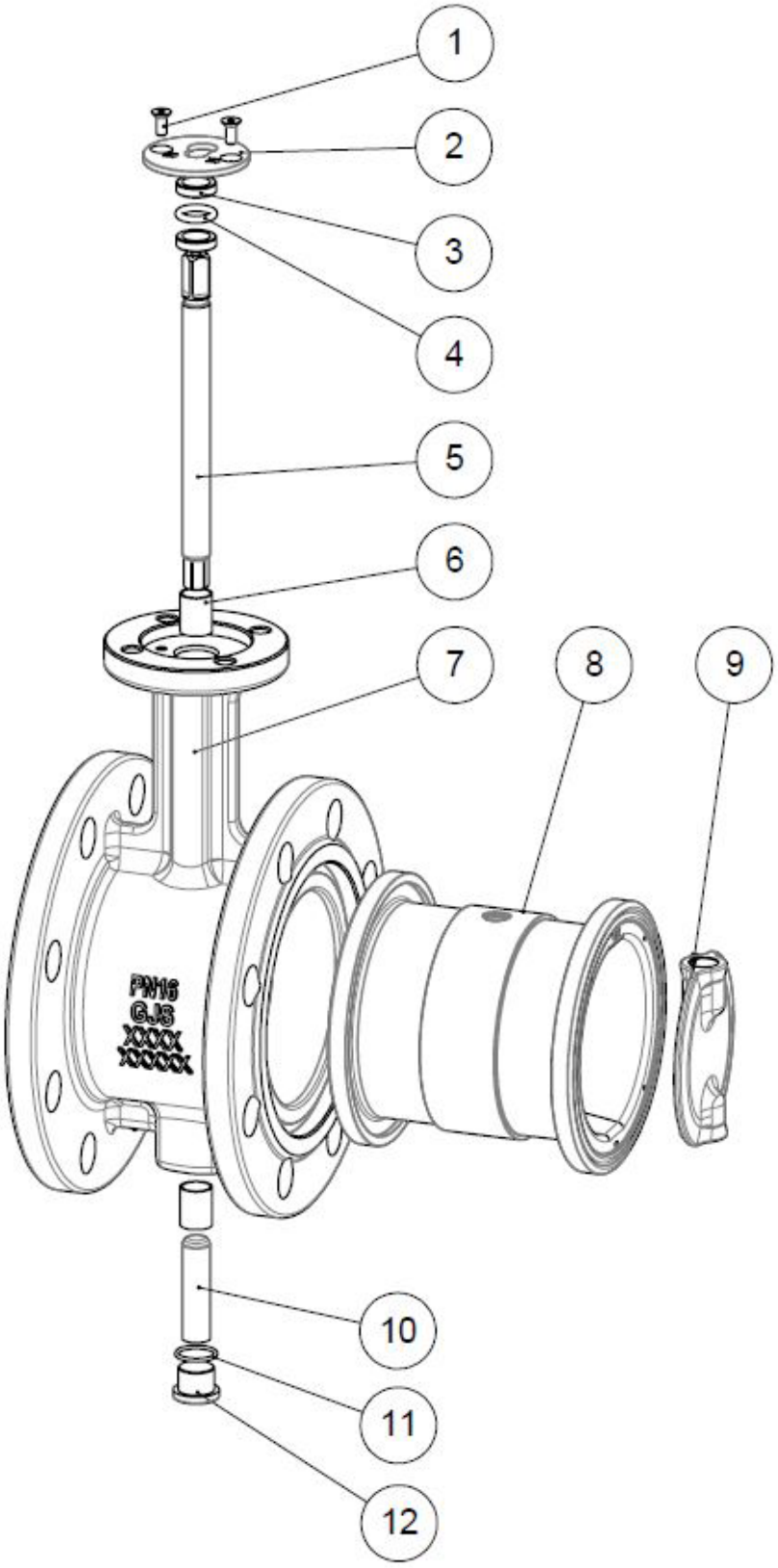
Installation, Operation and Maintenance Manual Series 76

AVK Series S76 Butterfly Valve

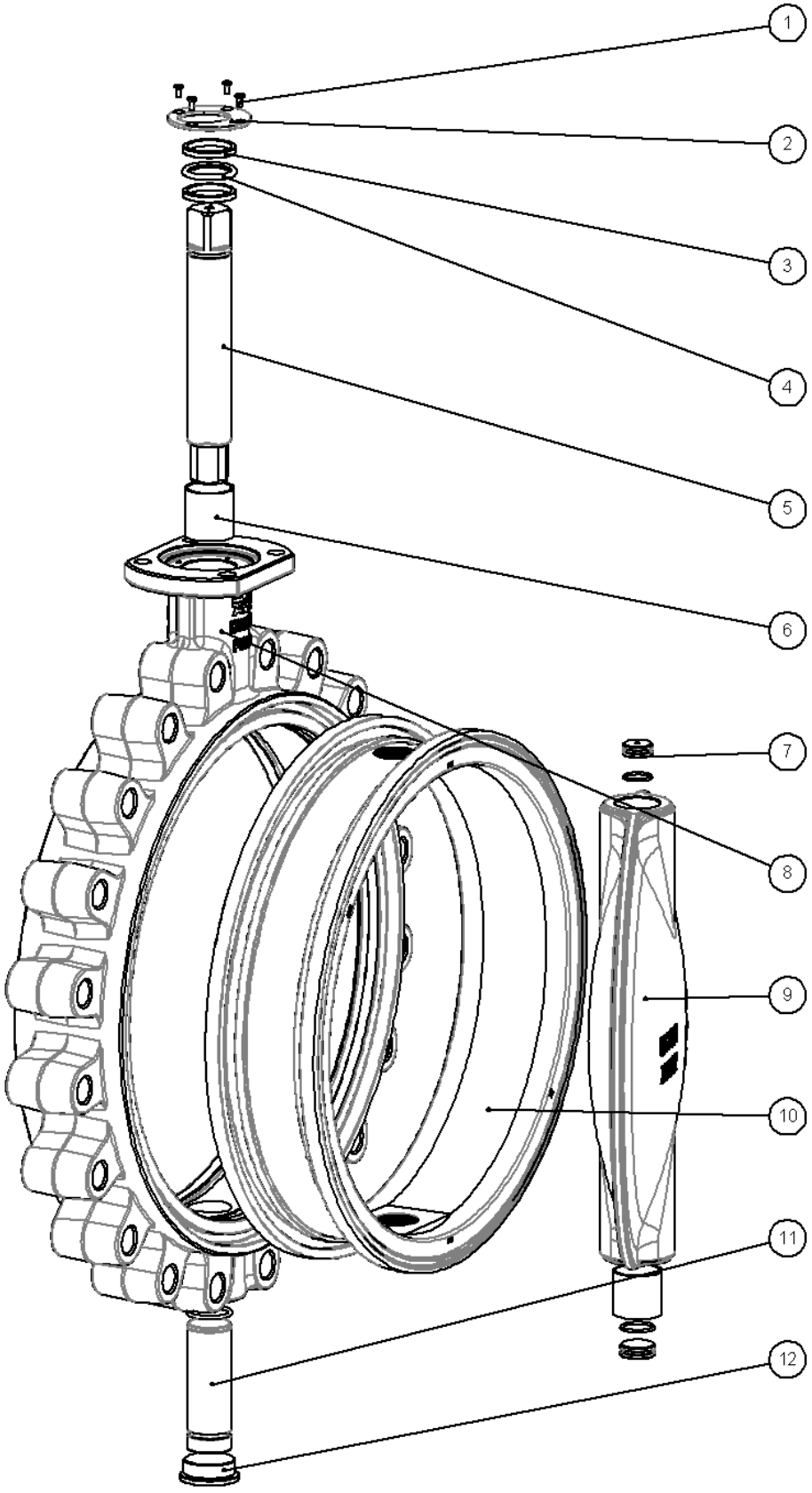
The AVK S76 is a wide range of concentric, loose liner butterfly valves double flange version with AVK's own high quality rubber liner that significantly increases the service life. The one-piece replaceable liner also serves as a profiled flange gasket and comes in either drinking water approved EPDM, high temperature EPDM or hydrocarbon resistant NBR. Disc material is stainless steel. The shaft in stainless steel, installed in low friction PTFE bearings in an anti-blow out design plus the unique disc sealing profile results in low operating torque and long life. The valves are suitable for bi-directional application.

1. AVK series S76 exploded view

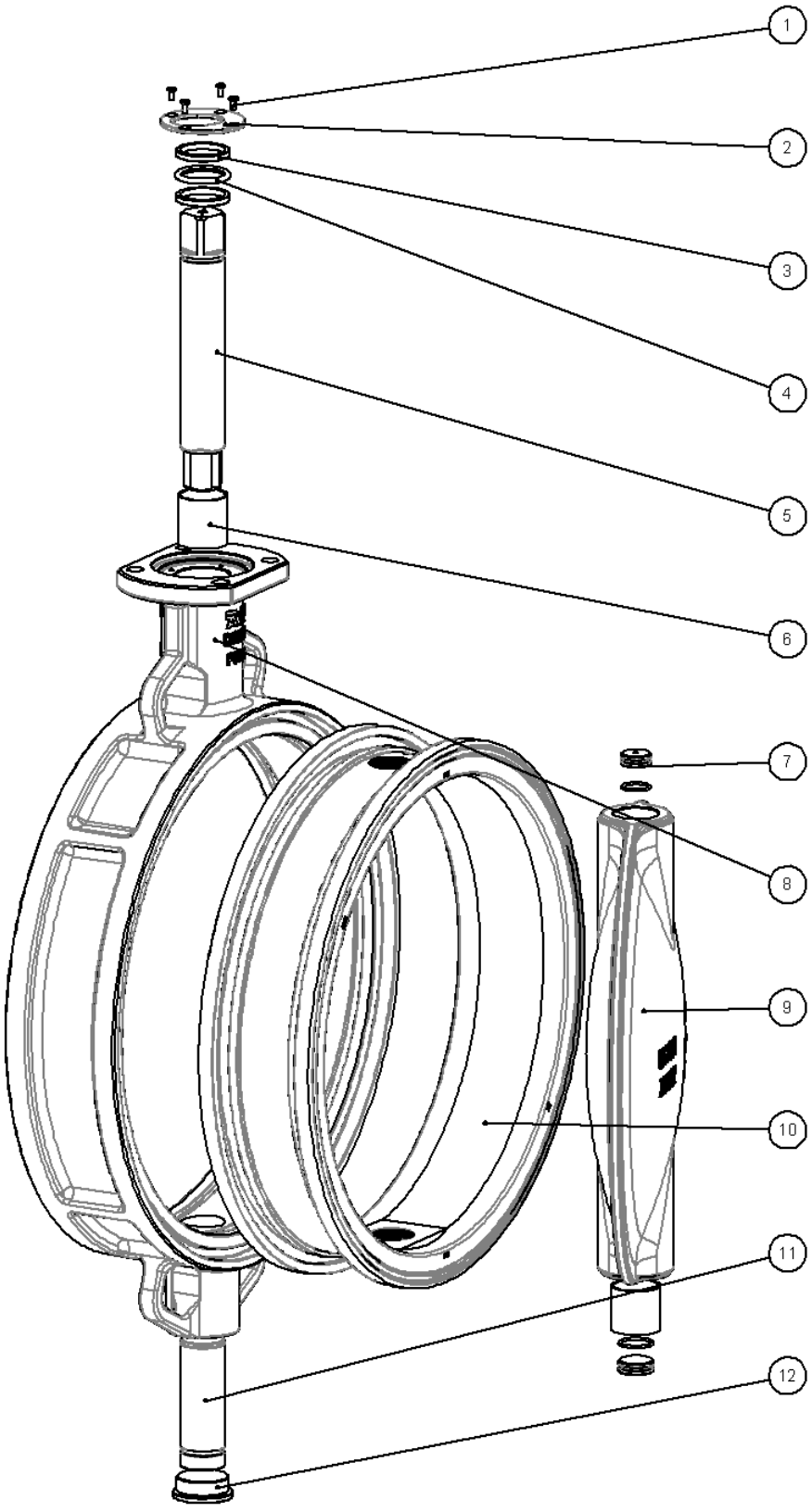
S76/74 exploded view



S76/71 exploded view



S76/70 exploded view



2. AVK series S76 parts list

S76/74 parts list

Item	Description	Material
1	Screw	Stainless Steel
2	Plate	POM
3	Ring	POM
4	O-ring	EPDM rubber/NBR rubber
5	Drive shaft	Stainless Steel
6	Bearing	Steel, PTFE coated
7	Body	Ductile iron - EN 1563 - GJS-500-7
8	Liner	EPDM rubber/NBR rubber
9	Disc	Stainless Steel
10	Lower shaft	Stainless Steel
11	O-ring	EPDM rubber/NBR rubber
12	Plug	POM

S76/71 parts list

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3. Table of contents

4. Principle of operation

AVK series 76 are designed with a centric loose rubber liner, disc type opening and around 90 ° to open and close or adjusting medium flow as on/off, regulating, control valve.

5. Health and safety at work

Make sure all relevant Health and Safety issues and regulations are adhered to prior to and during installation or maintenance work carried out on this product. It is the end user's responsibility to ensure that safe working practices are followed at all times.

Whenever AVK's products are installed, operated or maintained the inherent dangers of pressurised liquids and gasses must be addressed. Before work on a valve or other piping component is undertaken, that may involve the release of internal pressure, the valve or line must be fully isolated, depressurised and drained prior to commencing the work. FAILURE TO COMPLY WITH THIS MAY RESULT IN SEVERE INJURY OR DEATH.

All workers handling the product must be aware of the weight of the components or assemblies to be handled and manipulated during installation and maintenance.

It is essential that staff undertaking these operations are adequately trained and it is the responsibility of the end user that only trained and competent staff undertake these duties.

This manual has been designed to assist, but it cannot replace quality training in the workplace. However, the AVK technical staff is always available and ready to answer questions relating to specific problems that may not be covered by this manual.

AVK's products are designed to be fit for purpose and to a high reliability standard. This provides a safe, low risk product when used correctly for the purpose for which it was designed. However, this assumes that the equipment is used and maintained in accordance with this manual, and the user is advised to study it and to make it available to all staff that may need to refer to it.

AVK cannot be held responsible for incidents arising from incorrect installation, operation or maintenance. The responsibility for this rests wholly with the end user.

6. Receiving and storage

Unloading must be carried out carefully. The load must be put gently to the ground without dropping. Lift only by means of shackles in the flange bolt holes or slings around the valve body.

If a forklift is used it shall have sufficient capacity to lift the required weight and have a valid inspection certificate.

All workers involved in the unloading shall be able to perform their functions. They shall wear safety boots, safety vest, safety goggles and hard hat.

All slings used for the lifting shall be of sufficient strength. A record shall document that they have been stored under cool, dry conditions away from sunlight and chemical atmosphere, and that they still perform according to their marked strength.

Immediately after unloading the item should be inspected for compliance with specifications and damage in shipment.

Compliance with specification check shall as a minimum comprise: size, pressure class, etc.

Pls note that PN rating casted on body is max. pressure rating which may be higher than flange drilling and flange drilling will always be shown on product label

Damage in shipment check shall as a minimum comprise: coating, seating and sealing surfaces, etc., or accessories or any other evidence of mishandling during shipment.

Each item should be operated through one complete open-close cycle in the position in which it is to be installed.

Storage shall be under dry, cool conditions, away from direct sunlight and corrosive or otherwise chemically active atmosphere.

7. Installation and commissioning

WARNING: *Prior to installation make sure that all pressurized lines involved in the installation are isolated, depressurized and drained before starting any work. Failure to do so may result in sudden pressure release and subsequent severe injury or death.*

7.1 General safety instructions

Prior to installation, a check of the valve labelling and marking must be made to ensure that the correct valve is being installed.

Record the valve serial number and its location to help with traceability.

The valve shall be handled with great care not damaging the coating to avoid the risk of external corrosion.

Extra care shall be taken to make sure outside coating is intact or the use of other means of additional protection shall be used when the valve is installed in polluted or aggressive soil conditions or coastal environments. Alternatively, the frequency of inspections shall be increased to detect any corrosion.

Before installing and commissioning the valve shall be examined for damaged coating. If the coating is damaged repair is required. AVK can supply a coating repair kit.

The valve should be fully opened and closed to ensure it is operating satisfactorily.

Valves are precision manufactured items and as such, should not be subjected to misuse such as careless handling or allowing dirt to enter the valve through the end ports.

Excessive forces during installation and operation must be avoided.

All special packaging materials must be removed.

When valves are provided with lifting lugs or eye nuts, these should be used to lift the valve. These lugs are designed to take the weight of the valve only and not any attached pipe work etc. Valves should not be lifted using the hand wheel or stem. During lifting all applicable Health & Safety requirements should be observed.

Immediately prior to valve installation, the pipework to which the valve is fastened should be checked for cleanliness and freedom from debris.

Valve end protectors should only be permanently removed immediately before installation. The valve interior should be inspected through the end ports to determine whether it is clean and free from foreign matter.

The mating flanges (both valve and pipework flanges) should be checked for correct gasket contact face, surface finish and condition. If a condition is found which might cause leakage, no attempt to assemble should be made until the condition has been corrected.

Care should be taken to provide correct alignment of the flanges being assembled. It is important when installing any valve that pipeline stresses are kept to a minimum and no undue external forces are placed on the valve connections. During assembly, the bolts must be tightened sequentially to make the initial contact of flange and gasket flat and parallel followed by gradual and uniform tightening in an opposite bolting sequence to avoid bending one flange relative to the other, particularly on flanges with raised faces.

Parallel alignment of flanges is especially important in the case of the assembly of a valve into an existing system.

The bolting used for the flange connection must be checked for correct size, length, material and that all connection flange bolt holes are utilised.

7.2 Installation location

The location of the valve on site must allow sufficient space for maintenance work.

If the valve is installed in the open air, make sure it is protected against extreme weather conditions (e.g. formation of ice) by adequate covers.

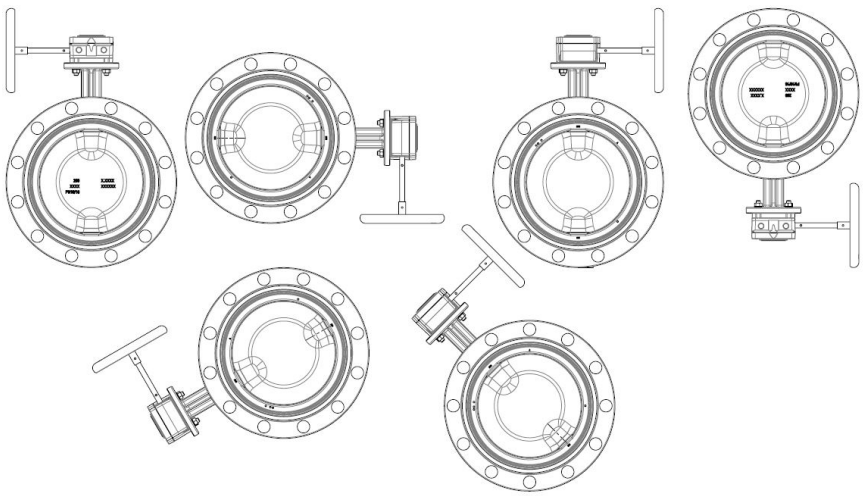
If the valve is used in a contaminated media, it requires a filter with a suitable mesh size placed upstream of the valve in order to prevent malfunction.

The following distances must be kept to avoid irregular flow which could disturb the valve function:

- The distance to elbows strainers, pump etc. should be kept to a minimum of 5 x DN, upstream or downstream
- The distance to control valves must be kept to a minimum of 10 x DN upstream of the butterfly valve.

7.3 Position of Installation

The butterfly valves in all nominal widths can be installed with shafts in horizontal or vertical position (with gear facing upwards or downwards).



7.4 Assembly instructions and fittings

Check the valve for possible damage that may have occurred during transport or storage.

Protect the valve from any kind of dirt on the construction site by using an adequate cover until installation.

All components (like rubber liner in the body) must be thoroughly cleaned before installation in order to remove all dirt particles. AVK does not assume any liability for consequential damage caused by dirt, shot-blasting gravel residues etc.

If any equipment is sand-blasted for cleaning prior to the installation, make sure that this equipment is adequately covered. If solvents are used for cleaning, make sure that the solvents do not destroy the pipeline seals or the valve.

The sealing and operational parts must be checked for proper functionality before installation.

If the valve needs a repaint at a later stage, it is important to keep sealing and operational parts completely free from paint. Also, it is not allowed to paint over the identification plates.

Suspending the valve by its disc may lead to damage or destruction of disc or valve.

Hexagon bolts and nuts with washers from flange to flange must be used in the through holes to connect the valve with the pipeline flanges. Fasten the bolts evenly and crosswise to prevent unnecessary tension with cracks or breaks in consequence. The pipeline must not be pulled towards the valve. If the gap between valve and flange is too wide, this must be compensated by a spacer ring.

The seal material must be selected according to the operation conditions.

The operator must select bolts and nuts suitable for the respective operating pressure, temperature, flange material and operational loads. Therefore, the operator must choose the tightening torque of the flange bolts according to the above parameters.

Make sure the flange bolts are not tightened too hard as this may result in crack formations in the flanges.

Make sure that pipeline flanges are in alignment with each other during installation of the valve.

The pipeline must be laid in a way that prevents harmful pipeline forces from being transmitted to the valve body. If construction work near the valve is still in process, the valve must be adequately covered to protect it from dirt.

8. Application hazards

Valves must only be installed in a piping system whose pressure and temperature do not exceed its nominal pressure and temperature range to max. 130 °C.

If system testing will subject the valve to pressures more than the working pressure rating, this should be within the production test pressure for the valve.

The maximum allowable pressure as specified is for non-shock conditions. Water hammer and impact for example, should be avoided.

The maximum permissible flow velocity is according to EN593. In addition to this, the valve may be operated at flow velocities up to 4 m/s, only 3 m/s for double flange DN200 to DN300 irrespective of the pressure level.

If the limits of use specified in these instructions are exceeded or if the valve is used on applications for which it was not designed, a potential hazard could result.

9. Operation and maintenance

9.1 Operation

9.1.1 Visual inspection

Before putting the valve into operation, all functional parts must be subjected to visual inspection. Checked the proper functioning of the valve by opening and closing it a few times.

Before putting a new installation into pipeline and especially after preparation works, open the valves completely and purge the pipeline system.

Caution: Purge the newly installed pipe systems in order to remove any foreign particles. Residues and dirt particles in the pipeline have the negative effect on the function of the valve or even block it completely.

9.1.2 Function check and pressure test

Prior to operation, the functional parts of the valve must be opened and closed completely at least once to ensure a trouble-free operation.

A newly installed pipeline system must be thoroughly cleaned to remove all foreign particles. Residue or dirt particles in the pipeline may damage the valve function or its free movement.

Please note that after repair work or upon commissioning of new equipment, it is very important to clean the pipeline system again with the valve in fully open position. If detergents or disinfectants are used, it must be ensured that these materials do not attack the valve material. As a standard, the valve is closed by turning the hand wheel clockwise towards the gearbox.

The dimensions of stem and actuators allow valve operation by one person via hand wheel. The 90° turn is confined by a limit stop on the gear. If it is turned any further due to excessive force, this may cause damage. Check that the function is working properly by opening and closing the valve several times (not in a dry state).

9.2 Maintenance

WARNING: *Prior to any maintenance work that requires disassembly make sure that the pressurized line involved is isolated, depressurized and drained before starting any disassembly. Failure to do so may result in sudden pressure release and subsequent severe injury or death.*

9.2.1 General instructions

The valve is designed to give long trouble-free service without the need of routine maintenance.

After the Number of operation cycles has been reached the wear inside the valve shall be examined.

- 2,500 cycles for DN50 to DN600 valve

If the wear is extensive worn components shall be replaced or a new valve shall be installed.

If internal or external leakage is suspected, it is recommended that AVK be contacted to suggest suitable remedial action.

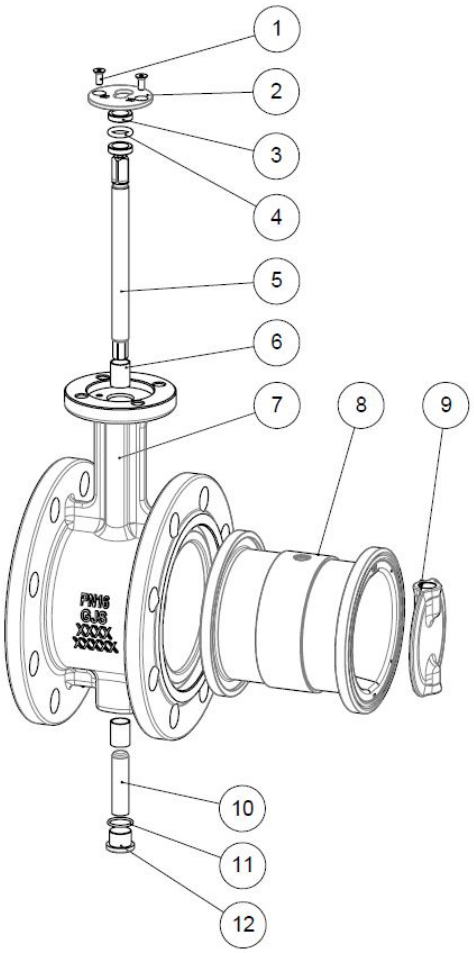
9.2.2 Inspection and operation intervals

- At least once a year, the valve must be inspected for tightness, proper operation and corrosion protection.
- In case of extreme operating conditions, such inspection is required more frequently.

9.3 Repair of (…)

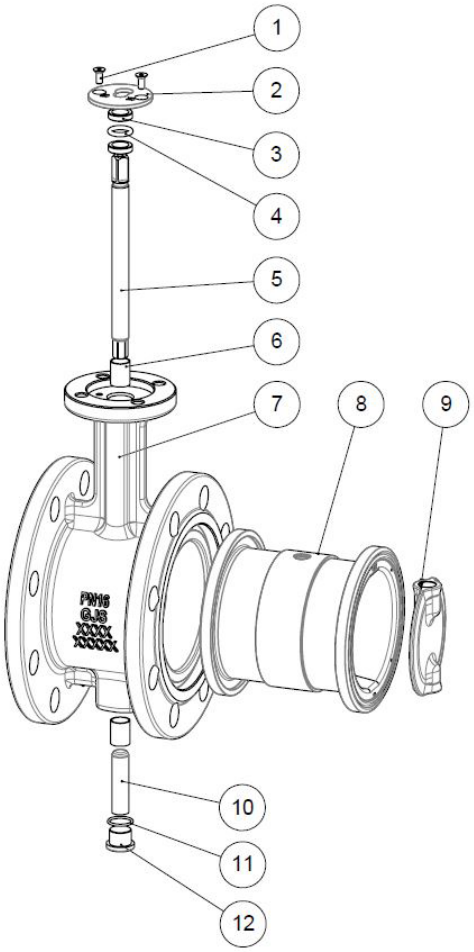
When the valve stops functioning properly it may be necessary to take it apart for repair:

9.3.1 Replacing the O-ring (part 4) in ring (part 3)



- Close the butterfly valve and remove the actuator
- Remove the plate (part 2) and ring (part 3)
- Clean the parts thoroughly
- Replace the O-rings (part 4)
- Reassemble in reverse order, tighten bolt
- Re-install the actuator, tight the top screws (part 1)
- Re-adjust the limit stops of the actuator

9.3.2 Replacing the O-ring (part 11) in stub shaft (part 10) or plug (part 12)



- Close the butterfly valve
- Remove the plug (part 12) and lower shaft **(**part 10**)**
- Clean the parts thoroughly
- Replace the O-rings (part 11)
- Reassemble in reverse order, tighten plug

10. Decommissioning

When decommissioning the valve it should be disposed of according to local regulations and in a way that allows as much recycling of materials as possible.

11. Trouble shooting

Symptom:	The valve make noises
Cause:	Unfavourable installation position causing unfavourable flow around or inside the valve (e.g. installed too closely downstream of an elbow). / Valve operating beyond its design limits
Cure:	Change installation position. / Check design and/or operation data, change flow resistance in the valve – if required – by using different intervals.
Symptom:	Leaks in the body seat
Cause:	Valve not completely closed; / Valve sealing damaged or worn; / Foreign particle in the seat area
Cure:	Close valve completely; / Replace sealing ring; / Flush valve; if required, disassemble valve and remove foreign object
Symptom:	High operating forces
Cause:	Valve seat polluted by deposits. / The valve is dry in pipeline, no medium present.
Cure:	Flush the valve, dismantle it if necessary, and clean the seat area. / The valve is operated more easily when it is wet
Symptom:	Valve can’t be operated
Cause:	Foreign particle in the seat area ; / Gear blocked ; / Electric actuator not connected to power supply / Unfavourable flow and impairment of movement.
Cure:	Flush valve; if required, disassemble valve and remove foreign object; / Dissolving the blockage ; / Connect to power supply. / Change installation position.

12. Recommended spare parts

Only genuine AVK spare parts should be used.

AVK accepts no responsibility for damage caused by failing non-AVK parts.

Following spare parts are recommended to purchase with a series 76 valve:

1. O-ring
2. Ring
3. Etc.