GEMÜ R647

Pneumatically operated diaphragm valve

EN **Operating instructions**

further information
webcode: GW-R647

Contents

1 General information

1.1 Notes

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

1.2 Symbols used

The following symbols are used in this document:

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

1.3 Definition of terms

Working medium

The medium that flows through the GEMÜ product.

Control medium

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

Control function

The possible actuation functions of the GEMÜ product.

1.4 Warning notes

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

SIGNAL WORD	
Possible symbol for the specific danger	Type and source of the danger ▶Possible consequences in case of non-compliance ●Measures for avoiding danger

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

The following signal words and danger levels are used:

⚠ DANGER

Imminent danger!

▶ Non-observance can cause death or severe injury

⚠ WARNING

Potentially dangerous situation!

▶ Non-observance can cause death or severe injury

⚠ CAUTION

Potentially dangerous situation!

▶ Non-observance can cause moderate to light injury

NOTICE

Potentially dangerous situation!

▶ Non-observance can cause damage to property

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

Symbol	Meaning
	Danger of explosion!
	Actuator is under spring tension!
	Corrosive chemicals!
	The equipment is subject to pressure!
	Hot plant components!
	Leakage!
	Maximum permissible pressure exceeded!

2 Safety information

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

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

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

The safety information does not take into account:

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

Prior to commissioning:

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

During operation:

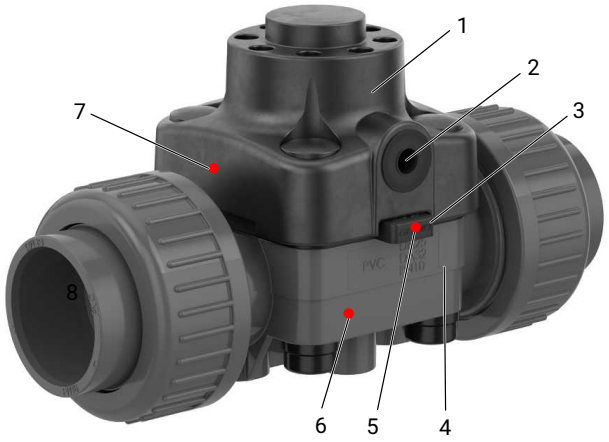
9. Keep this document available at the place of use.
10. Observe the safety information.
11. Operate the product in accordance with this document.
12. Operate the product in accordance with the specifications.
13. Maintain the product correctly.
14. Do not carry out any maintenance work and repairs not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

In cases of uncertainty:

15. Consult the nearest GEMÜ sales office.

3 Product description

3.1 Design



Item	Name	Materials
1	Actuator	PP-H glass fibre reinforced 30%
2	Control medium connector	
3	Diaphragm	NBR, FKM, EPDM
4	Valve body	PVC-U, grey ABS PP, reinforced PVDF Inliner PP-H, grey/outliner PP, reinforced Inliner PVDF/outliner PP, reinforced
5	CONEXO diaphragm RFID chip (see Conexo information)	
6	CONEXO body RFID chip (see Conexo information)	
7	CONEXO actuator RFID chip (see Conexo information)	

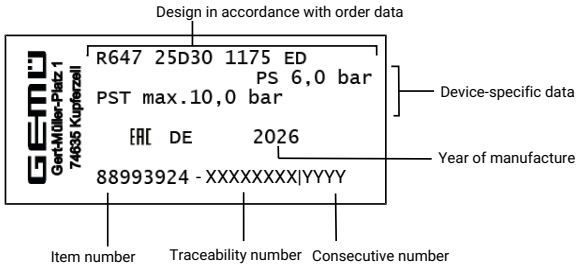
3.2 Description

The GEMÜ R647 2/2-way diaphragm valve is a straight through valve and is pneumatically operated. The valve doesn't have a closing spring and is only closed by applying compressed air. A diaphragm is the sealing element. The control medium applies direct pressure to the shut-off diaphragm pressing it against the shut-off weir in the valve body. The high-flow valve body provides compact dimensions at high flow rates.

3.3 Function

The product is designed for use in piping. It can be closed by a control medium or opened by operating pressure, which is how it controls the flow.

3.4 Product label



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

4 Correct use

⚠ DANGER

Danger of explosion!

► Risk of death or severe injury

● Do **not** use the product in potentially explosive zones.

⚠ WARNING

Improper use of the product!

► Risk of severe injury or death

► Manufacturer liability and guarantee will be void.

● Only use the product in accordance with the operating conditions specified in the contract documentation and in this document.

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

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

● Use the product in accordance with the technical data.

5 GEMÜ CONEXO

The interaction of valve components that are equipped with RFID chips and an associated IT infrastructure actively increase process reliability.

Thanks to serialization, every valve and every relevant valve component such as the body, actuator or diaphragm, and even automation components, can be clearly traced and read using the CONEXO pen RFID reader. The CONEXO app, which can be installed on mobile devices, not only facilitates and improves the "installation qualification" process, but also makes the maintenance process much more transparent and easier to document. The app actively guides the maintenance technician through the maintenance schedule and directly provides him with all the information assigned to the valve, such as test reports, testing documentation and maintenance histories. The CONEXO portal acts as a central element, helping to collect, manage and process all data.

For further information on GEMÜ CONEXO please visit:
www.gemu-group.com/conexo

6 Order data

The order data provide an overview of standard configurations.

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

Order codes

1 Type	Code
Diaphragm valve, pneumatically operated, plastic actuator	R647

2 DN	Code
DN 15	15
DN 20	20
DN 25	25
DN 32	32
DN 40	40
DN 50	50

3 Body configuration	Code
2/2-way body	D

4 Connection type	Code
Spigot	
DIN spigot	0
Spigot for IR butt welding	20
Spigot - inch, for welding or gluing, depending on the body material	30
Threaded spigot for fitting screw connection	7X
Union end	
Fitting screw connection with insert (socket) – DIN	7
GEMÜ 1035 fitting body with valve connection, DIN insert (sleeve)	07
Fitting screw connection with insert (threaded socket Rp) - DIN	7R
Fitting screw connection with insert inch - BS (socket)	33
Fitting screw connection with insert inch - ASTM (socket)	3M
Fitting screw connection with insert threaded socket NPT	3P
Fitting screw connection with insert JIS (socket)	3T
Fitting screw connection with insert (IR butt welding) – DIN	78
Flange	
Flange EN 1092, PN 10, form B, Overall length FTF EN 558 series 1, ISO 5752, basic series 1	4
Flange ANSI Class 125/150 RF, face-to-face dimension FTF EN 558 series 1, ISO 5752, basic series 1, length only for body configuration D	39

5 Valve body material	Code
PVC-U, grey	1
ABS	4
PP, reinforced	5
PVDF	20
Inliner PP-H, grey, Outliner PP, reinforced	71

5 Valve body material	Code
Inliner PVDF/Outliner PP, reinforced	75

6 Diaphragm material	Code
Elastomer	
NBR	2
FKM	4
EPDM	17
EPDM	29

7 Control function	Code
Closed by control pressure, opened by operating pressure	5

8 Actuator version	Code
Actuator size ED (diaphragm size 20)	ED
Actuator size FD (diaphragm size 25)	FD
Actuator size HD (diaphragm size 40)	HD

9 Special version	Code
Drinking water hygiene suitability according to system 1+, UBA-BWGL for plastics and other organic materials, Cold and hot water (23 °C–60 °C)	1

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

Order example

Ordering option	Code	Description
1 Type	R647	Diaphragm valve, pneumatically operated, plastic actuator
2 DN	25	DN 25
3 Body configuration	D	2/2-way body
4 Connection type	7	Fitting screw connection with insert (socket) – DIN
5 Valve body material	1	PVC-U, grey
6 Diaphragm material	17	EPDM
7 Control function	5	Closed by control pressure, opened by operating pressure
8 Actuator version	ED	Actuator size ED (diaphragm size 20)
9 Special version	1	Drinking water hygiene suitability according to system 1+, UBA-BWGL for plastics and other organic materials, Cold and hot water (23 °C–60 °C)
10 CONEXO		Without

7 Technical data

7.1 Medium

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.

Control medium: Inert gases

7.2 Temperature

Media temperature:

Valve body material	
PVC-U, grey (code 1)	10 — 60 °C
ABS (code 4)	-10 — 60 °C
Inliner PP-H grey / outliner PP, reinforced (code 71)	5 – 80 °C
Inliner PVDF / outliner PP, reinforced (code 75)	-10 — 80 °C

Ambient temperature:

Valve body material	
PVC-U, grey (code 1)	10 — 50 °C
ABS (code 4)	-10 — 50 °C
Inliner PP-H grey / outliner PP, reinforced (code 71)	5 — 50 °C
Inliner PVDF / outliner PP, reinforced (code 75)	-5 — 50 °C

Storage temperature: 0 — 40 °C

Control medium temperature: max. 40 °C

7.3 Pressure

Operating pressure: 0 — 6 bar

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.

The operating pressures apply at room temperature. In case of deviating temperatures, observe the pressure / temperature correlation.

The permissible operating pressure depends on the working medium temperature.

Observe control pressure / operating pressure diagram

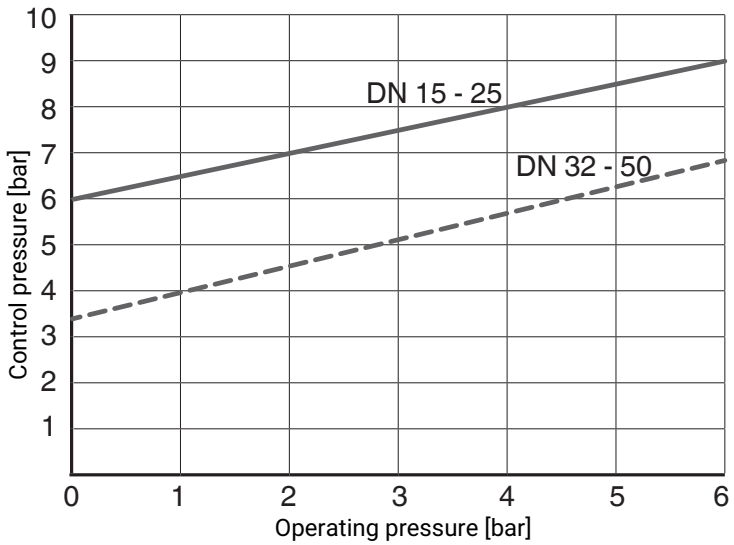
Control pressure: max. 10 bar

Pressure/temperature correlation:

Valve body material		Temperatures in °C (valve body)										
Materials	Code	-10	0	5	10	20	30	40	50	60	70	80
PVC-U	**1**	-	-	-	6.0	6.0	6.0	6.0	3.5	1.5	-	-
ABS	**4**	6.0	6.0	6.0	6.0	6.0	6.0	6.0	4.0	2.0	-	-
PP-H	**71**	-	-	6.0	6.0	6.0	6.0	6.0	5.5	4.0	2.7	1.5
PVDF	**75**	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	5.4	4.7

The pressure rating (PN) depends on the diaphragm size.
Data for extended temperature ranges on request. Please note that the ambient temperature and media temperature generate a combined temperature at the valve body which must not exceed the above values.

Control pressure/operating pressure diagram:



Kv values:

MG	DN	Kv values
20	**15**	6.0
	20	10.0
	25	12.0
25	**32**	20.0
40	**40**	42.0
	50	46.0

MG = diaphragm size, Kv values in m³/h
Kv values determined acc.to DIN EN 60534 standard, 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.
The Kv value curve (Kv value dependent on valve stroke) can vary depending on the diaphragm material and term of use.

Filling volume:

MG	Actuator size	Filling volume [dm³]
20	**ED**	0.27
25	**FD**	0.69
40	**HD**	1.42

7.4 Product conformity

Pressure Equipment Directive: 2014/68/EU

EAC: TR CU 010/2011

Drinking water: Drinking water hygiene suitability according to system 1+ (special function 1)
UBA-BWGL for plastics and other organic materials,
Cold and hot water (23 °C–60 °C)
System 1+

7.5 Materials

Materials:

Diaphragm material	O-ring material
PTFE	FKM
NBR	EPDM
FKM	FKM
EPDM	EPDM

7.6 Mechanical data

Weight:

Actuator

MG	Actuator size	Weight
20	**ED**	0.30
25	**FD**	0.40
40	**HD**	0.60

MG = diaphragm size, weight in kg

Valve body

MG	DN	Spigot		Union end				Flange
		Connection type code						
		0, 30	20	3P, 7, 7R	33	3M, 3T	78	4, 39
20	**15**	0.12	0.10	0.17	0.24	0.26	0.27	0.67
	20	0.13	0.12	0.21	0.28	0.30	0.36	0.84
	25	0.16	0.14	0.26	0.33	0.38	0.37	1.28
25	**32**	0.22	0.18	0.40	0.70	0.73	0.63	1.89
40	**40**	0.50	0.40	0.73	0.83	0.93	1.13	2.36
	50	0.57	0.47	1.00	1.40	1.50	1.60	3.08

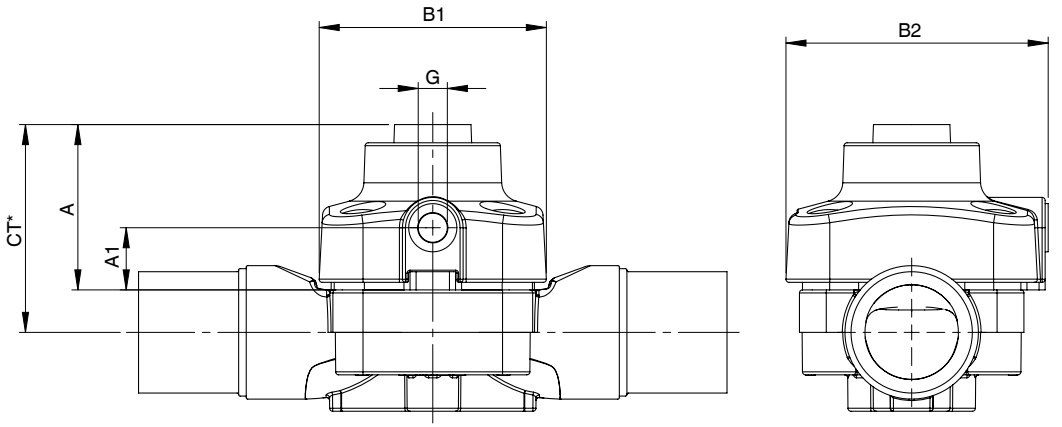
MG = diaphragm size, weight in kg

Installation position: Optional

Flow direction: Optional

8 Dimensions

8.1 Actuator dimensions

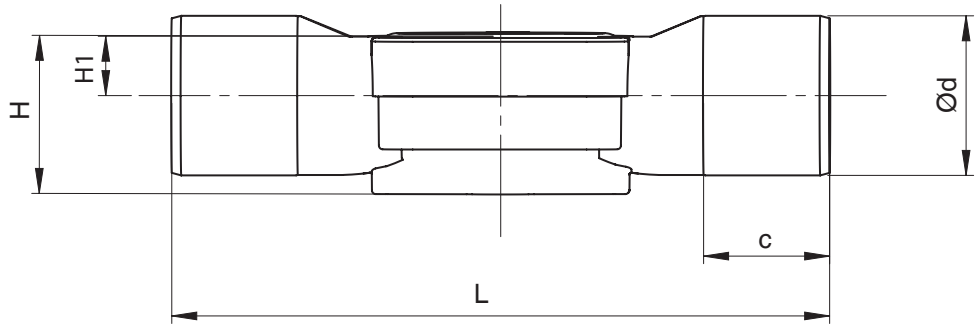


MG	DN	A	A1	B1	B2	G
20	**15, 20, 25**	50.0	19.0	64.0	69.5	G 1/4
25	**32**	54.0	20.0	75.0	85.0	G 1/4
40	**40, 50**	67.0	24.0	100.0	108.0	G 1/4

Dimensions in mm
* CT = A + H1 (see body dimensions)

8.2 Body dimensions

8.2.1 Spigot DIN / inch (code 0, 30)



Connection type spigot DIN (code 0) [1], body material PVC-U (code 1), inliner/outliner (code 71, 75) [2]

MG	DN	NPS	c		ød	H		H1	L
			Material			Material			
			1	71, 75		1	71, 75		
20	**15**	**1/2"**	16.0	18.0	20.0	36.0	36.0	10.0	124.0
	20	**3/4"**	19.0	19.0	25.0	38.0	38.0	12.0	144.0
	25	**1"**	22.0	22.0	32.0	39.0	39.0	13.0	154.0
25	**32**	**1¼"**	32.0	32.0	40.0	41.0	41.0	15.0	174.0
40	**40**	**1½"**	35.0	26.0	50.0	63.2	63.2	23.2	194.0
	50	**2"**	38.0	33.0	63.0	63.2	63.2	23.2	224.0

Connection type spigot – inch (code 30) [1], body material PVC-U (code 1), ABS (code 4) [2]

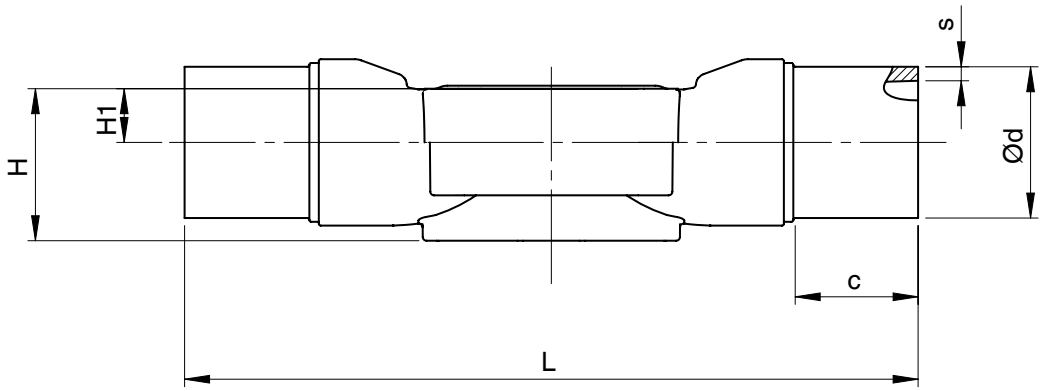
MG	DN	NPS	c	ød	H	H1	L
20	**15**	**1/2"**	24.0	21.4	36.0	10.0	141.0
	20	**3/4"**	27.0	26.7	38.0	12.0	144.0
	25	**1"**	30.0	33.6	39.0	13.0	154.0
25	**32**	**1¼"**	33.0	42.2	41.0	15.0	174.0
40	**40**	**1½"**	35.0	48.3	63.2	23.2	194.0
	50	**2"**	40.0	60.3	63.2	23.2	224.0

Dimensions in mm
MG = diaphragm size

1) **Connection type**
Code 0: DIN spigot
Code 30: Spigot - inch, for welding or gluing, depending on the body material

2) **Valve body material**
Code 1: PVC-U, grey
Code 4: ABS
Code 71: Inliner PP-H, grey, Outliner PP, reinforced
Code 75: Inliner PVDF/Outliner PP, reinforced

8.2.2 Spigot IR (code 20)



Connection type spigot IR (code 20) [1], body material inliner/outliner (code 71, 75) [2]

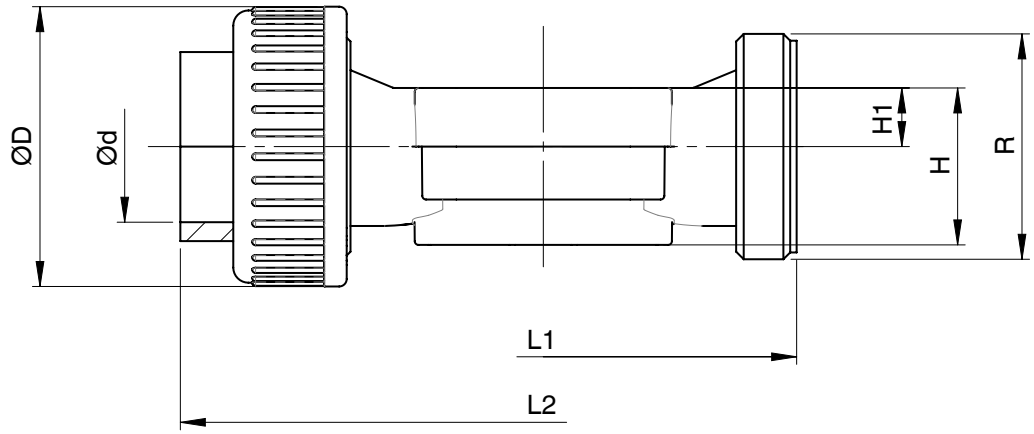
MG	DN	NPS	c	ød	H	H1	L	s	
								Material	
								71	75
20	**15**	**1/2"**	33.0	20.0	36.0	10.0	154.0	1.9	1.9
	20	**3/4"**	33.0	25.0	38.0	12.0	154.0	2.3	1.9
	25	**1"**	33.0	32.0	39.0	13.0	154.0	2.9	2.4
25	**32**	**1¼"**	33.0	40.0	41.0	15.0	194.0	3.7	2.4
40	**40**	**1½"**	33.0	50.0	63.2	23.2	194.0	4.6	3.0
	50	**2"**	33.0	63.0	63.2	23.2	224.0	5.8	3.0

Dimensions in mm
MG = diaphragm size

1) **Connection type**
Code 20: Spigot for IR butt welding

2) **Valve body material**
Code 71: Inliner PP-H, grey, Outliner PP, reinforced
Code 75: Inliner PVDF/Outliner PP, reinforced

8.2.3 Union end DIN (code 7)



Connection type union end (code 7) [1], body material PVC-U (code 1), ABS (code 4), inliner/outliner (code 71, 75) [2], diaphragm sizes 20 – 40

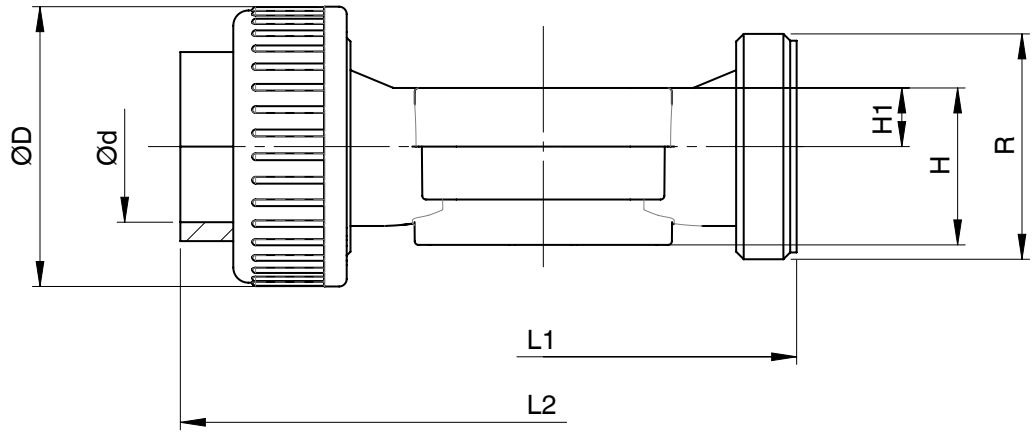
MG	DN	NPS	ød	øD	H	H1	L1	L2				R
								Material				
								1	4	71	75	
20	**15**	**1/2"**	20.0	43.0	36.0	10.0	108.0	146.0	150.0	143.0	146.0	G 1
	20	**3/4"**	25.0	53.0	38.0	12.0	108.0	152.0	156.0	146.0	150.0	G 1¼
	25	**1"**	32.0	60.0	39.0	13.0	116.0	166.0	170.0	158.0	162.0	G 1½
25	**32**	**1¼"**	40.0	74.0	41.0	15.0	134.0	192.0	196.0	181.0	184.0	G 2
40	**40**	**1½"**	50.0	83.0	63.2	23.2	154.0	222.0	222.0	207.0	210.0	G 2¼
	50	**2"**	63.0	103.0	63.2	23.2	184.0	266.0	266.0	245.0	248.0	G 2¾

Dimensions in mm
MG = diaphragm size

1) **Connection type**
Code 7: Fitting screw connection with insert (socket) – DIN

2) **Valve body material**
Code 1: PVC-U, grey
Code 4: ABS
Code 71: Inliner PP-H, grey, Outliner PP, reinforced
Code 75: Inliner PVDF/Outliner PP, reinforced

8.2.4 Union end inch (code 33, 3M, 3T)



Connection type union end inch (code 33, 3M, 3T) [1], body material PVC-U (code 1) [2], diaphragm sizes 20 - 40

MG	DN	NPS	ød			øD		H	H1	L1	L2			R	
			Connection type								Connection type				
			33	3M	3T	33, 3M	3T				33	3M	3T	33, 3M	3T
20	**15**	**1/2"**	21.4	21.4	22.0	43.0	53.0 *	36.0	10.0	108.0	146.0	158.0	152.0	G 1	G 1¼ *
	20	**3/4"**	26.8	26.7	26.0	53.0	53.0	38.0	12.0	108.0	152.0	164.0	152.0	G 1¼	G 1¼
	25	**1"**	33.6	33.5	32.0	60.0	60.0	39.0	13.0	116.0	166.0	180.0	166.0	G 1½	G 1½
25	**32**	**1¼"**	42.3	42.2	38.0	74.0	74.0	41.0	15.0	134.0	192.0	204.0	192.0	G 2	G 2
40	**40**	**1½"**	48.3	48.3	48.0	83.0	83.0	63.2	23.2	154.0	222.0	230.0	222.0	G 2¼	G 2¼
	50	**2"**	60.4	60.4	60.0	103.0	103.0	63.2	23.2	184.0	264.0	266.0	266.0	G 2¾	G 2¾

Connection type BS (code 33) [1], body material ABS (code 4) [2]

MG	DN	NPS	ød	øD	H	H1	L1	L2	R
20	**15**	**1/2"**	21.4	43.0	36.0	10.0	108.0	150.0	G 1
	20	**3/4"**	26.8	53.0	38.0	12.0	108.0	156.0	G 1¼
	25	**1"**	33.6	60.0	39.0	13.0	116.0	170.0	G 1½
25	**32**	**1¼"**	42.3	74.0	41.0	15.0	134.0	198.0	G 2
40	**40**	**1½"**	48.3	83.0	63.2	23.2	154.0	220.0	G 2¼
	50	**2"**	60.4	103.0	63.2	23.2	184.0	264.0	G 2¾

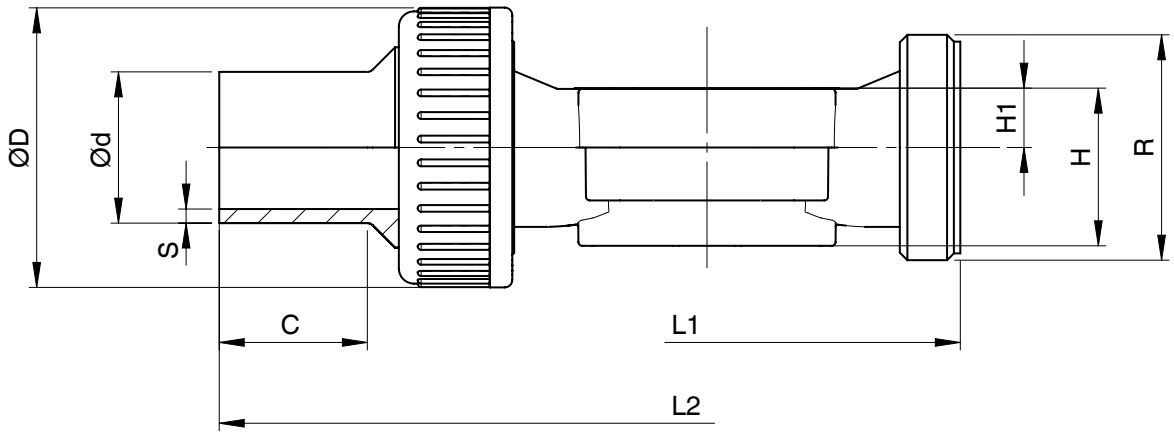
Dimensions in mm
MG = diaphragm size

* Insert requires valve body DN 20

1) **Connection type**
Code 33: Fitting screw connection with insert inch - BS (socket)
Code 3M: Fitting screw connection with insert inch - ASTM (socket)
Code 3T: Fitting screw connection with insert JIS (socket)

2) **Valve body material**
Code 1: PVC-U, grey
Code 4: ABS

8.2.5 Union end DIN (code 78)



Connection type union end DIN, IR butt welding (code 78)[1], body materials inliner/outliner (code 71, 75)[2]

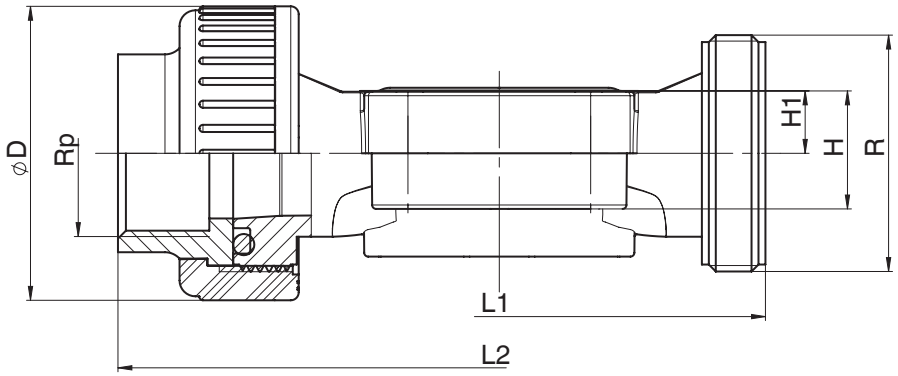
MG	DN	NPS	c	ød	øD	H	H1	L1	L2	R	s	
											Material	
											71	75
20	**15**	**1/2"**	36.0	20.0	43.0	36.0	10.0	108.0	214.0	G 1	1.9	1.9
	20	**3/4"**	37.0	25.0	53.0	38.0	12.0	108.0	220.0	G 1¼	2.3	1.9
	25	**1"**	39.0	32.0	60.0	39.0	13.0	116.0	234.0	G 1½	2.9	2.4
25	**32**	**1¼"**	39.0	40.0	74.0	41.0	15.0	134.0	258.0	G 2	3.7	2.4
40	**40**	**1½"**	43.0	50.0	83.0	63.2	23.2	154.0	284.0	G 2¼	4.6	3.0
	50	**2"**	43.0	63.0	103.0	63.2	23.2	184.0	320.0	G 2¾	5.8	3.0

Dimensions in mm
MG = diaphragm size

1) **Connection type**
Code 78: Fitting screw connection with insert (IR butt welding) – DIN

2) **Valve body material**
Code 71: Inliner PP-H, grey, Outliner PP, reinforced
Code 75: Inliner PVDF/Outliner PP, reinforced

8.2.6 Union end Rp (code 7R), NPT (code 3P)



Connection type union end Rp (code 7R), NPT (code 3P)[1], body material PVC-U (code 1)[2]

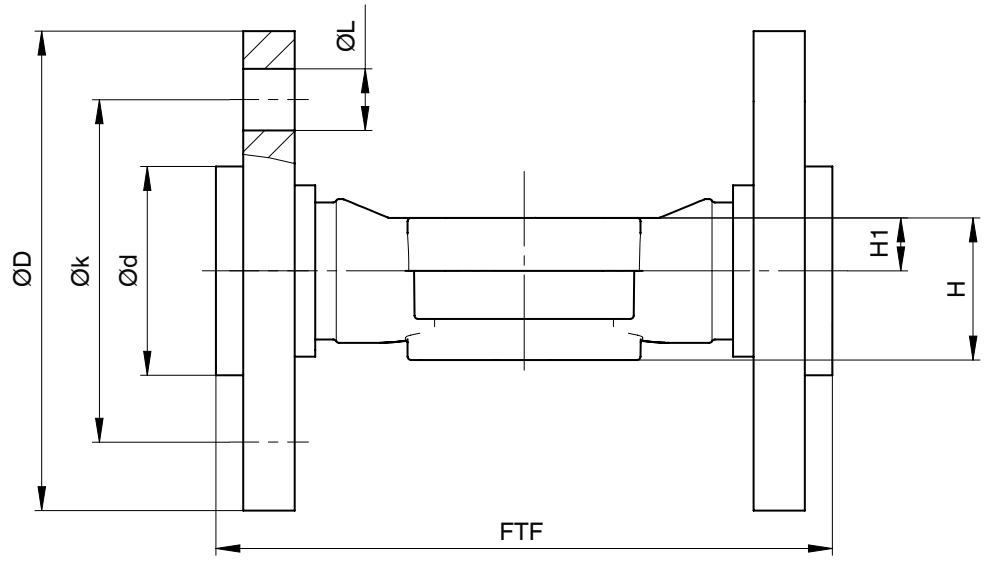
MG	DN	NPS	øD	H	H1	L1	L2	R	Rp/NPT
20	**15**	**1/2"**	43.0	36.0	10.0	108.0	146.0	G 1	1/2
	20	**3/4"**	53.0	38.0	12.0	108.0	152.0	G 1¼	3/4
	25	**1"**	60.0	39.0	13.0	116.0	166.0	G 1½	1
25	**32**	**1¼"**	74.0	41.0	15.0	134.0	192.0	G 2	1¼
40	**40**	**1½"**	83.0	63.2	23.2	154.0	222.0	G 2¼	1½
	50	**2"**	103.0	63.2	23.2	184.0	266.0	G 2¾	2

Dimensions in mm
MG = diaphragm size

1) **Connection type**
Code 7R: Fitting screw connection with insert (threaded socket Rp) - DIN
Code 3P: Fitting screw connection with insert threaded socket NPT

2) **Valve body material**
Code 1: PVC-U, grey

8.2.7 Flange EN (code 4)



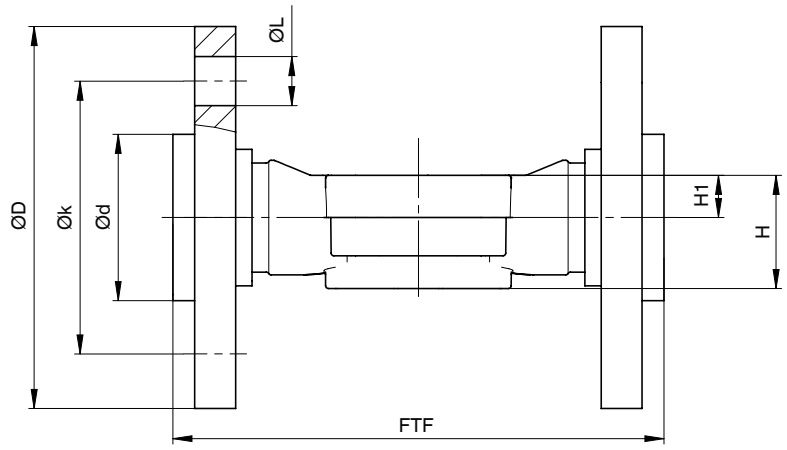
Connection type flange EN (code 4) [1], **body material inliner/outliner (code 71, 75)** [2]

MG	DN	NPS	ød	øD	FTF	H	H1	øk	øL	n
20	**15**	**1/2"**	45.0	95.0	130.0	36.0	10.0	65.0	14.0	4
	20	**3/4"**	58.0	105.0	150.0	38.0	12.0	75.0	14.0	4
	25	**1"**	68.0	115.0	160.0	39.0	13.0	85.0	14.0	4
25	**32**	**1¼"**	78.0	140.0	180.0	41.0	15.0	100.0	18.0	4
40	**40**	**1½"**	88.0	150.0	200.0	63.2	23.2	110.0	18.0	4
	50	**2"**	102.0	165.0	230.0	63.2	23.2	125.0	18.0	4

Dimensions in mm
MG = diaphragm size
n = number of bolts

1) **Connection type**
Code 4: Flange EN 1092, PN 10, form B, Overall length FTF EN 558 series 1, ISO 5752, basic series 1

2) **Valve body material**
Code 71: Inliner PP-H, grey, Outliner PP, reinforced
Code 75: Inliner PVDF/Outliner PP, reinforced



Connection type flange EN (code 4) [1], body materials PVC-U (code 1) [2]

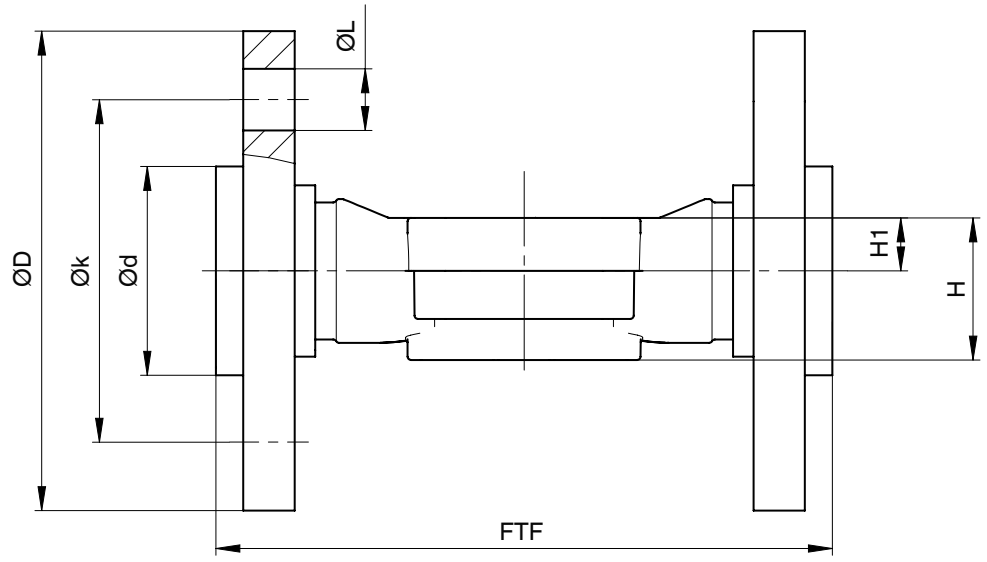
MG	DN	NPS	ød	øD	FTF	H	H1	øk	øL	n
20	**15**	**1/2"**	34.0	95.0	130.0	36.0	10.0	65.0	14.0	4
	20	**3/4"**	41.0	105.0	150.0	38.0	12.0	75.0	14.0	4
	25	**1"**	50.0	115.0	160.0	39.0	13.0	85.0	14.0	4
25	**32**	**1¼"**	61.0	140.0	180.0	41.0	15.0	100.0	18.0	4
40	**40**	**1½"**	73.0	150.0	200.0	63.2	23.2	110.0	18.0	4
	50	**2"**	90.0	165.0	230.0	63.2	23.2	125.0	18.0	4

Dimensions in mm
MG = diaphragm size
n = number of bolts

1) **Connection type**
Code 4: Flange EN 1092, PN 10, form B, Overall length FTF EN 558 series 1, ISO 5752, basic series 1

2) **Valve body material**
Code 1: PVC-U, grey

8.2.8 Flange ANSI Class (code 39)



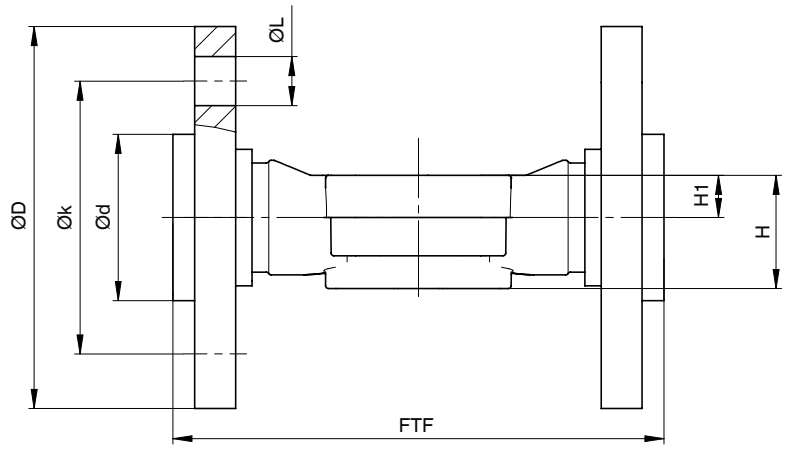
Connection type flange ANSI (code 39)[1], body material PVC-U (code 1)[2]

MG	DN	NPS	ød	øD	FTF	H	H1	øk	øL	n
20	**15**	**1/2"**	34.0	95.0	130.0	36.0	10.0	60.0	16.0	4
	20	**3/4"**	41.0	105.0	150.0	38.0	12.0	70.0	16.0	4
	25	**1"**	50.0	115.0	160.0	39.0	13.0	79.0	16.0	4
25	**32**	**1¼"**	61.0	140.0	180.0	41.0	15.0	89.0	16.0	4
40	**40**	**1½"**	73.0	150.0	200.0	63.2	23.2	98.0	16.0	4
	50	**2"**	90.0	165.0	230.0	63.2	23.2	121.0	19.0	4

Dimensions in mm
MG = diaphragm size
n = number of bolts

1) **Connection type**
Code 39: Flange ANSI Class 125/150 RF, face-to-face dimension FTF EN 558 series 1, ISO 5752, basic series 1, length only for body configuration D

2) **Valve body material**
Code 1: PVC-U, grey



Connection type flange ANSI (code 39)[1], inliner/outliner body material (code 71, 75)[2]

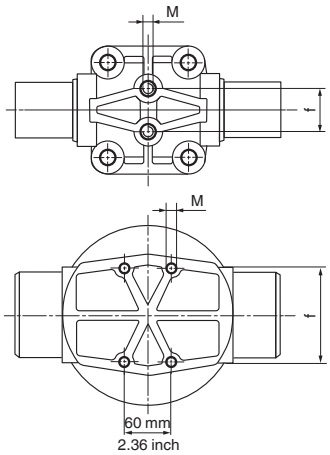
MG	DN	NPS	ød	øD	FTF	H	H1	øk	øL	n
20	**15**	**1/2"**	45.0	95.0	130.0	36.0	10.0	60.0	16.0	4
	20	**3/4"**	54.0	105.0	150.0	38.0	12.0	70.0	16.0	4
	25	**1"**	63.0	115.0	160.0	39.0	13.0	79.0	16.0	4
25	**32**	**1¼"**	73.0	140.0	180.0	41.0	15.0	89.0	16.0	4
40	**40**	**1½"**	82.0	150.0	200.0	63.2	23.2	98.0	16.0	4
	50	**2"**	102.0	165.0	230.0	63.2	23.2	121.0	19.0	4

Dimensions in mm
MG = diaphragm size
n = number of bolts

1) **Connection type**
Code 39: Flange ANSI Class 125/150 RF, face-to-face dimension FTF EN 558 series 1, ISO 5752, basic series 1, length only for body configuration D

2) **Valve body material**
Code 71: Inliner PP-H, grey, Outliner PP, reinforced
Code 75: Inliner PVDF/Outliner PP, reinforced

8.3 Valve body mounting



MG	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

Dimensions in mm, MG = diaphragm size

* Inch thread on request

9 Manufacturer's information

9.1 Delivery

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

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

9.2 Packaging

The product is packaged in a cardboard box which can be recycled as paper.

9.3 Transport

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

9.4 Storage

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

10 Installation in piping

10.1 Preparing for installation

NOTICE

Suitability of the product!

► The product must be appropriate for the piping system operating conditions (medium, medium concentration, temperature and pressure) and the prevailing ambient conditions.

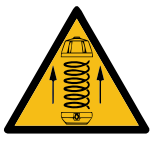
NOTICE

Tools!

► The tools required for installation and assembly are not included in the scope of delivery.
- Use appropriate, functional and safe tools.

1. Ensure the product is suitable for the relevant application.
2. Check the technical data of the product and the materials.
3. Keep appropriate tools ready.
4. Wear appropriate protective gear as specified in the plant operator's guidelines.
5. Comply with appropriate regulations for the connections.
6. Installation work must be performed by trained personnel.
7. Shut off the plant or plant component.
8. Secure the plant or plant component against recommissioning.
9. Depressurize the plant or plant component.
10. Completely drain the plant or plant component and allow it to cool down until the temperature is below the media vaporization temperature and cannot cause scalding.
11. Correctly decontaminate, rinse and ventilate the plant or plant component.
12. Lay piping so that the product is protected against transverse and bending forces, and also vibrations and tension.
13. Only install the product between matching aligned pipes (see chapters below).
14. Pay attention to the installation position (see "Installation position" chapter).

⚠ WARNING



Actuator is under spring tension!

► Risk of severe injury or death
- The actuator must not be opened; the valve must be returned to GEMÜ for maintenance purposes.

⚠ WARNING

Corrosive chemicals!

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

⚠ WARNING

The equipment is subject to pressure!

► Risk of severe injury or death

● Depressurize the plant or plant component.

● Completely drain the plant or plant component.

⚠ CAUTION

Hot plant components!

► Burns

● Only work on plant that has cooled down.

● Wear protective gear.

⚠ CAUTION

Leakage!

► Emission of dangerous materials

● Provide for precautionary measures against exceeding the maximum permissible pressure that may be caused by pressure surges (water hammer).

⚠ CAUTION

Maximum permissible pressure exceeded!

► Damage to the product!

● Provide for precautionary measures against exceeding the maximum permissible pressure that may be caused by pressure surges (water hammer).

⚠ CAUTION

Use as step!

► Damage to the product

► Risk of slipping-off

● Choose the installation location so that the product cannot be used as a foothold.

● Do not use the product as a step or a foothold.

10.2 Installation position

The installation position of the product is optional.

10.3 Installation with butt weld spigots

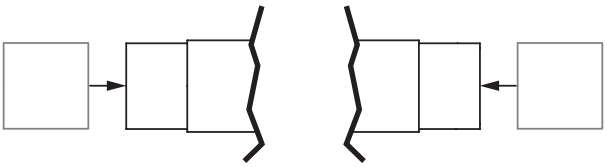


Fig. 1: Butt weld spigots

1. Carry out preparations for installation (see chapter "Preparing for installation").
2. Adhere to good welding practices!
3. Disassemble the actuator with the diaphragm before welding in the valve body (see "Removing the actuator" chapter).
4. Weld the body of the product in the piping.
5. Allow butt weld spigots to cool down.
6. Reassemble the valve body and the actuator with diaphragm (see "Mounting the actuator" chapter).
7. Re-attach or reactivate all safety and protective devices.
8. Flush the system.

10.4 Installation with union ends

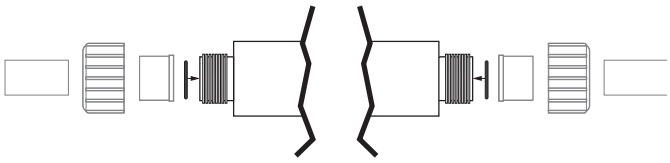


Fig. 2: Union end with insert

NOTICE

► The solvent cement is not included in the scope of delivery.

● Only use suitable solvent cement!

1. Carry out preparation for installation (see chapter "Preparing for installation").
2. Depending on the application, comply with the welding standards and the specifications of the solvent cement manufacturer for adhesive bonds.
3. Screw the threaded connections into the piping in accordance with valid standards.
4. Unscrew the union nut from the product body.
5. Reinsert the O-ring if necessary.
6. Push the union nut over the piping.
7. Connect the insert with the piping by solvent cementing/ welding.
8. Screw the union nut back onto the product body.
9. Connect the other side of the product body with the piping in the same way.
10. Re-attach or reactivate all safety and protective devices.

10.5 Installation with solvent cement spigots

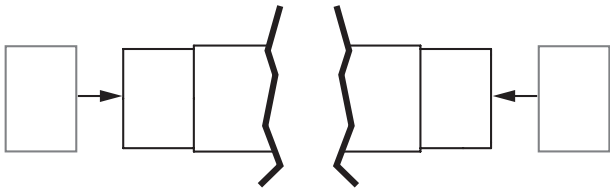


Fig. 3: Solvent cement spigot

NOTICE

► The solvent cement is not included in the scope of delivery.
● Only use suitable solvent cement!

1. Carry out preparations for installation (see chapter "Preparations for installation").
2. Apply solvent cement on the outside of the valve body spigots and on the inside of the piping as specified by the solvent cement manufacturer.
3. Connect the body of the product with the piping.
4. Reactivate all safety and protective devices.

10.6 Installation with flanged connection

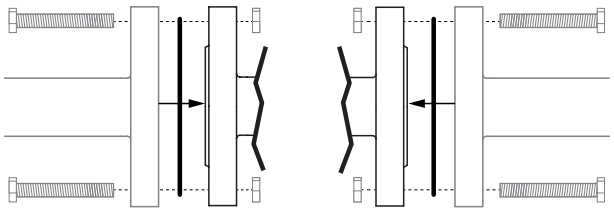


Fig. 4: Flanged connection

NOTICE

Sealing material!

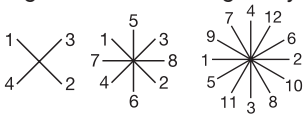
► The sealing material is not included in the scope of delivery.
● Only use appropriate sealing material.

NOTICE

Connector elements!

► The connector elements are not included in the scope of delivery.
● Only use connector elements made of approved materials.
● Observe permissible tightening torque of the bolts.

1. Keep sealing material ready.
2. Carry out preparations for installation (see chapter "Preparing for installation").
3. Ensure clean, undamaged sealing surfaces on the connection flanges.
4. Align flanges carefully before installing them.
5. Clamp the product centrally between the piping with flanges.
6. Centre the gaskets.
7. Connect the valve flange and the piping flange using appropriate sealing materials and matching bolting.
8. Use all flange holes.
9. Tighten the bolts diagonally.



10. Re-attach or reactivate all safety and protective devices.

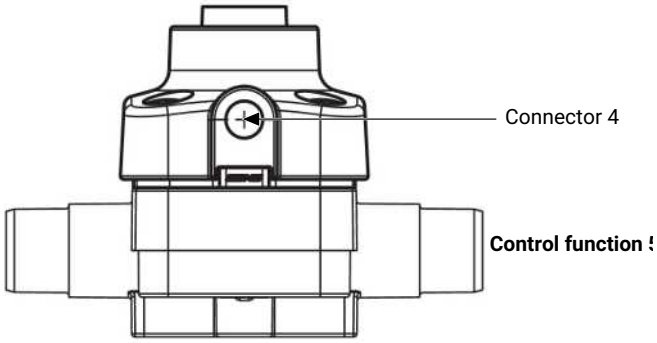
11 Pneumatic connections

11.1 Control function

The following control function is available:

Control function 5
closed by control pressure,
opened by operating pressure:

Valve resting position: Opened by operating pressure. Activation of the actuator (connector 4) closes the valve. When the control pressure is removed, the applied operating pressure opens the valve again.



11.2 Connecting the control medium

⚠ CAUTION

Only use control medium lines with parallel threads.

► If you use tapered screw threads, there is a risk of stress cracking at the control medium connector.

1. Use suitable connectors.
2. Connect the control medium lines tension-free and without any bends or knots.

Thread size of the control medium connector: G1/4

Control function		Connection
5	Closed by control pressure, opened by operating pressure	4: Control medium (close)
(connector 4, see picture above)		

12 Commissioning

⚠ WARNING

Corrosive chemicals!

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

⚠ CAUTION

Leakage!

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

⚠ CAUTION

Cleaning agent!

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

1. Check the tightness and the function of the product (close and reopen the product).
2. Flush the piping system of new plant and following repair work (the product must be fully open).

⇨ Harmful foreign matter has been removed.

⇨ The product is ready for use.

3. Commission the product.
4. Commissioning of actuators in accordance with the enclosed instructions.

13 Operation

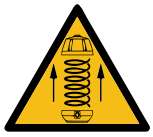
Operate the product according to the control function (see also chapter "Pneumatic connections").

14 Troubleshooting

Error	Possible cause	Troubleshooting
The product does not open or does not open fully	Operating pressure too low	Operate the product with the operating pressure specified in the datasheet (min. 0.5 bar)
	Control pressure too high	Operate the valve with the control pressure specified in the datasheet
The product is leaking downstream (does not close or does not close fully)	Operating pressure too high	Operate the product with operating pressure specified in datasheet
	Pilot valve faulty	Check and replace the pilot valve
	Shut-off diaphragm incorrectly mounted	Remove the actuator, check the diaphragm position, replace if necessary
	Control medium not connected	Connect the control medium
	Control pressure too low	Operate the product with the control pressure specified in the datasheet
	Foreign matter between shut-off diaphragm and valve body	Remove the actuator, remove foreign matter, check diaphragm and valve body for potential damage, replace damaged parts if necessary
	Bolting between valve body and actuator loose	Retighten the bolting between the valve body and the actuator
	Valve body is leaking or is damaged	Check the valve body for potential damage, replace the valve body if necessary
	Shut-off diaphragm faulty	Check shut-off diaphragm for potential damage, replace the shut off diaphragm if necessary
The product is leaking between actuator and valve body	Shut-off diaphragm incorrectly mounted	Remove the actuator, check the diaphragm mounting, replace the shut-off diaphragm if necessary
	Bolting between valve body and actuator loose	Tighten bolting between valve body and actuator
	Shut-off diaphragm faulty	Check shut-off diaphragm for potential damage, replace the shut-off diaphragm if necessary
	Actuator/valve body damaged	Replace actuator/valve body
Connection between valve body and piping leaking	Incorrect installation	Check installation of valve body in piping
	Threaded connections / unions loose	Tighten threaded connections / unions
	Sealing material faulty	Replace sealing material
Valve body leaking	Valve body faulty	Check valve body for potential damage, replace valve body if necessary

15 Inspection and maintenance

⚠ WARNING



Actuator is under spring tension!

► Risk of severe injury or death

● The actuator must not be opened; the valve must be returned to GEMÜ for maintenance purposes.

⚠ WARNING

The equipment is subject to pressure!

► Risk of severe injury or death

● Depressurize the plant or plant component.

● Completely drain the plant or plant component.

⚠ CAUTION

Hot plant components!

► Burns

● Only work on plant that has cooled down.

● Wear protective gear.

NOTICE

Use of incorrect spare parts!

► Damage to the GEMÜ product

► The manufacturer liability and guarantee will be void.

● Use only genuine parts from GEMÜ.

NOTICE

Exceptional maintenance work!

► Damage to the GEMÜ product

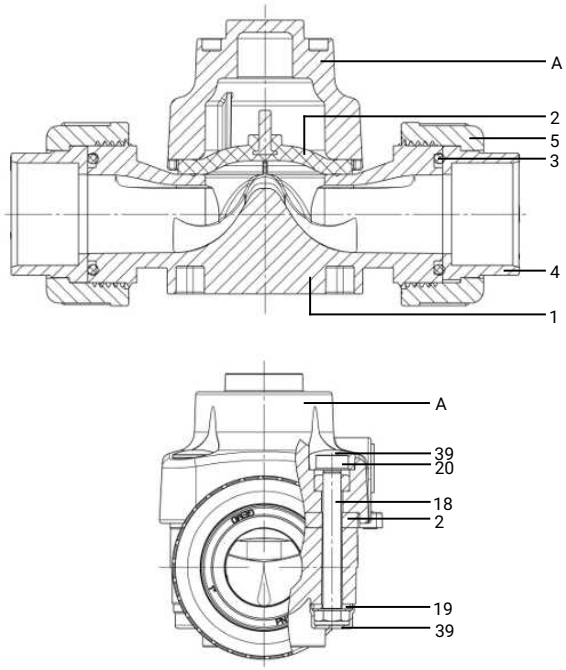
● Any maintenance work and repairs not described in these operating instructions must not be performed without consulting the manufacturer first.

The operator must carry out regular visual examination of the GEMÜ products dependent on the operating conditions and the potential danger in order to prevent leakage and damage.

The product also must be disassembled and checked for wear in the corresponding intervals.

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

15.1 Spare parts



Item	Name	Order designation
1	Valve body	B690
3	O-ring	
4	Insert	
5	Union nut	
2	Diaphragm	R690...M...
18	Bolt	R647...S30
19	Washer (2x)	
20	Nut	
39	Protective cap (2x)	
A	Actuator	A647

15.2 Removing the actuator

1. Move the actuator **A** to the open position.
2. Loosen the fastening elements between actuator **A** and valve body **1** diagonally and remove them.
3. Lift actuator **A** off valve body **1**.
4. Move the actuator **A** to the closed position.
5. Clean all parts of contamination (do not damage parts during cleaning).
6. Check parts for potential damage, replace if necessary (only use genuine parts from GEMÜ).

15.3 Removing the diaphragm

1. Remove actuator **A** (see chapter "Removing the actuator").
2. Remove the diaphragm.
3. Clean all parts of contamination (do not damage parts during cleaning).
4. Check parts for potential damage, replace if necessary (only use genuine parts from GEMÜ).

15.4 Mounting the diaphragm

15.4.1 General information

NOTICE

► Fit the diaphragms suitable for the product (suitable for medium, medium concentration, temperature and pressure). The diaphragm is a wearing part. Check the technical condition and function of the product before commissioning and during the whole term of use. Carry out checks regularly and determine the check intervals in accordance with the conditions of use and/or the regulatory codes and provisions applicable for this application.

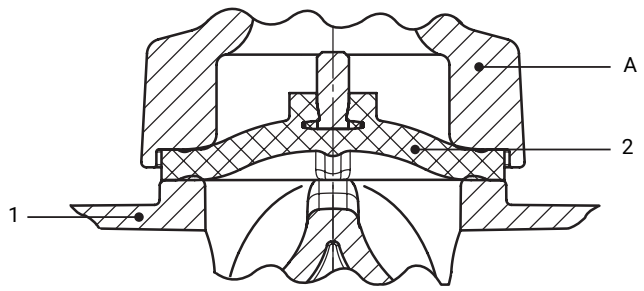
NOTICE

► If the diaphragm is not screwed into the adapter far enough, the closing force is transmitted directly onto the diaphragm pin and not via the compressor. This will cause damage and early failure of the diaphragm and leakage of the product. If the diaphragm is screwed in too far, perfect sealing at the valve seat will not be achieved. The function of the product is no longer ensured.

NOTICE

► Incorrectly mounted diaphragms cause the product leakage and emission of medium. In this case, remove the diaphragms, check the complete valve and diaphragms and reassemble again proceeding as described above.

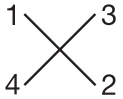
15.4.2 Mounting a concave diaphragm



1. Position the diaphragm **2** on the valve body **1**.
2. Align the tab with the manufacturer and material identification in parallel to the valve body weir.
3. Check whether the hole patterns of the actuator **A**, diaphragm **2** and valve body **1** match.

15.5 Fitting the actuator on the valve body

1. Position the actuator **A** on the valve body **1** with the positioned diaphragm **2**. Take care to align the diaphragm weir and valve body weir.
2. Tighten the bolts **18**, washers **19** and nuts **20** by hand.
3. Tighten the bolts **18** or nuts **20** diagonally.



4. Check the fully assembled valve for leaks.

NOTICE

► Service and maintenance:
Diaphragms set over the course of time. After installing/removing the valve, always retighten the bolts **18** or nuts **20** (see Chapter "Spare parts").

5. Ensure even compression of the diaphragm (approx. 10 to 15%).
   ⇨ Even compression is detected by an even outer bulge.

16 Removal from piping

1. Remove in reverse order to installation.
2. Deactivate the control medium.
3. Disconnect the control medium line(s).
4. Disassemble the product. Observe warning notes and safety information.

17 Disposal

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

18 Returns

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

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

19 EU Declaration of Incorporation

Version 1.0

Original EU-Einbauerklärung

EU Declaration of Incorporation

Wir, die Firma / We, the company

GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG
Gert-Müller-Platz 1
74635 Kupferzell
Deutschland

erklären hiermit in alleiniger Verantwortung, dass die nachfolgend bezeichneten Produkte den Vorschriften der genannten Richtlinien entspricht.

hereby declare under our sole responsibility that the below-mentioned products complies with the regulations of the mentioned Directives.

Produkt:	GEMÜ R647	**Product:**	GEMÜ R647
Produktname:	Pneumatisch betätigtes Membranventil	**Product name:**	Pneumatically operated diaphragm valve

Die unvollständige Maschine darf erst dann in Betrieb genommen werden, wenn gegebenenfalls festgestellt wurde, dass die Maschine, in die die unvollständige Maschine eingebaut werden soll, den Bestimmungen der Maschinenrichtlinie 2006/42/EG entspricht.

The partly completed machinery may be commissioned only if it has been determined, if necessary, that the machinery into which the partly completed machinery is to be installed meets the provisions of the Machinery Directive 2006/42/EC.

Richtlinien/Verordnungen: / **Directives/Regulations:**

MD 2006/42/EG[1)]

Folgende harmonisierte Normen (oder Teile hieraus) wurden angewandt: / **The following harmonized standards (or parts thereof) have been applied:**

EN ISO 12100:2010

Folgende grundlegenden Sicherheits- und Gesundheitsschutzanforderungen der EG-Maschinenrichtlinie 2006/42/EG, Anhang I wurden angewandt und eingehalten: / **The following essential health and safety requirements of the EC Machinery Directive 2006/42/EC, Annex I have been applied or adhered to:**

1.1.2.; 1.1.3.; 1.1.5.; 1.3.2.; 1.3.4.; 1.3.7.; 1.3.8.; 1.5.1.; 1.5.13.; 1.5.2.; 1.5.4.; 1.5.6.; 1.5.7.; 1.5.8.; 1.6.1.; 1.6.3.; 1.6.5.; 1.7.1.; 1.7.1.1.; 1.7.2.; 1.7.3.; 1.7.4.; 1.7.4.1.; 1.7.4.2.; 1.7.4.3.

[1)] MD 2006/42/EG

Bemerkungen:
Ferner wird erklärt, dass die speziellen technischen Unterlagen gemäß Anhang VII Teil B erstellt wurden.
Der Hersteller verpflichtet sich, einzelstaatlichen Stellen auf begründetes Verlangen die speziellen technischen Unterlagen zu der unvollständigen Maschine zu übermitteln. Diese Übermittlung erfolgt elektronisch.
Die gewerblichen Schutzrechte bleiben hiervon unberührt!

[1)] MD 2006/42/EG

Remarks:
We also declare that the specific technical documents have been created in accordance with part B of Annex VII.
The manufacturer undertakes to transmit relevant technical documents on the partly completed machinery to the national authorities in response to a reasoned request. This communication takes place electronically.
This does not affect the industrial property rights.

i.V. M. Barghoorn
Leiter Globale Technik

Ingelfingen, 07.01.2026

GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG
Gert-Müller-Platz 1, 74635 Kupferzell, Deutschland

www.gemu-group.com
info@gemue.de

20 EU Declaration of Conformity

CE Version 1.0 GEMÜ

EU-Konformitätserklärung

EU Declaration of Conformity

Wir, die Firma / We, the company

GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG
Gert-Müller-Platz 1
74635 Kupferzell
Deutschland

erklären hiermit in alleiniger Verantwortung, dass die nachfolgend bezeichneten Produkte den Vorschriften der genannten Richtlinien entspricht.

hereby declare under our sole responsibility that the below-mentioned products complies with the regulations of the mentioned Directives.

Produkt:	GEMÜ R647	**Product:**	GEMÜ R647
Produktname:	Pneumatisch betätigtes Membranventil	**Product name:**	Pneumatically operated diaphragm valve

Richtlinien/Verordnungen: / **Directives/Regulations:**

PED 2014/68/EU[1)]

Folgende harmonisierte Normen (oder Teile hieraus) wurden angewandt: / **The following harmonized standards (or parts thereof) have been applied:**

EN ISO 16138:2006/A1:2019

Weitere angewandte Normen: / **Further applied norms:**

AD 2000

[1)] PED 2014/68/EU
Benannte Stelle:
TÜV Rheinland Industrie Service GmbH
Am Grauen Stein 1
51105 Köln
Kennnummer der benannten Stelle: 0035
Nr. des QS-Zertifikats: 01 202 926/Q-02 0036
Angewandte(s) Konformitätsbewertungsverfahren: Modul H
Hinweis für Produkte mit einer Nennweite ≤ DN 25:
Die Produkte werden entwickelt und produziert nach GEMÜ eigenen Verfahrensanweisungen und Qualitätsstandards, welche die Forderungen der ISO 9001 und der ISO 14001 erfüllen. Die Produkte dürfen gemäß Artikel 4, Absatz 3 der Druckgeräterichtlinie 2014/68/EU keine CE-Kennzeichnung tragen.
Bemerkungen:
Der Einsatz des Produkts in Kategorie III gemäß Druckgeräterichtlinie 2014/68/EU sowie die Verwendung mit instabilen Gasen ist nicht zulässig.

[1)] PED 2014/68/EU
Notified body::
TÜV Rheinland Industrie Service GmbH
Am Grauen Stein 1
51105 Cologne, Germany
ID number of the notified body: 0035
No. of the QA certificate: 01 202 926/Q-02 0036
Conformity assessment procedure(s) applied: Module H
Information for products with a nominal size ≤ DN 25:
The products are developed and produced according to GEMÜ's in-house process instructions and standards of quality which comply with the requirements of ISO 9001 and ISO 14001. According to Article 4, Paragraph 3 of the Pressure Equipment Directive 2014/68/EU, these products must not be identified by a CE-marking.
Remarks:
Use of the product in category III in accordance with Pressure Equipment Directive 2014/68/EU and use with unstable gases are not permissible.

i.V. M. Barghoorn
Leiter Globale Technik

Ingelfingen, 07.01.2026

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