

# GEMÜ R477 Tugela

Manually operated butterfly valve

EN

## Operating instructions



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## 1 General information

### 1.1 Information

- The descriptions and instructions apply to the standard versions. For special versions not described in this document the basic information contained herein applies in combination with any additional special documentation.
- Correct installation, operation, maintenance and repair work ensure faultless operation of the product.
- Should there be any doubts or misunderstandings, the German version is the authoritative document.
- Contact us at the address on the last page for staff training information.
- A supplement to Directive 2014/34/EU (ATEX Directive) is included with the product, provided that it was ordered in accordance with ATEX.

### 1.2 Symbols used

The following symbols are used in this document:

Symbol	Meaning
●	Tasks to be performed
►	Response(s) to tasks
–	Lists

### 1.3 Definition of terms

#### Working medium

The medium that flows through the GEMÜ product.

#### Control function

The possible actuation functions of the GEMÜ product.

#### Control medium

The medium whose increasing or decreasing pressure causes the GEMÜ product to be actuated and operated.

### 1.4 Warning notes


Wherever possible, warning notes are organised according to the following scheme:


SIGNAL WORD	
Possible symbol for the specific danger	Type and source of the danger
	► Possible consequences of non-observance. ● Measures for avoiding danger.


Warning notes are always marked with a signal word and sometimes also with a symbol for the specific danger.

The following signal words and danger levels are used:










⚠ DANGER	
	<b>Imminent danger!</b> ► Non-observance can cause death or severe injury.


⚠ WARNING	
	<b>Potentially dangerous situation!</b> ► Non-observance can cause death or severe injury.

⚠ CAUTION	
	<b>Potentially dangerous situation!</b> ► Non-observance can cause moderate to light injury.

NOTICE	
	<b>Potentially dangerous situation!</b> ► Non-observance can cause damage to property.

The following symbols for the specific dangers can be used within a warning note:

Symbol	Meaning
	Danger of explosion!
	Moving components!
	The equipment is subject to pressure!
	Corrosive chemicals!
	GEMÜ products without an actuating element!
	Hot plant components!
	Leakage
	Maximum permissible pressure exceeded!
	Use as an end-of-line valve!

Symbol	Meaning
	Risk of crushing!

## 2 Safety information

The safety information in this document refers only to an individual product. Potentially dangerous conditions can arise in combination with other plant components, which need to be considered on the basis of a risk analysis. The operator is responsible for the production of the risk analysis and for compliance with the resulting precautionary measures and regional safety regulations.

The document contains fundamental safety information that must be observed during commissioning, operation and maintenance. Non-compliance with these instructions may cause:

- Personal hazard due to electrical, mechanical and chemical effects.
- Hazard to nearby equipment.
- Failure of important functions.
- Hazard to the environment due to the leakage of dangerous substances.

The safety information does not take into account:

- Unexpected incidents and events, which may occur during installation, operation and maintenance.
- Local safety regulations which must be adhered to by the operator and by any additional installation personnel.

### Prior to commissioning:

1. Transport and store the product correctly.
2. Do not paint the bolts and plastic parts of the product.
3. Carry out installation and commissioning using trained personnel.
4. Provide adequate training for installation and operating personnel.
5. Ensure that the contents of the document have been fully understood by the responsible personnel.
6. Define the areas of responsibility.
7. Observe the safety data sheets.
8. Observe the safety regulations for the media used.

### During operation:

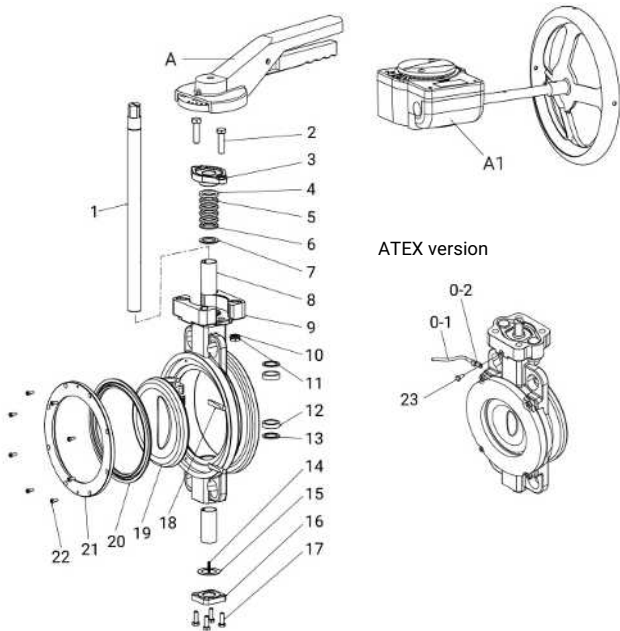
9. Keep this document available at the place of use.
10. Observe the safety information.
11. Operate the product in accordance with this document.
12. Operate the product in accordance with the specifications.
13. Maintain the product correctly.
14. Do not carry out any maintenance work and repairs not described in this document without consulting the manufacturer first.

### In cases of uncertainty:

15. Consult the nearest GEMÜ sales office.

### 3 Product description

#### 3.1 Construction



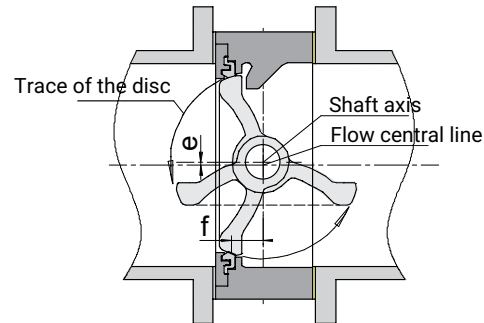
Item	Designation	Material
1	Shaft	see order code (order data)
2	Hexagon screw	Stainless steel
3	Packing washer	1.4408
4	Upper gland packing	PTFE
5	Middle gland packing	PTFE
6	Lower gland packing	PTFE
7	Packing washer	PTFE
8	Bush	316/PTFE
9	Housing	see order code (order data)
10	Spring washer	Stainless steel
11	Hexagon nut	Stainless steel
12	Shaft bearing	PTFE coated steel
13	Shaft bearing	PTFE coated steel
14	Static spring	Stainless steel
15	Sealing washer	Stainless steel
16	Lower cap	as body
17	Hexagon screw	Stainless steel
18	Washer pin	Steel
19	Washer	see order code (order data)
20*	Seat	see order code (order data)
21	Seat retainer	
22	Hexagon screw	Stainless steel
A	Hand lever	Aluminium, polyurethane coated
A1	Gearbox with handwheel	Die-cast aluminium casing

Item	Designation	Material
0	Earthing kit for ATEX version	
0-1	Stranded wire (ATEX version)	
0-2	Cable lug (ATEX version)	
23	Hexagon screw	Stainless steel

\* available as spare part

#### 3.2 Additional design features

##### Double-eccentric design



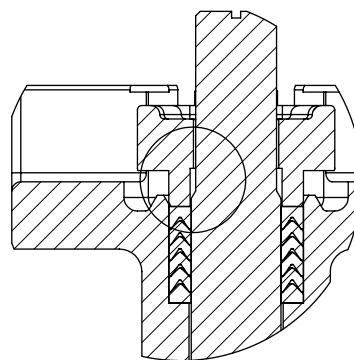
During operation, the disc directly disconnects from the seat, thereby reducing friction between the seat and disc, as well as the torque.

This design is particularly low-wear and this, together with the temperature-resistant carbon bushing, increases the service life.

##### Spherical surface

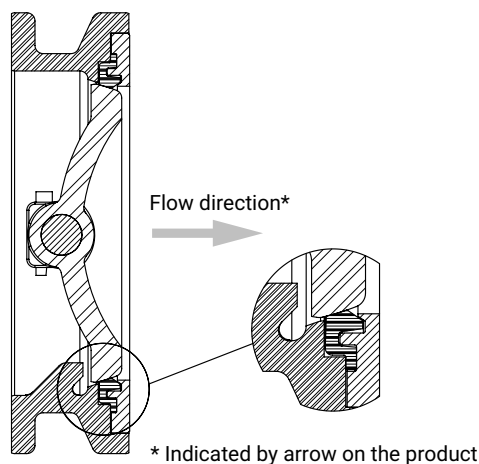
The disc is designed with a spherical surface for improved mechanical behaviour under pressure and temperature fluctuations.

##### Shaft blow-out protection

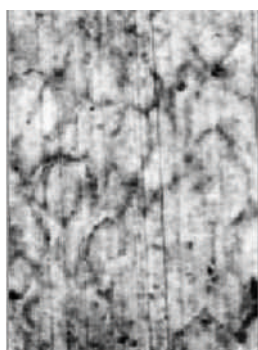


There is a chamfer at the upper end of the shaft which acts as an additional safety measure in case the shaft breaks.

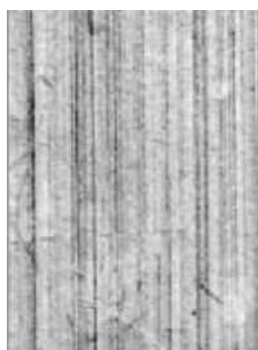
### Flow direction



### Seat material



**PTFE**



**TFM**

TFM™ is made from conventional PTFE and a 1% proportion of perfluoropropyl vinyl ether (PPVE). While the properties of conventional PTFE (excellent chemical resistance, application in a wide temperature range and resistance to embrittlement or ageing, etc.) are maintained, the PPVE additive leads to a better distribution of the PTFE particles and thus to a higher density of the polymer structure.

This leads to the following additional advantages:

- Significantly better cold flow properties (measured as deformation under load):  
Same cold flow properties as PTFE with 25% glass fibres.
- Reduced gas permeability and increased blocking properties
- The smooth surface results in less abrasion of the shut-off seal and fewer abraded particles in the medium.

### 3.3 Description

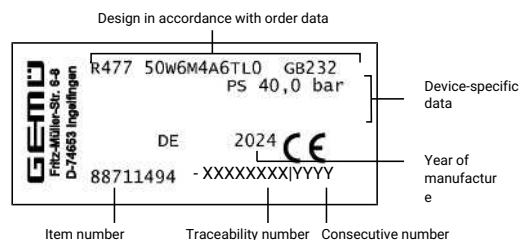
The GEMÜ R477 Tugela double eccentric metal butterfly valve is operated by a manual actuator. The butterfly valve is available in nominal sizes DN 50 to 600 and in standardized installation lengths API 609 category A (DIN 3202 K1).

### 3.4 Function

The product controls a flowing medium by manual operation.

### 3.5 Product label



The product label is located on the valve body. Product label data (example):




The month of manufacture is encoded in the traceability number and can be obtained from GEMÜ. The product was manufactured in Germany.

The operating pressure stated on the product label applies to a media temperature of 20 °C. The product can be used up to the maximum stated media temperature. You can find the pressure/temperature correlation in the technical data.

#### 4 Correct use

 <b>DANGER</b>	
	<p><b>Danger of explosion!</b></p> <ul style="list-style-type: none"> <li>▶ Risk of severe injury or death</li> <li>● Do not use the product in potentially explosive zones.</li> <li>● Only use the product in potentially explosive zones confirmed in the declaration of conformity.</li> </ul>

 <b>WARNING</b>	
<p><b>Improper use of the product!</b></p> <ul style="list-style-type: none"> <li>▶ Risk of severe injury or death</li> <li>▶ Manufacturer liability and guarantee will be void.</li> <li>● Only use the product in accordance with the operating conditions specified in the contract documentation and in this document.</li> </ul>	

The product is designed for installation in piping systems and for controlling a working medium.

- Use the product in accordance with the technical data.


##### 4.1 Product without special function X


The product is not intended for use in potentially explosive areas.

##### 4.2 Product with special function X

With the special version X order option, the product is intended for use in potentially explosive areas in zone 1 with gases, mists or vapours and zone 21 with combustible dusts in accordance with EU Directive 2014/34/EU (ATEX).

The product has the following explosion protection marking:

Gas:  II -/2 G Ex h -/IIB T6 ...T3 -/Gb X

Dust:  II -/2 D Ex h -/IIIC T150°C -/Db X

The product has been developed in compliance with the following harmonized standards:

- EN 1127-1:2011
- ISO 80079-36:2016
- ISO 80079-37:2016

Use of the product is permissible in the following ambient temperature ranges: -40 °C to +70 °C

**For use in potentially explosive areas, the following special conditions or operation limits must be observed:**

Index X is applied to the ATEX marking.

The following special conditions must be complied with:

- Temperature class depending on the temperature of the conveyed medium and the clock frequency
- Not permissible as an end-of-line valve



## 5 Order data

Other configurations available on request. Please check the availability with GEMÜ before ordering.

### Order codes

1 Type	Code
Butterfly valve, double-eccentric, manually operated, long service life, low friction thanks to direct separation of seat/disc, continuous and blow-out proof shaft, with anti-static unit and low-maintenance spindle seal, readjustable	R477

2 DN	Code
DN 50	50
DN 65	65
DN 80	80
DN 100	100
DN 125	125
DN 150	150
DN 200	200
DN 250	250
DN 300	300
DN 350	350
DN 400	400
DN 450	450
DN 500	500
DN 600	600

3 Body configuration	Code
Flange-mounted design (lug), face-to-face dimension FTF EN 558 series 20	L
Double flange design (U section), face-to-face dimension FTF EN 558, series 20	U
Intermediate flange design (wafer), face-to-face dimension FTF API609 table B, EN 558 series 108, EN 558 series 109	W

4 Operating pressure	Code
10 bar	2
16 bar	3
20 bar	4
25 bar	5
40 bar	6

5 Connection type	Code
PN 10 / flange EN 1092, face-to-face dimension FTF EN 558 series 108	2
PN 16 / flange EN 1092, face-to-face dimension FTF EN 558 series 108	3
PN 25 / flange EN 1092, face-to-face dimension FTF EN 558 series 20	5
PN 40 / flange EN 1092, face-to-face dimension FTF EN 558 series 109	6
ANSI B16.5, Class 150, face-to-face dimension FTF EN 558 series 108	D

5 Connection type	Code
ANSI B16.5, Class 300, face-to-face dimension FTF EN 558 series 109	M

6 Body material	Code
1.4408 / ASTM A351 / CF8M	4
1.0619 / ASTM A216 WCB, CDP coated 20 µm, for non-European countries, 1.0619 is not a material for pressure equipment according to 2014/68/EU	5

7 Disc material	Code
1.4408 / ASTM A351 CF8M	A

8 Shaft material	Code
1.4542 / ASTM 564 630 UNS S17400	6
1.4410 / ASTM A276 S32750	D
<b>Note:</b> -40 °C only possible with shaft material 1.4410 (Code D)	

9 Shut-off seal material	Code
TFM 1600 (FDA certification)	T

10 Liner fixing	Code
Loose liner	L

11 Actuator version	Code
Hand lever, aluminium	AHL11
Hand lever, aluminium	DAHL11
Hand lever, aluminium	DAHL14
Hand lever, 10 latch positions, diagonal square, WAF = 14 mm	VHL14
Hand lever, 10° latch positions, diagonal square, WAF = 17 mm	VHL17
Gearbox, die-cast aluminium casing	GB232
Gearbox, cast iron	GB880N

12 Type of design	Code
Without	
Gearbox prepared for limit switch mounting	7042
Thermal separation between actuator and valve body via mounting kit, mounting parts made from stainless steel	5227

13 Special version	Code
Without	
ATEX certification	X

14 CONEXO	Code
Without	
Integrated RFID chip for electronic identification and traceability	C

**Order example**

Ordering option	Code	Description
1 Type	R477	Butterfly valve, double-eccentric, manually operated, long service life, low friction thanks to direct separation of seat/disc, continuous and blow-out proof shaft, with anti-static unit and low-maintenance spindle seal, readjustable
2 DN	300	DN 300
3 Body configuration	W	Intermediate flange design (wafer), face-to-face dimension FTF API609 table B, EN 558 series 108, EN 558 series 109
4 Operating pressure	4	20 bar
5 Connection type	6	PN 40 / flange EN 1092, face-to-face dimension FTF EN 558 series 109
6 Body material	4	1.4408 / ASTM A351 / CF8M
7 Disc material	A	1.4408 / ASTM A351 CF8M
8 Shaft material	6	1.4542 / ASTM 564 630 UNS S17400
9 Shut-off seal material	T	TFM 1600 (FDA certification)
10 Liner fixing	L	Loose liner
11 Control function	0	Manually operated
12 Actuator version	GB232	Gearbox, die-cast aluminium casing
13 Type of design		Without
14 Special version		Without
15 CONEXO		Without

## 6 Technical data

### 6.1 Medium

**Working medium:** Gaseous and liquid media which have no negative impact on the physical and chemical properties of the disc and seat material.

### 6.2 Temperature

**Media temperature:** -40 – 230 °C

**Ambient temperature:** -40 – 70 °C

**Storage temperature:** -40 – 60 °C

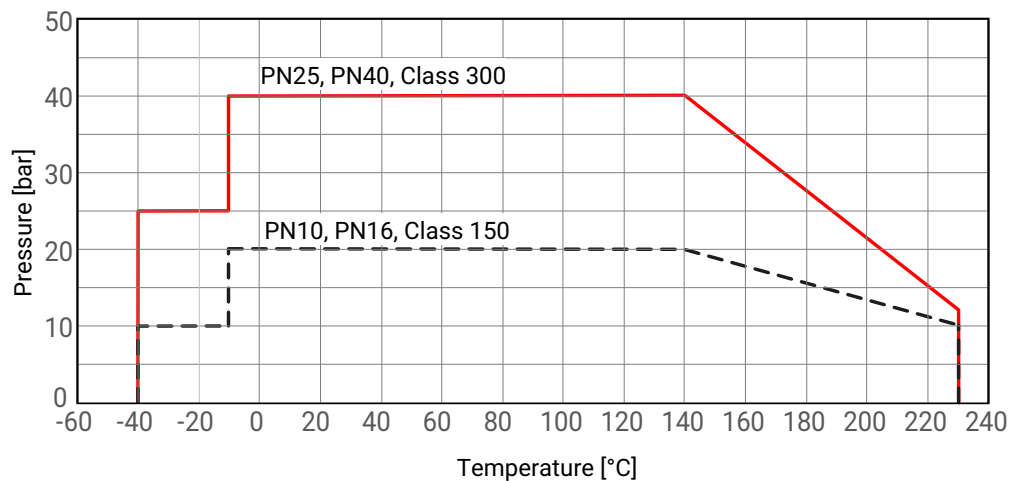
### 6.3 Pressure

**Operating pressure:** 0 – 40 bar

**Note:** Cannot be used as an end-of-line valve

**Vacuum:** Can be used up to a vacuum of 10 mbar (abs) due to a leak rate at  $10^{-3}$  [mbar l / sec]  
These values apply to room temperature and air. The values may deviate for other media and other temperatures.

**Pressure/temperature diagram:**





**Cv values:**

DN	NPS	Body	Kv in m³/h at opening angle in °						
		CLASS	90	80	65	50	35	20	0
50	2"	CL300	24.7	25.3	27.2	21.3	9.6	0.1	0.0
65	2½"	CL300	59.6	69.3	74.2	50.6	24.2	2.99	0.0
80	3"	CL300	123.0	129.0	118.0	95.5	60.2	17.2	0.0
100	4"	CL300	281.0	295.0	250.0	170.0	100.0	35.9	0.0
125	5"	CL300	423.0	449.0	393.0	276.0	168.0	52.3	0.0
150	6"	CL150	770.0	776.0	586.0	384.0	211.0	85.2	0.0
		CL300	696.0	705.0	543.0	363.0	200.0	78.0	0.0
200	8"	CL150	1480.0	1530.0	1160.0	734.0	414.0	192.0	0.0
		CL300	1470.0	1520.0	1150.0	734.0	419.0	195.0	0.0
250	10"	CL150	2400.0	2410.0	1780.0	1120.0	597.0	271.0	0.0
		CL300	2410.0	2340.0	1690.0	1030.0	522.0	218.0	0.0
300	12"	CL150	3650.0	3600.0	2610.0	1650.0	910.0	410.0	0.0
		CL300	3350.0	3250.0	2350.0	1490.0	781.0	345.0	0.0
350	14"	CL150	3890.0	3810.0	2960.0	2000.0	1200.0	647.0	0.0
		CL300	3860.0	3720.0	2780.0	1790.0	1030.0	510.0	0.0
400	16"	CL150	6350.0	5960.0	4270.0	2570.0	1420.0	720.0	0.0
		CL300	5300.0	5140.0	3670.0	2350.0	1330.0	643.0	0.0
450	18"	CL150	8080.0	7710.0	5360.0	3290.0	1800.0	888.0	0.0
		CL300	6740.0	6390.0	4650.0	2900.0	1590.0	767.0	0.0
500	20"	CL150	9590.0	9050.0	6320.0	3850.0	2070.0	948.0	0.0
		CL300	7800.0	7290.0	5460.0	3600.0	2040.0	1000.0	0.0
600	24"	CL150	14300.0	13400.0	9620.0	6100.0	3560.0	1950.0	0.0
		CL300	12400.0	11800.0	8550.0	5650.0	3240.0	1770.0	0.0

Cv values in m³/h

**6.4 Product conformity****Machinery Directive:** 2006/42/EC**Pressure Equipment Directive:** 2014/68/EU**Food:** FDA**EAC:** The product is certified according to EAC.**Explosion protection:** 2014/34/EU (ATEX)

**ATEX marking:** **Assessment of the body**  
 Special function code X  
 Gas:  II -/2 G Ex h -/IIC T6...T3 -/Gb X  
 Dust:  II -/2D Ex h -/IIIC T150°C -/Db X

**TA Luft (German Clean Air Act):** The product meets the following requirements under the max. permissible operating conditions:

- Tightness or compliance with the specific leak rate within the sense of TA-Luft as well as VDI 2440
- Compliance with the requirements in accordance with DIN EN ISO 15848-1, Table C.2, Class BH

## 6.5 Mechanical data

### Torques:

DN	NPS	Connection type code <sup>1)</sup>									
		D, 2, 3					M, 5, 6				
		Maximum pressure differential [bar]									
		0.0	6.0	10.0	16.0	20.0	0.0	20.0	25.0	40.0	50.0
50	2"	33.0	33.0	34.0	35.0	37.0	33.0	37.0	38.0	40.0	42.0
65	2½"	43.0	44.0	45.0	46.0	50.0	43.0	50.0	52.0	57.0	60.0
80	3"	54.0	56.0	57.0	58.0	64.0	54.0	64.0	67.0	74.0	79.0
100	4"	68.0	71.0	72.0	74.0	84.0	68.0	84.0	88.0	99.0	107.0
125	5"	90.0	94.0	96.0	100.0	115.0	90.0	115.0	121.0	139.0	151.0
150	6"	114.0	120.0	123.0	128.0	149.0	123.0	158.0	167.0	193.0	211.0
200	8"	181.0	192.0	200.0	211.0	258.0	202.0	280.0	299.0	358.0	397.0
250	10"	250.0	268.0	280.0	297.0	372.0	287.0	409.0	439.0	530.0	591.0
300	12"	357.0	387.0	408.0	438.0	567.0	393.0	603.0	655.0	813.0	918.0
350	14"	559.0	607.0	640.0	688.0	721.0	699.0	861.0	901.0	1023.0	1104.0
400	16"	950.0	1027.0	1079.0	1156.0	1207.0	1188.0	1445.0	1509.0	1701.0	1830.0
450	18"	1420.0	1534.0	1611.0	1725.0	1802.0	1629.0	2011.0	2107.0	2394.0	2585.0
500	20"	1967.0	2144.0	2262.0	2439.0	2557.0	2499.0	3089.0	3237.0	3679.0	3974.0
600	24"	3324.0	3579.0	3748.0	4003.0	4173.0	3579.0	4429.0	4641.0	5278.0	5703.0

Torques in Nm

#### 1) Connection type

Code 2: PN 10 / flange EN 1092, face-to-face dimension FTF EN 558 series 108

Code 3: PN 16 / flange EN 1092, face-to-face dimension FTF EN 558 series 108

Code 5: PN 25 / flange EN 1092, face-to-face dimension FTF EN 558 series 20

Code 6: PN 40 / flange EN 1092, face-to-face dimension FTF EN 558 series 109

Code D: ANSI B16.5, Class 150, face-to-face dimension FTF EN 558 series 108

Code M: ANSI B16.5, Class 300, face-to-face dimension FTF EN 558 series 109

**Weight:****Butterfly valve**

DN	NPS	Connection type code <sup>1)</sup>	
		D, 2, 3	M, 5, 6
50	2"	3.2	3.2
65	2½"	3.6	3.6
80	3"	4.9	4.9
100	4"	7.5	7.5
125	5"	8.0	8.0
150	6"	12.0	14.0
200	8"	18.0	23.0
250	10"	31.0	40.0
300	12"	47.0	66.0
350	14"	77.0	114.0
400	16"	96.0	146.0
450	18"	133.0	212.0
500	20"	156.0	261.0
600	24"	268.0	385.0

Weights in kg

1) **Connection type**

Code 2: PN 10 / flange EN 1092, face-to-face dimension FTF EN 558 series 108

Code 3: PN 16 / flange EN 1092, face-to-face dimension FTF EN 558 series 108

Code 5: PN 25 / flange EN 1092, face-to-face dimension FTF EN 558 series 20

Code 6: PN 40 / flange EN 1092, face-to-face dimension FTF EN 558 series 109

Code D: ANSI B16.5, Class 150, face-to-face dimension FTF EN 558 series 108

Code M: ANSI B16.5, Class 300, face-to-face dimension FTF EN 558 series 109

**Manual actuator**

Designation	Weight
AHL11, DAHL11, DAHL14	0.314
VHL14	0.7
VHL17	1.2
GB 232	5.4
GB880N	23.0

Weights in kg

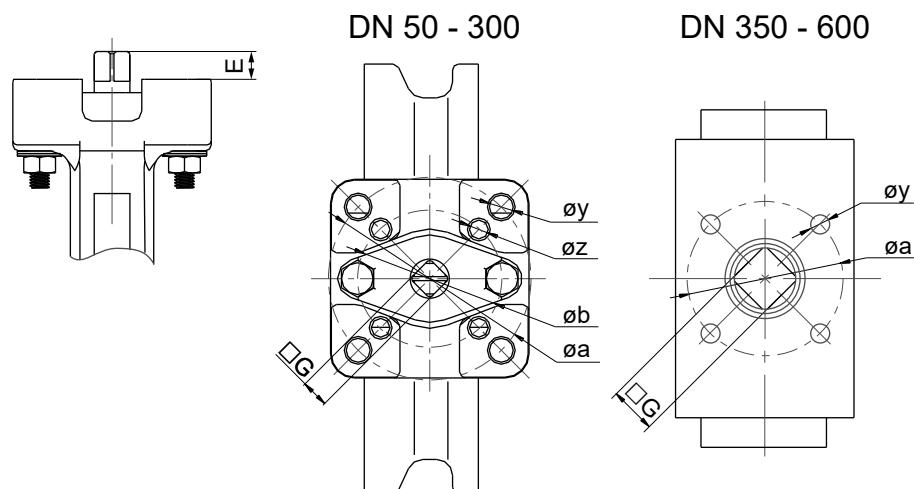
**Flow direction:**

Indicated by an arrow on the product

## 7 Dimensions

### 7.1 Actuator flange

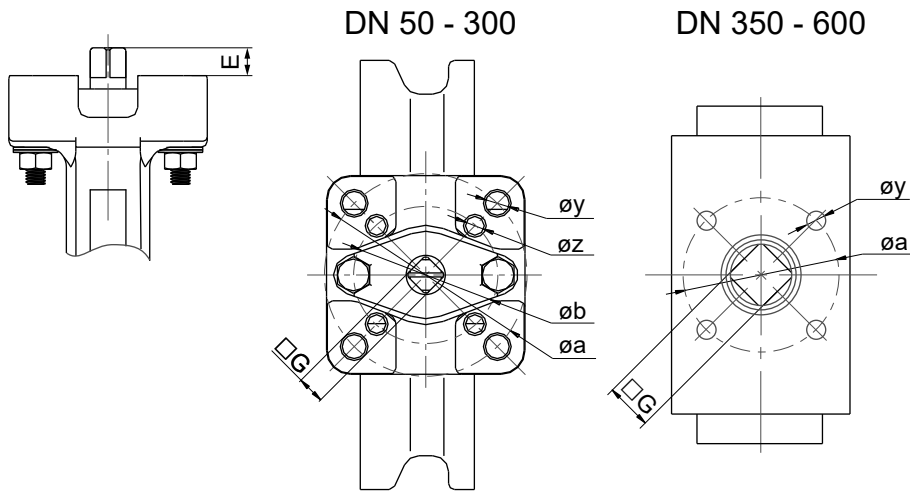
#### 7.1.1 Flange PN10 (code 2), PN16 (code 3), CLASS 150 (code D)



DN	NPS	ISO 5211	øa	øb	E	□G	øy	øz
50	2"	F05	50.0	-	15.0	11.0	4 x 7.0	-
65	2½"	F05/F07	70.0	50.0	15.0	11.0	4 x 9.5	4 x 7.0
80	3"	F05/F07	70.0	50.0	15.0	11.0	4 x 9.5	4 x 7.0
100	4"	F07	70.0	-	19.0	14.0	4 x 9.5	-
125	5"	F07	70.0	-	19.0	14.0	4 x 9.5	-
150	6"	F07/F10	102.0	70.0	19.0	14.0	4 x 12.0	4 x 9.5
200	8"	F10	102.0	-	22.0	17.0	4 x 12.0	-
250	10"	F10/F12	125.0	102.0	27.0	22.0	4 x 14.0	4 x 12.0
300	12"	F12/F14	140.0	125.0	32.0	27.0	4 x 18.0	4 x 14.0
350	14"	F14/F16	165.0	140.0	29.0	27.0	4 x 22.0	4 x 18.0
400	16"	F14/F16	165.0	140.0	38.0	36.0	4 x 22.0	4 x 18.0
450	18"	F14/F16	165.0	140.0	38.0	36.0	4 x 22.0	4 x 18.0
500	20"	F14/F16	165.0	140.0	48.0	46.0	4 x 22.0	4 x 18.0
600	24"	F16/F25	254.0	165.0	48.0	46.0	8 x 19.0	4 x 22.0

Dimensions in mm

### 7.1.2 Flange PN25 (code 5), PN40 (code 6), CLASS 300 (code M)

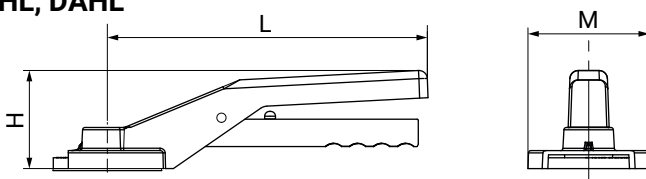


DN	NPS	ISO 5211	øa	øb	E	G	øy	øz
50	2"	F05	50.0	-	15.0	11.0	4 x 7.0	-
65	2½"	F05/F07	70.0	50.0	15.0	11.0	4 x 9.5	4 x 7.0
80	3"	F05/F07	70.0	50.0	15.0	11.0	4 x 9.5	4 x 7.0
100	4"	F07	70.0	-	19.0	14.0	4 x 9.5	-
125	5"	F07	70.0	-	19.0	14.0	4 x 9.5	-
150	6"	F10	102.0	-	22.0	17.0	4 x 12.0	-
200	8"	F10/F12	125.0	102.0	27.0	22.0	4 x 14.0	4 x 12.0
250	10"	F12/F14	140.0	125.0	32.0	27.0	4 x 18.0	4 x 13.5
300	12"	F14	140.0	-	32.0	27.0	4 x 18.0	-
350	14"	F14/F16	165.0	140.0	38.0	36.0	4 x 22.0	4 x 18.0
400	16"	F14/F16	165.0	140.0	48.0	46.0	4 x 22.0	4 x 18.0
450	18"	F16/F25	254.0	165.0	48.0	46.0	8 x 19.0	4 x 22.0
500	20"	F16/F25	254.0	165.0	57.0	55.0	8 x 19.0	4 x 22.0
600	24"	F16/F25	254.0	165.0	57.0	55.0	8 x 19.0	4 x 22.0

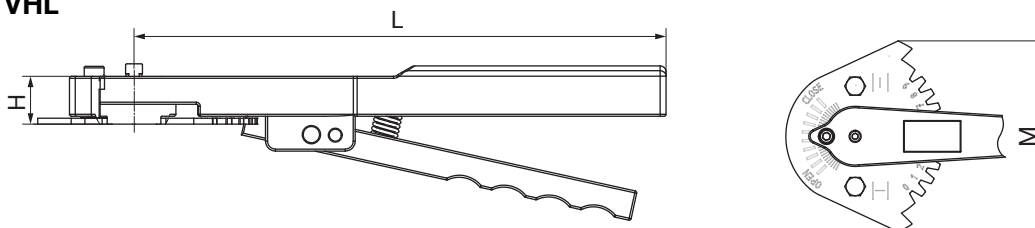
Dimensions in mm

### 7.2 Actuator dimensions

#### AHL, DAHL



#### VHL



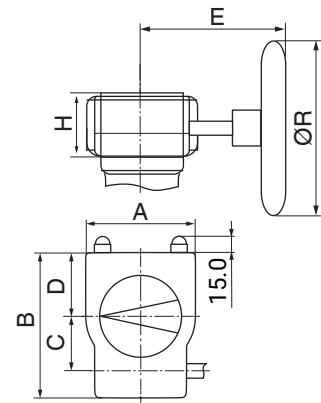
DN	Code	H	L	M
50 - 125	AHL11, DAHL11, DAHL14	70.0	200.0	74.0



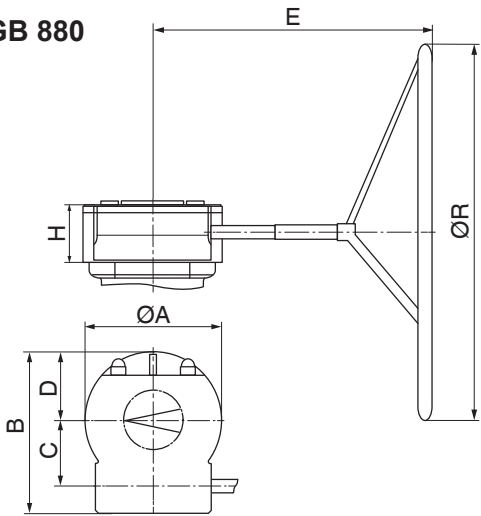
DN	Code	H	L	M
50 - 65	VHL14	19.0	195.0	107.0
80 - 125	VHL17	24.0	267.0	107.0

Dimensions in mm

### GB 232



### GB 880



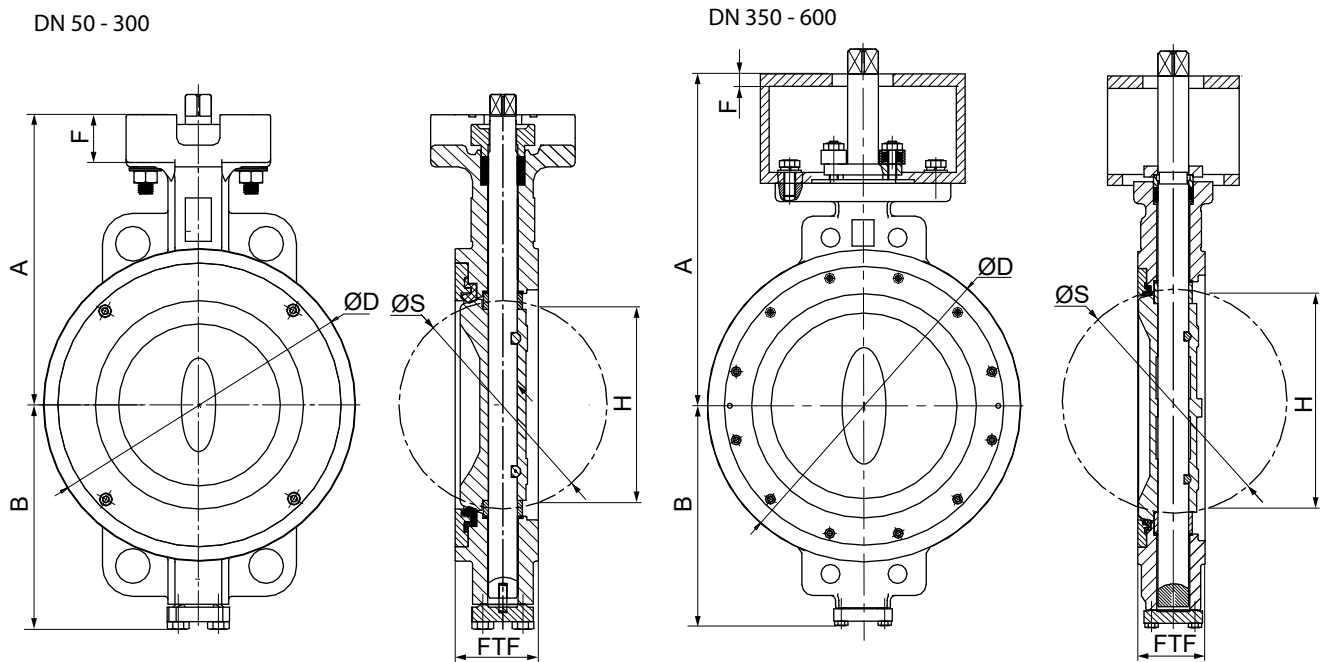
Code	DN	A	B	C	D	E	H	ØR
GB 232	50	80.0	114.0	42.5	48.0	121.0	53.0	100.0
	125	80.0	114.0	42.5	48.0	171.0	59.0	100.0
	150	80.0	114.0	42.5	48.0	171.0	59.0	160.0
	200 - 350	100.0	131.0	50.0	56.0	195.0	67.0	200.0
GB880N	400- 600	200.0	226.0	86.0	100.0	465.0	93.0	800.0

Dimensions in mm

### 7.3 Body

#### 7.3.1 Wafer body configuration

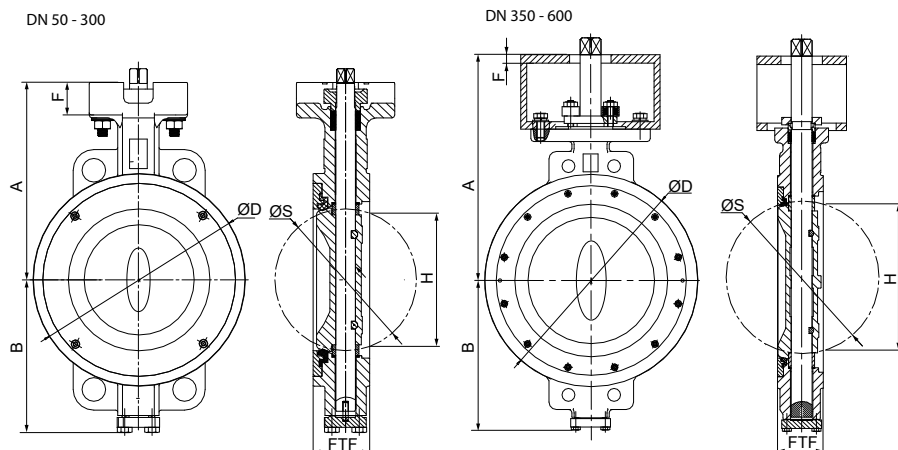
##### 7.3.1.1 Flange PN10 (code 2), PN16 (code 3), CLASS 150 (code D)



DN	NPS	A	B	ØD	F	FTF	H	ØS
50	2"	124.0	96.4	100.0	-	50.0	15.0	38.6
65	2½"	122.0	101.0	105.0	-	51.5	49.0	57.0
80	3"	143.5	115.0	132.0	-	49.5	69.0	74.0
100	4"	160.0	128.0	158.0	-	56.5	91.0	96.0
125	5"	176.5	148.0	186.0	-	57.0	103.0	111.0
150	6"	198.0	157.0	216.0	33.0	57.5	140.0	144.0
200	8"	230.0	195.0	266.0	35.0	63.0	179.0	188.0
250	10"	273.0	236.0	324.0	34.0	71.0	231.0	237.0
300	12"	319.0	262.0	381.0	30.0	81.5	276.0	283.0
350	14"	455.0	303.0	429.0	17.0	92.0	300.0	307.0
400	16"	490.0	337.5	480.0	17.0	101.5	347.0	363.5
450	18"	502.0	353.5	533.0	17.0	114.0	394.0	414.0
500	20"	524.0	376.5	584.0	17.0	127.0	434.0	458.0
600	24"	625.0	453.5	692.0	22.0	154.0	524.0	550.0

Dimensions in mm

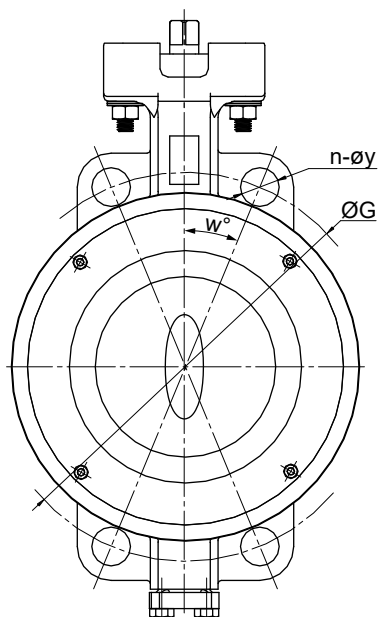
### 7.3.1.2 Flange PN25 (code 5), PN40 (code 6), CLASS 300 (code M)



DN	NPS	A	B	ØD	F	FTF	H	ØS
50	2"	124.0	96.4	100.0	22.0	50.0	15.0	38.6
65	2½"	122.0	101.0	105.0	15.0	51.5	49.0	57.0
80	3"	143.5	115.0	132.0	18.0	49.5	69.0	74.0
100	4"	160.0	128.0	158.0	23.0	56.5	91.0	96.0
125	5"	176.5	148.0	186.0	23.0	57.0	103.0	111.0
150	6"	217.5	170.5	216.0	26.0	59.0	140.0	144.0
200	8"	250.0	206.5	270.0	35.0	73.0	179.0	188.0
250	10"	303.0	248.0	324.0	31.0	83.0	231.0	237.0
300	12"	335.5	291.0	409.0	39.0	92.0	276.0	283.0
350	14"	470.0	320.5	445.0	17.0	117.0	300.0	315.0
400	16"	500.5	365.5	470.0	17.0	133.5	347.0	363.5
450	18"	531.0	382.5	560.0	17.0	149.0	394.0	414.0
500	20"	593.0	426.5	585.0	22.0	162.0	434.0	456.5
600	24"	645.0	498.0	692.0	22.0	181.0	524.0	550.0

Dimensions in mm

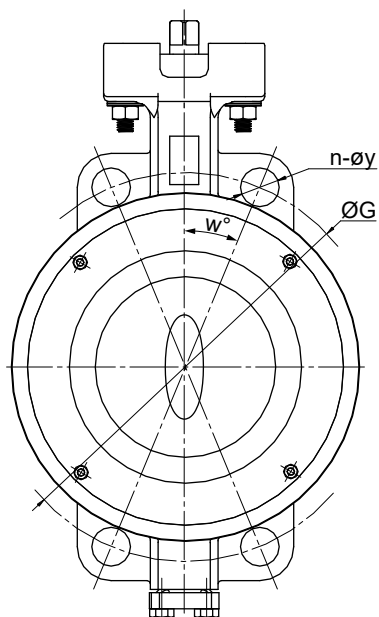
## 7.3.1.3 Connections



DN	NPS	PN10				PN16				PN25				PN40			
		n	ØG	w°	øy	n	ØG	w°	øy	n	ØG	w°	øy	n	ØG	w°	øy
50	2"	4	125.0	45.0	18.0	4	125.0	45.0	18.0	4	125.0	45.0	18.0	4	125.0	45.0	18.0
65	2½"	8	145.0	22.5	18.0	8	145.0	22.5	18.0	8	145.0	22.5	18.0	8	145.0	45.0	18.0
80	3"	8	160.0	22.5	19.0	8	160.0	22.5	19.0	8	160.0	22.5	19.0	8	160.0	22.5	19.0
100	4"	8	180.0	22.5	18.0	8	180.0	22.5	18.0	8	190.0	22.5	22.0	8	190.0	22.5	22.0
125	5"	8	210.0	22.5	18.0	8	210.0	22.5	18.0	8	220.0	22.5	26.0	8	220.0	22.5	26.0
150	6"	8	240.0	22.5	22.0	8	240.0	22.5	22.0	8	250.0	22.5	28.0	8	250.0	22.5	28.0
200	8"	8	295.0	22.5	24.0	12	295.0	15.0	24.0	12	310.0	15.0	28.0	12	320.0	15.0	30.0
250	10"	12	350.0	15.0	22.0	12	355.0	15.0	26.0	12	370.0	15.0	30.0	12	385.0	15.0	33.0
300	12"	12	400.0	15.0	22.0	12	410.0	15.0	26.0	16	430.0	11.25	M27	16	450.0	11.25	M30
350	14"	16	460.0	11.25	22.0	16	470.0	11.25	26.0	16	490.0	11.25	M30	16	510.0	11.25	M33
400	16"	16	515.0	11.25	28.0	16	525.0	11.25	30.0	16	550.0	11.25	M33	16	585.0	11.25	M36
450	18"	20	565.0	9.0	M24	20	585.0	9.0	M27	20	600.0	9.0	M33	20	610.0	9.0	M36
500	20"	20	620.0	9.0	M24	20	650.0	9.0	M30	20	660.0	9.0	M33	20	670.0	9.0	M39
600	24"	20	725.0	9.0	M27	20	770.0	9.0	M33	20	770.0	9.0	M36	20	795.0	9.0	M45

Dimensions in mm

n = number of bolt holes / bolts



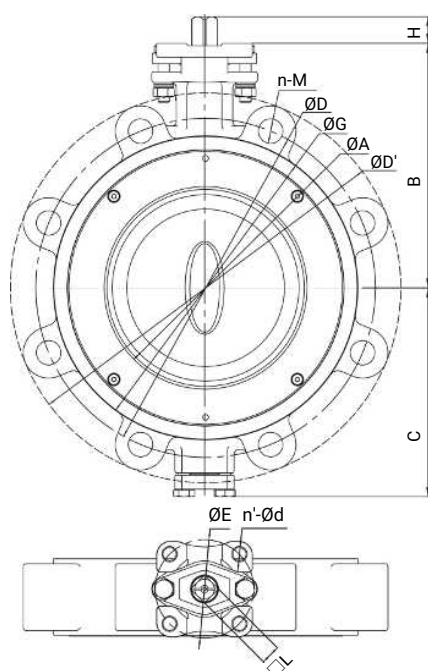
DN	NPS	CLASS 150				CLASS 300			
		n	ØG	w°	øy	n	ØG	w°	øy
50	2"	4	120.5	45.0	19.0	8	127.0	22.5	18.0
65	2½"	4	139.5	45.0	18.0	8	149.0	22.5	22.0
80	3"	4	152.5	45.0	19.0	8	168.5	22.5	22.0
100	4"	8	190.5	22.5	19.0	8	200.0	22.5	22.0
125	5"	8	216.0	22.5	24.0	8	235.0	22.5	22.0
150	6"	8	241.0	22.5	24.0	12	270.0	15.0	24.0
200	8"	8	298.5	22.5	24.0	12	330.0	15.0	28.0
250	10"	12	362.0	15.0	26.0	16	387.5	11.25	1" x 8UN
300	12"	12	432.0	15.0	26.0	16	451.0	11.25	1⅝" x 8UN
350	14"	12	476.0	15.0	30.0	20	514.5	9.0	1⅝" x 8UN
400	16"	16	540.0	11.25	28.6	20	571.5	9.0	1¼" x 8UN
450	18"	16	578.0	11.25	1⅝" x 8UN	24	628.5	7.5	1¼" x 8UN
500	20"	20	635.0	9.0	1⅝" x 8UN	24	685.5	7.5	1¼" x 8UN
600	24"	20	749.5	9.0	1¼" x 8UN	24	812.8	7.5	1½" x 8UN

Dimensions in mm

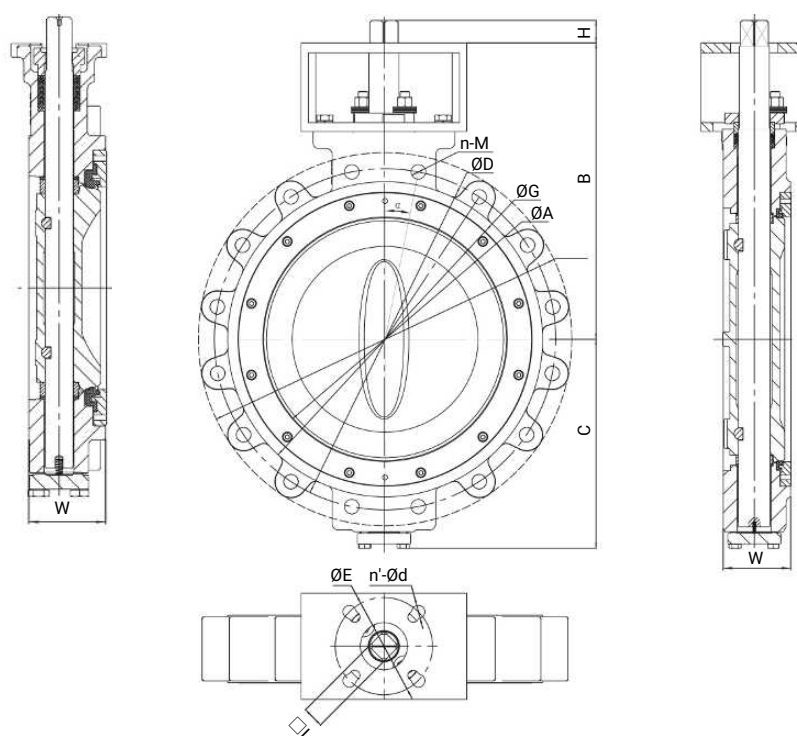
n = number of bolt holes / bolts

**7.3.2 Lug body configuration**

DN 50 - DN 300



DN 350 - DN 600



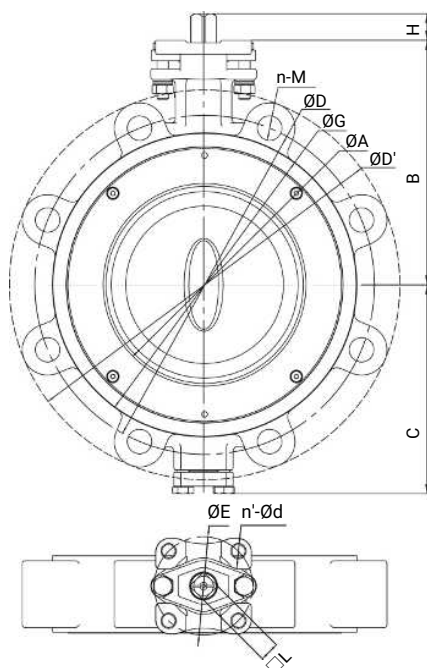
DN	NPS	ISO 5211	ØA	B	C	ØD'	ØG	H	□L	W	ØE	n'-ØF
50	2"	F05	38.5	116.0	86.0	155.0	100.0	15.0	11.0	42.0	50.0	4.0-7.0
65	2,5"	F05	57.0	126.2	93.0	174.0	105.0	15.0	11.0	45.5	50.0	4.0-7.0
80	3"	F05	74.0	133.8	102.0	182.5	132.0	15.0	11.0	47.0	50.0	4.0-7.0
100	4"	F07	96.0	148.5	118.0	220.5	158.0	19.0	14.0	52.0	70.0	4.0-9.5
125	5"	F07	111.0	161.5	133.0	250.0	186.0	19.0	14.0	54.0	70.0	4.0-9.5
150	6"	F07	144.0	173.8	148.5	277.0	216.0	19.0	14.0	57.5	70.0	4.0-9.5
200	8"	F10	188.0	230.0	195.0	335.0 / 331.0	266.0	22.0	17.0	60.0	102.0	4.0-12.0
250	10"	F10/F12	237.0	273.0	235.0	402.0	320.0	27.0	22.0	60.5	102.0/125.0	4.0-12.0/4.0-14.0
300	12"	F12/F14	283.0	319.0	261.0	472.0	378.0	32.0	27.0	78.5	150.0/140.0	4.0-14.0/4.0-18.0
350	14"	F14/F16	302.5	455.0	303.0	520.0	429.0	29.0	27.0	92.0	140.0/165.0	4.0-18.0/4.0-22.0
400	16"	F14/F16	363.5	490.0	342.0	588.0	480.0	38.0	36.0	101.6	140.0/165.0	4.0-18.0/4.0-22.0
450	18"	F14/F16	413.4	502.0	353.0	632.0	533.0	38.0	36.0	114.0	140.0/165.0	4.0-18.0/4.0-22.0
500	20"	F14/F16	458.0	524.0	376.0	704.0	584.0	48.0	46.0	127.0	140.0/165.0	4.0-18.0/4.0-22.0
600	24"	F16/F25	550.0	625.0	453.0	830.0	692.0	48.0	46.0	154.0	165.0/254.0	4.0-23.0/8.0-19.0

Dimensions in mm

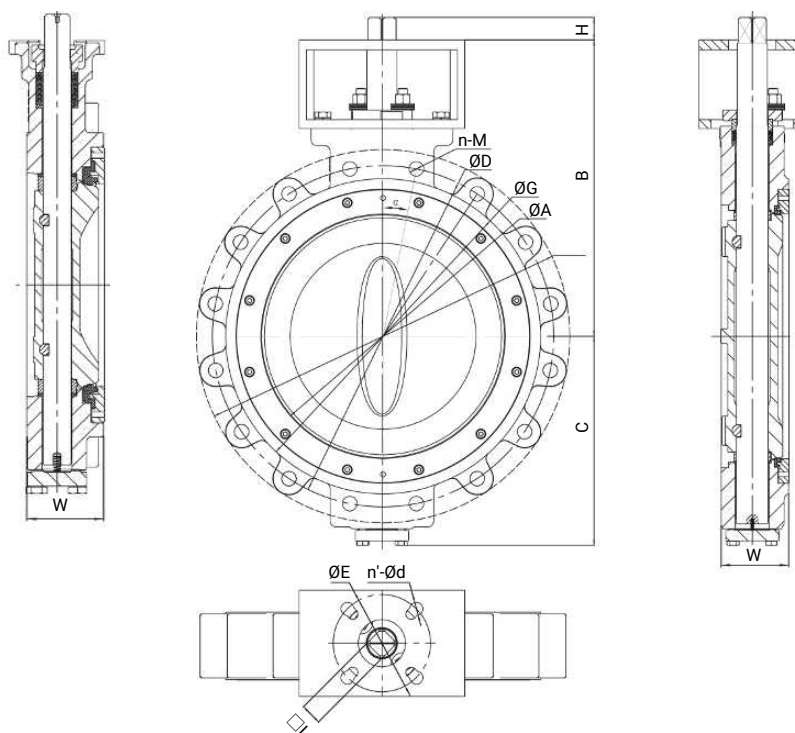
n = number of bolt holes / bolts

## 7.3.2.1 Connections

DN 50 - DN 300



DN 350 - DN 600



## PN10/PN16

DN	NPS	PN10				PN16			
		ØD	n-Ød	n-M	α	ØD	n-Ød	n-M	α
50	2"	125.0	4-M16	-	45.00°	125.0	4-M16	-	45.00°
65	2,5"	145.0	4-M16	-	45.00°	145.0	4-M16	-	45.00°
80	3"	-	-	-	-	-	-	-	-
100	4"	180.0	8-M16	-	22.50°	180.0	8-M16	-	22.50°
125	5"	210.0	8-M16	-	22.50°	210.0	8-M16	-	22.50°
150	6"	240.0	8-M20	-	22.50°	240.0	8-M20	-	22.50°
200	8"	295.0	8-M20	-	22.50°	295.0	12-M20	-	22.50°
250	10"	350.0	12-M20	-	15.00°	355.0	12-M24	-	15.00°
300	12"	400.0	12-M20	-	15.00°	410.0	12-M24	-	15.00°
350	14"	460.0	-	16-M20	11.25°	470.0	-	16-M24	11.25°
400	16"	515.0	-	16-M24	11.25°	525.0	-	16-M27	11.25°
450	18"	565.0	-	20-M24	9.00°	585.0	-	20-M27	9.00°
500	20"	620.0	-	20-M24	9.00°	650.0	-	20-M30	9.00°
600	24"	725.0	-	20-M27	9.00°	770.0	-	20-M33	9.00°

Dimensions in mm

n = number of bolt holes / bolts

**CLASS150**

DN	NPS	ØD	n-Ød	n-M	α
50	2"	120.5	4-5/8"-11UN	-	45.00°
65	2,5"	139.5	4-5/8"-11UN	-	45.00°
80	3"	152.5	4-5/8"-11UN	-	45.00°
100	4"	190.5	8-5/8"-11UN	-	22.50°
125	5"	216.0	8-3/4"-10UN	-	22.50°
150	6"	241.0	8-3/4"-10UN	-	22.50°
200	8"	298.5	8-3/4"-10UN	-	22.50°
250	10"	362.0	12-7/8"-9UN	-	15.00°
300	12"	432.0	12-7/8"-9UN	-	15.00°
350	14"	-	-	-	-
400	16"	539.8	-	16-1-UNC	11.25°
450	18"	-	-	-	-
500	20"	635.0	-	20-1½-8UN	9.00°
600	24"	749.3	-	20-1¼-8UN	9.00°

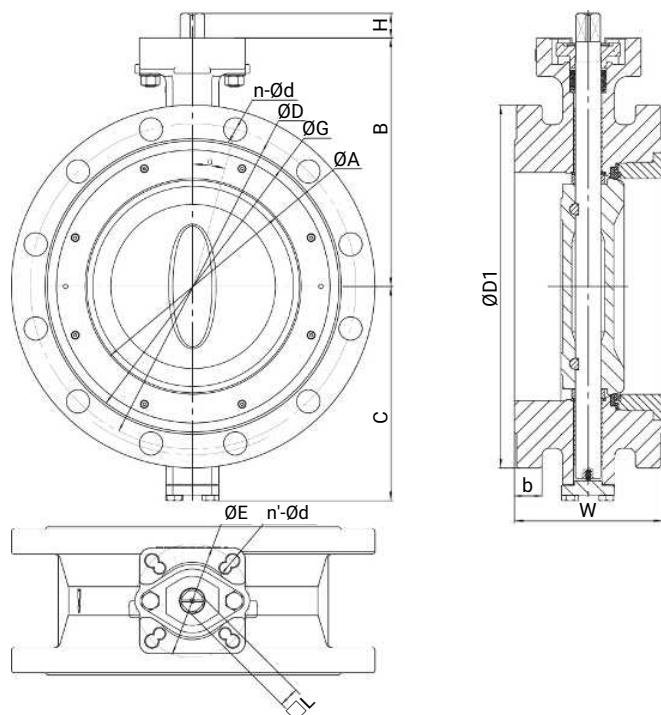
Dimensions in mm

n = number of bolt holes / bolts

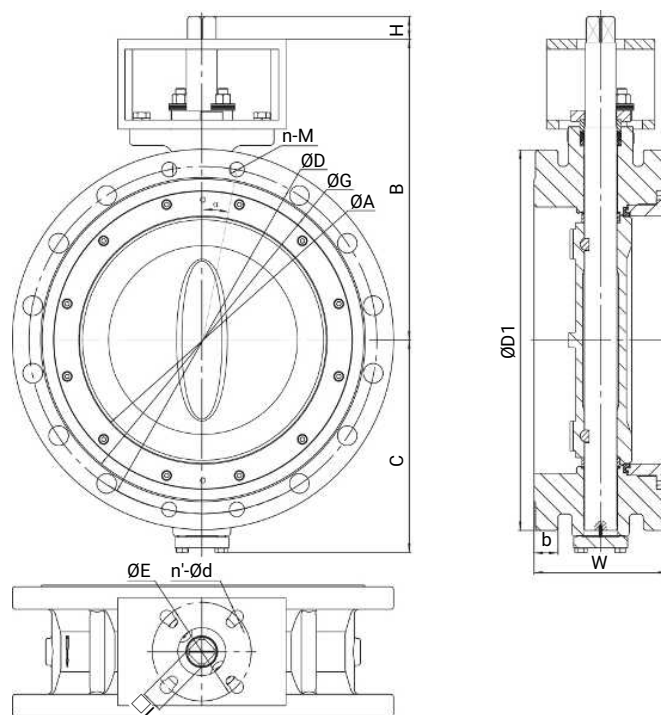


### 7.3.3 U section body configuration

DN 150 - DN 300



DN 350 - DN 600

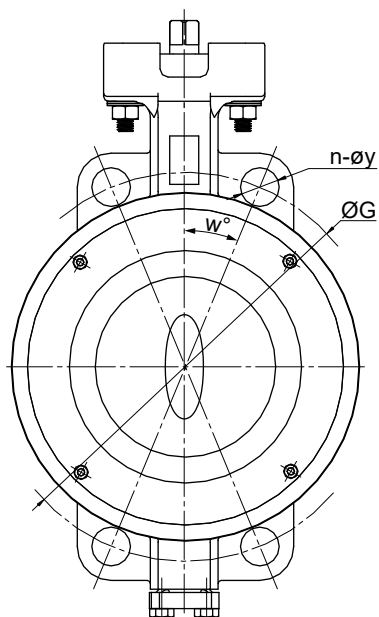


DN	NPS	ØA	B	C	ØG	H	□L	W	ØE	n'-ØF	ISO 5211
150	6"	144.0	198.0	157.0	216.0	19.0	14.0	140.0	70.0/102.0	4.0-9.5/4.0-12.0	F07/F10
200	8"	188.0	230.0	195.0	266.0	22.0	17.0	152.0	102.0	4.0-12.0	F10
250	10"	237.0	273.0	236.0	324.0	27.0	22.0	165.0	102.0/125.0	4.0-12.0/4.0-14.0	F10/F12
300	12"	283.0	318.5	262.0	381.0	32.0	27.0	178.0	125.0/140.0	4.0-14.0/4.0-18.0	F12/F14
350	14"	302.5	455.0	303.0	429.0	29.0	27.0	190.0	140.0/165.0	4.0-18.0/4.0-22.0	F14/F16
400	16"	363.5	490.0	342.0	480.0	38.0	36.0	216.0	140.0/165.0	4.0-18.0/4.0-22.0	F14/F16
450	18"	413.4	502.0	353.0	533.0	38.0	36.0	222.0	140.0/165.0	4.0-18.0/4.0-22.0	F14/F16
500	20"	458.0	524.0	376.0	584.0	48.0	46.0	229.0	140.0/165.0	4.0-18.0/4.0-22.0	F14/F16
600	24"	550.0	625.0	453.0	692.0	48.0	46.0	267.0	165.0/254.0	4.0-23.0/8.0-19.0	F16/F25

Dimensions in mm

n = number of bolt holes / bolts

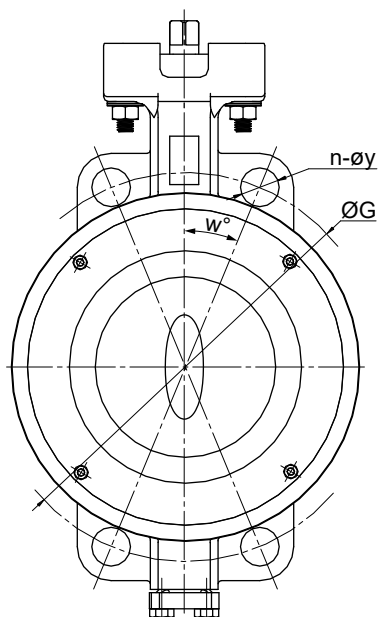
## 7.3.3.1 Connections



DN	NPS	PN10				PN16				PN25				PN40			
		n	ØG	w°	øy	n	ØG	w°	øy	n	ØG	w°	øy	n	ØG	w°	øy
50	2"	4	125.0	45.0	18.0	4	125.0	45.0	18.0	4	125.0	45.0	18.0	4	125.0	45.0	18.0
65	2½"	8	145.0	22.5	18.0	8	145.0	22.5	18.0	8	145.0	22.5	18.0	8	145.0	45.0	18.0
80	3"	8	160.0	22.5	19.0	8	160.0	22.5	19.0	8	160.0	22.5	19.0	8	160.0	22.5	19.0
100	4"	8	180.0	22.5	18.0	8	180.0	22.5	18.0	8	190.0	22.5	22.0	8	190.0	22.5	22.0
125	5"	8	210.0	22.5	18.0	8	210.0	22.5	18.0	8	220.0	22.5	26.0	8	220.0	22.5	26.0
150	6"	8	240.0	22.5	22.0	8	240.0	22.5	22.0	8	250.0	22.5	28.0	8	250.0	22.5	28.0
200	8"	8	295.0	22.5	24.0	12	295.0	15.0	24.0	12	310.0	15.0	28.0	12	320.0	15.0	30.0
250	10"	12	350.0	15.0	22.0	12	355.0	15.0	26.0	12	370.0	15.0	30.0	12	385.0	15.0	33.0
300	12"	12	400.0	15.0	22.0	12	410.0	15.0	26.0	16	430.0	11.25	M27	16	450.0	11.25	M30
350	14"	16	460.0	11.25	22.0	16	470.0	11.25	26.0	16	490.0	11.25	M30	16	510.0	11.25	M33
400	16"	16	515.0	11.25	28.0	16	525.0	11.25	30.0	16	550.0	11.25	M33	16	585.0	11.25	M36
450	18"	20	565.0	9.0	M24	20	585.0	9.0	M27	20	600.0	9.0	M33	20	610.0	9.0	M36
500	20"	20	620.0	9.0	M24	20	650.0	9.0	M30	20	660.0	9.0	M33	20	670.0	9.0	M39
600	24"	20	725.0	9.0	M27	20	770.0	9.0	M33	20	770.0	9.0	M36	20	795.0	9.0	M45

Dimensions in mm

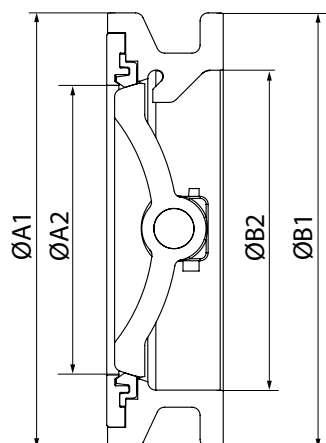
n = number of bolt holes / bolts



DN	NPS	CLASS 150				CLASS 300			
		n	ØG	w°	ø y	n	ØG	w°	ø y
50	2"	4	120.5	45.0	19.0	8	127.0	22.5	18.0
65	2½"	4	139.5	45.0	18.0	8	149.0	22.5	22.0
80	3"	4	152.5	45.0	19.0	8	168.5	22.5	22.0
100	4"	8	190.5	22.5	19.0	8	200.0	22.5	22.0
125	5"	8	216.0	22.5	24.0	8	235.0	22.5	22.0
150	6"	8	241.0	22.5	24.0	12	270.0	15.0	24.0
200	8"	8	298.5	22.5	24.0	12	330.0	15.0	28.0
250	10"	12	362.0	15.0	26.0	16	387.5	11.25	1" x 8UN
300	12"	12	432.0	15.0	26.0	16	451.0	11.25	1⅝" x 8UN
350	14"	12	476.0	15.0	30.0	20	514.5	9.0	1⅝" x 8UN
400	16"	16	540.0	11.25	28.6	20	571.5	9.0	1¼" x 8UN
450	18"	16	578.0	11.25	1⅝" x 8UN	24	628.5	7.5	1¼" x 8UN
500	20"	20	635.0	9.0	1⅝" x 8UN	24	685.5	7.5	1¼" x 8UN
600	24"	20	749.5	9.0	1¼" x 8UN	24	812.8	7.5	1½" x 8UN

Dimensions in mm

n = number of bolt holes / bolts

**7.4 Gasket**

DN	NPS	Connection											
		PN10, PN16, CL150, PN25, PN40, CL300				CL150				CL300			
		ØA1	ØA2	ØB1	ØB2	ØA1	ØA2	ØB1	ØB2	ØA1	ØA2	ØB1	ØB2
50	2"	99.6	38.6	99.0	56.0	-	-	-	-	-	-	-	-
65	2½"	105.0	57.0	104.8	74.0	-	-	-	-	-	-	-	-
80	3"	132.0	74.0	132.0	95.0	-	-	-	-	-	-	-	-
100	4"	157.5	96.0	156.7	115.8	-	-	-	-	-	-	-	-
125	5"	185.2	111.0	185.7	140.3	-	-	-	-	-	-	-	-
150	6"	-	-	-	-	215.2	144.0	215.2	159.9	215.5	144.0	215.5	159.5
200	8"	-	-	-	-	265.9	188.0	265.6	209.4	269.4	188.0	269.4	209.6
250	10"	-	-	-	-	324.0	118.5	324.0	254.0	324.0	237.0	324.0	254.0
300	12"	-	-	-	-	381.0	283.0	380.75	305.1	409.0	283.0	409.0	304.8
350	14"	-	-	-	-	427.6	307.2	428.0	365.0	445.0	314.7	445.0	364.0
400	16"	-	-	-	-	480.0	363.5	480.0	400.0	470.0	363.5	470.0	394.0
450	18"	-	-	-	-	533.0	414.0	533.0	444.5	560.0	414.2	560.0	444.5
500	20"	-	-	-	-	584.0	458.3	584.0	493.6	583.3	456.4	583.3	493.6
600	24"	-	-	-	-	692.0	549.8	692.0	610.0	690.3	549.8	690.3	599.7

Dimensions in mm



## 8 Manufacturer's information

### 8.1 Delivery

- Check that all parts are present and check for any damage immediately upon receipt.

The product's performance is tested at the factory. The scope of delivery is apparent from the dispatch documents and the design from the order number.

### 8.2 Transport

 <b>WARNING</b>	
	<b>Moving components!</b> <ul style="list-style-type: none"> <li>► Risk of injury!</li> <li>► Moving components can cause serious injury. Only actuate the valve once it has been fully installed in the relevant system. Actuating the valve when it has not been installed may lead to dangerous situations.</li> </ul>



1. Only transport the product by suitable means. Do not drop. Handle carefully.
2. After the installation dispose of transport packaging material according to relevant local or national disposal regulations / environmental protection laws.



### 8.3 Storage



1. Store the product free from dust and moisture in its original packaging.
2. Avoid UV rays and direct sunlight.
3. Do not exceed the maximum storage temperature (see chapter "Technical data").
4. Do not store solvents, chemicals, acids, fuels or similar fluids in the same room as GEMÜ products and their spare parts.
5. Close the compressed air connections with protection caps or sealing plugs.



## 9 Installation in piping



### 9.1 Preparing for installation



 <b>WARNING</b>	
	<b>The equipment is subject to pressure!</b> <ul style="list-style-type: none"> <li>► Risk of severe injury or death</li> <li>● Depressurize the plant or plant component.</li> <li>● Completely drain the plant or plant component.</li> </ul>



 <b>WARNING</b>	
	<b>Corrosive chemicals!</b> <ul style="list-style-type: none"> <li>► Risk of caustic burns</li> <li>● Wear appropriate protective gear.</li> <li>● Completely drain the plant.</li> </ul>



 <b>WARNING</b>	
	<b>GEMÜ products without an actuating element!</b> <ul style="list-style-type: none"> <li>► Risk of severe injury or death</li> <li>● Do not apply pressure to GEMÜ products installed in piping without an actuating element.</li> </ul>

 <b>CAUTION</b>	
	<b>Hot plant components!</b> <ul style="list-style-type: none"> <li>► Risk of burns</li> <li>● Only work on plant that has cooled down.</li> </ul>

 <b>CAUTION</b>	
	<b>Leakage</b> <ul style="list-style-type: none"> <li>► Emission of dangerous materials</li> <li>● Provide for precautionary measures against exceeding the maximum permissible pressure that may be caused by pressure surges (water hammer).</li> </ul>

 <b>CAUTION</b>	
	<b>Maximum permissible pressure exceeded!</b> <ul style="list-style-type: none"> <li>► Damage to the product!</li> <li>● Provide for precautionary measures against exceeding the maximum permissible pressure that may be caused by pressure surges (water hammer).</li> </ul>

 <b>CAUTION</b>	
	<b>Use as an end-of-line valve!</b> <ul style="list-style-type: none"> <li>► Damage to the GEMÜ product</li> <li>● When using the GEMÜ product as an end-of-line valve, a mating flange must be fitted.</li> </ul>

 <b>CAUTION</b>	
	<b>Risk of crushing!</b> <ul style="list-style-type: none"> <li>► Risk of severe injury</li> <li>● Before performing any work on the GEMÜ product, depressurize the plant.</li> </ul>

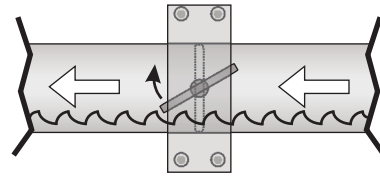
## NOTICE

### Suitability of the product!

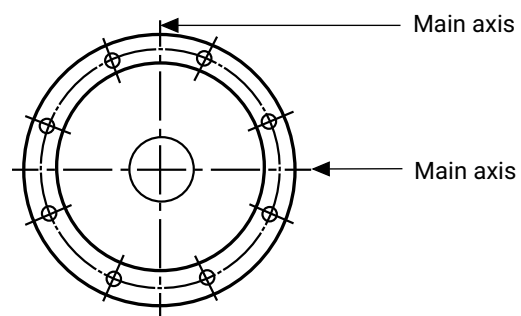
- The product must be appropriate for the piping system operating conditions (medium, medium concentration, temperature and pressure) and the prevailing ambient conditions.
1. Ensure the product is suitable for the relevant application.
  2. Check the technical data of the product and the materials.
  3. The external pressure must not exceed 1 bar PSa.
  4. Pressure surges are not permissible. The plant operator must plan appropriate precautionary measures.
  5. The pressure differential must not exceed the maximum operating pressure.
  6. The butterfly valve may only be used with a bonded liner up to 0.2 bar abs.
  7. The plant operator must ensure fire protection is in place. Regularly service electrical equipment designed for preventive fire protection in compliance with DIN VDE 0100-610 (IEC/EN 61557).
  8. Keep appropriate tools ready.
  9. Use appropriate protective gear as specified in plant operator's guidelines.
  10. Observe appropriate regulations for connections.
  11. Installation work must be performed by trained personnel.
  12. Shut off plant or plant component.
  13. Secure the plant or plant component against recommissioning.
  14. Depressurize the plant or plant component.
  15. Completely drain the plant or plant component and allow it to cool down until the temperature is below the media vaporization temperature and cannot cause scalding.
  16. Decontaminate, rinse and ventilate the plant or plant component properly.
  17. Lay piping so that the product is protected against transverse and bending forces, and also from vibrations and tension.
  18. Only install the product between matching aligned pipes (see following chapters).
  19. Please note the flow direction (see chapter "Installation location").
  20. Please note the installation position (see chapter "Installation location").
  21. The valve is not designed for loads caused by earthquakes.
  22. The plant operator must take into account loads and torques for the bearing elements.  
For valves with a nominal size > DN xx, suitable bearing elements may need to be used. Design weights and dimensions can be found in the datasheets.

## 9.2 Installation location

1. You can choose the installation position of the GEMÜ product. If media is contaminated and  $DN \geq 300$ , install GEMÜ R477 horizontally, so that the lower edge of the disc opens in-line with flow direction.



2. You can choose the flow direction of the GEMÜ product.
3. Arrange the bolt holes of piping and valves so that they are not on the two main axes (but rather symmetrical to them).



4. The inside diameter of the piping must match the nominal diameter of the GEMÜ product.
5. The diameter of the pipe flanges should be, in compliance with the respective nominal size, between "D max" and "D min" (see table).

DN	D max	D min
25	32	13
40	47	29
50	60	33
65	74	53
80	96	72
100	113	92
125	140	118
150	169	146
200	223	197
250	273	247
300	323	297
350	363	335
400	417	384
450	465	432
500	518	485
600	618	580

### 9.3 Installation of the standard version

#### CAUTION

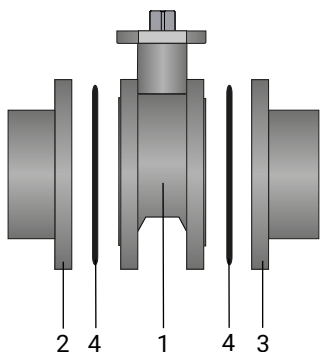
##### Damage!

- Before carrying out any welding on the piping, remove the butterfly valve to prevent damage to the liner.

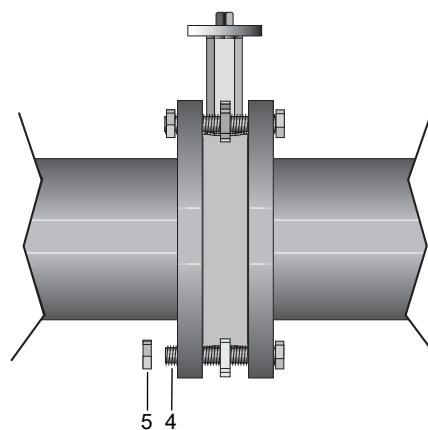
1. Shut off plant or plant component.
2. Secure against recommissioning.
3. Depressurize the plant or plant component.
4. Completely drain the plant or plant component and allow it to cool down until the temperature is below the media vaporization temperature and cannot cause scalding.
5. Correctly decontaminate, rinse and ventilate the plant or plant component.
6. Check flange faces for potential damage!
7. Remove any rough areas (rust, dirt, etc.) from the pipe flanges.
8. Sufficiently spread the pipe flanges.
9. Clamp the butterfly valve **1** centrally between the pipes with flanges **2** and **3**.
10. Centre the seals **4** accurately. Select seals according to medium (TFM/PTFE/graphite).

#### NOTICE

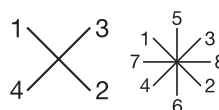
- Seals are not included in the scope of delivery.



11. Slightly open the butterfly valve **1**. The disc must not project from the body.
12. Insert bolts **4** in all holes in the flange.

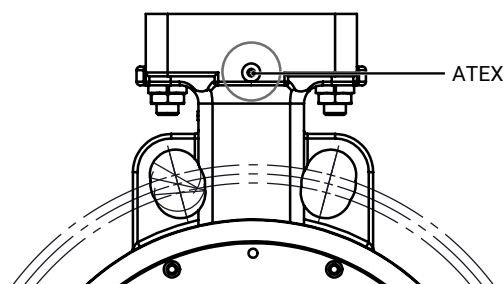


13. Slightly tighten the bolts **4** and nuts **5** diagonally.



14. Fully open the disc and check the alignment of the piping.
15. Tighten the nuts **5** diagonally until the flanges fit tightly on the body.  
Observe the permissible tightening torque of the bolts (see "Mechanical data").

### 9.4 Installation of the ATEX version



1. Install the butterfly valve, see chapter "Installation of the standard version".
2. Connect the earthing cable of the butterfly valve to the earth terminal of the plant.
3. Test the resistance between the earthing cable and actuator shaft (value <106 Ω, typical value <5 Ω).

## 10 Commissioning

#### WARNING



##### Corrosive chemicals!

- Risk of caustic burns
- Wear appropriate protective gear.
- Completely drain the plant.

**⚠ CAUTION****Leakage**

- ▶ Emission of dangerous materials
- Provide for precautionary measures against exceeding the maximum permissible pressure that may be caused by pressure surges (water hammer).

**⚠ CAUTION****Use as an end-of-line valve!**

- ▶ Damage to the GEMÜ product
- When using the GEMÜ product as an end-of-line valve, a mating flange must be fitted.

**⚠ CAUTION****Cleaning agent!**

- ▶ Damage to the GEMÜ product
- The plant operator is responsible for selecting the cleaning material and performing the procedure.

1. Check the tightness and the function of the product (close and reopen the product).
  2. Flush the piping system of new plant and following repair work (the product must be fully open).
- ⇒ Harmful foreign matter has been removed.
- ⇒ The product is ready for use.
3. Commission the product.
  4. Commissioning of actuators in accordance with the enclosed instructions.

**11 Operation****⚠ CAUTION****Incorrect operation of the hand lever!**

- ▶ Damage to the hand lever
- Do not open or close the hand lever with a fast movement.
- Do not extend the hand lever.

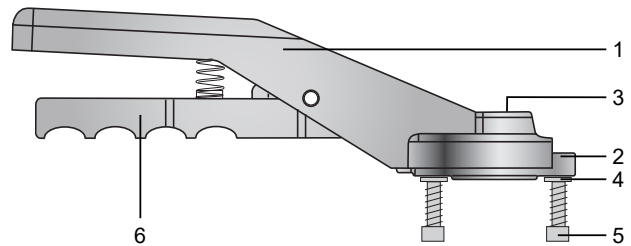
**11.1 Operating hand lever AHL / DAHL**

Fig. 1: Construction of hand lever AHL / DAHL

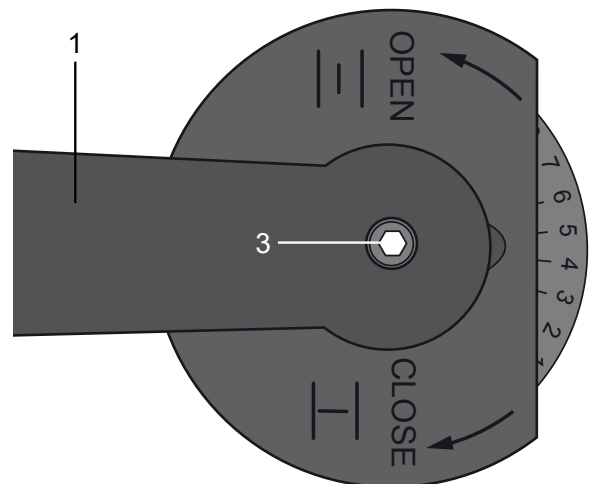


Fig. 2: Detail of latch setting of hand lever AHL / DAHL

1. Press locking device 6 upwards.
2. Move the hand lever 1 to the desired position and latch.

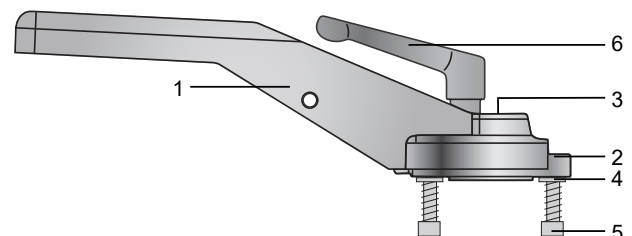
**11.2 Operating hand lever SAHL**

Fig. 3: Construction of hand lever SAHL



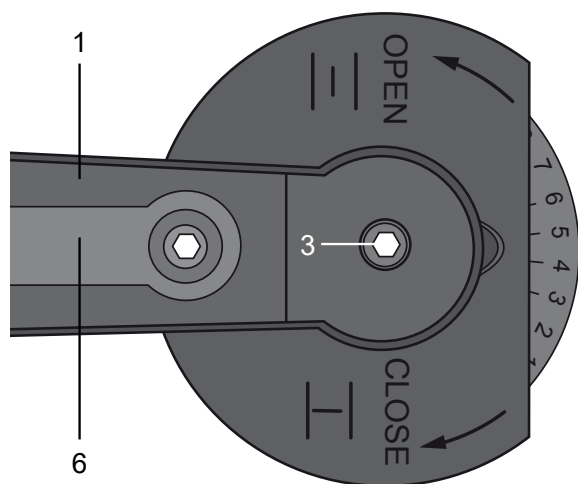


Fig. 4: Detail of latch setting of hand lever SAHL

1. Release locking device **6**.
  - ⇒ Turn the locking device anticlockwise: Hand lever loose.
2. Move the hand lever **1** to the desired position and fix the position with locking device **6**.
  - ⇒ Turn the locking device **6** clockwise: Hand lever fixed.

**12 Troubleshooting**

Error	Possible cause	Troubleshooting
The product does not open or does not open fully	Actuator defective	Replace the actuator
	Operating pressure too high	Operate the product with operating pressure specified in datasheet
	Foreign matter in the product	Remove and clean the product
	The actuator design is not suitable for the operating conditions	Use an actuator that is designed for the operating conditions
	Flange dimensions do not comply with specifications	Use correct flange dimensions
	Inside diameter of piping too small for nominal size of product	Install product with suitable nominal size
The product is leaking downstream (does not close or does not close fully)	Operating pressure too high	Operate the product with operating pressure specified in datasheet
The product does not close or does not close fully	The actuator design is not suitable for the operating conditions	Use an actuator that is designed for the operating conditions
	Foreign matter in the product	Remove and clean the product
Connection between valve body and piping leaking	Incorrect installation	Check installation of valve body in piping
	Threaded connections / unions loose	Tighten threaded connections / unions
	Sealing material faulty	Replace sealing material
Valve body leaking	Valve body leaking or corroded	Check valve body for damage, replace valve body if necessary
	Incorrect installation	Check installation of valve body in piping
Increased switching noises when opening the product	When the disc is in the closed position, this may cause a higher breakaway torque	Use the product regularly

### 13 Inspection and maintenance

#### ⚠ WARNING



##### The equipment is subject to pressure!

- ▶ Risk of severe injury or death
- Depressurize the plant or plant component.
- Completely drain the plant or plant component.

#### ⚠ CAUTION

##### Use of incorrect spare parts!

- ▶ Damage to the GEMÜ product
- ▶ Manufacturer liability and guarantee will be void.
- Use only genuine parts from GEMÜ.

#### ⚠ CAUTION



##### Hot plant components!

- ▶ Risk of burns
- Only work on plant that has cooled down.

#### NOTICE

##### Exceptional maintenance work!

- ▶ Damage to the GEMÜ product
- Any maintenance work and repairs not described in these operating instructions must not be performed without consulting the manufacturer first.

The operator must carry out regular visual examinations of the products, depending on the operating conditions and the potentially hazardous situations, in order to prevent leakage and damage.

1. Have servicing and maintenance work performed by trained personnel.
2. Wear appropriate protective gear as specified in the plant operator's guidelines.
3. Shut off plant or plant component.
4. Secure the plant or plant component against recommissioning.
5. Depressurize the plant or plant component.
6. Actuate products which are always in the same position four times a year.

#### 13.1 Cleaning the product

- Clean the product with a damp cloth.
- Do **not** clean the product with a high pressure cleaning device.

#### 13.2 ATEX version

1. Perform inspection and maintenance, see chapter "Installation of standard version".
2. Test the resistance between the earthing cable and actuator shaft at least once a year. (Value <106 Ω, typical value <5 Ω)

### 13.3 Removing the butterfly valve from the piping

#### ⚠ WARNING



##### The equipment is subject to pressure!

- ▶ Risk of severe injury or death!
- Depressurize the plant or plant component.
- Completely drain the plant or plant component.

#### ⚠ WARNING



##### Corrosive chemicals!

- ▶ Risk of caustic burns
- Wear appropriate protective gear.
- Completely drain the plant.

#### ⚠ CAUTION



##### Hot plant components!

- ▶ Risk of burns
- Only work on plant that has cooled down.

1. Maintenance work must only be performed by trained personnel.
2. Use appropriate protective gear as specified in plant operator's guidelines.
3. Move the butterfly valve to a slightly open position. The disc must not project from the body.
4. Loosen and remove flange bolts and nuts.
5. Spread the piping flanges.
6. Remove the butterfly valve.

## 14 Spare parts

### 14.1 Ordering spare parts

#### ⚠ CAUTION

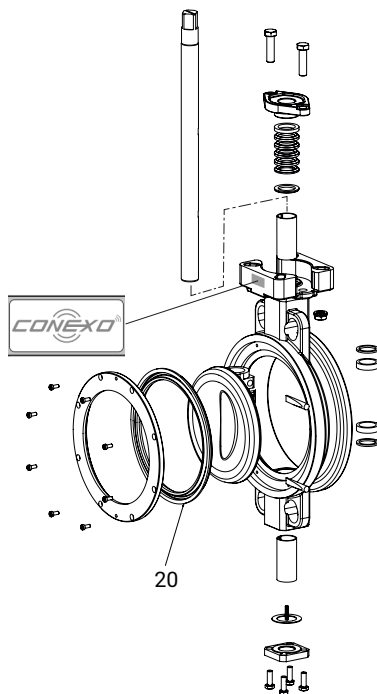
##### Use of incorrect spare parts!

- ▶ Damage to the GEMÜ product
- ▶ Manufacturer liability and guarantee will be void.
- Use only genuine parts from GEMÜ.

When ordering spare parts, please provide the following information:

1. Complete order code
2. Item number
3. Traceability number
4. Name of spare part
5. Area of use (medium, temperatures and pressures)

### 14.2 Overview of spare parts



Item	Name	Order designation
20	Seat	R470...SLN...5T

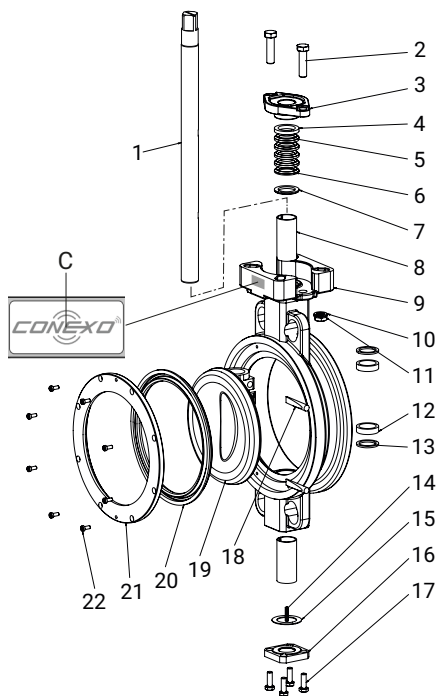
Item	Designation 1	Designation 2	Designation 3	Designation 4
88728128	R470 50SLN 6 5T	Wearing part liner R470	PN10, 16, 25, 40, CL150, CL300	Item 20, TFM 1600
88728131	R470 65SLN 6 5T	Wearing part liner R470	PN10, 16, 25, 40, CL150, CL300	Item 20, TFM 1600
88728132	R470 80SLN 6 5T	Wearing part liner R470	PN10, 16, 25, 40, CL150, CL300	Item 20, TFM 1600
88728134	R470100SLN 6 5T	Wearing part liner R470	PN10, 16, 25, 40, CL150, CL300	Item 20, TFM 1600
88728135	R470125SLN 6 5T	Wearing part liner R470	PN10, 16, 25, 40, CL150, CL300	Item 20, TFM 1600
88728137	R470150SLN 6 5T	Wearing part liner R470	PN10, 16, 25, 40, CL150, CL300	Item 20, TFM 1600

Item	Designation 1	Designation 2	Designation 3	Designation 4
88728139	R470200SLN 6 5T	Wearing part liner R470	PN10, 16, 25, 40, CL150, CL300	Item 20, TFM 1600
88728140	R470250SLN 3 5T	Wearing part liner R470	PN10, PN16, CL150	Item 20, TFM 1600
88728143	R470300SLN 3 5T	Wearing part liner R470	PN10, PN16, CL150	Item 20, TFM 1600
88728144	R470350SLN 3 5T	Wearing part liner R470	PN10, PN16, CL150	Item 20, TFM 1600
88728155	R470400SLN 3 5T	Wearing part liner R470	PN10, PN16, CL150	Item 20, TFM 1600
88728157	R470450SLN 6 5T	Wearing part liner R470	PN10, 16, 25, 40, CL150, CL300	Item 20, TFM 1600
88728158	R470500SLN 3 5T	Wearing part liner R470	PN10, PN16, CL150	Item 20, TFM 1600
88728160	R470600SLN 3 5T	Wearing part liner R470	PN10, PN16, CL150	Item 20, TFM 1600
88728141	R470250SLN 6 5T	Wearing part liner R470	PN25, PN40, CL300	Item 20, TFM 1600
88728142	R470300SLN 6 5T	Wearing part liner R470	PN25, PN40, CL300	Item 20, TFM 1600
88728152	R470350SLN 6 5T	Wearing part liner R470	PN25, PN40, CL300	Item 20, TFM 1600
88728156	R470400SLN 6 5T	Wearing part liner R470	PN25, PN40, CL300	Item 20, TFM 1600
88728159	R470500SLN 6 5T	Wearing part liner R470	PN25, PN40, CL300	Item 20, TFM 1600
88728161	R470600SLN 6 5T	Wearing part liner R470	PN25, PN40, CL300	Item 20, TFM 1600

### 14.3 Replacement of spare parts

#### NOTICE

- Assembly instructions for replacing the wearing parts are included with every wearing parts kit.



1. Undo and remove the hexagon screws **22**.
2. Remove the seat retainer **21**.
3. Remove and replace the seat **20**.
4. Assembly in reverse order.

### 15 Removal from piping

1. Disassemble the product. Observe warning notes and safety information.
2. Remove in reverse order to installation.

### 16 Disposal

1. Pay attention to adhered residual material and gas diffusion from penetrated media.
2. Dispose of all parts in accordance with the disposal regulations/environmental protection laws.

### 17 Returns

Legal regulations for the protection of the environment and personnel require that the completed and signed return delivery note is included with the dispatch documents. Returned goods can be processed only when this note is completed. If no return delivery note is included with the product, GEMÜ cannot process credits or repair work but will dispose of the goods at the operator's expense.

1. Clean the product.
2. Request a return delivery note from GEMÜ.
3. Complete the return delivery note.
4. Send the product with a completed return delivery note to GEMÜ.

**18 Declaration of Incorporation according to 2006/42/EC (Machinery Directive)**

# **Declaration of Incorporation**

**according to the EC Machinery Directive 2006/42/EC, Annex II, 1.B for partly completed machinery**

We, the company  
GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG  
Fritz-Müller-Strasse 6-8  
74653 Ingelfingen-Criesbach, Germany

declare that the following product  
Make: GEMÜ Butterfly valve, metal for operation with hand lever or gearbox  
Serial number: from 20.03.2019  
Project number: KL-Metall-Hand-2018-03  
Commercial name: GEMÜ R477

**meets the following essential requirements of the Machinery Directive 2006/42/EC:**

1.1.3, 1.1.5, 1.1.7, 1.2.1, 1.2.2, 1.2.3, 1.2.4, 1.2.5, 1.2.6, 1.3., 1.3.2, 1.3.3, 1.3.4, 1.3.7, 1.3.8, 1.3.9, 1.5.3, 1.5.5, 1.5.6, 1.5.7, 1.5.8, 1.5.9, 1.5.13, 1.5.14, 1.5.16, 1.6.1, 1.6.3, 1.6.5, 1.7.1.2

**We also declare that the specific technical documentation has been compiled in accordance with part B of Annex VII.**

**Citation of the harmonized standards used in compliance with Article 7 Section 2:**

EN ISO 12100:2010-11 Safety of machinery – General principles for design – Risk assessment and risk reduction (ISO 12100:2010)

EN 593:2017 Industrial valves – Metallic butterfly valves for general purposes

**Citation of other technical standards and specifications used:**

EN 558:2017-05 Industrial valves – Face-to-face and centre-to-face dimensions of metal valves for use in flanged pipe systems

The manufacturer or his authorised representative undertake to transmit, in response to a reasoned request by the national authorities, relevant information on the partly completed machinery. This transmission takes place:

Electronically  
Authorised documentation officer **GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG**  
**Fritz-Müller-Straße 6-8**  
**74653 Ingelfingen, Germany**

This does not affect the industrial property rights!

**Important note! The partly completed machinery may be put into service only if it was determined, where appropriate, that the machinery into which the partly completed machinery is to be installed meets the provisions of this Directive.**

2024-09-24



Joachim Brien  
Head of BU Industry

19 Declaration of conformity according to 2014/68/EU (Pressure Equipment Directive)

EU Declaration of Conformity  
in accordance with 2014/68/EU (Pressure Equipment Directive)

We, the company GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG  
Fritz-Müller-Strasse 6-8  
74653 Ingelfingen-Criesbach, Germany

declare that the product listed below complies with the safety requirements of the Pressure Equipment Directive 2014/68/EU.

Description of the pressure equipment: GEMÜ R477  
Notified body: TÜV Rheinland Industrie Service GmbH  
Number: 0035  
Certificate no.: 01 202 926/Q-02 0036  
Conformity assessment procedure: Module H  
Technical standard applied in parts: EN 1983, AD 2000


Classification of the valves: Max. permissible operating pressure when used as:

Wafer type butterfly valve						End-of-line valve
	Fluids of group 1		Fluids of group 2			Fluids of group 1 and 2
PS	Gases	Liquids	Gases	Liquids		Liquids
16	DN25–DN200	DN25–DN200	DN25–DN200	DN25–DN200		
10	DN250–DN350	DN250–DN600	DN250–DN500	DN250–DN600		DN25–DN200
6			DN600			DN250–DN600

Note for products with a nominal size ≤ DN 25:

The products are developed and produced according to GEMÜ process instructions and quality standards which comply with the requirements of ISO 9001 and ISO 14001.  
According to Article 4, Paragraph 3 of the Pressure Equipment Directive 2014/68/EU these products must not be identified by a CE-label.

2024-09-24



Joachim Brien  
Head of BU Industry





GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG  
Fritz-Müller-Straße 6-8, 74653 Ingelfingen-Criesbach, Germany  
Phone +49 (0) 7940 1230 · [info@gemue.de](mailto:info@gemue.de)  
[www.gemu-group.com](http://www.gemu-group.com)

Subject to alteration

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