

Diaphragm Valve Two Stage Actuator Metal

Construction

The GEMÜ 658/688 2/2-way or multi-port metal diaphragm valve has a two stage actuator.

The actuator has a stainless steel housing and is controlled by two pistons working independently of each other (for function see page 2).

Features

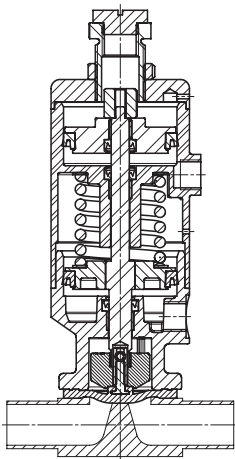
- Suitable for inert and corrosive* liquid and gaseous media
- Chemical resistance of actuator
- CIP/SIP cleaning and sterilizing capabilities
- An adjusting screw in the actuator enables the setting of the opening and closing function and also the setting of a part stroke (for reduced flow)
- Fast on/off operation and the possibility for precision dosing of the working medium
- Insensitive to particulate media
- Valve body and diaphragm available in various materials and designs
- Compact design
- Versions according to ATEX on request

Advantages

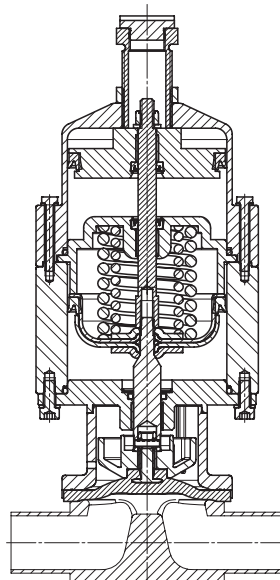
- Optional flow direction, will seal in either flow direction up to full operating pressure
- Optional mounting position
- Can be individually used. Space consuming piping systems and valve wiring are no longer necessary
- Extensive range of accessories (e.g. pilot valves, limit switches, field bus connections)
- With GEMÜ 688 the Closed and Open positions (full stroke) can be detected via M8x1 proximity switches. The proximity switches must be suitable for flush mounting. For diaphragm size 40 and 50 proximity switches with a minimum thread length of 35 mm are required.

*see information on working medium on page 2

Sectional drawing



GEMÜ 658



GEMÜ 688



GEMÜ 658



GEMÜ 688

Technical data

Working medium

Corrosive, inert, gaseous and liquid media which have no negative impact on the physical and chemical properties of the body and diaphragm material.

The valve will seal in both flow directions up to full operating pressure (gauge pressure).

Operating temperature (dependent on medium wetted materials) max. 150 °C

Control medium

Inert gases

Max. permissible temperature of control medium 60 °C

Ambient conditions

Max. ambient temperature 60 °C

MG	GEMÜ	Operating pressure [bar]		Control pressure
		EPDM / FPM	PTFE	[bar]
10	658	0 - 10	0 - 6	4.5 - 6.0
25	688	0 - 10	0 - 6	5.5 - 7.0
40	688	0 - 10	0 - 6	3.5 - 7.0
50	688	0 - 10	0 - 6	5.5 - 7.0

All pressures are gauge pressures. Operating pressure values were determined with static operating pressure applied on one side of a closed valve. Sealing at the valve seat and atmospheric sealing is ensured for the given values.

Information on operating pressures applied on both sides and for high purity media on request.

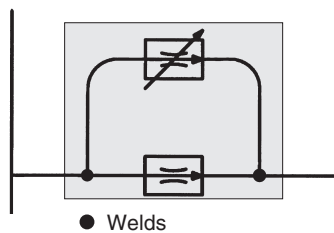
MG = diaphragm size

Kv values [m³/h]

MG	DN	DIN Code 0	DIN 11850 Series 1 Code 16	DIN 11850 Series 2 Code 17	DIN 11850 Series 3 Code 18	SMS 3008 Code 37	ASME BPE Code 59	EN ISO 1127 Code 60
10	10	-	2.4	2.4	2.4	-	2.2	3.3
	15	3.3	3.8	3.8	3.8	-	2.2	4.0
	20	-	-	-	-	-	3.8	-
25	15	4.1	4.7	4.7	4.7	-	-	7.4
	20	6.3	7.0	7.0	7.0	-	4.4	13.2
	25	13.9	15.0	15.0	15.0	12.6	12.2	16.2
40	32	25.3	27.0	27.0	27.0	26.2	-	30.0
	40	29.3	30.9	30.9	30.9	30.2	29.5	32.8
50	50	46.5	48.4	48.4	48.4	51.7	50.6	55.2

Kv values determined acc. to IEC 534 standard, inlet pressure 6 bar, Δp 1 bar, stainless steel valve body and soft elastomer diaphragm.

Application example

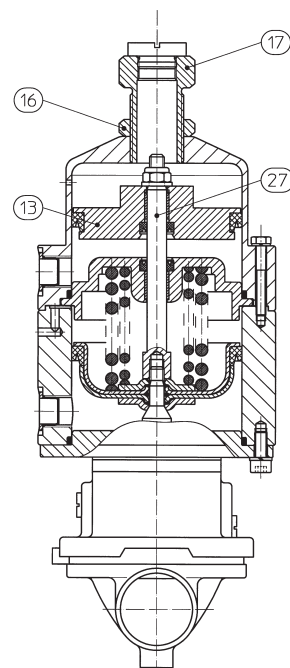


Functional description

When control pressure is applied, the lower actuator piston strokes 100%. The stroke of the upper part of the actuator, however, can be steplessly limited from 0% to 100% by means of the stroke limiter (item 17) and secured by the lock nut (item 16).

When a stroke limiter is used, the piston (item 13) moves against the stroke limiter (item 17) and flow restriction is possible.

If the lower part of the actuator is under control pressure, the valve fully opens, pushing the spindle (item 27) upwards through the upper piston.



Order data

Body configuration	Code
Tank valve body	B**
2/2-way body	D
Multi-port design	M**
T body	T*
* For dimensions see T Valves brochure	
** Dimensions and versions on request or according to customer requirements	

Valve body material	Code
1.4435 BN 2 (CF3M), investment casting, Fe < 0.5%	32
1.4435 (ASTM A 351 CF3M \triangle 316 L), investment casting	34
1.4408, investment casting	37
1.4435 (316 L), forged body	40
1.4435 (BN 2), forged body, Fe < 0.5%	42

Connection	Code
Butt weld spigots	
Spigots DIN	0
Spigots DIN 11850, series 1	16
Spigots DIN 11850, series 2	17
Spigots DIN 11850, series 3	18
Spigots DIN 11866, series A	1A
Spigots DIN 11866, series B	1B
Spigots JIS-G 3447	35
Spigots JIS-G 3459	36
Spigots SMS 3008	37
Spigots BS 4825, part 1	55
Spigots ASME BPE	59
Spigots EN ISO 1127	60
Spigots ANSI/ASME B36.19M, Schedule 10s	63
Spigots ANSI/ASME B36.19M, Schedule 40s	65
Threaded connections	
Threaded sockets DIN ISO 228	1
Threaded spigots DIN 11851	6
One side threaded spigot, other side cone spigot and union nut, DIN 11851	62
Aseptic unions on request	
Flanges	
Flanges EN 1092 / PN16 / form B, length EN 558, series 1, ISO 5752, basic series 1	8
Clamp connections	
Clamps ASME BPE for pipe ASME BPE, short design	80
Clamps DIN 32676 series B for pipe EN ISO 1127, length EN 558, series 7	82
Clamps ASME BPE for pipe ASME BPE length EN 558, series 7	88
Clamps DIN 32676 series A for pipe DIN 11850 length EN 558, series 7	8A
Clamps SMS 3017 for pipe SMS 3008 length EN 558, series 7	8E
Overview of available valve bodies see page 8	

Diaphragm material	Code
FPM	4
EPDM max. 130 °C	12
EPDM max. 150 °C	13
EPDM max. 150 °C	16
EPDM max. 150 °C	17
PTFE/EPDM convex PTFE loose max. 150 °C	5E*
PTFE/FPM convex PTFE loose max. 150 °C	5F*
PTFE/EPDM PTFE lamin. max. 150 °C	52**
* for diaphragm size 25 - 50 ** for diaphragm size 10	
Material complies with FDA requirements, except codes 4 and 5F	

Control function	Code
Normally closed (NC)	1

Version	Code
Diaphragm size 10	1T1
Control air connector positioned in-line with flow direction	
Diaphragm size 25	1V1
Control air connector 90° to flow direction	
Diaphragm size 40 + 50	2V1
Control air connector 90° to flow direction	

Surface finish	Code
See top of page 4	

Order example	688	25	D	60	34	13	1	1V1	1503
Type	688								
Nominal size		25							
Body configuration (code)			D						
Connection (code)				60					
Valve body material (code)					34				
Diaphragm material (code)						13			
Control function (code)							1		
Version (code)								1V1	
Surface finish (Code see top of page 4)									1503

Valve body surface finish, internal contour		Code
Ra ≤ 6.3 µm	blasted internal/external	1500*
Ra ≤ 6.3 µm	electropolished internal/external	1509*
Ra ≤ 0.8 µm	mechanically polished internal, blasted external	1502
Ra ≤ 0.8 µm	electropolished internal/external	1503
Ra ≤ 0.6 µm	mechanically polished internal, blasted external	1507
Ra ≤ 0.6 µm	electropolished internal/external	1508
Ra ≤ 0.4 µm	mechanically polished internal, blasted external	1536
Ra ≤ 0.4 µm	electropolished internal/external	1537
Ra ≤ 0.25 µm	mechanically polished internal, blasted external	1527
Ra ≤ 0.25 µm	electropolished internal/external	1516

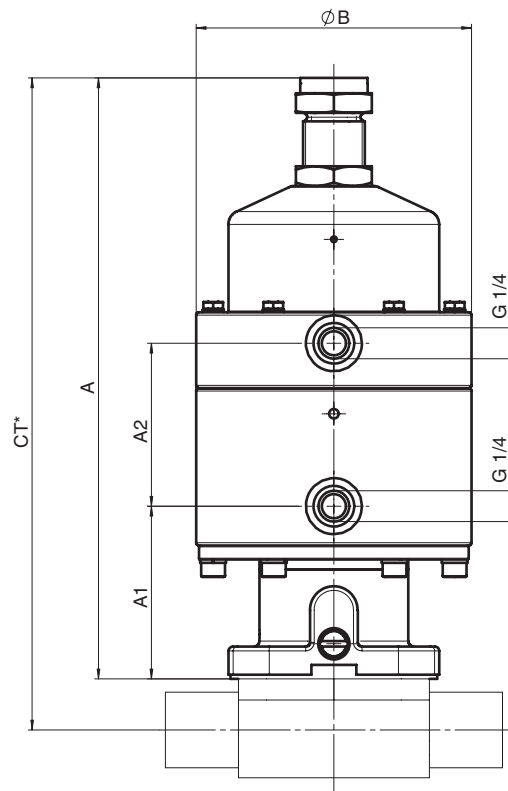
Ra acc. to DIN 4768; at defined reference points
Surface finish data refer to medium wetted surfaces

* only investment cast design

Actuator dimensions [mm]

MG	GEMÜ	Version	øB	A	A1	A2	Weight [kg]
10	658	1T1	61	169	35	63	1.75
25	688	1V1	98	216	64	50	4.80
40	688	2V1	168	320	76	95	18.90
50	688	2V1	168	328	84	95	19.10

MG = Diaphragm size



* CT = A + H1 (see body dimensions)

Body dimensions [mm]

Butt weld spigots, connection code 0, 16, 17, 18, 1A, 1B, 60 Valve body material: Investment casting (code 34), forged body (code 40)

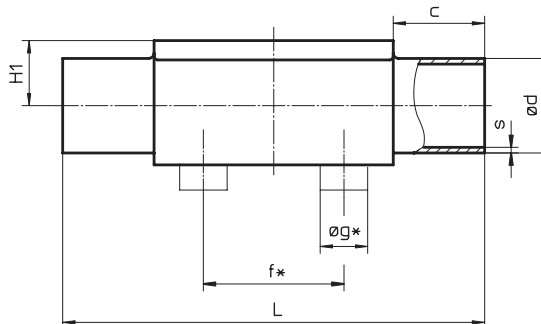
MG	DN	NPS	f*	øg*	L	c	H1*	H1**	DIN Series 0 Code 0		DIN 11850 Series 1 Code 16		DIN 11850 Series 2 Code 17		DIN 11850 Series 3 Code 18		DIN 11866 Series A Code 1A		DIN 11866 Series B Code 1B		EN ISO 1127 Code 60		Weight [kg]
									ød	s	ød	s	ød	s	ød	s	ød	s	ød	s	ød	s	
10	10	3/8"	30	13.5	108	25	12.5		-	-	12	1.0	13	1.5	14	2.0	13	1.5	17.2	1.6	17.2	1.6	0.30
	15	1/2"	30	13.5	108	25	12.5		18	1.5	18	1.0	19	1.5	20	2.0	19	1.5	21.3	1.6	21.3	1.6	0.30
	20	3/4"	30	13.5	108	25	12.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.30
25	15	1/2"	40	13.5	120	25	13.0	19.0	18	1.5	18	1.0	19	1.5	20	2.0	19	1.5	21.3	1.6	21.3	1.6	0.62
	20	3/4"	40	13.5	120	25	16.0	19.0	22	1.5	22	1.0	23	1.5	24	2.0	23	1.5	26.9	1.6	26.9	1.6	0.58
	25	1"	40	13.5	120	25	19.0	19.0	28	1.5	28	1.0	29	1.5	30	2.0	29	1.5	33.7	2.0	33.7	2.0	0.55
40	32	1 1/4"	68	13.5	153	25	24.0	26.0	34	1.5	34	1.0	35	1.5	36	2.0	35	1.5	42.4	2.0	42.4	2.0	1.45
	40	1 1/2"	75	13.5	153	25	26.0	26.0	40	1.5	40	1.0	41	1.5	42	2.0	41	1.5	48.3	2.0	48.3	2.0	1.32
50	50	2"	90	13.5	173	30	32.0	32.0	52	1.5	52	1.0	53	1.5	54	2.0	53	1.5	60.3	2.0	60.3	2.0	2.25

* only for investment cast design ** only for forged design MG = diaphragm size
For materials see overview on last page

Butt weld spigots, connection code 35, 36, 37, 55, 59, 63, 65 Valve body material: Investment casting (code 34), forged body (code 40)

MG	DN	NPS	f*	øg*	L	c	H1*	H1**	JIS-G 3447 Code 35		JIS-G 3459 Code 36		SMS 3008 Code 37		BS 4825 Code 55		ASME BPE Code 59		ANSI/ASME B36.19M 10s Code 63		ANSI/ASME B36.19M 40s Code 65		Weight [kg]
									ød	s	ød	s	ød	s	ød	s	ød	s	ød	s	ød	s	
10	10	3/8"	30	13.5	108	25	12.5		-	-	17.3	1.65	-	-	9.53	1.2	9.53	0.89	17.1	1.65	17.1	2.31	0.30
	15	1/2"	30	13.5	108	25	12.5		-	-	21.7	2.10	-	-	12.70	1.2	12.70	1.65	21.3	2.11	21.3	2.77	0.30
	20	3/4"	30	13.5	108	25	12.5		-	-	-	-	-	-	19.05	1.2	19.05	1.65	-	-	-	-	0.30
25	15	1/2"	40	13.5	120	25	13.0	19.0	-	-	21.7	2.10	-	-	-	-	-	-	21.3	2.11	21.3	2.77	0.62
	20	3/4"	40	13.5	120	25	16.0	19.0	-	-	27.2	2.10	-	-	19.05	1.2	19.05	1.65	26.7	2.11	26.7	2.87	0.58
	25	1"	40	13.5	120	25	19.0	19.0	25.4	1.2	34.0	2.80	25.0	1.2	-	-	25.40	1.65	33.4	2.77	33.4	3.38	0.55
40	32	1 1/4"	68	13.5	153	25	24.0	26.0	31.8	1.2	42.7	2.80	33.7	1.2	-	-	-	-	42.2	2.77	42.2	3.56	1.45
	40	1 1/2"	75	13.5	153	25	26.0	26.0	38.1	1.2	48.6	2.80	38.0	1.2	-	-	38.10	1.65	48.3	2.77	48.3	3.68	1.32
50	50	2"	90	13.5	173	30	32.0	32.0	50.8	1.5	60.5	2.80	51.0	1.2	-	-	50.80	1.65	60.3	2.77	60.3	3.91	2.25

* only for investment cast design ** only for forged design MG = diaphragm size
For materials see overview on last page



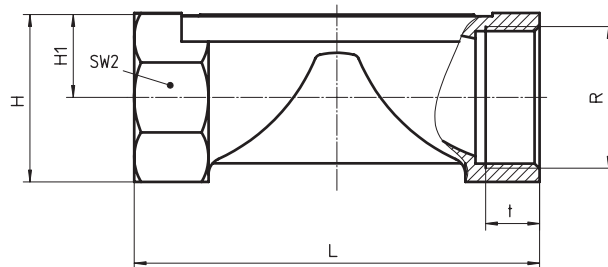
Body dimensions [mm]

Threaded sockets, connection code 1 Valve body material: investment casting (code 34, 37)

MG	DN	R	H	H1	t	L	SW2	Number of flats	Weight [kg]
10	12	G 3/8	23	10.5	13	55	22	2	0.17
	15	G 1/2	29	13.5	15	68	24	2	0.26
25	15	G 1/2	30	16.0	9	85	27	6	0.32
	20	G 3/4	33	17.0	10	85	32	6	0.34
	25	G 1	37	17.0	13	110	41	6	0.39
40	32	G 1 1/4	50	25.0	16	120	50	8	0.88
	40	G 1 1/2	52	25.0	18	140	55	8	0.93
50	50	G 2	69	34.0	18	165	70	8	1.56

MG = Diaphragm size

For materials see overview on last page



Threaded connections, connection code 6, 62 Valve body material: investment casting (code 34), forged body (code 40)

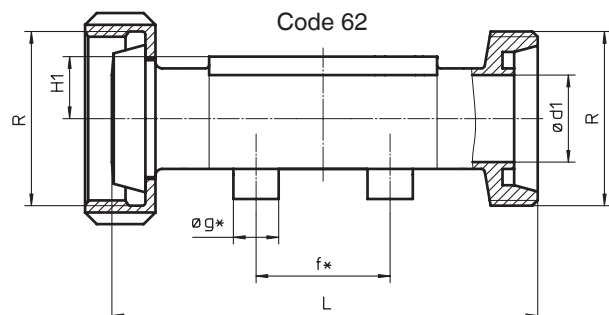
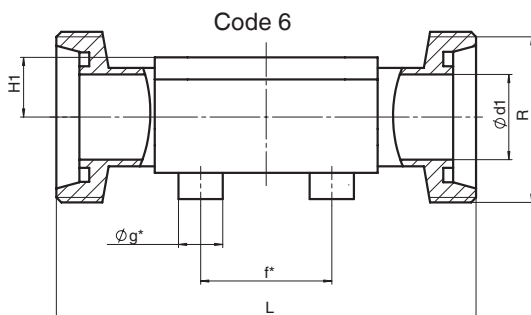
MG	DN	H1*	H1**	f*	øg*	ød1	Thread to DIN 405 R	Code 6 L	Code 62 L	Weight [kg]
10	10	12.5	-	30.0	13.5	10.0	RD 28 x 1/8	118	116	0.33
	15	12.5	-	30.0	13.5	16.0	RD 34 x 1/8	118	116	0.35
25	15	13.0	19	40.0	13.5	16.0	RD 34 x 1/8	118	116	0.71
	20	16.0	19	40.0	13.5	20.0	RD 44 x 1/6	118	114	0.78
	25	19.0	19	40.0	13.5	26.0	RD 52 x 1/6	128	127	0.79
40	32	24.0	26	68.0	13.5	32.0	RD 58 x 1/6	147	147	1.66
	40	26.0	26	75.0	13.5	38.0	RD 65 x 1/6	160	160	1.62
50	50	32.0	32	90.0	13.5	50.0	RD 78 x 1/6	191	191	2.70

* only for investment cast design

** only for forged design

MG = diaphragm size

For materials see overview on last page



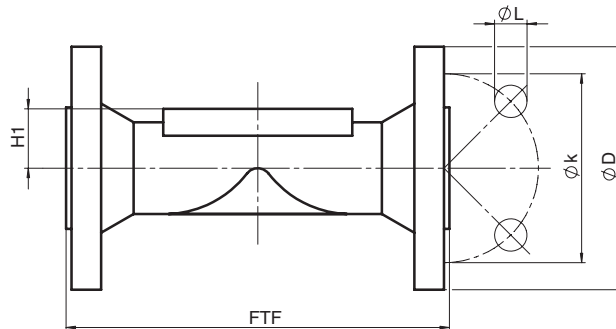
Body dimensions [mm]

Flanges - DIN EN 1092-2, connection code 8 Valve body material: investment casting (code 34)

MG	DN	øD	øk	øL	Number of bolts	H1	FTF	Weight [kg]
25	15	95	65	14	4	13	130*	1.85
	20	105	75	14	4	16	150	2.35
	25	115	85	14	4	19	160	2.85
40	32	140	100	18	4	24	180	4.90
	40	150	110	18	4	26	200	5.65
50	50	165	125	18	4	32	230	7.45

* no EN length

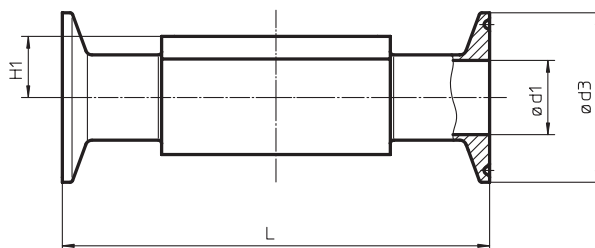
MG = diaphragm size



Clamp connections, connection code 80, 82, 88, 8A, 8E Valve body material: forged body (code 40)

MG	DN	NPS	H1	for pipe ASME BPE Code 80			for pipe EN ISO 1127 Code 82			for pipe ASME BPE Code 88			for pipe DIN 11850 Code 8A			for pipe SMS 3008 Code 8E			Weight [kg]
				ød1	ød3	L	ød1	ød3	L	ød1	ød3	L	ød1	ød3	L	ød1	ød3	L	
10	10	3/8"	12.5	-	-	-	14.0	25.0	108.0	-	-	-	10	34.0	108.0	-	-	-	0.30
	15	1/2"	12.5	9.40	25.0	88.9	18.1	50.5	108.0	9.40	25.0	108	16	34.0	108.0	-	-	-	0.43
	20	3/4"	12.5	15.75	25.0	101.6	-	-	-	15.75	25.0	117	-	-	-	-	-	-	0.43
25	15	1/2"	19.0	-	-	-	18.1	50.5	108.0	-	-	-	16	34.0	108.0	-	-	-	0.75
	20	3/4"	19.0	15.75	25.0	101.6	23.7	50.5	117.0	15.75	25.0	117	20	34.0	117.0	-	-	-	0.71
	25	1"	19.0	22.10	50.5	114.3	29.7	50.5	127.0	22.10	50.5	127	26	50.5	127.0	22.6	50.5	127	0.63
40	32	1 1/4"	26.0	-	-	-	38.4	64.0	146.0	-	-	-	32	50.5	146.0	31.3	50.5	146	1.62
	40	1 1/2"	26.0	34.80	50.5	139.7	44.3	64.0	159.0	34.80	50.5	159	38	50.5	159.0	35.6	50.5	159	1.50
50	50	2"	32.0	47.50	64.0	158.8	56.3	77.5	190.0	47.50	64.0	190	50	64.0	190.0	48.6	64.0	190	2.50

MG = diaphragm size



Overview of valve bodies for GEMÜ 658/688

		Spigots																							
Connection code		0		16		17		18		1A	1B	35		36	37		55		59		60		63	65	
Material code		34	40	34	40	34	40	34	40	40	40	34	40	40	34	40	34	40	34	40	34	40	40	40	
MG	DN																								
10	10	-	-	X	X	X	X	X	X	X	X	-	-	X	-	-	-	X	-	X	X	X	X	X	X
	15	X	X	X	X	X	X	X	X	X	X	-	-	X	-	-	X	X	-	X	X	X	X	X	X
	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	X	X	X	X	-	-	-	-	-
25	15	X	X	X	X	X	X	-	X	X	X	-	-	X	-	-	-	-	-	-	X	X	X	X	X
	20	X	X	X	X	X	X	-	X	X	X	-	-	X	-	-	X	X	X	X	X	X	X	X	X
	25	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	X	X	X	X	X	X	X
40	32	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	-	-	X	X	X	X	X	X
	40	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	X	X	X	X	X	X	X	X
50	50	X	X	X	X	X	X	X	X	X	X	X	X	X	X	-	-	X	X	X	X	X	X	X	X

MG = diaphragm size

Overview of valve bodies for GEMÜ 658/688

		Threaded connections					Flanges	Clamps				
Connection code		1	6		62		8	80	82	88	8A	8E
Material code		34	34	40	34	40	34	40	40	40	40	40
MG	DN											
10	10	-	W	W	W	W	-	-	K	-	K	-
	15	X	W	W	W	W	-	K	W	K	K	-
	20	-	-	-	-	-	-	K	-	K	-	-
25	15	-	W	W	W	W	W	-	W	-	K	-
	20	-	W	W	W	W	W	K	K	K	K	-
	25	-	W	W	W	W	W	K	K	K	K	K
40	32	-	W	W	W	W	W	-	W	-	K	K
	40	-	W	W	W	W	W	K	W	K	K	K
50	50	-	W	W	W	W	W	K	W	K	K	K

X Standard
 K Connections completely machined (not welded) in material code 40
 W Welded construction

MG = diaphragm size

Availability of material code 32: same as code 34, availability of material code 42: same as code 40

For further metal diaphragm valves, accessories and other products, please see our Product Range catalogue and Price List.
 Contact GEMÜ.

GEMÜ® VALVES, MEASUREMENT
AND CONTROL SYSTEMS

