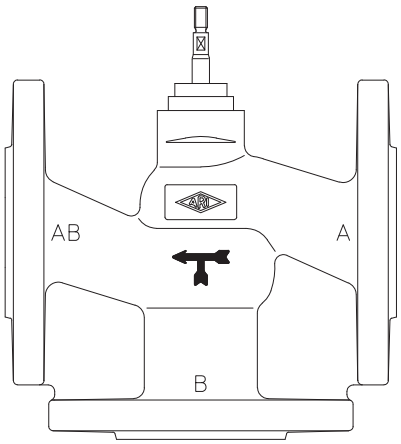
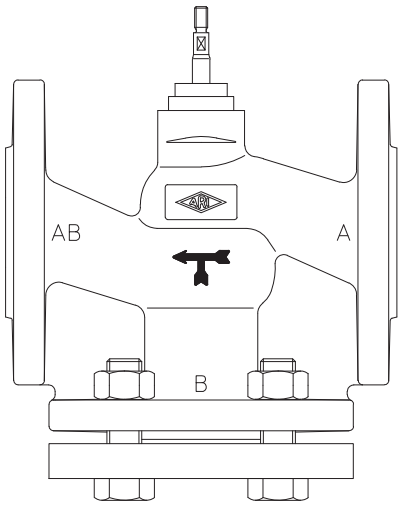
Operating and installation instructions

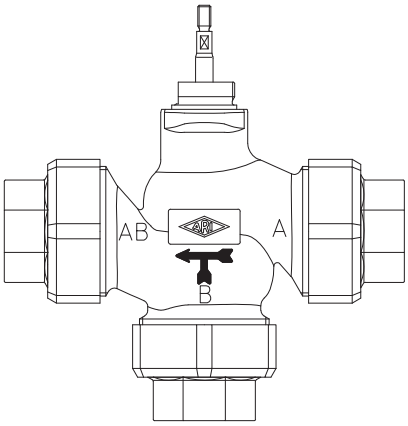
3-way / straight through control valves - STEVI® H 485-488



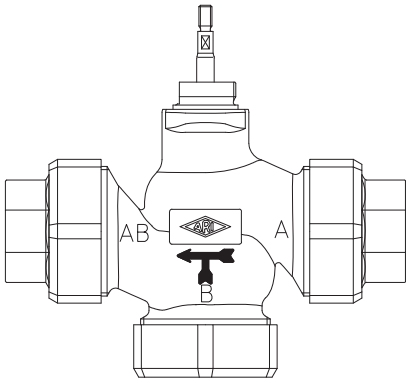
Series 485



Series 486



Series 487



Series 488

Contents

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 and repair.
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, 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

ATTENTION !

. . .

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.

- At -20°C to +65°C.
- The paint is a base coat to protect against corrosion during transportation and storage. Do not damage paint protection.

4.0 Description

4.1 Scope of applications

Valves are used for „controlling the flow of liquids, gases and vapours of fluid group 2 for heating, ventilation and air conditioning“.

ATTENTION !

- Refer to the data sheet for applications, limits on use and possibilities.

- Certain media require or preclude the use of special materials.

- The valves are designed for standard operating conditions. If conditions exceed these requirements, e.g. aggressive or abrasive media, 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.

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

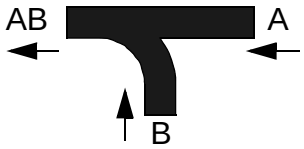
ARI servo controlled valves are especially suitable for actuation by electrical actuators.

A parabolic plug is used as a flow restrictor in flow directions A -> AB and AB -> A, and a slotted plug is used in flow directions B -> AB and AB -> B.

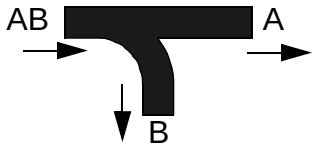
In diverting operation (1 inlet AB, 2 outlets A and B) high actuating forces must be expected.

Explanation:

Mixing operation



Diverting operation



When used as a straight through control valve, inlet B is fitted with a dummy flange (refer to item 7.3).

Please note the arrow on the valve indicating the flow direction.

4.3 Diagram

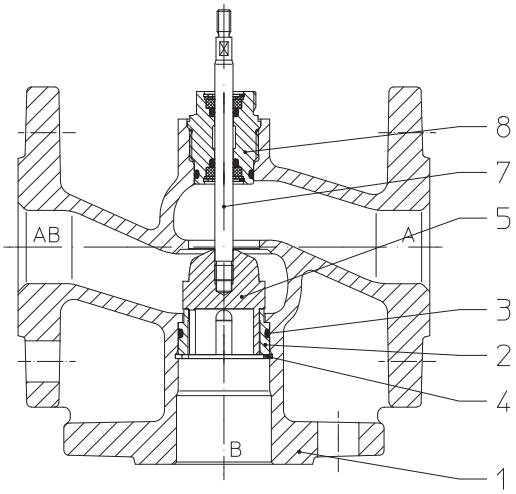


Fig. 1: Series 485

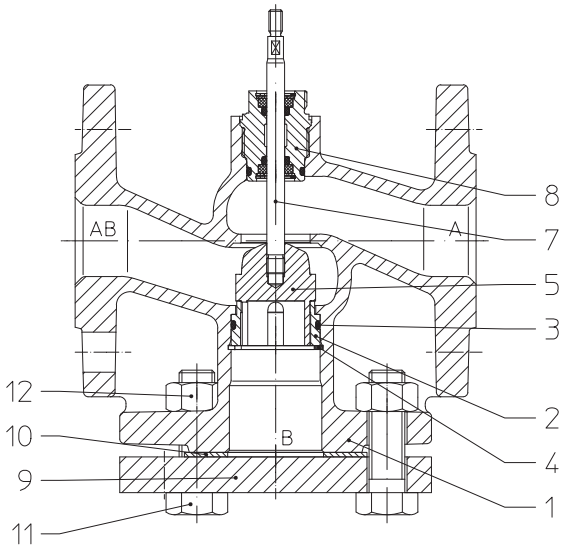


Fig. 2: Series 486

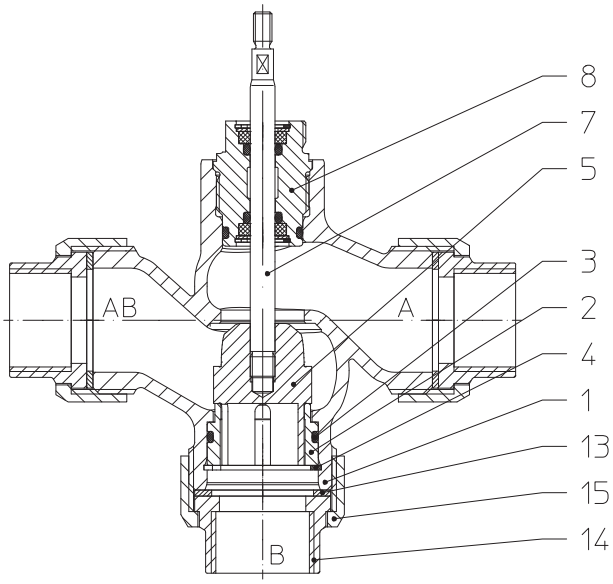


Fig. 3: Series 487

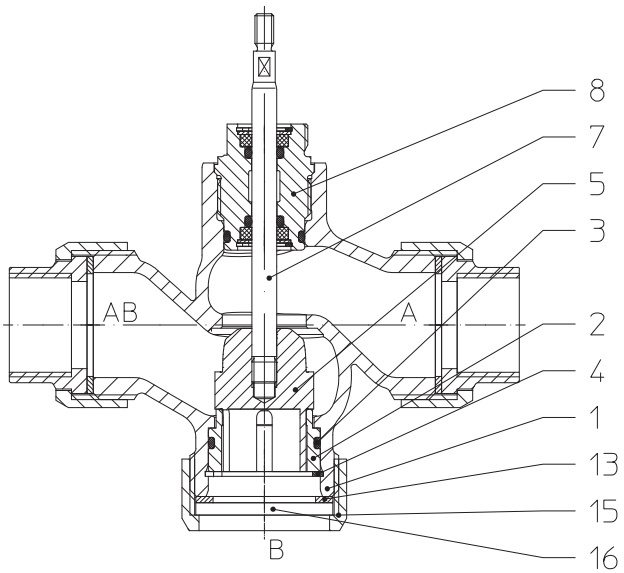


Fig. 4: Series 488

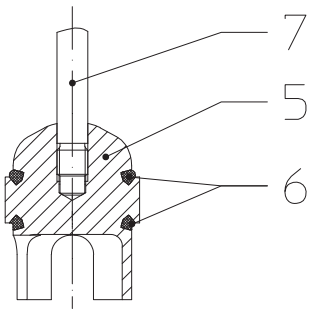


Fig. 5: Plug with soft seal

4.4 Technical data

for

- Principal dimensions

- **Pressure-temperature-ratings, etc.** refer to datasheet.

4.5 Marking

Details of the CE-marking on the name plate of the valve:

CE CE-marking

0525 Notified body

Manufacturer — Address of manufacturer: refer to item 11.0 Warranty / Guarantee

Fig. _____ Type-No.

SN __ __ —— Serial-No.

Year of manufacture (clear speech) (1. and 2. position of the serial-No.)

According to the Pressure Equipment Directive table 7, annex II valves are only allowed to bear the CE-marking ≥ Category I (≥ DN125 PN10, ≥ DN65 PN16).

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 !

- *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. Stopvalves shoud be installed before and after the controlvalve 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.

Permissible servo weights for valves with unsupported horizontal stems:

20 kg for DN 15 - 50
25 kg for DN 65 - 150

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 DN upstream and 6 x DN downstream of the valve.

5.3 Installation instructions concerning actuators

Normally, control valves are supplied complete with actuator fitted.
It is not permitted to mantle / dismantle actuators with valves operating at service conditions (temperature and pressure). The actuators must be assembled as describe in the operating instructions during conversion and maintenance.
During assembly work, the plug is not be turned on its seatring at closing pressure.

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

1800 N for DN 15-50
4500 N for DN 65-100
5000 N for DN 125-150

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 °C) or low (< 0 °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.

7.0 Care and maintenance

7.1 Replacement of stem sealings

If the stem starts leaking, the sealing is worn out and must be replaced.

ATTENION !

Refer to item 10.0 and 11.0 before dismantling the valve.

- Remove actuator. (Refer to operating instructions for actuator!)
- Unscrew worn stem sealing (pos. 8) from the body (pos. 1) and pull it off the stem (pos. 7).
- Check valve stem (pos. 7) for deposits and damage; if possible, remove with fine polishing linen.
- Otherwise the stem (pos. 7) must be replaced (for description refer to item 7.2), since a new sealing will soon start leaking again if the stem is damaged.
- Carefully push the new stem sealing (pos. 8) – factory-greased – onto the stem (pos. 7).
- Screw tightly into position

Tightning torques for stem seal:

DN	Torque
15 - 50	70 Nm
65 - 150	145 Nm

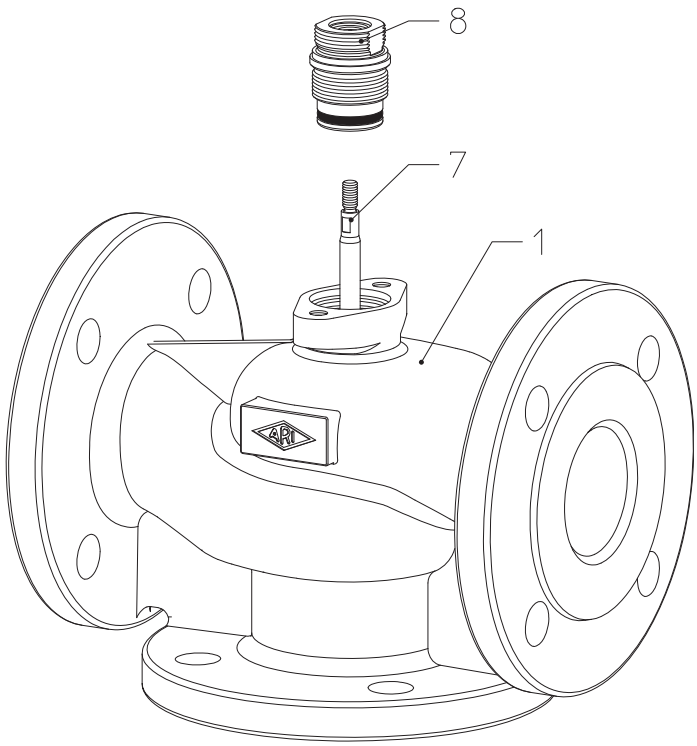


Fig. 6: Series 485

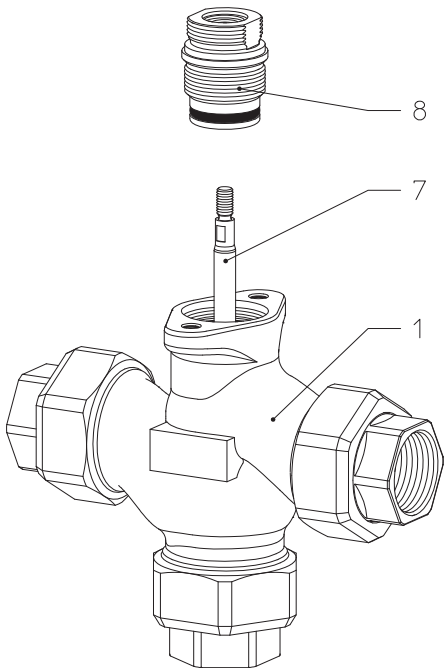


Fig. 7: Series 487

7.2 Replacement of plug, stem and seat

ATTENION !

Refer to item 10.0 and 11.0 before dismantling the valve.

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

Note:
If inlet B is fitted with a dummy flange (Series 486 and Series 488), refer to item 7.3.

- First remove the connection parts of the pipe (Pos. 13, 14, 15)
- Remove retaining ring (pos. 4).
- By pressing down the stem (pos. 7) remove seat ring (pos. 2) with O-ring (pos. 3).
- Plug (pos. 5) and stem (pos. 7) can now be removed.
- Reassemble in the reverse order.

ATTENION !

the O-ring (pos. 3) must be renewed during reassembly.

- To facilitate fitting the O-ring (pos. 3), lubricate lightly with grease (commercial EPDM-compatible grease).

Note:
The plug (pos. 5) can only be replaced complete with stem (pos. 7). Only the seat (pos. 2) for path B can be dilsmantled.

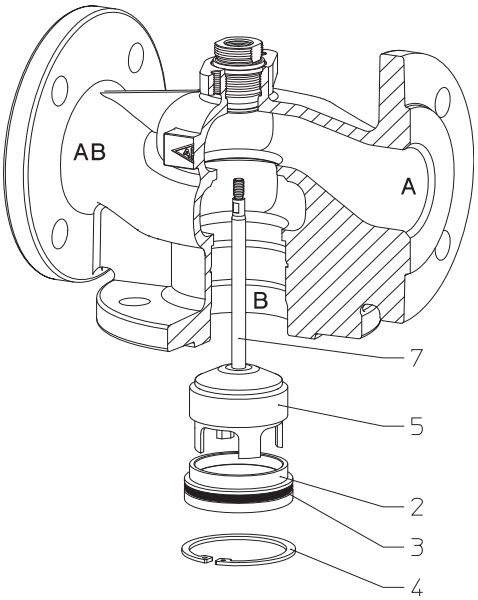


Fig. 8: Series 485

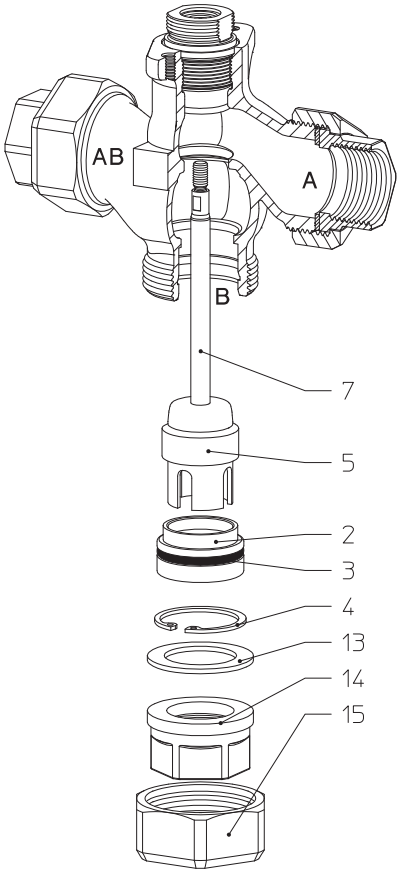


Fig. 9: Series 487

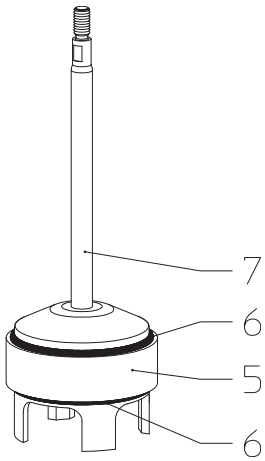


Fig. 10: Plug with soft seal

7.3 Conversion of 3-way in straight through control valve

7.3.1 Conversion of valve with flanges

Note:
Series 485 differs from Series 486 only in the dummy flange fitted for path B.

ATTENTION !

Refer to item 10.0 and 11.0 before dismantling the valve.

- Attach flange (pos. 9) and gasket (pos. 10) to flange B using hexagon screws (pos. 11) and nuts (pos. 12).
- Tighten evenly, crosswise.

Tightning torques for hexagonal nuts:

Bolts	Torque
M 10	20 Nm
M 12	35 Nm
M 16	80 Nm
M 20	150 Nm

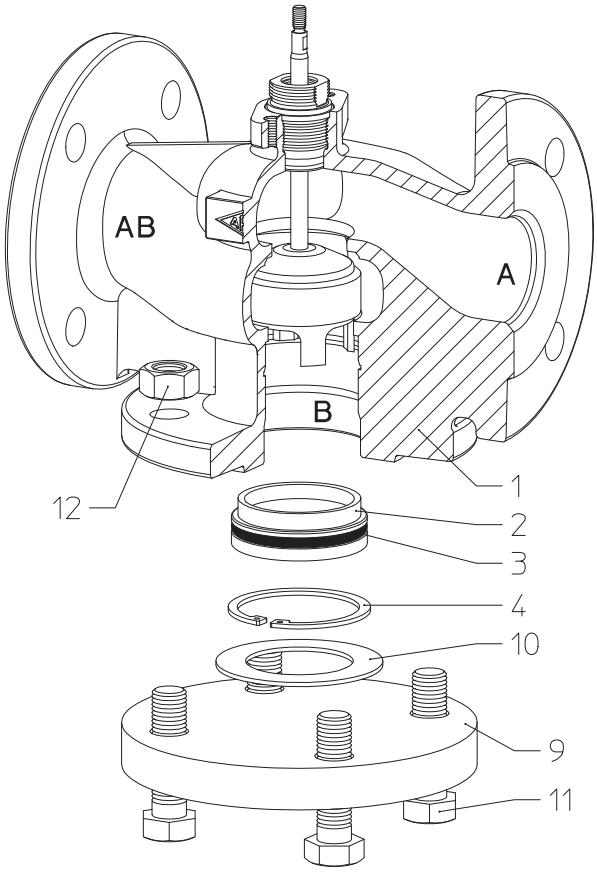


Fig. 11: Series 486

Refer to operating instructions for actuator concerned for installing actuators !

7.3.2 Conversion of valve with thread connections

Note:
Series 487 differs from Series 488 only in the dummy flange fitted for path B.

ATTENTION !

Refer to item 10.0 and 11.0 before dismantling the valve.

- Put the blind plate (Pos. 16) and gasket (Pos. 13) into the sleeve nut (Pos. 15).
- Screw it tight on the body (Pos. 1).

Tightning torques for the sleeve nut:

DN	Torque
15	35 Nm
20	45 Nm
25	65 Nm
32	130 Nm
40	170 Nm
50	300 Nm

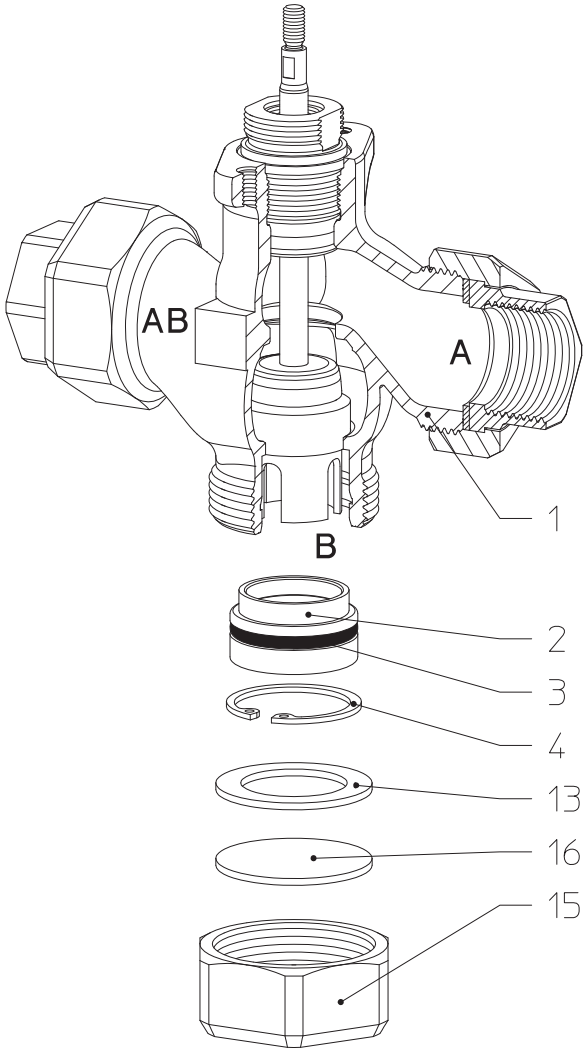


Fig. 12: Series 488

Refer to operating instructions for actuator concerned for installing actuators !

7.3.3 Conversion of design with plug with soft sealings

The O-ring (pos. 3) must be removed from the seat ring (pos. 2) to avoid vacuum caused by changing temperatures.

Note:
With series 487 the pipe connection parts (pos. 15, 14, 13) must be removed at first.

- Remove retaining ring (pos. 4).
- Remove seat ring (pos. 2) with O-ring (pos. 3).
  (The seat ring can be removed with the O-ring by pressing down the stem.)
- Remove O-ring (pos. 3) from the seat ring (pos. 2).
- Insert seat ring (pos. 2) without O-ring (pos. 3) in the body (pos. 1).
- Secure it with the retaining ring (pos. 4).

Note:
Fit path B with a blank flange, refer to item 7.3.1 respectively 7.3.2.

7.4 Conversion of straight through- in 3-way-control valve

ATTENTION !

Refer to item 10.0 and 11.0 before dismantling the valve.

Refer to item 7.3, but in reverse order.

Note:
With plugs with soft sealing (refer to Fig. 10), the O-ring (pos. 3) has to be inserted in the seat ring (pos. 2).

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 eliminate with the help of the following table "**9.0 troubleshooting table**", the supplier or manufacturer should be consulted.

9.0 Troubleshooting Table

ATTENTION !

- read item 10.0 and 11.0 prior to dismantling and repair work!
- read 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.	Valve plug slightly seized owing to solid dirt particles	Clean internals, smooth rough spots
Valve stem or plug cannot be moved.	Seatring and plug clogged with dirt	Clean seatring and plug with suitable solvent
	Valve plug seized in seatring or guide owing to deposits or dirt in medium	Replace plug and seatring
	With straight trough version, the O-ring in the seat ring groove was not removed	Remove O-ring; refer to item 7.3.3
Valve stem leaking.	Stem seal leaking	Replace stem seal; refer to item 7.1
Leakage too high when valve is closed.	Sealing surfaces of plug eroded or worn	Replace plug; refer to item 7.3.2.
	Sealing edge of seatring damages or worn	Replace seatring; refer to item 7.3.2
	Seatring and/or plug dirty.	Clean internals of valve
	Actuator not powerful enough	Install more powerful actuator, Check service data
Valve stem „hammers".	flow in the closing direction	increase actuator force

10.0 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.*

11.0 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, datasheets and relavant 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.

Technology for the Future.
GERMAN QUALITY VALVES
ARI-Armaturen Albert Richter GmbH & Co. KG, D-33750 Schloß Holte-Stukenbrock
Telephone (+49 5207) 994-0 Telefax (+49 5207) 994-158 or 159
Internet: http://www.ari-armaturen.com E-mail: info.vertrieb@ari-armaturen.com