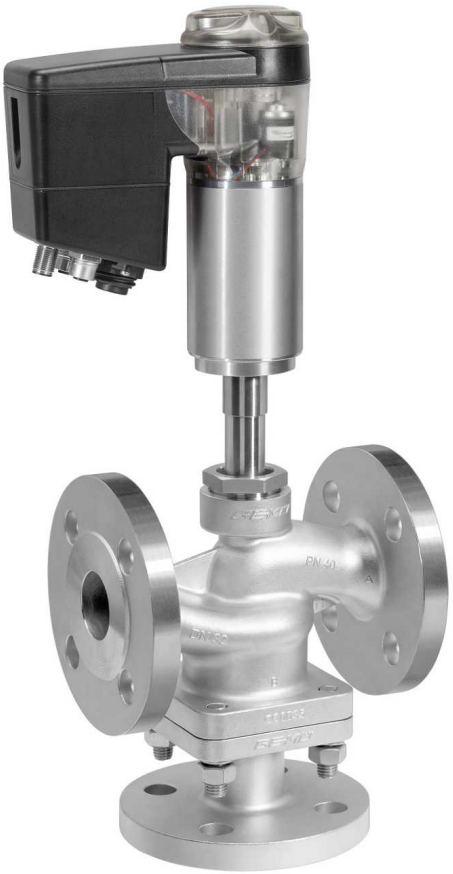
GEMÜ 343 eSyDrive

Motorized multi-port globe valve

EN **Operating instructions**



further information
webcode: GW-343

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 organized according to the following scheme:

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

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

The following signal words and danger levels are used:

⚠ DANGER

Imminent danger!

▶ Non-observance can cause death or severe injury

⚠ WARNING

Potentially dangerous situation!

▶ Non-observance can cause death or severe injury

⚠ CAUTION

Potentially dangerous situation!

▶ Non-observance can cause moderate to light injury

NOTICE

Potentially dangerous situation!

▶ Non-observance can cause damage to property

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

Symbol	Meaning
	Danger of explosion!
	The equipment is subject to pressure!
	Corrosive chemicals!
	Hot plant components!
	Maximum permissible pressure exceeded!
	Risk of crushing!
	Rotating cover!

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:

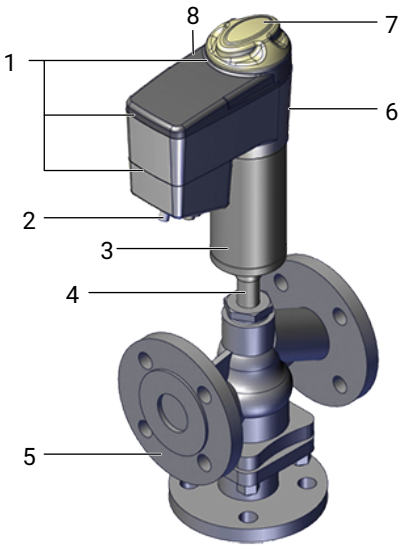
9. Keep this document available at the place of use.
10. Observe the safety information.
11. Operate the product in accordance with this document.
12. Operate the product in accordance with the specifications.
13. Maintain the product correctly.
14. Do not carry out any maintenance work and repairs not 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	1.4301/1.4305
4	Distance piece with leak detection hole	1.4408
5	Valve body	1.4408, cast bronze
6	Optical position indicator	PESU
7	Cover with high visibility LED, manual override and on-site control	PESU
8	Actuator top	PESU black

3.2 Buttons for on-site control

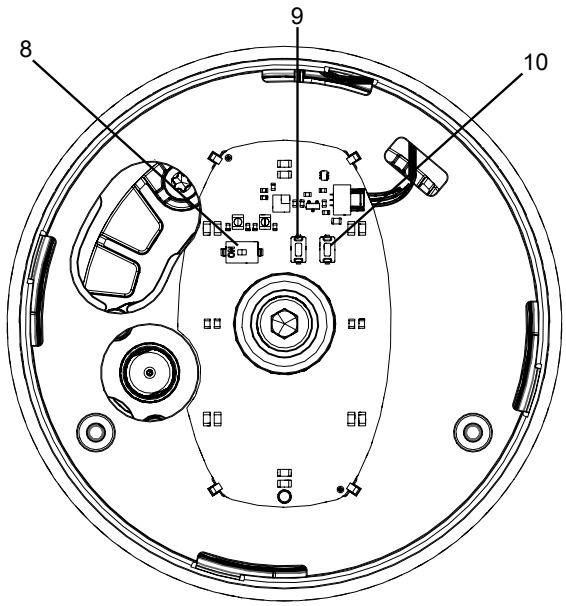


Fig. 1: Position of the buttons

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

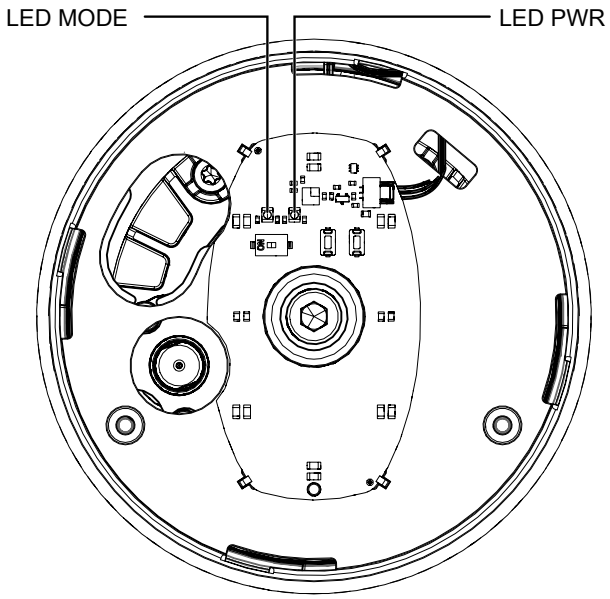


Fig. 2: Position of the status LEDs

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

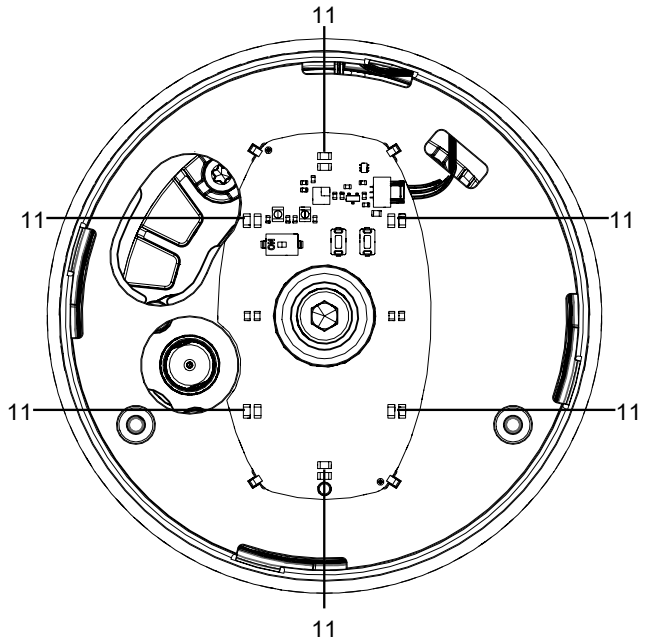


Fig. 3: Position of the high visibility LEDs

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%)	○	○

Function	High visibility LED	
	green	orange
Initialization	☀	☀
	alternating	
Location function	☀	○

3.4 Description

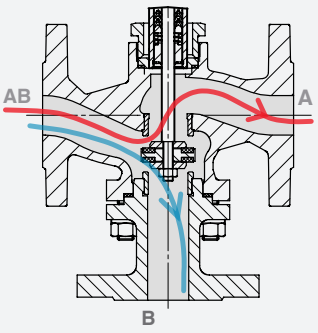
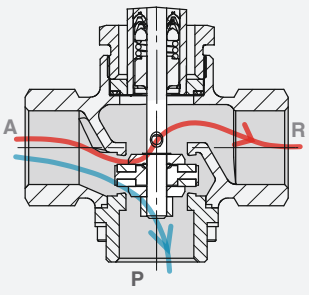
The GEMÜ 343 eSyDrive is a motorized 3/2-way globe valve with a hollow shaft electric actuator. The eSyDrive hollow shaft actuator can be operated as On/Off or with integrated positioner or process controller. The valve spindle is sealed by a self-adjusting gland packing. This provides a low-maintenance and reliable valve spindle seal even after an extended period of operation. 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.

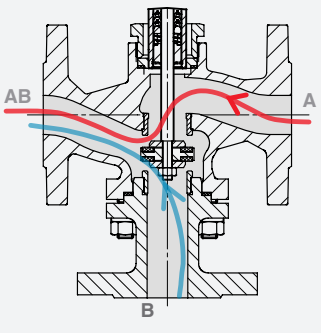
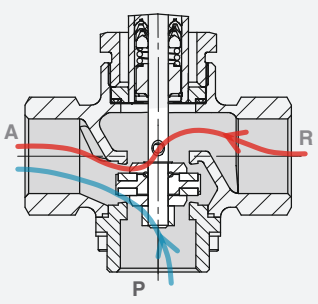
3.5 Function

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

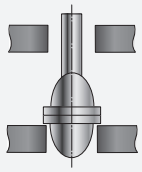
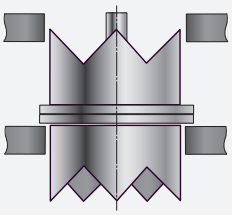
The product has an optical position indicator as standard. The optical position indicator indicates the OPEN and CLOSED positions.

3.5.1 Functions

Flange - Distribution	Threaded socket - Distribution
	

Flange - Mixing	Threaded socket - Mixing
	

3.6 Regulating cone/regulating cage

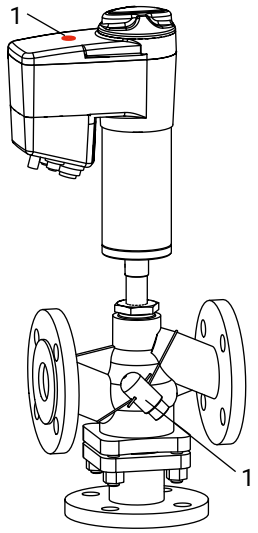
Regulating cone	Regulating cage
	
Regulating cone: DN 15 - 50	Regulating cage: DN 65 - 100

4 GEMÜ CONEXO

Order with CONEXO

GEMÜ CONEXO must be ordered separately with the ordering option "CONEXO" (see order data).

For electronic identification purposes, each replaceable component contained in the product is equipped with an RFID chip (1). Where you can find the RFID chip differs from product to product.



The CONEXO pen helps read out information stored in these RFID chips. The CONEXO app or CONEXO portal is required to view this information.

5 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.

6 Order data

The order data provide an overview of standard configurations.

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

Order codes

1 Type	Code
Multi-port globe valve, electrically operated, electro-mechanical hollow shaft actuator, body with flanged connection, eSyDrive	343

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 Housing configuration	Code
Multi-port design	M

4 Connection type	Code
Threaded socket DIN ISO 228	1
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 40, form B, face-to-face dimension FTF EN 558 series 1, ISO 5752, basic series 1	11
Flange ANSI Class 125/150 RF, face-to-face dimension FTF EN 558 series 1, ISO 5752, basic series 1	39

5 Valve body material	Code
CC499K, cast bronze	9
1.4408, investment casting	37

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

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

10 Actuator version	Code
Actuator size 2	2A

11 Type of design	Code
Standard	
For elevated temperatures	2024

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

Order example

Ordering option	Code	Description
1 Type	343	Multi-port globe valve, electrically operated, electro-mechanical hollow shaft actuator, body with flanged connection, eSyDrive
2 DN	40	DN 40
3 Housing configuration	M	Multi-port design
4 Connection type	11	Flange EN 1092, PN 40, 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	2A	Actuator size 2
11 Type of design		Standard
12 CONEXO		Without

7 Technical data

7.1 Medium

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

Max. permissible viscosity: 600 mm²/s

Other versions for lower / higher temperatures and higher viscosities on request.

7.2 Temperature

Media temperature: -10 — 180 °C

-10 to 250 °C with K-no. 2024 + seat seal code 5G

For material code 37 + K-no. 2013: -40 to 180 °C

Ambient temperature: -10 — 60 °C

-10 to 40 °C with K-no. 2024 + seat seal code 5G

Storage temperature: 0 — 40 °C

7.3 Pressure

Operating pressure:

B–AB/AB–A

DN	Actuator version					
	0A		1A		2A	
	Flange	Threaded socket	Flange	Threaded socket	Flange	Threaded socket
15	32.0	16.0	-	-	-	-
20	20.0	16.0	40.0	16.0	-	-
25	12.0	12.0	25.0	16.0	-	-
32	-	-	20.0	16.0	-	-
40	-	-	12.0	12.0	25.0	16.0
50	-	-	8.0	8.0	16.0	16.0
65	-	-	5.0	-	10.0	-
80	-	-	4.0	-	6.0	-
100	-	-	-	-	4.0	-

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

Leakage rate:

Open/Close valve

Seat seal	Standard	Test procedure	Leakage rate	Test medium
PTFE	DIN EN 12266-1	P12	A	Air

Control valve

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

Pressure/temperature correlation:

Connection type code [1]	Material code [2]	Max. permissible operating pressures in bar at temperature in °C				
		RT	100	150	200	250
1	**9**	16.0	16.0	16.0	13.5	-
8	**37**	16.0	16.0	14.5	13.4	12.7
11	**37**	40.0	40.0	36.3	33.7	31.8

All pressures are gauge pressures.
The valves are suitable for temperatures as low as -10 °C
RT = room temperature

1) **Connection type**
Code 1: Threaded socket DIN ISO 228
Code 8: Flange EN 1092, PN 16, 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

2) **Valve body material**
Code 9: CC499K, cast bronze
Code 37: 1.4408, investment casting

Kv values:

Open/Close valve

	Flange		Threaded socket	
DN	AB - A	B - AB	A - R	P - A
15	4.1	5.4	2.5	3.6
20	7.5	11.6	3.3	5.5
25	12.0	17.6	7.3	10.6
32	18.8	27.0	10.4	18.0
40	30.7	46.7	20.9	31.0
50	42.0	67.1	33.7	47.0
65	71.9	119.9	-	-
80	107.6	174.4	-	-
100	157.1	250.7	-	-

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 - Flange

DN	Flange			
	AG 0	AG 1	AG 2	Kv value
15	RS190	-	-	4.0
20	RS191	RS193	-	6.3
25	RS192	RS194	-	10.0
32	-	RS195	-	14.0
40	-	RS196	RS200	20.0
50	-	RS197	RS231	32.0
65	-	RS198	RS232	63.0
80	-	RS199	RS233	90.0
100	-	-	RS234	140.0

Kv values in m³/h
Kv values refer to the flow direction A-AB and B-AB.

Kv values:

Control valve - Threaded socket

DN	Threaded socket			
	AG 0	AG 1	AG 2	Kv value
15	RS180	-	-	1.6
20	RS181	-	-	2.5
25	RS182	RS183	-	6.3
32	-	RS184	-	10.0
40	-	RS185	RS188	16.0
50	-	RS187	RS189	25.0

Kv values in m³/h
Kv values refer to the flow direction A-AB and B-AB.

7.4 Product compliance

Machinery Directive: 2006/42/EC

Pressure Equipment Directive: 2014/68/EU

EMC Directive: 2014/30/EU

RoHS Directive: 2011/65/EU

7.5 Mechanical data

Protection class: IP 65 acc. to EN 60529

Actuating speed:

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

Weight:

Actuator

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

Body

DN	Flange	Threaded socket
15	3.4	0.6
20	4.9	0.7
25	5.7	1.1
32	8.5	1.8
40	9.7	2.3
50	15.8	3.4
65	19.4	-
80	24.6	-
100	32.8	-

Weights in kg

7.6 Actuator duty cycle and service life

Service life:

Control operation - Class C acc. to EN 15714-2 (1,800,000 start-ups and 1200 start-ups per hour).

Open / Close duty - Minimum 1,000,000 switching cycles at room temperature and permissible duty cycle.

Duty cycle:

Control operation - Class C acc. to EN 15714-2.

Open/Close duty - 100%

7.7 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. 100 W
Reverse battery protection	Yes		

7.7.1 Analogue input signals

7.7.1.1 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)

7.7.1.2 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)

7.7.2 Digital input signals

Digital inputs:	3
Function:	Can be selected 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)

7.7.3 Analogue output signals

7.7.3.1 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

7.7.4 Digital output signals

7.7.4.1 Switching outputs 1 and 2

Design:	2x make contact, potential-free
Switching voltage:	max. 48 V DC / 48 V AC
Switch rating:	max. 60 W / 2A
Switch points:	Adjustable 0 - 100 %

7.7.4.2 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

7.7.5 Communication eSy-Web

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.

7.7.6 Communication Modus TCP

Interface: Modbus TCP

IP address: 192.168.2.1 alterable via web browser

Subnet screen: 255.255.252.0 alterable via web browser

Port: 502

Supported function codes:

Code Dezimal	Code Hex	Function
3	0x03	Read Holding Registers
4	0x04	Read Input Registers
6	0x06	Write Single Register
16	0x10	Write Multiple Registers
23	0x17	Read / Write Multiple Registers

7.7.7 Behaviour in the event of an error

Function: In the event of an error the valve moves to the error position.

Notes: Moving to the error position is only possible with full power supply. This behaviour is not a safety position. The valve must be operated with a GEMÜ 1571 emergency power supply module (see accessories) to ensure the function in case of voltage loss.

Error position: Closed, open or hold (adjustable via eSy-web web interface).

8 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.

NOTICE

Damage to unused connectors due to penetration of humidity!

- ► Unused plugs must be covered with the protective caps supplied with the product to ensure IP protection.

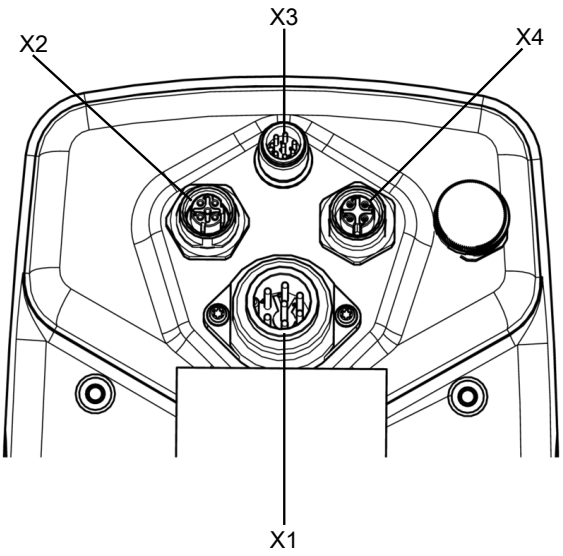
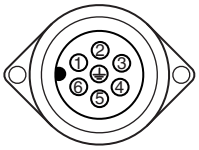


Fig. 4: Overview of electrical connections

8.1 Connection X1



7-pin plug, Binder, type 693

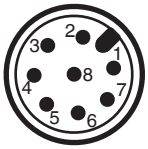
Pin	Signal name
Pin 1	Uv, 24 V DC supply voltage
Pin 2	Uv GND
Pin 3	Relay output K1, common
Pin 4	Relay output K1, make contact
Pin 5	Relay output K2, common
Pin 6	Relay output K2, make contact
Pin PE	Function earth

8.2 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

8.3 Connection X3



8-pin M12 plug, A-coded

Pin	Signal name
Pin 1	W+ set value input
Pin 2	W – set value input
Pin 3	X + 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

8.4 Connection X4

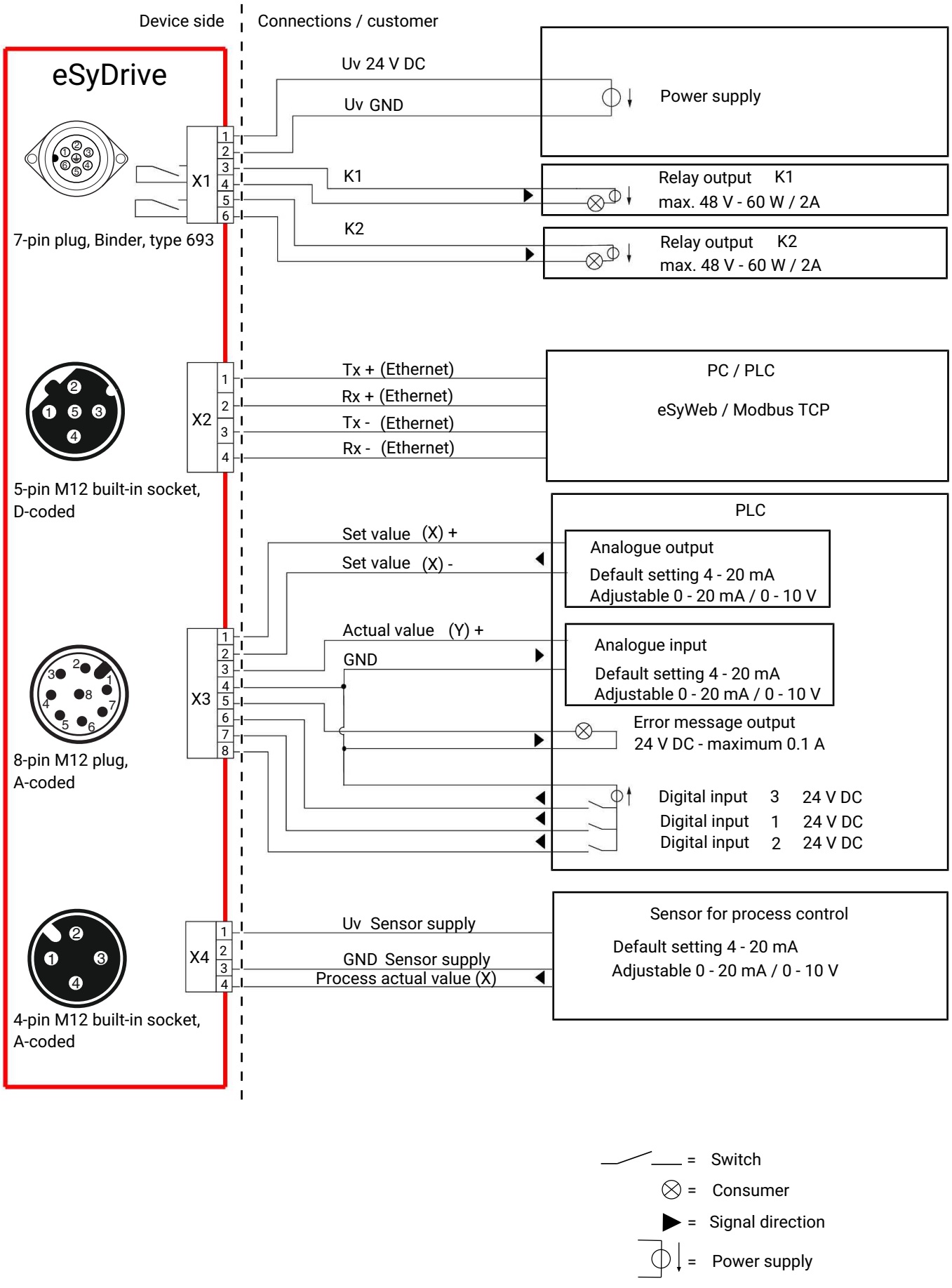
4-pin M12 built-in socket, A-coded

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

8.5 Connecting the product electrically

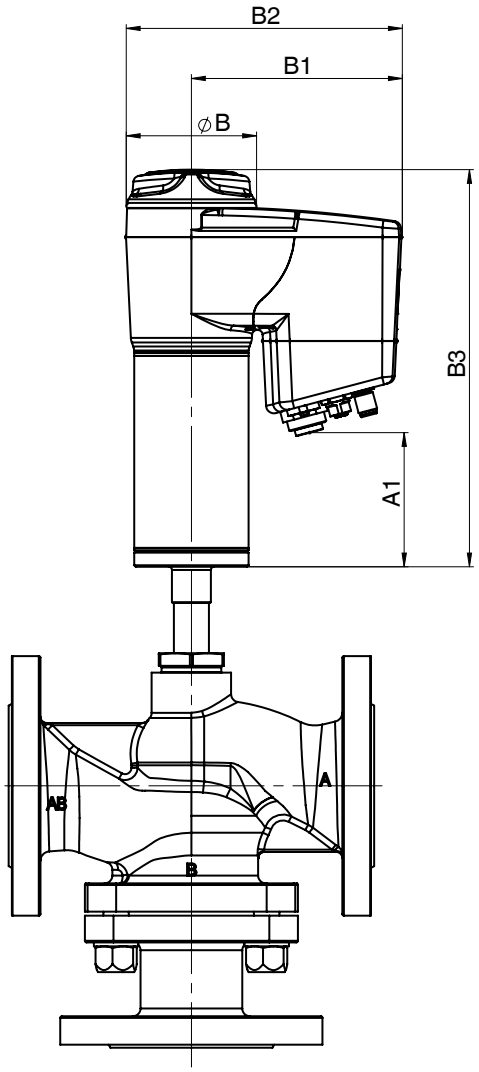
1. Protect the electrical connections from direct contact with rain water.
2. Lay the cables and pipework so that neither condensate nor rain water can get into the plug unions.
3. Check that all plug cable glands and fittings are mechanically secured.
   ⇨ The cable must be held firmly on all sides.
4. Check whether the actuator cover/manual override is closed and undamaged.
5. Correctly close the actuator cover/manual override again immediately after use (see “Manual override“, page 27).
6. Correctly close the product again after replacing the diaphragm.

8.6 Connection diagram



9 Dimensions

9.1 Actuator dimensions

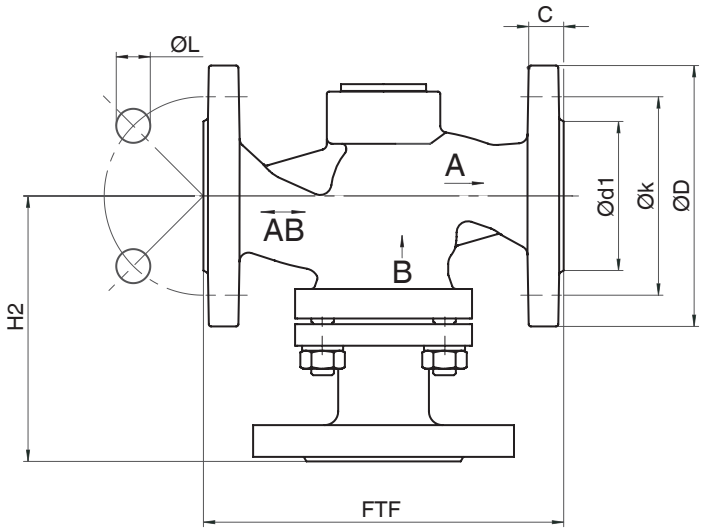


Actuator version	A1	B	B1	B2	B3
0A	45.0	68.0	126.0	160.0	193.0
1A	86.0	82.0	132.0	172.0	252.0
2A	121.0	129.0	157.0	224.0	304.0

Dimensions in mm

9.2 Body dimensions

9.2.1 Flange EN (code 8, 11)



Connection type flange, length EN 558 (code 8) [1], investment casting material (code 37) [2]

DN	NPS	C	ø D	FTF	H2	ø k	ø L	n
65	**2½"**	20.0	185.0	290.0	183.0	145.0	18.0	4
80	**3"**	22.0	200.0	310.0	204.0	160.0	18.0	8
100	**4"**	24.0	220.0	350.0	236.0	180.0	18.0	8

Connection type flange, length EN 558 (code 11) [1], investment casting material (code 37) [2]

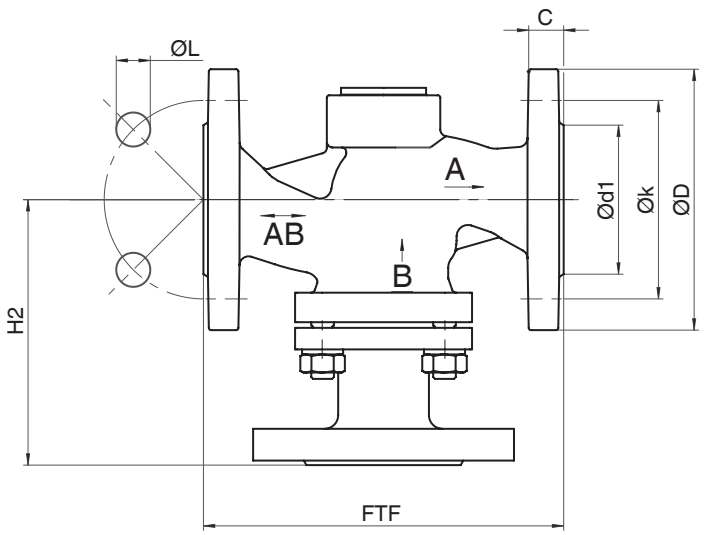
DN	NPS	C	ø D	FTF	H2	ø k	ø L	n
15	**1/2"**	16.0	95.0	130.0	97.0	65.0	14.0	4
20	**3/4"**	18.0	105.0	150.0	112.0	75.0	14.0	4
25	**1"**	18.0	115.0	160.0	118.0	85.0	14.0	4
32	**1¼"**	18.0	140.0	180.0	143.0	100.0	18.0	4
40	**1½"**	18.0	150.0	200.0	147.0	110.0	18.0	4
50	**2"**	20.0	165.0	230.0	167.0	125.0	18.0	4

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
Code 11: Flange EN 1092, PN 40, 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

9.2.2 Flange ANSI Class (code 39)



Connection type flange, length EN 558 (code 39) [1], **investment casting material (code 37)** [2]

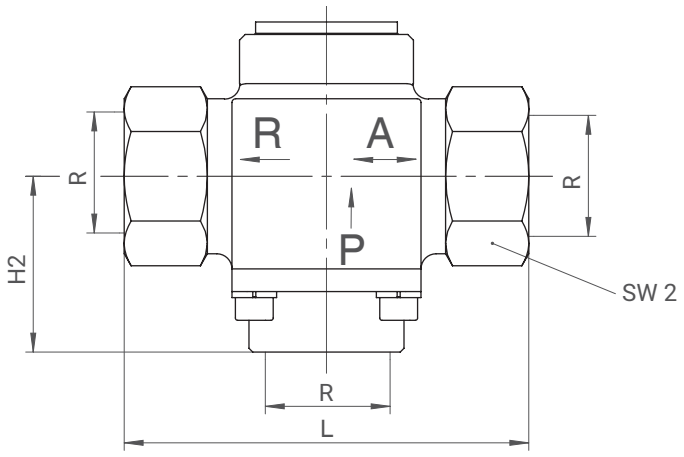
DN	NPS	C	ø D	FTF	H2	ø k	ø L	n
15	**1/2"**	16.0	90.0	130.0	97.0	60.3	15.9	4
20	**3/4"**	18.0	100.0	150.0	112.0	69.9	15.9	4
25	**1"**	18.0	110.0	160.0	118.0	79.4	15.9	4
32	**1¼"**	18.0	115.0	180.0	143.0	88.9	15.9	4
40	**1½"**	18.0	125.0	200.0	147.0	98.4	15.9	4
50	**2"**	20.0	150.0	230.0	167.0	120.7	19.0	4

Dimensions in mm
n = number of bolts

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

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

9.2.3 Threaded socket DIN (code 1)



Connection type threaded socket DIN (code 1) [1], block material (code 9) [2]

DN	NPS	CT		CT1		H2	L	R	SW1	SW2
		Actuator		Actuator						
		1	2	1	2					
15	**1/2"**	192.0	-	88.0	-	41.0	75.0	G 1/2	36	27
20	**3/4"**	196.0	-	92.0	-	46.0	87.0	G 3/4	36	32
25	**1"**	196.0	-	92.0	-	47.0	107.0	G 1	41	41
32	**1¼"**	200.0	277.0	96.0	125.0	66.0	123.0	G 1¼	55	50
40	**1½"**	200.0	277.0	96.0	125.0	68.0	147.0	G 1½	55	58
50	**2"**	204.0	281.0	100.0	125.0	74.0	171.0	G 2	55	70

Dimensions in mm

1) **Connection type**
Code 1: Threaded socket DIN ISO 228

2) **Valve body material**
Code 9: CC499K, cast bronze

10 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.

11 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.

12 Storage

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

13 Installation in piping

13.1 Preparing for installation

⚠ WARNING

The equipment is subject to pressure!

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

⚠ WARNING

Corrosive chemicals!

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

⚠ CAUTION

Hot plant components!

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

⚠ CAUTION

Maximum permissible pressure exceeded!

- ► Damage to the product!
- ● Provide for precautionary measures against exceeding the maximum permissible pressure that may be caused by pressure surges (water hammer).

⚠ CAUTION

Use as step!

- ► Damage to the product
- ► Risk of slipping-off
- ● Choose the installation location so that the product cannot be used as a foothold.
- ● Do not use the product as a step or a foothold.

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

13.2 Installation position

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

13.3 Installation with flanged connection

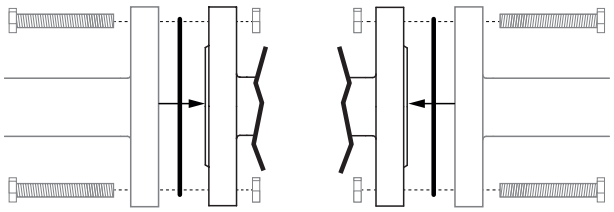


Fig. 5: Flanged connection

NOTICE

Sealing material!

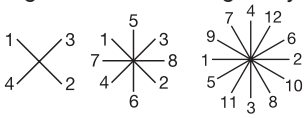
► The sealing material is not included in the scope of delivery.
● Only use appropriate sealing material.

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.

14 Network connection

14.1 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.

14.2 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.

14.3 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.

15 Commissioning

15.1 Commissioning on the device

1. Ensure that the "ON-Site" DIP switch 8 is not in the "ON" position (see “Buttons for on-site control“, page 6).
2. Press and hold down the "INIT/CLOSE" button **10** for at least 8 s.
   ⇨ Initialization of the actuator begins.
3. Green and orange LEDs flash alternately.
   ⇨ Initialization is completed.

⇨ Commissioning is completed.

15.2 Commissioning via the eSy-Web web interface

- See separate eSy-Web operating instructions.

15.3 Commissioning via digital input

✓ The function of input 3 is set to init.

1. Apply 24 V DC signal briefly (max. 2 s) to connection X3 pin 6 (reference GND connection X3 pin 4).
   ⇨ Initialization of the actuator begins.
2. Green and orange LEDs flash alternately.
   ⇨ Initialization is completed.

⇨ Commissioning is completed.

16 Operation

⚠ CAUTION

Risk of crushing!

► Risk of severe injury. The guide piece is accessible when the housing cover is removed, posing a risk of crushing by the guide piece when the actuator moves.

- Operation, maintenance, inspection and assembly must only be performed by qualified and trained personnel.

⚠ CAUTION

Risk of crushing!

► Risk of severe injury. Contact with the threaded spindle is possible on the base of the actuator, posing a risk of crushing by the threaded spindle when the actuator moves.

- Operation, maintenance, inspection and assembly must only be performed by qualified and trained personnel.

16.1 Manual override

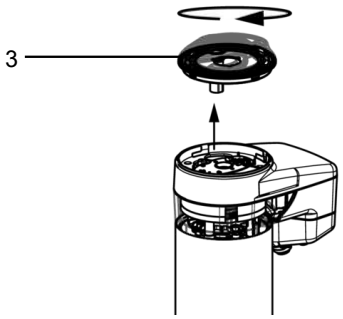
⚠ WARNING

Rotating cover!

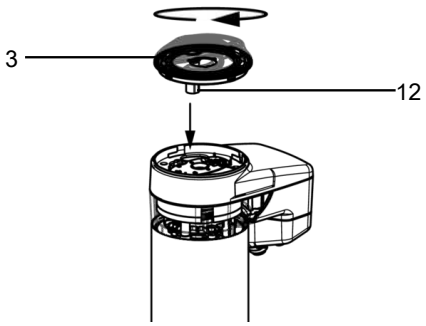
► Risk of crushing

- Disconnect the power supply before using the manual override.

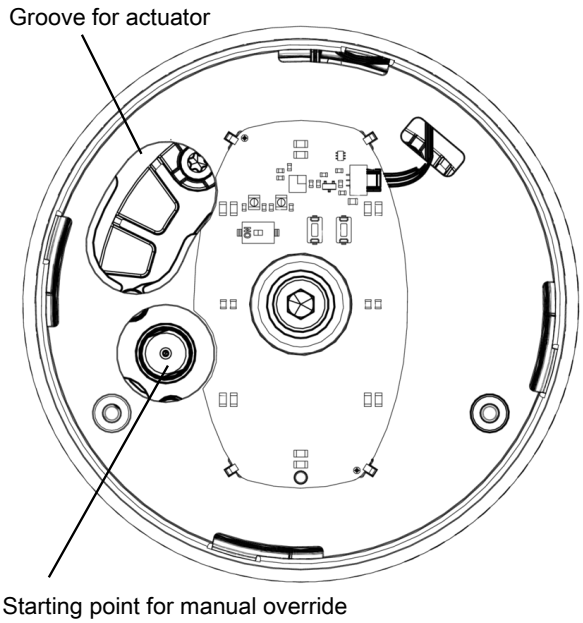
1. Disconnect the power supply.
2. Turn housing cover **3** clockwise.
3. Remove housing cover **3**.



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.

⇨ Housing cover is closed.

11. Reconnect the power supply.

16.2 Operation on the device

16.2.1 Moving the valve to the open position

1. Move "ON-Site" DIP switch 8 to the "ON" position (see “Buttons for on-site control“, page 6).

   ⇨ Control on the device is activated.
2. Press "OPEN" button **9**.

   ⇨ The valve moves slowly to the open position.
3. Also press "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 "ON-Site" DIP switch **8** to the "OFF" position.

   ⇨ Control on the device is deactivated.

⇨ The valve is in the open position.

16.2.2 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.

16.3 Operation via the web server

See separate "eSy-Web" operating instructions.

17 Inspection and maintenance

⚠ WARNING

The equipment is subject to pressure!

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

NOTICE

Use of incorrect spare parts!

- ► Damage to the GEMÜ product
- ► The manufacturer liability and guarantee will be void.
- ● Use only genuine parts from GEMÜ.

⚠ CAUTION

Hot plant components!

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

NOTICE

Exceptional maintenance work!

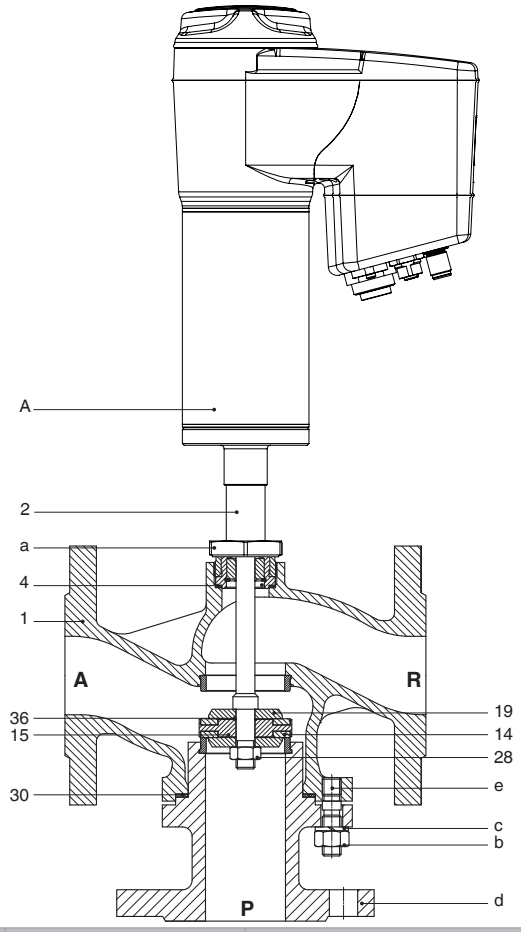
- ► Damage to the GEMÜ product
- ● Any maintenance work and repairs not described in these operating instructions must not be performed without consulting the manufacturer first.

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

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

1. Have servicing and maintenance work performed by trained personnel.
2. Wear appropriate protective gear as specified in plant operator's guidelines.
3. Shut off plant or plant component.
4. Secure the plant or plant component against recommissioning.
5. Depressurize the plant or plant component.
6. Actuate GEMÜ products which are always in the same position four times a year.
7. If necessary, the end position counter **User** can be reset after maintenance or other changes under parameter Cycle Counter.

17.1 Spare parts



Item	Name	Order designation
1	Valve body	K312.../K314...
2	Spindle	
4	Sealing washer	343...SVS
14	Seat seal	343...SVS
15	Valve plug	
19	Retaining washer	
28	Hexagon nut	
30	Gasket	343...SVS
36	O-ring	343...SVS
A	Actuator	9343...
a	Union nut	
b	Hexagon nut	
c	Washer	
d	Seat flange	
e	Stud bolt	

17.2 Removing the actuator

NOTICE

Gasket!

- Replace the gasket **4** and gasket/O-ring **30** each time the actuator is disassembled/assembled.

1. Move the actuator **A** to the open position (connection A-P open).
2. Undo and remove the screws **e**, hexagon nuts **b** and washers **c** on the seat flange **d**.
3. Pull the seat flange **d** downwards.
4. Remove the gasket/O-ring **30**.
5. Move the actuator **A** to the closed position (connection A-R open).
6. Undo and remove the hexagon nut **28** on the valve plug **15** with the retaining washer **19**.
7. Move the actuator **A** to the open position (connection A-P open).

⇨ The valve plug **15** becomes loose.

8. Move the actuator **A** to the closed position (connection A-R open).
9. Remove all of the loosened parts.
10. Loosen the union nut **a**.
11. Remove the actuator **A** from the valve body **1**.
12. Remove the gasket **4**.
13. Remove the electrical connections.
14. Clean all parts of contamination (do not damage parts during cleaning).
15. Check parts for potential damage, replace if necessary (only use genuine parts from GEMÜ).

17.3 Replacing the seals

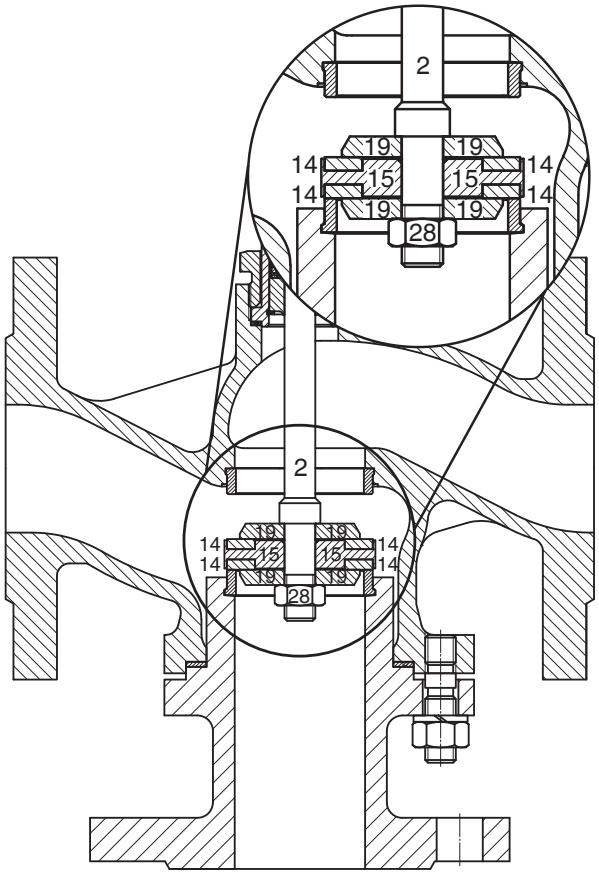


Fig. 6: Seat seal when installed

NOTICE

Steel seat seal

► The steel seat seal may only be replaced by GEMÜ. Send the **complete** valve to GEMÜ together with a completed return delivery note.

1. Remove actuator **A** (see chapter "Removing the actuator").
2. Loosen the retaining washer **19** on the spindle **2** (hold the spindle **2** in place using an appropriate tool that will not damage the spindle surface).
3. Remove the seat seal **14**.
4. Clean all parts of contamination (do not damage parts during cleaning).
5. Check parts for potential damage, replace if necessary (only use genuine parts from GEMÜ).
6. Insert the new seat seals **14** into the valve plug **15** from above and below.
7. Apply appropriate thread locking compound to the thread of the valve plug **15**.
8. Push the upper retaining washer **19** over the spindle **2**.
9. Place the O-ring **36** on the valve plug **15**.
10. Push the valve plug **15** with inserted seat seals **14** over the spindle **2**.
11. Push the lower retaining washer **19** over the spindle **2** and upwards as far as the valve plug **15**, and secure it with the hexagon nut **28**.
12. Mount actuator **A** (see chapter "Mounting the actuator").

17.4 Mounting the actuator

NOTICE

Gasket!

● Replace the gasket **4** and gasket/O-ring **30** each time the actuator is disassembled/assembled.

1. Move the actuator A to the open position (connection A-P open).
2. Insert a new gasket **4** in the valve body **1**.
3. Place the actuator **A** on the valve body **1** approx. 90° anticlockwise to the end position of the electrical connections and screw it on so that it is hand tight using the union nut **a**.

⇨ The actuator can be rotated through 360°. The electrical connections can be in any position.

4. Tighten the union nut **a** with an open-end wrench (for torques, see table). This causes the actuator to turn approx. 90° clockwise until it reaches the desired position.

Nominal size	Torques [Nm]
DN 15	100
DN 20	100
DN 25	100
DN 32	100
DN 40	100
DN 50	100
DN 65	120
DN 80	120
DN 100	120

5. Move the actuator **A** to the closed position (connection A-R open).
6. Insert the gasket/O-ring **30** into the seat flange **d**.
7. Connect the valve body **1** and the seat flange using screws, washers and nuts.
8. With the valve fully assembled, check that it is working correctly and that it is leak-tight.

17.5 Cleaning the product

- Clean the product with a damp cloth.
- Do **not** clean the product with a high pressure cleaning device.

18 Error messages

18.1 LED error messages

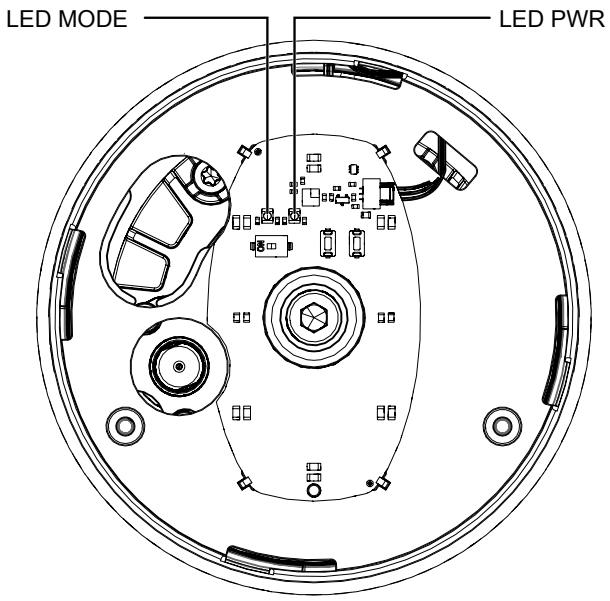
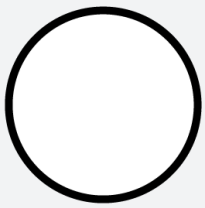
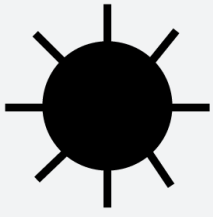
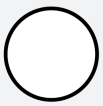
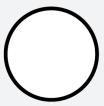
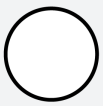
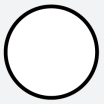
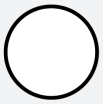
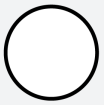
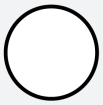
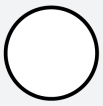
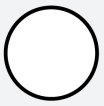
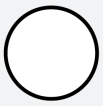
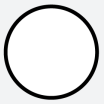
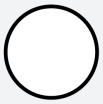
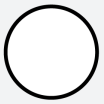
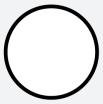
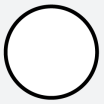
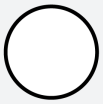


Fig. 7: Position of the status LEDs

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

Function	High visibility LED	
	green	orange
Error / Error display		

Function	LED MODE		LED PWR	
	yellow	blue	green	red
Undervoltage (no error display of the high visibility LED)				
Internal error	 alternating			 alternating
Calibration faulty	 simultaneously			 simultaneously
Initialization failure				
Temperature error (overtemperature)				
Set value error (< 4 mA, > 20 mA)				
Actual value error (< 4 mA, > 20 mA)				

18.2 Troubleshooting

Error	Possible cause	Troubleshooting
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
	Valve body leaking or damaged	Carry out initialisation, check valve body for damage, replace valve body if necessary.
The product does not close or does not 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 does not open or does not 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 is leaking between actuator and valve body	Bolting between valve body and actuator loose	Tighten bolting between valve body and actuator
	Actuator/valve body damaged	Replace actuator/valve body
The product is leaking between actuator flange and valve body	Mounting parts loose	Retighten mounting parts
	Valve body / actuator damaged	Replace valve body/actuator
Valve body of the GEMÜ product is leaking	Valve body of the GEMÜ product is faulty or corroded	Check valve body of the GEMÜ product for potential damage, replace valve body if necessary
Body of the GEMÜ product is leaking	Incorrect installation	Check installation of valve body in piping
Valve body connection to piping leaking	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

19 Removal from piping

⚠ WARNING

Corrosive chemicals!

► Risk of caustic burns

- Wear appropriate protective gear.
- Completely drain the plant.

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

20 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.

21 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.

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

EU Declaration of Incorporation

according to the EC Machinery Directive 2006/42/EC, Annex II B

We, the company	GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG Fritz-Müller-Strasse 6–8 74653 Ingelfingen-Criesbach, Germany

hereby declare under our sole responsibility that the below-mentioned product complies with the relevant essential health and safety requirements in accordance with Annex I of the above-mentioned Directive.

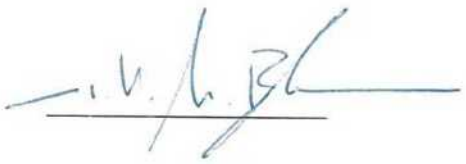
Product:	GEMÜ 343
Product name:	Motorized multi-port globe valve
The following essential health and safety requirements of the EC Machinery Directive 2006/42/EC, Annex I have been applied or adhered to:	1.1.2.; 1.1.3.; 1.1.5.; 1.3.2.; 1.3.4.; 1.3.7.; 1.3.8.; 1.5.1.; 1.5.13.; 1.5.2.; 1.5.4.; 1.5.6.; 1.5.7.; 1.5.8.; 1.6.1.; 1.6.3.; 1.6.5.; 1.7.1.; 1.7.1.1.; 1.7.2.; 1.7.3.; 1.7.4.; 1.7.4.1.; 1.7.4.2.; 1.7.4.3.
The following harmonized standards (or parts thereof) have been applied:	EN ISO 12100:2010

We also declare that the specific technical documents have been created in accordance with part B of Annex VII.

The manufacturer undertakes to transmit relevant technical documents on the partly completed machinery to the national authorities in response to a reasoned request. This communication takes place electronically.

This does not affect the industrial property rights.

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



M. Barghoorn
Head of Global Technics

Ingelfingen, 04/07/2023

23 EU Declaration of Conformity in accordance with 2014/68/EU (Pressure Equipment Directive)

EU Declaration of Conformity

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

We, the company	GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG Fritz-Müller-Strasse 6–8 74653 Ingelfingen-Criesbach, Germany

hereby declare under our sole responsibility that the below-mentioned product complies with the regulations of the above-mentioned Directive.

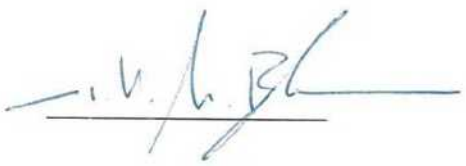
Product:	GEMÜ 343
Product name:	Motorized multi-port globe valve
Notified body:	TÜV Rheinland Industrie Service GmbH Am Grauen Stein 1 51105 Cologne, Germany
ID number of the notified body:	0035
No. of the QA certificate:	01 202 926/Q-02 0036
Conformity assessment procedure:	Module H1
The following harmonized standards (or parts thereof) have been applied:	EN 12516-3:2002/AC:2003

Information for products with a nominal size ≤ DN 25:

The products are developed and produced according to GEMÜ's in-house process instructions and standards of quality which comply with the requirements of ISO 9001 and ISO 14001. According to Article 4, Paragraph 3 of the Pressure Equipment Directive 2014/68/EU, these products must not be identified by a CE-marking.

Other applied technical standards / Remarks:

- AD 2000



M. Barghoorn
Head of Global Technics

Ingelfingen, 04/07/2023

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

24 EU Declaration of Conformity in accordance with 2014/30/EU (EMC Directive)

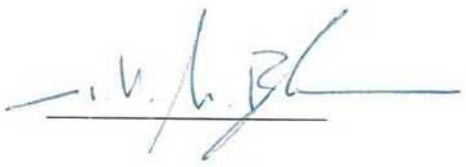
EU Declaration of Conformity

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

We, the company	GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG Fritz-Müller-Strasse 6–8 74653 Ingelfingen-Criesbach, Germany

hereby declare under our sole responsibility that the below-mentioned product complies with the regulations of the above-mentioned Directive.

Product:	GEMÜ 343
Product name:	Motorized multi-port globe valve
The following harmonized standards (or parts thereof) have been applied:	EN 61800-3:2004/A1:2012; EN 61000-6-2:2005/AC:2005 (valid for all types) EN 61326-1:2013; EN 61000-6-4:2007/A1:2011 (only valid for Actuator size 1 / Actuator size 0)



M. Barghoorn
Head of Global Technics

Ingelfingen, 04/07/2023

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25 EU Declaration of Conformity In accordance with 2011/65/EU (RoHS Directive)

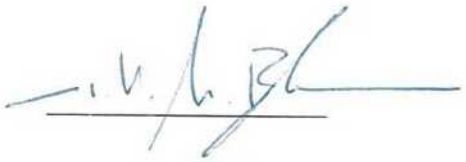
EU Declaration of Conformity

In accordance with 2011/65/EU (RoHS Directive)

We, the company	GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG Fritz-Müller-Strasse 6–8 74653 Ingelfingen-Criesbach, Germany

hereby declare under our sole responsibility that the below-mentioned product complies with the regulations of the above-mentioned Directive.

Product:	GEMÜ 343
Product name:	Motorized multi-port globe valve
The following harmonized standards (or parts thereof) have been applied:	EN IEC 63000:2018



M. Barghoorn
Head of Global Technics

Ingelfingen, 04/07/2023

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