

GEMÜ 615

Pneumatically operated diaphragm valve

EN

Operating instructions



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1 General information

1.1 Information

- 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.

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 function

The possible actuation functions of the GEMÜ product.

Control medium

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

1.4 Warning notes


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


SIGNAL WORD	
Possible symbol for the specific danger	<p>Type and source of the danger</p> <ul style="list-style-type: none"> ▶ Possible consequences of non-observance. ● Measures for avoiding danger.


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

The following signal words and danger levels are used:



⚠ DANGER	
	<p>Imminent danger!</p> <ul style="list-style-type: none"> ▶ Non-observance can cause death or severe injury.

⚠ WARNING	
	<p>Potentially dangerous situation!</p> <ul style="list-style-type: none"> ▶ Non-observance can cause death or severe injury.

⚠ CAUTION	
	<p>Potentially dangerous situation!</p> <ul style="list-style-type: none"> ▶ Non-observance can cause moderate to light injury.

NOTICE	
	<p>Potentially dangerous situation!</p> <ul style="list-style-type: none"> ▶ Non-observance can cause damage to property.

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

Symbol	Meaning
	Corrosive chemicals!
	Hot plant components!

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 substances.

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:

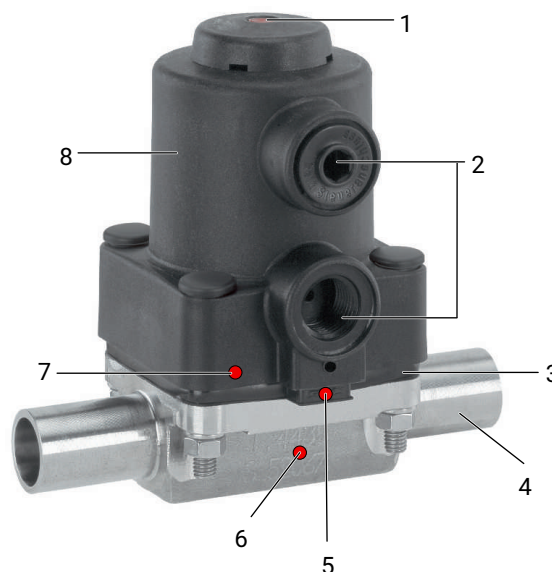
9. Keep this document available at the place of use.
10. Observe the safety information.
11. Operate the product in accordance with this document.
12. Operate the product in accordance with the specifications.
13. Maintain the product correctly.
14. Do not carry out any maintenance work and repairs not 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 Construction



Item	Name	Materials
1	Position indicator	
2	Control air connectors	
3	Diaphragm	EPDM FKM PTFE/EPDM (one-piece)
4	Valve body	1.4408, investment casting 1.4435, investment casting 1.4435 (F316L), forged body 1.4435 (BN2), forged body, Δ Fe < 0.5 % 1.4539, forged body CW614N, CW617N (brass)
5	CONEXO diaphragm RFID chip (see Conexo information)	
6	CONEXO body RFID chip (see Conexo information)	
7	CONEXO actuator RFID chip (see Conexo information)	
8	Piston actuator	PP, glass fibre reinforced

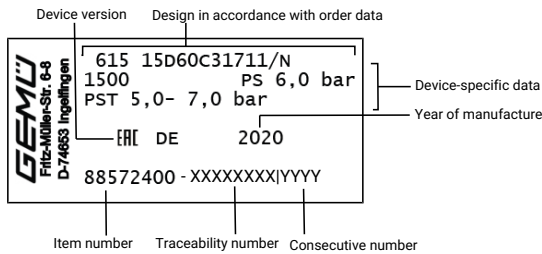
3.2 Description

The GEMÜ 615 2/2-way diaphragm valve has a low-maintenance plastic piston actuator and is pneumatically operated. An integrated optical position indicator is standard. Normally Closed (NC), Normally Open (NO) and Double Acting (DA) control functions are available.

3.3 Function

The product is designed for use in piping. It can be closed or opened by a control medium, 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 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

5 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 piston actuator, optical position indicator	615

2 DN	Code
DN 10	10
DN 12	12
DN 15	15
DN 20	20

3 Body configuration	Code
2/2-way body	D

4 Connection type	Code
Spigot	
Spigot DIN	0
Spigot DIN EN 10357 series B (2014 edition; formerly DIN 11850 series 1)	16
Spigot EN 10357 series A/DIN 11866 series A formerly DIN 11850 series 2	17
Spigot DIN 11850 series 3	18
Spigot JIS-G 3459 schedule 10s	36
Spigot BS 4825, part 1	55
Spigot ASME BPE/DIN EN 10357 series C (from 2022 edition)/DIN 11866 series C	59
Spigot ISO 1127/DIN EN 10357 series C (2014 edition)/DIN 11866 series B	60
Spigot ANSI/ASME B36.19M schedule 10s	63
Spigot ANSI/ASME B36.19M schedule 5s	64
Spigot ANSI/ASME B36.19M schedule 40s	65
Threaded connection	
Threaded socket DIN ISO 228	1
Threaded spigot DIN 11851	6
Cone spigot and union nut DIN 11851	6K
Clamp	
Clamp ASME BPE, face-to-face dimension FTF ASME BPE, length only for body configuration D	80
Clamp DIN 32676 series B, face-to-face dimension FTF EN 558 series 7, length only for body configuration D	82
Clamp ASME BPE, for pipe ASME BPE, face-to-face dimension FTF EN 558 series 7, length only for body configuration D	88
Clamp DIN 32676 series A, face-to-face dimension FTF acc. to EN 558 series 7, length only for body configuration D	8A
Clamp DIN 32676 series C, face-to-face dimension FTF ASME BPE, length only for body configuration D	8P

4 Connection type	Code
Clamp DIN 32676 series C, face-to-face dimension FTF EN 558 series 7, length only for body configuration D	8T

5 Valve body material	Code
Investment casting material	
1.4408, investment casting	37
1.4435, investment casting	C3
Forged material	
1.4435 (F316L), forged body	40
1.4435 (BN2), forged body, $\Delta Fe < 0.5\%$	42
1.4539, forged body	F4
Brass	
CW614N, CW617N (brass)	12

6 Diaphragm material	Code
Elastomer	
FKM	4
EPDM	13
EPDM	17
EPDM	19
EPDM	28
EPDM	29
PTFE	
PTFE/EPDM one-piece	54

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

8 Actuator version	Code
Actuator size 1/N	1/N

9 Surface	Code
$Ra \leq 6.3 \mu\text{m}$ (250 $\mu\text{in.}$) for media wetted surfaces, mechanically polished internal	1500
$Ra \leq 0.8 \mu\text{m}$ (30 $\mu\text{in.}$) for media wetted surfaces, in accordance with DIN 11866 H3, mechanically polished internal	1502
$Ra \leq 0.8 \mu\text{m}$ (30 $\mu\text{in.}$) for media wetted surfaces, in accordance with DIN 11866 HE3, electropolished internal/external	1503
$Ra \leq 0.6 \mu\text{m}$ (25 $\mu\text{in.}$) for media wetted surfaces, mechanically polished internal	1507
$Ra \leq 0.6 \mu\text{m}$ (25 $\mu\text{in.}$) for media wetted surfaces, electropolished internal/external	1508

9 Surface	Code
Ra ≤ 0.25 µm (10 µin.) for media wetted surfaces *), in accordance with DIN 11866 HE5, electropolished internal/external, *) for inner pipe diameters < 6 mm, in the spigot Ra ≤ 0.38 µm	1516
Ra ≤ 0.25 µm (10 µin.) for media wetted surfaces *), in accordance with DIN 11866 H5, mechanically polished internal, *) for inner pipe diameters < 6 mm, in the spigot Ra ≤ 0.38 µm	1527
Ra ≤ 0.4 µm (15 µin.) for media wetted surfaces, in accordance with DIN 11866 H4, mechanically polished internal	1536
Ra ≤ 0.4 µm (15 µin.) for media wetted surfaces, in accordance with DIN 11866 HE4, electropolished internal/external	1537
Ra max. 0.51 µm (20 µin.) for media wetted surfaces, in accordance with ASME BPE SF1, mechanically polished internal	SF1
Ra max. 0.64 µm (25 µin.) for media wetted surfaces, in accordance with ASME BPE SF2, mechanically polished internal	SF2

9 Surface	Code
Ra max. 0.76 µm (30 µin.) for media wetted surfaces, in accordance with ASME BPE SF3, mechanically polished internal	SF3
Ra max. 0.38 µm (15 µin.) for media wetted surfaces, in accordance with ASME BPE SF4, electropolished internal/external	SF4
Ra max. 0.51 µm (20 µin.) for media wetted surfaces, in accordance with ASME BPE SF5, electropolished internal/external	SF5
Ra max. 0.64 µm (25 µin.) for media wetted surfaces, in accordance with ASME BPE SF6, electropolished internal/external	SF6

10 Special version	Code
Without	
BELGAQUA certification	B
Special version for oxygen, maximum medium temperature: 60 °C	S

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

Order example

Ordering option	Code	Description
1 Type	615	Diaphragm valve, pneumatically operated, plastic piston actuator, optical position indicator
2 DN	15	DN 15
3 Body configuration	D	2/2-way body
4 Connection type	60	Spigot ISO 1127/DIN EN 10357 series C (2014 edition)/DIN 11866 series B
5 Valve body material	C3	1.4435, investment casting
6 Diaphragm material	17	EPDM
7 Control function	1	Normally closed (NC)
8 Actuator version	1/N	Actuator size 1/N
9 Surface	1500	Ra ≤ 6.3 µm (250 µin.) for media wetted surfaces, mechanically polished internal
10 Special version	S	Special version for oxygen, maximum medium temperature: 60 °C
11 CONEXO		Without

6 Technical data

6.1 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.
For special oxygen version (code S): only gaseous oxygen

Control medium: Inert gases

6.2 Temperature

Media temperature:

Diaphragm material	Standard	Special version for oxygen
FKM (code 4)	-10 – 80 °C	-
EPDM (code 13)	-10 – 80 °C	0 – 60 °C
EPDM (code 17)	-10 – 80 °C	-
EPDM (code 19)	-10 – 80 °C	0 – 60 °C
EPDM (code 28)	-10 – 80 °C	-
EPDM (code 29)	-10 – 80 °C	-
PTFE/EPDM (code 54)	-10 – 80 °C	0 – 60 °C

Ambient temperature: 0 – 60 °C

Control medium temperature: 0 – 40 °C

Storage temperature: 0 – 40 °C

6.3 Pressure

Operating pressure:

MG	DN	Diaphragm material	
		Elastomer	PTFE
10	10 - 20	0 - 6	0 - 6

MG = diaphragm size

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.

Pressure rating:

PN 16

Leakage rate:

Leakage rate A to P11/P12 EN 12266-1

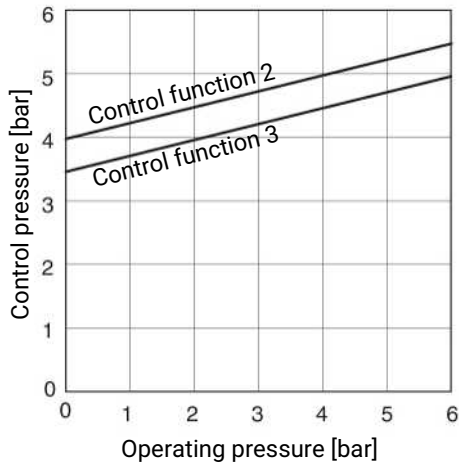
Control pressure:

MG	DN	Control function 1	Control function 2	Control function 3
10	10 - 20	5 - 7	max. 5.5	max. 5.0

MG = diaphragm size

All pressures are gauge pressures.

Control pressure/operating pressure diagram – 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.

Filling volume:

0.02 dm³

Kv values:

MG	DN	Connection type code						
		0	16	17	18	59	60	1
10	10	-	2.4	2.4	2.4	2.2	3.3	-
	12	-	-	-	-	-	-	3.2
	15	3.3	3.8	3.8	3.8	2.2	4.0	3.4
	20	-	-	-	-	3.8	-	-

MG = diaphragm size

Kv values in m³/h

Kv values determined in accordance with DIN EN 60534 standard, inlet pressure 5 bar, Δp 1 bar, stainless steel 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.

6.4 Product conformity

Machinery Directive: 2006/42/EC

Pressure Equipment Directive: 2014/68/EU

Food: Regulation (EC) No. 1935/2006
Regulation (EC) No. 10/2011*
FDA*
USP* Class VI

Drinking water: Belgaqua*
* depending on version and/or operating parameters

6.5 Mechanical data

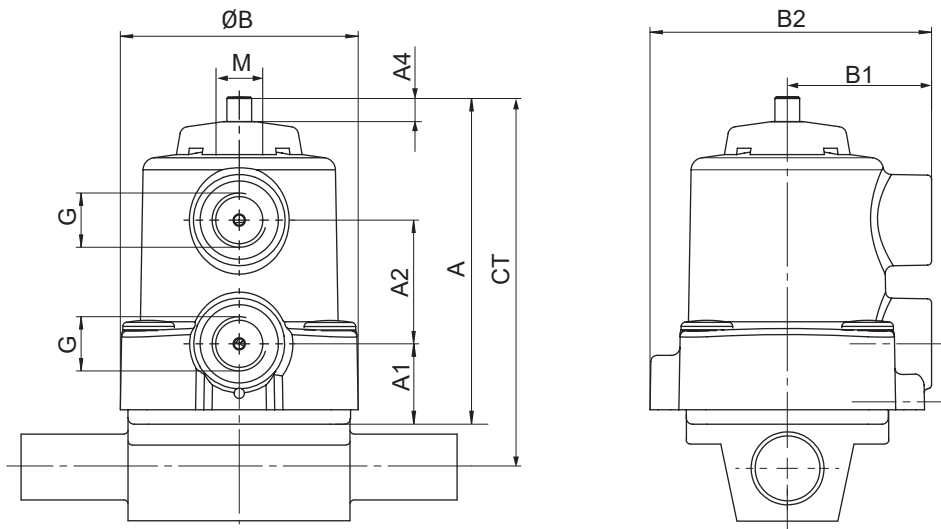
Weight: **Actuator**
0.18 kg

Body

MG	DN	Spigot	Threaded socket	Threaded spigot	Clamp
		Connection type code			
		0, 16, 17, 18, 36, 55, 59, 60, 63, 64, 65	1	6, 6K	80, 82, 88, 8A, 8P, 8T
10	10	0.30	-	0.33	0.30
	12	-	0.17	-	-
	15	0.30	0.26	0.35	0.43
	20	-	-	-	0.43

Weights in kg
MG = diaphragm size

Installation position: Optional
Observe the angle of rotation for optimized draining when it comes to installation.
See separate document, "Angle of rotation technical information".

7 Dimensions**7.1 Actuator dimensions**

MG	A	A1	A2	$\varnothing B$	B1	B2	A4	G	M
10	80.0	21.0	30.0	57.0	35.0	68.0	4.0	G 1/4	M12x1

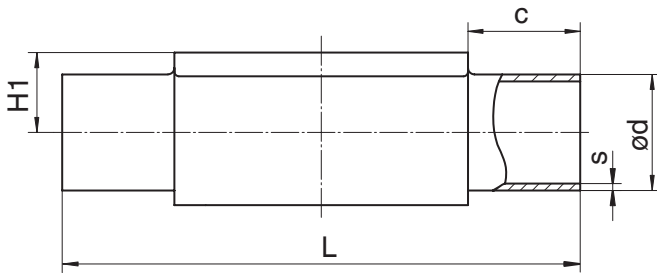
Dimensions in mm

MG = diaphragm size

* CT = A + H1 (see body dimensions)

7.2 Body dimensions

7.2.1 Spigot DIN/EN/ISO (code 0, 16, 17, 18, 60)



Connection type spigot DIN/EN/ISO (code 0, 16, 17, 18, 60)¹⁾, forged material (code 40, 42, F4)²⁾

MG	DN	NPS	c (min)	ød					H1	L	s				
				Connection type							Connection type				
				0	16	17	18	60			0	16	17	18	60
10	10	3/8"	25.0	-	12.0	13.0	14.0	17.2	12.5	108.0	-	1.0	1.5	2.0	1.6
	15	1/2"	25.0	18.0	18.0	19.0	20.0	21.3	12.5	108.0	1.5	1.0	1.5	2.0	1.6

Dimensions in mm

MG = diaphragm size

1) Connection type

Code 0: Spigot DIN

Code 16: Spigot DIN EN 10357 series B (2014 edition; formerly DIN 11850 series 1)

Code 17: Spigot EN 10357 series A/DIN 11866 series A formerly DIN 11850 series 2

Code 18: Spigot DIN 11850 series 3

Code 60: Spigot ISO 1127/DIN EN 10357 series C (2014 edition)/DIN 11866 series B

2) Valve body material

Code 40: 1.4435 (F316L), forged body

Code 42: 1.4435 (BN2), forged body, Δ Fe < 0.5%

Code F4: 1.4539, forged body

Connection type spigot DIN/EN/ISO (code 17, 60)¹⁾, investment casting material (code C3)²⁾

MG	DN	NPS	c (min)	ød		H1	L	s	
				Connection type				Connection type	
				17	60			17	60
10	10	3/8"	25.0	13.0	17.2	12.5	108.0	1.5	1.6
	15	1/2"	25.0	19.0	21.3	12.5	108.0	1.5	1.6

Dimensions in mm

MG = diaphragm size

1) Connection type

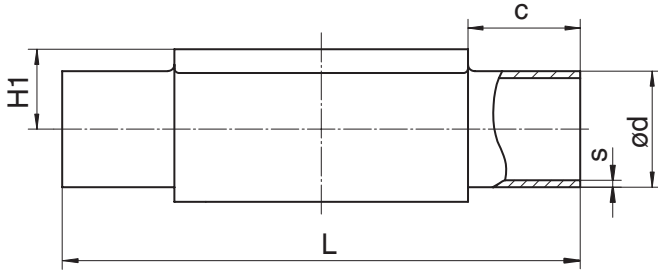
Code 17: Spigot EN 10357 series A/DIN 11866 series A formerly DIN 11850 series 2

Code 60: Spigot ISO 1127/DIN EN 10357 series C (2014 edition)/DIN 11866 series B

2) Valve body material

Code C3: 1.4435, investment casting

7.2.2 Spigot ASME/BS (code 55, 59, 63, 64, 65)



Connection type spigot ASME/BS (code 55, 59, 63, 64, 65)¹⁾, forged material (code 40, 42, F4)²⁾

MG	DN	NPS	c (min)	ød					H1	L	s				
				Connection type							Connection type				
				55	59	63	64	65			55	59	63	64	65
10	10	3/8"	25.0	9.53	9.53	17.1	-	17.1	12.5	108.0	1.2	0.89	1.65	-	2.31
	15	1/2"	25.0	12.70	12.70	21.3	21.3	21.3	12.5	108.0	1.2	1.65	2.11	1.65	2.77
	20	3/4"	25.0	19.05	19.05	-	-	-	12.5	108.0	1.2	1.65	-	-	-

Connection type spigot ASME BPE (code 59)¹⁾, investment casting material (code C3)²⁾

MG	DN	NPS	c (min)	ød	H1	L	s
10	20	3/4"	25.0	19.05	12.5	108.0	1.65

MG = diaphragm size

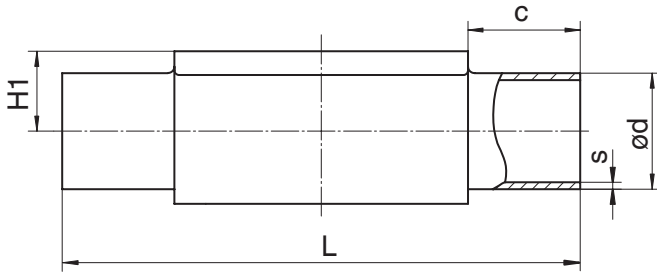
1) Connection type

- Code 55: Spigot BS 4825, part 1
- Code 59: Spigot ASME BPE/DIN EN 10357 series C (from 2022 edition)/DIN 11866 series C
- Code 63: Spigot ANSI/ASME B36.19M schedule 10s
- Code 64: Spigot ANSI/ASME B36.19M schedule 5s
- Code 65: Spigot ANSI/ASME B36.19M schedule 40s

2) Valve body material

- Code 40: 1.4435 (F316L), forged body
- Code 42: 1.4435 (BN2), forged body, Δ Fe < 0.5%
- Code C3: 1.4435, investment casting
- Code F4: 1.4539, forged body

7.2.3 Spigot JIS/SMS (code 36)



Connection type spigot JIS/SMS (code 36)¹⁾, forged material (code 40, 42, F4)²⁾

MG	DN	NPS	c (min)	ød	H1	L	s
10	10	3/8"	25.0	17.3	12.5	108.0	1.65
	15	1/2"	25.0	21.7	12.5	108.0	2.10

Dimensions in mm

MG = diaphragm size

1) Connection type

Code 36: Spigot JIS-G 3459 schedule 10s

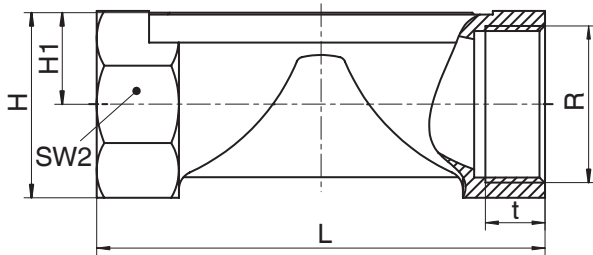
2) Valve body material

Code 40: 1.4435 (F316L), forged body

Code 42: 1.4435 (BN2), forged body, $\Delta Fe < 0.5\%$

Code F4: 1.4539, forged body

7.2.4 Threaded socket DIN (code 1)



Connection type threaded socket (code 1)¹⁾, brass material (code 12)

MG	DN	NPS	H	H1	L	n	R	SW 2	t
10	12	3/8"	23.0	11.0	55.0	2	G 3/8	22.0	13.0
	15	1/2"	29.0	14.0	75.0	2	G 1/2	25.0	15.0

Connection type threaded socket (code 1)¹⁾, investment casting material (code 37)²⁾

MG	DN	NPS	H	H1	L	n	R	SW 2	t
10	12	3/8"	25.0	13.0	55.0	2	G 3/8	22.0	12.0
	15	1/2"	30.0	15.0	68.0	2	G 1/2	27.0	15.0

Dimensions in mm

MG = diaphragm size

n = number of flats

1) Connection type

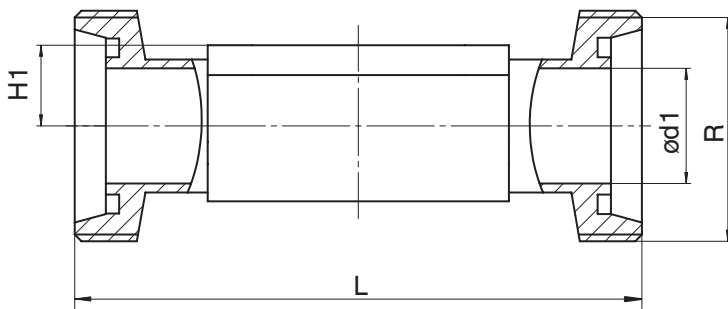
Code 1: Threaded socket DIN ISO 228

2) Valve body material

Code 12: CW614N, CW617N (brass)

Code 37: 1.4408, investment casting

7.2.5 Threaded spigot DIN (code 6)



Connection type threaded spigot DIN (code 6)¹⁾, forged material (code 40, 42)²⁾

MG	DN	NPS	ød1	H1	L	R
10	10	3/8"	10.0	12.5	118.0	Rd 28 x 1/8
	15	1/2"	16.0	12.5	118.0	Rd 34 x 1/8

Dimensions in mm

MG = diaphragm size

1) **Connection type**

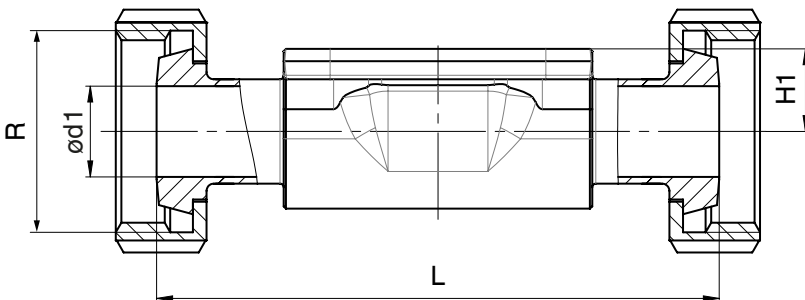
Code 6: Threaded spigot DIN 11851

2) **Valve body material**

Code 40: 1.4435 (F316L), forged body

Code 42: 1.4435 (BN2), forged body, Δ Fe < 0.5%

7.2.6 Cone spigot DIN (code 6K)



Connection type cone spigot DIN (code 6K)¹⁾, forged material (code 40, 42)²⁾

MG	DN	NPS	ød1	H1	L	R
10	10	3/8"	10.0	12.5	116.0	Rd 28 x 1/8
	15	1/2"	16.0	12.5	116.0	Rd 34 x 1/8

Dimensions in mm

MG = diaphragm size

1) **Connection type**

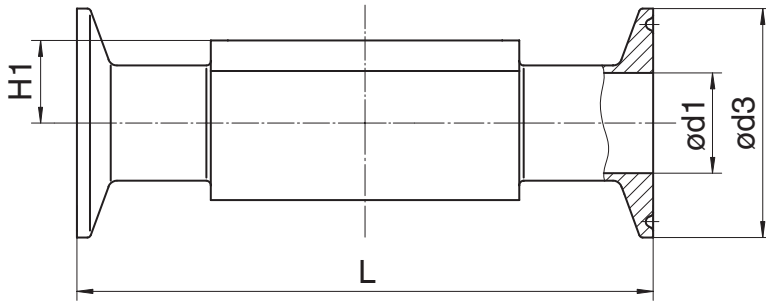
Code 6K: Cone spigot and union nut DIN 11851

2) **Valve body material**

Code 40: 1.4435 (F316L), forged body

Code 42: 1.4435 (BN2), forged body, Δ Fe < 0.5%

7.2.7 Clamp (code 80, 82, 88, 8A, 8E, 8P, 8T)



Connection type clamp DIN/ASME (code 80, 88, 8P, 8T), forged material (code 40, 42, F4)¹⁾

MG	DN	NPS	ød1		ød3		H1	L	
			Connection type					Connection type	
			80, 8P	88, 8T	80, 8P	88, 8T		80, 8P	88, 8T
10	15	1/2"	9.40	9.40	25.0	25.0	12.5	88.9	108.0
	20	3/4"	15.75	15.75	25.0	25.0	12.5	101.6	117.0

Connection type clamp DIN/ISO (code 82, 8A), forged material (code 40, 42, F4)¹⁾

MG	DN	NPS	ød1		ød3		H1	L	
			Connection type					Connection type	
			82	8A	82	8A		82	8A
10	10	3/8"	14.0	10.0	25.0	34.0	12.5	108.0	108.0
	15	1/2"	18.1	16.0	50.5	34.0	12.5	108.0	108.0

Dimensions in mm

MG = diaphragm size

1) Valve body material

Code 40: 1.4435 (F316L), forged body

Code 42: 1.4435 (BN2), forged body, Δ Fe < 0.5%

Code F4: 1.4539, forged body

8 Manufacturer's information

8.1 Packaging

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

8.2 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.

8.3 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.


8.4 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 Installation in piping


9.1 Preparing for installation

 WARNING	
The equipment is subject to pressure!	
<ul style="list-style-type: none"> ▶ Risk of severe injury or death ● Depressurize the plant. ● Completely drain the plant. 	

 WARNING	
	Corrosive chemicals!
	<ul style="list-style-type: none"> ▶ Risk of caustic burns ● Wear appropriate protective gear. ● Completely drain the plant.

 CAUTION	
	Hot plant components!
	<ul style="list-style-type: none"> ▶ Risk of burns ● Only work on plant that has cooled down.

 CAUTION	
Use as step.	
<ul style="list-style-type: none"> ▶ 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. 	

 CAUTION	
Leakage	
<ul style="list-style-type: none"> ▶ Emission of dangerous materials. ● Provide precautionary measures against exceeding the maximum permitted pressures caused by pressure surges (water hammer). 	

NOTICE	
Suitability of the product!	
<ul style="list-style-type: none"> ▶ The product must be appropriate for the piping system operating conditions (medium, medium concentration, temperature and pressure) and the prevailing ambient conditions. 	

NOTICE	
Tools	
<ul style="list-style-type: none"> ▶ The tools required for installation and assembly are not included in the scope of delivery. ● Use appropriate, functional and safe tools. 	
<ol style="list-style-type: none"> 1. Ensure the suitability of the product for each respective use. 2. Check the technical data of the product and the materials. 3. Keep appropriate tools ready. 4. Ensure appropriate protective gear as specified in the plant operator's guidelines. 5. Observe appropriate regulations for connections. 6. Have installation work carried out by trained personnel. 7. Shut off plant or plant component. 8. Secure plant or plant component against recommissioning. 9. Depressurize the plant or plant component. 10. Completely drain the plant (or plant component) and let it cool down until the temperature is below the media vaporization temperature and scalding can be ruled out. 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 chapter "Installation position"). 	

9.2 Installation position

The installation position of the product is optional.

9.3 Installation with butt weld spigots

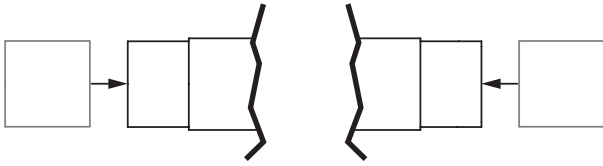


Fig. 1: Butt weld spigots

1. Carry out preparation for installation (see chapter "Preparing for installation").
2. Adhere to good welding practices!
3. Remove the actuator and diaphragm from the valve body.
4. Weld the body of the product in the piping.
5. Allow butt weld spigots to cool down.
6. Mount the actuator and diaphragm on the valve body.
7. Re-attach or reactivate all safety and protective devices.

9.4 Installation with threaded spigots

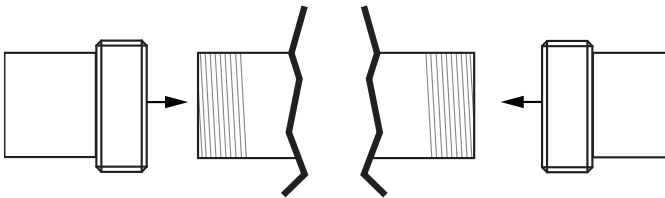


Fig. 2: Threaded spigots

NOTICE

Thread sealant

- ▶ The thread sealant is not included in the scope of delivery.
- Only use appropriate thread sealant.

1. Keep thread sealant ready.
2. Carry out preparations for installation (see chapter "Preparing for installation").
3. Screw the pipe into the threaded connection of the valve body in accordance with valid standards.
 - ⇒ Use appropriate thread sealant.
4. Re-attach or reactivate all safety and protective devices.

9.5 Installation with threaded sockets

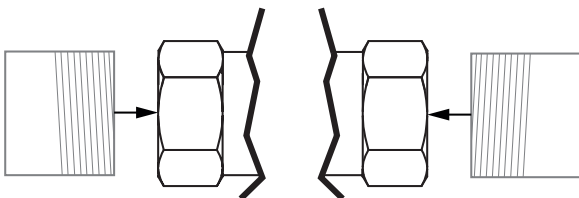


Fig. 3: Threaded socket

NOTICE

Sealing material

- ▶ The sealing material is not included in the scope of delivery.
- Only use appropriate sealing material.

1. Keep thread sealant ready.
2. Carry out preparations for installation (see chapter "Preparing for installation").
3. Screw the threaded connections into the pipe in accordance with valid standards.
4. Screw the body of the product onto the piping using appropriate thread sealant.
5. Re-attach or reactivate all safety and protective devices.

9.6 Installation with clamp connections

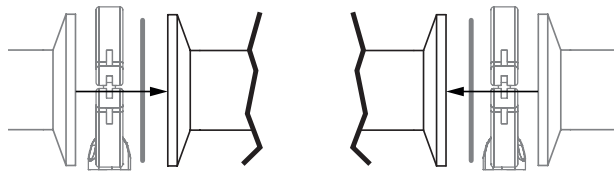


Fig. 4: Clamp connection

NOTICE

Gasket and clamp

- ▶ The gasket and clamps for clamp connections are not included in the scope of delivery.

1. Keep ready gasket and clamp.
2. Carry out preparation for installation (see chapter "Preparing for installation").
3. Insert the corresponding gasket between the body of the product and the pipe connection.
4. Connect the gasket between the body of the product and the pipe connection using clamps.
5. Re-attach or reactivate all safety and protective devices.

9.7 After the installation

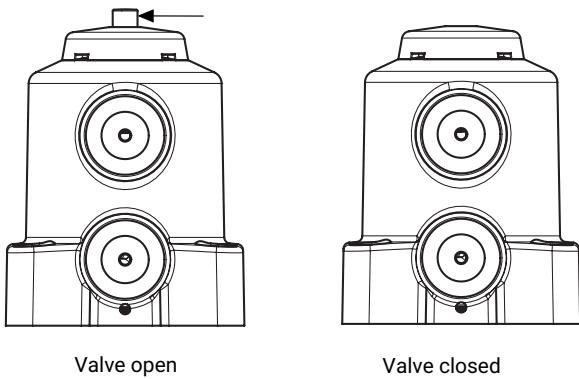
NOTICE

Diaphragms set in the course of time.

- ▶ Leakage
- After disassembly/assembly of the product, check that the bolts and nuts on the body are tight and retighten if required.
- Retighten the bolts and nuts at the very latest after the first sterilization process.
- Re-attach or reactivate all safety and protective devices.

9.8 Operation

Optical position indicator



10 Pneumatic connections

10.1 Control function

The following control functions are available:

Control function 1

Normally closed (NC):

Valve resting position: closed by spring force. Activation of the actuator (connector 2) opens the valve. When the actuator is vented, the valve is closed by spring force.

Control function 2

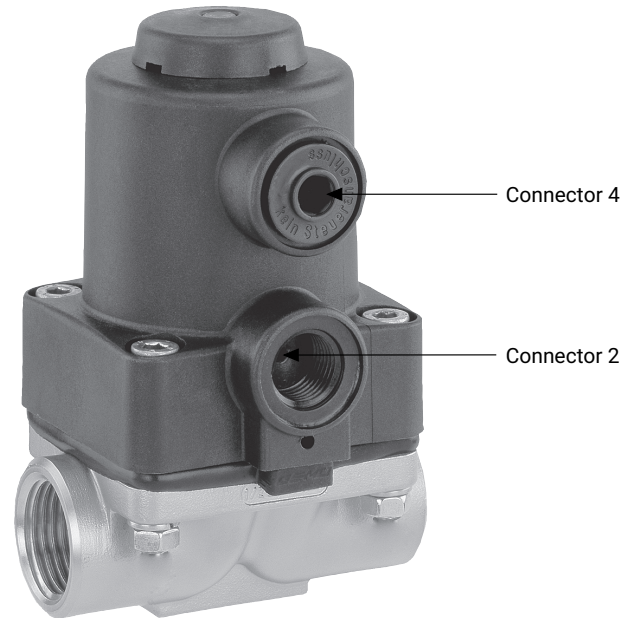
Normally open (NO):

Valve resting position: opened by spring force. Activation of the actuator (connector 4) closes the valve. When the actuator is vented, the valve is opened by spring force.

Control function 3

Double acting (DA):

Valve resting position: no defined normal position. The valve is opened and closed by activating the respective control medium connectors (connector 2: open/connector 4: close).



Control function 1: connector 4 is closed with a blanking plug.
 Control function 2: connector 2 is closed with a blanking plug.

Control function	Connectors	
	2	4
1 (NC)	+	-
2 (NO)	-	+
3 (DA)	+	+
+ = available / - = not available (see figure for connectors 2 / 4)		

10.2 Connecting the control medium

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

Thread size of the control medium connectors: G1/4

NOTICE

- ▶ For control air connectors made of plastic, no screw-in connectors with a tapered thread R1/4" may be used.

Control function		Connectors
1	Normally closed (NC)	2: Control medium (open)
2	Normally open (NO)	4: Control medium (close)
3	Double acting (DA)	2: Control medium (open) 4: Control medium (close)

See figure for connectors 2 / 4

11 Commissioning

⚠ WARNING



Corrosive chemicals!

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

⚠ CAUTION

Leakage

- ▶ Emission of dangerous materials.
- Provide precautionary measures against exceeding the maximum permitted pressures 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. Commission actuators in accordance with the enclosed instructions.

12 Operation

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

13 Troubleshooting

Error	Error cause	Troubleshooting
Control medium escaping from connector 4* (control function NC) or from connector 2* (control function NO)	Piston faulty	Replace the actuator
Control medium escaping from leak detection hole*	Spindle seal leaking	Replace the actuator and check control medium for impurities
Working medium escaping from leak detection hole*	Shut-off diaphragm faulty	Check shut-off diaphragm for potential damage, replace diaphragm if necessary
The product does not open or does not open fully	Control pressure too low (for control function NC)	Operate the product with the control pressure specified in the datasheet
	Pilot valve faulty (for NC control function and DA control function)	Check and replace pilot valve
	Control medium not connected	Connect control medium
	Shut-off diaphragm incorrectly mounted	Remove the actuator, check the diaphragm mounting, replace the shut-off diaphragm if necessary
	Actuator spring faulty (for control function NO)	Replace the actuator
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
	Control pressure too low (for control function NO and control function DA)	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 actuator if necessary
	Valve body leaking or damaged	Check valve body for potential damage, replace valve body if necessary
	Shut-off diaphragm is defective	Check shut-off diaphragm for potential damage, replace diaphragm if necessary
	Actuator spring faulty (for control function NC)	Replace actuator
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 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 is leaking	Valve body is leaking	Check valve body for damage, replace valve body if necessary

* see chapter "Spare parts"


14 Inspection and maintenance

⚠ WARNING

The equipment is subject to pressure!

- ▶ Risk of severe injury or death
- Depressurize the plant.
- Completely drain the plant.

⚠ CAUTION



Hot plant components!

- ▶ Risk of burns
- Only work on plant that has cooled down.

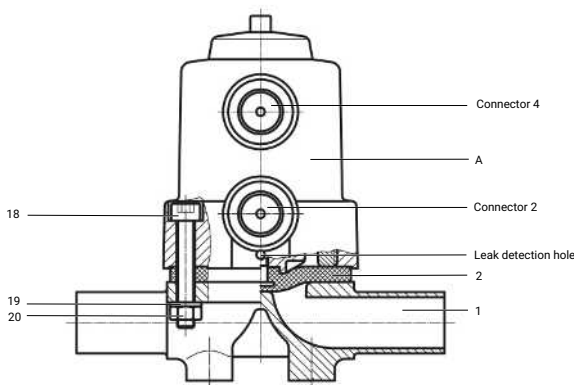
⚠ CAUTION

- Servicing and maintenance work must only be performed by trained personnel.
- Do not extend hand lever. GEMÜ shall assume no liability whatsoever for damages caused by improper handling or third-party actions.
- In case of doubt, contact GEMÜ prior to commissioning.

1. Wear appropriate protective gear as specified in the plant operator's guidelines.
2. Shut off plant or plant component.
3. Secure against recommissioning.
4. Depressurize the plant or plant component.

The operator must carry out regular visual examination of the valves dependent on the operating conditions and the potential danger in order to prevent leakage and damage. The valve also has to be disassembled in corresponding intervals and checked for wear (see "Fitting/removing spare parts").

14.1 Spare parts



Item	Name	Order designation
A	Actuator	9615
1	Body	K600

Item	Name	Order designation
2	Diaphragm	Code 4
		Code 13
		Code 17
		Code 19
		Code 28
		Code 29
		Code 36
	Code 54	
18, 19, 20	Screw connection kit	615 S30

14.2 Fitting/removing spare parts

14.2.1 Valve disassembly (removing the actuator from the body)

1. Move the actuator **A** to the open position.
2. Remove the actuator **A** from the valve body **1**.
3. Move the actuator **A** to the closed position.

NOTICE

Important:

- ▶ Clean all parts of contamination (do not damage the parts during cleaning) following removal. Check parts for potential damage; replace if necessary (only use genuine parts from GEMÜ).

14.2.2 Removing the diaphragm

NOTICE

- ▶ Before removing the diaphragm, please remove the actuator, see "Valve disassembly (removing the actuator from the body)".

1. Unscrew the diaphragm.
2. Clean all parts of remains of product and contaminants. Do not scratch or damage parts during cleaning!
3. Check all parts for potential damage.
4. Replace damaged parts (only use genuine parts from GEMÜ).

14.2.3 Mounting the diaphragm

14.2.3.1 General information

NOTICE

- ▶ Mount the correct diaphragm that suits the valve (suitable for medium, medium concentration, temperature and pressure). The shut-off diaphragm is a wearing part. Check the technical condition and function of the valve before commissioning and during the whole duration 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.

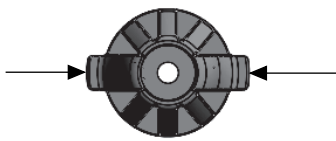
NOTICE

► 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 thus leakage of the valve. If the diaphragm is screwed in too far, perfect sealing at the valve seat will not be achieved. The function of the valve is no longer ensured.

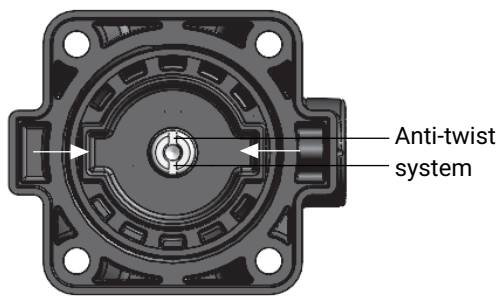
NOTICE

► An incorrectly mounted diaphragm may cause valve leakage/emission of medium. In this case, remove the diaphragm, check the complete valve and diaphragm and re-assemble, proceeding as in the instructions above.

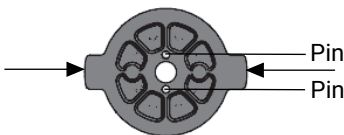
The compressor is loose.



Compressor - View from diaphragm side

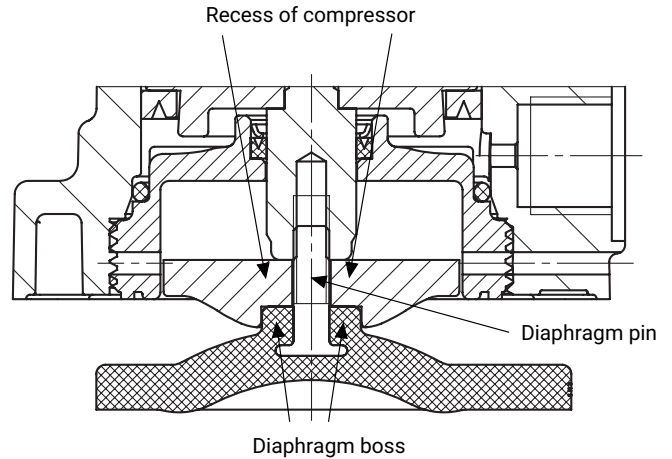


Compressor, control function NO and DA



- Place the compressor loosely on the actuator spindle, fit the wings into the guides (arrows).

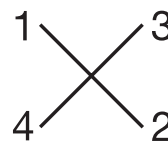
14.2.3.2 Mounting a concave diaphragm



1. Move the actuator **A** to the closed position.
2. Place the compressor loosely on the actuator spindle, fit the wings into the guides (see "General information" chapter). Control function NO and DA: ensure that the pins are engaged in the anti-twist system.
3. Check if the compressor fits closely in the guides.
4. Manually screw the new diaphragm into the compressor tightly.
5. Check if the diaphragm boss fits closely in the recess of the compressor.
6. If it is difficult to screw it in, check the thread, replace damaged parts (only use genuine parts from GEMÜ).
7. When clear resistance is felt, turn back the diaphragm anticlockwise until its bolt holes are in correct alignment with the bolt holes of the actuator.

14.2.4 Mounting the actuator on the valve body

1. Move the actuator **A** to the open position.
2. Position the actuator **A** with the mounted diaphragm **2** on the valve body **1**, take care to align the compressor weir and valve body weir (see sectional drawings).
3. Insert and tighten the bolts **18** with washers **19** by hand (hand tight only).
4. Move the actuator **A** to the closed position.
5. Fully tighten the bolts **18** diagonally.



6. Ensure that the diaphragm **2** is compressed evenly (approx. 10-15 %, visible by an even bulge to the outside).
7. Check the tightness of the fully assembled valve.

NOTICE

► Service and maintenance:
Diaphragms set in the course of time. After valve disassembly / assembly check that the bolts **18** on the body are tight and retighten as necessary.

15 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.

16 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.

17 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.

18 EU Declaration of Incorporation according to the EC Machinery Directive 2006/42/EC, Annex II B

Declaration of Incorporation

according to the EC Machinery Directive 2006/42/EC, Annex II, 1.B for partly completed machinery

Manufacturer: GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG
Postfach 30
Fritz-Müller-Straße 6-8
D-74653 Ingelfingen-Criesbach

Description and identification of the partly completed machinery:

Make: GEMÜ Diaphragm valve, pneumatically operated
Serial number: from December 29, 2009
Project number: MV-Pneum-2009-12
Commercial name: Type 615

We hereby declare that the following essential requirements of the Machinery Directive 2006/42/EC have been fulfilled:

1.1.3.; 1.1.5.; 1.1.7.; 1.2.1.; 1.3.; 1.3.2.; 1.3.3.; 1.3.4.; 1.3.7.; 1.3.9.; 1.5.3.; 1.5.5.; 1.5.6.; 1.5.7.; 1.5.8.; 1.5.9.; 1.6.5.; 2.1.1.; 3.2.1.; 3.2.2.; 3.3.2.; 3.4.4.; 3.6.3.1.; 4.1.2.1.; 4.1.2.3.; 4.1.2.4.; 4.1.2.5.; 4.1.2.6. a); 4.1.2.6. b); 4.1.2.6. c); 4.1.2.6. d); 4.1.2.6. e); 4.1.3.; 4.2.1.; 4.2.1.4.; 4.2.2.; 4.2.3.; 4.3.1.; 4.3.2.; 4.3.3.; 4.4.1.; 4.4.2.; 5.3.; 5.4.; 6.1.1.; 6.3.3.; 6.4.1.; 6.4.3.

We also declare that the specific technical documentation has been compiled in accordance with part B of Annex VII.

We expressly declare that the partly completed machinery complies with the relevant provisions of the following EC directives:

2006/42/EC:2006-05-17: (Machinery Directive) Directive 2006/42/EC of the European Parliament and of the Council of 17 May 2006 on machinery, and amending Directive 95/16/EC (recast) (1)

The manufacturer or his authorised representative undertake to transmit, in response to a reasoned request by the national authorities, relevant information on the partly completed machinery. This transmission takes place:

electronically

This does not affect the intellectual property rights!

Important note! The partly completed machinery may be put into service only if it was determined, where appropriate, that the machinery into which the partly completed machinery is to be installed meets the provisions of this Directive.



Joachim Brien
Head of Technical Department

Ingelfingen-Criesbach, February 2013



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Subject to alteration

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