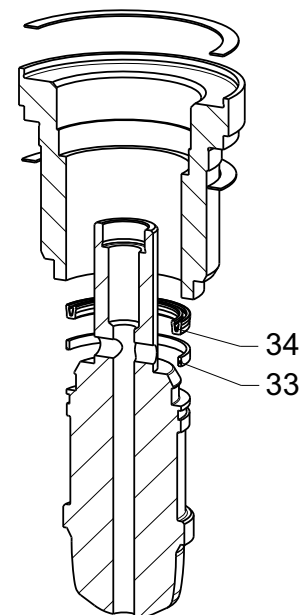


Fig. 18: Pressure balanced plug with PTFE V-ring

7.2.3 Replacement of seals of pressure balanced plugs (lamellar rings)



ATTENTION !

Refer to item 11.0 and 12.0 before dismantling the valve.

- Remove actuator
(refer to operating instructions for actuator!)
- Remove plug (replace if necessary) as described in 7.2.1.
- Prise lamellar rings (45) out of groove in plug.
- Insert new laminar rings (one pack consists of three rings) one at a time, making sure that gaps are 120° apart. There must be one lamellar ring pack in each groove after replacement. During maintenance, both packs must be replaced at the same time.
- Clean sliding surface of guide bush (32); smooth with fine abrasive if necessary.
- If sliding surface is badly damaged, replace guide bush.
- Replace 2 gaskets (8).
- Assemble in reverse order.
- Secure with nuts (10) and tighten crosswise
(For tightening torques, refer to section 7.3).

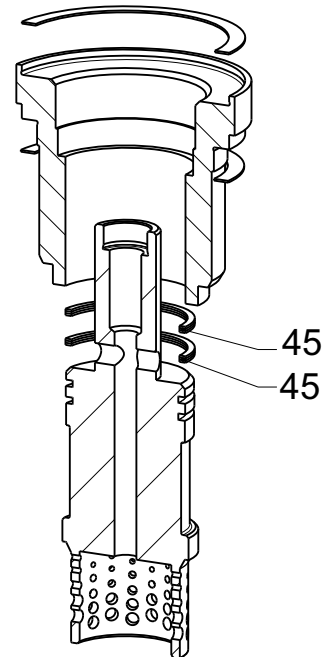


Fig. 19: Pressure balanced plug with lamellar rings

7.2.4 Replacement of the seat ring



ATTENTION !

Refer to item 11.0 and 12.0 before dismantling the valve.

- Remove actuator. (Refer to operating instructions for actuator!)
- Loose nuts (pos. 11).
- Detach valve top part.
- Unscrew seat ring (pos. 2) with a special wrench (can be obtained from the manufacturer).
- Clean thread and sealing taper in body (pos. 1) and apply with suitable lubricant.
- Replace respectively recondition seat ring (pos. 2).
- Install seat ring (pos. 2). (For tightening torques refer to item 7.3.2.)
- Replace gasket (pos. 8).
- Assemble valve top part.
- Secure with nuts (pos. 11) and tighten them crosswise.
(For tightening torques refer to item 7.3.1.)

7.3 Tightening torques

7.3.1 Tightening torques for nuts

M 10	=	15 - 30 Nm
M 12	=	35 - 50 Nm
M 16	=	75 - 100 Nm
M 20	=	130 - 150 Nm
M 24	=	280 - 300 Nm
M 30	=	630 - 650 Nm

7.3.2 Tightening torques for seat rings

DN 15/ 20	=	100 Nm
DN 25/ 32	=	130 Nm
DN 40/ 50	=	300 Nm
DN 65	=	360 Nm
DN 80	=	620 Nm
DN100 / 100v (M20)	=	900 Nm
DN125	=	1000 Nm
DN125v (M20)	=	1400 Nm
DN125vv (M27)	=	2600 Nm
DN150	=	1200 Nm
DN150v (M20)	=	1600 Nm
DN150vv (M27)	=	3000 Nm

! Refer to operating instructions for actuator concerned for installing actuators !

8.0 Troubleshooting

In the event of malfunction or faulty operating performance check that the installation and adjustment work has been carried out and completed in accordance with these Operating Instructions.



ATTENTION !

- It is essential that the safety regulations are observed when identifying faults.

If malfunctions cannot be eliminated with the help of the following table "9.0 Troubleshooting table", the supplier or manufacturer should be consulted.

9.0 Disposal



ATTENTION !

- The valve must be completely emptied of all residues and properly disposed of. Residual medium in the valve can represent a health or safety hazard.

10.0 Troubleshooting table



ATTENTION !

- refer to item 11.0 and 12.0 prior to dismantling and repair work!
- refer to item 6.0 before restarting the plant !

Fault	Possible cause	Corrective measures
No flow	Valve closed.	Open valve (using actuator).
	Flange covers not removed.	Remove flange covers.
Little flow	Valve not sufficiently open.	Open valve (using actuator).
	Dirt sieve clogged.	Clean / replace sieve.
	Piping system clogged.	Check piping system.
	Kvs value of valve unsuitable.	Fit valve with higher Kvs value.
Valve stem moves in jerks.	Stuffing box sealing too tight (for valves with graphite packings).	Slacken stuffing box gland or hex. nut (pos. 21) slightly. Valve must not start leaking!
	Valve plug slightly seized owing to solid dirt particles.	Clean internals, smooth rough spots.
Valve stem or plug cannot be moved.	Seating and plug clogged with dirt; especially with V-port and perforated plugs.	Clean seating and plug with suitable solvent.
	Valve plug seized in seating or guide owing to deposits or dirt in medium.	Replace plug and seating; use parts made from different material if necessary.
Valve stem leaking.	PTFE V-ring unit damaged or worn.	Replace ring pack; refer to item 7.1.1
	Stuffing box gland too slack in valves with stuffing box packings.	Tighten or repack stuffing box gland or nuts (pos. 21); refer to item 7.1.3
	Bellows defective in valves with bellows seal.	Replace bellows unit; refer to item 7.1.4
Leakage too high when valve is closed.	Sealing surfaces of plug eroded or worn.	Replace plug; refer to item 7.2
	Sealing edge of seating damaged or worn.	Replace seating; refer to item 7.2, fit dirt sieve if necessary.
	Piston sealing ring worn (pressure-relieved valves).	Replace sealing ring; refer to item 7.2.2
	Seating and/or plug dirty.	Clean internals of valve; fit strainer if necessary.
	Pneumatic actuator not completely vented; spring force not fully effective.	Vent actuator air chamber completely.
	Actuator not powerful enough.	Install more powerful actuator. Check service data.

11.0 Dismantling the valve or the top part



ATTENTION !

The following points must be observed:

- *Pressureless pipe system.*
- *Medium must be cool.*
- *Plant must be drained.*
- *Purge piping systems in case of caustic, inflammable, aggressive or toxic media.*

12.0 Warranty / Guarantee

The extent and period of warranty cover are specified in the "Standard Terms and Conditions of Albert Richter GmbH & Co. KG" valid at the time of delivery or, by way of departure, in the contract of sale itself.

We guarantee freedom of faults in compliance with state-of-the-art technology and the confirmed application.

No warranty claims can be made for any damage caused as the result of incorrect handling or disregard of operating and installation instructions, technical data sheets and relevant regulations.

This warranty also does not cover any damage which occurs during operation under conditions deviating from those laid down by specifications or other agreements.

Justified complaints will be eliminated by repair carried out by us or by a specialist appointed by us.

No claims will be accepted beyond the scope of this warranty. The right to replacement delivery is excluded.

The warranty shall not cover maintenance work, installation of external parts, design modifications or natural wear.

Any damage incurred during transport should not be reported to us but *rather* to the competent cargo-handling depot, the railway company or carrier company immediately or else claims for replacements from these companies will be invalidated.



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