

Diaphragm Valve, Plastic

Construction

The GEMÜ R690 diaphragm valve has a low maintenance membrane actuator which can be controlled by air or inert gases. Normally Closed (NC), Normally Open (NO) and Double Acting (DA) control functions are available. All medium wetted parts and the actuator housing are made of high-grade plastic materials which can be selected to suit the application.

Features

- Suitable for inert and corrosive* liquid and gaseous media
- Insensitive to particulate media
- Optional flow direction and mounting position
- Nominal pressure PN 10 / 150 PSI
- Nominal size DN 15 - DN 100 / NPS 1/2" - NPS 4"
- Actuator housing in glass fibre reinforced PP
- Valve body and diaphragm available in various materials and designs

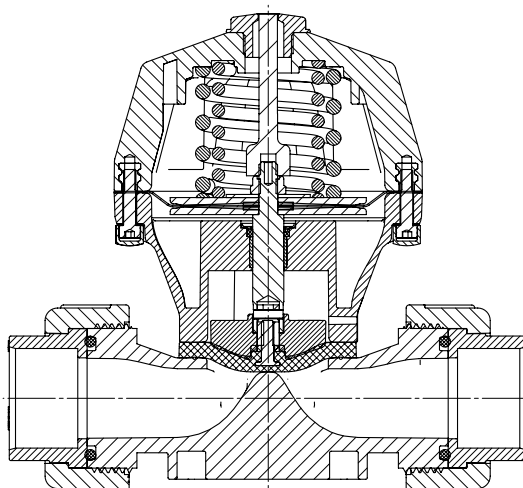
Advantages

- Compact, lightweight construction and high performance
- Good flow characteristics due to flow optimized valve body
- Proven long-life membrane actuator
- Leak detection hole
- Diaphragm easy to replace
- Adjusted instrumentation
- Optical position indicator as standard
- Optional accessories
 - Electrical position indicator with microswitches or proximity switches
 - Positioner and process controller
 - Stroke limiter
 - Pilot valve

*see information on working medium on page 2



Sectional drawing



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.

Working medium temperature

Valve body PVC-U	10 to 60 °C
Valve body ABS	-10 to 60 °C
Valve body PP / PP-H	5 to 80 °C
Valve body PVDF	-10 to 80 °C

The permissible operating pressure depends on the working medium temperature.

Ambient temperature

Valve body PVC-U	10 to 50 °C
Valve body ABS	-10 to 50 °C
Valve body PP / PP-H	5 - to 50 °C
Valve body PVDF	-10 - to 50 °C

Control medium

Inert gases	
Max. perm. temperature of control medium	40 °C

Filling volume (control function 1):

Diaphragm size 20	0.10 dm ³
Diaphragm size 25	0.20 dm ³
Diaphragm size 40	0.55 dm ³
Diaphragm size 50	1.10 dm ³
Diaphragm size 80	2.50 dm ³
Diaphragm size 100	2.50 dm ³

O-ring material for valve bodies with union ends

Diaphragm material	O-ring material
NBR	EPDM
FPM	FPM
EPDM	EPDM
PTFE	FPM
Other combinations on request	

Kv value

MG	DN	[m ³ /h]
20	15	6
	20	10
	25	12
25	32	20
	40	42
40	50	46
	65	70
50	80	120
80	100	189

Kv values determined acc. to DIN EN 60534, inlet pressure 5 bar, Δp 1 bar, PVC-U valve body and soft elastomer diaphragm.

The Kv values for other product configurations (e.g. other diaphragm or body materials) may differ. In general, all diaphragms are subject to the influences of pressure, temperature, the process and their tightening torques. Therefore the Kv values may exceed the tolerance limits of the standard.

MG = diaphragm size

				Control function 1		
MG	DN	NPS	Actuator size *	Operating pressure [bar]		Control pressure [bar]
				EPDM/FPM	PTFE	
20	15, 20, 25	1/2", 3/4", 1	EDL	0 - 3	0 - 3	3.0 - 7.0
			EDM	0 - 6	0 - 6	3.8 - 7.0
			EDN	0 - 10	0 - 10	5.0 - 7.0
25	32	1 1/4"	FDL	0 - 3	0 - 3	2.5 - 6.0
			FDM	0 - 6	0 - 6	3.2 - 6.0
			FDN	0 - 10	0 - 10	5.0 - 7.0
40	40, 50	1 1/2", 2"	HDM	0 - 4	0 - 4	3.0 - 7.0
			HDN	0 - 10	0 - 10	5.0 - 7.0
50	65	2 1/2"	KDL	0 - 3	0 - 3	3.0 - 6.0
			KDM	0 - 6	0 - 6	4.0 - 7.0
			KDN	0 - 10	0 - 10	5.5 - 7.0
80	80	3"	MDN	0 - 8	0 - 6	5.0 - 7.0
100	100	4"	NDN	0 - 6	0 - 4	5.5 - 7.0

* Actuator sizes _DL, _DM with a lower force spring package to extend diaphragm life and for vacuum applications.

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

			Control function 2			Control function 3			Kv value
MG	DN	NPS	Operating pressure [bar]		Control pressure [bar]*	Operating pressure [bar]		Control pressure [bar]*	[m³/h]
			EPDM/FPM	PTFE		EPDM/FPM	PTFE		
20	15	1/2"							6
	20	3/4"	0 - 10	0 - 10	max. 6.0	0 - 10	0 - 10	max. 6.0	10
	25	1"							12
25	32	1 1/4"	0 - 10	0 - 10	max. 5.5	0 - 10	0 - 10	max. 5.5	20
40	40	1 1/2"	0 - 10	0 - 10	max. 5.5	0 - 10	0 - 10	max. 5.5	42
	50	2"							46
50	65	2 1/2"	0 - 10	0 - 10	max. 5.0	0 - 10	0 - 10	max. 5.0	70
80	80	3"	0 - 8	0 - 6	max. 5.0	0 - 8	0 - 6	max. 4.5	120
100	100	4"	0 - 6	0 - 4	max. 5.0	0 - 6	0 - 4	max. 4.5	189

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.

*For required control pressure depending on operating pressure see diagram.

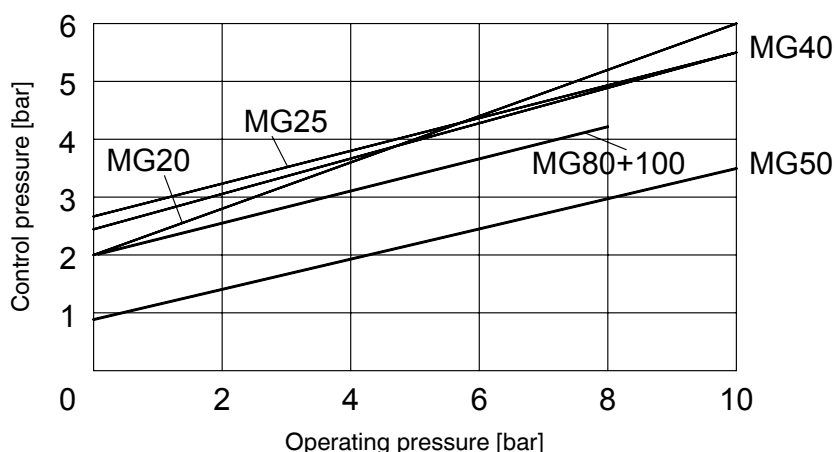
Kv values determined acc. to DIN EN 60534, inlet pressure 5 bar, Δp 1 bar, PVC-U valve body and soft elastomer diaphragm.

The Kv values for other product configurations (e.g. other diaphragm or body materials) may differ. In general, all diaphragms are subject to the influences of pressure, temperature, the process and their tightening torques. Therefore the Kv values may exceed the tolerance limits of the standard.

MG = diaphragm size

Control pressure characteristic DN 15 - 100 (EPDM, FPM)

Control function 2 and 3



The control pressure depending on the prevailing operating pressure, as shown in the diagram, is intended as a guide for operating the system with low wear on the diaphragm.

Pressure / temperature correlation for plastic

Temperature in °C (plastic body)		-10	±0	5	10	20	25	30	40	50	60	70	80
Valve body material		Permissible operating pressure in bar											
PVC-U	Code 1	-	-	-	10.0	10.0	10.0	8.0	6.0	3.5	1.5	-	-
ABS	Code 4	10.0	10.0	10.0	10.0	10.0	10.0	8.0	6.0	4.0	2.0	-	-
PP	Code 5	-	-	10.0	10.0	10.0	10.0	8.5	7.0	5.5	4.0	2.7	1.5
PP-H	Code 71	-	-	10.0	10.0	10.0	10.0	8.5	7.0	5.5	4.0	2.7	1.5
PVDF	Code 20	10.0	10.0	10.0	10.0	10.0	10.0	9.0	8.0	7.0	6.3	5.4	4.7
PVDF	Code 75	10.0	10.0	10.0	10.0	10.0	10.0	9.0	8.0	7.1	6.3	5.4	4.7

Data for extended temperature ranges on request. Please note that the ambient temperature and medium temperature generate a combined temperature at the valve body which must not exceed the above values.

Order data

Body configuration	Code
2/2-way body	D

Connection	Code
Spigots DIN for socket solvent cementing/welding	0
Flanges EN 1092 / PN10 / form B, length EN 558, series 1, ISO 5752, basic series 1	4
Union ends with DIN insert (socket)	7
Union ends with Rp threaded socket inserts	7R
Spigots for IR butt welding	20
Spigots - inch for socket solvent cementing/welding	30
Union ends with inch insert - BS (socket)	33
Flanges ANSI Class 125/150 RF, length EN 558, series 1, ISO 5752, basic series 1	39
Union ends with inch ASTM insert (socket)	3M
Union ends with JIS insert (socket)	3T
Union ends with DIN insert (for IR butt welding)	78

Valve body material	Code
PVC-U, grey	1
ABS	4
PP, mineral reinforced (DN 65 - 100)	5
PVDF (DN 65 - 100)	20
Inliner PP-H grey / outliner PP reinforced (DN 15 - 50)	71
Union nut made from PP	
Inliner PVDF / outliner PP reinforced (DN 15 - 50)	75
Union nut made from PVDF	

Diaphragm material	Code
NBR	2
FPM	4
EPDM	14
PTFE/EPDM, one-piece	54
PTFE/EPDM, two-piece (MG 25 - MG 50)	5M
other diaphragm material on request	

Control function	Code
Normally closed (NC)	1
Normally open (NO)	2
Double acting (DA)	3

Actuator size	Code
Diaphragm size 20 (DN 15, 20, 25)	E
Diaphragm size 25 (DN 32)	F
Diaphragm size 40 (DN 40, 50)	H
Diaphragm size 50 (DN 65)	K
Diaphragm size 80 (DN 80)	M
Diaphragm size 100 (DN 100)	N

Actuator version (base)	Code
For body configuration D	D

Spring set	Code
Low	L*
Medium	M*
Standard	N
* only control function 1 (NC)	

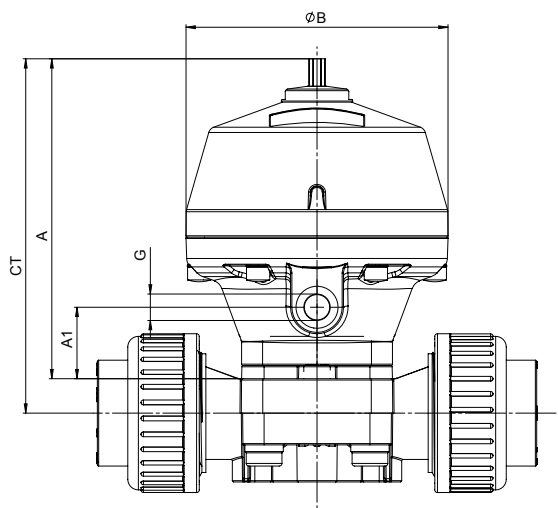
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Type	R690									
Nominal size		20								
Body configuration (code)			D							
Connection (code)				7						
Valve body material (code)					1					
Diaphragm material (code)						14				
Control function (code)							1			
Actuator size (code)								E		
Actuator version, base (code)									D	
Spring set (code)										N

Dimensions [mm]

Actuator dimensions - Control function 1

MG	DN	øB	A	A1	G	Weight [kg]
20	15 - 25	100	119	27	G 1/4	0.7
25	32	130	145	28	G 1/4	1.6
40	40 - 50	170	198	52	G 1/4	3.5
50	65	210	240	90	G 1/4	5.5
80	80	260	317	127	G 1/4	11.3
100	100	260	349	149	G 1/4	11.5

MG = diaphragm size

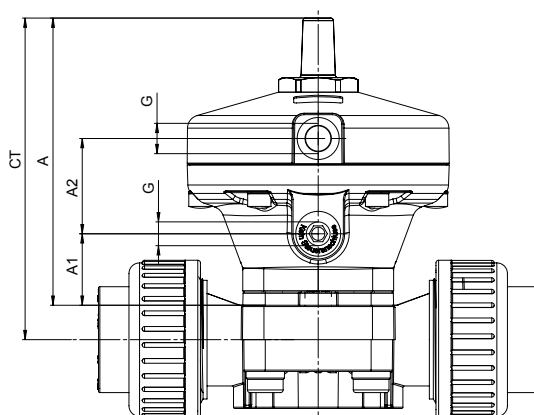


* CT = A + H1 (see body dimensions)

Actuator dimensions - Control function 2 and 3

MG	DN	øB	A	A1	A2	G	Weight [kg]
20	15 - 25	100	109	27	36	G 1/4	0.5
25	32	130	123	28	46	G 1/4	1.0
40	40 - 50	170	163	52	55	G 1/4	2.0
50	65	210	195	90	29	G 1/4	3.6
80	80	260	270	127	41	G 1/4	8.1
100	100	260	307	149	46	G 1/4	9.4

MG = diaphragm size



* CT = A + H1 (see body dimensions)

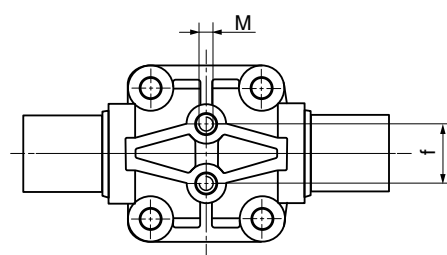
Dimensions [mm]

Valve body mounting

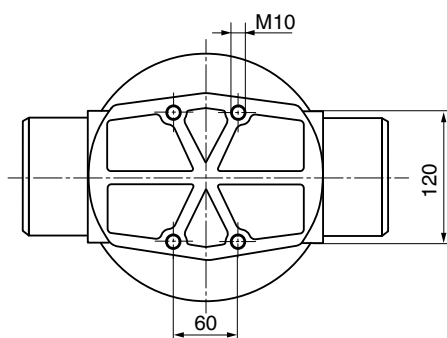
Diaphragm size	DN	M Connection code 0, 4, 7, 7R, 20, 33, 39, 3M, 3T, 78	M Connection code 30	f
20	15 - 25	M6	M6*	25.0
25	32	M6	M6*	25.0
40	40 - 50	M8	M8*	44.5
50	65	M8	M8*	44.5
80	80	M12	1/2 " **	100.0
100	100	M10	3/8 " **	120.0

* Inch thread on request.

** Metric thread on request.



DN 15 - 80



DN 100

Body dimensions [mm]

Spigots, connection code 0
Valve body material: PVC-U (code 1), PP (code 5), PVDF (code 20),
Inliner PP-H (code 71), Inliner PVDF (code 75)

MG	DN	NPS	H1	L	H			ød	c			Weight [kg]
					Material code 1	Material code 5, 20	Material code 71, 75		Material code 1	Material code 5, 20	Material code 71, 75	
20	15	1/2"	10.0	124	36.0	-	36.0	20	16	-	18	0.12
	20	3/4"	12.0	144	38.0	-	38.0	25	19	-	19	0.13
	25	1"	13.0	154	39.0	-	39.0	32	22	-	22	0.16
25	32	1 1/4"	15.0	174	41.0	-	41.0	40	32	-	32	0.22
40	40	1 1/2"	23.2	194	63.2	-	63.2	50	35	-	26	0.50
	50	2"	23.2	224	63.2	-	63.2	63	38	-	33	0.57
50	65	2 1/2"	38.8	284	78.8	78.8	-	75	46	46	-	0.92
80	80	3"	62.0	300	117.0	117.0	-	90	51	51	-	4.00
100	100	4"	75.0	340	140.0	140.0	-	110	61	61	-	4.40

MG = diaphragm size

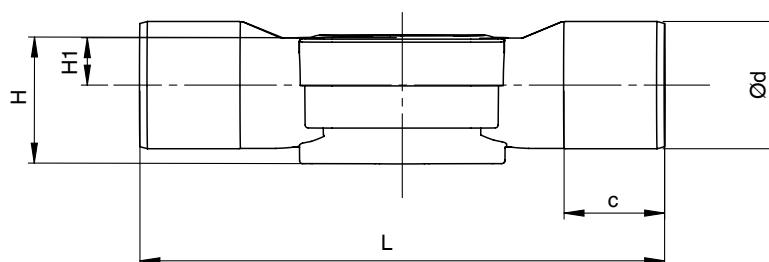
For materials see overview on page 12

Spigots, connection code 30
Valve body material: PVC-U (code 1), ABS (code 4)

MG	DN	NPS	H1	L	H	ød	c	Weight [kg]
20	15	1/2"	10.0	141	36.0	21.4	24	0.12
	20	3/4"	12.0	144	38.0	26.7	27	0.13
	25	1"	13.0	154	39.0	33.6	30	0.16
25	32	1 1/4"	15.0	174	41.0	42.2	33	0.22
40	40	1 1/2"	23.2	194	63.2	48.3	35	0.50
	50	2"	23.2	224	63.2	60.3	40	0.57
50	65	2 1/2"	38.8	284	78.8	73.0	46	0.92
80	80	3"	62.0	300	117.0	88.9	51	4.00
100	100	4"	75.0	340	140.0	114.3	61	4.40

MG = diaphragm size

For materials see overview on page 12



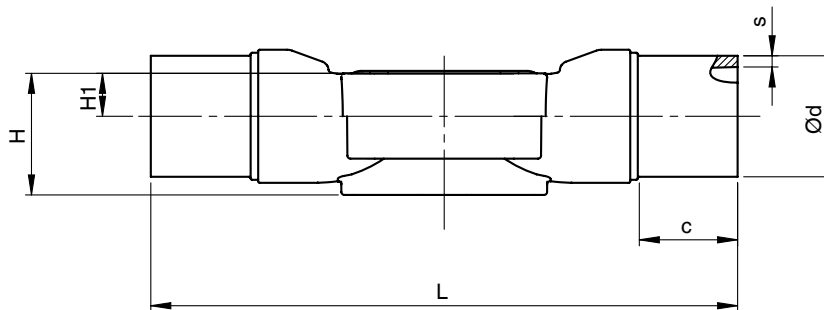
Body dimensions [mm]

Spigots for IR butt welding, connection code 20
Valve body material: PVDF (code 20), inliner PP-H (code 71), inliner PVDF (code 75)

MG	DN	L	H	H1	ød	s		c	Weight [kg]
						Material code 71	Material code 20, 75		
20	15	154	36.0	10.0	20	1.9	1.9	33	0.10
	20	154	38.0	12.0	25	2.3	1.9	33	0.12
	25	154	39.0	13.0	32	2.9	2.4	33	0.14
25	32	194	41.0	15.0	40	3.7	2.4	33	0.18
40	40	194	63.2	23.2	50	4.6	3.0	33	0.40
	50	224	63.2	23.2	63	5.8	3.0	33	0.47
50	65	284	78.8	38.8	75	-	3.6	43	3.57
80	80	300	117.0	62.0	90	-	4.3	51	3.30
100	100	340	140.0	75.0	110	-	5.3	59	4.00

MG = diaphragm size

For materials see overview on page 12

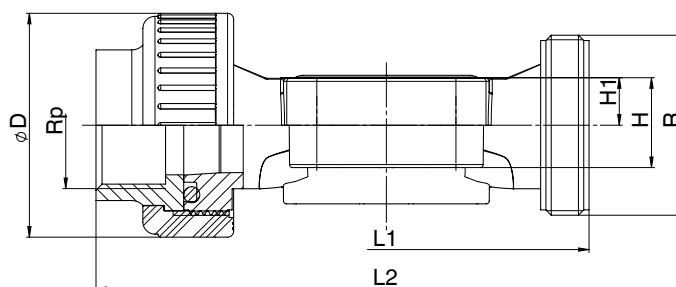


Union ends with insert, connection code 7R
Valve body material: PVC-U (code 1)

MG	DN	R	øD	L1	H	H1	L2	Rp	Weight [kg]
20	15	G 1	43	108	36.0	10.0	146	1/2	0.17
	20	G 1 1/4	53	108	38.0	12.0	152	3/4	0.21
	25	G 1 1/2	60	116	39.0	13.0	166	1	0.26
25	32	G 2	74	134	41.0	15.0	192	1 1/4	0.40
40	40	G 2 1/4	83	154	63.2	23.2	222	1 1/2	0.73
	50	G 2 3/4	103	184	63.2	23.2	266	2	1.00

MG = diaphragm size

For materials see overview on page 12



Body dimensions [mm]

Union ends with insert, connection code 7

Valve body material: PVC-U (code 1), ABS (code 4), inliner PP-H (code 71), inliner PVDF (code 75)

MG	DN	R	øD	L1	H	H1	L2				ød	Weight [kg]
							Material code 1	Material code 4	Material code 71	Material code 75		
20	15	G 1	43	108	36.0	10.0	146	150	143	146	20	0.17
	20	G 1 1/4	53	108	38.0	12.0	152	156	146	150	25	0.21
	25	G 1 1/2	60	116	39.0	13.0	166	170	158	162	32	0.26
25	32	G 2	74	134	41.0	15.0	192	196	181	184	40	0.40
40	40	G 2 1/4	83	154	63.2	23.2	222	222	207	210	50	0.73
	50	G 2 3/4	103	184	63.2	23.2	266	266	245	248	63	1.00

MG = diaphragm size

For materials see overview on page 12

Union ends with insert, connection code 33, 3M

Valve body material: PVC-U (code 1), ABS (code 4)

								Connection code 33				Connection code 3M		
MG	DN	NPS	R	øD	L1	H	H1	L2		ød	Weight [kg]	L2	ød	Weight [kg]
								Material code 1	Material code 4			Material code 1		
20	15	1/2"	G 1	43	108	36.0	10.0	146	150	21.4	0.24	158	21.4	0.26
	20	3/4"	G 1 1/4	53	108	38.0	12.0	152	156	26.8	0.28	164	26.7	0.30
	25	1"	G 1 1/2	60	116	39.0	13.0	166	170	33.6	0.33	180	33.5	0.38
25	32	1 1/4"	G 2	74	134	41.0	15.0	192	198	42.3	0.70	204	42.2	0.73
40	40	1 1/2"	G 2 1/4	83	154	63.2	23.2	222	220	48.3	0.83	230	48.3	0.93
	50	2"	G 2 3/4	103	184	63.2	23.2	264	264	60.4	1.40	266	60.4	1.50

MG = diaphragm size

For materials see overview on page 12

Union ends with insert, connection code 3T

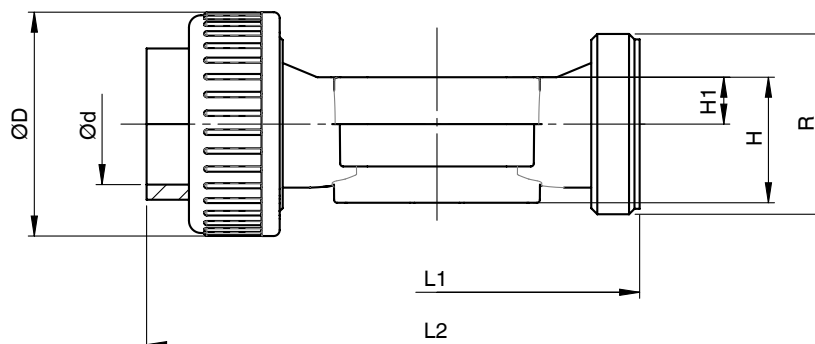
Valve body material: PVC-U (code 1)

MG	DN	R	øD	L1	H	H1	L2	ød	Weight [kg]
20	15	G 1 1/4*	53*	108	36.0	10.0	152	22	0.26
	20	G 1 1/4	53	108	38.0	12.0	152	26	0.30
	25	G 1 1/2	60	116	39.0	13.0	166	32	0.38
25	32	G 2	74	134	41.0	15.0	192	38	0.73
40	40	G 2 1/4	83	154	63.2	23.2	222	48	0.93
	50	G 2 3/4	103	184	63.2	23.2	266	60	1.50

* Insert requires valve body DN 20

MG = diaphragm size

For materials see overview on page 12



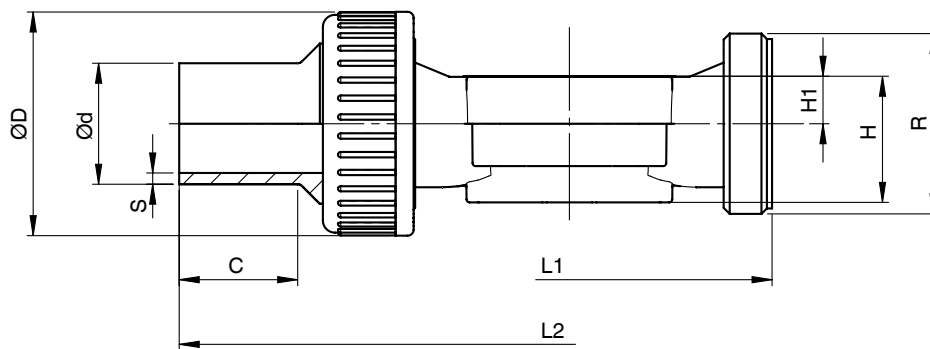
Body dimensions [mm]

Union ends with insert, connection code 78
Valve body material: inliner PP-H (code 71), inliner PVDF (code 75)

MG	DN	L1	L2	H	H1	øD	ød	R	s		c	Weight [kg]
									Material code 71	Material code 75		
20	15	108	214	36.0	10.0	43	20	G 1	1.9	1.9	36	0.27
	20	108	220	38.0	12.0	53	25	G 1 1/4	2.3	1.9	37	0.36
	25	116	234	39.0	13.0	60	32	G 1 1/2	2.9	2.4	39	0.37
25	32	134	258	41.0	15.0	74	40	G 2	3.7	2.4	39	0.63
40	40	154	284	63.2	23.2	83	50	G 2 1/4	4.6	3.0	43	1.13
	50	184	320	63.2	23.2	103	63	G 2 3/4	5.8	3.0	43	1.60

MG = diaphragm size

For materials see overview on page 12



Body dimensions [mm]

Flanges, connection code 4
Valve body material: PVC-U (code 1), PP (code 5), PVDF (code 20),
inliner PP-H (code 71), inliner PVDF (code 75)

MG	DN	FTF	H	H1	øD	øL	ød			øk	Number of bolts	Weight [kg]
Material code							1	5, 71	20, 75			
20	15	130	36.0	10.0	95	14	34	45	45	65	4	0.67
	20	150	38.0	12.0	105	14	41	58	58	75	4	0.84
	25	160	39.0	13.0	115	14	50	68	68	85	4	1.28
25	32	180	41.0	15.0	140	18	61	78	78	100	4	1.89
40	40	200	63.2	23.2	150	18	73	88	88	110	4	2.36
	50	230	63.2	23.2	165	18	90	102	102	125	4	3.08
50	65	290	78.8	38.8	185	18	106	122	120	145	4	3.20
80	80	310	117.0	62.0	200	18	125	138	125	160	8	6.70
100	100	350	140.0	75.0	220	18	150	158	150	180	8	8.20

MG = diaphragm size

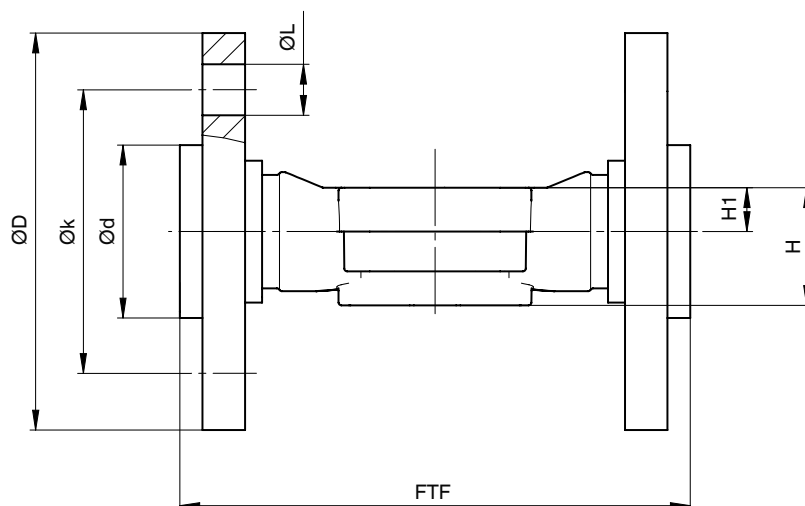
For materials see overview on page 12

Flanges, connection code 39
Valve body material: PVC-U (code 1), PP (code 5), PVDF (code 20),
inliner PP-H (code 71), inliner PVDF (code 75)

MG	DN	FTF	H	H1	øD	øL	ød			øk	Number of bolts	Weight [kg]
Material code							1	5, 71	20, 75			
20	15	130	36.0	10.0	95	16	34	45	45	60	4	0.67
	20	150	38.0	12.0	105	16	41	54	54	70	4	0.84
	25	160	39.0	13.0	115	16	50	63	63	79	4	1.28
25	32	180	41.0	15.0	140	16	61	73	73	89	4	1.89
40	40	200	63.2	23.2	150	16	73	82	82	98	4	2.36
	50	230	63.2	23.2	165	19	90	102	102	121	4	3.08
50	65	290	78.8	38.8	185	19	106	122	120	140	4	3.20
80	80	310	117.0	62.0	200	19	125	133	125	152	4	6.70
100	100	350	140.0	75.0	229	19	150	158	150	190	8	8.20

MG = diaphragm size

For materials see overview on page 12



Overview of valve bodies for GEMÜ R690																			
Connection code		0					4					7				7R	20		
Material code		1	5	20	71	75	1	5	20	71	75	1	4	71	75	1	20	71	75
Diaphragm size	DN																		
20	15	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
	25	X	-	-	X	X	X	-	-	X	X	X	X	X	X	X	-	X	X
25	32	X	-	-	X	X	X	-	-	X	X	X	X	X	X	X	-	X	X
40	40	X	-	-	X	X	X	-	-	X	X	X	X	X	X	X	-	X	X
	50	X	-	-	X	X	X	-	-	X	X	X	X	X	X	X	-	X	X
50	65	X	X	X	-	-	X	X	X	-	-	-	-	-	-	-	X	-	-
80	80	X	X	X	-	-	X	X	X	-	-	-	-	-	-	-	X	-	-
100	100	X	X	X	-	-	X	X	X	-	-	-	-	-	-	-	X	-	-

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Overview of valve bodies for GEMÜ R690														
Connection code		30		33		39					3M	3T	78	
Material code		1	4	1	4	1	5	20	71	75	1	1	71	75
Diaphragm size	DN													
20	15	X	X	X	X	X	-	-	X	X	X	-	X	X
	20	X	X	X	X	X	-	-	X	X	X	X	X	X
	25	X	X	X	X	X	-	-	X	X	X	X	X	X
25	32	X	X	X	X	X	-	-	X	X	X	X	X	X
40	40	X	X	X	X	X	-	-	X	X	X	X	X	X
	50	X	X	X	X	X	-	-	X	X	X	X	X	X
50	65	X	X	-	-	X	X	X	-	-	-	-	-	-
80	80	X	X	-	-	X	X	X	-	-	-	-	-	-
100	100	X	X	-	-	X	X	X	-	-	-	-	-	-

Should there be any doubts or misunderstandings, the German version of this data sheet is the authoritative document!

Accessories



GEMÜ 1041
Compensating and mounting plates



GEMÜ 0324
Pilot solenoid valve

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