Operation and Maintenance Instructions

VAG CEREX® 300 Butterfly Valve

VAG CEREX® 300-L Butterfly Valve

VAG CEREX® 300-W Butterfly Valve

Edition 7 - 13-12-2017

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1 General

1.1 Safety

These Operation and Maintenance Instructions must be observed and applied at all times along with the general “VAG Installation and Operation Instructions for Valves” (see www.vag-group.com / Category: Installation and Operation Instructions).

Arbitrary alterations of this product and the parts supplied with it are not allowed. VAG will not assume any liability for consequential damage due to non-compliance with these instructions. When using this valve, the generally acknowledged rules of technology have to be observed (e.g. DIN standards, DVGW data sheets W332 Butterfly Valves, VDI directives, etc.). The installation must only be carried out by qualified staff (see also Section 7.1 General safety instructions). For further technical information such as dimensions, materials or applications, please refer to the respective documentation (KAT-A 1331).

VAG valves are designed and manufactured to the highest standards and their safety of operation is ensured in general. However, valves may be potentially dangerous if they are operated improperly or are not installed for their in-tended use.

All personnel dealing with the assembly, disassembly, operation, maintenance and repair of the valves must have read and understood the complete Operating and Maintenance Instructions (Accident Prevention Regulations, VBG 1 §§ 14 and following [Regulations issued by the Trade Associations] and ANSI Z535).

Before removing any protective devices and/or performing any work on the valves, depressurise the pipeline section and ensure it is free of hazards. Unauthorised, unintentional and unexpected actuation as well as any hazardous movements caused by stored energy (pressurised air, water under pressure) must be prevented.

In the case of equipment that must be monitored and inspected, all relevant laws and regulations, such as the Industrial Code, the Accident Prevention Regulations, the Ordinance of Steam Boilers and instructional pamphlets issued by the Pressure Vessels Study Group must be complied with. In addition, the local accident prevention regulations must be observed.

If a valve serving as an end-of-line valve is to be opened in a pressurised pipeline, this should be done with the utmost care to prevent the emerging fluid from causing damage. Care must also be taken when closing the valve in order not squeeze your hands. WAFER-type butterfly valves must never be used as end-of-line valves.

When a valve needs to be dismantled from a pipeline, fluid may emerge from the pipeline or the valve. The pipeline must be emptied completely before the valve is dismantled. Special care needs to be taken in case of residues which may continue flowing.

1.2 Proper use

The VAG CEREX® 300 Butterfly Valve is a shut-off valve for installation between pipelines (WAFER-Type and LUG-Type) or for installation to the pipeline flanges (LUG-type).

The VAG CEREX® 300 Butterfly Valve is intended to shut off the medium. Its use as a control valve is only possible within certain limits.

If a valve is used for continuous control operation, the operation limits must be coordinated in consultation with VAG before the order is placed and/or before installation. Cavitation must always be prevented.

For the respective technical application ranges (e.g. operating pressure, medium, temperature) please refer to the specific product-related documentation (KAT-A 1331).

For any deviating operating conditions and applications, the manufacturer’s written approval must be obtained!

These Operation and Maintenance Operation Instructions contain important information on the safe and reliable operation of the VAG CEREX® 300 Butterfly Valves.

Observing these Operation and Maintenance Instructions helps you to:

- Prevent hazards
- Reduce repair costs and down-times of the valve and/or the entire plant
- Improve the operational safety and useful life expectancy of the equipment.

For the butterfly valves, the same safety regulations must be complied with as those applicable to the entire system they are in-stalled in.

These Operation and Maintenance Instructions only provide safety instructions which apply in addition for the butterfly valves. Also, the Operation and Maintenance Instructions supplied for the components to be assembled must be understood and observed.

In accordance with German “DVGW Standard” W332 (section 5.2.2) centric butterfly valves for the earth installation are unsuitable.

1.3 Identification

According to DIN EN 19 all valves bear an identification label specifying the nominal diameter (DN), nominal pressure (PN), body material and the manufacturer’s logo.

A rating plate is attached to the body and contains at least the following information:

VAG	Manufacturer’s name
DN	Nominal diameter of the valve
PN	Nominal pressure of the valve
Body material	EN-JS 1030 (GGG-40 – nodular cast iron)
Disk	Material depending on type
Profiled seal	Material depending on type

Date of manufacture

2 Transport and Storage

2.1 Transport

For transportation to its installation site, the valve must be packed in stable packaging material suitable for the size of the valve. Ensure that the valve is protected against atmospheric influences and external damage. When the valve is shipped under specific climatic conditions (e.g. overseas transport), it must be specially protected and wrapped in plastic film and a desiccant must be added.

The factory-applied corrosion protection and any assemblies must be protected against damage by external influences during transport and storage.

The VAG CEREX® 300 Butterfly Valve must be transported with the disk slightly open. For this purpose, place the valve on one of its two flanges (cf. Figure 1 and Figure 2).

If the valve is supplied with mounted actuators, ensure safe storage of the actuators to prevent transverse loads acting on the connection points.

When selecting and using slings, observe the weight and the type of sling. The use of the slings should comply with the usual regulations.

VAG CEREX® 300 Butterfly Valves with large nominal diameters have en eccentric centre of gravity. If improper slings are used, the valves may swing to the side while being lifted.

Never lift or lower the load abruptly as the forces occurring may damage both the valve and the lifting equipment.

For transport purposes and also to support assembly, lifting devices such as cables and belts must only be attached to the body of the valve or the bearing lugs. The length and positioning of the cables/belts must ensure that the valve is in a horizontal position during the entire lifting procedure.

The general regulations relating to the use of lifting equipment must be complied with.

For valves that have been factory-packed in transport crates (wooden crates), the centre of gravity of the entire unit must be taken into account. The centre of gravity is marked on each side of the crate at our factory and must be considered for all lifting operations.

Figure 1: Transport position

2.2 Storage

The VAG CEREX® 300 Butterfly Valve has to be stored with its disk slightly open (see Figure 2).

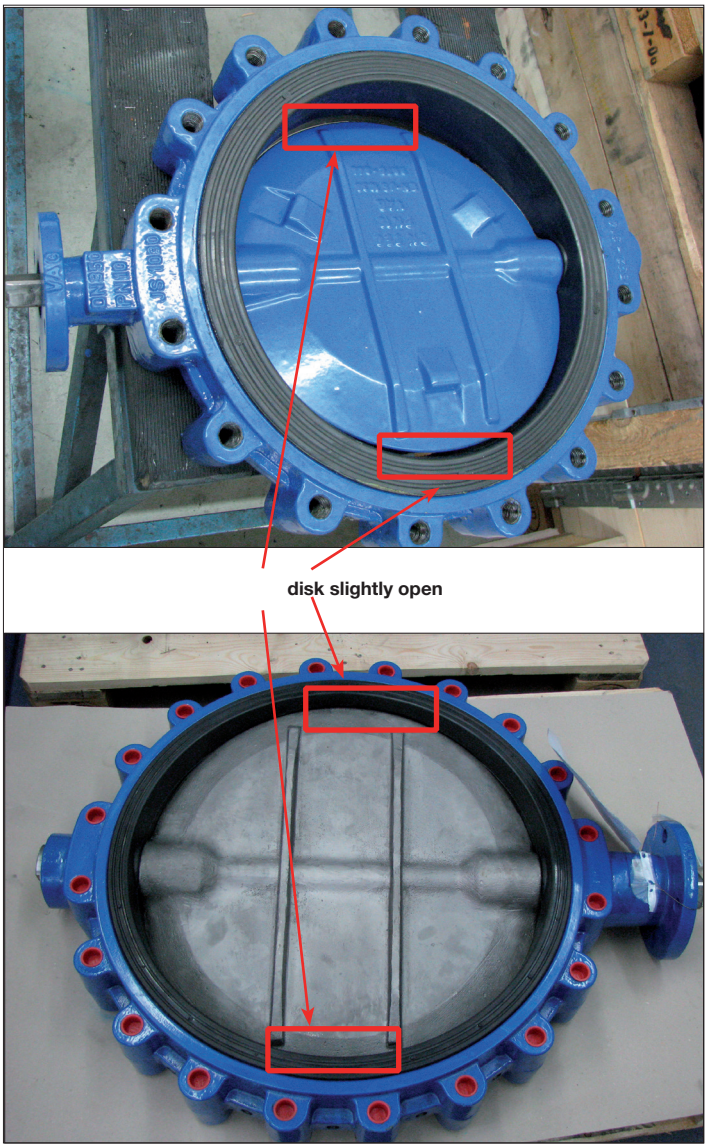


Figure 2: : Storage with the disk slightly open

The elastomeric parts (seals) must be protected against direct sunlight and/or UV light as otherwise their long-term sealing function cannot be guaranteed. Store the valve in a dry and well-aerated place and avoid direct radiator heat. Protect any assembly units important for the function such as the disk and the profiled seal against dust and other dirt by adequate covering.

Do not remove the protective caps of the connections / flanges and the packaging materials until immediately prior to assembly.

The valve can be stored in ambient temperatures ranging from -20 °C to + 50 °C (protected by adequate covers). If the valve is stored at temperatures below 0 °C, it should be warmed up to at least +5° C before installation and before it is put into operation.

3 Product features

3.1 Features and function description

VAG CEREX® 300 Butterfly Valves are always used for shutting off the medium.

As a standard, the valve is supplied in the following types:

WAFER-Type:

- For insertion between pipeline flanges

LUG-Type:

- For installation with bolts between pipeline flanges
- As end-of-line valve with flanged connection to pipeline flanges and with the following operation pressures

  - DN 50 - 300: 16 bar
  - DN 350 - 400: 14 bar
  - DN 450 - 600: 10 bar

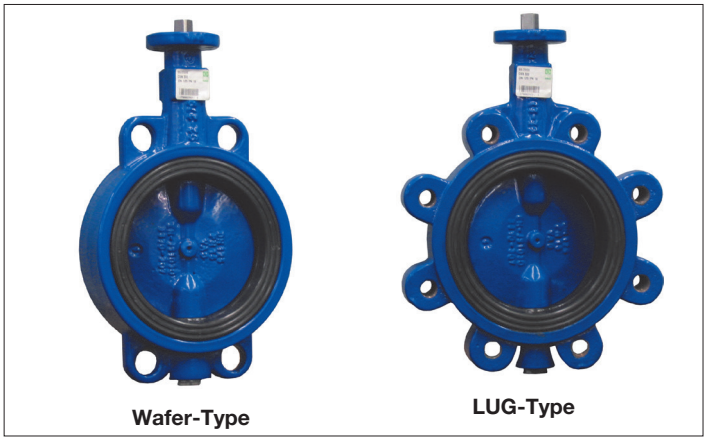


Figure 3: Types of VAG CEREX® 300 Butterfly Valves

3.2 Applications

In the standard "Water" version, VAG CEREX® 300 Butterfly Valves are equipped with EPDM profiled seals and can be used with the following media:

- Water
- Raw water and cooling water
- Weak acids and alkaline solutions (with adapted corrosion protection)

If the valve is used in oil- or gas-containing media or in domestic sewage systems, this may lead to the destruction of the EPDM seals, the rubber coating and O-rings and is therefore not admissible.

If the valve is used in gaseous media or filtered waste water, NBR is to be used as material for the seals.

The VAG CEREX® 300 Butterfly Valve should only be used in media in which where there is no risk of clogging.

For information about the corresponding temperature limits, please refer to the product-related technical documentation (KAT -A 1331).

In case of deviating operating conditions and applications, please consult the manufacturer

3.3 Performance limits

3.3.1 Cavitation

VAG CEREX® 300 Butterfly Valves are mainly used to shut off flow. If a VAG CEREX® 300 Butterfly Valve is used to control flow, the operational limits of the maximum flow velocity as well as the cavitation limits must be observed.

The operational limits can be calculated either using the VAG UseCAD® or the following calculation rules:

Cavitation limits

After the upstream and downstream pressures of the valve as well as the flow rate have been determined, the cavitation value is calculated as follows:

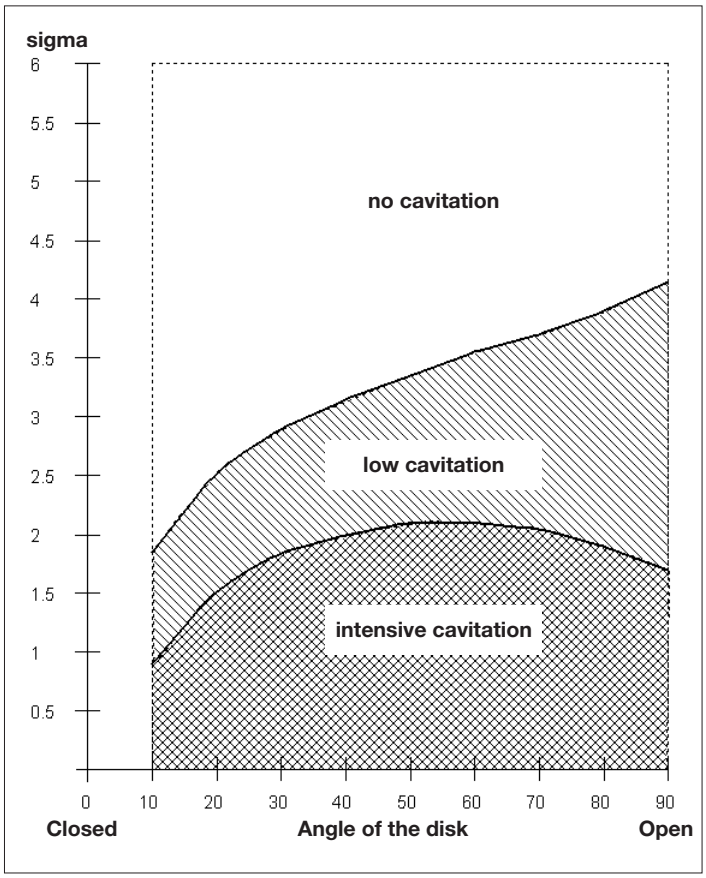


Figure 4: Sigma values to establish the degree of cavitation in butterfly valves

Calculation of the σ-value: $\sigma = \dfrac{H_2 + H_{At} - H_d}{(H_1 - H_2) + \dfrac{v^2}{2 * g}}$

H1	=	Inlet pressure	[mWS]
H2	=	Outlet pressure	[mWS]
HAt	=	Atmospheric pressure	[mWS]
Hd	=	Evaporation pressure	[mWS]
v	=	Flow velocity in the pipe	[m/s]
g	=	Gravitational acceleration	[m/s²]

The VAG CEREX® 300 Butterfly Valve has the correct dimensions when the computed σ - value lies above the limit curve of σ_k. The recommended control range lies between 10-100% opening degree. Below that no reasonable control can be guaranteed. If cracking noises or vibrations occur while the valve is being put into operation, the actual operation conditions should be checked. In case of changed operation conditions, the equipment may have to be recalculated. If the computed σ - value lies below the limit curves of σ_k cavitation will occur.

To remedy the problems, we recommend:

- Changing the back pressure
- Choosing a different place of installation

If the σ - value lies above the limit curves of σ_K the noise is caused by other things and the pipeline will have to be checked.

3.3.2 Kv values (valve fully open)

DN	Kv [m³/h]	ZETA-value
50	195	0,26
65	321	0,29
80	435	0,34
100	754	0,28
125	1264	0,24
150	1868	0,23
200	3128	0,26
250	4885	0,26
300	7026	0,26
350	9514	0,26
400	12426	0,26
450	15722	0,26
500	19415	0,26
600	27958	0,26

Table 1: KV values

In case a valve is used in continuous control operation, the operation limits need to be coordinated in consultation with VAG before the valve is ordered and/or installed. Cavitation must always be prevented.

Permanent operation in intermediate position will result in increased wear of the valve. Operation limits need to be established according to Section 3.3.1.

3.3.3 Maximum permissible flow velocity

VAG CEREX® 300 Butterfly Valves are dimensioned to EN 593 for the following flow velocities:

- Liquid media: 4m/s (for nominal pressure PN16)
- Gaseous media: 35m/s (for nominal pressure PN16)

The operating torque of butterfly valves greatly depends on the differential pressure and the flow velocity. If you intend to operate the CEREX® 300 Butterfly Valve at higher flow velocities, this requires the recalculation of the valve by VAG.

If you have any questions on the design and dimensioning of the valve, please contact your coordinator in charge at VAG-Armaturen GmbH.

3.4 Permissible and impermissible modes of operation

The maximum operating temperatures and operating pressures specified in the technical documentation (KAT-A 1331) must not be exceeded.

The pressure applied to the closed valve must not exceed its rated pressure.

VAG CEREX® 300 Butterfly Valves have to be equipped with an actuator having a limit stop for the open and closed position.

Hand levers can be used as actuators for valves of a nominal diameter of up to DN 200 and a nominal pressure of PN 16. Valves with larger nominal diameters should not be equipped with hand levers as it will not be possible for one operator only to handle the operating torque.

The only types of gear units that may be mounted are self-locking worm gears with limit stops in the open and closed position. Due to the self-lock of the gear unit it suffices to locate the final position of the gear unit (limit stop).

4 Installation into the pipeline

4.1 Conditions required on site

When installing the valve between two pipeline flanges, these must be coplanar and in alignment. If the pipes are not in alignment, they must be aligned before installation of the valve, as otherwise this may result in impermissibly high loads acting on the valve body during operation, which may eventually even lead to fracture.

When the valve is installed, the minimum diameters of the counter-flanges must be observed to ensure trouble-free opening and closing of the valve and proper sealing on the pipeline flange.

Make sure that the valve is installed into the pipeline as stress-free as possible. Wafer-type butterfly valves must not transmit any pipeline forces. The distance between the flanges must be wide enough to provide sufficient space for the face-to-face length of the valve and the protruding profiled seal.

The lug-type VAG CEREX® 300 Butterfly Valve can be used as end-of-line valve in closed position and without counter flange up to the following operating pressure:

- DN 50 - 300: 16 bar
- DN 350 - 400: 14 bar
- DN 450 - 600: 10 bar

When used as an end-of-line valve, the butterfly valve must not be operated without suitable counter-flange!

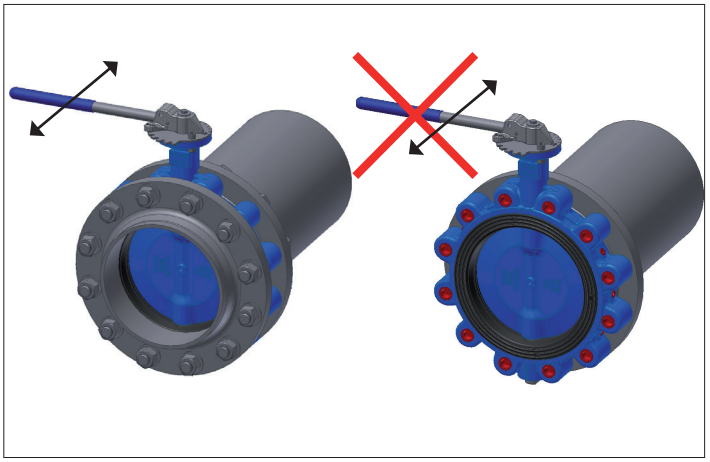


Figure 5: Operation of the VAG CEREX® 300-L Butterfly Valve as end-of-line valve only with suitable counter-flange

It needs to be ensured that the insertion depth of the fastening bolts corresponds at least to the face-to-face length of the valve and that the valve is bolted to the end of the pipeline using all its threaded lugs. If the bolts used are too short, the threads may be stripped.

If you want to open a valve serving as an end-of-line valve in a pressurised pipeline, please do so with the utmost care to prevent the emerging medium from causing physical injury and damage to the environment.

Be careful when closing the end-of-line valve in order not to squeeze your hands between the disk and body!

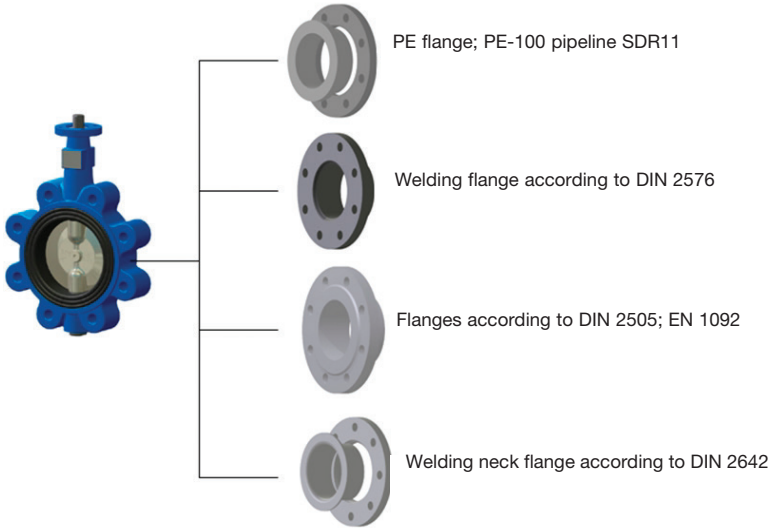
In case of works around the valve causing dirt (e.g. painting, masonry or working with concrete), the valve must be protected by adequate covering.

When the valve is installed, no additional seals between the valve and the pipeline must be used as the profiled body seal also functions as a flange seal. Only assembly aids approved for application in drinking water pipelines must be used.

When using PE flanges and flared welding neck flanges make sure that the diameter of the flare of the flange is larger than the outer diameter of the sealing face of the profiled seal. This is the only way to ensure that the body of the VAG CEREX® 300 Butter-fly Valve can provide support to the flange. If the diameter of the flare is too small this will result in the failure of the valve and is therefore impermissible.

4.2 Installation location

The installation location of the valve must be selected to provide sufficient space for function checks and maintenance works (e.g. dismantling and cleaning of the valve).



DN	Connection PE 100 welding neck flange	Flanges EN 1092	Welding flange DIN 2576	Flared flange DIN 2642
50	DA50 SDR11 DA63 SDR11 DA75 SDR11		Flange A50 * 60,3 Flange A50 * 57	Flared G50 * 60,3 Flared G50 * 57
65	DA75 SDR11 DA90 SDR11		Flange A65 * 76,1	Flared G65 * 76,1
80	DA90 SDR11 * DA110 SDR11 DA125 SDR11 **		Flange A80 * 88,9	Flared G80 * 88,9
100	DA125 SDR11 DA140 SDR11 DA160 SDR11 **	Type 01	Flange A100 * 114,3 Flange A100 * 108	Flared G100 * 114,3 Flared G100 * 108
125	DA160 SDR11 DA180 SDR11	02 04	Flange A125 * 139,7 Flange A125 * 1332	Flared G125 * 139,7 Flared G125 * 133
150	DA180 SDR11 * DA200 SDR11	11	Flange A150 * 168,3 Flange A150 * 159	Flared G150 * 168,3 Flared G150 * 159
200	DA225 SDR11 * DA250 SDR11 DA280 SDR11 **	12 21	Flange A200 * 219,1	Flared G200 * 219,1
250	DA280 SDR11 *** DA315 SDR11	32 33	Flange A250 * 273 Flange A250 * 267	Flared G250 * 273 Flared G250 * 267
300	DA355 SDR11	34	Flange A300 * 323,9	Flared G300 * 323,9
350	--		Flange A350 * 355,6 Flange A350 * 368	Flared G350 * 355,6 Flared G350 * 368
400	--		Flange A400 * 406,4 Flange A400 * 419	Flared G400 *406,4 Flared G400 * 419
450	--		Flange A450 * 457	not standardised
500	--		Flange A500 * 508	not standardised
600	--		not standardised	not standardised

* Accurate alignment of the valve necessary; we recommend chamfering the pipeline by 2 x 45°
** Accurate alignment of the valve necessary as otherwise there may be leaks at the profiled seal
*** Only possible with adaptation of the pipeline flange

Figure 6: Flange design types

If the valve is installed in the open, it must be protected against extreme atmospheric influences (e.g. formation of ice etc.) by adequate covers.

If the valve is installed as an end-of-line valve, it must be made sure that the free outlet side cannot be accessed by humans.

Attention!! The pressure on the closed valve must not exceed its nominal pressure (see KAT-A 1331).

To ensure the trouble-free function and long service life of the valve, several factors have to be taken into account when positioning the valve.

4.2.1 Installations in the pipeline upstream and downstream of the valve

- If the valve is used in contaminated media, a filter with a suitable mesh size must be provided upstream of the valve in order to prevent malfunction.
- Directly upstream of (3 x DN) and downstream of (3 x DN) a VAG CEREX® Butterfly Valve an inspection valve, an elbow, T-pieces and Y-filters should be provided as otherwise irregular flow may disturb the proper function of the VAG CEREX® Butterfly Valve.
- Branches and elbows may cause the disk to vibrate.
- A damping zone between the branch/elbow and the valve is ideal.
- When installing a butterfly valve downstream of a control valve or a plunger valve, make sure that there is enough space between them (minimum 10 x DN) (see Figure 8).
- If the required damping zone cannot be observed, turbulences in the flow may lead to vibrations of the disk, which will shorten the service life of the valve.

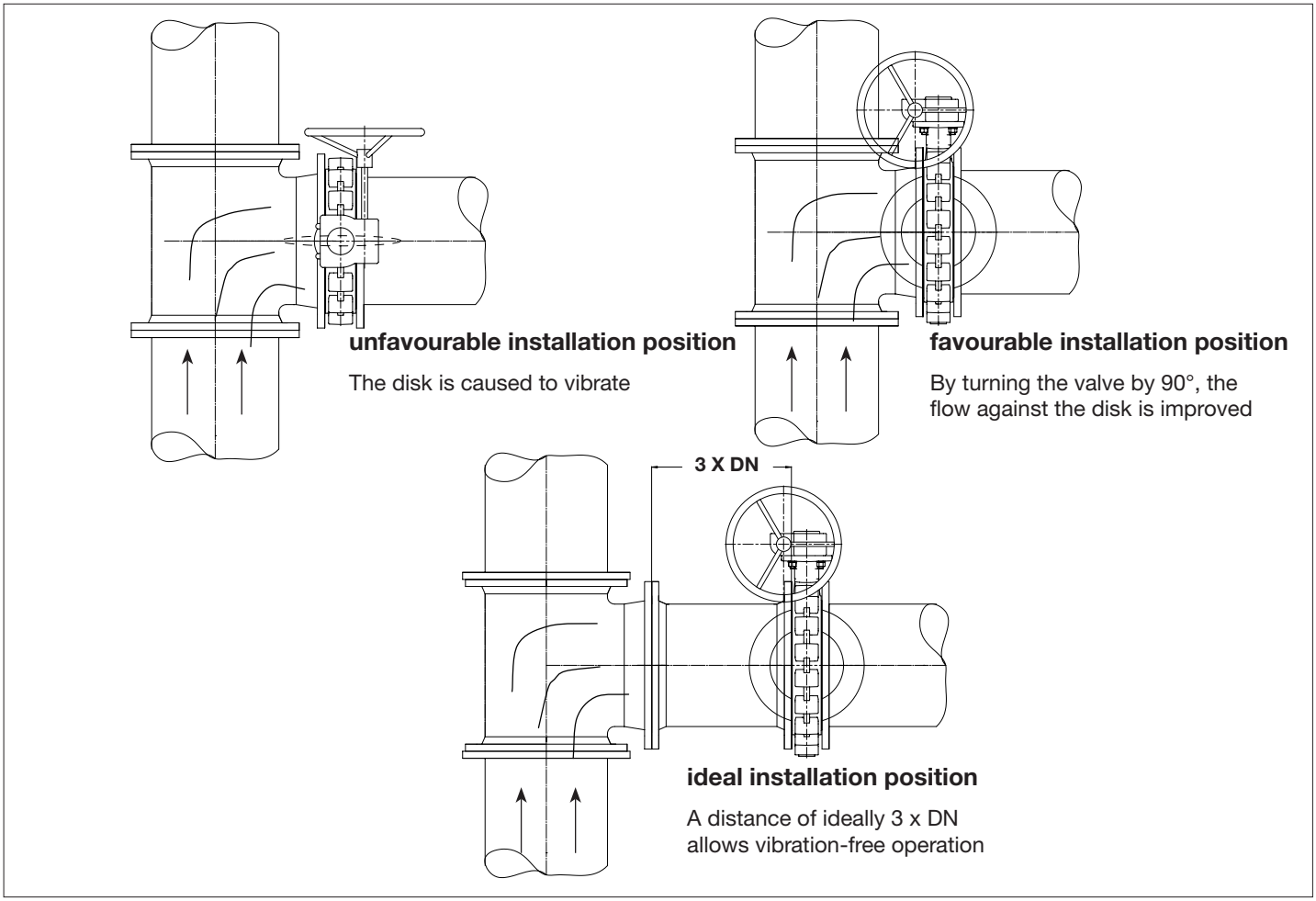


Figure 7: Installation of the VAG CEREX® 300 Butterfly Valve at elbows and branches

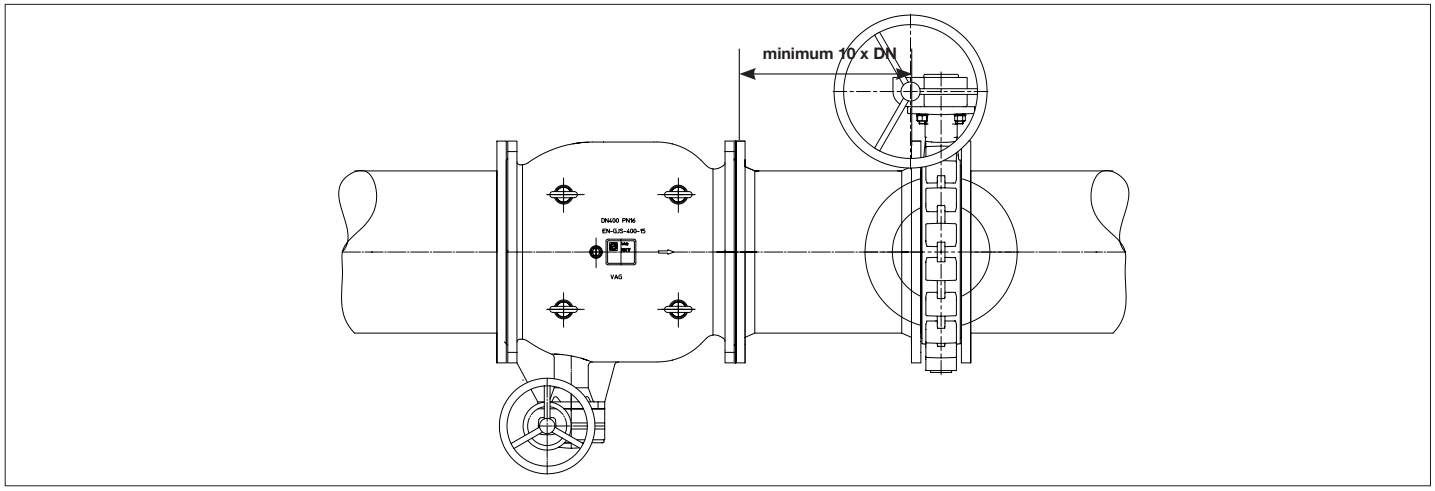


Figure 8: Installation of the VAG CEREX® 300 Butterfly Valve downstream of control valves

4.3 Installation position

VAG CEREX® 300 Butterfly Valves can be installed irrespective of the flow direction.

The preferred installation position of VAG CEREX® 300 Butterfly Valves is with the disk shaft in horizontal position.

If the valve is used in media containing solid matter or in which sedimentation may occur, we also recommend installing the valve with the disk shaft in horizontal position.

Butterfly valves with diameters of < DN 300 can also be installed with the disk shaft in vertical position.

If you intend to install valves of larger nominal diameters with the disk shaft in vertical position, please consult VAG before you order and/or install the valve.

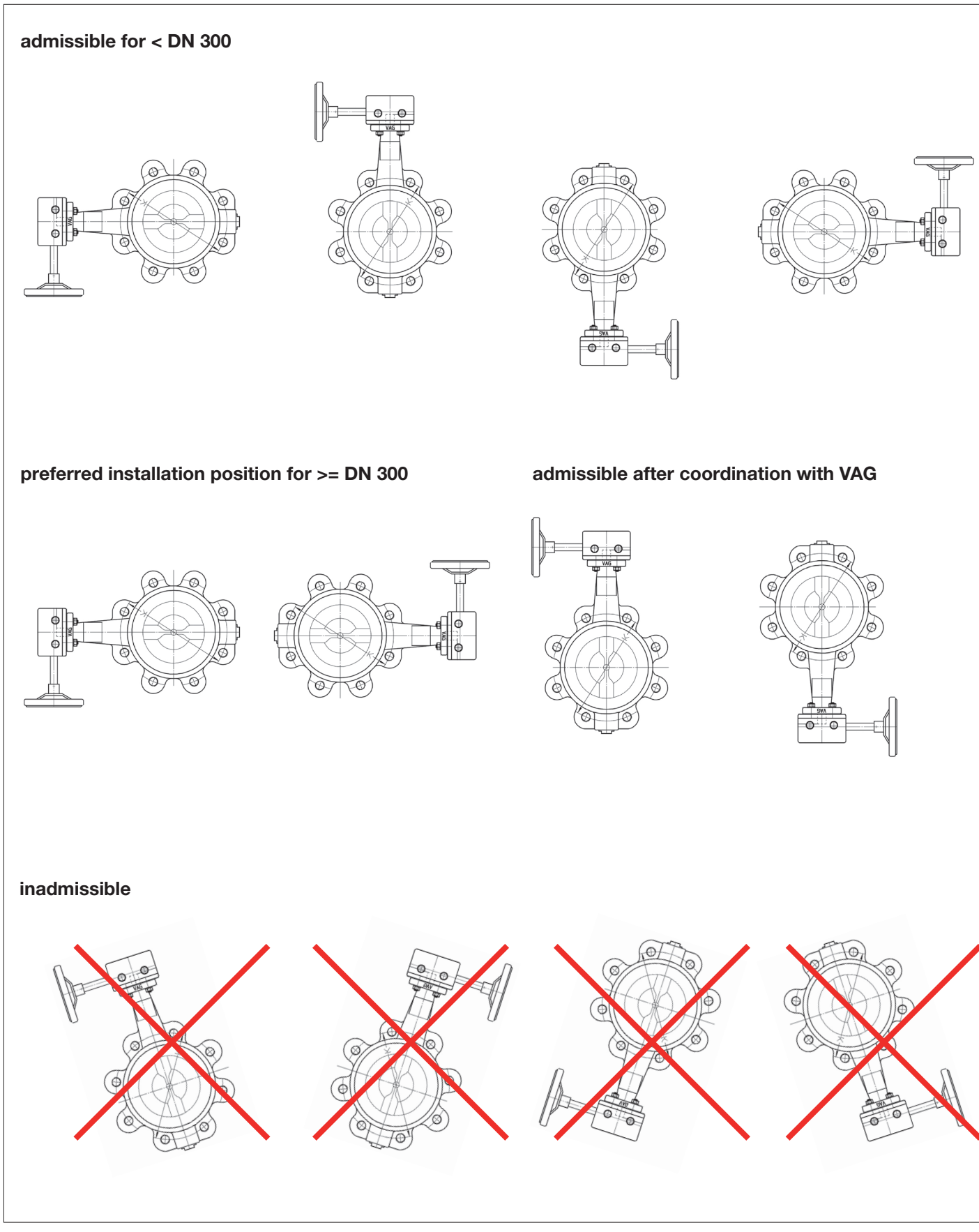


Figure 9: Installation positions

4.4 Assembly instructions and fittings

Check the valve for possible damage that may have occurred during transport or storage. Protect the valve against dirt from the construction site by adequate covering until installation. Prior to installation all components essential for proper function, such as the disk and the seals must be thoroughly cleaned to remove all dirt particles. VAG does not assume any liability for consequential damage caused by dirt, shot-blasting gravel residue etc.

The function parts should be checked for proper operation prior to installation.

Should the valves be repainted later on, it must be ensured that no paint is applied to the functional parts. The identification plates must not be painted over either. If the equipment is sand-blasted for any reason prior to installation, these parts must be adequately covered. If solvents are used for cleaning, you should ensure that they do not damage the seals of the pipeline or the valve.

For the assembly of the VAG CEREX® 300 Butterfly Valve you must ensure that proper load suspension devices as well as means of transport and lifting devices are available.

The valve is installed in the pipeline with the disk slightly open.

While the valve is being installed, it must be made sure that the flanges of the pipeline it is connected to are aligned and level with each other. Welding works on the pipeline must be performed before the valves are installed to prevent damage to the seals and the corrosion protection. Welding residues must be removed before the equipment is put into operation.

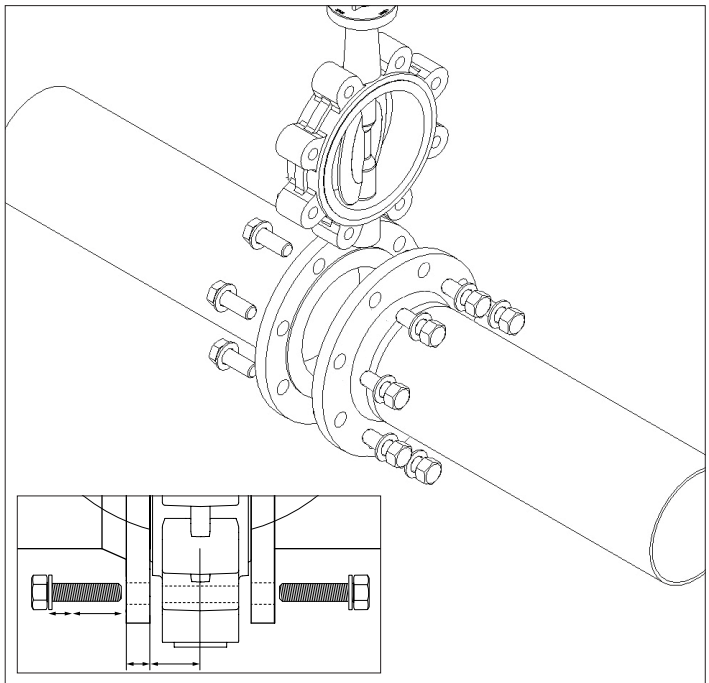


Figure 10: Inserting the valve into the pipeline

The pipeline must be laid in a way that prevents harmful pipeline forces from being transmitted to the valve body. Should construction works near or above the valve not be completed yet, the valve must be covered to protect it from dirt.

When CEREX® 300 Butterfly Valves with profiled seals are installed, no additional seals must be used.

When installing the valve in an assembled pipeline make sure that the space between the pipeline flanges is wide enough to prevent damage to the sealing faces of the profiled seal while the valve is being assembled between the pipeline flanges.

However, this space must not be too large to prevent the generation of additional tensions in the pipeline while the flange connection is being fastened. While installing it, carefully centre the valve via the flange bolts.

Flange bolts should be fastened evenly and crosswise. This ensures evenly distributed pressure on the profiled seal and thus the tightness of the valve.

The tightening torques of the flange bolts should ensure that the butterfly valve and the counter-flanges are fastened so that they form a “block” (metal-to-metal). This is the only way to guarantee that the profiled seal seals properly on the flanges of the body.

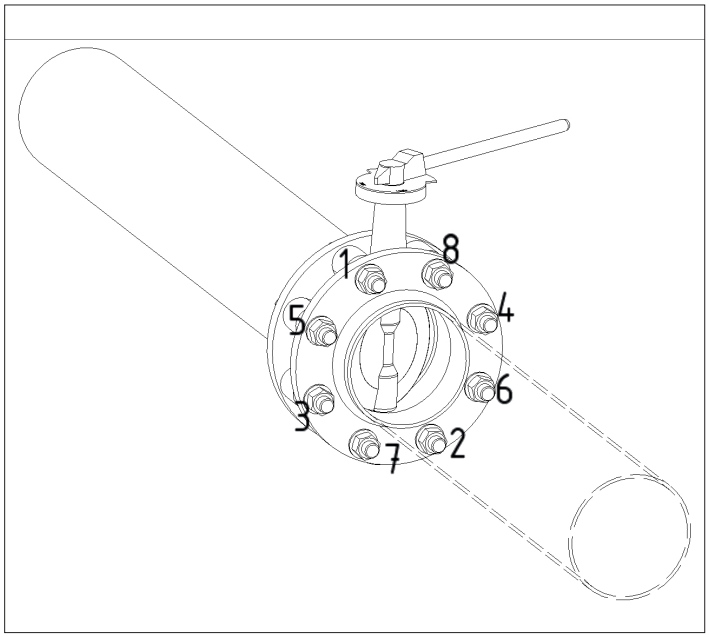


Figure 11: Cross-wise fastening of the bolts

5 Set-up and operation of the valve

5.1 Visual inspection and preparation

Before putting the valve and the equipment into operation, perform a visual inspection of all functional parts. Check whether all bolted connections have been properly fastened.

For proper assembly, storage and transport the valves are factory-lubricated. Depending on their condition when they are to be put into operation, the valves may have to be lubricated again. If the valve is installed in a drinking water pipeline, lubricants must be used which are approved for use with foodstuffs or drinking water.

- Profiled seal and O-rings: KLÜBERSYNTH VR 69-252 (with KTW approval for drinking water)

Manufacturer: Klüber Lubrication München AG

5.2 Function check and pressure test

Prior to installation, the function parts of the valve have to be opened and closed completely at least once and should be checked for trouble-free operation.

The pressure test of the valves has already been performed in the

manufacturer's factory. When doing a pressure test of a pipeline section with installed valves, the following instructions must be observed:

Valve open: The test pressure must not exceed 1.5 x the PN specified on the rating plate

Valve closed: The test pressure must not exceed 1.1 x the PN specified on the rating plate

Newly installed pipeline systems should first be thoroughly purged to remove all foreign particles. If residues or dirt particles are present in the pipeline, they might clog the installations while the pipeline is being purged. This may impair the function of the valve or even block it.

In particular after repair work or upon the commissioning of new equipment, the pipeline system is to be purged again with the valve being fully open. If detergents or disinfectants are used, it must be ensured they do not attack the valve materials. As a standard, the valve is closed by turning clockwise at the gear.

The dimensions of the stems and actuators allow operation of the valve by one person via the handwheel. Extensions for operation are not permissible as they may damage the valve due to excessive force. The 90° turn is limited by a limit stop located at the gear. If it is turned further using excessive force, this may cause a break. Proper function is to be checked by opening and closing the valve several times.

6 Actuators

6.1 General

For manual operation (handwheel and hand lever), normal manual forces are sufficient. The use of extensions to increase the operation torque is not permissible.

The use of hand levers is possible for valves from DN 40 to DN 200.

The position of the manual lever shows the position of the valve:

- Hand lever 90° across the pipeline: valve closed
- Hand lever in parallel to the pipeline: valve open

Actuators (gears, pneumatic, hydraulic and electric actuators) are designed for flow velocities according to Table 2 in EN 1074-1 (valves used for water supply; requirements relating to fitness for use). Any deviating operating conditions need to be specified. The adjustment of the limit stops (OPEN, CLOSE) must not be changed without the manufacturer's consent. If a valve is installed without gear it must be ensured that such a valve is not pressurised.

For detailed information on gears and actuators, please refer to the operation manuals issued by the manufacturers of these components (e.g. AUMA, Rotork). In some cases the manuals need to be obtained by the user himself.

VAG CEREX® 300 Butterfly Valves have an adjustment angle of 90°. The valve itself is not equipped with position limiters. The actuator must be equipped with limit stops.

The limit position adjustment is to be done in compliance with the operating manuals issued by the respective gear manufacturers, such as AUMA, Rotork etc. In case a gear is retrofitted, its nominal torque and the adjustment of the limit stops "OPEN" and "CLOSE" must be adapted to the valve.

Non-compliance with these regulations may result in danger for life and limb and/or cause damage to the pipeline system. If actuators powered by external sources of energy (electric, pneumatic or hydraulic) have to be disassembled from the valve, the safety instructions under Section 1.1 need to be observed and the external source of energy must be switched off.

For valves equipped with pneumatic actuators, the direction of rotation of the actuator must be selected so that the limit stop is to be adjusted when the valve is in closed position. In case of valves equipped with spring-return actuators the disk protrudes from the body on both sides when the valve is delivered. The packaging of the protruding edge is provided to protect the disk against damage. The micro-finished sealing face at the edge of the disk must not be damaged.

6.2 Operating torques

Operating torques are the maximum required torques [in Nm] at the driven shaft at full differential pressure.

- The torques specified are stated for liquid and lubricating media without safety factor

DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600
PN 10	8	18	28	35	65	90	150	250	320	450	875	1130	1900	2200
PN 16	10	20	30	40	80	110	190	300	400	600	1000	1275	2100	2500

Table 2: Torques at the valve shaft

- Electric actuators have to be designed with an additional safety factor of 1.5
- If required, please contact us to enquire about the respective torques and/or adjustment torques for electric actuators
- the torques of valves operated in dry media need to be designed with a safety factor of 2.0

Butterfly valves with a dry profiled seal require higher actuating torques when they are operated for the first time!

- the dimensions of the actuator flanges and shaft ends can be found in Section "Design"

6.3 Assembly of the electric actuator

The electric actuator is mounted to the input flange of the gear. The actuator size is selected according to the maxi-mum actuation elements.

The valve is switched off:

- position-dependent in Open position
- position-dependent in Closed position

The switching points are factory-adjusted. The torque switches serve as overload protection in the intermediate positions. If the valve is retrofitted with an electric actuator, the position switches have to be adjusted after the actuator has been mounted. For the adjustment procedure, please refer to the operating manual issued by the manufacturer of the electric actuator.

The relevant safety regulations of the VDI / VDE and the instructions of the manufacturer of the electric actuator must be observed.

When the items are delivered, the adjustment screws and the

connection bolts of the gear and the electric actuator are sealed with labels and/or identified by colour markings. The removal or breaking of these identifications will result in the loss of the manufacturer's warranty.

7 Maintenance and repair

7.1 General safety instructions

Prior to the performance of inspection and maintenance work on the valve or its assemblies, shut-off the pressurised pipeline, depressurise it and secure it against inadvertent activation. Depending on the type and hazardousness of the fluid conveyed, comply with all required safety regulations!

After completing the maintenance works and before resuming operation, check all connections for tightness. Perform the steps described for initial set-up as described under Section 5 "Set-up and operation".

A VAG CEREX® 300 Butterfly Valve is not self-locking. The actuator/the gear must not be disassembled as long as the valve is pressurised. This also applies in case the complete valve is dismantled.

Statutory and local provisions as well as the safety and accident prevention regulations must be observed and complied with at all times.

Couplings and connections must never be disassembled when they are under pressure.

Servicing, maintenance and inspection work as well as the replacement of spare parts must be carried out by qualified personnel. The plant operator is responsible for determining the suitability of the personnel or for ensuring that they have all relevant qualifications.

In case the operator's employees do not have the qualifications required, they should attend a training course. Valve related training courses can be undertaken by VAG Service employees.

In addition to this, the plant operator needs to ensure that all employees have understood these Operation and Maintenance In-

Figure 12: Markings on the gear unit

structions as well as all further instructions referred to in them.

Protective equipment such as safety boots, safety helmets, goggles, protective gloves etc. must be worn during all work requiring such protective equipment or for which such protective equipment is prescribed.

Quickly closing the valve will lead to water hammers in the pipeline. Prior to the performance of any work on the valve and equipment it must be ensured that the relevant pipeline section has been depressurised and/or de-energised.

7.2 Inspection and operation intervals

The valve should be checked for tightness, proper operation and corrosion at least once per year (DVGW Instruction Sheet W 392).

We recommend operating valves which permanently remain in the same position three to four times per year.

In case of extreme operating conditions inspection should be performed more frequently.

7.3 Maintenance work and replacement of parts

7.3.1 Design

The design view in Picture 13 serves as a partial overview.

7.3.2 Recommendations for the replacement of parts

The profiled seal, O-rings and bearing bushes have to be replaced at the intervals demanded by the medium. The replacement intervals depend on the operating conditions.

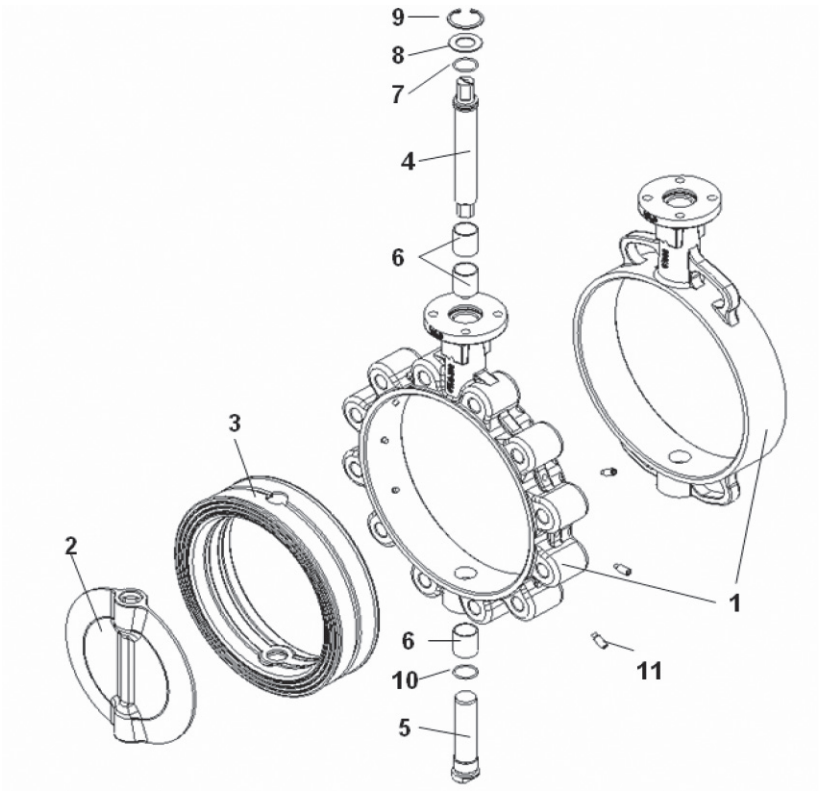
7.3.3 Cleaning and lubrication

Seals, O-rings and the profiled seal should always be slightly greased when they are replaced. For this purpose lubricants approved for use with foodstuffs or drinking water have to be used.

Recommended lubricants:

- Profiled seal and O-rings: KLÜBERSYNTH VR 69-252 (with KTW approval for drinking water)

Manufacturer: Klüber Lubrication München AG



Item	Designation	Quantity	Material	Spare part
1	Body	1	EN-JS 1030	
2	Disk	1	EN-JS 1030 (epoxy-coated) or 1.4408	
3	Profiled seal	1	EPDM or NBR	•
4	Actuator shaft	1	1.4021/1.4462	
5	Shaft of cover side	1	1.4021/1.4462	
6	Bearing bush	3		•
7	O-ring of driven shaft	1	NBR	•
8	Washer	1	14301	
9	Seeger circlip ring	1	14310	•
10	O-ring of cover side	4	NBR	•
11	Securing screw	6 (> DN 200 PN 16)	A2-70	

Figure 13: Design and spare parts

For valves used in gas applications the use of suitable grease is mandatory.

8 Trouble-shooting

For all repair and maintenance work, please observe the general safety instructions described in Section 7.1!

9 How to contact us

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Service

Our service hotline can be reached 24/7 world-wide. In case of emergency, please contact us by phone.

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Service by E-Mail: service@vag-group.com

Problem	Cause	Remedial action
Valve makes noise	Unfavourable installation position causing unfavourable flow around or inside the valve (e.g. installed too closely downstream of an elbow etc.)	Change installation position
	Valve operating be-yond its design limits	Check design and/or operation data, change flow resist-ance in the valve, if required, by using different internals
Valve cannot be operated	Foreign matter jammed in the seat area	Flush valve, dismantle, if necessary, and remove foreign matter
	Gear blocked	Undo block
	No electrical connec-tion of electric actuator	Establish electrical connection
	Unfavourable flow and im-pairment of movement	Change installation position
Leaks in the body seat	Valve not completely closed yet	Close valve completely
	Valve seal damaged or worn	Replace seal
Cavitation in valve	Valve operating beyond its design limits	Butterfly valve not suitable for use as control valve. Replace valve by a more suitable valve type.
	Operational data changed	
Leaks at the body	Deterioration of seals	Replace seals or collar
High operating forces	Seat of the valve polluted by deposits	Flush valve, dismantle, if necessary, and clean seat area
	Valve is dry in pipeline, no medium present	Valve can be operated more easily when wet

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