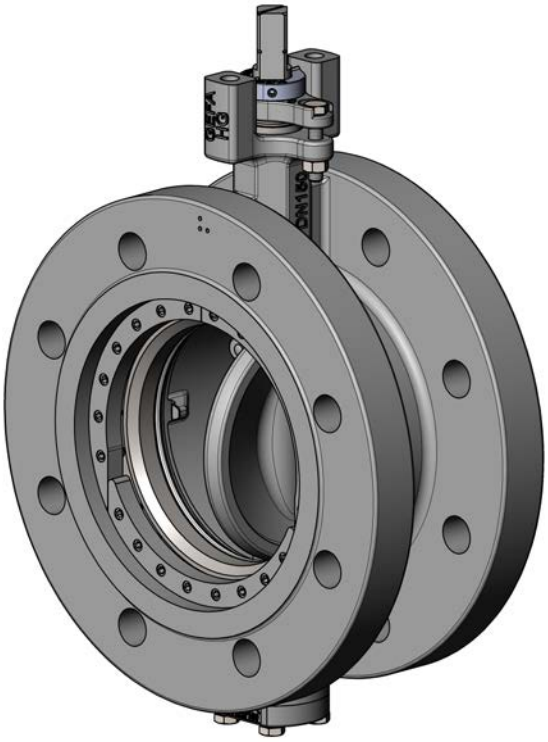
VALVE TECHNOLOGY

# Original instructions

# HG5



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## 1 Imprint

Read the operating instructions thoroughly before installing your valve. Failure to follow these instructions or the warning and safety labels could result in serious injury or property damage. These operating instructions must be available to all users at all times. GEFA Processtechnik GmbH is not liable for unauthorized changes of the device or for improper use.

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# 2 Safety instruction

This chapter contains basic instructions for the safe handling of this valve.

Observe all instructions for transport, storage, installation, commissioning, maintenance and decommissioning as well as disposal. In explosive arenas, the relevant standards, the specifications of the manufacturer and the risk assessment must be observed

Failure to observe safety instructions may result in personal injury and / or property damage.

The safety instructions in this documentation are uniform and marked with an icon on the left side of the note. A signal word above the text indicates the hazard level. The color of the hazard word additionally signals the hazard level.

The warning notice also includes:

> Nature and origin of danger.
> Possible consequences of the danger.
> Measures to avoid the danger.

If more than one hazard level occurs, the safety notice for the highest level is used.

| | |
|---|---|
|  | Nature and origin of danger.<br>Possible consequences of the danger.<br>Measures to avoid the danger. |

### Signal words for warnings

The signal word identifies the severity of the hazard that occurs if it is not avoided.

| | |
|---|---|
| **DANGER** | Means: Serious personal injury threatens immediately. |
| **WARNING** | Means: Serious personal injury may be imminent. |
| **CAUTION** | Means: Light / medium personal injury threatens immediately. |
| **NOTICE** | Means: property damage threatens directly or possibly. |

## 2.1 Used information and warning signs

The warning sign represents a source of danger. Warning signs are located:

> At the device near the source of danger.
> In the operating instructions before the activity is described, which can be a hazard.

The following information and warning signs are used in this operating manual:

| | |
|---|---|
|  | **Safety Notice General** |
|  | **Wear safety gloves** |
|  | **Wear safety shoes** |

Observe and obey all local safety regulations, safety precautions and operating instructions. These apply in addition to or in addition to the safety instructions stated and shown in this manual. If contradictory identifications occur, speak with the responsible authority. All PPE (personal protective equipment) must be provided by the user of the valve.

## 2.2 Intended Use

The valve is used exclusively for shutting off, throttling and regulating media flows under the Consideration of the data given on the valve and technical details given in this manual Data, diagrams, applications described and only in connection with the components, which are recommended by GEFA Processtechnik GmbH, approved and mentioned in this documentation.

The faultless and safe operation of the device requires proper transport, proper storage and installation as well as careful operation and maintenance. This documentation is part of the device and must be available at all times. Observe all safety regulations which are listed in this documentation.

The valve may only be operated in such a way that no fatigue stress occurs. Max. 500 pressure cycles at $\Delta p = PS$ or max. 500 / $(\Delta p / PS)^3$ permissible equivalent pressure cycles (see DIN EN 13445-3 section 5.4.2). The valve may only be operated in this way within the scope of the DGRL.

The suitability of the product wetted parts used and their chemical resistance must be clarified before commissioning the system. The usual flow rates for this valve must not be exceeded. Changes or modifications to the device are not permitted. The improper use leads to the exclusion of any liability claims.

## 2.3 User

All work on the unit may only be performed by qualified personnel and together with this documentation. Qualified persons within the meaning of this documentation are those who are authorized to assemble, commission and mark devices, systems and connections in accordance with the standards of safety technology.

## 2.4 Improper use

Do not mount the valve if:

- Parts are obviously damaged.
- There is not enough free space to ensure easy operation of the hand levers, handwheels and manual emergency shifts.

Or the fitting as:

- Support member of the pipe guide is used.
- Riser is used.

This includes the actuators such as hand levers, gear operator, actuator, feedback and control systems.

## 2.5 Due diligence of the operator

It is the duty of care of the operator to plan and control all actions that ensure safety in the workplace.

**In particular, the operator must ensure that:**

- The valve is only used as intended.
- The valve is only operated in a perfect, fully functional condition.
- The safety regulations relevant to the installation site and generally applicable technical rules for the installation location must be observed.
- The permissible materials of the wetted parts are suitable for the media, pressures and temperatures used.

**The operator must also ensure that the responsible personnel:**

- Has the necessary qualifications to work with the valve.
- Has read and understood the operation instructions before working with the valve and follows the described instructions.
- Can clearly identify all safety signs required for the work.
- All necessary protective equipment is provided and must be worn.

## 2.6 Product safety

The valves of GEFA Processtechnik GmbH correspond to the state of the art and the prescribed safety rules, but nervertheless hazards can occur in connection with valves. The valve may only be operated in proper condition, in the intended area and under consideration of all associated documentation. Any change to the valve may only be made after approval by the manufacturer. The basic requirement for trouble-free operation is proper connection of the electrical, hydraulic and pneumatic lines.



**⚠ WARNING**

**Improper use / excessive stress of the valve**

The use of material incompatible media or operating outside the approved specification, exceeding the manufacturer's approved pressure and temperature limits, the use of the valve as a climbing aid, including all actuators (hand lever, gearbox, drive, feedback and control systems), and from the outside acting loads and shear forces due to additional stresses can lead to failure of the pressure-bearing parts and bursting of the valve.

## 2.7 Product-specific dangers



**⚠ WARNING**

**Dangers relating to a valve**

The flow medium, the control pressure, the temperature and moving parts can potentially pose a hazard. These potential hazards must be prevented by appropriate activities by the operator.

It is not permissible to reach into the valve at any time. In general, there is a risk of injury to moving parts.

## 2.8 Outflowing media



**⚠ WARNING**

**Outflowing media**

If harmful or environmentally hazardous media leak out (e.g. leaks or disassembly of the valve), they must be collected in such a way that there are no hazards to persons or the environment. Observe all applicable local regulations that apply to the disposal of the respective medium and the valve.

## 2.9 Failure of actuator operating power



**⚠ WARNING**

**Failure of actuator operating power**

In case of failure of actuator operating power, the valve could go into a state of insecurity for its intended use.

Choose your valve in such a way that if the actuator operating power fails, the valve can change into a safe operating state for its intended use.

## 2.10 Mounting of actuators

Observe the following notes for mounting of a valve actuator.



**⚠ CAUTION**

**Ventilation of pneumatic components**

a) During venting operations on pneumatic components, increased noise may occur.

⇨ Prevent this by suitable measures (silencer).



**NOTICE**

**Mounting of actuators**

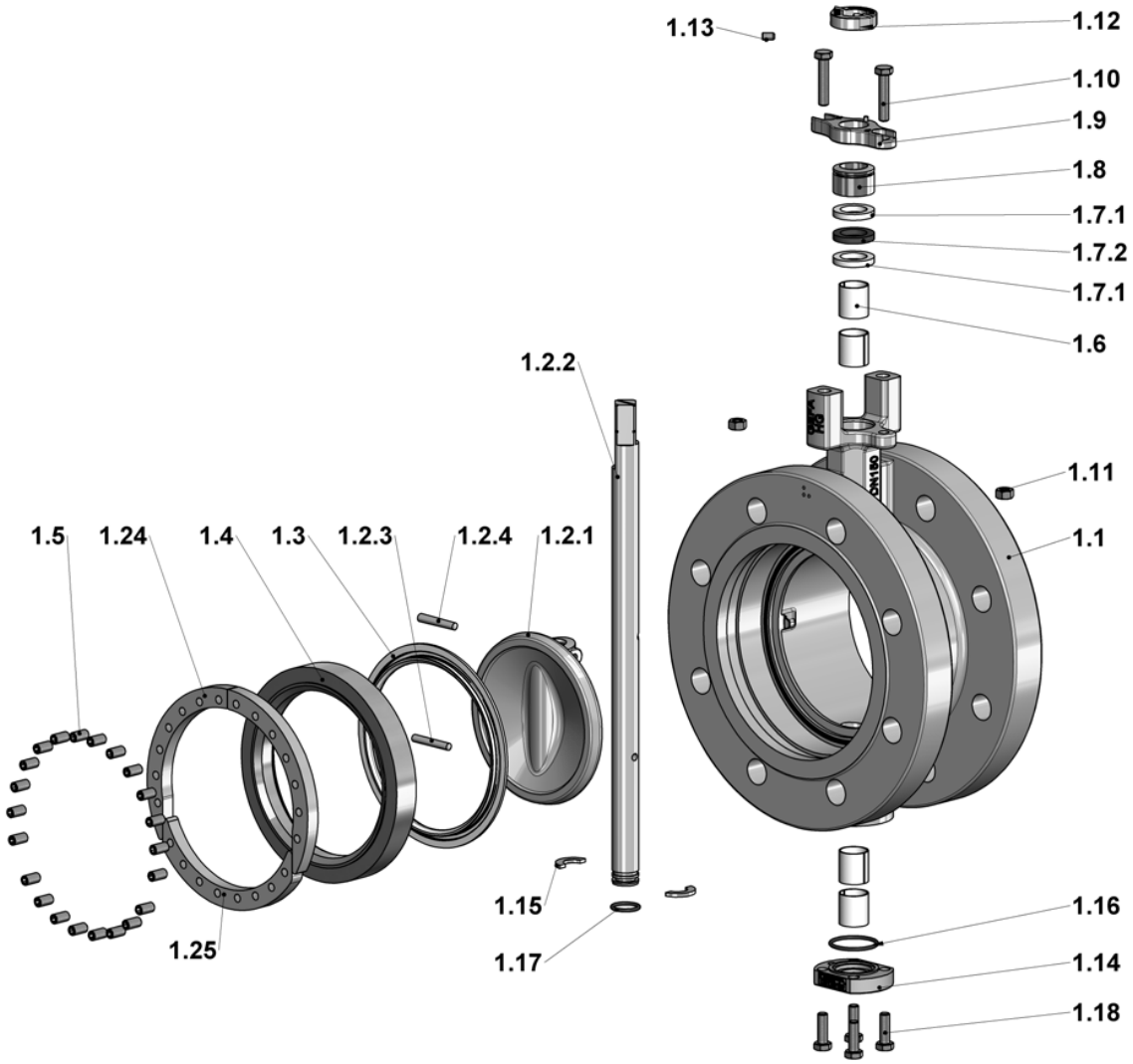
Actuators must be installed in alignment with the valve stem. Tensions can lead to increased wear or leakage of the stem seal.

The weight of a built-up actuator must not load the stem of the valve on one side. Therefore actuators must be intercepted if necessary - without fixation.

Pneumatic or hydraulic actuators must be operated at the agreed design pressure. Pay attention to the maximum permissible operating pressure.

# 3 Scope of delivery

## 3.1 Exploded view drawing DN80-300




(The description of the components can be found at the end of the chapter)

### 3.2 Components high performance butterfly valve series HG

| Pos. | Description |
|---|---|
| 1.1 | Body |
| 1.2 | Disc with stem |
| 1.2.1 | Disc |
| 1.2.2 | Stem |
| 1.2.3 | Straight pin |
| 1.2.4 | Tapered pin (≤ DN300) |
| 1.3 | Seat |
| 1.4 | Insert ring |
| 1.5 | Set screw / Cylinder screw |
| 1.6 | Bearing |
| 1.7 | Gland packing |
| 1.7.1 | Gland packing |
| 1.7.2 | Gland packing |
| 1.8 | Gland |
| 1.9 | Gland flange |
| 1.10 | Hexagon screw / Stud screw |
| 1.11 | Hexagon nut |
| 1.12 | Limit stop |
| 1.13 | Set screw |
| 1.14 | Bottom flange |
| 1.15 | Axial securing device |
| 1.16 | Bottom flange seal |
| 1.17 | O-ring |
| 1.18 | Hexagon screw |
| 1.24 | Clamping element |
| 1.25 | Clamping element |

(See illustrations in this chapter)

## 4 Transport and storage



**⚠ WARNING**

**Transport of the valve**

Failure to comply with the transport instructions can result in significant personal injury(even death) and property damage.



**NOTICE**

**Transport**

The transport may only be carried out by qualified and authorized personnel with suitable protective equipment.

In order to guarantee a faultless function, pay attention to the following during transport and storage:

- The valve must be transported and stored dry and clean.
- During transport and intermediate storage the high performance butterfly valve should not be outside a temperature range of -15°C and +30°C.
- In humid rooms, a drying material or heating must be used to avoid condensation
- If the valves are painted (coated) on the outside, this coating must remain without damage, otherwise the faulty spots must be repaired immediately!
- The factory-adjusted basic setting (position of the disc at delivery) must not be changed.

The transport packaging protects the valve against soiling and damage, therefore it is important:

- do not remove the packaging until the valve is going to be installed.

To prevent damage and life-threatening injuries when transporting the valve:

- Impact and vibrations must be avoided.
- Only use suitable and approved load handling equipment and slings.
- When selecting the load suspension and slinging equipment, take the weight of the valve into account.
- The transportation routes must be blocked and marked, that no unauthorized person can enter the danger zone.
- Do not suspend large valve on the gearbox or flange! Protect the shut-off element and flange sealing surfaces against any damage!
- For valves that are delivered without actuation, the shut-off element is not secured against adjustment. It must be transported in such a way that it can not be opened from the closed position by external influences (eg vibration).

## 5 Mounting and initial operation

Before installing and initial operation of the valve, the customer is obliged to check the completeness and correctness of the scope of delivery. In particular, the suitability of the materials and the operating parameters such as nominal diameter, pressure rating, medium, operating temperatures and, if applicable, control characteristics should be verified with the intended operating conditions and the ambient conditions (piping system). If you have ordered additional parts or a customized valve, please check the details carefully.



**⚠ WARNING**

**Damaged / incomplete valve**

Damaged or incomplete valves no longer meet the safety requirements and must not be installed.



**⚠ WARNING**

**Hazardous media**

Work on parts in contact with hazardous media may only be carried out with appropriate protective equipment.



**⚠ CAUTION**

**Earthing the valve**

If the valve is supplied with anti-static device and used in potentially explosive zones, the body of the valve must be connected effectively at site with the potential compensation cable before the valve is put into operation.



**NOTICE**

**Avoid vibration**

Vibrations, water hammer and cavitation as well as abrasive media components lead to damage to the valve and impair the service life.



**NOTICE**

**Installation at high suspended matter concentrations**

If the concentration of suspended matter is high (e.g. media which are very viscous), it is recommended to mount the high performance butterfly valve with valve shaft in horizontal position and stop boss facing upwards.



**NOTICE**

**Approach end position „open”!**

The end position is always approached from the open position. This is the only way to ensure that any clearance from the drive (eg gearbox) that is possibly present has no influence on the end position. If the exact end position is exceeded, bring the valve back into the open or partly open position. Then approach the end position again from the open position.

## 5.1 Installation conditions

In order to ensure trouble-free functioning of the valve, pay attention in the provided range of the fitting:

▪that the piping system must be routed, that damaging shear and bending stresses can not affect the valve body.

▪that there is enough free space available, that the operation of the hand lever, the hand wheel and the emergency and switching devices is easily possible.

> The valve must be installed between pipeline flanges according to DIN EN 1092-1, DIN 2501 or ANSI B16.5. It should be taken into account, that a valve which is designed for a particular flange standard cannot be normally used for other flanges.

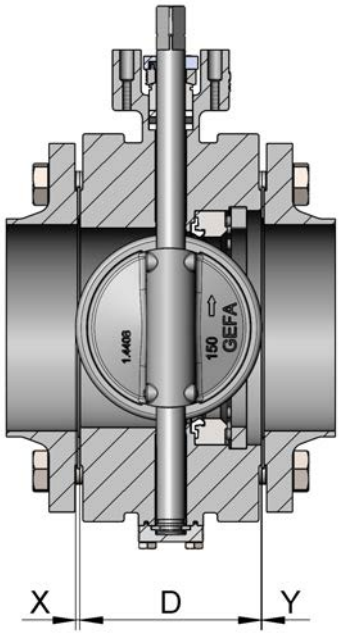
> If pipeline flanges are to be used which are not in accordance with the specifications of the order, the manufacturer is to be consulted.

> The surfaces of the pipeline flanges between which the valve is installed have to be parallel to one another, the sealing surfaces must be clean and without damage. No cross marks may be visible.

> Flanges and pipes must not be completely welded when the valve is installed, as the valve can be damaged.

> The valve is installed with two suitable seals between two pipe flanges.

> Screws, nuts and seals are not included in the manufacturer scope of supply, but must be available during installation. All flange gaskets intended for the application can be used.




| DN | D | X | Y |
|---|---|---|---|
| 80 | 114 | - | - |
| 100 | 127 | - | - |
| 150 | 140 | 4 | 1 |
| 200 | 152 | 22 | 19 |
| 250 | 165 | 39 | 36 |
| 300 | 178 | 54 | 51 |

## 5.2 Installation position

The valve can basically be installed in any position.

If the concentration of suspended matter is high (e.g. media which are very viscous), it is recommended to mount the high performance butterfly valve with valve shaft in horizontal position and stop boss facing upwards.

The recommended pressure direction (direction of the arrow on the body) guarantees the highest level of tightness. The valve also provides a reliable seal when it is used against the recommended pressure direction.

Consult the manufacturer if the valve is to be used for applications with a frequent change of pressure direction.

## 5.3 Initial operation

Factory-provided the valve was tested for leaks with air or water. Remains of the test medium may still be present at the contact surfaces of the valve. Pay attention to any reactions with the operating medium. Before installing the valve, flush the pipeline and remove any general impurities, welding residues, etc. Remove the transport packaging shortly before fitting the valve to avoid damage during transport.

Before putting the valve into operation:

▪check that all necessary connections (e.g. compressed air connections) are connected and secure.

▪flush the pipeline with the valve completly open to remove any impurities (such as welding residues) that may have occurred during installation.

▪check the function of the valve. If there is any doubt about the function, replace the valve.

During a system pressure test the following pressures must not be exceeded:

> 1,5 x PS with shut-off element in open position

> 1.1 x ΔPmax (maximum allowable differential pressure) or 1.1 x PS (maximum allowable pressure) with the shut-off element closed, the lower value must be used.



**NOTICE**

**Flushing process**

The valve must not be switched during the flushing process.

## 5.4 Mounting instructions



**⚠ DANGER**

**Installation as end fitting**

Within the scope of PED 2014/68/EU, the valve must not be used as the last shut-off of a pressurised pipeline before the atmosphere.

Outside the scope of PED 2014/68/EU, the manufacturer must be consulted if the valve is to be used as the last shut-off of a pressurised pipeline before the atmosphere.

In the case of a valve that is used as the last shut-off before the atmosphere, the free connection must be secured with a blank flange so that no leakage to the outside can occur.

If a pipeline flange is removed, it must be ensured that no damage can be caused by escaping medium even if there is a leak in the sealing system.

Prior to the mounting of the valve:

- > Flush the pipeline to remove all traces of soiling, welding residues, etc.
- > Remove the transport packaging and check whether the flange connections are without damage and clean.
- > Check whether the flange clearance is in accordance with the face-to-face dimension of the valve.
- > Before mounting the valve, the flanges are to be sufficiently spread using a suitable tool.
- > The valve must **be** completely closed.
- > Insert the valve and the seals between the flanges.
- > Insert the flange screws.
- > Remove the spreader and hand-tighten the screws.
- > Check whether the valve, the seals and the counter-flanges are in true alignment.
- > Carefully open and close the valve in order to ensure that the shut-off element is not getting in touch with the pipeline. Check that the disc has adequate clearance.

Observe the following when the **shut-off element is completely closed:**

> Tighten the flange screws crosswise using the stipulated torque. The tightening torque depends on the seals chosen.

## NOTICE

**Forces and torques of the flange screw**

To prevent damage to the valve, the tightening torques listed in the table below must not be exceeded.

**Tightening forces and tightening torques for flange screw.**

The values in this table are the load per screw.

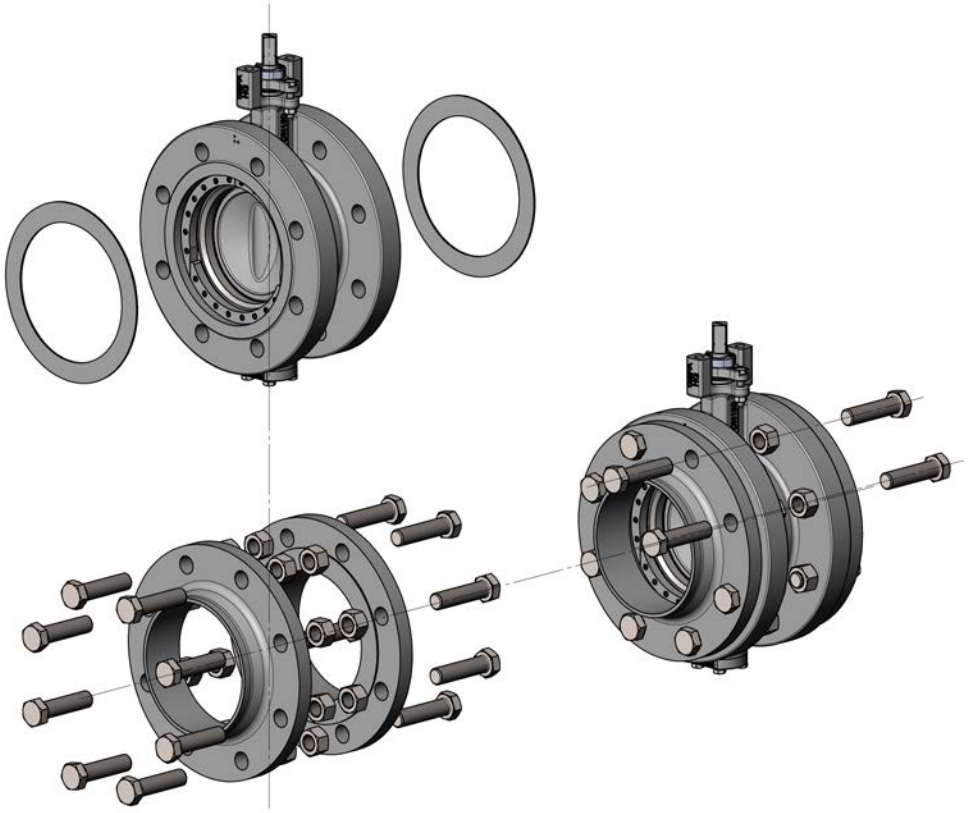
| DN | PN10 | | | PN16 | | | PN25 | | | PN40 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | [kN] | screw | [Nm] | [kN] | screw | [Nm] | [kN] | screw | [Nm] | [kN] | screw | [Nm] |
| 80 | 18 | 8 x M16 | 60 | 18 | 8 x M16 | 60 | 18 | 8 x M16 | 60 | 18 | 8 x M16 | 60 |
| 100 | 21 | 8 x M16 | 70 | 21 | 8 x M16 | 70 | 21 | 8 x M20 | 70 | 21 | 8 x M20 | 70 |
| 150 | 32 | 8 x M20 | 135 | 32 | 8 x M20 | 135 | 32 | 8 x M24 | 160 | 32 | 8 x M24 | 160 |
| 200 | 45 | 8 x M20 | 190 | 30 | 12 x M20 | 128 | 30 | 12 x M24 | 155 | X | X | X |
| 250 | 38 | 12 x M20 | 160 | 38 | 12 x M24 | 195 | 38 | 12 x M27 | 215 | X | X | X |
| 300 | 43 | 12 x M20 | 180 | 43 | 12 x M24 | 220 | 32 | 16 x M27 | 190 | X | X | X |

The screw forces [kN] are the defining values.

These forces must not be exceeded.

The specified torques are for reference only and were calculated using a coefficient of friction of 0,18.

If necessary, the torques must be adjusted.



## 5.5 Impermissible operation

In order to operate the valve as efficiently as possible and to avoid malfunctions:

- > Valves must not be used to support the pipeline nor as a step-up. This includes the differ-ent kinds of opera-tion like hand levers, gear operators, actuators, feedback and control sys-tems.
- > Do not exceed the pressure and temperature range specified on the valve or specified in the technical data (PS / TS).
- > Never operate the valve without actuating devices and/or locking of the shut-off-element.

The corresponding pressure-temperature range diagram can be found in chapter “technical data” under pres-sure-temperature range diagram.

- > Avoid all foreign particles on the sealing surfaces.
- > Do not operate the valve in the cavitation area.
- > The throttling and control range in an intermediate position with an opening of 0 to 20% is not permissible in the long run, as the flow rate will be excessive high and the valve will be damaged.

## 6 Operation



**⚠ CAUTION**

**Pipelines are under pressure**

a) Before removing the valve make sure that the pipe section is depressurised and evacuated.

⇨ In case of toxic, caustic and other outgasing media the pipe section must also be ventilated.



**⚠ DANGER**

**There is an acute danger to life when opening a pressurized valve!**

Opening of screw connenctions, limit switches, manual overrides or auxiliary equipment when the valve is under pressure may result in eruption of the fluid and damage to the valve.



**NOTICE**

**Opening a (pressurized) valve**

Since the operator of the valve is responsible for a safety rating, it is important to observe and comply with all local and company safety regulations. In addition, in order to ensure safe working on a valve, at least all safety precautions listed below must be taken:

a) Make sure that the pipe section into which the valve has been integrated is depressurised and drained.

b) Let the valve and the flow medium cool down. If dangerous substances have flowed through the relevant pipe section, it must be additionally rinsed and aerated.

c) Remove attached actuators before removing the valve or secure them against unauthorized use and accidental operation.



**⚠ WARNING**

**Hazardous media**

Work on parts in contact with hazardous media may only be carried out with appropriate protective equipment.



**NOTICE**

**Inspection**

In the case of dangerous fluids, the tightness must be checked regularly, especially against the atmosphere. If there are signs of leakage, these must be remedied immediately by resealing.



**NOTICE**

**Usability of the valve**

Valves that regularly remain in one position must be operated at regular intervals to ensure their mobility.

The valve may only be operated by trained persons who know the operating instructions, understand them and can work in accordance with.

# 7 Maintenance and repair



**⚠ WARNING**

**Hazardous media**

Work on parts in contact with hazardous media may only be carried out with appropriate protective equipment.



**⚠ CAUTION**

**Pipelines are under pressure**

a) Before removing the valve make sure that the pipe section is depressurised and evacuated.

⇨ In case of toxic, caustic and other outgasing media the pipe section must also be ventilated.



**NOTICE**

**Qualified persons**

Work on the valve may only be carried out by qualified and authorised persons.

## 7.1 Maintenance



**⚠ DANGER**

**There is an acute danger to life when opening a pressurized valve!**

Opening of screw connenctions, limit switches, manual overrides or auxiliary equipment when the valve is under pressure may result in eruption of the fluid and damage to the valve.

The valves of GEFA Processtechnik GmbH are as far as possible maintenance-free. However, for operational safety reasons, all valves should nevertheless be checked regularly, for example by assessing the external condition and their accessories. Valves should generally be operated regularly in order not to impair the proper operation of all moving parts due to excessive downtimes. Maintenance intervals are to be determined by the operator according to the conditions of use.

A routine maintenance or lubrication of the valve is not necessary.

### 7.2 Tighten/Replacing the Gland Packing

Should a leakage occur at the gland packing, retighten the gland nut(1.11)*. Take care that the gland nut is not. Normally the leakage can be stopped by simply turning the nut by a quarter.

If the leakage cannot be stopped using the above method, the gland packing must be replaced. For replacing the gland packing the valve needs not to be removed from the pipeline. Follow the steps below to safely change the stuffing box packing.

> Check whether the pipeline has been rendered depressurized and is empty.
> Remove the operating element. See chapter Mounting the hand lever and chapter Installing the MULTITOP mounting plate-
> Loosen the fixing devices(1.13)* of the limit stop and lift off the limit stop.
> Loosen the fixing devices(1.10, 1.11)* of the gland flange and lift off the gland flange (1.9)*.
> Remove the gland(1.8)*. A groove in the upper part of the gland makes the removal easier.
> Remove the packing rings (1.7)* and thoroughly clean the packing area.
> Insert a new packing set, whereby it is to be ensured that the correct packing material is used.
> Insert the gland, place the gland flange on top and fix it using the screws and nuts.
> **Attention:** The arrows on the gland flange must point in the recommended pressure direction which is marked at the sides of the body.
> Tighten the nuts reciprocally so that the gland flange is not tilted. Only slightly tighten the nuts until the leakage is stopped.
> Reinstall the operating element.

*(See chapter 3 "Scope of delivery")

### 7.3 Replacing the Seat

The valve must be taken out of the pipeline for replacing the seat.

> Ensure that the pipeline is rendered depressurized and is empty.
> Completely close the valve, loosen the flange screws and remove them so far that the valve can be taken out.
> Place the valve with the clamping ring (1.4)* and the clamping elements (1.24 and 1.25) turned upwards.
> Unscrew the threaded pins (1.5)* and lift the clamping elements and the clamping ring out of the body.
> Remove the old seat (1.3)*. Clean the body and clamping ring in the area of the seat support.
> Open the valve disc.
> In the case of metal seats, position the seat in the body and then place the clamping ring on the seat. For non-metallic seats, put the seat into the insert ring and then place the insert ring with the seat on the body. For double seats (e.g. Firesafe version), place the metallic ring on the body, put the non-metallic seat into the insert ring and then place the insert ring with the non-metallic seat on the metallic ring.
> Place the two lateral clamping elements (1.24) on the insert ring so that the remaining gap points towards the base flange. Push the clamping elements outward into the groove in the body. Place the lower clamping element (1.25) in the remaining gap and push it outward into the groove in the body.
> Screw the threaded pins (1.5) into the clamping elements with medium-strength threadlocker, but do not tighten them yet. The insert ring must remain movable.
> Close the valve disc exactly.
> Align the clamping elements, making sure that the clamping elements rest on the outside in the groove of the body.
> Tighten the threaded pins alternately to the prescribed torque (M6 = 6 Nm / M8 = 15 Nm / M10 = 30 Nm / M12 = 52 Nm).
> *(see Chapter 3 “Scope of supply”)

# 8 Decommissioning and disposal



**⚠ CAUTION**

**Pipelines are under pressure**

a) Before removing the valve make sure that the pipe section is depressurised and evacuated.

⇨ In case of toxic, caustic and other outgasing media the pipe section must also be ventilated.



**⚠ WARNING**

**Hazardous media**

Work on parts in contact with hazardous media may only be carried out with appropriate protective equipment.

## 8.1 Decommissioning

To enable safe maintenance or removal of the valve, at least all safety precautions listed here must be taken:

> Make sure that the pipe section in which the valve is located is depressurized and drained.

> If toxic, corrosive or other outgassing substances have flowed through the pipe section concerned, it must be additionally ventilated.

> Before removing the valve, dismantle the mounted actuators or secure them against external switching and inadvertent operation.

Since the operator of the valve is responsible for a safety classification, it is essential to observe and comply with all local and company standard safety precautions.

## 8.2 Removing of the valve



**⚠ WARNING**

**Opening of pneumatic valves / cylinders**

The opening of pneumatic actuators or pneumatic cylinders, which are equipped with a closing or opening spring, is associated with increased risk. It is essential to follow the maintenance and repair instructions. Maintenance and repair instructions can be found on www.gefa.com or request them directly from us.



**NOTICE**

**Removing of the valve**

Since the operator of the valve is responsible for a safety classification, it is important to observe and comply with all local and company-standard safety precautions. In addition, in order to ensure safe working on a valve, at least all safety precautions listed below must be taken:

a) Before carrying out maintenance and repair work, make sure that all parts of the valve that may come into contact with the unit have cooled down to room temperature.

b) Check if the pipeline is depressurised and exhausted.

c) Check if pneumatic and hydraulic operating controls are depressurised.

d) Check the piping system and the pneumatic or hydraulic operating controls for residual energy (e.g. pressure pad).

e) Automatic or remotely operated valves are to be decoupled from the automatic mode or the remote control for the duration of the maintenance and repair work.

f) Work on parts in contact with hazardous media may only be carried out with suitable protective equipment.

g) Only original spare parts may be used.

To ensure safe removal of the valve, it is essential that you adhere to all safety precautions listed in this documentation.

The valve is removed by loosening the flange screws and sufficient spreading of the mating flanges.

> The valve disc must be closed at an angle within the face-to-face dimension of the valve to prevent damage to the disc. The position mark on the narrow end of the shaft square or the keyway is parallel to the valve disc.

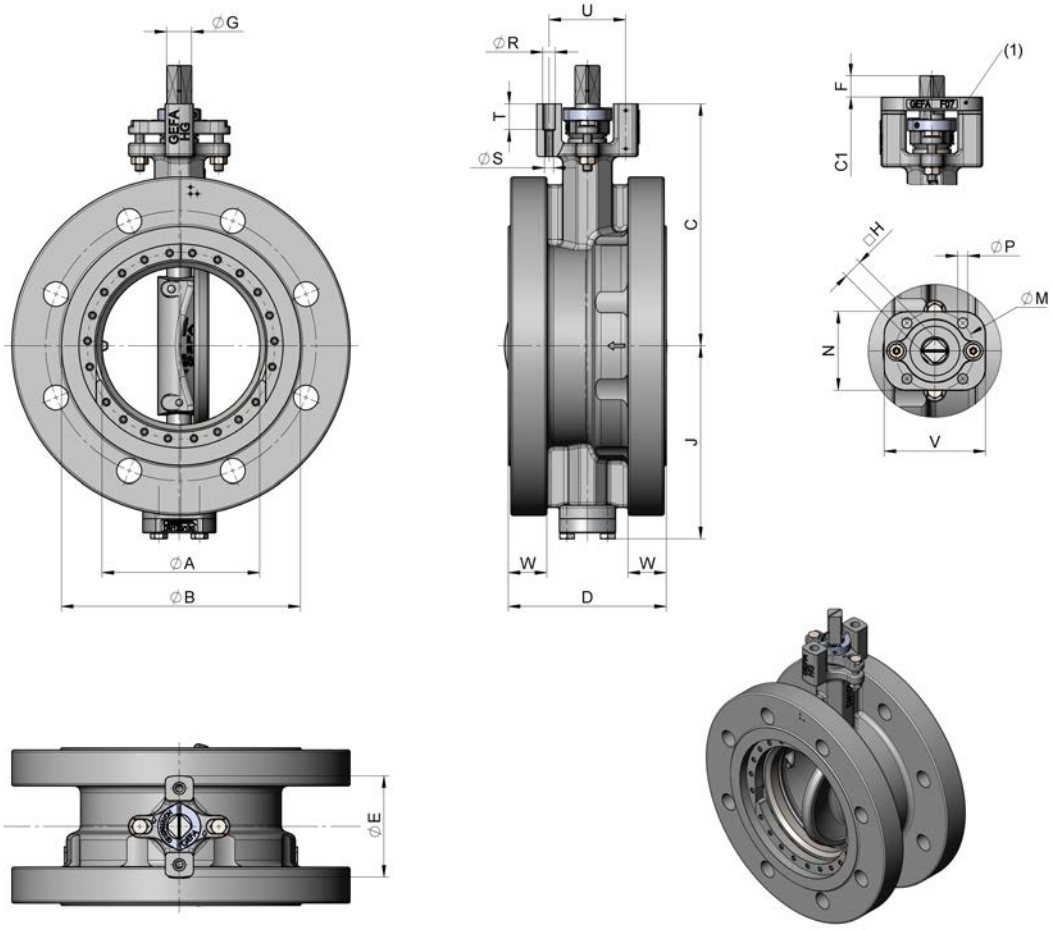
## 8.3 Disposal

All valve parts must be disposed of in accordance with the disposal regulations / environmental protection regulations. Pay attention to residual adhesion and outgassing of the flow media.

# 9 Technical data and Materials

## 9.1 Data sheet DN80-300

Face to face dimension: EN 558-1 line 13 (DIN 3202-F16)



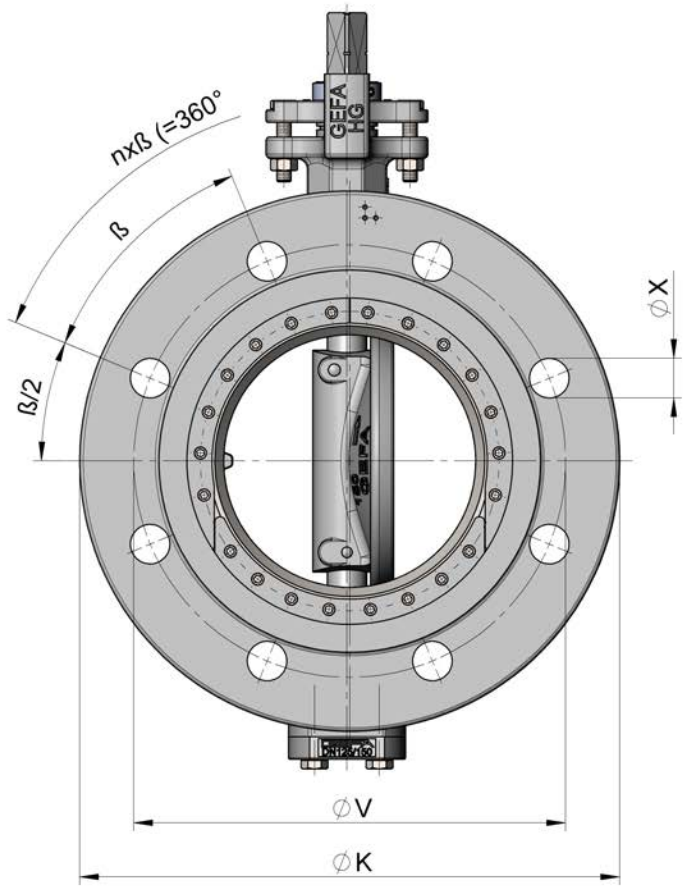

| DN | NPS | ØA | ØB | C | C1 | D | E | F | ØG | J | ØR | ØS | T | U | W | Smallest connection DIN 3337 / ISO 5211 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 80 | 3“ | 75 | 133 | 162 | 177 | 114 | 90 | 16 | 18 | 119 | 11 | M8 | 23 | 68 | 25 | F05 |
| 100 | 4“ | 97 | 156 | 179 | 194 | 127 | 90 | 16 | 18 | 131 | 11 | M8 | 23 | 68 | 25 | F05 |
| 150 | 6“ | 140 | 212 | 215 | 230 | 140 | 90 | 19 | 22 | 171 | 11 | M8 | 23 | 68 | 34 | F07 |
| 200 | 8“ | 189 | 268 | 262 | 280 | 152 | 125 | 24 | 28 | 211 | 13 | M10 | 23 | 95 | 36 | F10 |
| 250 | 10“ | 236 | 323 | 292 | 310 | 165 | 125 | 24 | 28 | 243 | 13 | M10 | 23 | 95 | 41 | F10 |
| 300 | 12“ | 279 | 374 | 336 | 356 | 178 | 150 | 29 | 36 | 278 | 16 | M10 | 22 | 115 | 41 | F12 |

| Mounting plate ISO 5211 | F05 | F07 | F10 | F12 | F14 | F16 |
|---|---|---|---|---|---|---|
| □H | 14 | 17 | 22 | 27 | 36 | 46 |
| ØM | 50 | 70 | 102 | 125 | 140 | 165 |
| N | 50 | 70 | 95 | 125 | 135 | 160 |
| n x ØP | 4 x 7 | 4 x 9 | 4 x 11 | 4 x 13,5 | 4 x 18 | 4 x 22 |
| V | 90 | 90 | 125 | 150 | 150 | 160 |

(1) MULTITOP mounting plate and square – adapter for direct mounting of actuators with larger connection flange.Special designs possible.

Subject to changes

## 9.2 Flange connection DN80-300



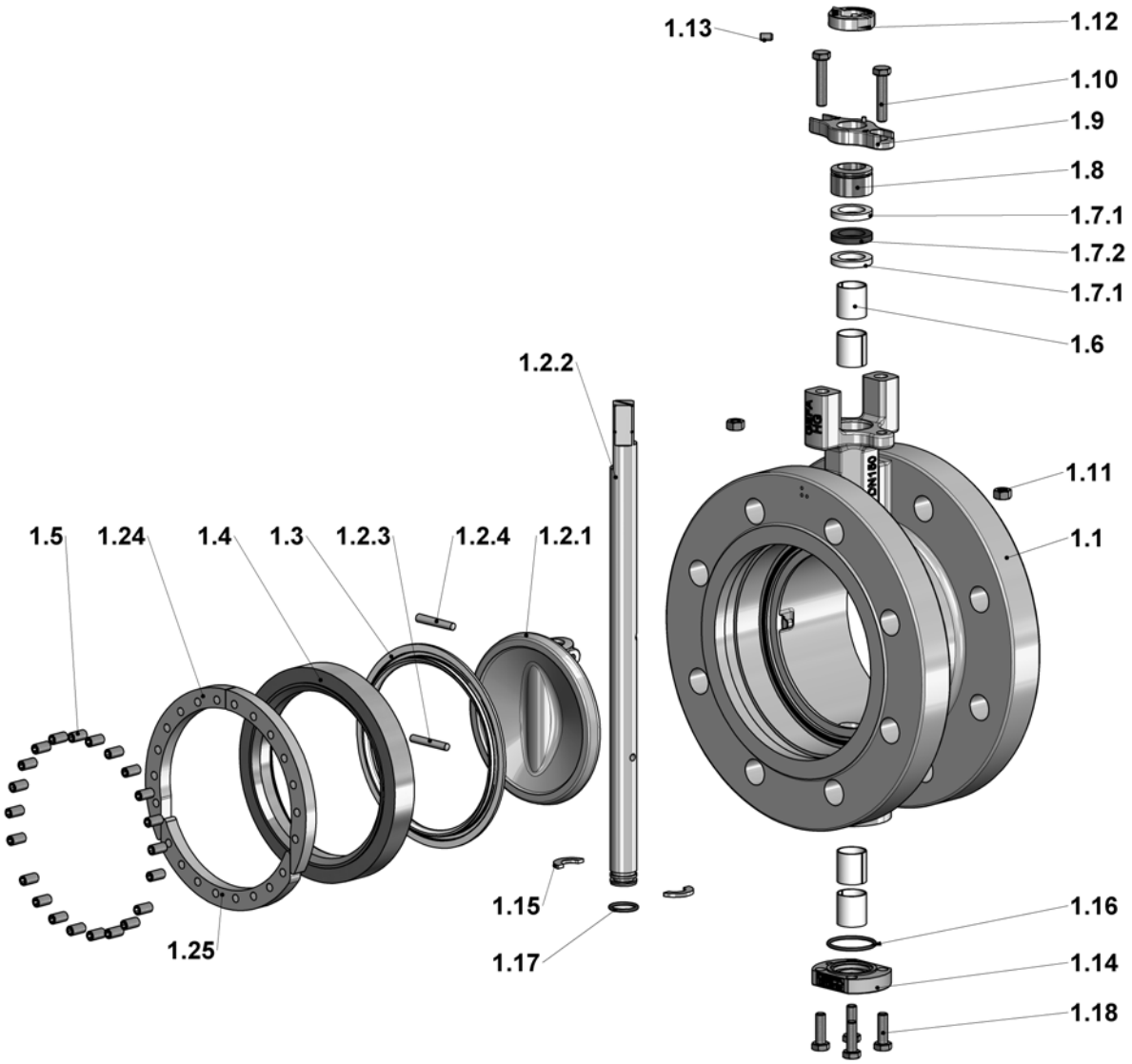



| DN | NPS | Pressure level | ØK | ØV | n | ØX | ß | Kg |
|---|---|---|---|---|---|---|---|---|
| 80 | 3“ | PN10-PN40 | 200 | 160 | 8 | 18 | 45° | 13.6 |
| | | Class 150 | | 152.4 | 4 | 19.1 | 90° | |
| 100 | 4“ | PN10 / PN16 | 235 | 180 | 8 | 18 | 45° | 17.7 |
| | | PN25 / PN40 | | 190 | 8 | 22 | 45° | |
| | | Class 150 | | 190.5 | 8 | 19.1 | 45° | |
| 150 | 6“ | PN10 / PN16 | 300 | 240 | 8 | 22 | 45° | 36.0 |
| | | PN25 / PN40 | | 250 | 8 | 26 | 45° | |
| | | Class 150 | | 241.3 | 8 | 22.2 | 45° | |
| 200 | 8“ | PN10 | 360 | 295 | 8 | 22 | 45° | 53.0 |
| | | PN16 | | 295 | 12 | 22 | 30° | |
| | | PN25 | | 310 | 12 | 26 | 30° | |
| | | Class 150 | | 298.5 | 8 | 22.2 | 45° | |
| 250 | 10“ | PN10 | 425 | 350 | 12 | 22 | 30° | 79.0 |
| | | PN16 | | 355 | 12 | 26 | 30° | |
| | | PN25 | | 370 | 12 | 30 | 30° | |
| | | Class 150 | | 362 | 12 | 25.4 | 30° | |
| 300 | 12“ | PN10 | 485 | 400 | 12 | 22 | 30° | 100.0 |
| | | PN16 | | 410 | 12 | 26 | 30° | |
| | | PN25 | | 430 | 16 | 30 | 22.5° | |
| | | Class 150 | | 431.8 | 12 | 25.4 | 30° | |

Maximum pressure: please refer to pressure-temp. range diagram

Subject to changes

## 9.3 Materials DN80-300




| Materials | | | | | | | |
|---|---|---|---|---|---|---|---|
| Pos. | Description | HG.4466TG | HG.6666TG | HG.4435M | HG.6635M | HG.4435HM | HG.6635HM |
| Permissible temperature ($t_s$) | | -50°C / +220°C | -50°C / +220°C | -50°C / +220°C | -50°C / +220°C | -50°C / +400°C | -50°C / +400°C |
| 1.1 | Body | 1.0619 | 1.4408 | 1.0619 | 1.4408 | 1.0619 | 1.4408 |
| 1.2 | Valve disc with stem | | | | | | |
| 1.2.1 | Valve disc | 1.4408 | 1.4408 | 1.4408 nitrated | 1.4408 nitrated | 1.4408 nitrated | 1.4408 nitrated |
| 1.2.2 | Stem | 1.4571 | 1.4571 | 1.4571 | 1.4571 | 1.4571 | 1.4571 |
| 1.2.3 | Cylinder pin | A4 | A4 | A4 | A4 | A4 | A4 |
| 1.2.4 | Taper pin | A4 | A4 | A4 | A4 | A4 | A4 |
| 1.3 | Seat* | | | | | | |
| 1.3.1 | Seat* | PTFE + glass | PTFE + glass | 1.4571 nitrated | 1.4571 nitrated | 1.4571 nitrated | 1.4571 nitrated |
| 1.3.2 | Sealing tape* | ---- | ---- | Graphite | Graphite | Graphite | Graphite |
| 1.4 | Insert ring | 1.0577 | 1.4571 | 1.0577 | 1.4571 | 1.0577 | 1.4571 |
| 1.5 | Threaded pin | A4 | A4 | A4 | A4 | A4 | A4 |
| 1.6 | Bearing bush | 1.4401 / PTFE | 1.4401 / PTFE | 1.4401 / PTFE | 1.4401 / PTFE | 1.4401 | 1.4401 |
| 1.7 | Package* | PTFE + graph-ite | PTFE + graph-ite | PTFE + graph-ite | PTFE + graph-ite | Graphite | Graphite |
| 1.7.1 | Package* | PTFE | PTFE | PTFE | PTFE | Graphite | Graphite |
| 1.7.2 | Package* | Graphite | Graphite | Graphite | Graphite | ---- | ---- |
| 1.8 | Gland | 1.4305 | 1.4305 | 1.4305 | 1.4305 | 1.4305 | 1.4305 |
| 1.9 | Packing gland | 1.4408 | 1.4408 | 1.4408 | 1.4408 | 1.4408 | 1.4408 |
| 1.10 | Hexagon screw | A2-70 | A2-70 | A2-70 | A2-70 | A2-70 | A2-70 |

| Materials | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1.11 | Hexagon nut | A2 | A2 | A2 | A2 | A2 | A2 |
| 1.12 | Override protection | 1.4308 | 1.4308 | 1.4308 | 1.4308 | 1.4308 | 1.4308 |
| 1.13 | Threaded pin | A2 | A2 | A2 | A2 | A2 | A2 |
| 1.14 | Base flange | 1.4408 | 1.4408 | 1.4408 | 1.4408 | 1.4408 | 1.4408 |
| 1.15 | Axial securing | 1.4571 nitrated | 1.4571 nitrated | 1.4571 nitrated | 1.4571 nitrated | 1.4571 nitrated | 1.4571 nitrated |
| 1.16 | Base flange seal* | FEP / FPM | FEP / FPM | FEP / FPM | FEP / FPM | Graphite | Graphite |
| 1.17 | O-ring* | FPM | FPM | FPM | FPM | FPM | FPM |
| 1.18 | Hexagon screw | A2-70 | A2-70 | A2-70 | A2-70 | A2-70 | A2-70 |
| 1.24 | Clamping element | 1.0577 | 1.4571 | 1.0577 | 1.4571 | 1.0577 | 1.4571 |
| 1.25 | Clamping element | 1.0577 | 1.4571 | 1.0577 | 1.4571 | 1.0577 | 1.4571 |

*= Wear parts

If resistance to intergranular corrosion is required, the application temperature must not exceed 300 ° C.

Subject to changes

## 9.4 Pressure-temperature diagram DN80-300

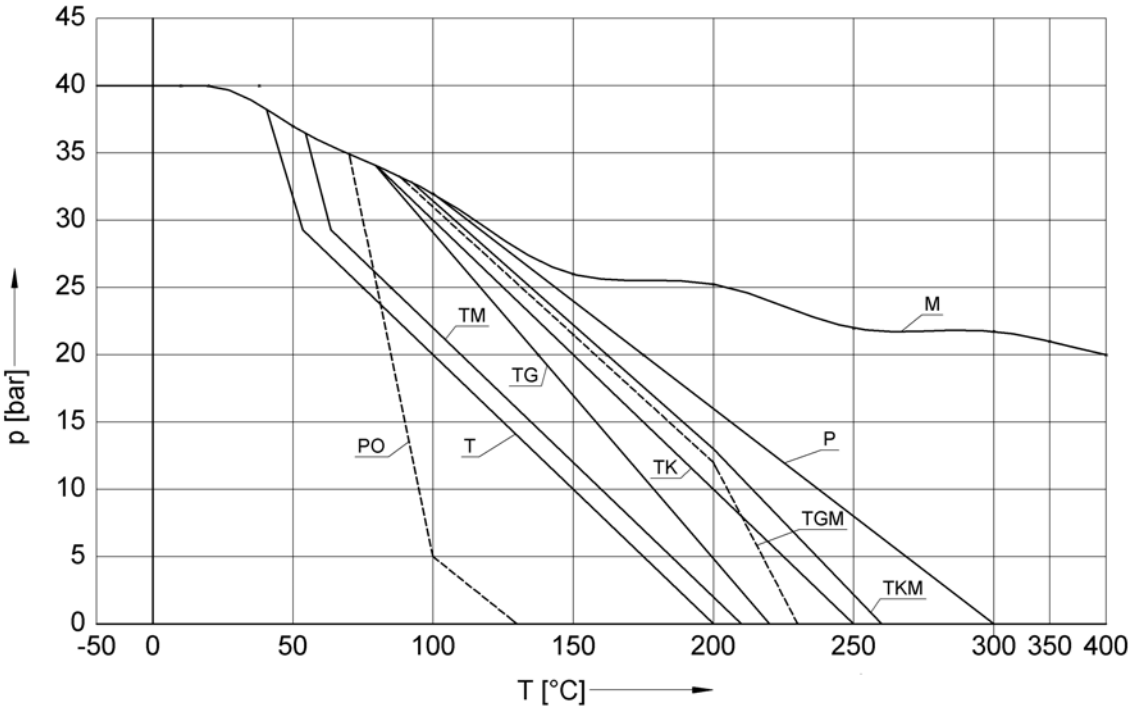
### 9.4.1 Pressure-temperature diagram DN80-150

**NOTICE**

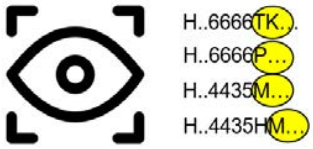
**Pressure-temperature range diagram**

The pressure-temperature range diagrams show the limits of use of the various seat ring options. These limits apply to the intended use. Process variables and properties of the medium can influence the values in the diagram.

If resistance to intergranular corrosion is required, the application temperature must not exceed 300 ° C.




| | | | |
|---|---|---|---|
| M | Metal seat | TK | PTFE / carbon seat |
| P | PEEK seat | TM | PTFE seat + Metall seat |
| PO | POM seat | TGM | PTFE / glass seat + Metal seat |
| T | PTFE seat | TKM | PTFE / carbon seat + Metal seat |
| TG | PTFE / glass seat | | |




The maximum differential pressure for PEEK or POM seats is 5 bar if the valve is used against the recommended flow direction.

| Metal seat | |
|---|---|
| Seat Leakage | DIN 3230-BO2 > 2<br>EN 12266-P12 > B |

| PTFE seat and similar materials | |
|---|---|
| Seat Leakage | DIN 3230-BO2 > 1<br>EN 12266-B12 > A |

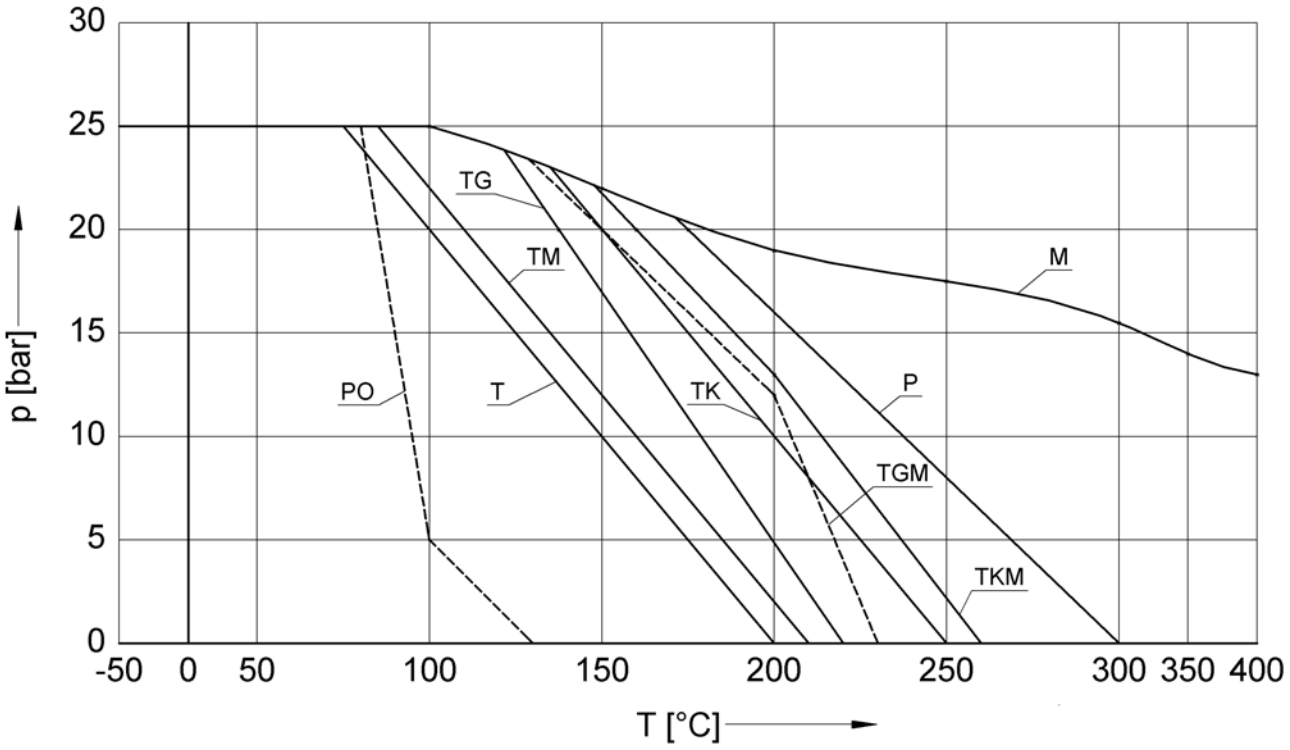
### 9.4.2 Pressure-temperature diagram DN200-300

**NOTICE**

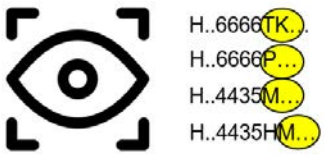
**Pressure-temperature range diagram**

The pressure-temperature range diagrams show the limits of use of the various seat ring options. These limits apply to the intended use. Process variables and properties of the medium can influence the values in the diagram.

If resistance to intergranular corrosion is required, the application temperature must not exceed 300 ° C.




| | | | |
|---|---|---|---|
| M | Metal seat | TK | PTFE / carbon seat |
| P | PEEK seat | TM | PTFE seat + Metall seat |
| PO | POM seat | TGM | PTFE / glass seat + Metal seat |
| T | PTFE seat | TKM | PTFE / carbon seat + Metal seat |
| TG | PTFE / glass seat | | |




The maximum differential pressure for PEEK or POM seats is 5 bar if the valve is used against the recommended flow direction.

| Metal seat | |
|---|---|
| Seat Leakage | DIN 3230-BO2 > 2<br>EN 12266-P12 > B |

| PTFE seat and similar materials | |
|---|---|
| Seat Leakage | DIN 3230-BO2 > 1<br>EN 12266-B12 > A |

## 10 How to proceed in case of malfunctions



**⚠ DANGER**

When eliminating malfunctions, all safety-relevant information in these operating instructions must be observed.

| Type of malfunction | Possible Cause | Action |
|---|---|---|
| Leakage at the flange connection to the pipeline | Flange screws are loose | Tighten the flange screws with the specified torque. |
| | Flange seal defective | Loosen flange connection, remove valve and flange seals.<br>Replace flange seals. |
| | Flange seal not suitable | Loosen flange connection, remove valve and flange seals.<br>Replace flange seals with a suitable one. |
| | Flange connection not parallel | Loosen flange connection, remove valve and flange seals.<br>Check plane parallelism of the flange connection and - if not sufficient - correct. |
| | Damaged sealing surfaces | Loosen flange connection, remove valve and flange seals.<br>Check sealing surfaces on all flanges and the valve.<br>Replace flanges or valve if necessary. |
| Leakage at the Gland (Leakage at the stem) | Gland screws are loose | Tighten the gland packing screws in accordance with the maintenance chapter. |
| | Gland packing worn out | Replace gland packing in accordance with the maintenance chapter. |
| Leakage at the seat of the valve in closed position of the shut-off element | Valve not completely closed | Manually operated valve:<br>Open the valve slightly and repeat the closing process.<br>Check whether the valve is completely closed. |
| | | Pneumatically and hydraulically operated valve:<br>Open the valve slightly and repeat the closing process.<br>Check and if necessary reset the stroke limits on the actuator. |
| | | Electrically operated valve:<br>Open the valve slightly and repeat the closing process.<br>Check and, if necessary, reset the limit switches. |
| | Trapped parts between the valve disc and seat ring | Open the valve fully and remove any jammed parts. |
| | Contamination on the valve disc or seat ring | Open the valve fully and flush the pipeline.<br>Open and close the valve several times. |
| | Seat ring damaged | Remove the valve.<br>Replace seat ring in accordance with the maintenance chapter. |
| Closing or opening process sluggish | Insufficient control pressure | Check the control pressure, possibly increase the control pressure. |
| | Control valve dirty | Remove and clean the control valve, install strainer if necessary. |
| | Actuator defective | Check actuator and replace if necessary. |
| | Clogged valve | Remove and clean the valve, if necessary replace defective parts according to the instructions of the manufacturer. |
| Operational malfunction (Valve disc cannot be moved) | Actuator elements defective | Pneumatically and hydraulically operated valve:<br>- Control of the control pressure<br>- Check whether there is power for the control valve<br>- Check whether the control valve is defective<br>Replace elements if necessary. |
| | | Electrically operated valve:<br>- Check whether power is available<br>- Check whether the motor is defective<br>- Check whether the limit switch is defective or misaligned<br>Replace actuator if necessary. |
| | Valve clogged or damaged | Remove and clean the valve, if necessary replace defective parts according to the instructions of the manufacturer. |

**For further questions please contact the service:**

Tel. +49 (0) 231/ 61009-0.

If the error can not be corrected, the product must be returned to the manufacturer. In this case, the valve must be completely cleaned to prevent any injuries or health hazards due to residues of the flow media.

When returning the product to the manufacturer, enclose the safety data sheet of the media. Furthermore, if necessary, it must be stated which safety measures have to be observed when handling the returned product.

# 11 Annex

## 11.1 Mounting of operating elements



**⚠ DANGER**

**There is an acute danger to life when opening a pressurized valve!**

Opening of screw connenctions, limit switches, manual overrides or auxiliary equipment when the valve is under pressure may result in eruption of the fluid and damage to the valve.



**⚠ WARNING**

**Observe safety instructions**

Before any work on the valve, the general safety information must be read and observed.



**NOTICE**

**Subsequent construction**

In the event of subsequent assembly of operating elements and actuators, which is not carried out by our personnel, we do not assume any warranty for the correct function of the valve.



**NOTICE**

**Qualified persons**

Work on the valve may only be carried out by qualified and authorised persons.



**NOTICE**

**Opening a (pressurized) valve**

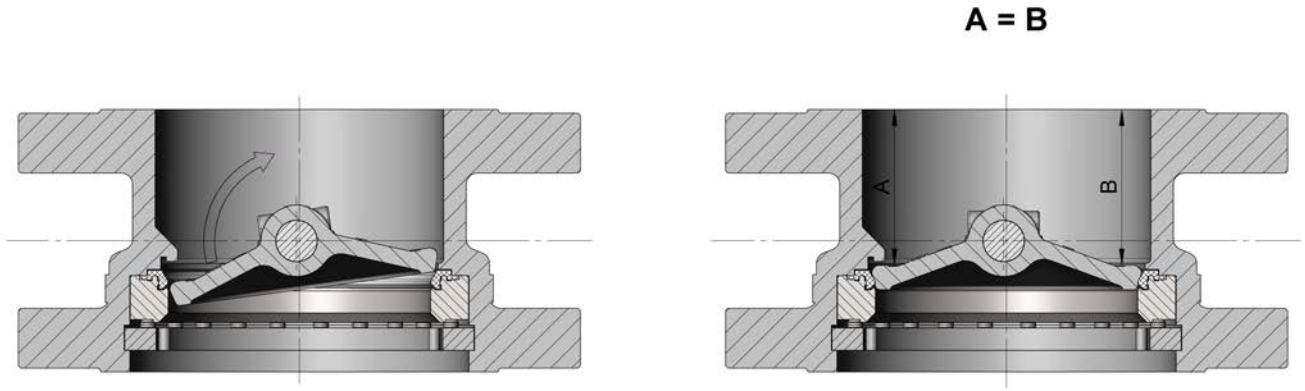
Since the operator of the valve is responsible for a safety rating, it is important to observe and comply with all local and company safety regulations. In addition, in order to ensure safe working on a valve, at least all safety precautions listed below must be taken:

a) Make sure that the pipe section into which the valve has been integrated is depressurised and drained.

b) Let the valve and the flow medium cool down. If dangerous substances have flowed through the relevant pipe section, it must be additionally rinsed and aerated.

c) Remove attached actuators before removing the valve or secure them against unauthorized use and accidental operation.

The highest level of tightness can only be achieved when the valve disc is completely closed. In case operating elements (hand levers, gear operators, actuators, etc.) are mounted, the stop position must be exactly adjusted. The stop boss does not serve the purpose of a limit stop, but merely as an override safety device which ensures that the seat ring is not damaged. The highest level of tightness of the valve is achieved ca. 1°-2° before the stop boss is reached. If the valve is not installed in the pipeline, the exact stop position can be checked as follows: The distance from the edge of the body to the valve disc must be measured on both sides at a position offset 90° to the valve shaft. If the distances are identical, the valve is closed exactly. Care must be taken that the valve is always moved to the stop position from the opened position. This is the only way to guarantee that any play from the actuator (e.g. gear) has no influence on the stop position. If the exact stop position has been overridden, the valve must be returned to the opened or partly opened position, then moved back again into the stop position from this opened position.




It must be ensured that the actuator is centred on the valve shaft. The weight of a mounted actuator must not place a one-sided load on the valve shaft. For this reason, actuators must be supported if necessary - without fixation. External loads must not be applied to actuators, this can damage or destroy the valve. If the valve is mounted in the recommended pressure direction, the opening movement of the valve disc is supported by the pressure of the medium, this being design-related (double-eccentric design). For this reason, when carrying out switching operations using a hand lever, the lever is to be held secure when the star knob is being loosened. After the switching operation has been completed, the position of the hand lever is to be secured by tightening the star knob.

### 11.1.1 Mounting of the hand lever

Follow the instructions below when assembling the hand lever:

> Screw the stud bolt (3.2) into the body and put the washer (3.8) on it.

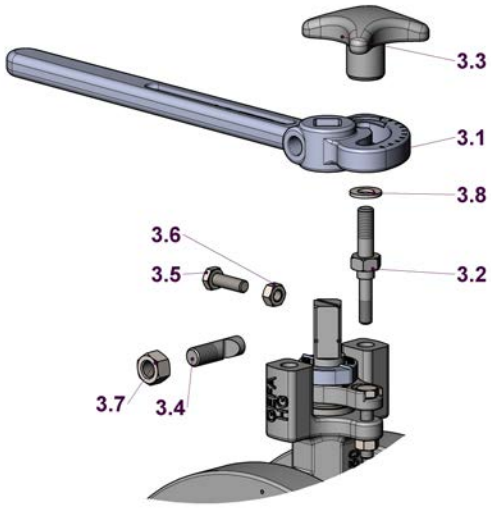
> Insert the clamping bolt(3.4) into the hand lever (3.1) in such a way that the slit in the clamping bolt is aligned with the square in the hand lever..

> Place the hand lever on the shaft. The hand lever must lie on top of the washer(3.8).

> Tighten the clamping bolt with nut(3.7), thus fixing the hand lever to the shaft.

> Close the valve and adjust the stop position using the screw (3.5) einstellen. Secure the screw with a nut(3.6).

> Screw the star knob(3.3) onto the stud bolt. For operating the valve loosen the star knob and retighten afterwards.




### 11.1.2 Mounting of the MULTITOP mounting plate

Follow the instructions below when assembling the MULTITOP mounting plate:

> Place the mounting plate (2.1) on the body.

> Insert the spring dowel sleeves (2.2) through the mounting plate into the body. The slit in the split taper sleeve must be facing in the force direction (see arrow in the mounting drawing) to reach a rigid connection.

> Do not insert the mounting plate without using spring dowel sleeves as the transverse forces cannot be taken on by the screws.

> Insert the cylinder screws (2.3) and tighten them.

> If required, push the square adapter (2.5) onto the shaft. If necessary, use the enclosed retaining ring to ensure that the square adapter will not slip off the shaft (2.4).

