GEMÜ 539 eSyDrive

Motorized globe valve

EN **Operating instructions**

further information
webcode: GW-539

Contents

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 LED symbols

The following LED symbols are used in the documentation:

Symbol	LED conditions
○	Off
●	Lit (on)
✺	Flashing

1.4 Definition of terms

Working medium

The medium that flows through the GEMÜ product.

1.5 Warning notes

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

SIGNAL WORD	
Possible symbol for the specific danger	Type and source of the danger ▶ 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

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
	Corrosive chemicals!
	Hot plant components!
	Hot actuator parts!
	Rotating cover!
	Incorrect combination of actuator and valve body!

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:

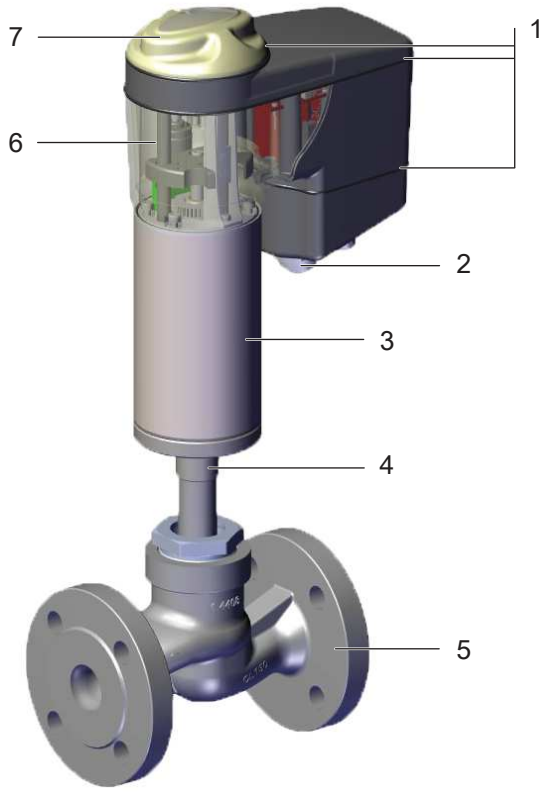
9. Keep this document available at the place of use.
10. Observe the safety information.
11. Operate the product in accordance with this document.
12. Operate the product in accordance with the specifications.
13. Maintain the product correctly.
14. Do not carry out any maintenance work and repairs not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



Item	Name	Materials
1	O-rings	EPDM
2	Electrical connections	
3	Actuator base	1.4301
4	Distance piece with leak detection hole	1.4408
5	Valve body	1.4408, SG iron
6	Optical position indicator	PESU
7	Cover with high visibility LED, manual override and on-site control	PESU

3.2 Buttons for on-site control

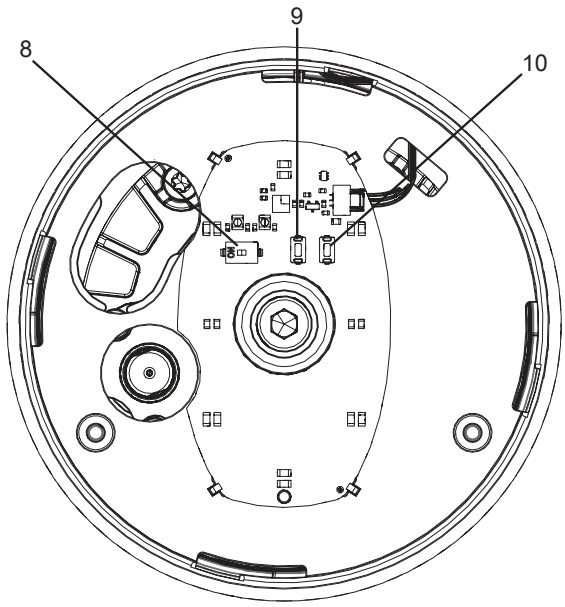


Fig. 1: Position of the buttons

Item	Name	Function
8	DIP switch, "ON-site" control	Switches the on-site control on the device on or off
9	"OPEN" button	Moves actuator to the open position Resets the network settings
10	"INIT/CLOSE" button	Moves actuator to the closed position Starting initialisation

3.3 LED displays

3.3.1 On-site status LEDs

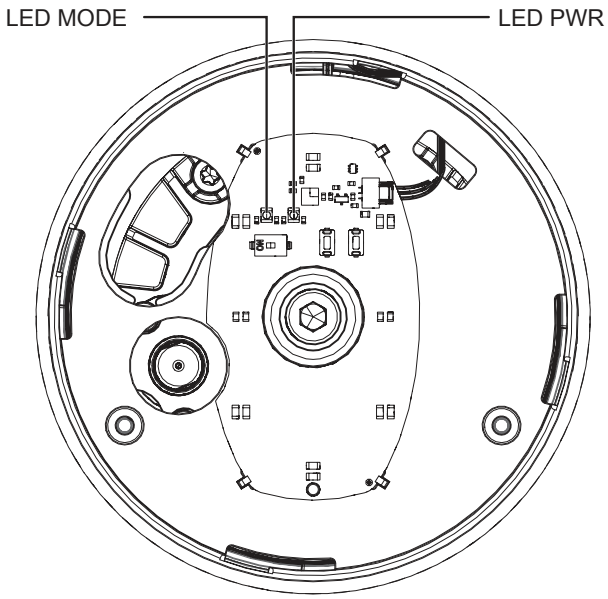


Fig. 2: Position of the status LEDs

The user checks the following conditions directly on-site at the valve using LED MODE and LED PWR:

Function	LED MODE		LED PWR	
	Yellow	Blue	Green	Red
Automatic operation	●	○	●	○
Manual operation	✳	○	●	○
Actuator switched off (OFF mode)	○	○	●	○
Manual operation (on-site)	○	●	●	○
Software update	✳	✳	●	○
	alternating			
On-site initialisation (buttons)	○	✳	●	○
Remote initialisation (via DIgIn)	●	○	●	○

Function	LED MODE		LED PWR	
	Yellow	Blue	Green	Red
Operation via emergency power supply module			☀	

3.3.2 High visibility LEDs

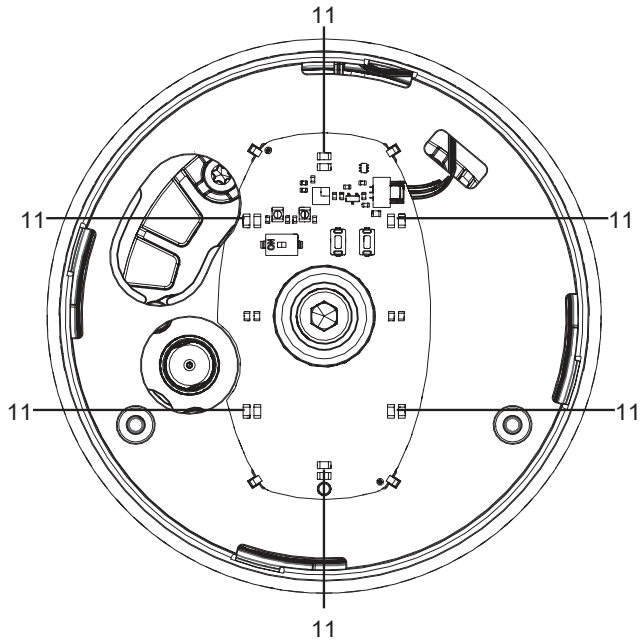


Fig. 3: Position of the high visibility LEDs

Item	Name
11	High visibility LEDs

Function		High visibility LED	
		Green	Orange
OPEN position	Position indicator LEDs, standard	○	●
OPEN position	Position indicator LEDs, inversed	●	○
CLOSED position	Position indicator LEDs, standard	●	○
CLOSED position	Position indicator LEDs, inversed	○	●
Position unknown	(e.g. 50%)	○	○
Initialisation		☀	☀
		alternating	

Function	High visibility LED	
	Green	Orange
Location function	☀	○

3.4 Description

The GEMÜ 539 is a motorized 2/2-way globe valve with a hollow shaft electric actuator. The eSyDrive hollow shaft actuator can be operated as ON/OFF or with integrated positioner or process controller. The valve spindle is sealed by a self-adjusting gland packing providing low maintenance and reliable valve spindle sealing even after a long service life. A wiper ring fitted in front of the gland packing protects the seal against contamination and damage. An integral optical and electrical position indicator is standard.

3.5 Function

The product controls or regulates (depending on version) a flowing medium by being closed or opened by a motorized actuator.

The product has an optical position indicator as standard. The optical position indicator indicates the OPEN and CLOSED positions.

3.6 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.

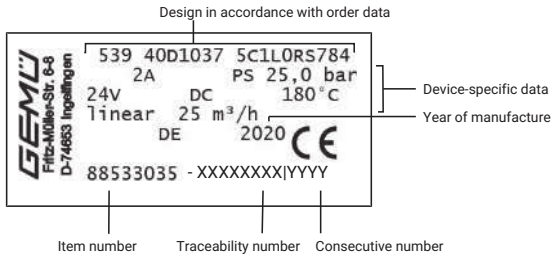
The product is designed for installation in piping systems and for controlling a working medium.

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

- ● Use the product in accordance with the technical data.

3.7 Product label

The product label is located on the actuator. Product label data (example):



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

The operating pressure stated on the product label applies to a media temperature of 20 °C. The product can be used up to the maximum stated media temperature. You can find the pressure/temperature correlation in the technical data.

4 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
Globe valve, electrically operated, electro-mechanical hollow shaft actuator, eSyDrive	539

2 DN	Code
DN 15	15
DN 20	20
DN 25	25
DN 32	32
DN 40	40
DN 50	50
DN 65	65
DN 80	80
DN 100	100

3 Body configuration	Code
2/2-way body	D

4 Connection type	Code
Flange EN 1092, PN 16, form B, face-to-face dimension FTF EN 558 series 1, ISO 5752, basic series 1	8
Flange EN 1092, PN 25, form B, face-to-face dimension FTF EN 558 series 1, ISO 5752, basic series 1	10
Flange EN 1092, PN 40, form B, face-to-face dimension FTF EN 558 series 1, ISO 5752, basic series 1	11
Flange ANSI Class 150 RF, face-to-face dimension FTF EN 558 series 1, ISO 5752, basic series 1	39
Flange JIS 20K, face-to-face dimension FTF EN 558 series 10, ASME/ANSI B16.10 table 1, column 16, DN 50 drilled to JIS 10K	48

5 Valve body material	Code
1.4408, investment casting	37
EN-GJS-400-18-LT (GGG 40.3)	90

6 Seat seal	Code
PTFE	5
PTFE, glass fibre reinforced	5G
1.4404	10

7 Voltage/frequency	Code
24 V DC	C1

8 Control module	Code
OPEN/CLOSE, positioner and process controller	L0

9 Regulating cone	Code
Please find the number of the optional regulating cone (R-No.) for the linear or equal-percentage modified regulating cone in the Kv value table.	R....

10 Actuator version	Code
Actuator size 0	0A
Actuator size 1	1A
Actuator size 2	2 A

11 Special version	Code
Special version for oxygen, maximum medium temperature: 60 °C, media wetted seal materials and auxiliary materials with BAM testing	S

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

Order example

Ordering option	Code	Description
1 Type	539	Globe valve, electrically operated, electro-mechanical hollow shaft actuator, eSyDrive
2 DN	40	DN 40
3 Body configuration	D	2/2-way body
4 Connection type	10	Flange EN 1092, PN 25, form B, face-to-face dimension FTF EN 558 series 1, ISO 5752, basic series 1
5 Valve body material	37	1.4408, investment casting
6 Seat seal	5	PTFE
7 Voltage/frequency	C1	24 V DC
8 Control module	L0	OPEN/CLOSE, positioner and process controller
9 Regulating cone	RS916	60 m³/h - mod.EQ
10 Actuator version	2 A	Actuator size 2
11 Special version	S	Special version for oxygen, maximum medium temperature: 60 °C, media wetted seal materials and auxiliary materials with BAM testing
12 CONEXO		Without

5 Technical data

5.1 Medium

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

Max. permissible viscosity: 600 mm²/s (cSt)
Other versions for lower/higher temperatures and higher viscosities on request.

5.2 Temperature

Media temperature: -10 to 180 °C

Ambient temperature: -10 — 60 °C

5.3 Pressure

Operating pressure:

DN	Actuator version		
	0A	1A	2A
15	32	-	-
20	20	40	-
25	12	32	-
32	-	20	-
40	-	12	25
50	-	8	16
65	-	5	10
80	-	4	6
100	-	-	4

Pressures in bar
All pressures are gauge pressures.
For max. operating pressures the pressure / temperature correlation must be observed.
Higher operating pressures on request

Leakage rate:

Open/Close valve

Seat seal	Standard	Test procedure	Leakage rate	Test medium
Metal	DIN EN 12266-1	P12	F	Air
EPDM, FKM, PTFE	DIN EN 12266-1	P12	A	Air

Control valve

Seat seal	Standard	Test procedure	Leakage rate	Test medium
Metal	DIN EN 60534-4	1	IV	Air
PTFE, FKM, EPDM	DIN EN 60534-4	1	VI	Air

Pressure/temperature correlation:

Connection types code [1]	Material code [2]	Max. allowable operating pressures in bar at temperature in °C			
		RT	100	150	200
8	**37**	16.0	16.0	14.5	13.4
10	**37**	25.0	25.0	22.7	21.0
11	**37**	40.0	40.0	36.3	33.7
39	**37**	19.0	16.0	14.8	13.6
8	**90**	16.0	16.0	15.5	14.7
39	**90**	17.2	16.0	14.8	13.9

1) **Connection type**
Code 8: Flange EN 1092, PN 16, form B, face-to-face dimension FTF EN 558 series 1, ISO 5752, basic series 1
Code 10: Flange EN 1092, PN 25, form B, face-to-face dimension FTF EN 558 series 1, ISO 5752, basic series 1
Code 11: Flange EN 1092, PN 40, form B, face-to-face dimension FTF EN 558 series 1, ISO 5752, basic series 1
Code 39: Flange ANSI Class 150 RF, face-to-face dimension FTF EN 558 series 1, ISO 5752, basic series 1
Code 48: Flange JIS 20K, face-to-face dimension FTF EN 558 series 10, ASME/ANSI B16.10 table 1, column 16, DN 50 drilled to JIS 10K

2) **Valve body material**
Code 37: 1.4408, investment casting
Code 90: EN-GJS-400-18-LT (GGG 40.3)

Kv values:

Open/Close valve

DN	
15	4.6
20	8.0
25	13.0
32	22.0
40	35.0
50	50.0
65	90.0
80	127.0
100	200.0

Kv values in m³/h
Kv values determined in accordance with DIN EN 60534. The Kv value specifications refer to the largest actuator for the respective nominal size. The Kv values for other product configurations (e.g. other connections or body materials) may differ.

Control valve:

Standard regulating cone (DIN)

DN	Kv values	Operating pressure	Actuator version	linear	Equal percentage
15	4.0	32	0A	RS851	RS861
20	6.3	20	0A	RS852	RS862
25	10.0	12	0A	RS853	RS863
	10.0	32	1A	RS854	RS864
32	16.0	20	1A	RS855	RS865
40	25.0	12	1A	RS856	RS866
	25.0	20	2A	RS784	RS794
50	40.0	8	1A	RS857	RS867
	40.0	16	2A	RS785	RS795
65	63.0	5	1A	-	RS868
	80.0	10	2A	-	RS796
80	90.0	4	1A	-	RS869
80	100.0	6	2A	-	RS798
100	160.0	4	2A		RS799

Kv values in m³/h
Pressures in bar

Standard regulating cone with reduced seat

DN	Kv values	Operating pressure	Actuator version	linear	equal percentage
15	0.10*	40	0A	RA104	RA307
	0.16*	40	0A	RB110	RA309
	0.25*	40	0A	RB111	RB307
	0.40*	40	0A	RB112	RB308
	0.63*	40	0A	RC107	RC307
	1.00*	40	0A	RC108	RC308
	1.60	40	0A	RD107	RD307
	2.50	40	0A	RE110	RE310
20	1.60	40	0A	RD108	RD308
	2.50	40	0A	RE111	RE311
	4.00	40	0A	RF113	RF313
25	2.50	40	0A	RE112	RE312
	4.00	40	0A	RF114	RF314
	6.30	32	0A	RG115	RG315
32	4.00	40	0A	RF115	RF315
	6.30	36	0A	RG116	RG316
	10.00	20	0A	RH110	RH310
40	6.30	35	0A	RG117	RG317
	10.00	20	0A	RH111	RH311
	16.00	12	0A	RJ107	RJ307
50	10.00	18	0A	RH112	RH312
	16.00	12	0A	RJ108	RJ308
	25.00	19	1A	RK104	RK304

* metal seated
Kv values in m³/h

5.4 Product compliance

Food:
Regulation (EC) No. 1935/2004*
Regulation (EC) No. 10/2011*
FDA*
* depending on version and/or operating parameters

Pressure Equipment Directive: 2014/68/EU

Machinery Directive: 2006/42/EU

5.5 Mechanical data

Protection class: IP 65 acc. to EN 60529

Weight:

Actuator

Actuator version 0A	1.8 kg
Actuator version 1A	3.0 kg
Actuator version 2A	9.0 kg

Body

Connection types	8, 11, 39, 40	8, 10, 13, 47	8, 10, 39
Valve body	Flange K512	Flange K514	Flange K534
DN			
15	3.40	1.80	2.20
20	4.60	2.50	3.00
25	6.80	3.10	3.70
32	8.80	4.60	5.30
40	10.90	5.10	6.30
50	14.50	7.20	8.40
65	21.70	-	-
80	29.20	-	-
100	37.10	-	-

Weights in kg

Operating time:

Actuator version 0A	adjustable, max. 6 mm/s
Actuator version 1A	adjustable, max. 6 mm/s
Actuator version 2A	adjustable, max. 4 mm/s

5.6 Electrical data

Supply voltage:

	Actuator size 0	Actuator size 1	Actuator size 2
Voltage	Uv = 24 V DC ± 10%		
Rating	Max. 28 W	Max. 65 W	Max. 120 W
Operating mode (OPEN/CLOSE operation)	Continuous duty		
Operating mode (control operation)	Class C acc. to EN 15714-2		
Reverse battery protection	Yes		

5.6.1 Analogue input signals

5.6.1.1 Set value

Input signal: 0/4 - 20 mA; 0 – 10 V DC (selectable using software)

Input type: passive

Input resistance: 250 Ω

Accuracy/linearity: ≤ ±0.3% of full flow

Temperature drift: ≤ ±0.1% / 10°K

Resolution: 12 bit

Reverse battery protection: No

Overload proof: Yes (up to ± 24 V DC)

5.6.1.2 Process actual value

Input signal: 0/4 - 20 mA; 0 – 10 V DC (selectable using software)

Input type: passive

Input resistance: 250 Ω

Accuracy/linearity: ≤ ±0.3% of full flow

Temperature drift: ≤ ±0.1% / 10°K

Resolution: 12 bit

Reverse battery protection: No

Overload proof: Yes (up to ± 24 V DC)

5.6.2 Digital input signals

Digital inputs:	3
Function:	selectable using software
Voltage:	24 V DC
Logic level "1":	>14 V DC
Logic level "0":	< 8 V DC
Input current:	typ. 2.5 mA (at 24 V DC)

5.6.3 Analogue output signals

5.6.3.1 Actual value

Output signal:	0/4 - 20 mA; 0 – 10 V DC (selectable using software)
Output type:	Active (AD5412)
Accuracy:	≤ ±1% of full flow
Temperature drift:	≤ ±0.1% / 10°K
Load resistor:	≤ 750 kΩ
Resolution:	10 bit
Overload proof:	Yes (up to ± 24 V DC)
Short-circuit proof:	Yes

5.6.4 Digital output signals

5.6.4.1 Switching outputs 1 and 2

Design:	2x change-over contact, potential-free
Switch rating:	125 V AC / 2 A 48 V DC / 2 A
Switch points:	Adjustable 0 - 100 %

5.6.4.2 Switching output 3

Function:	Signal fault
Type of contact:	Push-Pull
Switching voltage:	Supply voltage
Switching current:	≤ 0.1 A
Drop voltage:	Max. 2.5 V DC at 0.1 A
Overload proof:	Yes (up to ± 24 V DC)
Short-circuit proof:	Yes
Pull-Down resistance:	120 kΩ

5.6.5 Communication

Interface: Ethernet

Function: Parameterisation via web browser

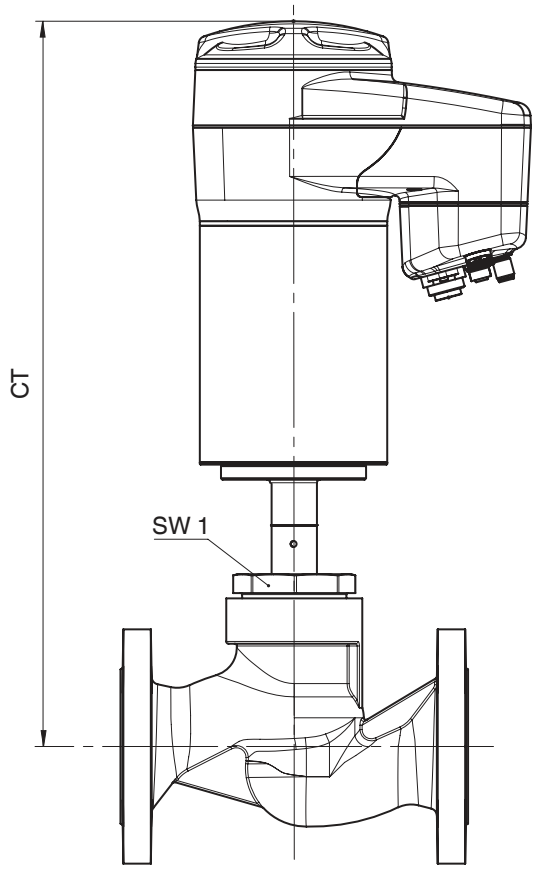
IP address: 192.168.2.1 alterable via web browser

Subnet screen: 255.255.252.0 alterable via web browser

The actuator and the PC must be in the same network to use the web server. The IP address of the actuator is entered in the web browser and the actuator can then be parametrised. In order to use more than one actuator, a definitive IP address must be assigned to each actuator in the same network.

6 Dimensions

6.1 Installation dimensions

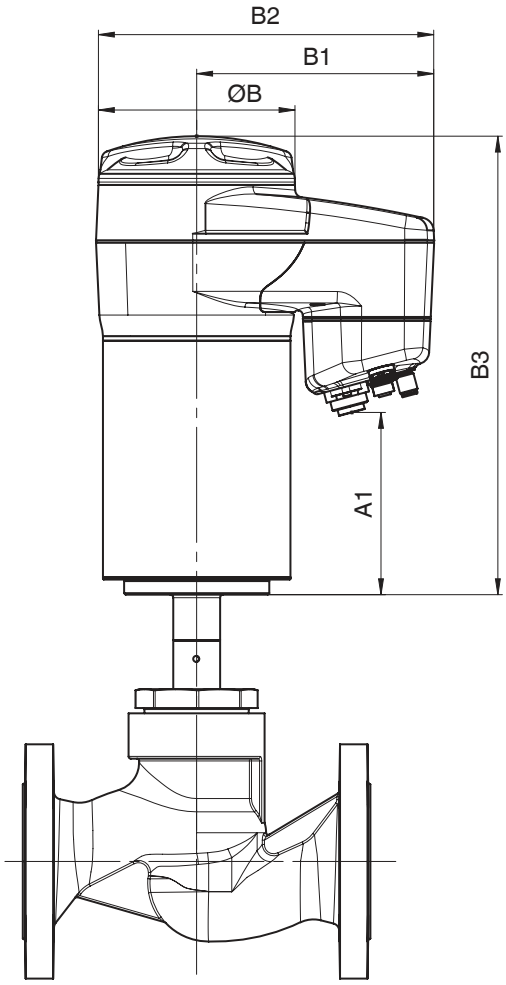


		Actuator version 0A	Actuator version 1A	Actuator version 2A
DN	SW1	CT	CT	CT
15	36	311,0	-	-
20	41	318,0	375,0	-
25	46	328,0	386,0	-
32	55	-	391,0	-
40	60	-	402,0	471,0
50	55	-	410,0	479,0
65	75	-	433,0	502,0
80	75	-	-	522,0

		Actuator version 0A	Actuator version 1A	Actuator version 2A
DN	SW1	CT	CT	CT
100	75	-	-	543,0

Dimensions in mm

6.2 Actuator dimensions

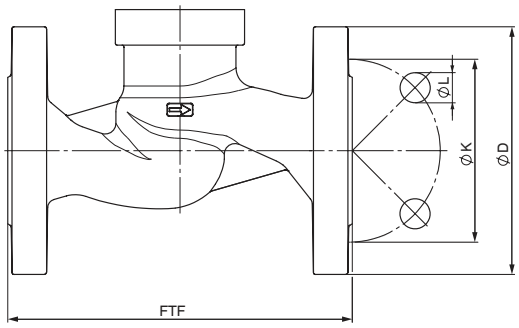


Actuator version	A1	B	B1	B2	B3
0A	45.0	68.0	126.0	160.0	193.0
1A	86.0	82.0	132.0	172.0	252.0
2A	121.0	129.0	157.0	224.0	304.0

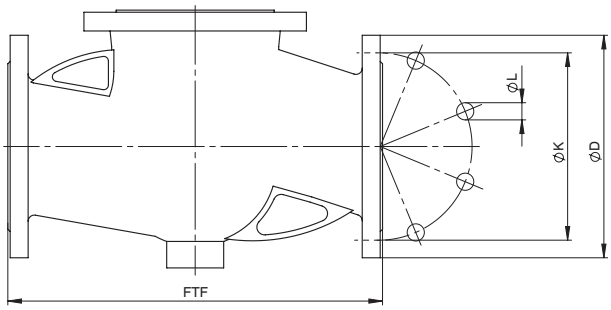
Dimensions in mm

6.3 Body dimensions

6.3.1 Flange connection types code 8



DN 15 - 50



DN 65 - 100

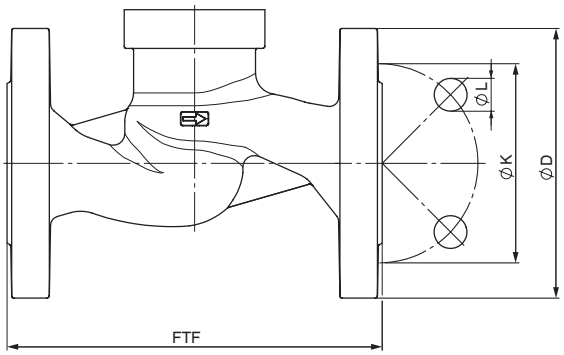
DN	Connection types code 8 [1]									
	Material code [2]									
	37					90				
	FTF	ø D	ø L	ø K	n	FTF	ø D	ø L	ø K	n
15	-	-	-	-	-	130.0	95.0	14.0	65.0	4
20	-	-	-	-	-	150.0	105.0	14.0	75.0	4
25	-	-	-	-	-	160.0	115.0	14.0	85.0	4
32	-	-	-	-	-	180.0	140.0	18.0	100.0	4
40	-	-	-	-	-	200.0	150.0	18.0	110.0	4
50	230.0	165.0	18.0	125.0	-	230.0	165.0	18.0	125.0	4
65	290.0	185.0	18.0	145.0	4	290.0	185.0	18.0	145.0	4
80	310.0	200.0	18.0	160.0	8	310.0	200.0	18.0	160.0	8
100	350.0	220.0	18.0	180.0	8	350.0	220.0	18.0	180.0	8

Dimensions in mm
n = number of bolts

1) **Connection type**
Code 8: Flange EN 1092, PN 16, form B, face-to-face dimension FTF EN 558 series 1, ISO 5752, basic series 1

2) **Valve body material**
Code 37: 1.4408, investment casting
Code 90: EN-GJS-400-18-LT (GGG 40.3)

6.3.2 Flange connection types code 10, 11, 48



DN 15 - 50 (code 10, 48)
DN 40, 50 (code 11)

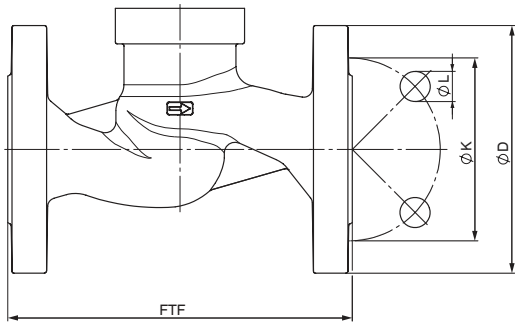
DN	Connection types code [1]														
	10					11					48				
	Material code 37 [2]														
	FTF	ø D	ø L	ø k	n	FTF	ø D	ø L	ø K	n	FTF	ø D	ø L	ø K	n
15	130.0	95.0	14.0	65.0	4	130.0	95.0	14.0	65.0	4	108.0	95.0	15.0	70.0	4
20	150.0	105.0	14.0	75.0	4	150.0	105.0	14.0	75.0	4	117.0	100.0	15.0	75.0	4
25	160.0	115.0	14.0	85.0	4	160.0	115.0	14.0	85.0	4	127.0	125.0	19.0	90.0	4
32	180.0	140.0	18.0	100.0	4	180.0	140.0	18.0	100.0	4	-	-	-	-	-
40	200.0	150.0	18.0	110.0	4	200.0	150.0	18.0	110.0	4	16..0	140.0	19.0	105.0	4
50	230.0	165.0	18.0	125.0	4	-	-	-	-	-	203.0	155.0	19.0	120.0	4

Dimensions in mm
n = number of bolts

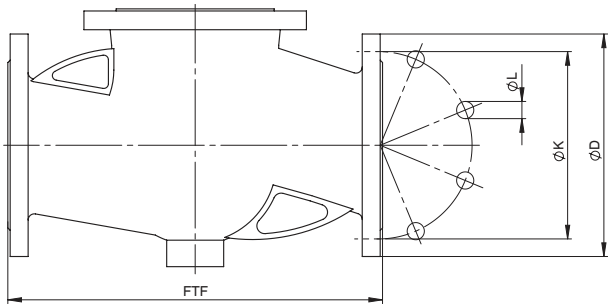
1) **Connection type**
Code 10: Flange EN 1092, PN 25, form B, face-to-face dimension FTF EN 558 series 1, ISO 5752, basic series 1
Code 11: Flange EN 1092, PN 40, form B, face-to-face dimension FTF EN 558 series 1, ISO 5752, basic series 1
Code 48: Flange JIS 20K, face-to-face dimension FTF EN 558 series 10, ASME/ANSI B16.10 table 1, column 16, DN 50 drilled to JIS 10K

2) **Valve body material**
Code 37: 1.4408, investment casting

6.3.3 Flange connection types code 39



DN 15 - 50



DN 65 - 100

DN	Connection types code 39 [1]				
	Material code 37,90 [2]				
	FTF	ø D	ø L	ø K	n
15	130.0	90.0	15.9	60.3	4
20	150.0	100.0	15.9	69.9	4
25	160.0	110.0	15.9	79.4	4
32	180.0	115.0	15.9	88.9	4
40	200.0	125.0	15.9	98.4	4
50	230.0	150.0	19.0	120.7	4
65	290.0	180.0	19.0	139.7	4
80	310.0	190.0	19.0	152.4	4
100	350.0	230.0	19.0	190.5	8

Dimensions in mm
n = number of bolts

1) **Connection type**
Code 39: Flange ANSI Class 150 RF, face-to-face dimension FTF EN 558 series 1, ISO 5752, basic series 1

2) **Valve body material**
Code 37: 1.4408, investment casting
Code 90: EN-GJS-400-18-LT (GGG 40.3)

7 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.

8 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 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.

10 Installation in piping

10.1 Preparing for installation

⚠ WARNING

The equipment is subject to pressure!

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

⚠ WARNING

Corrosive chemicals!

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

⚠ CAUTION

Hot plant components!

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

⚠ CAUTION

Exceeding the maximum permissible pressure.

► Damage to the product.
- Provide precautionary measures against exceeding the maximum permitted pressures 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.

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. 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 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 from vibrations and tension.
13. Only install the product between matching aligned pipes (see chapters below).
14. Please note the flow direction.
15. Please note the installation position (see chapter "Installation position").

10.2 Installation position

GEMÜ recommend installing the actuator vertically upright or vertically down to optimise the service life.

10.3 Installation with flanged connection

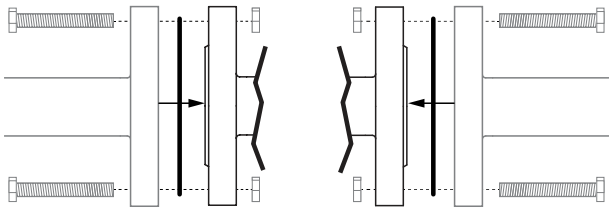


Fig. 4: Flanged connection

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 Electrical connection

NOTICE

Appropriate cable socket/appropriate mating connector!

- ► The appropriate cable socket and/or appropriate mating connector is included for X1, X3 and X4.
- ► The appropriate cable socket and/or appropriate mating connector is **not** included for X2.

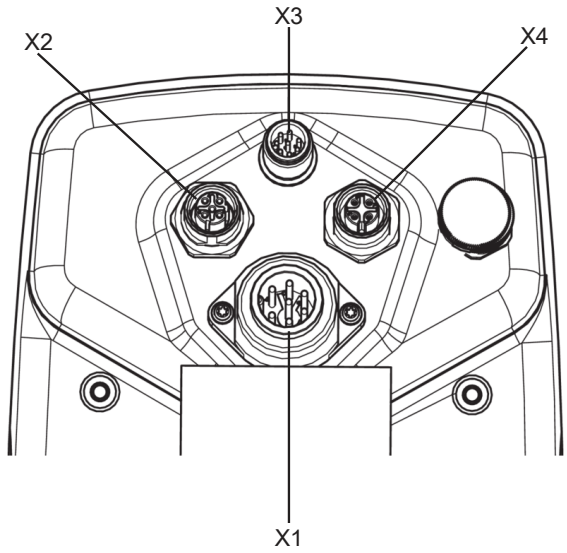


Fig. 5: Overview of electrical connections

11.1 Connection X1

7-pin plug, Binder, type 693

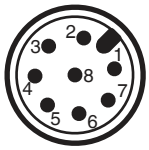
Pin	Signal name
Pin 1	Uv, 24 V DC supply voltage
Pin 2	Uv GND
Pin 3	Relay output K1, common
Pin 4	Relay output K1, make contact
Pin 5	Relay output K2, common
Pin 6	Relay output K2, make contact
Pin PE	Function earth

11.2 Connection X2

5-pin M12 built-in socket, D-coded

Pin	Signal name
Pin 1	Tx + (Ethernet)
Pin 2	Rx + (Ethernet)
Pin 3	Tx - (Ethernet)
Pin 4	Rx - (Ethernet)
Pin 5	Shield

11.3 Connection X3



8-pin M12 plug, A-coded

Pin	Signal name
Pin 1	I + set value input
Pin 2	I – set value input
Pin 3	I + actual value output
Pin 4	GND (actual value output, digital input 1 – 3, error message output)
Pin 5	Error message output 24 V DC
Pin 6	Digital input 3
Pin 7	Digital input 1
Pin 8	Digital input 2

11.4 Connection X4

4-pin M12 built-in socket, A-coded

Pin	Signal name
Pin 1	UV, 24 V DC actual value supply
Pin 2	n. c.
Pin 3	X -, process actual value input
Pin 4	X+, process actual value input
Pin 5	n. c.

11.5 Connecting the valve electrically

⚠ CAUTION

Do not clean valve with a high pressure cleaning device

- ► Valve is designed for IP 65. The actuator and the electric connections are damaged by the extremely high pressures of the high pressure cleaning device.

⚠ CAUTION

Hot actuator parts!

► Risk of burns!

● Only work on plant that has cooled down.

● If necessary, wear gloves when working on the electrical connection.

1. Protect the electrical connections from direct contact with rain water.
2. Lay the cables and pipework so that neither condensate nor rain water can get into the plug unions.
3. Check that all plug cable glands and fittings are mechanically secured.
   ⇨ The cable must be held firmly on all sides.
4. Connect connections X1 to X4 in accordance with the overview.

⇨ Electrical connection is completed.

12 Network connection

12.1 Network settings

The network interface has the following default settings:

IP address: 192.168.2.1

Subnet screen: 255.255.252.0

The default settings can be changed. See the eSy-Web operating instructions.

12.2 Connecting the network

1. Connect the network plug and cables with the electrical connection X2 of the product.
2. Change the IP address using the web server.

12.3 Resetting the network settings

1. Ensure that the "ON-Site" DIP switch **8** is not in the "ON" position.
2. Press and hold down the "OPEN" button **9** for at least 8 s.
   ⇨ LED 1 flashes fast in blue.
3. Press the "INIT/CLOSE" button **10**.
   ⇨ Network settings are reset in the default settings.

13 Commissioning

13.1 Commissioning on the device

1. Ensure that the "ON-Site" DIP switch **8** is not in the "ON" position.
2. Press and hold down the "INIT/CLOSE" button **10** for at least 8 s.
   ⇨ Initialisation of the actuator begins.
3. Green and orange LEDs flash alternately.
   ⇨ Initialisation is completed.

⇨ Commissioning is completed.

13.2 Commissioning via the eSy-Web web interface

● See separate eSy-Web operating instructions.

13.3 Commissioning via digital input

✓ The function of input 3 is set to init.

1. Connect 24 V signal briefly (max. 2 s) to connection X3 on pins 7 and 4.
   ⇨ Initialisation of the actuator begins.
2. Green and orange LEDs flash alternately.
   ⇨ Initialisation is completed.

⇨ Commissioning is completed.

14 Operation

14.1 Operation on the device

14.1.1 Moving the valve to the open position

1. Move the "ON-Site" DIP switch **8** to the "ON" position.
   ⇨ Control on the device is activated.
2. Press the "OPEN" button **9**.
   ⇨ The valve moves slowly to the open position.
3. Also press the "INIT/CLOSE" button **10**.
   ⇨ The valve moves quickly to the open position.
   ⇨ If the valve is fully opened, the high visibility LEDs are lit in green.
4. Move the "ON-Site" DIP switch **8** to the "OFF" position.
   ⇨ Control on the device is deactivated.

⇨ The valve is in the open position.

14.1.2 Moving the valve to the closed position

1. Move the "ON-Site" DIP switch **8** to the "ON" position.
   ⇨ Control on the device is activated.
2. Press the "INIT/CLOSE" button **10**.
   ⇨ The valve moves slowly to the closed position.
3. Also press the "OPEN" button **9**.
   ⇨ The valve moves quickly to the closed position.
   ⇨ If the valve is fully closed, the high visibility LEDs are lit in orange.
4. Move the "ON-Site" DIP switch **8** to the "OFF" position.
   ⇨ Control on the device is deactivated.

⇨ The valve is in the closed position.

14.2 Operation via the web server

See separate "eSy-Web" operating instructions.

14.3 Manual override

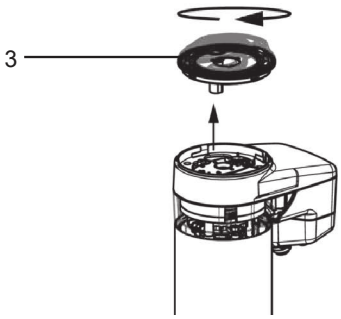
⚠ WARNING

Rotating cover!

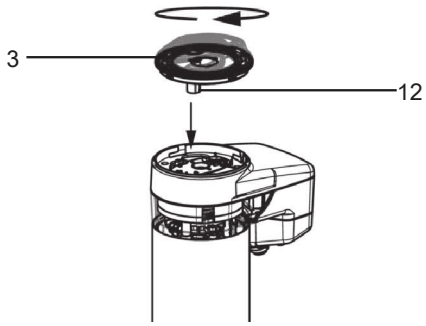
► Risk of crushing.

● Disconnect the power supply before using the manual override.

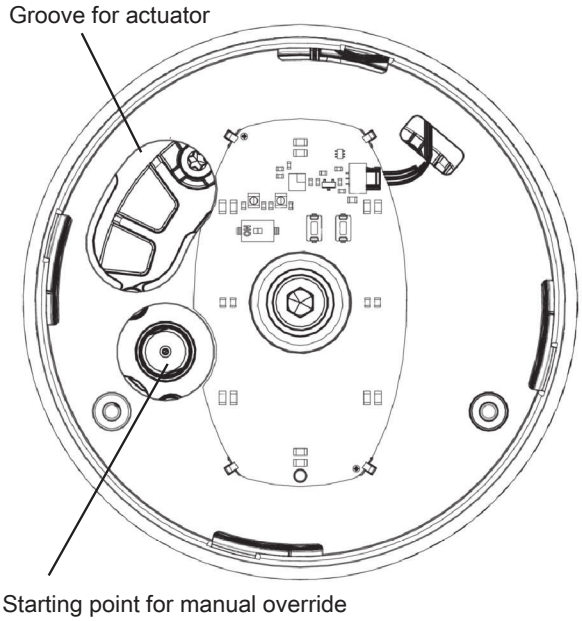
1. Disconnect the power supply.
2. Turn housing cover **3** clockwise.
3. Remove housing cover **3**.



4. Place the actuator of housing cover **12** in the starting point for manual override.



Item	Name
3	Housing cover
12	Housing cover actuator



5. Turn housing cover **3** anticlockwise.

⇨ The product opens.

6. Turn housing cover **3** clockwise.

⇨ The product closes.

7. Pull manual override off the starting point.
8. Ensure correct positioning of the O-ring.
9. Push actuator **12** into the groove provided for this purpose.
10. Turn housing cover **3** anticlockwise until it stops.

⇨ The actuator cover is closed.

11. Reconnect the power supply.

15 Inspection and maintenance

⚠ WARNING

The equipment is subject to pressure!

► Risk of severe injury or death.

● Depressurize the plant.

● Completely drain the plant.

⚠ CAUTION

Use of incorrect spare parts!

► Damage to the GEMÜ product.

► Manufacturer liability and guarantee will be void.

● Use only genuine parts from GEMÜ.

⚠ CAUTION

Hot plant components!

► Risk of burns!

● Only work on plant that has cooled down.

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 depending 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 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

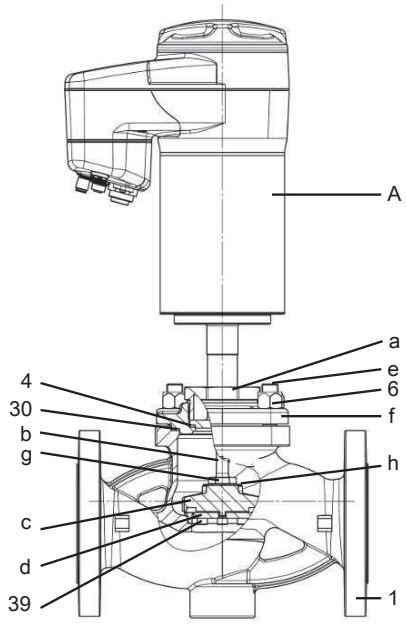


Fig. 6: Spare parts

Item	Name	Order description
1	Valve body	K536...
4	Sealing washer	539...SVS...
6	Hexagon nut	
14	Seat seal	
30	Sealing washer	
39	Cylindrical screw	
A	Actuator	9539...
a	Union nut	-
b	Spindle	-
c	Valve plug	-
d	Retaining washer	-
e	Stud bolt	-
f	Seat flange	-
g	Union nut	-
h	Locking plate	-

15.2 Removing the actuator

15.2.1 Removing actuator DN 15 - DN 50

1. Move the actuator **A** to the open position.
2. Undo union nut **a**.
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).

15.2.2 Removing actuator DN 65 - DN 100

1. Move the actuator **A** to the open position.
2. Loosen fastening elements between the actuator flange and the valve body flange diagonally and remove them.
3. Lift off actuator **A** and seat flange **f** from valve body **1**.
4. Remove sealing washer **30**.
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 Replacing the seals

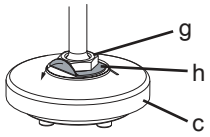
15.3.1 Replacing the seals DN 15 - DN 50

1. Remove the actuator.
2. Remove sealing washer **4** from the valve body.
3. Loosen nut **e** on spindle **b** (hold spindle **b** with appropriate tool that will not damage the spindle surfaces).
4. Clean all parts of contamination (do not damage parts during cleaning).
5. Insert new seat seal **14**.
6. Remove retaining washer **d**.
7. Apply appropriate thread locking compound on the thread of spindle **b**.
8. Fix spindle **b** in place with nut **e** (hold spindle **b** in place with appropriate tools which do not damage the spindle surfaces).
9. Insert new sealing washer **4** in valve body **1**.

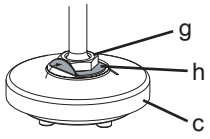
Mount the actuator.

15.3.2 Replacing the seals DN 65 - DN 100

1. Remove the actuator.
2. Bend the locking plate **h** 90°, so that it lies flat on the valve plug **c**.



3. Unscrew the entire valve plug **c** from the union nut **g**.
4. Loosen cylindrical screws **39** from valve plug **c**.
5. Remove retaining washer **d**.
6. Remove seat seal **14**.
7. Unscrew seat flange **f** from the union nut.
8. Remove sealing washer **4** from the valve body.
9. Clean all parts of contamination (do not damage parts during cleaning).
10. Insert new sealing washer **4** in seat flange **f**.
11. Screw the seat flange **f** into the union nut **a** and tighten it until it is hand tight.
12. Screw union nut **a** tight with an appropriate open-end wrench.
13. Insert new seat seal **14**.
14. Insert retaining washer **d** and use cylindrical screws **39** to fix it in place.
15. Place the locking plate **h** on the valve plug **c**.
16. Screw the entire valve plug **c** onto the union nut **g**.
17. Bend the locking plate **h** by 90°, so that it lies flat on the union nut **g**.



⇨ The union nut **g** is secured against twisting.

18. Mount the actuator.

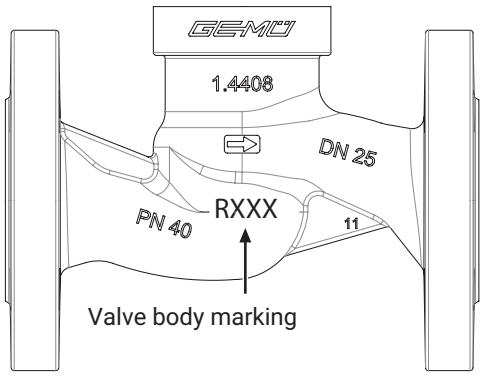
15.4 Mounting the actuator

⚠ CAUTION

Incorrect combination of actuator and valve body!

► Risk of damage to the actuator and valve body.

- For control valves with a reduced valve seat, make sure that the combination of actuator and valve body is correct.
- Compare the product label of the actuator with the valve body marking.



Actuator product label	Valve body marking
RAxxx	R002
RBxxx	R004
RCxxx	R006
RDxxx	R008
RExxx	R010
RFxxx	R012
RGxxx	R015
RHxxx	R020
RJxxx	R025
RKxxx	R032
RMxxx	R040

15.4.1 Mounting actuator DN 15 - DN 50

1. Move the actuator **A** to the open position.
2. Lubricate the thread of the union nut **a** using a suitable lubricant.
3. Place actuator **A** on valve body **1** approx. 90° in front of the end position (orientation of the connections) and screw hand tight with union nut **a**.
4. Tighten union nut **a** with an open-end wrench (for torques, see table).
   ⇨ This rotates the actuator clockwise approx. 90° to the desired position.

Nominal size	Torque
DN 15	90 Nm
DN 20	100 Nm
DN 25	120 Nm
DN 32	120 Nm
DN 40	150 Nm
DN 50	200 Nm

5. Move the actuator **A** to the closed position.
6. With the valve fully assembled, check the function and tightness.

15.4.2 Mounting actuator DN 65 - DN 100

1. Move the actuator **A** to the open position.
2. Insert new sealing washer **30** in valve body flange.
3. Place actuator **A** and seat flange **f** on valve body **1**.
4. Tighten the hexagon nuts **6** diagonally.

Nominal size	Torque
DN 65	200 Nm
DN 80	200 Nm
DN 100	200 Nm

5. Move the actuator **A** to the closed position.
6. With the valve fully assembled, check the function and tightness.

16 Troubleshooting

Error	Possible cause	Troubleshooting
The product leaks downstream (doesn't close or doesn't close fully)	Operating pressure too high	Operate the product with operating pressure specified in datasheet
	Valve body leaks or is damaged	Check valve body for potential damage, replace valve body if necessary
The product doesn't close or doesn't close fully	The actuator design is not suitable for the operating conditions	Use an actuator that is designed for the operating conditions
	Foreign matter in the product	Remove and clean the product
	Voltage is not connected	Connect voltage
The product doesn't open or doesn't open fully	Actuator defective	Replace the actuator
	Operating pressure too high	Operate the product with operating pressure specified in datasheet
	Foreign matter in the product	Remove and clean the product
	The actuator design is not suitable for the operating conditions	Use an actuator that is designed for the operating conditions
	Voltage is not connected	Connect voltage
	Cable ends incorrectly wired	Wire cable ends correctly
The product leaks between actuator and valve body	Bolting between valve body and actuator loose	Retighten bolting between valve body and actuator
	Actuator/valve body damaged	Replace actuator/valve body
The product leaks between actuator flange and valve body	Mounting parts loose	Retighten mounting parts
	Valve body / actuator damaged	Replace valve body/actuator
Body of the GEMÜ product is leaking	Body of the GEMÜ product is faulty or corroded	Check the body of the GEMÜ product for potential damage, replace body if necessary
	Incorrect installation	Check installation of valve body in piping
Valve body connection to piping leaks	Incorrect installation	Check installation of valve body in piping
LED 1 is not lit	No initialisation	Initialise valve
	Supply voltage too low	Check supply voltage
LED 1 lights up yellow	Set value signal outside of the area	Check set value signal
	Temperature error	Check temperature
LED 1 flashes yellow	Actual value signal outside of the area	Check actual value signal
LED 1 and 2 are flashing yellow and red simultaneously	No calibration	Contact GEMÜ
	Internal error	Contact GEMÜ

17 Removal from piping

1. Remove in reverse order to installation.
2. Unscrew the electrical wiring.
3. Disassemble the product. Observe warning notes and safety information.

18 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.

19 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.

20 Declaration of Incorporation according to 2006/42/EC (Machinery Directive)

Declaration of Incorporation

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

We, GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG
Fritz-Müller-Straße 6-8
74653 Ingelfingen-Criesbach, Germany

declare that the following product

Make: GEMÜ Motorized globe valve

Commercial name: GEMÜ 539

meets the following essential requirements of the Machinery Directive 2006/42/EC:

1.1.2. a), 1.1.2. d), 1.1.3., 1.1.4., 1.1.5., 1.1.6., 1.1.7., 1.1.8., 1.2.1., 1.3., 1.3.2., 1.3.4., 1.3.5., 1.3.6., 1.3.7., 1.3.8., 1.3.9., 1.5.1., 1.5.3., 1.5.5., 1.5.6., 1.5.7., 1.6.1., 1.6.3., 1.6.5., 2.1.1., 2.3., 3.2.1., 3.2.2., 3.3.2., 3.3.4., 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. c), 4.1.2.6. d), 4.1.2.6. e), 4.1.3., 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., 5.2., 5.3., 5.4., 6.1.1., 6.3.1., 6.4.3.

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

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

Authorised documentation officer **GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG**
Fritz-Müller-Straße 6-8
74653 Ingelfingen, Germany

This does not affect the industrial 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.

2020-07-08

Joachim Brien
Head of Technical Department

21 Declaration of conformity according to 2014/68/EU (Pressure Equipment Directive)

EU Declaration of Conformity

in accordance with 2014/68/EU (Pressure Equipment Directive)

We, GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG
Fritz-Müller-Straße 6-8
74653 Ingelfingen-Criesbach, Germany

declare that the product listed below complies with the safety requirements of the Pressure Equipment Directive 2014/68/EU.

Description of the pressure equipment:	GEMU 539
Notified body:	TÜV Rheinland Industrie Service GmbH
Number:	0035
Certificate no.:	01 202 926/Q-02 0036
Conformity assessment procedure:	Module H
Technical standard used:	EN 1983, AD 2000

Note for products with a nominal size ≤ DN 25:
The products are developed and produced according to GEMÜ process instructions and quality standards 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-label.

2021-02-08

Joachim Brien
Head of Technical Department

22 Declaration of conformity according to 2014/30/EU (EMC Directive)

EU Declaration of Conformity

in accordance with 2014/30/EU (EMC Directive)

We, GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG
Fritz-Müller-Straße 6-8
74653 Ingelfingen-Criesbach, Germany

declare that the product listed below complies with the safety requirements of the EMC Directive 2014/30/EU.

Description of the product: GEMÜ 539

Technical standards used:

Interference resistance:

- DIN EN 61326-1 (industrial processes)
- DIN EN 61800-3

Interference emission:

- DIN EN 61800-3

2021-01-29

Joachim Brien
Head of Technical Department

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