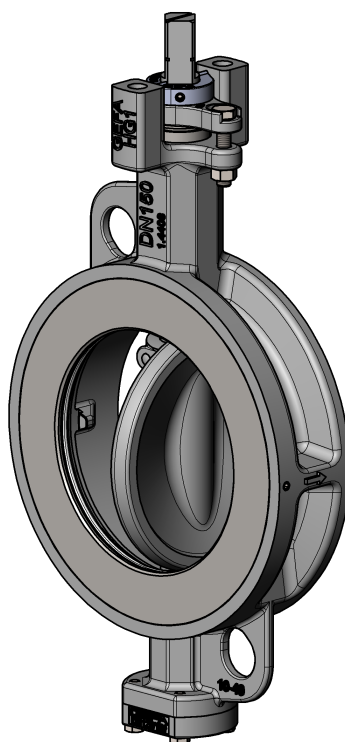




ARMATURENTECHNIK

Original instructions

HG1



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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.

	<p>Nature and origin of danger.</p> <p>Possible consequences of the danger.</p> <p>Measures to avoid the danger.</p>
---	--

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 load changes at $\Delta p = PS$ or max. $500 / (\Delta p / PS)^3$ permissible partial load changes (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 nevertheless 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



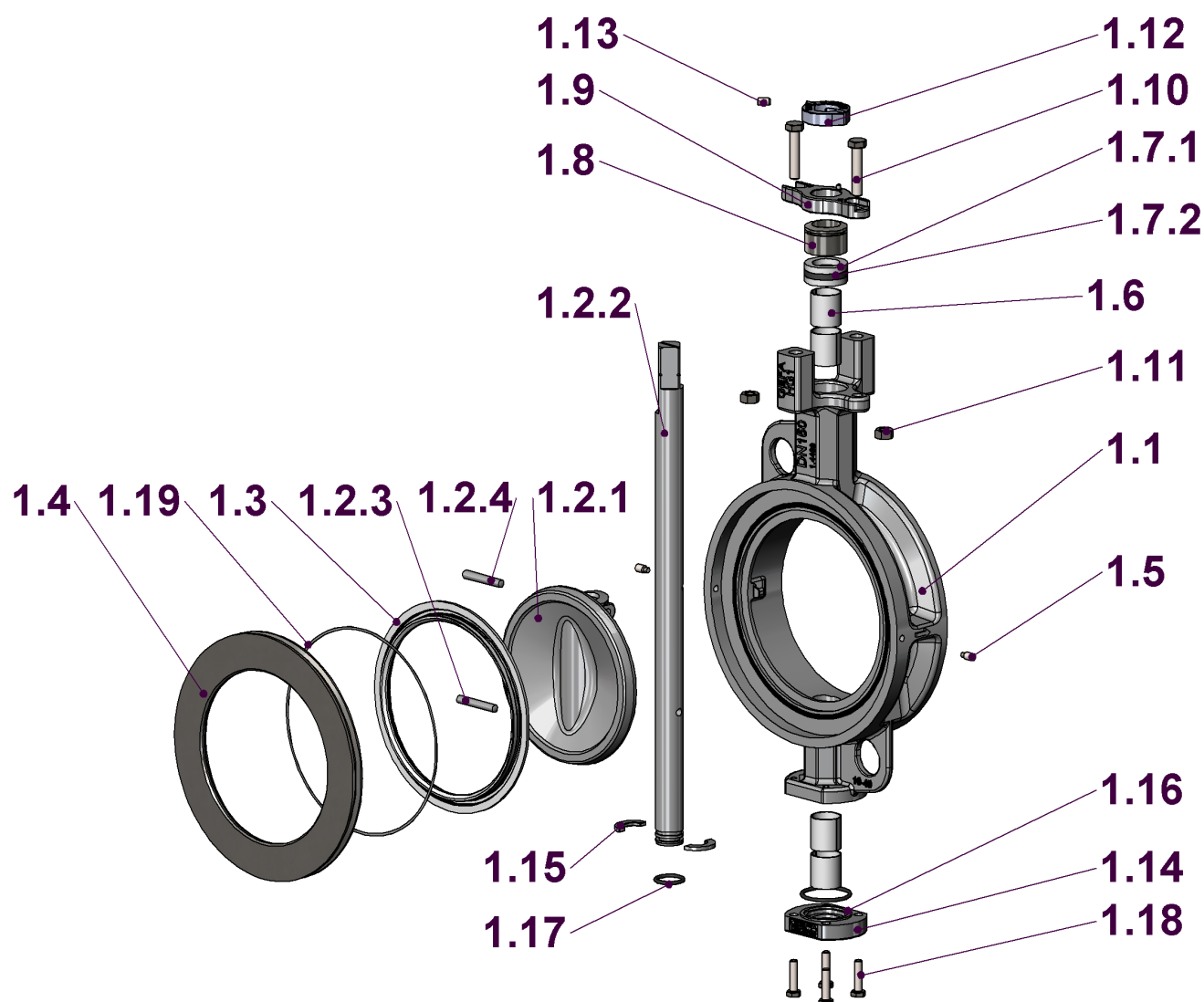
Actuators must be installed in alignment with the valve stem. Tensions can lead to increased wear or leakage of the stem seal.

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.

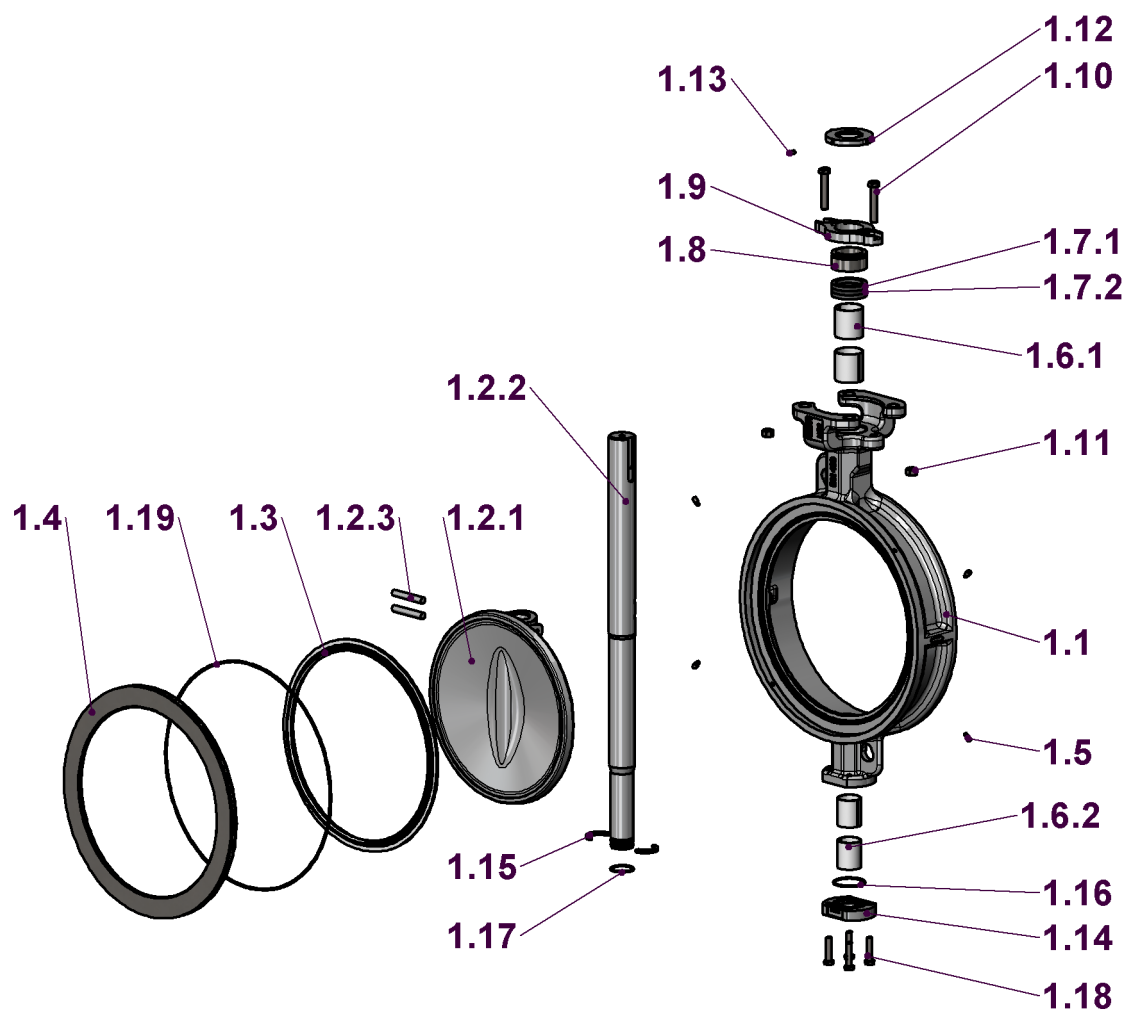
3 Scope of delivery

3.1 Exploded view DN50-300



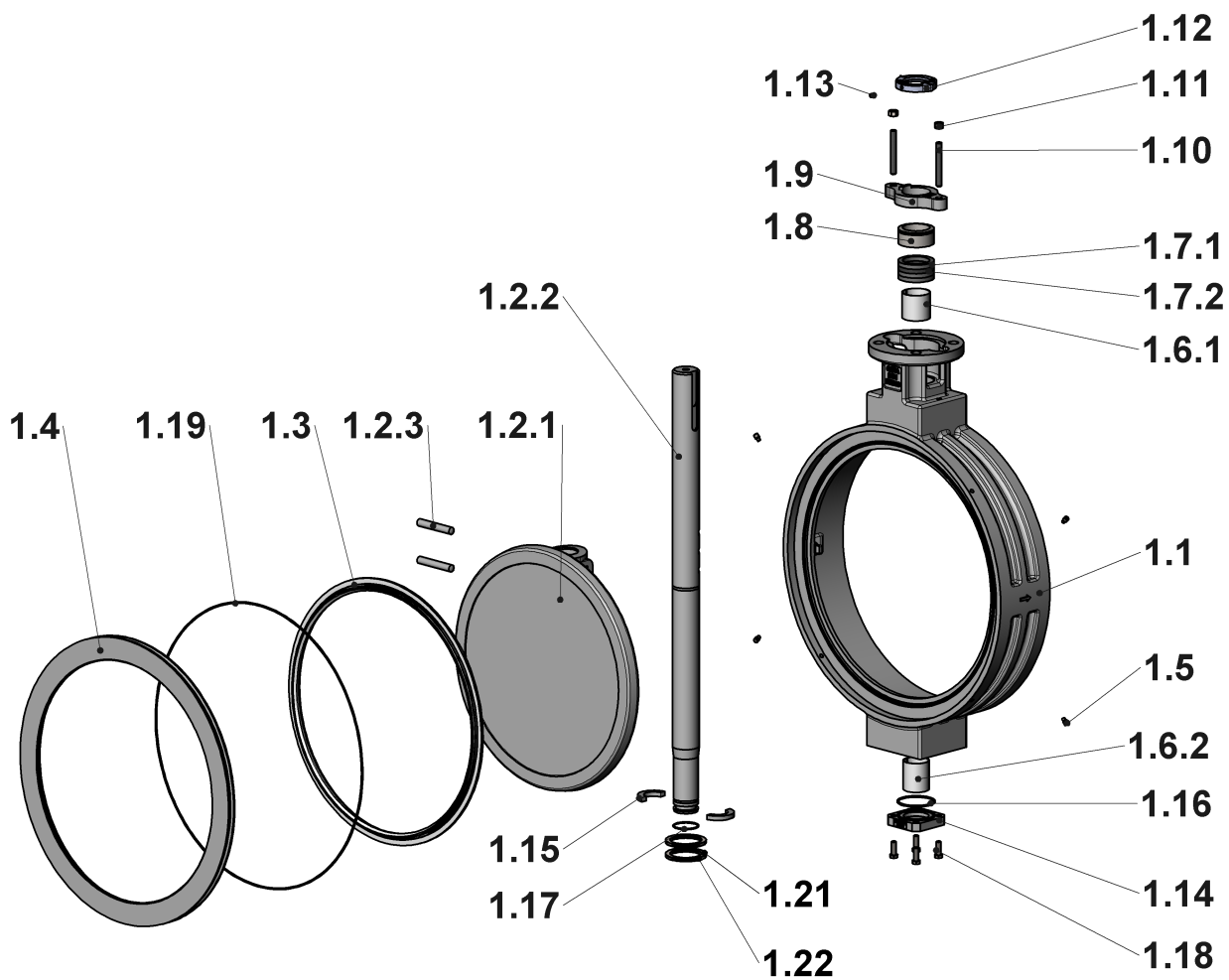
(The description of the components can be found at the end of the chapter)

3.2 Exploded view DN350-500



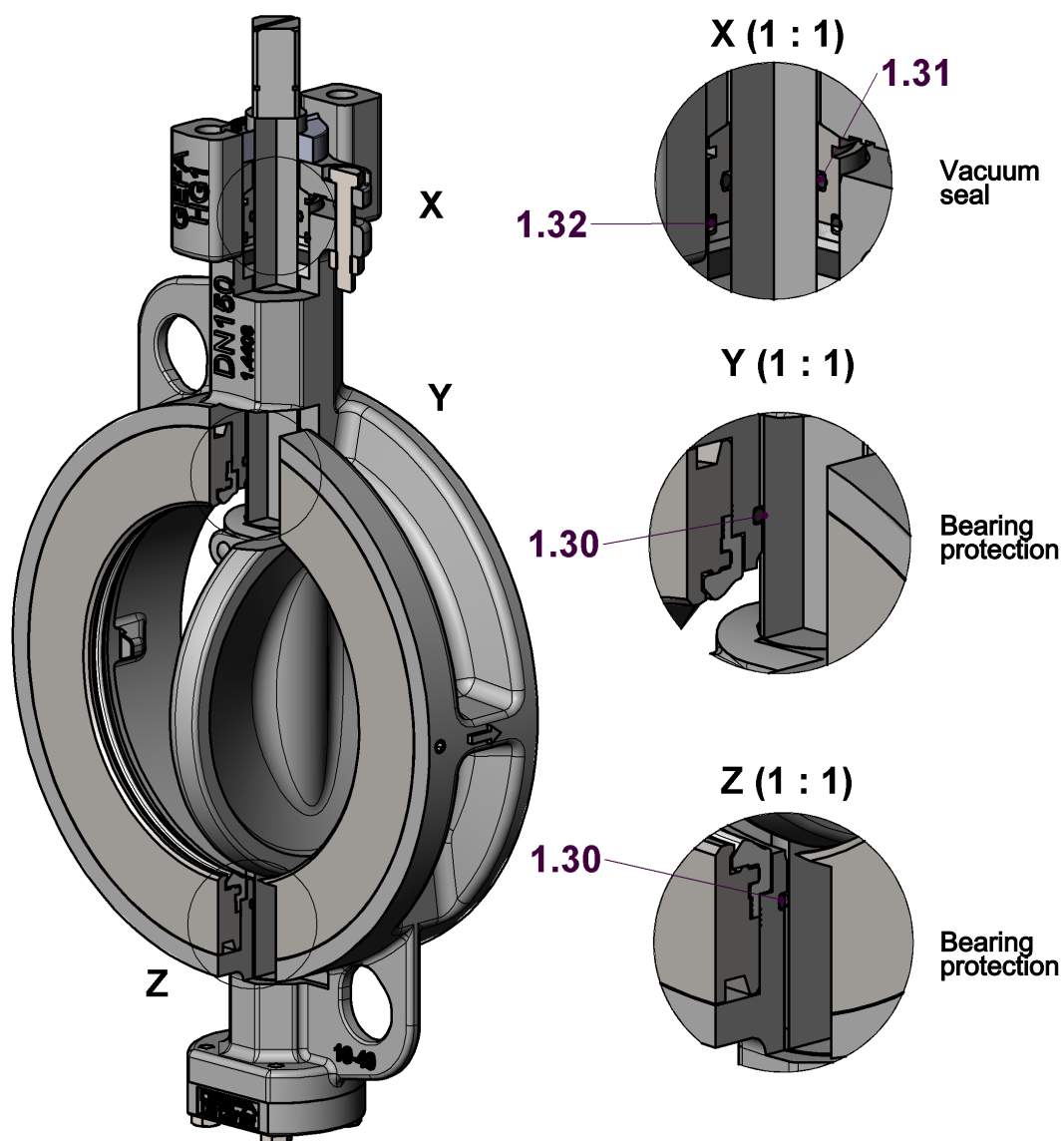
(The description of the components can be found at the end of the chapter)

3.3 Exploded view DN600-800



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

3.4 Bearing protection and vacuum seal DN50-800 (optional)



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

3.5 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 (\leq 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 / Set 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
1.19	Sealing tape (optional)
1.21	Shim ring (\geq DN700)
1.22	Shim ring (\geq DN700)
1.30	O-ring (optional)
1.31	O-ring (optional)
1.32	O-ring (optional)

(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“!

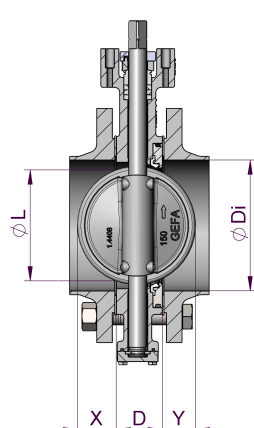


The end position is always approached from the open position. This is the only way to ensure that any clearance from the drive (eg gearbox) that is possibly present has no influence on the end position. If the exact end position is exceeded, bring the valve back into the open or partly open position. 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 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.
- > The "clearance" of the mating flanges - including inner coating - has to be sufficient to allow the disc to be fully opened without touching ($\varnothing Di \geq \varnothing L + 6 \text{ mm}$). This must be checked before the valve is installed and compared with the space necessary for the valve according to the table.

DN	D	ØL	X	Y	
50	43	46	8	2	
65	46	59	13	10	
80	46	76	21	15	
100	52	93	26	24	
125	56	118	38	31	
150	56	139	48	41	
200	60	190	71	62	
250	68	238	93	80	
300	78	281	110	95	
350	78	321	130	115	
400	102	363	139	128	
500	127	468	180	168	
600	154	542	202	199	

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.

For nominal sizes >DN300 it is generally recommended to mount the valve with valve shaft in horizontal position.

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 completely 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 ΔP_{max} (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

- > 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.
- > In order to intercept the valve between the flanges during the mounting process, we recommend (depending on the mounting position) to insert the lower flange screws without tightening them.

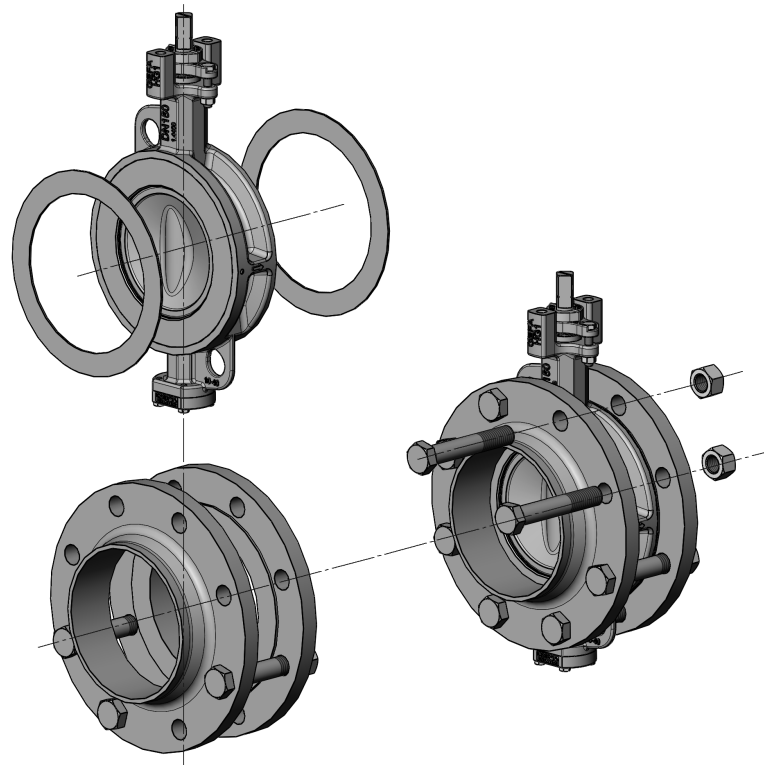
The screw is not to be initially inserted in the centring aid area (rib).

- > 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.
- > If no specifications are given, the following standard values can be used:

Flange screw	M16	M20	M24	M27	M30	M33	M36	M39	M42	M45
Torque in Nm	85	165	285	425	570	780	980	1250	1550	1950



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 different kinds of operation like hand levers, gear operators, actuators, feedback and control systems.
- > 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 pressure-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.
- > Lay the valve down with the insert ring (1.4)* facing upwards.
- > Loosen the set screws or cylinder screws (1.5)* and remove the insert ring.
- > Remove the old seat (1.3)* as well as seal (1.19 / 1.20 Optional)*. Clean the body and insert ring in the area of the seat-engaging surface.
- > If necessary, glue a new sealing tape (1.19 / 1.20) * onto the insert ring.
- > Lateral screw connection (1.5)*: Open the valve. For metallic seat, place the seat in the body and then place the insert ring on the seat. For non-metallic seat rings, insert the seat into the insert ring and then place the insert ring with the seat on the body. For double-seated rings (e.g. firesafe version), place the metallic ring on the body, place the non-metallic seat in the insert ring and then place the insert ring with the non – metallic seat on the metallic. Screw in setscrews (1.5) * only until the insert ring can be moved but can not be pushed out. Close the valve disc to center the insert ring and the seat, alternately tighten the setscrews hand-tight in order to fix the insert ring.
- > Axial screw connection (1.5)*: Close the valve completely. For metallic seat, place the seat in the body and then place the insert ring on the seat. For non-metallic seat rings, insert the seat into the insert ring and then place the insert ring with the seat on the body. For double-seated rings (e.g. firesafe version), place the metallic ring on the body, place the non-metallic seat in the insert ring and then place the insert ring with the non-metallic seat on the metallic ring and alternately tighten the cylinder screws (1.5) *.
- > *(See chapter 3 "Scope of delivery")

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

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

- > Before removing the high performance butterfly 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.
- > Actuators either have to be dismantled before the valve is removed or they have to be secured against unauthorized or unintentional operation.

Since the operator of the valve is responsible for a safety rating, it is important 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.

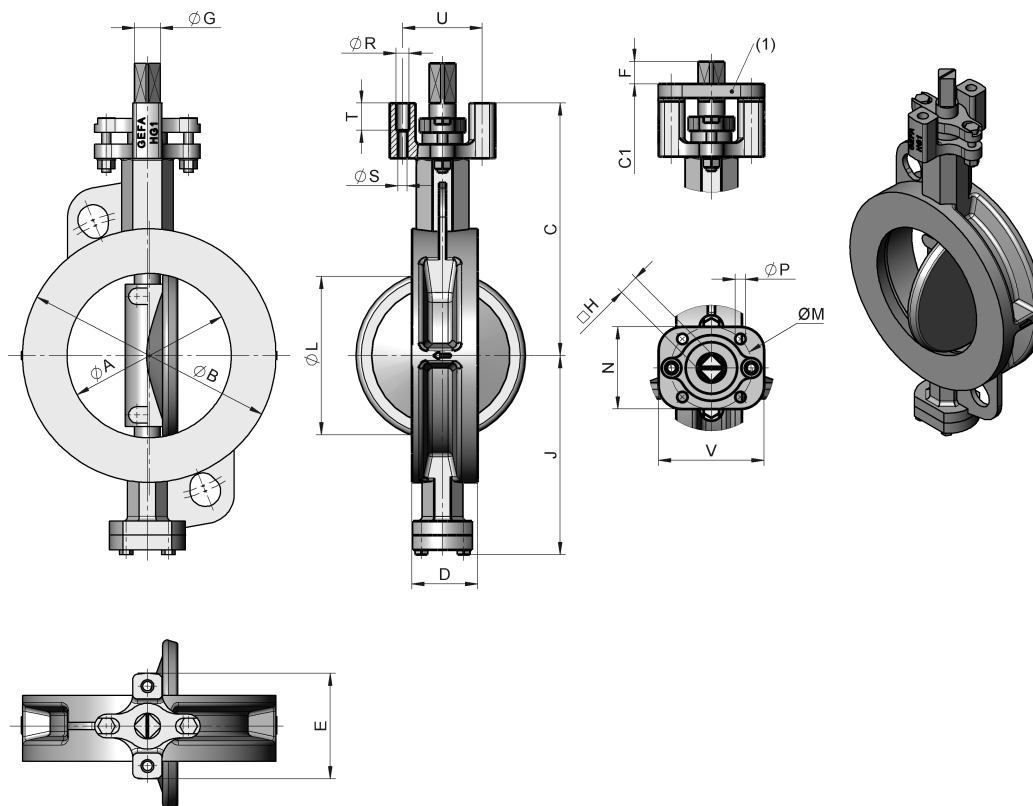
8.3 Disposal

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 DN50-300

Face to face dimension: EN 558-1 line 20 (DIN 3202-K1)



DN	NPS	ØA	ØB	C	C1	D	E	F	ØG	J	ØL	ØR	ØS	T	U	min.mounting plate DIN 3337 / ISO 5211
50	2"	47	102	142	157	43	90	16	18	103	46	11	M8	23	68	F05
65	2 1/2"	64	122	154	169	46	90	16	18	115	59	11	M8	23	68	F05
80	3"	76	133	162	177	46	90	16	18	122	76	11	M8	23	68	F05
100	4"	98	156	179	194	52	90	16	18	135	93	11	M8	23	68	F05
125	5"	119	188	197	212	56	90	19	22	152	118	11	M8	23	68	F07
150	6"	140	216	215	230	56	90	19	22	174	139	11	M8	23	68	F07
200	8"	190	268	262	280	60	125	24	28	216	190	13	M10	23	95	F10
250	10"	237	323	292	310	68	125	24	28	248	238	13	M10	23	95	F10
300	12"	280	375	336	356	78	150	29	36	283	281	16	M10	22	115	F12

DN	50	65	80	100	125	150	200	250	300
kg	3,9	4,7	5,2	6,7	9,6	11,7	19,6	28,0	40,0

Weight without mounting plate

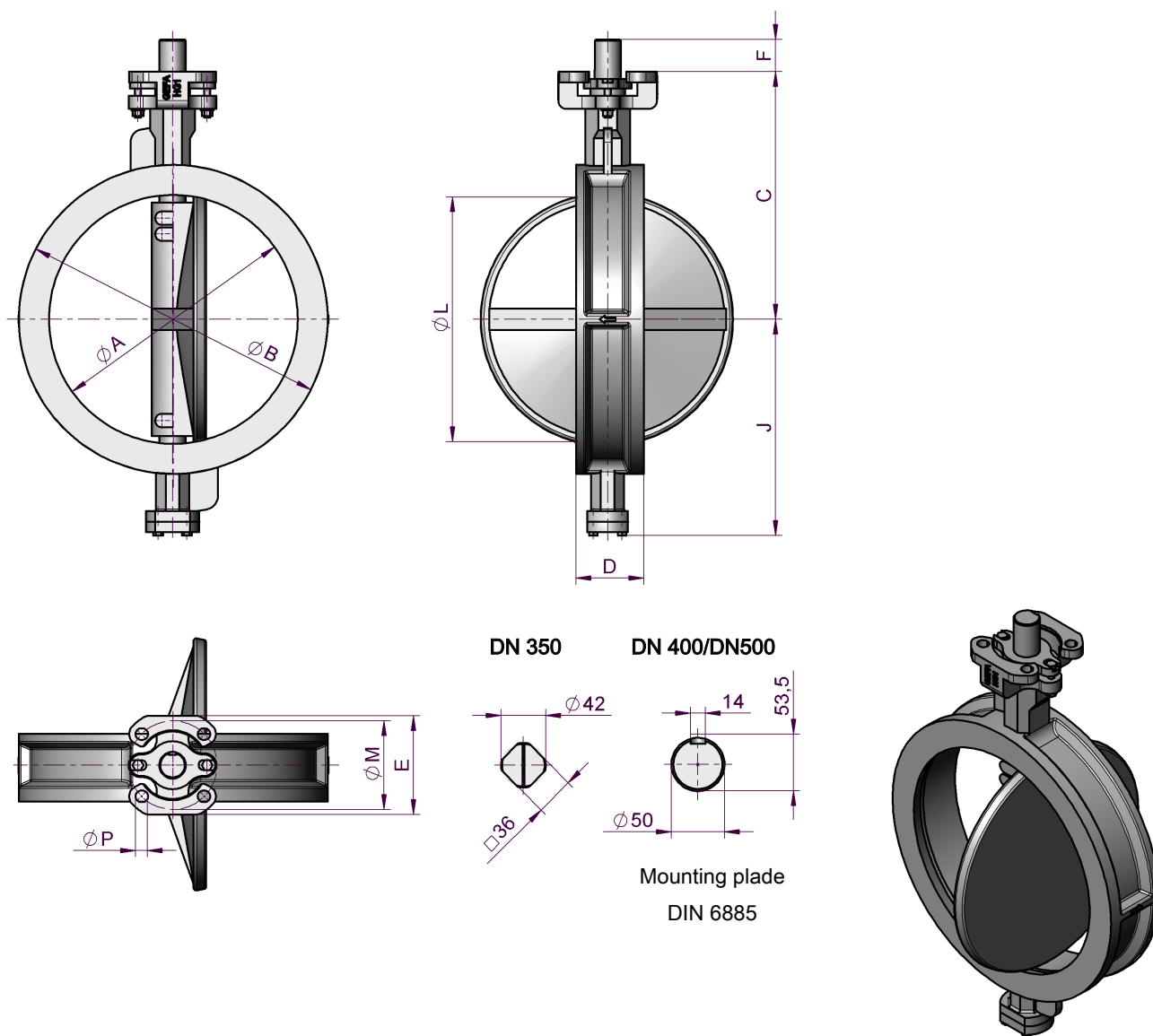
Mounting plate ISO 5211	F05	F07	F10	F12	F14	F16
□H	14	17	22	27	36	46
ØM	50	70	102	125	140	165
N	50	70	95	125	135	160
n x ØP	4 x 7	4 x 9	4 x 11	4 x 13,5	4 x 18	4 x 22
V	90	90	125	150	150	160

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

Subject to changes

9.2 Data sheet DN350-500

Face to face dimension: EN 558-1 line 20 (DIN 3202-K1)



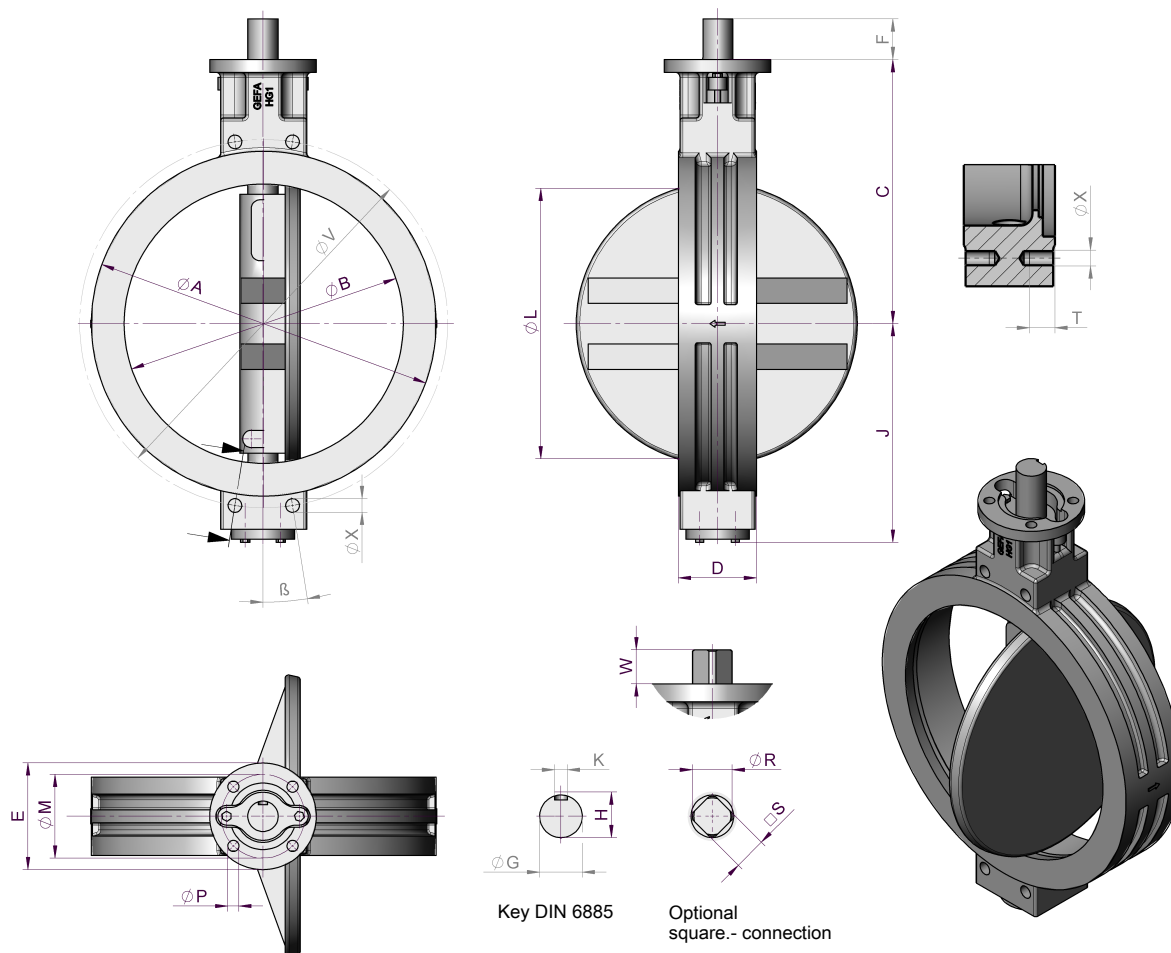
DN	NPS	$\varnothing A$	$\varnothing B$	C	D	E	F	J	$\varnothing L$	$\varnothing M$	$n \times \varnothing P$	Mounting plate ISO 5211
350	14"	318	415	365	78	145	38	312	321	140	4x18	F14
400	16"	362	470	405	102	185	60	351	363	165	4x22	F16
500	20"	467	580	465	127	185	60	409	468	165	4x22	F16

DN	350	400	500
NPS	14"	16"	20"
kg	51	79	118

Subject to changes

9.3 Data sheet DN600-800

Face to face dimension: EN 558-1 line 20 (DIN 3202-K1)



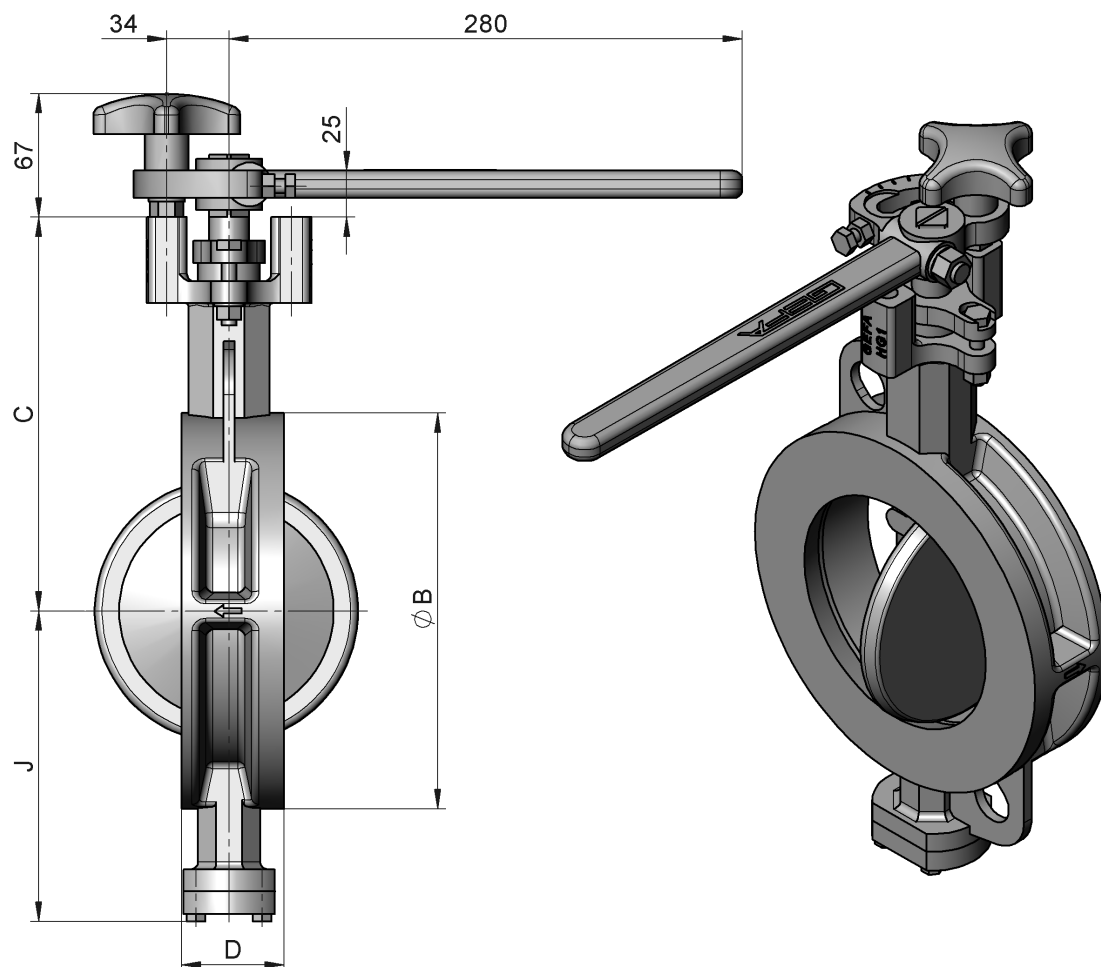
DN	NPS	ØA	ØB	C	D	E	F	J	ØL	ØM	nxØP	Mounting plate ISO 5211
600	24"	679	550	520	154	210	80	434	542	165	4x22	F16
800	32"	890	732	660	190	300	110	579	729	254	8x18	F25

DN	NPS	Ø G	H	K	R	S	W
600	24"	60	64	18	56	46	48
800	32"	72	76,5	20	69	55	57

DN	NPS	Pressure class	ØV	ØX	T	β	kg
600	24"	PN6	705	4xM24	43	9°	219
		PN10	725	4xM27	43	9°	
		PN16	770	4xM33	43	9°	
		Class 150	749,3	1 1/4"-8 UN	43	9°	
800	32"	PN6	920	4xM27	48	7,5°	462
		PN10	950	4xM30	48	7,5°	
		PN16	950	4xM36	48	7,5°	
		Class 150	977,9	4 x 1 1/2"-8UN	48	7,5°	

Subject to changes

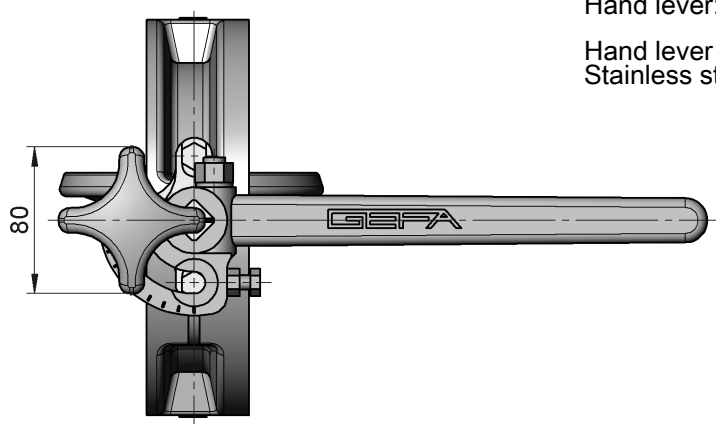
9.4 Data sheet DN50-150 with hand lever



Materials

Hand lever: stainless steel

Hand lever accessories:
Stainless steel

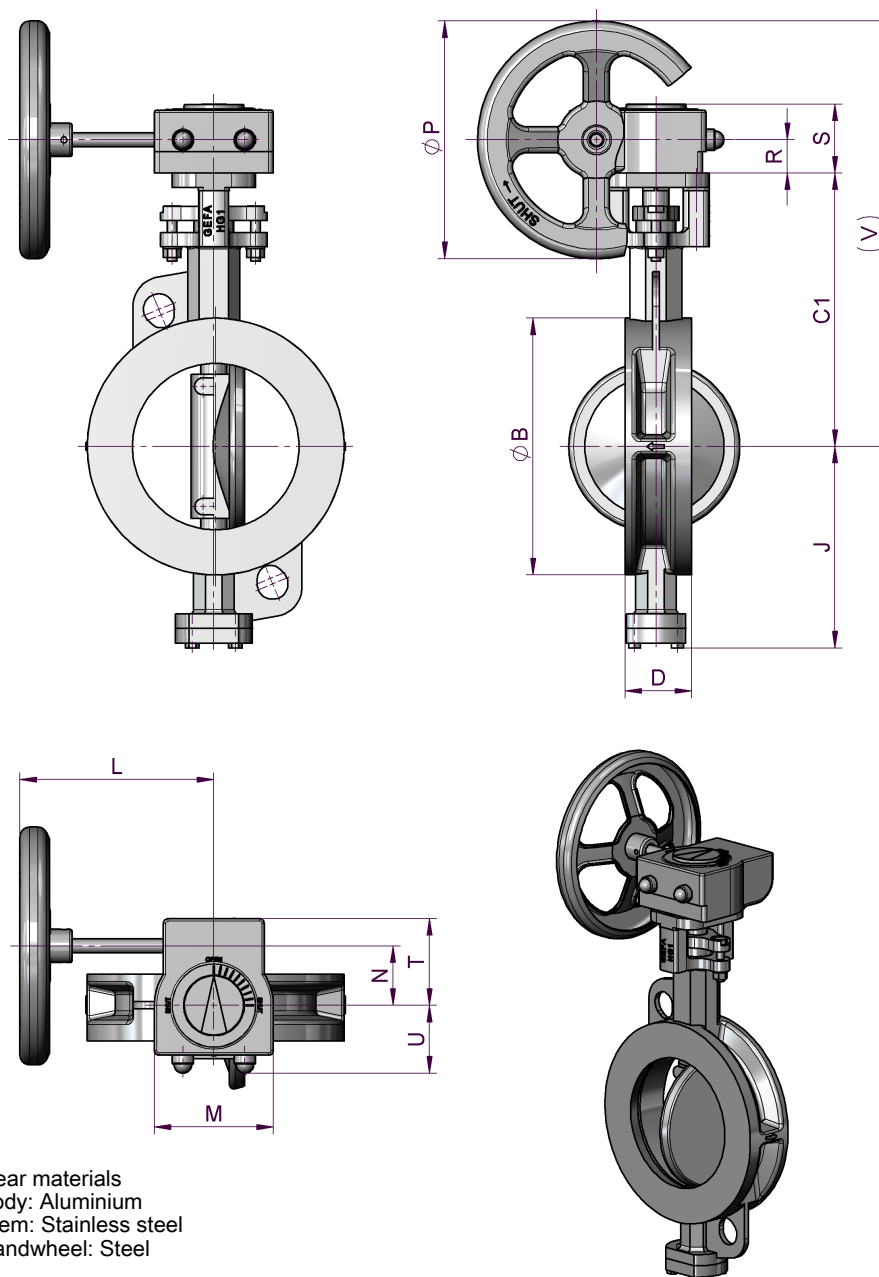


DN	NPS	ØB	C	D	J	kg
50	2"	102	142	43	103	1,5
65	2 ½"	122	154	46	115	1,5
80	3"	133	162	46	122	1,5
100	4"	156	179	52	135	1,5
125	5"	188	197	56	152	1,5
150	6"	216	215	56	174	1,5

Weight of hand lever including accessories:

Subject to changes

9.5 Data sheet DN50-300 with aluminium gear operator BGH



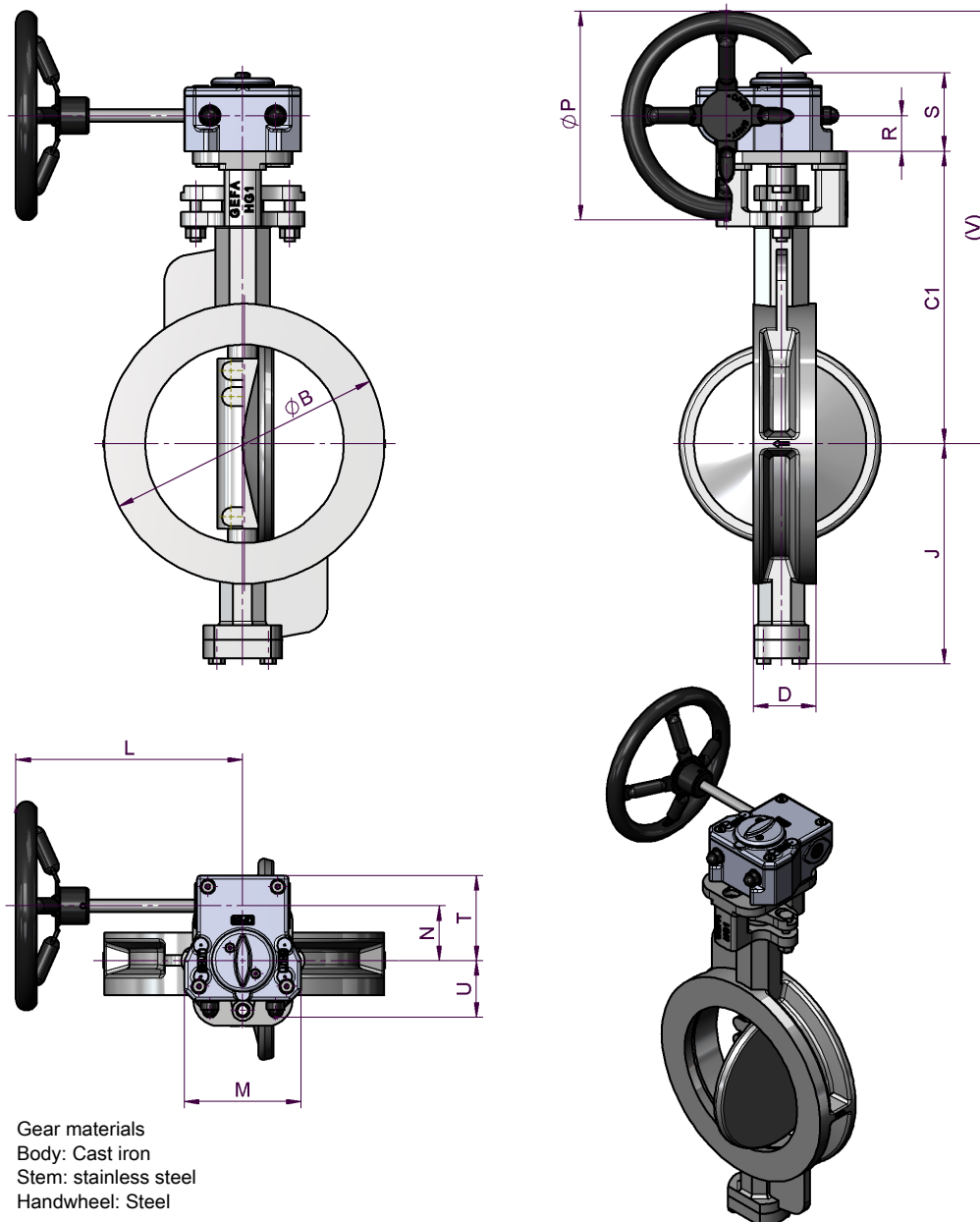
Gear materials
Body: Aluminium
Stem: Stainless steel
Handwheel: Steel

Weight of gear operator including handwheel and mounting plate.
Regarding valve data please refer to relevant data sheets.
Seat: TG = PTFE/glass-seat / M = metal seat

DN	NPS	Seat	Gear type	ØB	C1	D	J	L	M	N	ØP	R	S	T	U	V	kg
50	2"	TG/M	BGH200900714140	102	157	43	103	160	100	50	140	28	58	73	57	255	1,8
65	2 1/2"	TG/M	BGH200900714140	122	169	46	115	160	100	50	140	28	58	73	57	267	1,8
80	3"	TG/M	BGH200900714140	133	177	46	122	160	100	50	140	28	58	73	57	275	1,8
100	4"	TG/M	BGH200900714140	156	194	52	135	160	100	50	140	28	58	73	57	292	1,8
125	5"	TG/M	BGH200900717200	188	212	56	152	163	100	50	200	28	58	73	57	340	2,2
150	6"	TG/M	BGH200900717200	216	230	56	174	163	100	50	200	28	58	73	57	358	2,2
200	8"	TG/M	BGH201251222300	268	280	60	216	225	142	65	300	40	73	96	75	470	4,2
250	10"	TG/M	BGH201251222300	323	310	68	248	225	142	65	300	40	73	96	75	500	4,2
300	12"	TG/M	BGH201401227400	375	356	78	283	325	185	80	400	51	99	126	100	607	10,2

Subject to changes

9.6 Data sheet DN50-300 with cast iron gear operator BGPQ



Gear materials
Body: Cast iron
Stem: stainless steel
Handwheel: Steel

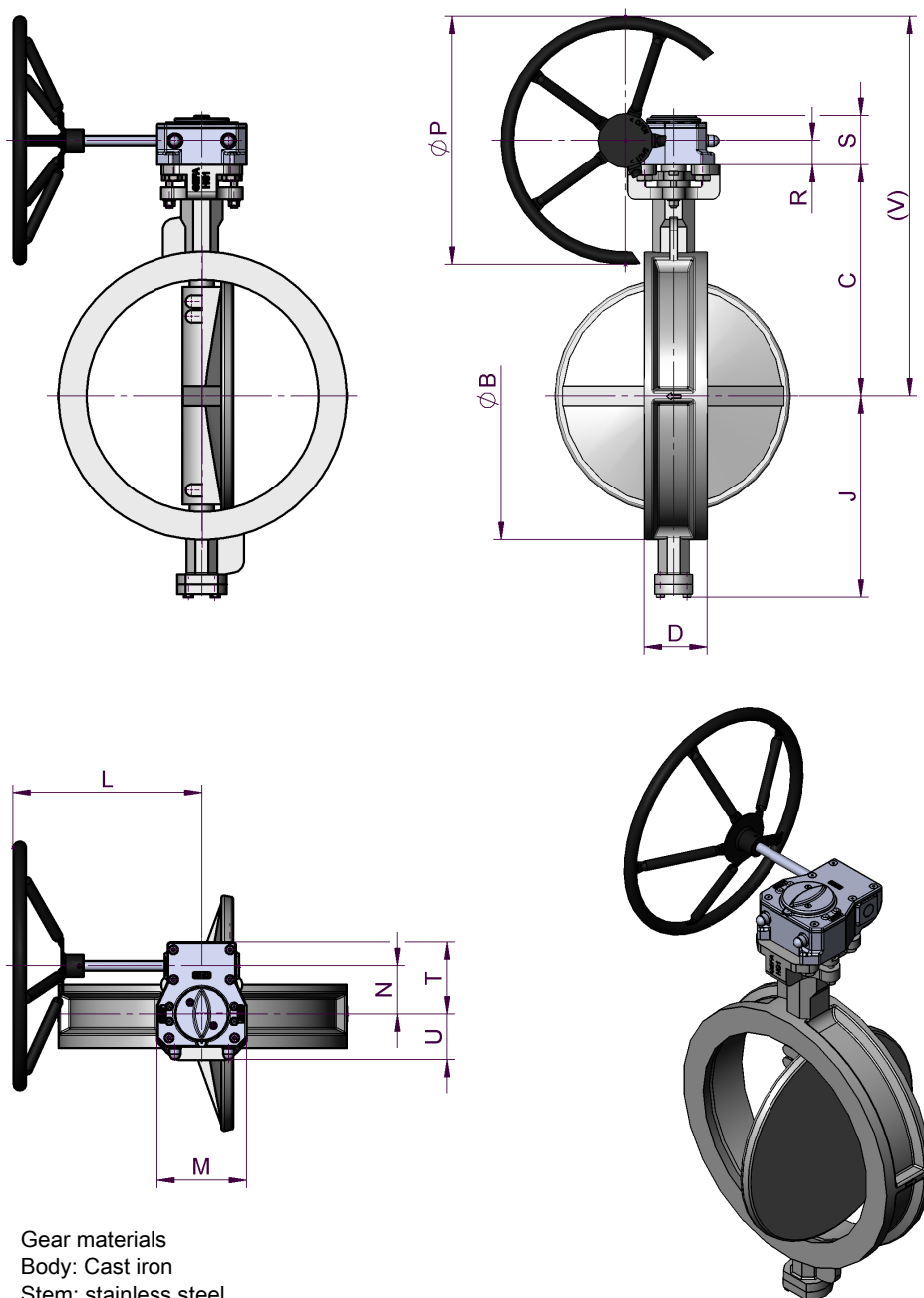
Upon request chain wheel can be supplied. Weight of gear operator including handwheel. Regarding valve data please refer to relevant data sheets.

Seat: TG = PTFE/glass-seat / M = metal seat

DN	NPS	Seat	Gear type	ØB	C1	D	J	L	M	N	ØP	R	S	T	U	V	kg
50	2"	TG/M	BGPQ200S14v12512	102	157	43	103	126	84	44	125	29	64	68	46	249	2,3
65	2 1/2"	TG/M	BGPQ200S14v12512	122	169	46	115	126	84	44	125	29	64	68	46	261	2,3
80	3"	TG/M	BGPQ200S14v12512	133	177	46	122	126	84	44	125	29	64	68	46	269	2,3
100	4"	TG/M	BGPQ200S14v12512	156	194	52	135	126	84	44	125	29	64	68	46	286	2,3
125	5"	TG/M	BGPQ400S17V20012	188	212	56	152	215	112	53	200	34	75	82	55	346	4,1
150	6"	TG/M	BGPQ400S17V20012	216	230	56	174	215	112	53	200	34	75	82	55	364	4,1
200	8"	TG/M	BGPQ400S22V20012	268	280	60	216	215	112	53	200	34	75	82	55	414	4,1
250	10"	TG	BGPQ400S22V20012	323	310	68	248	215	112	53	200	34	75	82	55	444	4,1
250	10"	M	BGPQ800S22V25015	232	310	68	248	266	135	69	250	43	91	115	73	478	7,6
300	12"	TG	BGPQ800S22V25015	375	356	78	283	266	135	69	250	43	91	115	73	524	7,6
300	12"	M	BGPQ1500S27V40020	375	356	78	283	309	156	84	400	45	97	123	83	601	12,5

Subject to changes

9.7 Data sheet DN350-500 with cast iron gear operator BGPQ



Gear materials
Body: Cast iron
Stem: stainless steel
Handwheel: Steel

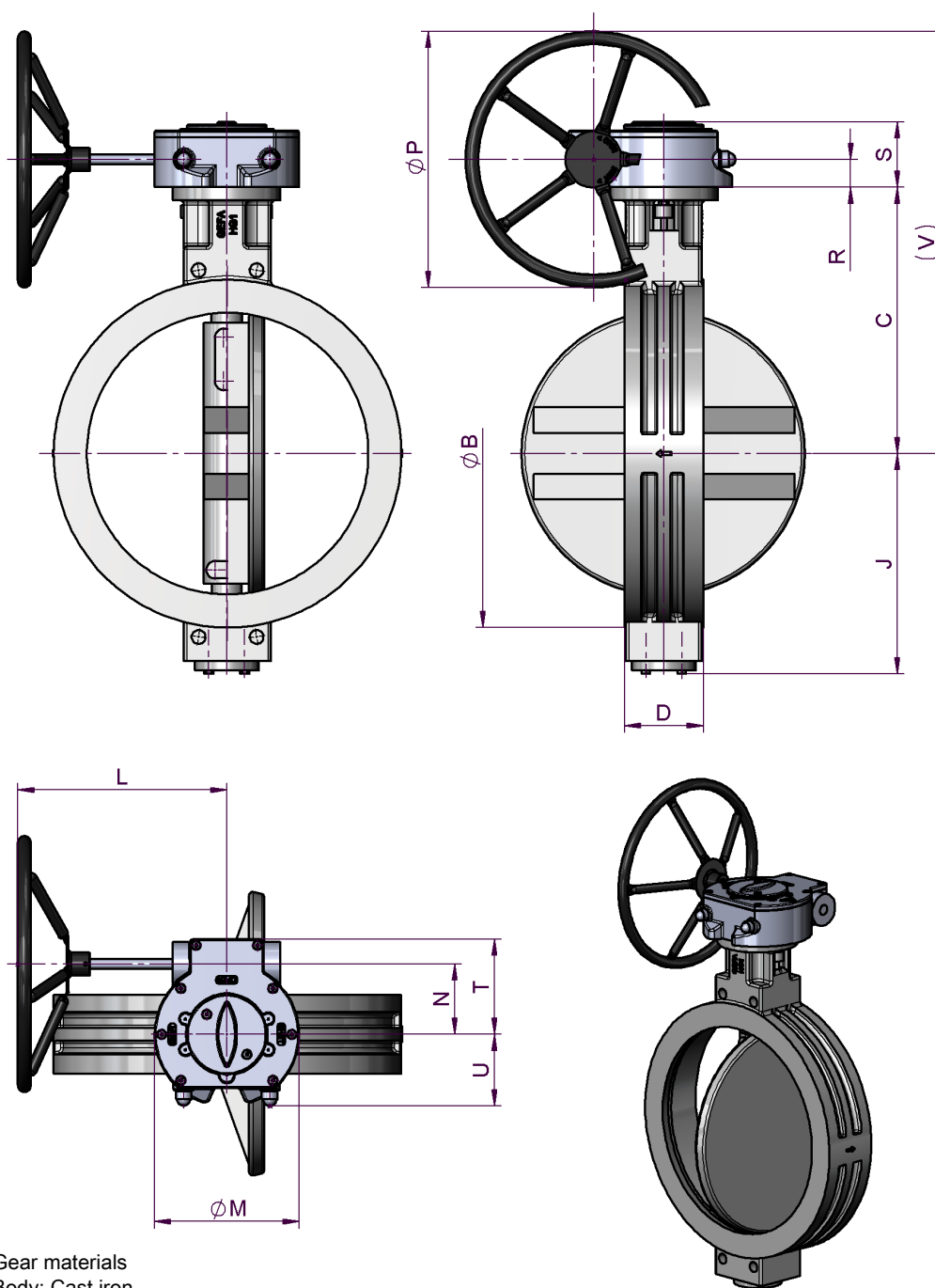
Upon request chain wheel can be supplied. Weight of gear operator including handwheel. Regarding valve data please refer to relevant data sheets.

Seat: TG = PTFE/glass-seat / M = metal seat

DN	NPS	Seat	Gear type	ØB	C1	D	J	L	M	N	ØP	R	S	T	U	V	kg
350	14"	TG/M	BGPQ1500S36V40020	415	365	78	312	309	156	84	400	45	97	123	83	610	12,5
400	16"	TG/M	BGPQ2000S5050020	470	405	102	351	379	180	97	500	50	100	144	92	705	16,5
500	20"	TG	BGPQ2000S5050020	580	465	127	409	379	180	97	500	50	100	144	92	765	16,5
500	20"	M	BGPQ3000S5050020	580	465	127	409	383	250	118	500	49	118	163	115	764	27,0

Subject to changes

9.8 Data sheet DN600-800 with cast iron gear operator BGPQ



Gear materials
Body: Cast iron
Stem: stainless steel
Handwheel: Steel

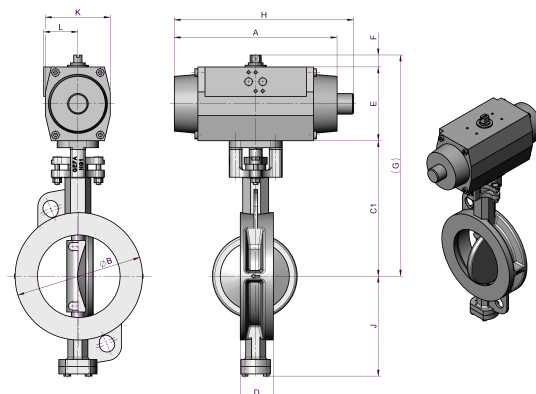
Upon request chain wheel can be supplied. Weight of gear operator including handwheel. Regarding valve data please refer to relevant data sheets.

Seat: TG = PTFE/glass-seat / M = metal seat

DN	NPS	Seat	Gear type	ØB	C	D	J	L	M	N	ØP	R	S	T	U	V	kg
600	24"	TG/M	BGPQ4000S6050020	679	520	154	434	408	282	138	500	55	128	186	140	825	37,0
800	32"	TG/M	BGPQ6500S7250020	890	660	190	579	440	282	138	500	55	128	186	140	965	41,5

Subject to changes

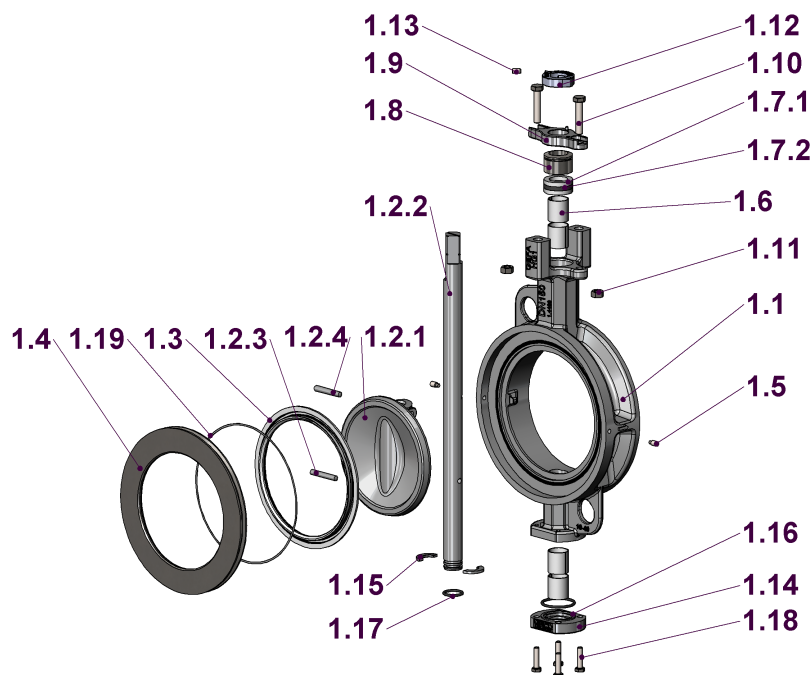
9.9 Data sheet DN50-300 with actuator series APM



DN	NPS	Actuator type	A	ØB	C1	D	E	F	G	H	J	K	L
50	2"	APM3	213	102	157	43	100	20	277	240	103	85	50
		APM3,5	236				110	20	287	268		98	53
		APM4	276				125	20	302	304		110	58
		APM4,5	310				142	0	329	350		128	69
65	2 1/2"	APM3	213	122	169	46	100	20	289	240	115	85	50
		APM3,5	236				110	20	299	268		98	53
		APM4	276				125	20	314	304		110	58
		APM4,5	310				142	30	341	350		128	69
80	3"	APM3	213	133	177	46	100	20	297	240	122	85	50
		APM3,5	236				110	20	307	268		98	53
		APM4	276				125	20	322	304		110	58
		APM4,5	310				142	30	349	350		128	69
100	4"	APM3,5	236	156	194	52	110	20	324	268	135	98	53
		APM4	276				125	20	339	304		110	58
		APM4,5	310				142	30	366	350		128	69
		APM5	366				155	30	379	405		140	-
125	5"	APM3,5	236	188	212	56	110	20	342	268	152	98	53
		APM4	276				125	20	357	304		110	58
		APM4,5	310				142	30	384	350		128	69
		APM5	366				155	30	397	405		140	-
		APM5,5	388				176	30	418	442		160	-
150	6"	APM4	276	216	230	56	125	20	375	304	174	110	89
		APM4,5	310				142	30	405	350		128	69
		APM5	366				155	30	415	405		140	-
		APM5,5	388				176	30	436	442		160	-
		APM6	468				200	30	460	500		175	-
200	8"	APM4,5	310	268	280	60	142	30	452	350	216	128	69
		APM5	366				155	30	465	405		140	-
		APM5,5	388				176	30	486	442		160	-
		APM6	468				200	30	510	500		175	-
		APM8	563				250	50	580	612		215	-
250	10"	APM5	366	323	310	68	155	30	495	405	248	140	-
		APM5,5	388				176	30	516	442		160	-
		APM6	468				200	30	540	500		175	-
		APM8	563				250	50	610	612		215	-
300	12"	APM5,5	388	375	356	78	176	30	562	442	283	160	-
		APM6	468				200	30	586	500		175	-
		APM8	563				250	50	656	612		215	-
		APM10	750				335	50	741	838		290	-

Subject to changes

9.10 Materials DN50-DN300

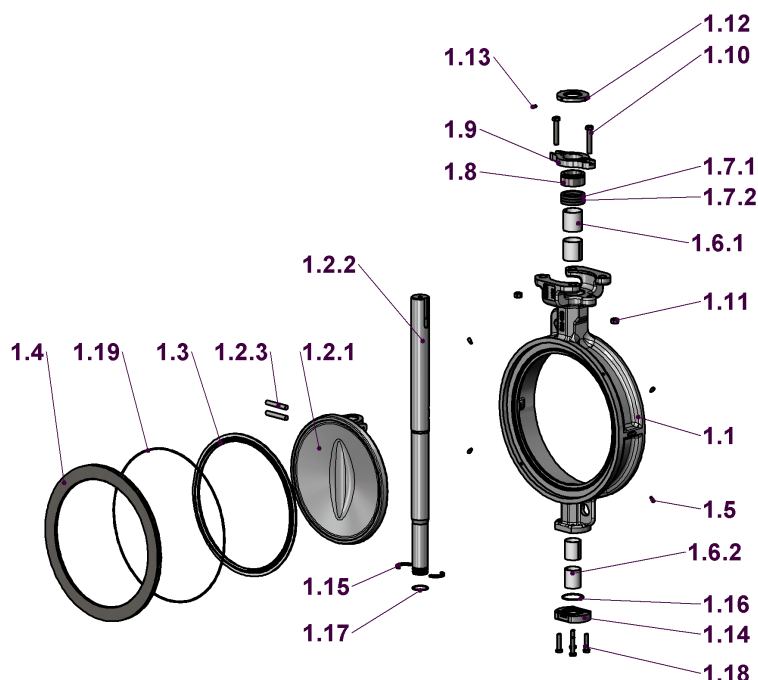


Materials							
Pos.	Description	HG.4466TG	HG.6666TG	HG.4435M	HG.6635M	HG.4435HM	HG.6635HM
	Permissible temperature(t _s)	-50°C / +220°C	-50°C / +220°C	-50°C / +220°C	-50°C / +220°C	-50°C / +400°C	-50°C / +400°C
1.1	Body	1.0619	1.4408	1.0619	1.4408	1.0619	1.4408
1.2	Disc with stem						
1.2.1	Disc	1.4408	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	Straight pin	A4	A4	A4	A4	A4	A4
1.2.4	Tapered 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	1.4571 / 1.4408	1.4571 / 1.4408	1.4571 / 1.4408	1.4571 / 1.4408	1.4571 / 1.4408	1.4571 / 1.4408
1.5	Set screw	A2	A2	A2	A2	A2	A2
1.6	Bearing	1.4401 / PTFE	1.4401 / PTFE	1.4401 / PTFE	1.4401 / PTFE	1.4401	1.4401
1.7	Gland packing	PTFE + Graphite	PTFE + Graphite	PTFE + Graphite	PTFE + Graphite	Graphite	Graphite
1.7.1	Gland packing	PTFE	PTFE	PTFE	PTFE	Graphite	Graphite
1.7.2	Gland packing	Graphite	Graphite	Graphite	Graphite	----	----
1.8	Gland	1.4305	1.4305	1.4305	1.4305	1.4305	1.4305
1.9	Gland flange	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
1.11	Hexagon nut	A2	A2	A2	A2	A2	A2
1.12	Limit stop	1.4308	1.4308	1.4308	1.4308	1.4308	1.4308
1.13	Set screw	A2	A2	A2	A2	A2	A2
1.14	Bottom flange	1.4408	1.4408	1.4408	1.4408	1.4408	1.4408
1.15	Axial securing device	1.4571 nitrated	1.4571 nitrated	1.4571 nitrated	1.4571 nitrated	1.4571 nitrated	1.4571 nitrated
1.16	Bottom 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
1.19	Sealing tape	PTFE (≥ DN200)	PTFE (≥ DN200)	Graphite (≥ DN300)	Graphite (≥ DN300)	Graphite (≥ DN300)	Graphite (≥ DN300)

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

Subject to changes

9.11 Materials DN350-500

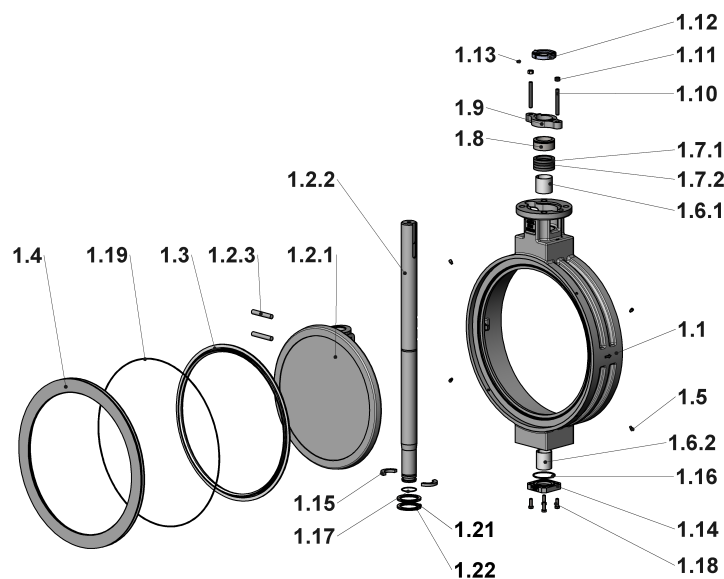


Materials							
Pos.	Description	HG.4444TG	HG.6666TG	HG.4444M	HG.6635M	HG.4444HM	HG.6635HM
	Permissible temperature (ts)	-50°C / +220°C	-50°C / +220°C	-50°C / +220°C	-50°C / +220°C	-50°C / +400°C	-50°C / +400°C
1.1	Gehäuse	1.0619	1.4408	1.0619	1.4408	1.0619	1.4408
1.2	Disc with stem						
1.2.1	Disc	1.0619 nickel-plated	1.4408 nitrated	1.0619 nickel-plated	1.4408 nitrated	1.0619 nickel-plated	1.4408 nitrated
1.2.2	Stem	1.4021	1.4571	1.4021	1.4571	1.4021	1.4571
1.2.3	Straight 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	Steel	1.4571	Stahl	1.4571	Stahl	1.4571
1.5	Set screw	A2	A2	A2	A2	A2	A2
1.6	Bearing	1.4401 / PTFE	1.4401 / PTFE	1.4401 / PTFE	1.4401 / PTFE	1.4401	1.4401
1.7	Gland packing	PTFE + Graphite	PTFE + Graphite	PTFE + Graphite	PTFE + Graphite	Graphite	Graphite
1.7.1	Gland packing	PTFE	PTFE	PTFE	PTFE	Graphite	Graphite
1.7.2	Gland packing	Graphite	Graphite	Graphite	Graphite	----	----
1.8	Gland	1.4305	1.4305	1.4305	1.4305	1.4305	1.4305
1.9	Gland flange	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
1.11	Hexagon nut	A2	A2	A2	A2	A2	A2
1.12	Limit stop	1.4308	1.4308	1.4308	1.4308	1.4308	1.4308
1.13	Set screw	A2	A2	A2	A2	A2	A2
1.14	Bottom flange	1.4408	1.4408	1.4408	1.4408	1.4408	1.4408
1.15	Axial securing device	1.4571 nitrated	1.4571 nitrated	1.4571 nitrated	1.4571 nitrated	1.4571 nitrated	1.4571 nitrated
1.16	Axial securing device	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
1.19	Sealing tape	PTFE	PTFE	Graphite	Graphite	Graphite	Graphite

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

Subject to changes

9.12 Materials DN600-800



Materials							
Pos.	Description	HG.4444TG	HG.6666TG	HG.4444M	HG.6635M	HG.4444HM	HG.6635HM
	Permissible temperature (ts)	-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	Disc with stem						
1.2.1	Disc	1.0619 nickel -plated	1.4408 nitrated	1.0619 nickel -plated	1.4408 nitrated	1.0619 nickel -plated	1.4408 nitrated
1.2.2	Stem	1.4021	1.4571	1.4021	1.4571	1.4021	1.4571
1.2.3	Straight 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	Steel	1.4571	Steel	1.4571	Steel	1.4571
1.5	Set screw	A2	A2	A2	A2	A2	A2
1.6	Bearing	1.4401 / PTFE	1.4401 / PTFE	1.4401 / PTFE	1.4401 / PTFE	1.4401	1.4401
1.7	Gland packing	PTFE + Graphite	PTFE + Graphite	PTFE + Graphite	PTFE + Graphite	Graphite	Graphite
1.7.1	Gland packing	PTFE	PTFE	PTFE	PTFE	Graphite	Graphite
1.7.2	Gland packing	Graphite	Graphite	Graphite	Graphite	----	----
1.8	Gland	1.4305	1.4305	1.4305	1.4305	1.4305	1.4305
1.9	Gland flange	1.4408	1.4408	1.4408	1.4408	1.4408	1.4408
1.10	Set screw	A4	A4	A4	A4	A4	A4
1.11	Hexagon nut	A2	A2	A2	A2	A2	A2
1.12	Limit stop	1.4308	1.4308	1.4308	1.4308	1.4308	1.4308
1.13	Set screw	A2	A2	A2	A2	A2	A2
1.14	Bottom flange	1.4408	1.4408	1.4408	1.4408	1.4408	1.4408
1.15	Axial securing device	1.4571 nitrated	1.4571 nitrated	1.4571 nitrated	1.4571 nitrated	1.4571 nitrated	1.4571 nitrated
1.16	Bottom 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
1.19	Sealing tape	PTFE	PTFE	Graphite	Graphite	Graphite	Graphite
1.21	Shim ring	A4 nitrated (≥ DN700)	A4 nitrated (≥ DN700)	A4 nitrated (≥ DN700)	A4 nitrated (≥ DN700)	A4 nitrated (≥ DN700)	A4 nitrated (≥ DN700)
1.22	Shim ring	A4 nitrated (≥ DN700)	A4 nitrated (≥ DN700)	A4 nitrated (≥ DN700)	A4 nitrated (≥ DN700)	A4 nitrated (≥ DN700)	A4 nitrated (≥ DN700)

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

Subject to changes

9.13 Pressure-temperature range diagram DN 50-800

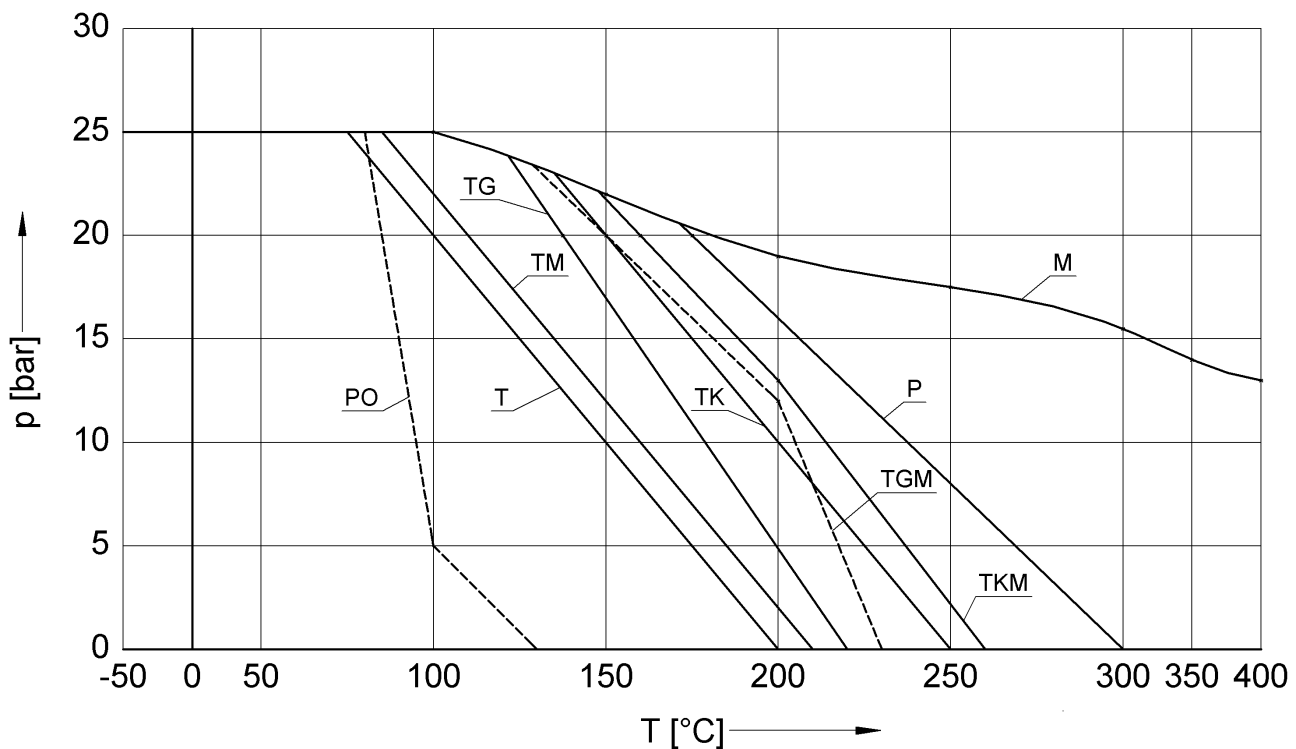
9.13.1 Pressure-temperature range diagram DN 50-300

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 EN 12266-P12 > B
PTFE seat and similar materials	
Seat Leakage	DIN 3230-BO2 > 1 EN 12266-B12 > A

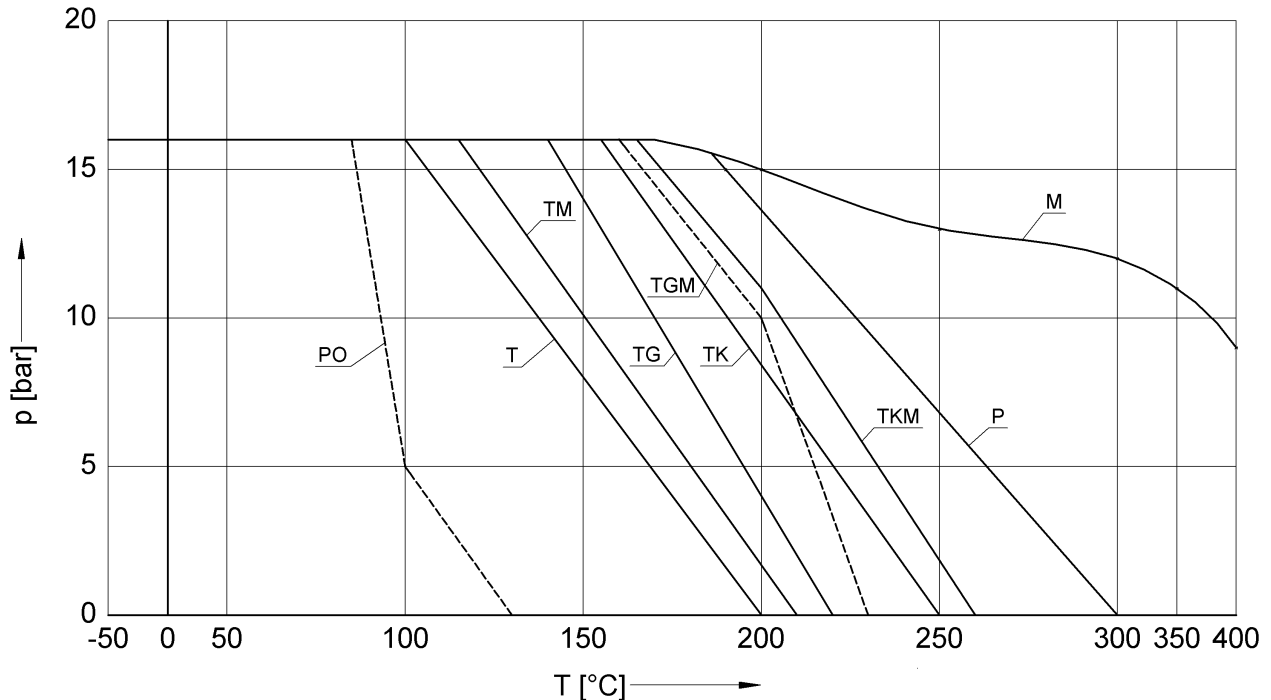
9.13.2 Pressure-temperature range diagram DN 350-500

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 EN 12266-P12 > B
PTFE seat and similar materials	
Seat Leakage	DIN 3230-BO2 > 1 EN 12266-B12 > A

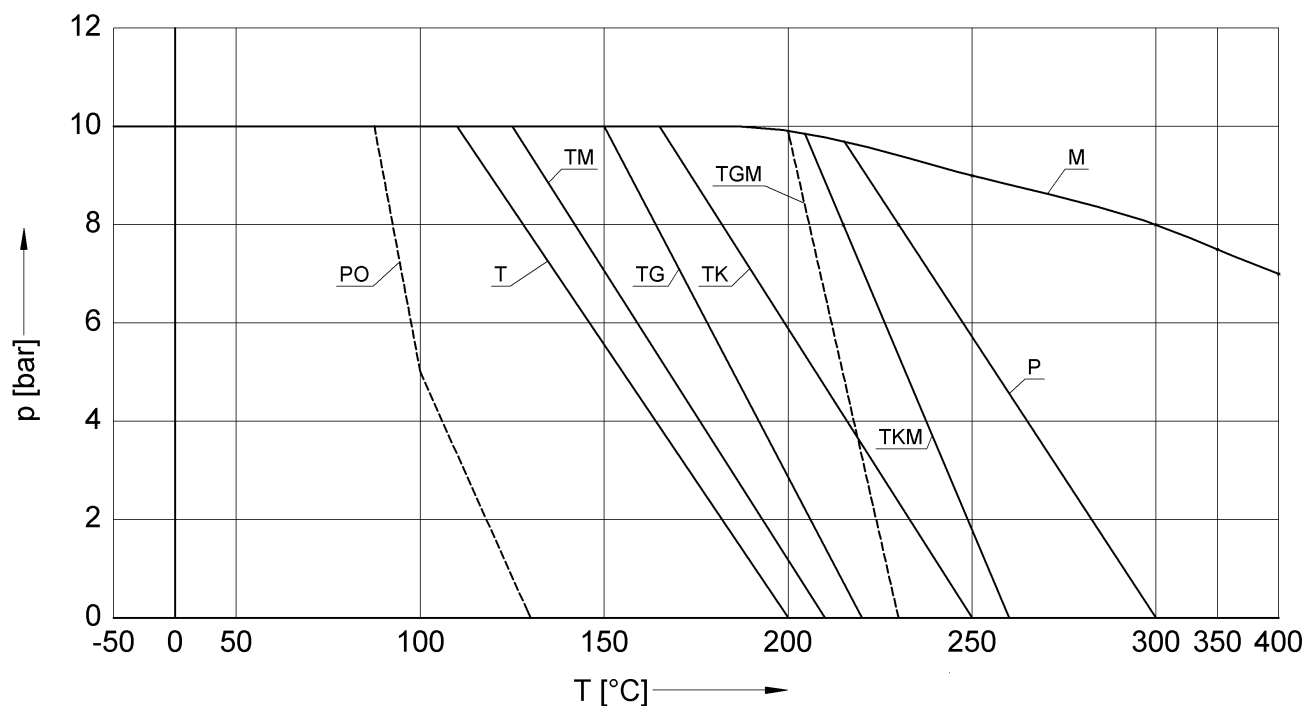
9.13.3 Pressure-temperature range diagram DN 600-800

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 EN 12266-P12 > B
PTFE seat and similar materials	
Seat Leakage	DIN 3230-BO2 > 1 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. Replace flange seals.
	Flange seal not suitable	Loosen flange connection, remove valve and flange seals. Replace flange seals with a suitable one.
	Flange connection not parallel	Loosen flange connection, remove valve and flange seals. Check plane parallelism of the flange connection and - if not sufficient - correct.
	Damaged sealing surfaces	Loosen flange connection, remove valve and flange seals. Check sealing surfaces on all flanges and the valve. 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: Open the valve slightly and repeat the closing process. Check whether the valve is completely closed.
		Pneumatically and hydraulically operated valve: Open the valve slightly and repeat the closing process. Check and if necessary reset the stroke limits on the actuator.
		Electrically operated valve: Open the valve slightly and repeat the closing process. 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. Open and close the valve several times.
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: - Control of the control pressure - Check whether there is power for the control valve - Check whether the control valve is defective Replace elements if necessary.
		Electrically operated valve: - Check whether power is available - Check whether the motor is defective - Check whether the limit switch is defective or misaligned 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 connections, 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

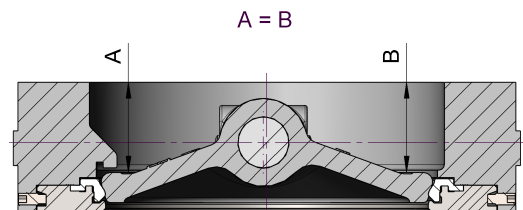
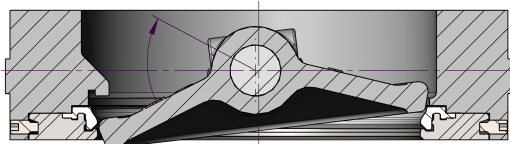


Opening a (pressurized) valve

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:

- Make sure that the pipe section into which the valve has been integrated is depressurised and drained.
- 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.
- 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 off-set 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.

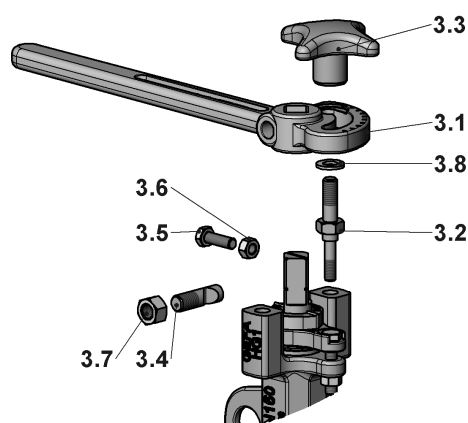


It must be ensured that the actuator is centred on the valve shaft. The weight of a mounted actuator must not place a one-sided load on the valve shaft. For this reason, actuators must be supported if necessary - without fixation. External loads must not be applied to actuators, this can damage or destroy 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).

