GEMÜ®

Diaphragm Valve, Metal

Construction

The GEMÜ 618 motorized metal diaphragm valve has a low maintenance electric actuator and a reversible synchronous motor. It is operated via a non-self-locking reduction gear and cam. The valve has an integrated optical position indicator as standard. GEMÜ 618 is also available without a metal distance piece for applications with lower operating temperatures (only diaphragm size 10).

Features

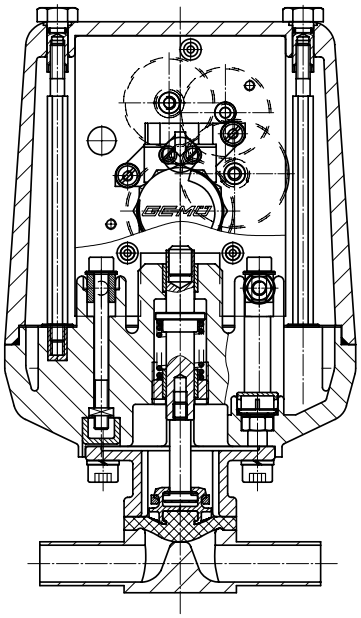
- Suitable for inert and corrosive* liquid and gaseous media
- Insensitive to particulate media
- The motor will withstand being stalled under full voltage
- Valve body and diaphragm available in various materials and designs
- Suitable for use as a control valve (with integrated control module)

Advantages

- Direct 0/4 - 20 mA signal processing (with integrated control module)
- Opening and closing behaviour is independent of the operating pressure
- Hermetic separation between medium and actuator
- Optional flow direction
- Installation for an optimized draining is possible

*see information on working medium on page 2

Sectional drawing



GEMÜ® 618

Technical data

Working medium

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

Operating time

See actuator version (page 4)	approx. 17 or 45 s

Load resistor

32 Ω

Protection class

IP 65 acc. to DIN 40050

Electrical data

Power supply	
	Uv = 24 V 50/60 Hz +/- 10%
	Uv = 120 V 50/60 Hz +/- 10%
	Uv = 230 V 50/60 Hz +/- 10%
Power consumption	3.5 VA
Rating	100%
Electrical connection	
	2 x PG 13.5 (Versions AE, AP)
	2 x round connector (Binder series 717), (Versions E1, E2, E3)

Temperatures

Media temperature

FPM (Code 4/4A)	Direct mount	-10 ... 60 °C	With distance piece	-10 ... 90 °C*
EPDM (Code 13/3A)	Direct mount	-10 ... 60 °C	With distance piece	-10 ... 100 °C*
EPDM (Code 14)	Direct mount	-10 ... 60 °C	With distance piece	-10 ... 90 °C*
EPDM (Code 17)	Direct mount	-10 ... 60 °C	With distance piece	-10 ... 100 °C*
PTFE/EPDM (Code 54)	Direct mount	-10 ... 60 °C	With distance piece	-10 ... 100 °C*

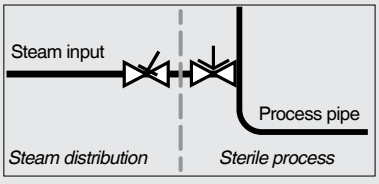
* only actuator version with distance piece (code B0 or B1)

Sterilisation temperature [1]

FPM (Code 4/4A)	not applicable
EPDM (Code 13/3A)	130 °C [2], max. 60 min per cycle
EPDM (Code 14)	not applicable
EPDM (Code 17)	130 °C [2], max. 180 min per cycle
PTFE/EPDM (Code 54)	max. 150 °C [2], no time limit per cycle

[1] The sterilisation temperature is valid for steam (saturated steam) or superheated water.

[2] If the sterilisation temperatures listed above are applied to the EPDM diaphragms for longer periods of time, the service life of the diaphragms will be reduced. In these cases, maintenance cycles must be adapted accordingly. This also applies to PTFE diaphragms exposed to high temperature fluctuations. PTFE diaphragms can also be used as moisture barriers; however, this will reduce their service life. The maintenance cycles must be adapted accordingly. GEMÜ 555 and 505 globe valves are particularly suitable for use in the area of steam generation and distribution. The following valve arrangement for interfaces between steam pipes and process pipes has proven itself over time: A globe valve for shutting off steam pipes and a diaphragm valve as an interface to the process pipes.



Ambient temperature -15 ... 55 °C

Technical data

Diaphragm size	Operating pressure
	[bar]
8	0 - 6
10	0 - 6

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

Kv values [m^3/h]								
Pipe standard		**DIN**	**EN 10357 series B (formerly DIN 11850 series 1)**	**EN 10357 series A (formerly DIN 11850 series 2) / DIN 11866 series A**	**DIN 11850 Series 3**	**SMS 3008**	**ASME BPE / DIN 11866 series C**	**ISO 1127 / EN 10357 series C / DIN 11866 series B**
Connection code		**0**	**16**	**17**	**18**	**37**	**59**	**60**
MG	**DN**							
8	4	0.5	-	-	-	-	-	-
	6	-	-	1.1	-	-	-	1.2
	8	-	-	1.3	-	-	0.6	2.2
	10	-	2.1	2.1	2.1	-	1.3	-
	15	-	-	-	-	-	2.0	-
10	10	-	2.4	2.4	2.4	-	2.2	3.3
	15	3.3	3.8	3.8	3.8	-	2.2	4.0
	20	-	-	-	-	-	3.8	-

MG = diaphragm size
Kv values determined acc. to DIN EN 60534, inlet pressure 5 bar, Δp 1 bar, stainless steel valve body (forged 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.

Order data

Body configuration	Code
Tank valve body	B**
2/2-way body	D
T body	T*
* For dimensions see T Valves brochure	
** Dimensions and versions on request	

Valve body material	Code
CW617N (brass)	12
1.4435, investment casting	C3
1.4408, investment casting	37
1.4435 (316L), forged body	40
1.4435 (BN2), forged body Δ Fe<0,5%	42
1.4539, forged body	F4

Connection	Code
Butt weld spigots	
Spigots DIN	0
Spigots EN 10357 series B (formerly DIN 11850 series 1)	16
Spigot EN 10357 series A (formerly DIN 11850 series 2) / DIN 11866 series A	17
Spigots DIN 11850 series 3	18
Spigots JIS-G 3459	36
Spigots BS 4825 Part 1	55
Spigot ASME BPE / DIN 11866 series C	59
Spigot ISO 1127 / EN 10357 series C / DIN 11866 series B	60
Spigots ANSI/ASME B36.19M Schedule 10s	63
Spigots ANSI/ASME B36.19M Schedule 40s	65
Threaded connections	
Threaded sockets DIN ISO 228	1
Threaded spigots DIN 11851	6
One side threaded spigot, other side cone spigot and union nut, DIN 11851	62
Aseptic unions on request	
Clamp connections	
Clamps ASME BPE for pipe ASME BPE, length ASME BPE	80
Clamps DIN 32676 series B for pipe EN ISO 1127, length EN 558, series 7	82
Clamps ASME BPE for pipe ASME BPE, length EN 558, series 7	88
Clamps DIN 32676 series A for pipe DIN 11850, length EN 558, series 7	8A
Clamps SMS 3017 for pipe SMS 3008, length EN 558, series 7	8E
Aseptic clamps on request	
For overview of available valve bodies see page 11	

Diaphragm material	Code	
FPM	4	4A*
EPDM	13	3A*
EPDM	14	
EPDM	17	17*
EPDM		36
PTFE/EPDM, one-piece		54*
* for diaphragm size 8		
Material complies with FDA requirements, except codes 4, 4A and 14		

Supply voltage/mains frequency	Code
24 V 50/60 Hz	C4
120 V 50/60 Hz	G4
230 V 50/60 Hz	L4

Order data

Functional module	Code
OPEN / CLOSE control with additional end position feedback (signal voltage = supply voltage)	AE
OPEN / CLOSE control with potentiometer output	AP
Control of valve position, actual value detection internal, set value external, 0 - 10 V	E1
Control of valve position, actual value detection internal, set value external, 0/4 - 20 mA	E2
Control of process variables, actual value external, 0/4 - 20 mA, set value external, 0/4 - 20 mA	E3

Actuator version	Code
Operating time 17 sec. (not possible for diaphragm size 8)	A0
Operating time 45 sec. (not possible for diaphragm size 8)	A1
Operating time 17 sec., with distance piece	B0
Operating time 45 sec., with distance piece	B1

Special version	K-no.
With Hirschmann plug	6027

Order example	618	10	D	60	40	13	L4	AE	1516	A0	-
Type	618										
Nominal size*		10									
Body configuration (code)			D								
Connection (code)				60							
Valve body material (code)					40						
Diaphragm material (code)						13					
Supply voltage/mains frequency (code)							L4				
Functional module (code)								AE			
Surface finish (code see page 6)									1516		
Actuator version (code)										A0	
Special version (K-no.)											-

* Diaphragm size 8: Always state the nominal size in the range DN 004 – 015

Order data

Internal surface finishes for forged and block material bodies [1]

Readings for Process Contact Surfaces	Mechanically polished [2]		Electropolished	
	Hygienic class DIN 11866	Code	Hygienic class DIN 11866	Code
Ra ≤ 0.80 µm	H3	1502	HE3	1503
Ra ≤ 0.60 µm	-	1507	-	1508
Ra ≤ 0.40 µm	H4	1536	HE4	1537
Ra ≤ 0.25 µm [3]	H5	1527	HE5	1516

Readings for Process Contact Surfaces acc. to ASME BPE 2016 [4]	Mechanically polished [2]		Electropolished	
	ASME BPE Surface Designation	Code	ASME BPE Surface Designation	Code
Ra Max. = 0.76 µm (30 µinch)	SF3	SF3	-	-
Ra Max. = 0.64 µm (25 µinch)	SF2	SF2	SF6	SF6
Ra Max. = 0.51 µm (20 µinch)	SF1	SF1	SF5	SF5
Ra Max. = 0.38 µm (15 µinch)	-	-	SF4	SF4

Internal surface finishes for investment cast bodies

Readings for Process Contact Surfaces	Mechanically polished [2]	
	Hygienic class DIN 11866	Code
Ra ≤ 6.30 µm	-	1500
Ra ≤ 0.80 µm	H3	1502
Ra ≤ 0.60 µm [5]	-	1507

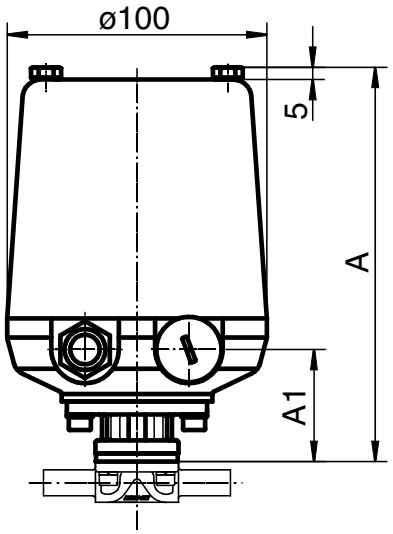
[1] Surface finishes of customized valve bodies may be limited in special cases.
[2] Or any other finishing method that meets the Ra value (acc. to ASME BPE).
[3] The smallest possible Ra finish for pipe connections with an internal pipe diameter < 6 mm is 0.38 µm.
[4] When using these surfaces, the bodies are marked according to the specifications of ASME BPE.
The surfaces are only available for valve bodies which are made of materials (e.g. GEMÜ material codes 40, 41, F4, 44) and use connections (e.g. GEMÜ connection codes 59, 80, 88) according to ASME BPE.
[5] Not possible for GEMÜ connection code 59, DN 8 and GEMÜ connection code 0, DN 4.

Ra acc. to DIN EN ISO 4288 and ASME B46.1

Actuator dimensions [mm]

MG	DN	Actuator version	A	A 1	Weight [kg]
8	004 - 015	B0, B1	152	44	0.85

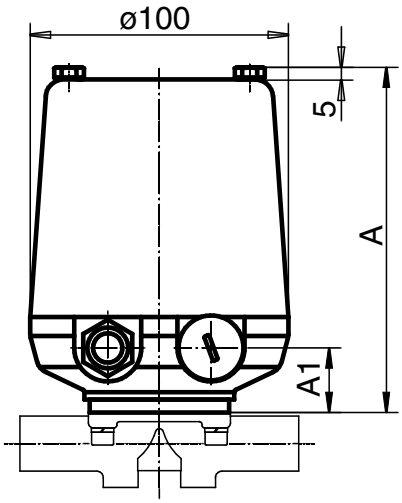
MG = Diaphragm size



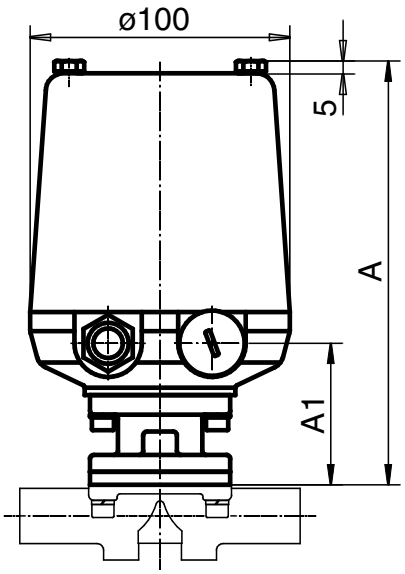
Actuator version B0, B1
with metal distance piece

MG	DN	Actuator version	A	A 1	Weight [kg]
10	10 - 20	A0, A1	134	25	0.95
	10 - 20	B0, B1	164	55	

MG = Diaphragm size



Actuator version A0, A1
Direct mount



Actuator version B0, B1
with metal distance piece

Body dimensions [mm]

Butt weld spigots, connection code 0, 16, 17, 18
Valve body material: Investment casting (code C3), forged body (code 40, F4)

Pipe standard						DIN		EN 10357 series B (formerly DIN 11850 series 1)		EN 10357 series A (formerly DIN 11850 series 2) / DIN 11866 series A		DIN 11850 Series 3		Weight [kg]
Connection code						0		16		17		18		
MG	DN	NPS	L	c	H1	ød	s	ød	s	ød	s	ød	s	
8	4	-	72	20	8.5	6	1.0	-	-	-	-	-	-	0.09
	6	-	72	20	8.5	-	-	-	-	8	1.0	-	-	0.09
	8	1/4”	72	20	8.5	-	-	-	-	10	1.0	-	-	0.09
	10	3/8”	72	20	8.5	-	-	12	1.0	13	1.5	14	2.0	0.09
10	10	3/8”	108	25	12.5	-	-	12	1.0	13	1.5	14	2.0	0.30
	15	1/2”	108	25	12.5	18	1.5	18	1.0	19	1.5	20	2.0	0.30

* only for investment cast design MG = diaphragm size For materials see overview on page 11

Butt weld spigots, connection code 60
Valve body material: Investment casting (code C3), forged body (code 40, F4)

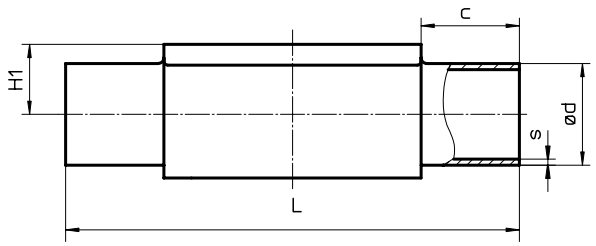
Pipe standard							ISO 1127 / EN 10357 series C / DIN 11866 series B		Weight [kg]
Connection code							60		
MG	DN	NPS	L	c	H1*	H1**	ød	s	
8	6	-	72	20	-	8.5	10.2	1.6	0.09
	8	1/4”	72	20	8.5	8.5	13.5	1.6	0.09
	10	3/8”	72	20	-	8.5	-	-	0.09
10	10	3/8”	108	25	12.5	12.5	17.2	1.6	0.30
	15	1/2”	108	25	12.5	12.5	21.3	1.6	0.30

* only for investment cast design ** only for forged design MG = diaphragm size
For materials see overview on page 11

Butt weld spigots, connection code 36
Valve body material: Investment casting (code C3), forged body (code 40, F4)

Pipe standard						JIS-G 3459		Weight [kg]
Connection code						36		
MG	DN	NPS	L	c	H1	ød	s	
8	6	-	72	20	8.5	10.5	1.20	0.09
	8	1/4”	72	20	8.5	13.8	1.65	0.09
10	10	3/8”	108	25	12.5	17.3	1.65	0.30
	15	1/2”	108	25	12.5	21.7	2.10	0.30

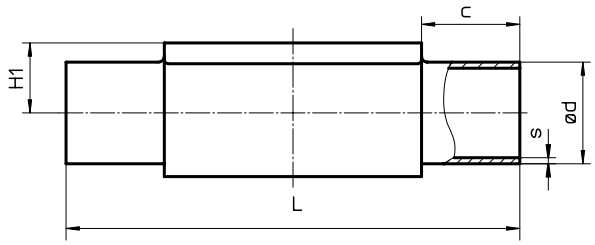
MG = diaphragm size For materials see overview on page 11



Body dimensions [mm]

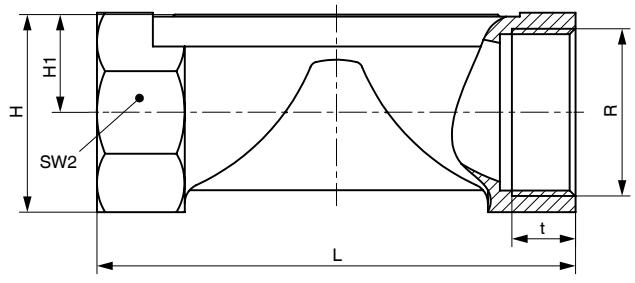
Butt weld spigots, connection code 55, 59, 63, 65 Valve body material: Investment casting (code C3), forged body (code 40, F4)															
Pipe standard							BS 4825 Part 1		ASME BPE / DIN 11866 series C		ANSI/ASME B36.19M Schedule 10s		ANSI/ASME B36.19M Schedule 40s		Weight [kg]
Connection code							55		59		63		65		
MG	DN	NPS	L	c	H1*	H1**	ød	s	ød	s	ød	s	ød	s	
8	6	-	72	20	-	8.5	-	-	-	-	10.3	1.24	10.3	1.73	0.09
	8	1/4”	72	20	8.5	8.5	6.35	1.2	6.35	0.89	13.7	1.65	13.7	2.24	0.09
	10	3/8”	72	20	8.5	8.5	9.53	1.2	9.53	0.89	-	-	-	-	0.09
	15	1/2”	72	20	8.5	8.5	12.70	1.2	12.70	1.65	-	-	-	-	0.09
10	10	3/8”	108	25	-	12.5	9.53	1.2	9.53	0.89	17.1	1.65	17.1	2.31	0.30
	15	1/2”	108	25	-	12.5	12.70	1.2	12.70	1.65	21.3	2.11	21.3	2.77	0.30
	20	3/4”	108	25	12.5	12.5	19.05	1.2	19.05	1.65	-	-	-	-	0.30

* only for investment cast design ** only for forged design MG = diaphragm size
For materials see overview on page 11



Threaded sockets, connection code 1 Valve body material: Brass (code 12), investment casting (code 37)															
MG	DN	R	Material code 12						Material code 37						Weight [kg]
			H	H1	t	L	SW2	Number of flats	H	H1	t	L	SW2	Number of flats	
8	8	G 1/4	-	-	-	-	-	-	19	9	11	72	18	6	0.09
10	12	G 3/8	23	11	13	55	22	2	25	13	12	55	22	2	0.17
	15	G 1/2	29	14	15	75	25	2	30	15	15	68	27	2	0.26

MG = diaphragm size For materials see overview on page 11

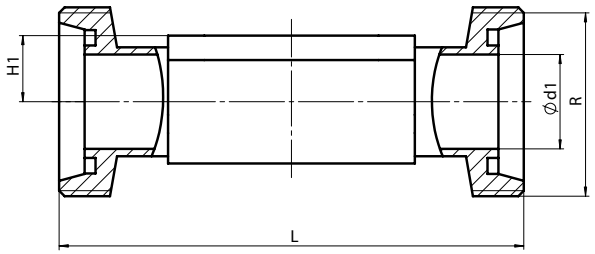


Body dimensions [mm]

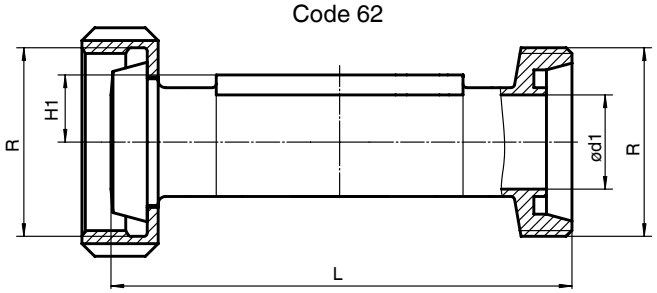
Threaded connections, connection code 6, 62 Valve body material: Forged body (code 40)							
MG	**DN**	**H1**	**ød1**	**Thread to DIN 405 R**	**Code 6 L**	**Code 62 L**	**Weight [kg]**
8	10	8.5	10.0	RD 28 x 1/8	92	90	0.21
10	10	12.5	10.0	RD 28 x 1/8	118	116	0.33
	15	12.5	16.0	RD 34 x 1/8	118	116	0.35

MG = diaphragm size

Code 6

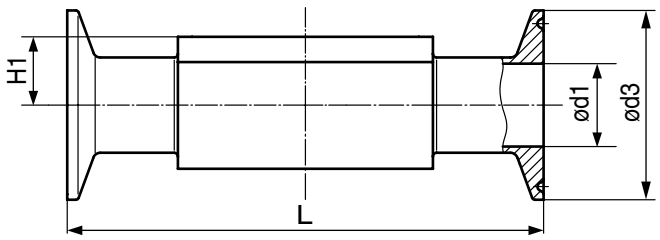


Code 62



Clamp connections, connection code 80, 82, 88, 8A, 8E Valve body material: Forged body (code 40, F4)																
Pipe connection for clamp				**ASME BPE**						**ISO 1127 / EN 10357 series C / DIN 11866 series B**			**EN 10357 series A (formerly DIN 11850 series 2) / DIN 11866 series A**			**Weight [kg]**
Clamp connection				**ASME BPE**						**DIN 32676 series B**			**DIN 32676 series A**			
Clamp connection code				**80**			**88**			**82**			**8A**			
MG	**DN**	**NPS**	**H1**	**ød1**	**ød3**	**L**	**ød1**	**ød3**	**L**	**ød1**	**ød3**	**L**	**ød1**	**ød3**	**L**	
8	6	1/8 ”	8.5	-	-	-	-	-	-	7.0	25.0	63.5	6	25.0	63.5	-
	8	1/4”	8.5	4.57	25.0	63.5	-	-	-	10.3	25.0	63.5	8	25.0	63.5	0.15
	10	3/8”	8.5	7.75	25.0	63.5	-	-	-	-	-	-	10	34.0	88.9	0.18
	15	1/2”	8.5	9.40	25.0	63.5	9.40	25.0	108	-	-	-	-	-	-	0.18
10	10	3/8”	12.5	-	-	-	-	-	-	14.0	25.0	108.0	10	34.0	108.0	0.30
	15	1/2”	12.5	9.40	25.0	88.9	9.40	25.0	108	18.1	50.5	108.0	16	34.0	108.0	0.43
	20	3/4”	12.5	15.75	25.0	101.6	15.75	25.0	117	-	-	-	-	-	-	0.43

MG = diaphragm size



Overview of valve bodies for GEMÜ 618															
		Spigots													
Connection code		0		16	17		18	36	55	59		60		63	65
Material code		C3	40	40	C3	40	40	40	40	C3	40	C3	40	40	40
MG	DN														
8	4	X	X	-	-	-	-	-	-	-	-	-	-	-	-
	6	-	-	-	X	X	-	X	-	-	-	-	X	X	X
	8	-	-	-	X	X	-	X	X	X	X	X	X	X	X
	10	-	-	X	X	X	X	-	X	X	X	-	-	-	-
	15	-	-	-	-	-	-	-	X	X	X	-	-	-	-
10	10	-	-	X	X	X	X	X	X	-	X	X	X	X	X
	15	-	X	X	X	X	X	X	X	-	X	X	X	X	X
	20	-	-	-	-	-	-	-	X	X	X	-	-	-	-

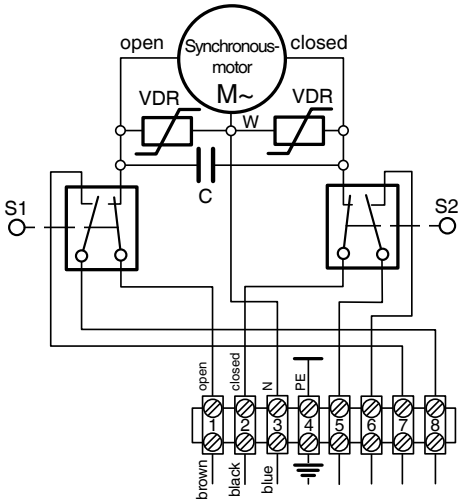
Availability of material code 42, F4: same as code 40
MG = diaphragm size

		Threaded connections				Clamps			
Connection code		1		6	62	80	82	88	8A
Material code		12	37	40	40	40	40	40	40
MG	DN								
8	6	-	-	-	-	-	K	-	K
	8	-	X	-	-	K	K	-	K
	10	-	-	W	W	K	-	-	W
	15	-	-	-	-	K	-	W	-
10	10	-	-	W	W	-	K	-	K
	12	X	X	-	-	-	-	-	-
	15	X	X	W	W	K	W	K	K
	20	-	-	-	-	K	-	K	-

X = Standard
K = Connections completely machined (not welded)
W = Welded construction
Availability of material code 42, F4: same as code 40
MG = diaphragm size

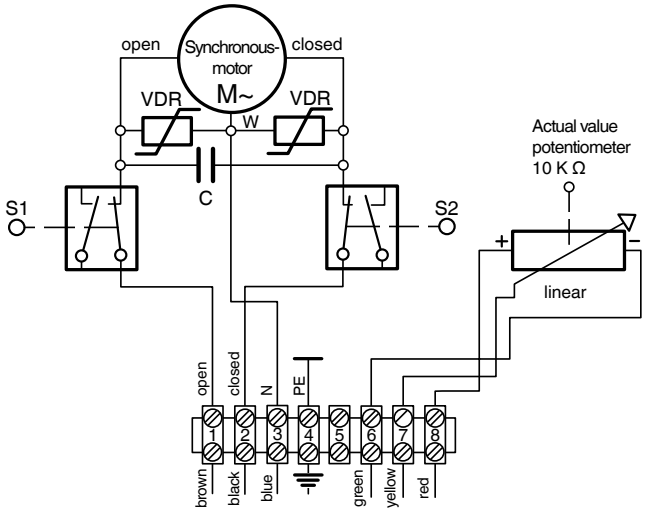
Connection diagramm

Connection diagram - Functional module code AE

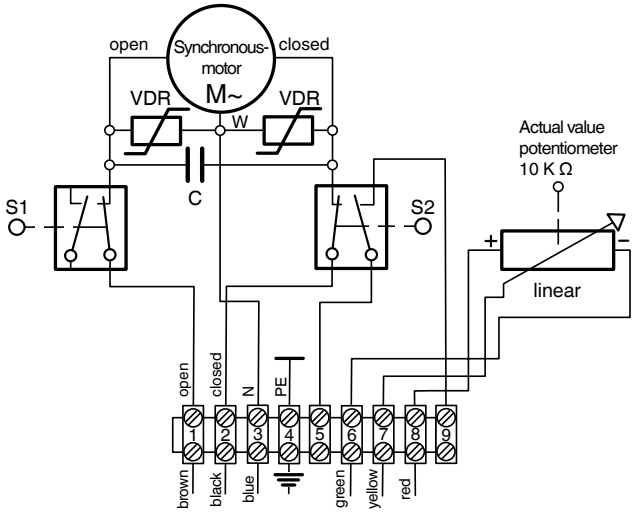


The voltage of the end position feedback must be identical with the supply voltage of the actuator.

Connection diagram - Functional module code AP

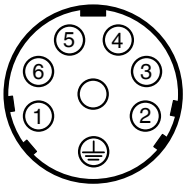


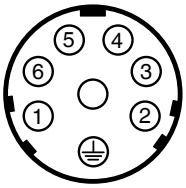
Connection diagram K-Nr. 7014



The voltage of the end position feedback must be identical with the supply voltage of the actuator.

Connection diagram - Functional module code E1 / E2

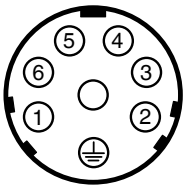


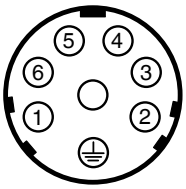


Pin	Designation
1	L, motor voltage
2	N, motor voltage
3	not connected
4	not connected
5	not connected
6	not connected
7	⏚, PE

Pin	Designation
1	not connected
2	not connected
3	not connected
4	not connected
5	GND, set value input
6	I+ / U+, set value input
7	not connected

Connection diagram - Functional module code E3

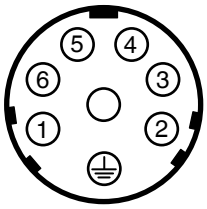




Pin	Designation
1	L, motor voltage
2	N, motor voltage
3	not connected
4	not connected
5	not connected
6	not connected
7	⏚, PE

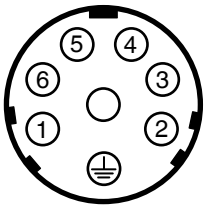
Pin	Designation
1	not connected
2	not connected
3	GND, actual value input
4	I+ / U+, actual value input
5	GND, set value input
6	I+ / U+, set value input
7	not connected

Connection diagram - Functional module code E1



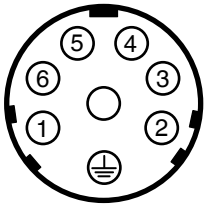
Pin	Bezeichnung
1	L1, motor voltage
2	N
3	not connected
4	not connected
5	not connected
6	not connected
7	⏚, PE

Connection diagram - Functional module code E2

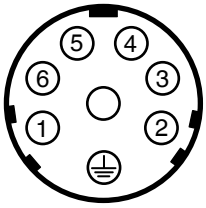


Pin	Bezeichnung
1	not connected
2	not connected
3	not connected
4	not connected
5	GND, Sollwerteingang
6	I+ / U+, Sollwerteingang
7	not connected

Connection diagram - Functional module code E3

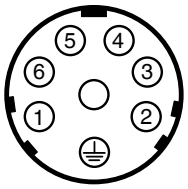


Pin	Bezeichnung
1	L1, motor voltage
2	N
3	not connected
4	not connected
5	not connected
6	not connected
7	⏚, PE



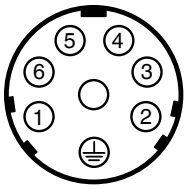
Pin	Bezeichnung
1	not connected
2	not connected
3	GND, Istwerteingang
4	I+ / U+, Istwerteingang
5	GND, Sollwerteingang
6	I+ / U+, Sollwerteingang
7	not connected

Functional module AE OPEN / CLOSE control with 2 additional end position feedback signals and Hirschmann plug N 6 R AM2 (design: 6027)



Pin	Designation
1	L1, motor voltage for direction of travel OPEN
2	L1, motor voltage for direction of travel CLOSED
3	N, reference voltage
4	n.c.
5	Us, S2 (24) CLOSED end position [Us=Ub]
6	Us, S1 (24) OPEN end position [Us=Ub]
7	⏚, PE

Functional module AP OPEN / CLOSE control with potentiometer output and Hirschmann plug N 6 R AM2 (design: 6027)



Pin	Designation
1	L1, motor voltage for direction of travel OPEN
2	L1, motor voltage for direction of travel CLOSED
3	N, reference voltage
4	Us +, actual value potentiometer, signal voltage
5	Us -, actual value potentiometer, signal output
6	Us ⎍, actual value potentiometer, signal voltage
7	⏚, PE

Electrical connection version

	Terminal strip and cable gland	Hirschmann plug (K-no. 6027)
AE	X	X
AP	X	X
E1	-	X
E2	-	X
E3	-	X

Characteristic progress with functional module E2 or 3-point controller GEMÜ 1283