

# 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

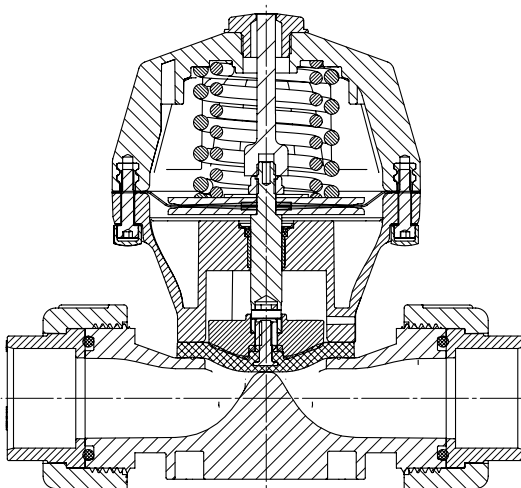
## Advantages

- 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
  - 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	-20 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	-5 - to 50 °C

### Control medium

Inert gases

Max. perm. temperature of control medium 40 °C

Filling volume (control function 1):

Diaphragm size 20	0.27 dm <sup>3</sup>
Diaphragm size 25	0.69 dm <sup>3</sup>
Diaphragm size 40	1.42 dm <sup>3</sup>
Diaphragm size 50	1.10 dm <sup>3</sup>
Diaphragm size 80	2.50 dm <sup>3</sup>
Diaphragm size 100	2.50 dm <sup>3</sup>

### 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	

MG	DN	NPS	Control function 1			Control function 2 and 3			Kv value						
			Operating pressure [bar]		Control pressure [bar]	Operating pressure [bar]		Control pressure [bar]*	[m <sup>3</sup> /h]						
			EPDM/FPM	PTFE		EPDM/FPM	PTFE								
20	15	1/2"	0 - 10	0 - 10	5.0 - 7.0	0 - 10	0 - 10	max. 6.0	6						
	20	3/4"							10						
	25	1"							12						
25	32	1 1/4"	0 - 10	0 - 10	5.0 - 7.0	0 - 10	0 - 10	max. 5.5	20						
40	40	1 1/2"							42						
	50	2"							46						
50	65	2 1/2"	0 - 10	0 - 10	5.5 - 7.0	0 - 10	0 - 10	max. 5.0	70						
80	80	3"							0 - 8	0 - 6	5.0 - 7.0	0 - 8	0 - 6	max. 5.5	120
100	100	4"													0 - 6

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.

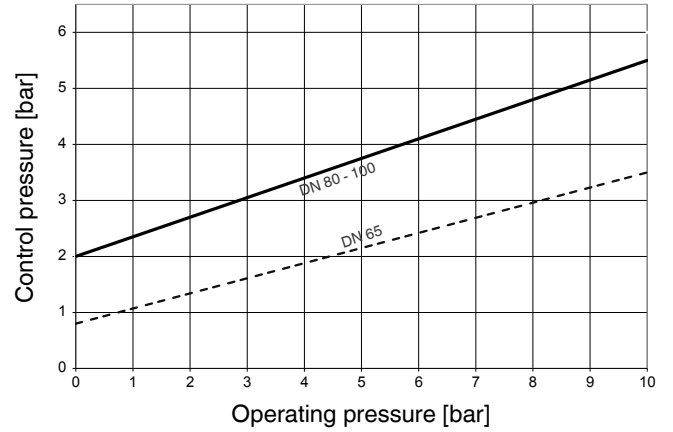
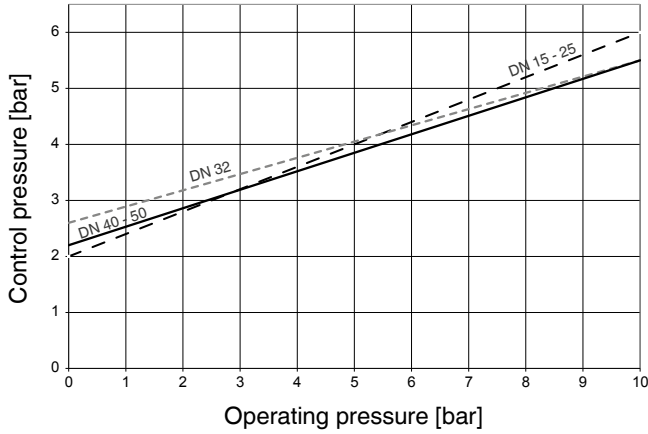
Kv values determined acc. to DIN EN 60534, inlet pressure 5 bar,  $\Delta p$  1 bar, PVC-U valve body and soft elastomer diaphragm.

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



### Pressure / temperature correlation for plastic

Temperature in °C (plastic body)		-20	-10	±0	5	10	20	25	30	40	50	60	70	80
		Valve body material												
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	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	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, reinforced (DN 65 - 100)	5
PVDF (DN 65 - 100)	20
Inliner PP-H grey / outliner PP reinforced (DN 15 - 50)	71
Inliner PVDF / outliner PP reinforced (DN 15 - 50)	75

Diaphragm material	Code
NBR	2
FPM	4
EPDM	14
PTFE/EPDM, PTFE laminated	52
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
Standard	N

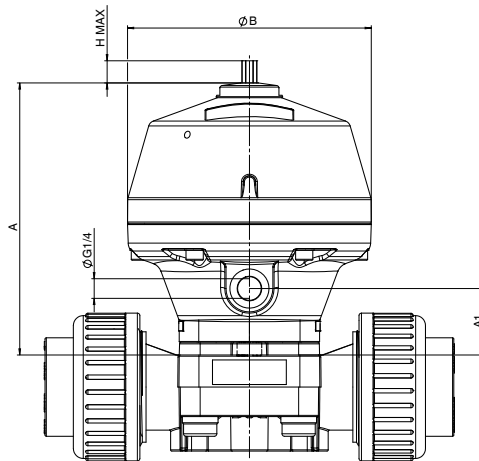
Order example	R690	20	D	7	1	14	1	E	D	N
Type	R690									
Nominal size		20								
Body configuration (code)			D							
Connection (code)				7						
Valve body material (code)					1					
Diaphragm material (code)						14				
Control function (code)							1			
Actuator size (code)								E		
Actuator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

## Dimensions [mm]

### Actuator dimensions - Control function 1

MG	DN	ø B	A	A1	H max.	Weight [kg]
20	15 - 25	100	111	27	8	0.7
25	32	130	136	28	9	1.6
40	40 - 50	170	184	52	14	3.5
50	65	210	220	90	20	5.5
80	80	260	285	127	32	11.3
100	100	260	312	149	37	11.5

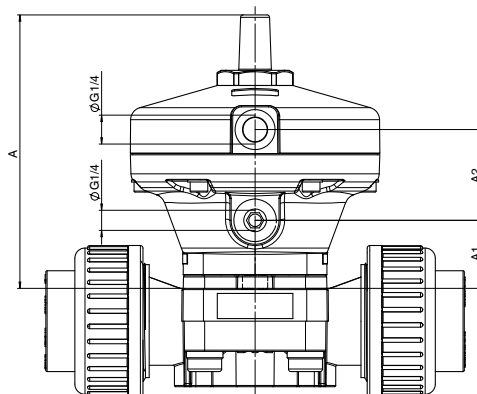
MG = diaphragm size



### Actuator dimensions - Control function 2 and 3

MG	DN	ø B	A	A1	A2	Weight [kg]
						C.f. 2 + 3
20	15 - 25	100	109	27	36	0.5
25	32	130	123	28	46	1.0
40	40 - 50	170	163	52	55	2.0
50	65	210	195	90	29	3.6
80	80	260	270	127	41	8.1
100	100	260	307	149	46	9.4

MG = diaphragm size

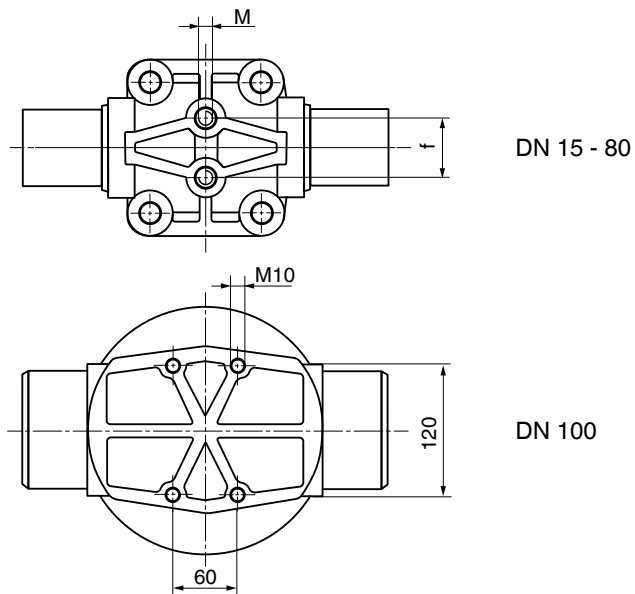


## Dimensions [mm]

### Valve body mounting

Diaphragm size	DN	M*	f
20	15 - 25	M6	25.0
25	32	M6	25.0
40	40 - 50	M8	44.5
50	65	M8	44.5
80	80	M12	100.0
100	100	see drawing	

For valves with body material ABS (code 4) and inch spigots (code 30) mounting bushes with inch thread can be supplied on request.



## 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

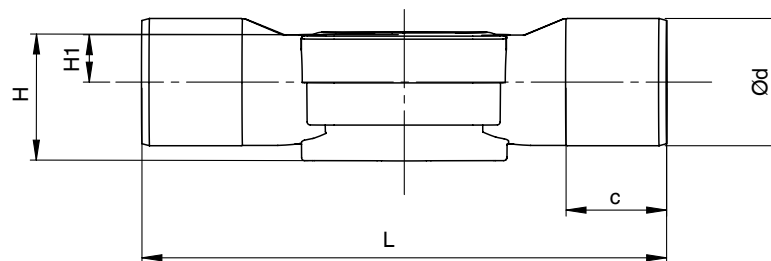
For materials see overview on page 12

**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



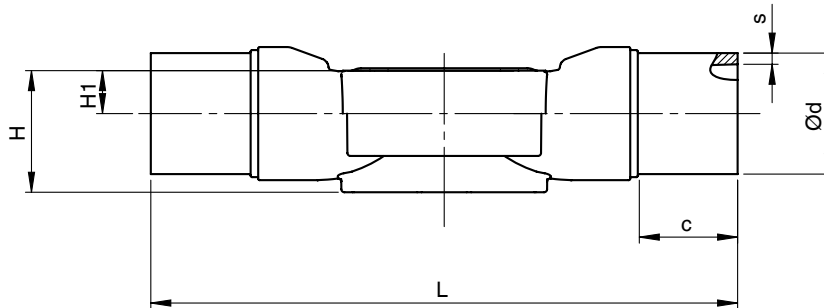
## Body dimensions [mm]

### 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

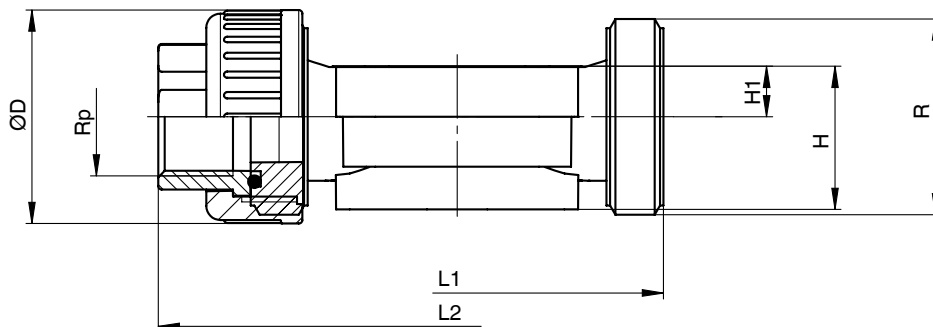


### Union ends with insert, connection code 7R Valve body material: PVC-U (code 1)

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)

MG	DN	NPS	R	øD	L1	H	H1	Connection code 33				Connection code 3M			
								L2		ød	Weight [kg]	L2		ød	Weight [kg]
								Material code 1	Material code 4			Material code 1	Weight [kg]		
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

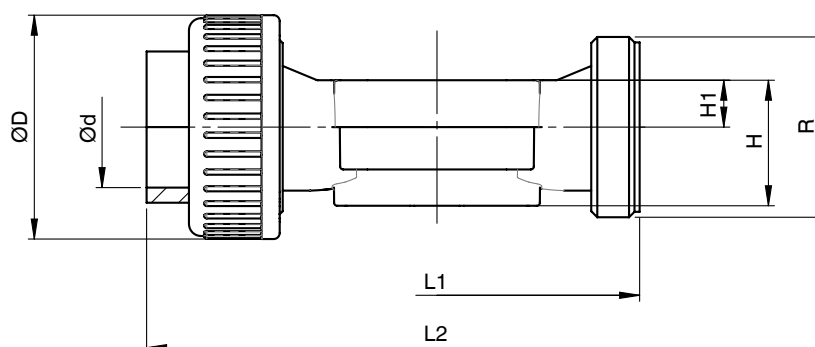
### Union ends with insert, connection code 3T Valve body material: PVC-U (code 1)

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



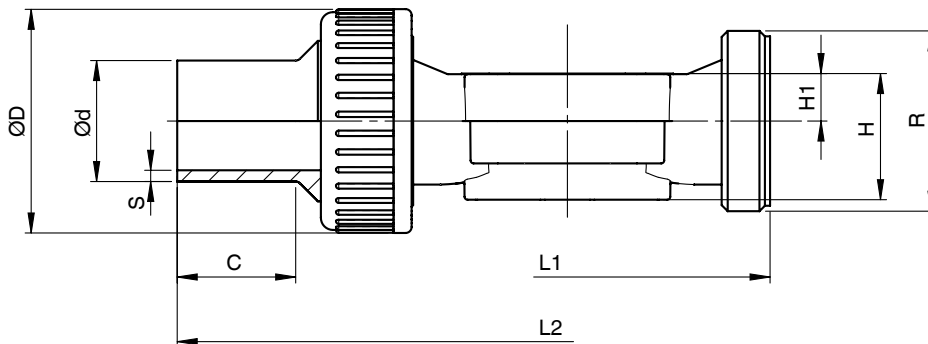
## Body dimensions [mm]

**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]
20	15	108	214	36.0	10.0	43	20	G 1	1.9	36	0.27
	20	108	220	38.0	12.0	53	25	G 1 1/4	2.3	37	0.36
	25	116	234	39.0	13.0	60	32	G 1 1/2	2.9	39	0.37
25	32	134	258	41.0	15.0	74	40	G 2	3.7	39	0.63
40	40	154	284	63.2	23.2	83	50	G 2 1/4	4.6	43	1.13
	50	184	320	63.2	23.2	103	63	G 2 3/4	5.8	43	1.60

MG = diaphragm size

For materials see overview on page 12



## Body dimensions [mm]

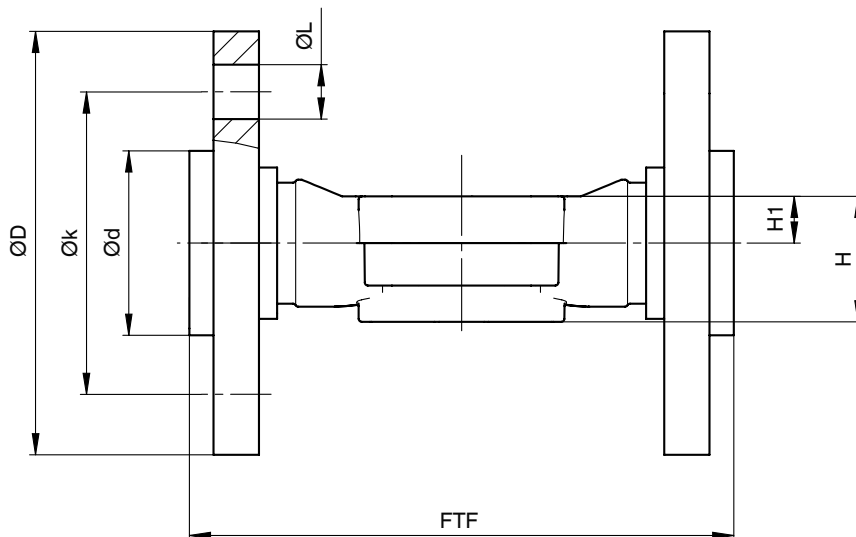
**Flanges, connection code 4, 39**  
 Valve body material: PVC-U (code 1), PP (code 5), PVDF (code 20),  
 inliner PP-H (code 71), inliner PVDF (code 75)

MG	DN	FTF	H	H1	Connection code 4					Connection code 39					Weight [kg]
					øD	øL	ød	øk	Number of bolts	øD	øL	ød	øk	Number of bolts	
20	15	130	36.0	10.0	95	14	45*	65	4	95	16	45	60	4	0.67
	20	150	38.0	12.0	105	14	58	75	4	105	16	54	70	4	0.84
	25	160	39.0	13.0	115	14	68	85	4	115	16	63	79	4	1.28
25	32	180	41.0	15.0	140	18	78	100	4	140	16	73	89	4	1.89
40	40	200	63.2	23.2	150	18	88	110	4	150	16	82	98	4	2.36
	50	230	63.2	23.2	165	18	102	125	4	165	19	102	121	4	3.08
50	65	290	78.8	38.8	185	18	122	145	4	185	19	122	140	4	3.20
80	80	310	117.0	62.0	200	18	138	160	8	200	19	133	152	4	6.70
100	100	350	140.0	75.0	220	18	158	180	8	229	19	158	190	8	8.20

\* Material code 1 ød = 34

MG = diaphragm size

For materials see overview on page 12



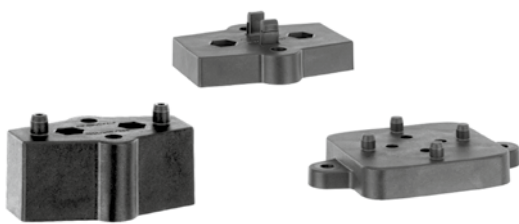
### Overview of valve bodies for GEMÜ R690

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	-	-

### 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	-	-	-	-	-	-	

### 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.  
Contact GEMÜ.