

Globe Valve, Metal

Construction

The GEMÜ 538 motorized 2/2-way valve has a compact electric linear actuator with a motor designed for DC and AC operating voltages. The integrated gear translates the rotary motor movement into a linear movement. The actuator is available as an Open/Close version or with an integrated positioner and additional 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. The wiper ring fitted in front of the gland packing protects it against contamination and damage.

Features

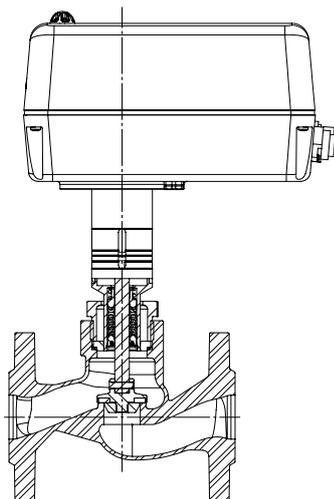
- OPEN/CLOSE function or CONTROL version
- Actuating speed and control parameters easily adjustable
- Optimized initialisation and valve control
- Parameterisation during operation
- Torque limitation
- Electronic limitation of opening and closing stroke
- Positioner and process controller are synchronized with each other
- Optional integrated emergency power supply module with selectable safety position
- Version with bellows (option)

Advantages

- High flow capability
- 2-colour LEDs with good visibility for indication of end position and travel direction
- Extensive integrated diagnostic functions
- Simple commissioning and versatile operating facilities
 - Fascia keys
 - PC connection with Internet browser MS® Internet Explorer
 - Field bus interfaces, e.g. Profibus DP
 - e^{sy}-com interface for connecting a Bluetooth module or industrial modem to enable access via PDA or PC



GEMÜ 538



Technical data

Working medium

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

Max. perm. pressure of working medium see table on page 3

Media temperature -10° to 180° C

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

Leakage rate

Leakage rate A to P11/P12 EN 12266-1

Operating conditions

Storage temperature -10 to +60°C

Ambient temperature see Derating curve on page 3

General information

Protection class to EN 60529 IP 65
Weight See table
Dimensions L x W x H See dimensional drawing
Mounting position Optional
Particulars: Safety function during electrical power supply failure (by optional emergency power supply module)

Position indication

LED 2-colour, good visibility

Directives

EC low voltage directive 73/23/EEC
EMC directive 89/336/EEC
Interference emission EN 61000-6-4
Interference resistance EN 61000-6-2
Rating 40%

Actuator materials

Housing cover PSU
Housing base PPS 40 glass reinforced
Distance piece 1.4301

Electrical data (all versions)

Power supply

Power supply $U_V = 24V DC \pm 10\%$
max. residual ripple $\pm 10\%$
 $U_V = 120V 50/60 Hz \pm 10\%$
 $U_V = 230V 50/60 Hz \pm 10\%$
Power consumption DC approx. 96 W
AC approx. 120 VA

Electrical connection (see electrical connection pages 6+7)

Power supply 1 x Binder series 693
Input/output signals 1 x M12 plug, A-coded
(not Profibus DP) 1 x M12 socket, A-coded
1 x M12 plug, B-coded

Operating elements

Keys 4 membrane protected fascia keys

Electrical data (Economy version)

Input signals

Control inputs 2 x 24V DC
Voltage $U_{rated} = 24V DC$
Level "Logical 1" $14V DC \leq U_H \leq 28V DC$
Level "Logical 0" $0V DC \leq U_L \leq 8V DC$
Input current $I_{typ} = 2.5 mA (@ 24V DC)$

Electrical data (Industrial version)

Input signals
Control inputs 2 x 24V DC

Digital inputs
Function 2 x (optional)
selectable (ON, OFF, safety position, loading of parameter set)

Voltage $U_{rated} = 24V DC$
Level "Logical 1" $14V DC \leq U_H \leq 28V DC$
Level "Logical 0" $0V DC \leq U_L \leq 8V DC$
Input current $I_{typ} = 2.5 mA (@ 24V DC)$

Output signals

Digital outputs
Number 2 relay outputs (potential-free)
Switching voltage = U_V
Switching current $\leq 0.5 A$
Function selectable
(position, warnings, errors)

Display elements

Text display 2-line display with 16 digits each, with background light
LED Field bus status
(only with Profibus DP version)

Interfaces

PC interface RS 232 with PPP protocol for Internet browser
Field bus Profibus DP V1 interface certified

Electrical data (Industrial version with integrated control module)

Analogue inputs *)
Set value external 0/4 - 20 mA (selectable)
(for version with positioner)

Actual value external 0/4 - 20 mA (selectable)
(for version with process controller)
Input resistance 120 Ω

Analogue output
Actual value position feedback 4 - 20 mA

Digital inputs

Number of integrated inputs 2 inputs (use of the analogue inputs)
Voltage $U_{rated} = 24V DC$
Level "Logical 1" $14V DC \leq U_H \leq 28V DC$
Level "Logical 0" $0V DC \leq U_L \leq 8V DC$
Input current $I_{typ} = 18 mA (@ 24V DC)$

Positioner

Deviation $\geq 0.1 \%$ (adjustable)
P D parameters adjustable
Initialisation automatic or manual

Process controller (for version with process controller)

Type of controller continuous controller
PID parameters adjustable

*) Analogue inputs can be used as digital inputs by external wiring with a resistor according to the operating instructions and software function.

Electrical data (optional integrated emergency power supply module)

Charging time max. 3 min
(for complete charging)

Additional current consumption during charging process max. 3 A
Number of guaranteed switching cycles at full load 1 switching cycle

Technical data

Mechanical actuator data

Actuator version 2D

Max. actuator stroke	28.8 mm
Actuating speed	max. 3.3 mm/sec.
Axial force	4500 N
Actuator size	2

Actuator version 3E

Max. actuator stroke	46.0 mm
Actuating speed	max. 2.5 mm/sec.
Axial force	5500 N
Actuator size	3

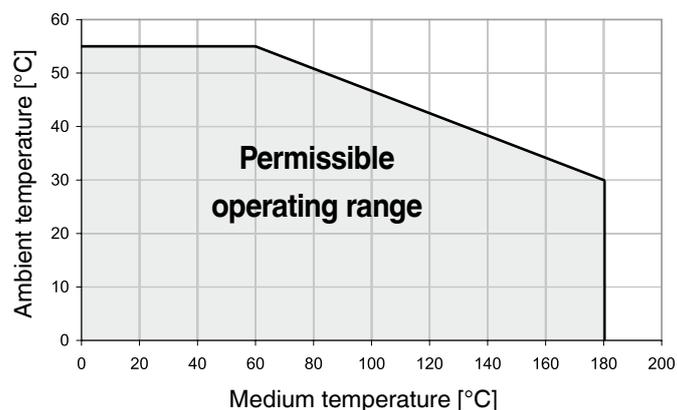
Actuator version 3F

Max. actuator stroke	46.0 mm
Actuating speed	max. 1.85 mm/sec.
Axial force	7800 N
Actuator size	3

Actuator version 3G

Max. actuator stroke	37.4 mm
Actuating speed	max. 1.04 mm/sec.
Axial force	14000 N
Actuator size	3

Derating curve



Max. operating pressure* [bar]

DN	Actuator version 2D	Actuator version 3E	Actuator version 3F	Actuator version 3G	Kv value [m ³ /h]
25	25	-	-	-	13.0
32	25	-	-	-	22.0
40	20	-	-	-	35.0
50	12	-	-	-	50.0
65	-	12	16	-	90.0
80	-	7	12	16	127.0
100	-	3	6	12	200.0

Operating pressure for seal material PTFE (code 5), for seal material steel (code 10) only 60% of the values indicated above.

* Please observe pressure / temperature correlation (see table below).

Kv values determined acc. to IEC 534 standard, flanges EN 1092.

Pressure / temperature correlation for globe valve bodies

Connection code	Material code	Max. allowable operating pressures in bar at temperature °C*					
		RT	100	150	200	250	300
8	37	16.0	16.0	14.5	13.4	12.7	11.8
10	37	25.0	25.0	22.7	21.0	19.8	18.5
11	37	40.0	40.0	36.3	33.7	31.8	29.7
39	37	19.0	16.0	14.8	13.6	12.0	10.2
8	90	16.0	16.0	15.5	14.7	13.9	11.2
39	90	17.2	16.0	14.8	13.9	12.1	10.2

* The valves can be used down to -10°C

RT = Room Temperature

All pressures are gauge pressures.

Pressure-temperature correlation for connection code 48: DN 15 - 40 see connection code 10, DN 50 see connection code 8.

Technical data

Features of the different actuator versions

Features	<i>SideStep</i> [®] <i>Economy</i> OPEN / CLOSE control	<i>SideStep</i> [®] <i>Industrial</i> OPEN / CLOSE control	<i>SideStep</i> [®] <i>Industrial</i> control system
	Code A*	Code C, D	Code S, T, P, R
2-line display	-	X	X
Automatic initialisation	X	X	X
4 fascia keys	X	X	X
Position indication by LED	X	X	X
Operating indication by LED	X	-	-
e. <i>sy</i> -com interface	-	X	X
Axial force (adjustable)	-	X	X
Actuating speed (adjustable)	-	X	X
Option Profibus	-	X	X
Positioner	-	-	X
Option process controller	-	-	X
Option digital inputs	-	X	X
Extended diagnostic facilities	-	X	X
Alarm outputs (adjustable)	-	X	X
Analogue output	-	-	X
Min / Max position (adjustable)	-	-	X

* not available for actuator version 3

Order data

Body configuration	Code
2/2-way body	D

Connection	Code
Flanges	
Flanges EN 1092 / PN16 / form B, length EN 558, series 1, ISO 5752, basic series 1	8
Flanges EN 1092 / PN25 / form B, length EN 558, series 1, ISO 5752, basic series 1	10
Flanges EN 1092 / PN40 / form B, length EN 558, series 1, ISO 5752, basic series 1	11
Flanges ANSI CLASS 125/150 RF, length EN 558, series 1, ISO 5752, basic series	39
Flanges drilled according to JIS 20K (DN 15 - 40), Flanges drilled according to JIS 10K (DN 50), length EN 558, series 10, ASME/ANSI B 16.10 table 1, column 16	48

Valve body material	Code
1.4408, cast stainless steel	37
EN-GJS-400-18-LT (GGG 40.3) SG iron	90

Seat seal	Code
PTFE	5
PTFE, glass reinforced	5G
Steel	10
Other seat seals such as NBR, etc. available on request	

Supply voltage/mains frequency	Code
24V DC	C1
120V 50/60 Hz	G4
230V 50/60 Hz	L4

Main function	Code
OPEN/CLOSE control (Economy) * (not available for actuator version 3)	A
OPEN/CLOSE control (Industrial)	C
OPEN/CLOSE control (Industrial) + emergency power supply module (not available for actuator version 3)	D
Positioner	S
Positioner + emergency power supply module (not available for actuator version 3)	T
Process controller and positioner	P
Process controller and positioner + emergency power supply module (not available for actuator version 3)	R

* With version "Main function A (Economy)" no options are possible.

Option	Code
Without option	0
Digital inputs	1
Profibus DP	2

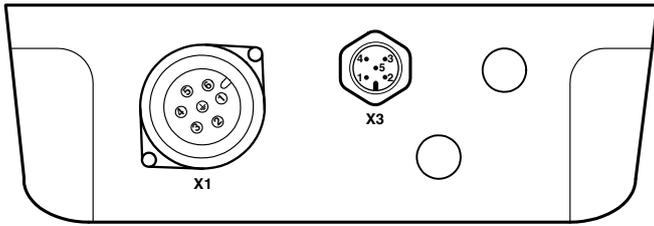
R-Number	Code
Version with regulating cone on request	-

Actuator version	Code
Actuator size 2, actuating force 4500 N	2D
Actuator size 3, actuating force 5500 N	3E
Actuator size 3, actuating force 7800 N	3F
Actuator size 3, actuating force 14000 N	3G

Note
Overview available valve bodies see table on page 8

Order example	538	25	D	8	90	5	C1	A	0	-	2D
Type	538										
Nominal size		25									
Body configuration (code)			D								
Connection (code)				8							
Valve body material (code)					90						
Seat seal (code)						5					
Supply voltage/mains frequency (code)							C1				
Main function (code)								A			
Option (code)									0		
R-Number (code) - Version with regulating cone on request										-	
Actuator version (code)											2D

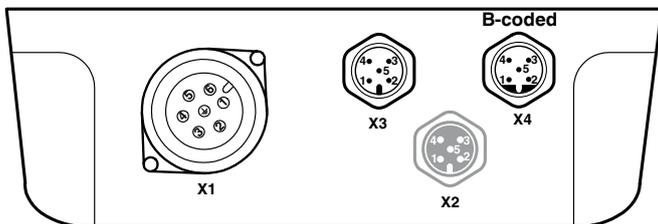
Electrical connection - OPEN/CLOSE Economy



Connection	Pin	Signal name
X 3 M12 plug A-coded	1	U _v , signal supply, 24V DC
	2	L+, direction of travel OPEN
	3	GND, direction of travel OPEN/CLOSED
	4	L+, direction of travel CLOSED
	5	Input, keypad lock, 24V DC

Connection	Pin	Signal name
X 1 Connector Binder series 693	1	U _v , L1 / L+ supply voltage
	2	U _v , N / L- supply voltage
	3	n.c.
	4	n.c.
	5	n.c.
	6	n.c.
	PE	Protective earth conductor

Electrical connection - OPEN/CLOSE Industrial



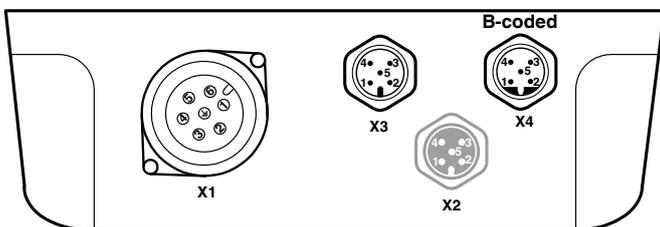
Connection	Pin	Signal name
X 2 * M12 socket A-coded	1	U _v , signal supply, 24V DC
	2	Digital input 1
	3	GND, signal supply
	4	Digital input 2
	5	n.c.

Connection	Pin	Signal name
X 3 M12 plug A-coded	1	L+, direction of travel OPEN
	2	GND, direction of travel OPEN
	3	L+, direction of travel CLOSED
	4	GND, direction of travel CLOSED
	5	n.c.

Connection	Pin	Signal name
X 4 M12 plug B-coded	1	n.c.
	2	n.c.
	3	RxD, Receive Data, RS 232
	4	TxD, Transmit Data, RS 232
	5	GND, RS 232

* Connection X 2 only available as Option Digital inputs Code 1

Electrical connection - Positioner/ process controller



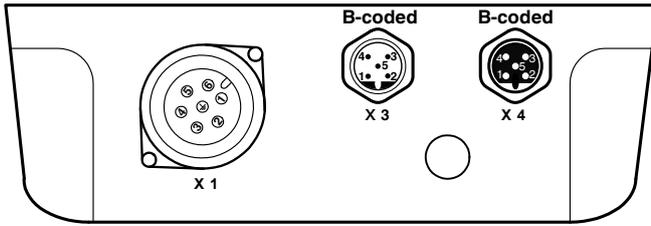
Connection	Pin	Signal name
X 2 * M12 socket A-coded	1	U _v , signal supply, 24V DC
	2	Digital input 1
	3	GND, signal supply
	4	Digital input 2
	5	n.c.

Connection	Pin	Signal name
X 3 M12 plug A-coded	1	I+, set value input 0/4 - 20 mA
	2	I-, set value input 0/4 - 20 mA
	3	I+, actual value output 4 - 20 mA
	4	I-, actual value output 4 - 20 mA
	5	n.c.

Connection	Pin	Signal name
X 4 M12 plug B-coded	1	I+, actual value input 0/4 - 20 mA
	2	I-, actual value input 0/4 - 20 mA
	3	RxD, Receive Data, RS 232
	4	TxD, Transmit Data, RS 232
	5	GND, RS 232

* Connection X 2 only available as Option Digital inputs Code 1

Electrical connection - Profibus DP



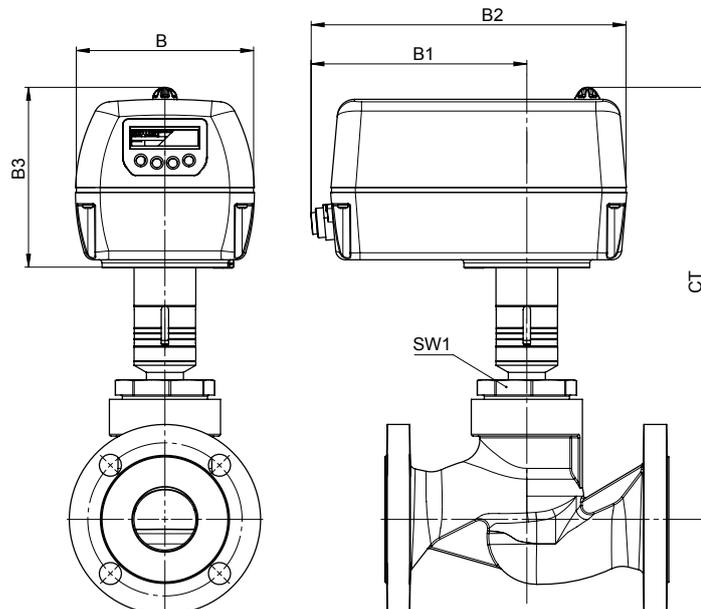
Connection	Pin	Signal name
X 3 M12 plug B-coded	1	n.c.
	2	RxD / TxD-N
	3	n.c.
	4	RxD / TxD-P
	5	Shield

Connection	Pin	Signal name
X 1 Connector Binder series 693	1	U _v , L1 / L+ supply voltage
	2	U _v , N / L- supply voltage
	3	n. c.
	4	n. c.
	5	n. c.
	6	n. c.
	PE	Protective earth conductor

Connection	Pin	Signal name
X 4 M12 socket B-coded	1	BUS-VDC, +5 V DC
	2	RxD / TxD-N
	3	GND
	4	RxD / TxD-P
	5	Shield

Dimensions [mm]

Installation dimensions												Weight [kg] (Actuator)		
DN	Material code		Actuator version									Actuator version		
			2D					3E, 3F, 3G						
	37	90	Material code 37, 90					Material code 37, 90						
	SW 1		B	B1	B2	B3	CT	B	B1	B2	B3	CT	2D	3E, 3F, 3G
25	46	46	145	175	256	148	330	-	-	-	-	-	6.5	-
32	55	55	145	175	256	148	335	-	-	-	-	-	6.5	-
40	60	60	145	175	256	148	346	-	-	-	-	-	6.8	-
50	75	75	145	175	256	148	354	-	-	-	-	-	7.0	-
65	60	75	-	-	-	-	-	170	203	296	197	481	-	10.0
80	60	75	-	-	-	-	-	170	203	296	197	496	-	10.5
100	75	75	-	-	-	-	-	170	203	296	197	517	-	11.0

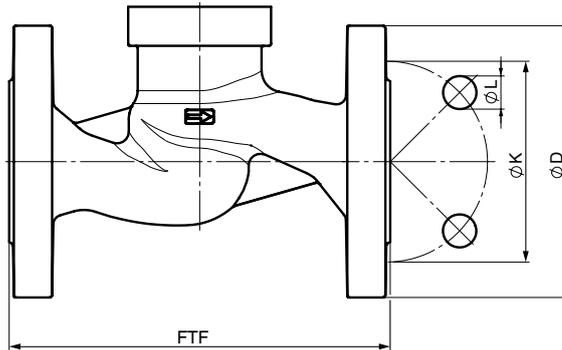


Body dimensions [mm]

Flanges, connection code 8, 10, 11, 39, 48
Valve body material 1.4408 (code 37), EN-GJS-400-18-LT (code 90)

DN	Number of bolts	Connection code 8, 10, 11				Connection code 39				Connection code 48				Weight [kg]
		FTF	ø D	ø K	ø L	FTF	ø D	ø K	ø L	FTF	ø D	ø K	ø L	
25	4	160	115	85	14	160	110	79.4	15.9	127	125	90	19	3.7
32	4	180	140	100	18	180	115	88.9	15.9	-	-	-	-	5.3
40	4	200	150	110	18	200	125	98.4	15.9	165	140	105	19	6.3
50	4	230	165	125	18	230	150	120.7	19.0	203	155	120	19	8.4

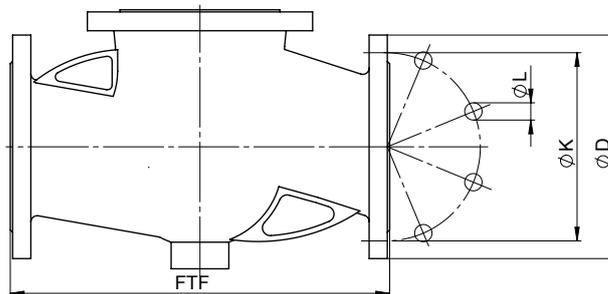
For materials see overview on page 9



Flanges, connection code 8, 39
Valve body material 1.4408 (code 37), EN-GJS-400-18-LT (code 90)

DN	FTF	Connection code 8				Connection code 39				Weight [kg]
		ø D	ø K	ø L	Number of bolts	ø D	ø K	ø L	Number of bolts	
65	290	185	145	18	4	180	139.7	19	4	12.7
80	310	200	160	18	8	190	152.4	19	4	15.4
100	350	220	180	18	8	230	190.5	19	8	23.0

For materials see overview on page 9



Body dimensions [mm]

Overview of metal bodies for GEMÜ 538

Connection code	8		10	11	39		48
Material code	37	90	37	37	37	90	37
DN 25	-	X	-	X	X	X	X
DN 32	-	X	X	X	X	X	-
DN 40	-	X	X	X	X	X	X
DN 50	X	X	-	-	X	X	X
DN 65	X	X	-	-	X*	X	-
DN 80	X	X	-	-	X*	X	-
DN 100	X	X	-	-	X*	X	-

* DIN flange drilled to ANSI Class 150

Technical data sheet

Should there be any doubts or misunderstandings, the German version of this data sheet is the authoritative document!

Subject to alteration · 01/2016 · 88380442

For further globe valves, accessories and other products, please see our Product Range catalogue and Price List.
Contact GEMÜ.

GEMÜ® VALVES, MEASUREMENT
AND CONTROL SYSTEMS

