High Flow Straightway Diaphragm Valve

2/2 Way - Manually Operated

Introduction

Diaphragm valve with straightway design, 2/2 - way, metal construction for high flow services. Sealing is effected by a flexible diaphragm (made of elastomeric material), which when fully closed seals tight for positive closure even with fibrous or gritty materials in the pipeline. Because of its smooth body geometry, linings are available with high chemical and abrasion resistance. The Gemü 657 high flow straightway diaphragm valve is therefore the ideal choice for on-off service involving abrasive slurries, sludges, high viscosity fluids and other applications where higher flow capacity and unobstructed flow are demanded.



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2/2 Way - Manually Operated

Construction



A versatil strong valve of easy operation comprising a single body, a metal bonnet and a resilient rubber diaphragm. When GEMÜ 657 valve is fully open, the “high lift” travel of the diaphragm in this position permits a straight-through flow in either direction and valve cleaning by rodding or brushing without removal of the bonnet. The diaphragm has basically two functions i.e., to cut off the flow and to isolate the working parts from the media, thus the process fluid only contacts the body/lining and the diaphragm. The 657 standard ductile iron bonnet features visual position indicator, 304 stainless steel locking device and lube fitting. In addition, GEMÜ 657 valve has a non-rising "ergonomic" handwheel and a stainless steel rising stem with position indicator. This valve is available with diameters of 25 to 200 mm (1" to 8"), flanged, epoxi painted ductile iron or other material (on request). A comprehensive variety of body lining and diaphragm materials generates hundreds of possible GEMÜ 657 straightway valve combinations and permits efficient handling of a lot of corrosive and abrasive slurries, high viscosity fluids and media containning solids in suspension. The valve will seal against flow in either direction up to full working pressure.

Advantages



- Particularly suited for higt flow services.
- Valve life is longer than other conventional straight-through valves due to a lower flow restriction.
- Long trouble-free operation and lower operating cost. High operating efficiency on account of low pressure drop and streamline flow.
- Bubbletight shutoff. The diaphragm will accommodate itself to grit, rust, slurry or fibrous particles present in the line.
- The GEMÜ 657 can be rodded or brushed without removing bonnet.
- The diaphragm isolates the process fluid from working parts of the valve providing long life to the bonnet assembly.
- No stuffing box to repack or packing gland to adjust.
- Lower maintenance cost/easy in line maintenance. The diaphragm is replaced quickly and easily without the need to remove the body from the pipeline.
- Possibility of replacement of other diaphragm valves (other manufacturer) already installed.
- The valve can be installed in any position in the pipeline and used in either direction of flow (bidirectional).
- Confortable handwheel for easy operation.
- Wide interchangeability of bonnet assemblies and diaphragms.
- Easy future automation using pneumatic actuators GEMÜ 659 without the need to remove the body from the pipeline.
- Out and out durability and efficiency.



Applications

Depending on the material of the valve body or lining and the diaphragm used, the valve can be used for shutting off flow of practically any liquid or gaseous fluid, either neutral or aggressive and with or without solid materials in suspension. This valve type is well suited for on-off service involving media such as abrasive and acid slurries, clays, fertilizers, fibrous slurries, viscous fluids, cement, anode slimes and ores (coal, iron ore, phosphates, bauxite, etc) as found in mining, minerals processing plants, fertilizer industry, pulp and paper mills, titanium dioxide plants, industrial effluent and sewage treatment, alcohol and sugar plants, liquid or solid product recovery, among others.

Subject to alteration

Construction Details and Advantages

Typical configuration

"Ergonomic" Handwheel (Non-rising)

Lube fitting

Thrust bearing.
(It makes easier the valve operation)

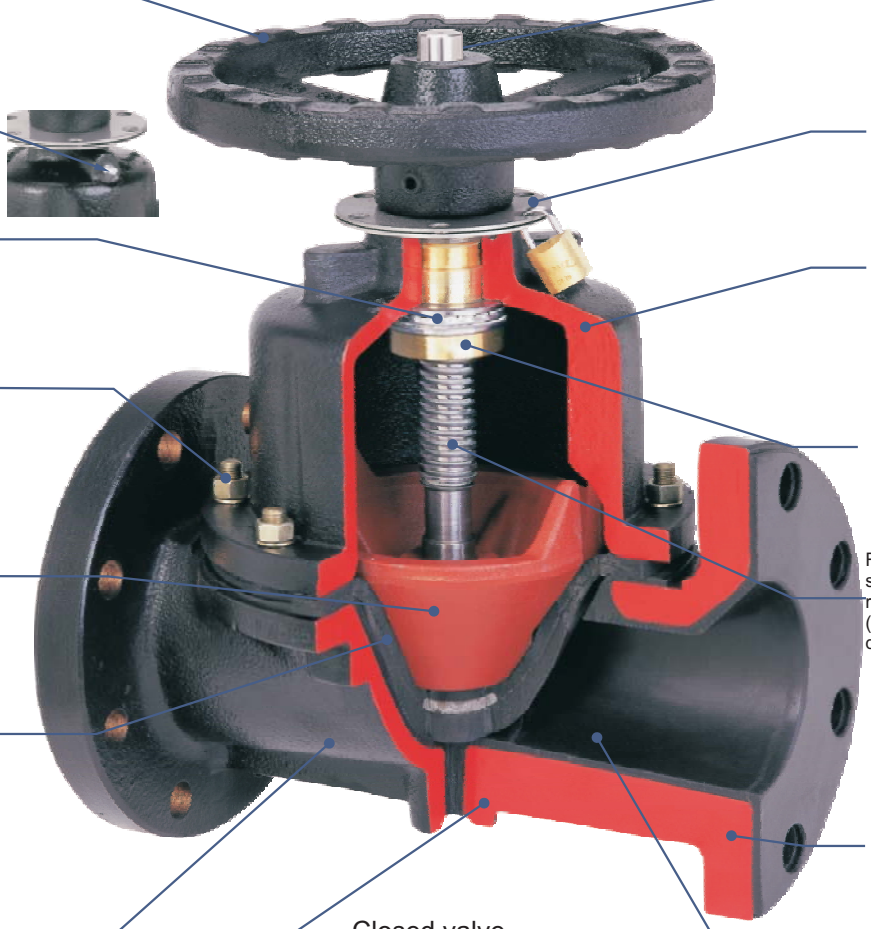
Plated carbon steel fasteners
(stainless steel on request)

Compressor assembly supports the diaphragm throughout valve stroke

Diaphragm
available in various elastomer grades to suit all abrasive and corr-abrasive applications. Provides a bubble-tight seal and isolates all bonnet parts from the line fluid

Standard black epoxy paint (other special paint upon request)

Standard ductile iron body with smooth bore and high flow straightway design



Closed valve

Standard visual position indicator

Stainless steel handwheel locking collar (Protection system against unauthorized operation of the valve - padlock is supplied separately

Standard ductile iron Bonnet (It can be removed from the pipeline without removing the valve body)

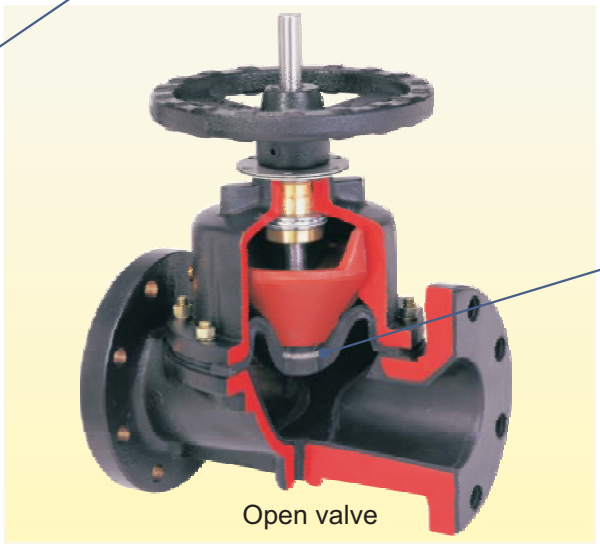
Brass Bushing

Rising AISI 410 stainless steel stem features precision rolled trapezoid threads (provides strength and durability)

Lining of the body of different materials such as Hard Rubber (Ebonite), Hypalon, Butyl, Neoprene, Natural Rubber, Derakene, PP (polypropylene), Tefzel, ECTFE (Halar), glass, among others

All rubber and plastic lined bodies are injection molded through 8". Its smooth high flow design without internal cavities or crevices to entrap process fluids provides a higher flow than other competitive diaphragm valves

Diaphragm stays completely out of the flow passage when the valve is fully open. The 657 is self draining when piping is pitched



Open valve

Subject to alteration

Technical Data for Ordering

GENERAL DATA

Working medium: According to body material, lining and sealing (diaphragm), any neutral or corrosive liquid or gaseous fluid. Well suited for abrasive and slurry applications

Maximum perm. temperature of working medium: 120°C
(Maximum limit may vary according to the diaphragm and lining material)

Maximum working *Pressure: 7 bar
May be lower due to the valve diameter - see the table of working pressures on page 07/22.
* The GEMÜ 657 valve is not recommended for vacuum service

Note: Refer to the document "GEMÜ general technical data on metal diaphragm valves" and the "GEMÜ Table of chemical resistance" for correct selection of materials.

SPECIFICATION AND CODING

Note: In case of any doubt see the document "GEMÜ BR Product figure number code system"

Product Category	Ref. No.
Valve	V

Product Type	Ref. No.
GEMÜ 657 High Flow Straightway Metal Diaphragm Valve handwheel operated	0657

Nominal Size* (DN)			Ref. No.
(mm)	(In.)	Kv (m³/h)**	
25	1"	48	025
40	1.½"	98	040
50	2"	240	050
65	2.½"	380	065
80	3"	450	080
100	4"	590	100
150	6"	1800	150
200	8"	3600	200

* Refer to the Gemü 655 standard bore straightway diaphragm valve for other valve sizes, i.e.: DN 15 (1/2"), DN 20 (3/4"), DN 125 (5"), DN 250 (10"), DN 300 (12") and DN 350 (14")
** Kv (data relative to valves without lining). For additional Kv ratings (lined valves), see on page 07/22.

Body Configuration	Ref. No.
Two-way body with inlet and outlet on the same axis	D

Valve Connection	Ref. No.
Flanged ANSI B16.5, class 150, RF (smooth finish). Face-to-face MSS SP-88.	38
Flanged ANSI B16.5, class 150, FF (smooth finish). Face-to-face MSS SP-88.	44
Flanged ANSI B16.1, class 125, FF (smooth finish). Face-to-face MSS SP-88.	45
Flanged ANSI B16.5, class 150, RF (serrated concentric) Face-to-face MSS SP-88.	3B

Note: Other Connections, on request.

Subject to alteration

Technical Data for Ordering

Body/Lining Material	Ref. No.
Cast iron DIN 1691 GG 25 Max. temperature: Limited by diaphragm selection	08
Cast carbon steel ASTM A 216 Grade WCB Max. temperature: Limited by diaphragm selection	11
Ductile iron DIN 1693 GGG 40.3 with Polypropylene lining. Max. temperature: Limited by diaphragm selection	18
316L Cast stainless steel ASTM A 351 Grade CF3M Max. temperature: Limited by diaphragm selection	44
316 Cast stainless steel ASTM A 351 Grade CF8M Max. temperature: Limited by diaphragm selection	47
Cast iron DIN 1691 GG 25 with glass lining Max. temperature: Limited by diaphragm selection	50
Cast iron DIN 1691 GG 25 with ECTFE (Halar) coating Max. temperature: Limited by diaphragm selection	55
Ductile iron DIN 1693 GGG 40.3 with Tefzel lining. Max. temperature: Limited by diaphragm selection	62
Ductile iron DIN 1693 GGG 40.3 with soft natural rubber lining. Max. temperature: -20°C to 80°C	82
Ductile iron DIN 1693 GGG 40.3 with hard rubber lining. Max. temperature: -20°C to 90°C	83
Ductile iron DIN 1693 GGG 40.3 with PVDF lining. Max. temperature: Limited by diaphragm selection	85
Ductile iron DIN 1693 GGG 40.3 with Hypalon lining . Max. temperature: -10°C to 90°C	86
Ductile iron DIN 1693 GGG 40.3 with Neoprene lining . Max. temperature: -20°C to 90°C	87
Ductile iron DIN 1693 GGG 40.3 with Butyl lining . Max. temperature: -20°C to 100°C	88
Ductile iron DIN 1693 GGG 40.3 with silica free soft natural rubber lining . Max. temperature: -20°C to 80°C	89

Note: Other materials for body and lining on request.

Diaphragm Material	Ref. No.
CSM Hypalon (Chlorine Sulphonyl Polyethylene Rubber) Max. temperature: -10°C to 90°C	01
NBR Perbunan (Nitrile Butadiene Rubber) Max. temperature: -10°C to 80°C	02
FPM Viton (Fluorine Rubber) Max. temperature: -10°C to 120°C	04
IIR (Butyl Rubber) Max. temperature: -20°C to 100°C	06
CR Neoprene (Chloroprene Rubber) Max. temperature: -20°C to 90°C	08
NR Natural Rubber. Max. temperature: -20°C to 80°C	15
EPDM Ethylene Propylene Rubber Max. temperature: -20°C to 110°C	24
NR Silica free Natural Rubber. Max. temperature: -20°C to 80°C	25

Note: Other materials for Diaphragm on request.

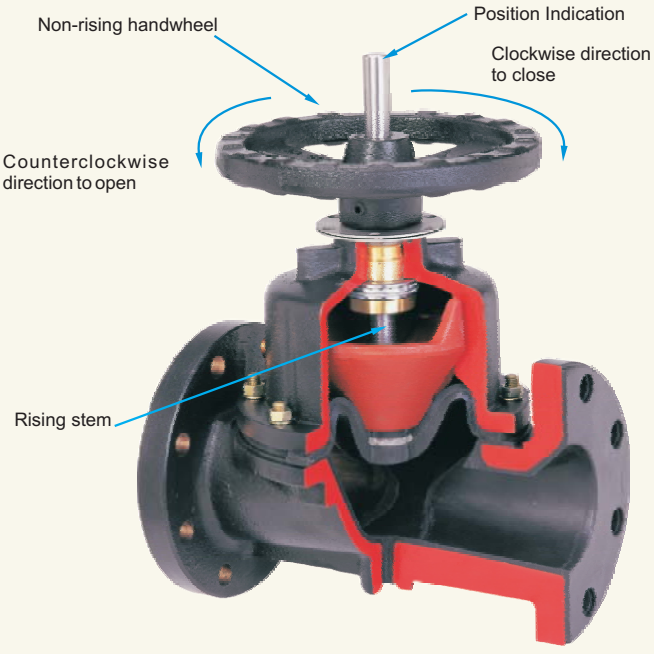
Control Function	Ref. No.
Manually operated	0

Subject to alteration

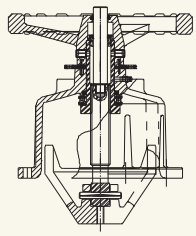
Technical Data for Ordering

Bonnet Assembly Options

Valve Operation



Note: Valves for applications in highly corrosive environment (with special protection in epoxy, Halar, polyurethane, chemical nickel, etc), on request.

Product	Supplementary Code
 Actuator with sealed bonnet*. (Additional safety should the diaphragm ruptures, specially indicated for hazardous service applications).	8544
* A standard sealed bonnet is only recommended for hazardous materials which will not damage bonnet shell, stem, bushing or compressor. Selaled bonnet are not equipad with lube fitting.	
 Electrical limit switches:	
-Valve Position (open/closed)	8237
-Valve Position (open)	7233
-Valve Position (closed)	7154
 Proximity switches:*	
-Valve Position (open/closed)	8237
-Valve Position (open)	7233
-Valve Position (closed)	7154
* 3 wire, PNP (other types, i.e.: NPN, or 2 wire NAMUR, on request)	

Product	Supplementary Code
 Extended stem*	
-Extension of 1.0 m	8522
-Extension of 1.5 m	8564
-Extension of 2.0 m	8565
-Extension of 2.5 m	8566
-Extension of 3.0 m	8567
Other lengths available on request.	
* Furnished when access to handwheel is limited	
 Optical position indicator with adjustable travel stop	8501
In addition to indicating valve position, the closing stroke can be limited to prevent overclosure of the valve and as consequence it prolongs diaphragm life.	

ORDER EXAMPLE (GEMÜ 657 High Flow Straightway Diaphragm valve Figure Number Composition)

GEMÜ Figure Number	V	0657	100	D	44	88	06	0	8501
Product Category	V								
Product Type		0657							
Nominal Size (DN)			100						
Body Configuration				D					
Valve Connection					44				
Body/Lining Material						88			
Diaphragm material							06		
Control Function								0	
Supplementary Code (See bonnet assembly options)									8501

If possible also provide
1. Working medium and concentration.
2. Working pressure and temperature.
3. Mode and/or frequency of operation.
4. Flow rate
5. Percent solids
6. Temperature cycling.
7. Line shock conditions.
8. Use of line cleaning fluids.
9. Type of exposure (Weather, submersion, off shore platform, etc.).

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Subject to alteration

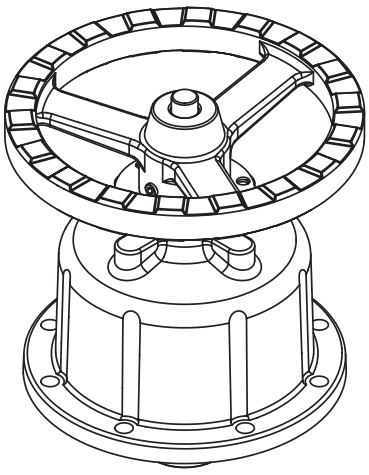
Dimensional Data, Operating Pressures and Weights

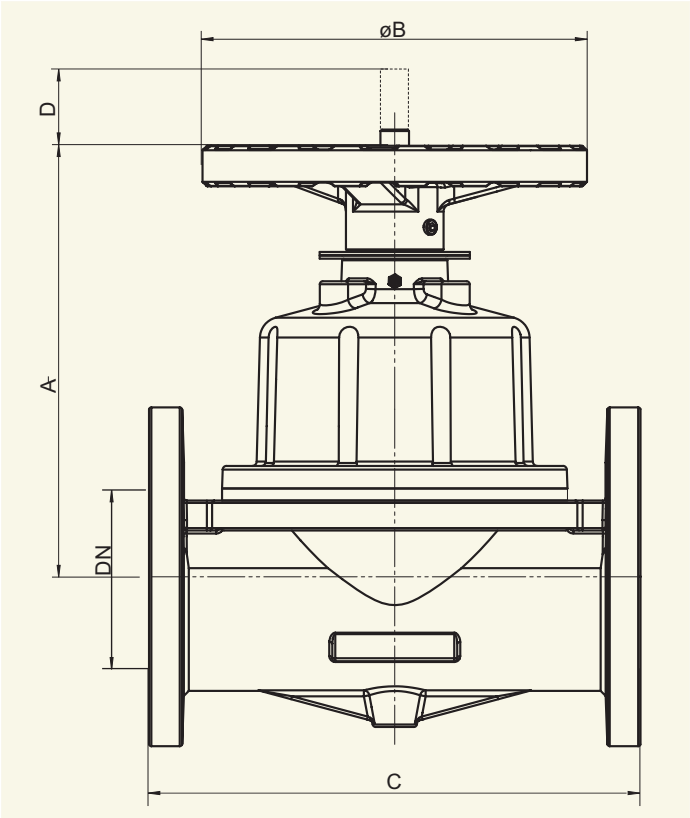
Nominal Size DN		Height "A"	Diameter "B"	Face to Face*** "C" Unlined bodies	"D"	Maximum working pressure**	Weight *	Valve Kv Ratings (m3/h) (100% open)			Stem Travel	Number of turns*
mm	In	(mm)	(mm)	(mm)	(mm)	(bar)	(Kg)	Unlined	Rubber lined	Glass lined	(mm)	* between closed and open position
25	1"	133	135	140	15,5	7.0	4,6	48	48	43	20	5
40	1.1/2"	164	150	165	31,5	7.0	7,8	98	95	88	32	8
50	2"	193	150	191	47,0	7.0	11,6	240	240	235	52	13
65	2.1/2"	231	222	216	57,0	7.0	20,6	380	375	360	55	11
80	3"	231	222	254	57,0	7.0	24,0	450	450	430	60	12
100	4"	293	256	318	65,0	7.0	39,0	590	600	580	65	13
150	6"	412	362	406	105,0	5.0	78,6	1800	1750	1720	105	21
200	8"	508	465	521	147,0	3.5	150,0	3600	3500	3400	147	21

* Weights are approximate and only for cast iron body. Materials with other than iron densities should have their respective weights increased/reduced in the same proportion.

** The above-mentioned pressures are manometric (positive). The GEMÜ 657 valve is not recommended for vacuum service.

*** The mentioned "face-to-faces" refer only to unlined valves, as there is a great number of combinations of different types of materials/linings, the dimensional data for all valve bodies (including face-to-face) are given separately on pages 8/22 and 9/22 , under the heading "Valve Body Dimensions"





Valve Body Dimensions

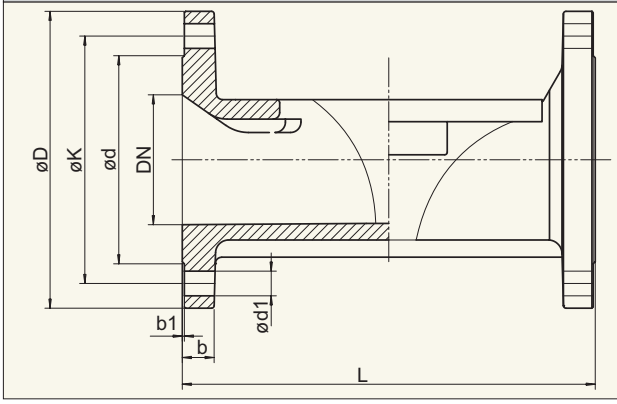
Flanged ANSI B 16.1, 125# or ANSI B 16.5, 150# - Face-to-Face MSS SP-88*

Connection No. →	3B		38		44				45						D	b	Only for Bodies with Flange RF	K	d1	(No. of Holes)
Body Material No. →	11, 44 and 47		18,62 and 85		11, 44, and 47		82, 83, 86 87, 88, and 89		08		50		55							
DN mm	DN In	L	b1	L	b1	L	b1	L	b1	L	b1	L	b1	L	b1			d			Z
25	1"	140	1,6	146	3,5	140	-	146	3,5	140	-	143	1,5	141,6	0,8	108.0	11.2	50.8	79.2	16	4
40	1.1/2"	165	1,6	175	3,5	165	-	171.5	3,5	165	-	168	1,5	166,6	0,8	127.0	14.2	73.2	98.6	16	4
50	2"	191	1,6	200	3,5	191	-	197	3,5	191	-	194	1,5	192,6	0,8	152.4	15.7	91.9	120.7	19	4
65	2.1/2"	216	1,6	225	3,5	216	-	222	3,5	216	-	219	1,5	217,6	0,8	177.8	17.5	104.6	139.7	19	4
80	3"	254	1,6	260	3,5	254	-	260	3,5	254	-	257	1,5	255,6	0,8	190.5	19.1	127.0	152.4	19	4
100	4"	318	1,6	327	3,5	318	-	324	3,5	318	-	321	1,5	319,6	0,8	228.6	23.9	157.2	190.5	19	8
150	6"	406	1,6	416	5,0	406	-	416	5,0	406	-	409	1,5	407,6	0,8	279.0	25.4	215.9	241.3	22	8
200	8"	521	1,6	530	5,0	521	-	530	5,0	521	-	524	1,5	522,6	0,8	342.9	28.4	269.7	298.5	22	8

* Tolerances are in accordance with MSS SP-88

NOTES: I) Refer to GEMÜ 655 Standard bore straightway diaphragm valve for other valve sizes, i.e: DN 15 (1/2"), DN 20 (3/4"), DN 125 (5"), DN 250 (10"), DN 300 (12") and DN 350 (14")

Body without lining, raised face (serrated concentric), face-to-face MSS SP-88

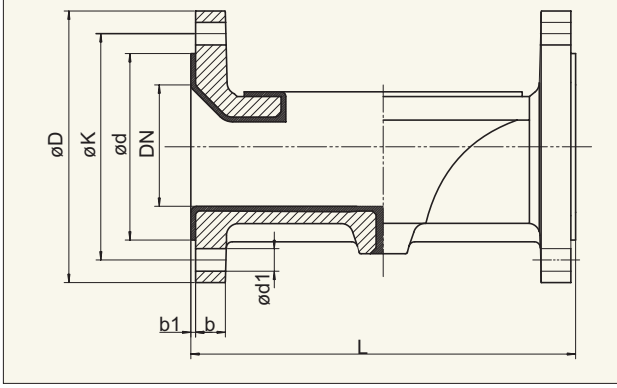


Combinations of connections and materials covered by this configuration

Connection Code	Body Material Code
3B	11
3B	44
3B	47

Note: In this case b1 = height of raised face.

Body with thick lining (injection molded), raised face (smooth finish), Face-to-face MSS SP-88



Combinations of connections and materials covered by this configuration

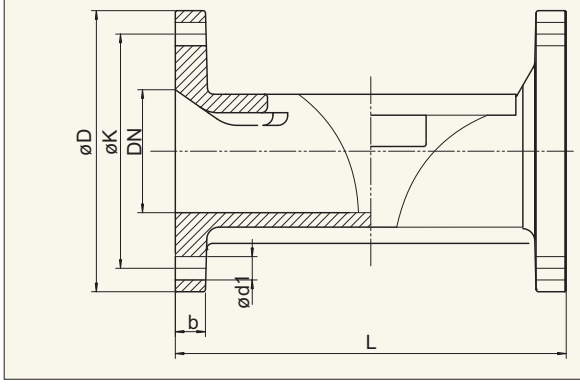
Connection Code	Body Material Code
38	18
38	62
38	85

Note: In this case b1 = height of raised face.

Subject to alteration

Valve Body Dimensions

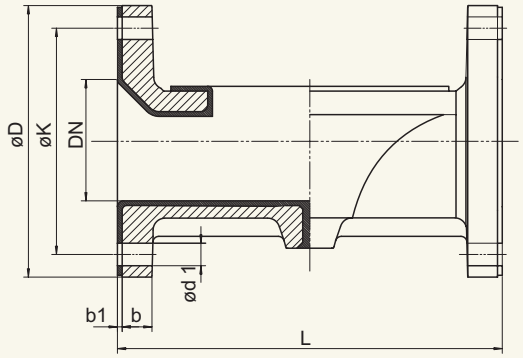
Body without lining, flat face (smooth finish), face-to-face MSS SP-88



Combinations of connections and materials covered by this configuration

Connection Code	Body Material Code
44	11
44	44
44	47
45	08

Body with thick lining (injection molded), flat face (smooth finish), Face-to-face MSS SP-88

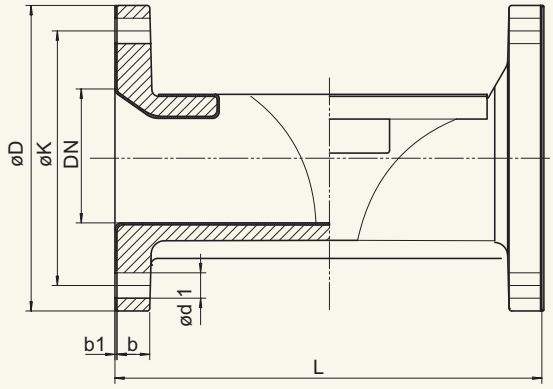


Combinations of connections and materials covered by this configuration

Connection Code	Body Material Code
44	82
44	83
44	86
44	87
44	88
44	89

Note: In this case b1 = lining thickness

Body with thin lining (coating), flat face (smooth finish), face-to-face MSS SP-88



Combinations of connections and materials covered by this configuration

Connection Code	Body Material Code
45	50
45	55

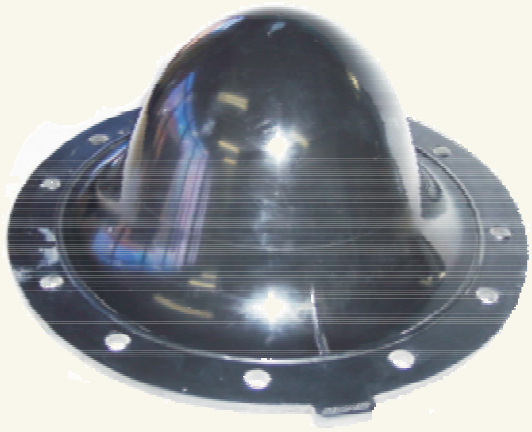
Note: In this case b1 = lining thickness

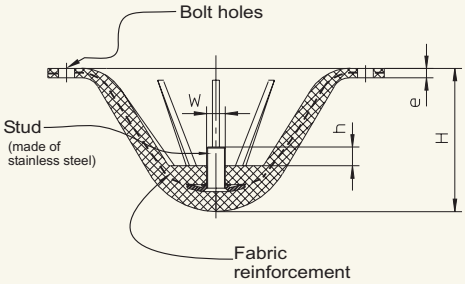
Dimensional Data for Diaphragms

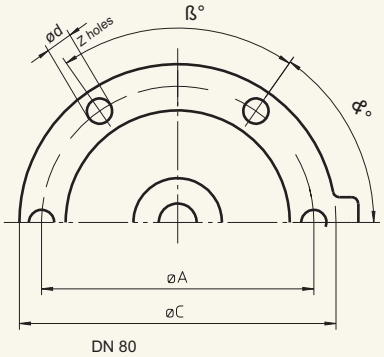
Nominal Size (DN)		A	B	C	D	d	e	h	W	Z (No. of Holes)	H	&	ß	£	Y
mm	In														
25	1"	63,5	58,8	90	75	10	4	10	1/4"	4	33	-	-	-	-
32	1.1/4"	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40	1.1/2"	86	63,5	116	110	10	5	10	1/4"	4	36	-	-	-	-
50	2"	101,6	82,5	136	135	12	5	10	5/16"	4	60	-	-	-	-
65	2.1/2"	133,4	101,6	175	155	17	7	12	3/8"	4	75	-	-	-	-
80	3"	171,5		196	-	12	6	15	3/8"	6	75	55°	35°	-	-
100	4"	204	-	222	-	13	8,5	17	3/8"	8	100	20°	45°	50°	-
150	6"	305	-	340	-	17	8	20	5/8"	8	138	20°	40°	60°	-
200	8"	381	-	420	-	17	10	25	5/8"	12	190	15°	30°	25°	20°

Note: The thread (W) of diaphragm stud is according to Whitworth standard.

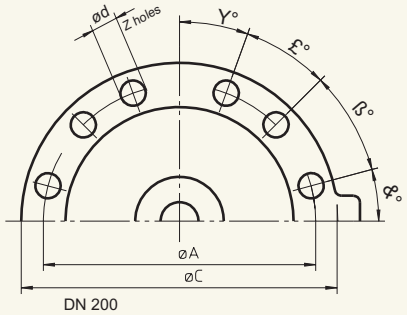




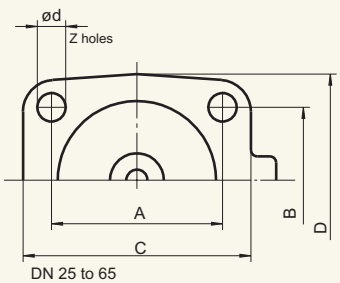




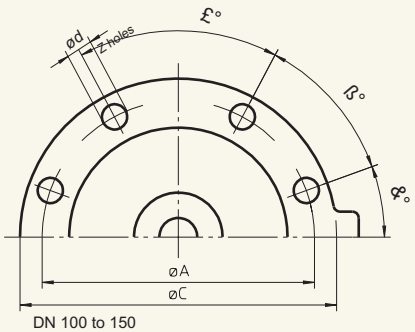
DN 80



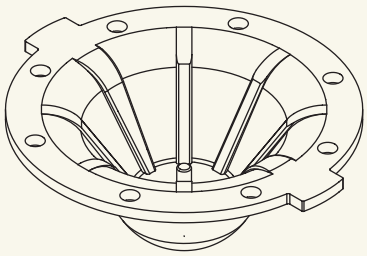
DN 200



DN 25 to 65



DN 100 to 150



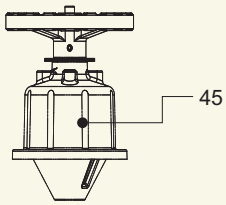
Gemü 657 diaphragms are interchangeable whit many competitive straightway diaphragms.
See above the Gemü 657 diaphragm dimensions.

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Subject to alteration

List of Replacement Parts and Components

Pos.	Piece Name	Quantity (Units)
1	Body	01
2	Diaphragm	01
3	Compressor	01
4	Bonnet	01
5	Stem	01
6	Position indicator	01
7	Handwheel	01
8	Stem Bushing	01
11	Set Screw	02
12	Thrust Bearing	01
13	Compressor Pin	01
15	Hex Head Machine Bolt	04
17	Lock Washer	04
18	Hex Nut	04
20	Locking Collar	02
21	Plastic Washer	01
22	O'ring	01
23	Lube Fitting	01
45	Bonnet Assembly (see details below)	01



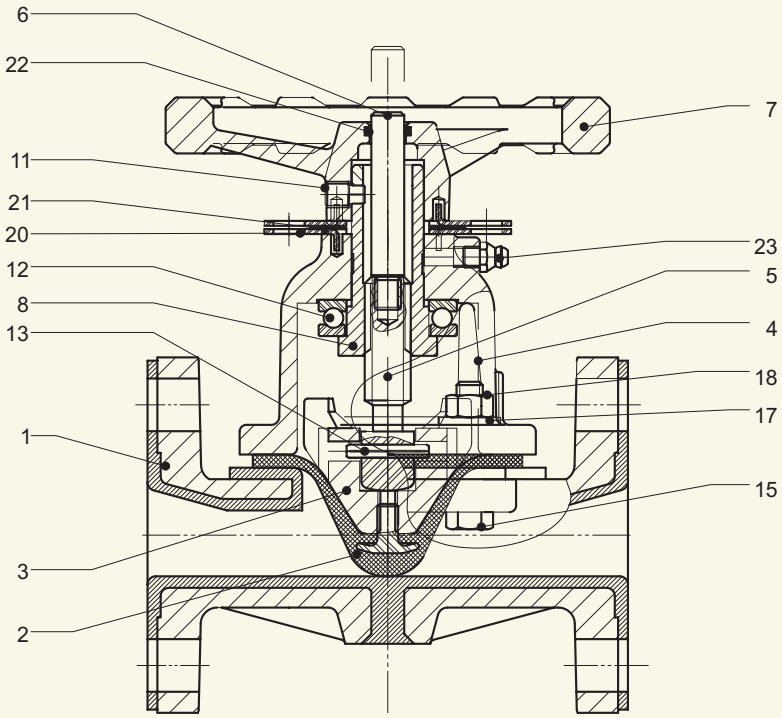
(Bonnet assembly means the following complete group of parts assembled into a single unit: Compressor, bonnet, stem, position indicator, handwheel, stem bushing, set screw, thrust bearing, compressor pin, locking collars, plastic washer, o'ring and lube fitting.)

Note:
I) Contact your nearest Gemü sales engineer for the material list.

This section drawing shows valve configuration:

Valve diameter 25 mm (1")

Valve body Flanged, with or without lining.

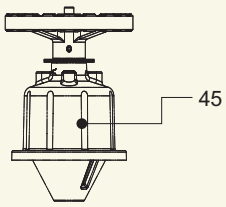


As you order replacement parts, you always must advise the GEMÜ figure number of the valve for which these parts are intended
(See on page 06 in the section "order example" how to obtain the complete figure number of a specific GEMÜ 657 diaphragm valve).
Practical Examples: 1) Diaphragm (pos. 2) GEMÜ type V0657025D4488060
2) Body (pos.1) GEMÜ type V0657025D4486010
3) Bonnet Assembly (pos. 45) GEMÜ type V0657025D4508080

Subject to alteration

List of Replacement Parts and Components

Pos.	Piece Name	Quantity (Units)
1	Body	01
2	Diaphragm	01
3	Compressor	01
4	Bonnet	01
5	Stem	01
6	Position indicator	01
7	Handwheel	01
8	Stem Bushing	01
11	Set Screw	02
12	Thrust Bearing	01
13	Compressor Pin	01
15	Hex Head Machine Bolt	04
17	Lock Washer	04
18	Hex Nut	04
20	Locking Collar	02
21	Plastic Washer	01
22	O'ring	01
23	Lube Fitting	01
45	Bonnet Assembly (see details below)	01



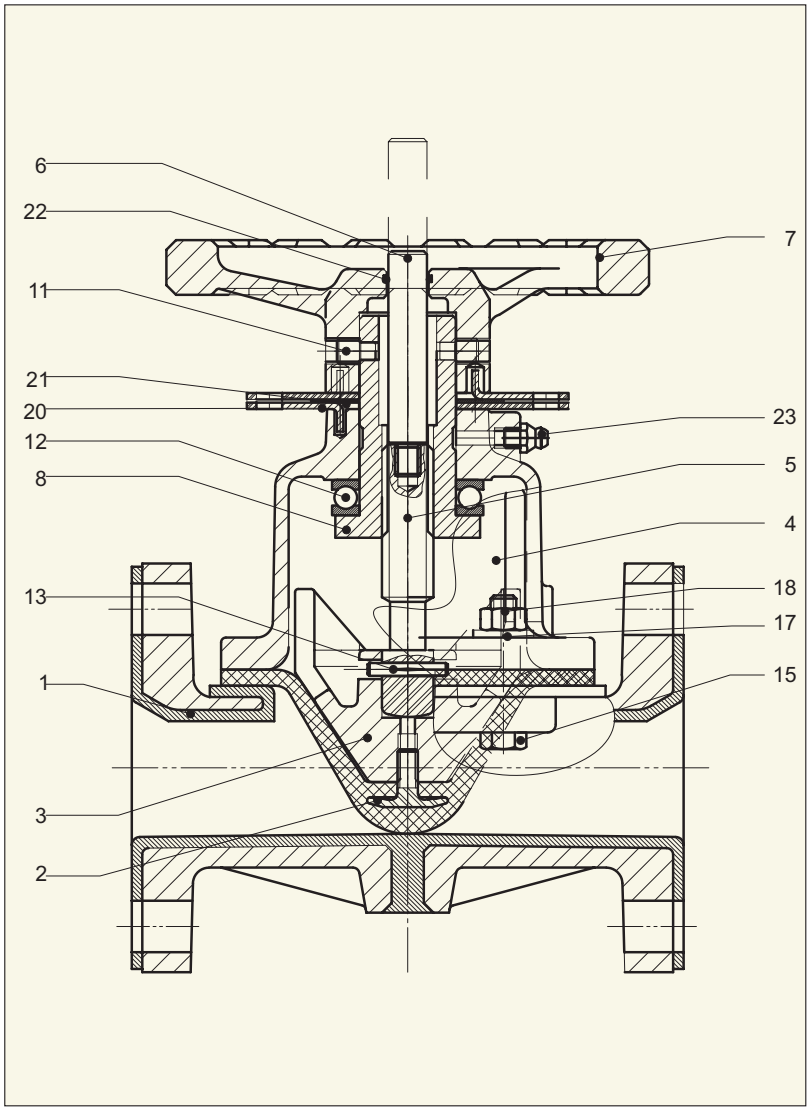
(Bonnet assembly means the following complete group of parts assembled into a single unit: Compressor, bonnet, stem, position indicator, handwheel, stem bushing, set screw, thrust bearing, compressor pin, locking collars, plastic washer, o'ring and lube fitting.)

Note:
I) Contact your nearest Gemü sales engineer for the material list.

This section drawing shows valve configuration:

Valve diameter 40 mm (1.1/2")

Valve body Flanged, with or without lining.

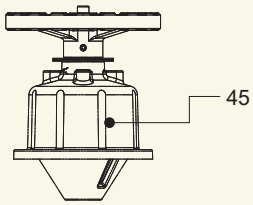


As you order replacement parts, you always must advise the GEMÜ figure number of the valve for which these parts are intended
(See on page 06 in the section "order example" how to obtain the complete figure number of a specific GEMÜ 657 diaphragm valve).
Practical Examples: 1) Diaphragm (pos. 2) GEMÜ type V0657040D4487080
2) Body (pos.1) GEMÜ type V0657040D4488060
3) Bonnet Assembly (pos. 45) GEMÜ type V0657040D450808

Subject to alteration

List of Replacement Parts and Components

Pos.	Piece Name	Quantity (Units)
1	Body	01
2	Diaphragm	01
3	Compressor	01
4	Bonnet	01
5	Stem	01
6	Position indicator	01
7	Handwheel	01
8	Stem Bushing	01
11	Set Screw	02
12	Thrust Bearing	01
13	Compressor Pin	01
15	Hex Head Machine Bolt	04
17	Lock Washer	04
18	Hex Nut	04
20	Locking Collar	02
21	Plastic Washer	01
22	O'ring	01
23	Lube Fitting	01
45	Bonnet Assembly (see details below)	01



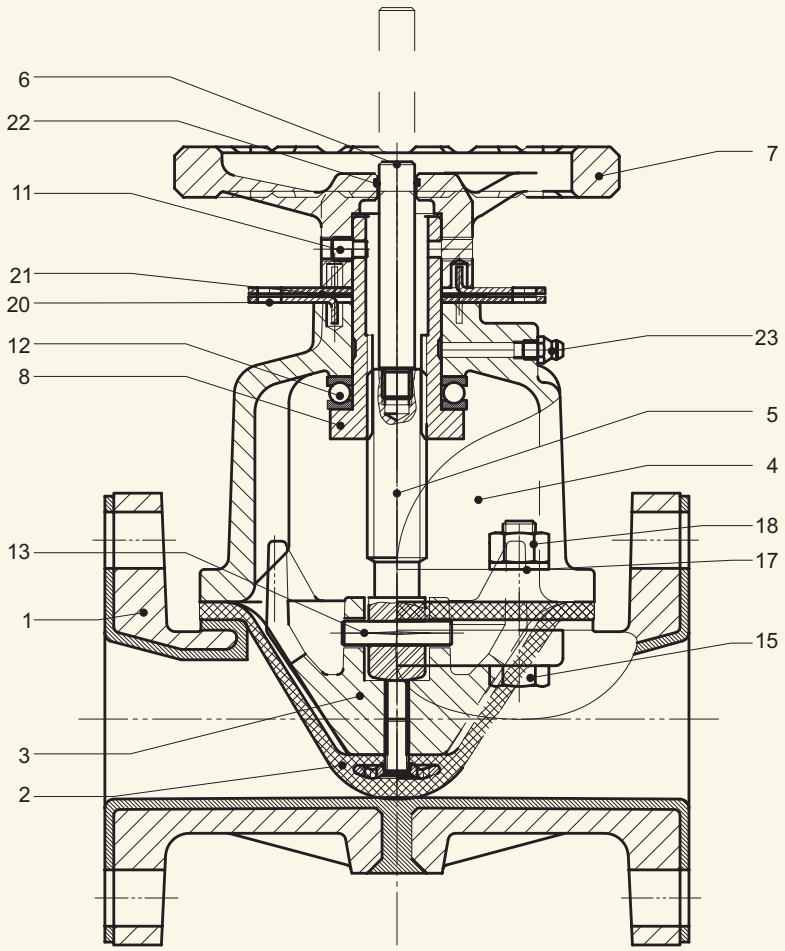
(Bonnet assembly means the following complete group of parts assembled into a single unit: Compressor, bonnet, stem, position indicator, handwheel, stem bushing, set screw, thrust bearing, compressor pin, locking collars, plastic washer, o'ring and lube fitting.)

Note:
I) Contact your nearest Gemü sales engineer for the material list.

This section drawing shows valve configuration:

Valve diameter 50 mm (2")

Valve body Flanged, with or without lining.

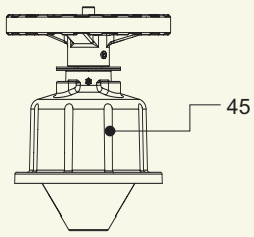


As you order replacement parts, you always must advise the GEMÜ figure number of the valve for which these parts are intended
(See on page 06 in the section "order example" how to obtain the complete figure number of a specific GEMÜ 657 diaphragm valve).
Practical Examples: 1) Diaphragm (pos. 2) GEMÜ type V0657050D4486010
2) Body (pos.1) GEMÜ type V0657050D4487080
3) Bonnet Assembly (pos. 45) GEMÜ type V0657050D4508080

Subject to alteration

List of Replacement Parts and Components

Pos.	Piece Name	Quantity (Units)
1	Body	01
2	Diaphragm	01
3	Compressor	01
4	Bonnet	01
5	Stem	01
6	Position Indicator	01
7	Handwheel	01
8	Stem Bushing	01
11	Set Screw	02
12	Thrust Bearing	01
13	Compressor Pin	01
15	Hex Head Machine Bolt	04
17	Lock Washer	04
18	Hex Nut	04
20	Locking Collar	02
21	Plastic Washer	01
22	O'ring	01
23	Lube Fitting	01
45	Bonnet Assembly (see details below)	01



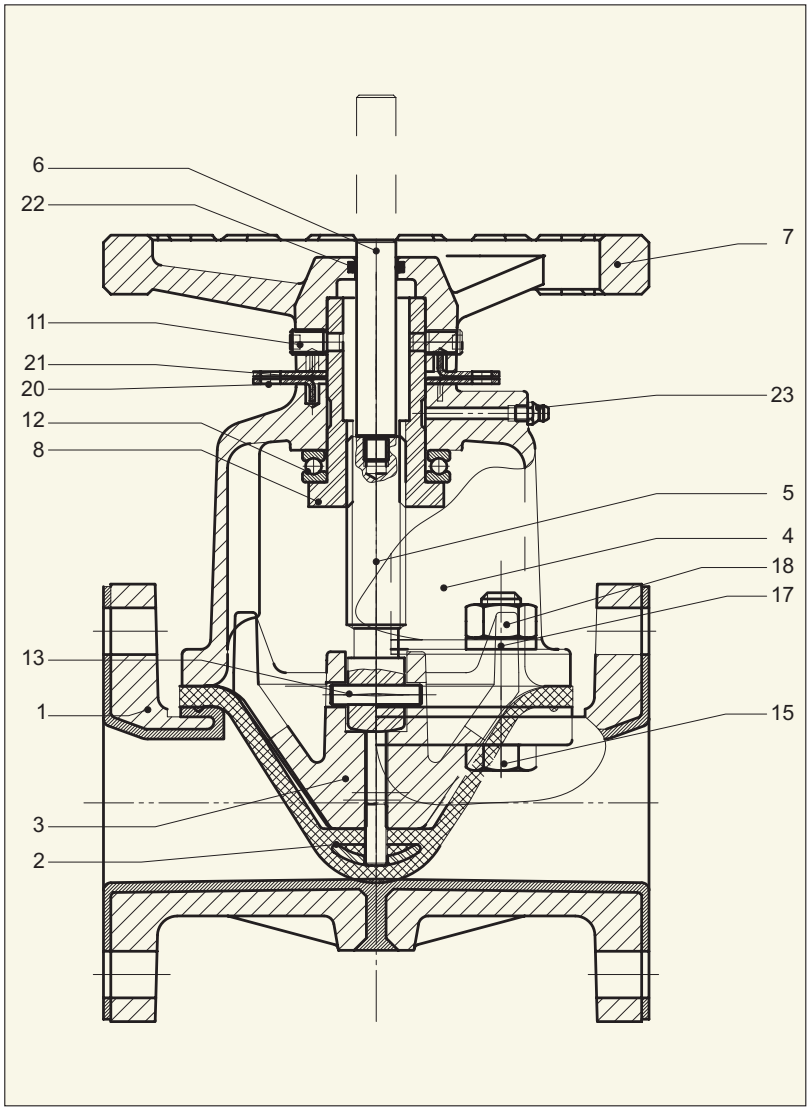
(Bonnet assembly means the following complete group of parts assembled into a single unit: Compressor, bonnet, stem, position indicator, handwheel, stem bushing, set screw, thrust bearing, compressor pin, locking collars, plastic washer, o'ring and lube fitting.)

Note:
I) Contact your nearest Gemü sales engineer for the material list.

This section drawing shows valve configuration:

Valve diameter 65 mm (2.1/2")

Valve body Flanged, with or without lining.

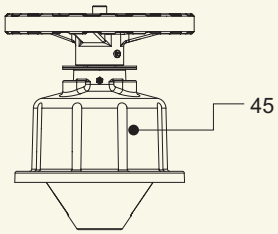


As you order replacement parts, you always must advise the GEMÜ figure number of the valve for which these parts are intended
(See on page 06 in the section "order example" how to obtain the complete figure number of a specific GEMÜ 657 diaphragm valve).
Practical Examples: 1) Diaphragm (pos. 2) GEMÜ type V0657065D4486010
2) Body (pos.1) GEMÜ type V0657065D4550040
3) Bonnet Assembly (pos. 45) GEMÜ type V0657065D4488080

Subject to alteration

List of Replacement Parts and Components

Pos.	Piece Name	Quantity (Units)
1	Body	01
2	Diaphragm	01
3	Compressor	01
4	Bonnet	01
5	Stem	01
6	Position Indicator	01
7	Handwheel	01
8	Stem Bushing	01
11	Set Screw	02
12	Thrust Bearing	01
13	Compressor Pin	01
15	Bonnet Stud	06
17	Lock Washer	06
18	Hex Nut	06
20	Locking Collar	02
21	Plastic Washer	01
22	O'ring	01
23	Lube Fitting	01
45	Bonnet Assembly (see details below)	01



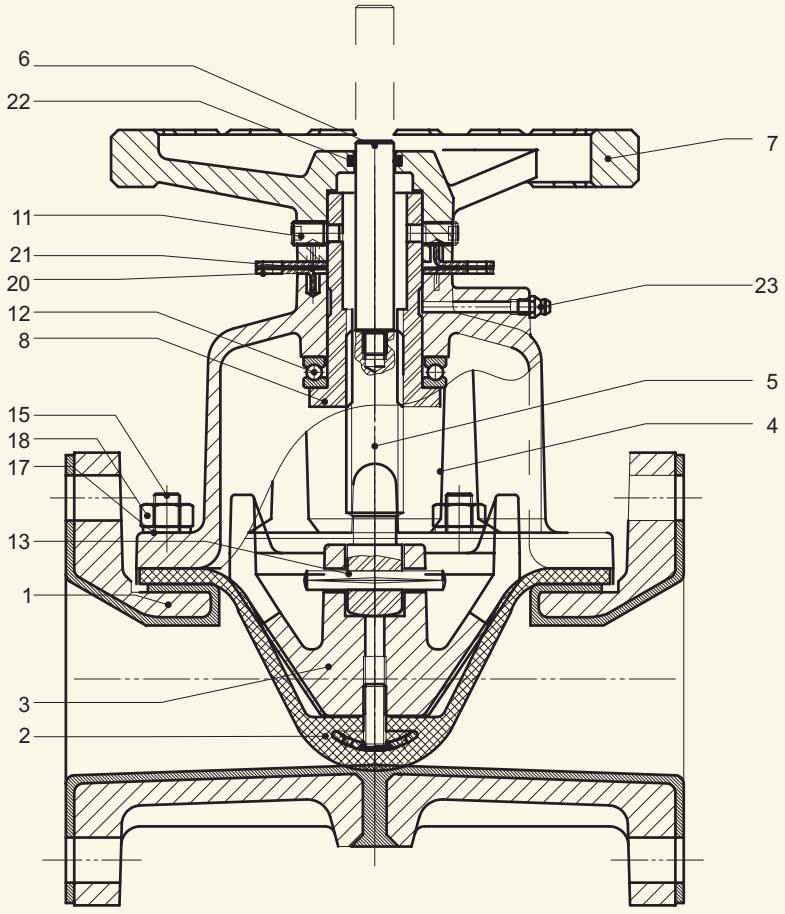
(Bonnet assembly means the following complete group of parts assembled into a single unit: Compressor, bonnet, stem, position indicator, handwheel, stem bushing, set screw, thrust bearing, compressor pin, locking collars, plastic washer, o'ring and lube fitting.)

Note:
I) Contact your nearest Gemü sales engineer for the material list.

This section drawing shows valve configuration:

Valve diameter 80 mm (3")

Valve body Flanged, with or without lining.

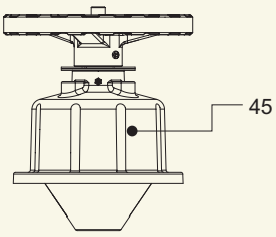


As you order replacement parts, you always must advise the GEMÜ figure number of the valve for which these parts are intended
(See on page 06 in the section "order example" how to obtain the complete figure number of a specific GEMÜ 657 diaphragm valve).
Practical Examples: 1) Diaphragm (pos. 2) GEMÜ type V0657080D4487080
2) Body (pos.1) GEMÜ type V0657080D4486010
3) Bonnet Assembly (pos. 45) GEMÜ type V0657080D4508140

Subject to alteration

List of Replacement Parts and Components

Pos.	Denominação	Qt. (Pçs)
1	Body	01
2	Diaphragm	01
3	Compressor	01
4	Bonnet	01
5	Stem	01
6	Position Indicator	01
7	Handwheel	01
8	Stem Bushing	01
11	Set Screw	02
12	Thrust Bearing	01
13	Compressor Pin	01
15	Bonnet Stud	08
17	Lock Washer	08
18	Hex Nut	08
20	Locking Collar	02
21	Plastic Washer	01
22	O'ring	01
23	Lube Fitting	01
45	Bonnet Assembly (see details below)	01



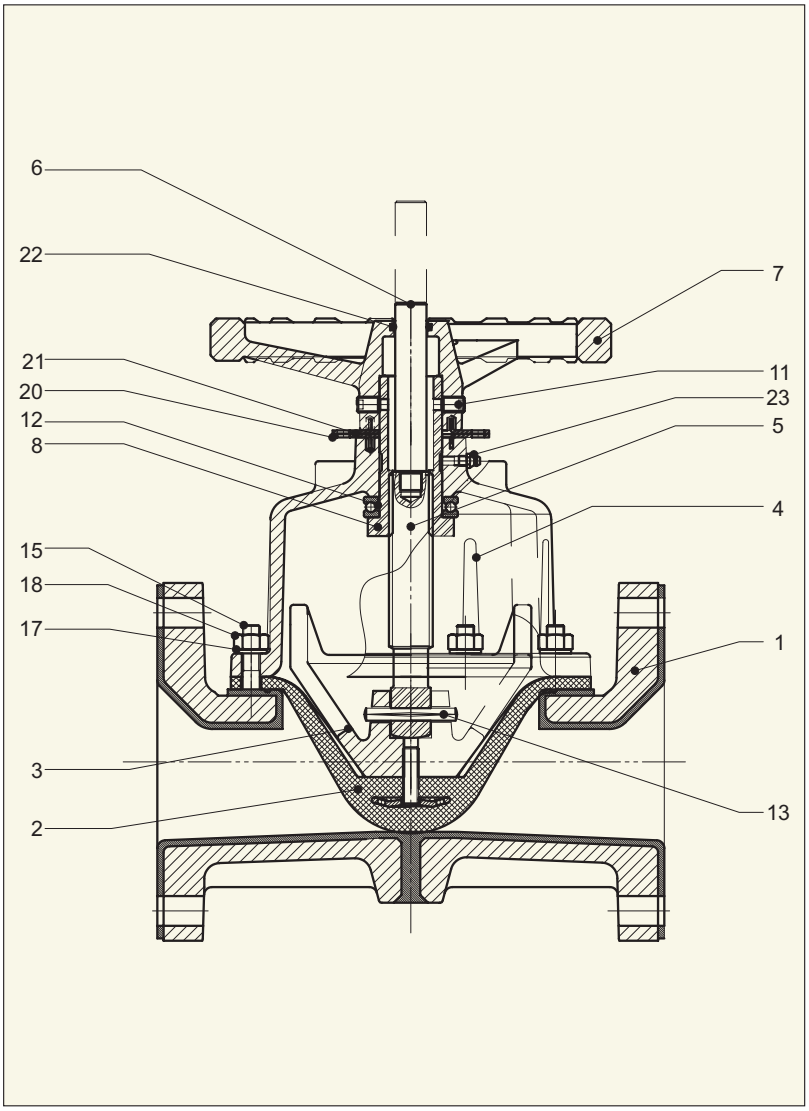
(Bonnet assembly means the following complete group of parts assembled into a single unit: Compressor, bonnet, stem, position indicator, handwheel, stem bushing, set screw, thrust bearing, compressor pin, locking collars, plastic washer, o'ring and lube fitting.)

Note:
I) Contact your nearest Gemü sales engineer for the material list.

This section drawing shows valve configuration:

Valve diameter 100 mm (4")

Valve body Flanged, with or without lining.



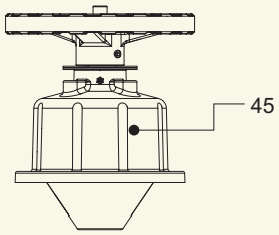
As you order replacement parts, you always must advise the GEMÜ figure number of the valve for which these parts are intended
(See on page 06 in the section "order example" how to obtain the complete figure number of a specific GEMÜ 657 diaphragm valve).
Practical Examples: 1) Diaphragm (pos. 2) GEMÜ type V0657100D4508140
2) Body (pos.1) GEMÜ type V0657100D4487080
3) Bonnet Assembly (pos. 45) GEMÜ type V0657100D4550040

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Subject to alteration

List of Replacement Parts and Components

Pos.	Piece Name	Quantity (Units)
1	Body	01
2	Diaphragm	01
3	Compressor	01
4	Bonnet	01
5	Stem	01
6	Position Indicator	01
7	Handwheel	01
8	Stem Bushing	01
11	Set Screw	02
12	Thrust Bearing	01
13	Compressor Pin	01
15	Bonnet Stud	08
17	Lock Washer	08
18	Hex Nut	08
20	Locking Collar	02
21	Plastic Washer	01
22	O'ring	01
23	Lube Fitting	01
27	Damper Collar	01
45	Bonnet Assembly (see details below)	01



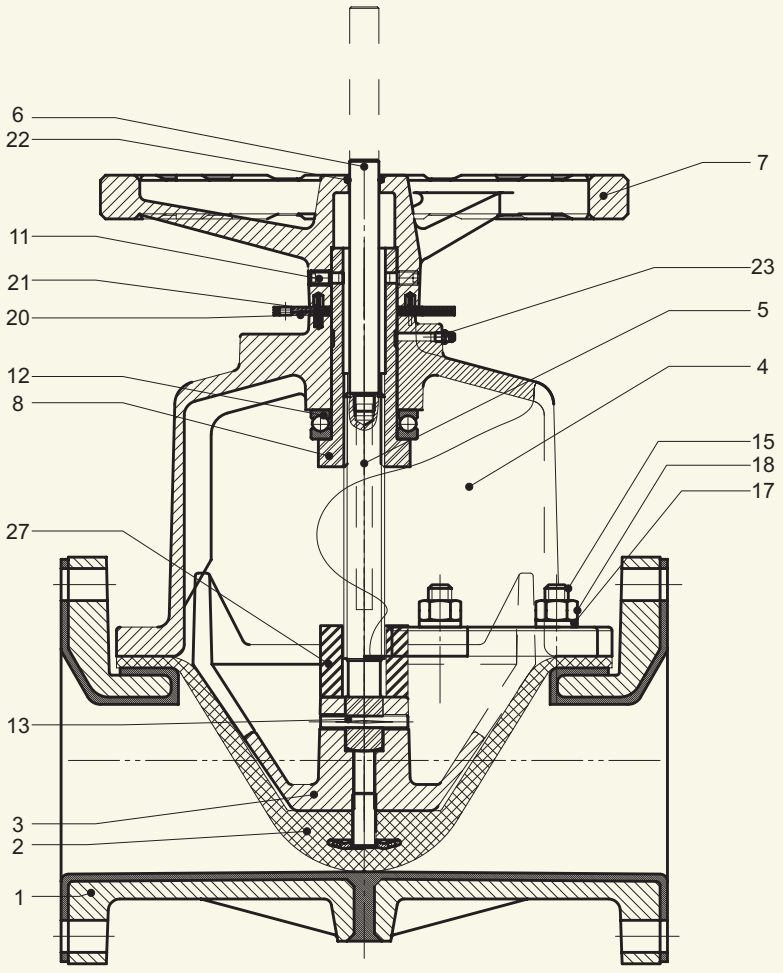
(Bonnet assembly means the following complete group of parts assembled into a single unit: Compressor, bonnet, stem, position indicator, handwheel, stem bushing, set screw, thrust bearing, compressor pin, locking collars, plastic washer, o'ring, lube fitting and damper collar.)

Note:
I) Contact your nearest Gemü sales engineer for the material list.

This section drawing shows valve configuration:

Valve diameter 150 mm (6")

Valve body Flanged, with or without lining.

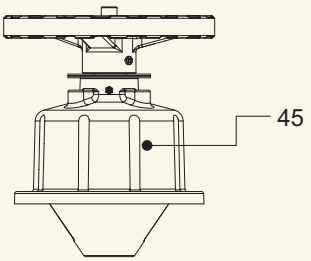


As you order replacement parts, you always must advise the GEMÜ figure number of the valve for which these parts are intended
(See on page 06 in the section "order example" how to obtain the complete figure number of a specific GEMÜ 657 diaphragm valve).
Practical Examples: 1) Diaphragm (pos. 2) GEMÜ type V0657150D4488060
2) Body (pos.1) GEMÜ type V0657150D4487080
3) Bonnet Assembly (pos. 45) GEMÜ type V0657150D4486010

Subject to alteration

List of Replacement Parts and Components

Pos.	Denominação	Qt. (Pçs)
1	Body	01
2	Diaphragm	01
3	Compressor	01
4	Bonnet	01
5	Stem	01
6	Position Indicator	01
7	Handwheel	01
8	Stem Bushing	01
12	Thrust Bearing	01
13	Compressor Pin	01
15	Bonnet Stud	12
17	Lock Washer	12
18	Hex Nut	12
20	Locking Collar	02
21	Plastic Washer	01
22	O'ring	01
23	Lube Fitting	01
27	Damper Collar	01
29	Flat Key	01
30	Handwheel Nut	01
45	Bonnet Assembly (see details below)	01



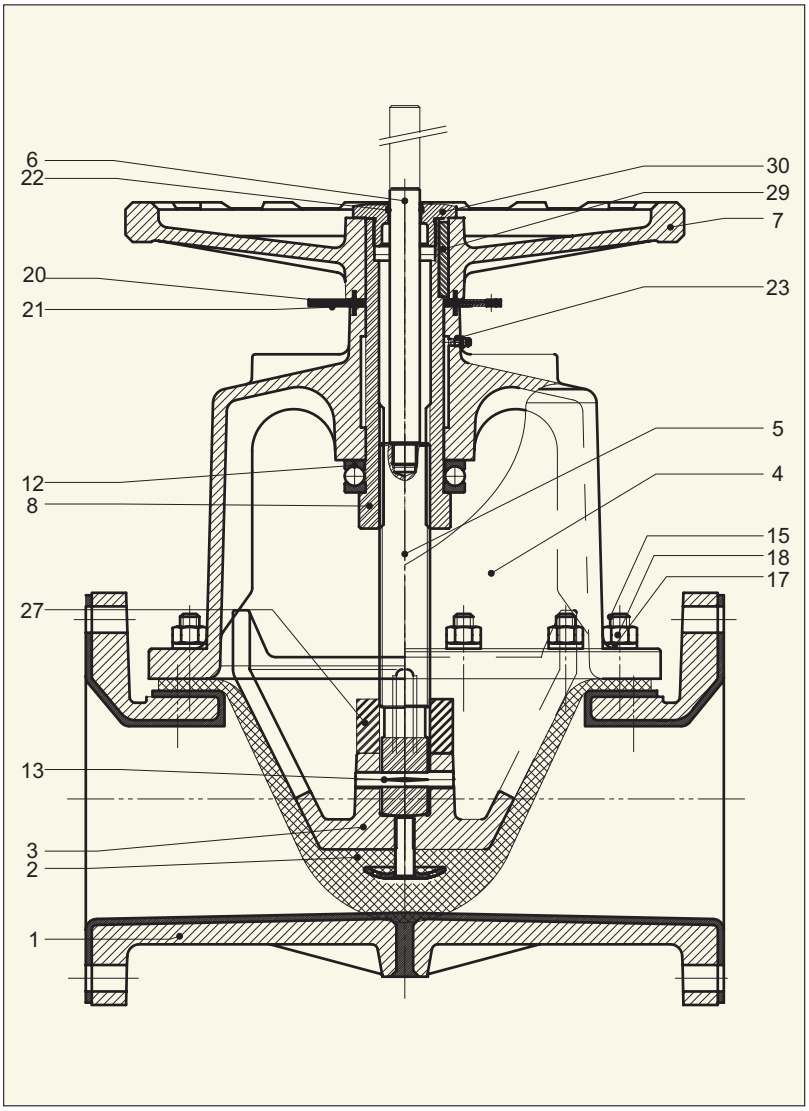
(Bonnet assembly means the following complete group of parts assembled into a single unit: Compressor, bonnet, stem, position indicator, handwheel, stem bushing, thrust bearing, compressor pin, locking collars, plastic washer, o'ring, lube fitting damper collar, flat key and handwheel nut)

Note:
I) Contact your nearest Gemü sales engineer for the material list.

This section drawing shows valve configuration:

Valve diameter 200 mm (8")

Valve body Flanged, with or without lining.



As you order replacement parts, you always must advise the GEMÜ figure number of the valve for which these parts are intended
(See on page 06 in the section "order example" how to obtain the complete figure number of a specific GEMÜ 657 diaphragm valve).
Practical Examples: 1) Diaphragm (pos. 2) GEMÜ type V0657200D4508080
2) Body (pos.1) GEMÜ type V0657200D4487080
3) Bonnet Assembly (pos. 45) GEMÜ type V0657200D4508140

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Subject to alteration

Installation, Operation and Maintenance Instructions

Note: All the instructions below refer to the 657 valve with standard bonnet assembly. For 657 valves with special bonnet assemblies (see on page 06/22 the available options), consult the respective valve type maintenance sheet in Gemü data manual.

I) Installation

You can install GEMU 657 Straightway diaphragm valve on the pipeline in any position: horizontal, upright or inclined. The direction of the flow does not matter.
Follow the recommendations below before you install the valve:

1°) Confirm that the valve is suitable for the process fluid, concentration, pressure and temperature.

2°) Ensure enough space is provided for easy and safe operation of the handwheel.

3°) Ensure there is room to enable future replacement of the diaphragm.

Note: In cases where the valve is installed in hazardous locations and/or where the access is troublesome, remember that you can remove the bonnet assembly from the GEMÜ 657 and replace it with a pneumatic actuator model GEMÜ 659 without removing the valve body from the pipeline.

4°) Existing Systems:
Make sure that this pipeline is blocked (airtight) with valves on both ends, before servicing begins. Be aware of the toxicity, corrosive effects and dangers regarding the fluid flowing through the pipeline and use suitable protection equipment. The best way would be to drain the pipeline completely before you install or service the valve.

5°) Valve installation is very simple. Ensure that the valve is properly aligned and the connecting pipework adequatelly supported and the valve connection is to the correct standard, rating class, material and diameter. For flanged connections use a gasket that is suitable for the kind of service and flange type. Tighten the bolts between the flange of the valve and mating flange on the pipeline. Follow the diametrically opposite order of tightening bolts and apply suitable and uniform torque. ATTENTION: For valve bodies with glass lining use soft gaskets, e. g. rubber gaskets compatible with the fluid flowing through the pipeline.

IMPORTANT NOTE: I) If the valve is to be stored for a long period, it's recommended to leave the diaphragm in it's relaxed position i. e. nearly closed position.

II) As the diaphragm always consists of a compressible elastomer, which is subject to deformation, we recommend that after storage and putting the valve in the line, that the body/bonnet bolts are checked for tightness and retightened if necessary.

II) Operation

The GEMÜ 657 diaphragm valve can be operated by a single person even under maximum working pressure.
NOTE: Never use levers or any other devices to close or open the valve.

The valve closes as you turn the handwheel clockwise. When the valve seals, you must stop the closing movement. This will prevent excessive tightening (overclosure) of the diaphragm and consequently will extend its life. If you require a protection against excessive tightening, the valve may be supplied with an adjustable travel stop.
Turn the handwheel counterclockwise to open the valve. See on page 07/22 for number of turns an stem travel information.

Subject to alteration

Installation, Operation and Maintenance Instructions

III) Maintenance

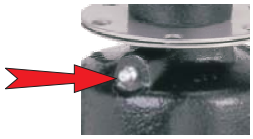
External valve parts should be periodically checked for leakage and for the need for maintenance. If you have specified material for the valve body or lining and diaphragm that would be suitable for the application in question, you may expect a long life for the whole assembly. What may happen is the shortening of the diaphragm life (wearing part) from excessive (undue) tightening when closing the valve, fatigue because of a great number of operations, or else in very demanding applications such as handling abrasive fluids. Therefore the maintenance this valve requires is practically the replacement of diaphragm. One other kind of intervention that may be required is servicing. When you replace the diaphragm, you should also inspect the valve thoroughly. Check the inner condition of the body, especially its seat, as well as the bonnet assembly and its inner mechanisms, including lubrication. If you find that the repair or replacement of parts or of the complete assembly is required specially because of excessive wear or corrosion, do it at the same time.

Note 1)Safety: As the maintenance works on this product could require the use of mechanical tools and devices, we recommend that a skilled professional who has been trained for this task carries out the whole operation described below.

Note 2)Warranty: The valve should be sent to the GEMÜ factory for the "Diaphragm Replacement " and/or "Repair" services for the duration of warranty period or the warranty is void . If you have any questions, please contact the GEMÜ customer service department for further details.

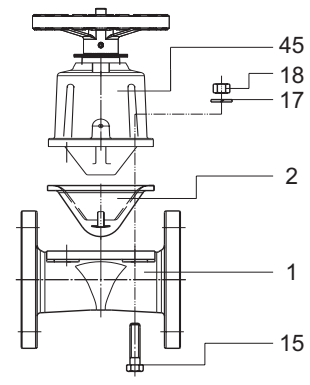
III.1) Lubrification

All the 657 valve are fitted with lube fitting (pos. 23). Apply one shot of grease every 6 months. As a general rule, in harsh chemical atmospheres, it is recommended that all contacting surfaces subject to friction be lubricated every 12 months.

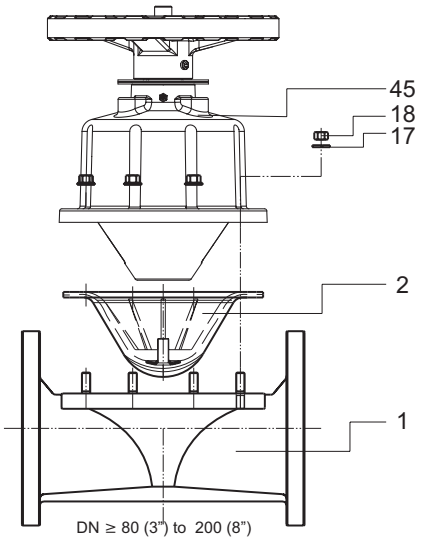


III.2) Procedure for replacing the diaphragm

Before you start to replace the diaphragm itself, make sure that the pipeline on which the valve is installed is completely drained or blocked (airtight) with valves on both sides. Be aware of the toxicity, corrosive effects and dangers regarding the fluid flowing through the pipeline and use the suitable protection equipment (for example: gloves, overalls, face masks, etc.). The best way would be to drain the line completely before you start the operation. You do not have to remove the valve body from the pipeline to replace the diaphragm.



DN 25 (1") to 65 (2.1/2")



DN ≥ 80 (3") to 200 (8")

Subject to alteration

Installation, Operation and Maintenance Instructions

1°) Close the valve nearly to the closed position and remove hex nuts (pos. 18), washers (pos. 17) and bolts (pos. 15), except stud bolts (valves with DN ≥ 80 mm), in this case, to leave the stud bolts in the valve body. Inspect the general condition of these fastening elements and replace them by other original ones if required.

2°) Remove the bonnet assembly (pos. 45) by pulling it by the handwheel. If it is stuck by the diaphragm to the valve body (it may happen in valves which have been installed for a long period of time), you can loosen it by turning the handwheel clockwise (closing the valve). This movement will detach the bonnet. Do not use tools with sharp edges to separate the diaphragm from the valve body, as you may damage the seat. To make easier the following steps, put the bonnet assembly upside down on a workbench (propped by its handwheel)

3°) To detach the diaphragm (pos. 2) from the bonnet (pos. 45), rotate the former counterclockwise to unscrew it from the compressor (pos. 3).

4°) As soon as the diaphragm becomes detached, use the opportunity to carry out visual inspection of the inner condition of the bonnet. If convenient, remove the compressor (pos. 3) from the remaining part of the bonnet to make the inspection easier. For this, you have to simply turn the bonnet (pos. 4) clockwise until these parts becomes completely detached. Assess the general conditions of parts and replace them for new ones if required. Before you reassemble the bonnet assembly, lubricate the stem and bushing thread.

5°) Replace the compressor + bushing in the bonnet.

6°) Take the new diaphragm (pos. 2), check it meets the specifications for the application and its dimensions are identical to the previous one. See the figure below for location of valve type, size and grade marking.



For example: **D 0675 150 ;⑥and X123456**		
Where:	**D 0657**	means diaphragm for 657 high flow straightway diaphragm valve
	150	Nominal pipe size 150 mm (6")
	⑥	Part number for Butyl Rubber
	X **123456**	Charge number

7°) Adjust the bonnet nearly to the closed position. Screw the new diaphragm (pos. 2) on by its stud onto the thread inside the compressor (pos. 3) until both of them meet steadly and then align the holes in the bonnet (pos. 4) with the holes in the diaphragm (pos. 2), so that all holes coincide perfectly.

8°) Rotate handwheel (pos. 7) counterclockwise just enough to permit flange area of diaphragm to rest flat against flange area of bonnet (pos. 4)

Subject to alteration

Installation, Operation and Maintenance Instructions

9°) Replace the complete bonnet assembly (pos. 45) with its diaphragm on valve body. Align the holes, so that they coincide and the diaphragm sealing bead is aligned with the seat of the valve. Replace the mounting bolts (pos.15) (only for valves with DN up to 65 mm). Replace the hex nuts (pos.18) and the corresponding spring washers (pos. 17). Tighten the nuts in diametrically opposite order (crisscross pattern). The required torque is the combined result of such factors as material of diaphragm and of bolt, boltcross section (ø) and degree of bolt lubrication.

The recommended torques to reach a perfect seal are informed on the table below:

657 - Bonnet fastener torques

Nominal Size DN		Torques in kgf . m
mm	In	
25	1"	0,5
40	1.1/2"	0,5
50	2"	1,2
65	2.1/2"	2,2
80	3"	3,5
100	4"	2,2
150	6"	6,0
200	8"	6,0

Notes:
1) Torque may be exceeded by up to 10%
2) It is recommended to retighten the bonnet nuts 24 hours after system reaches working temperature and pressure.

10°) Test the airtightness of the valve and quality of its operation before you reinitiate operation of the line.

11°) Reactivate the normal operation of the line.

Subject to alteration

GEMÜ® VALVES, ACTUATORS AND CONTROL SYSTEMS
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