Angle Seat Globe Valve, Metal

Construction

The GEMÜ 548 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.

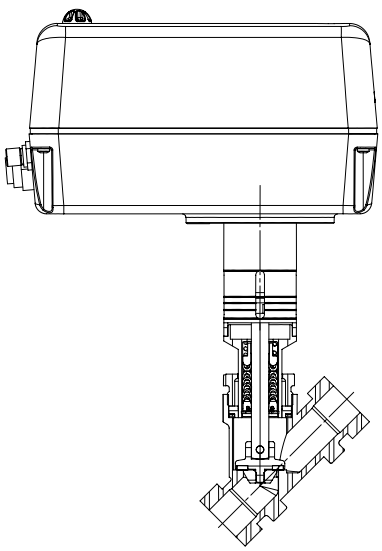
Features

- 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 548



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

Flow direction: flow under the seat

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 ± 10% max. residual ripple ± 10% U_V = 120V 50/60 Hz ± 10% U_V = 230V 50/60 Hz ± 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 (not Profibus DP)	1 x M12 plug, A-coded 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 ≤ U_H ≤ 28V DC
Level "Logical 0"	0V DC ≤ U_L ≤ 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	2 x (optional)
Function	selectable (ON, OFF, safety position, loading of parameter set)
Voltage	U_{rated} = 24V DC
Level "Logical 1"	14V DC ≤ U_H ≤ 28V DC
Level "Logical 0"	0V DC ≤ U_L ≤ 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	≤ 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 ≤ U_H ≤ 28V DC
Level "Logical 0"	0V DC ≤ U_L ≤ 8V DC
Input current	I_{typ} = 18 mA (@ 24V DC)

Positioner

Deviation	≥ 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)

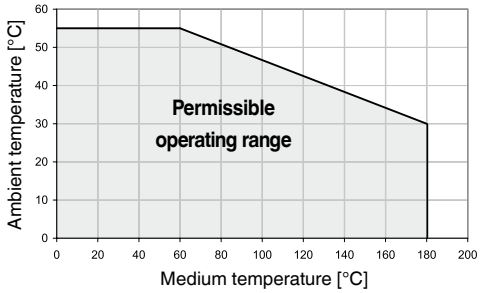
Charging time	max. 3 min (for complete charging)
Additional current consumption during charging process	max. 3 A
Number of guaranteed switching cycles at full load	1 switching cycle

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

Derating curve



Pressure / temperature correlation for globe valve bodies

Connection code	Material code	Max. allowable operating pressures in bar at temperature °C*						
		RT	50	100	150	200	250	300
1, 3D, 9 (up to DN 50)	9	16.0	16.0	16.0	16.0	13.5	-	-
1, 9 (from DN 65)	9	10.0	10.0	10.0	10.0	8.5	-	-
1, 9, 17, 37, 60, 3C, 3D	37	25.0	23.7	21.3	19.2	17.7	16.4	15.4
0, 16, 17, 18, 37, 59, 60	34	25.0	24.2	21.2	19.3	17.9	16.8	15.9
88 (DN 15 - DN 40)	34	25.0	24.2	21.2	19.3**	-	-	-
88 (DN 50 - DN 80)	34	16.0	16.0	16.0	16.0**	-	-	-
82 (DN 15 - DN 32)	34	25.0	24.2	21.2	19.3**	-	-	-
82 (DN 40 - DN 65)	34	16.0	16.0	16.0	16.0**	-	-	-
86 (DN 15 - DN 40)	34	25.0	24.2	21.2	19.3**	-	-	-
86 (DN 50 - DN 65)	34	16.0	16.0	16.0	16.0**	-	-	-

* The valves can be used down to -10°C ** max. temperature 140 °C RT = Room Temperature
All pressures are gauge pressures.

Max. operating pressure [bar] / Kv value [m^3/h]

Actuator version 2D			Actuator version 3F	
DN	Max. operating pressure*	Kv value	Max. operating pressure*	Kv value
25	25	15.5	-	-
32	25	27.0	-	-
40	20	41.0	-	-
50	12	63.0	-	-
65	8	91.0	16	103
80	6	120.0	14	135

* Please note that cast bronze valve bodies, when in pipe systems according to DIN, are only suitable up to PN 16, cast stainless steel bodies up to PN 25. All pressures are gauge pressures. Sealing at the valve seat and atmospheric sealing is ensured for the given values. Larger actuators are available for higher operating pressures - consult GEMÜ. Kv values: tolerance ±10%.

Technical data

Features of the different actuator versions			
Features	***SideStep® Economy*** **OPEN / CLOSE control**	***SideStep® Industrial*** **OPEN / CLOSE control**	***SideStep® Industrial*** **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.sy-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
Angle body only in material code 37 (DN 15 - 50)	E

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

Connection	Code
Butt weld spigots	
Spigots DIN	0
Spigots DIN 11850, series 1	16
Spigots DIN 11850, series 2	17
Spigots DIN 11850, series 3	18
Spigots SMS 3008	37
Spigots ASME BPE	59
Spigots EN ISO 1127	60
Threaded connections	
Threaded sockets DIN ISO 228	1
Threaded sockets BS 21 Rc length DIN 3202-4 series M8	3C
Threaded spigots DIN ISO 228	9
Threaded sockets NPT length DIN 3202-4 series M8	3D
Clamp connections	
Clamps following ASME BPE for pipe EN ISO 1127, length EN 558, series 1	82
Clamps DIN 32676 for pipe DIN 11850, length EN 558, series 1	86
Clamps ASME BPE for pipe ASME BPE, length EN 558, series 1	88

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

Valve body material	Code
(Rg 5) CC499K, Cast bronze	9
1.4435 (ASTM A 351 CF3M ≙ 316L), Investment casting	34
1.4408, Cast stainless steel	37

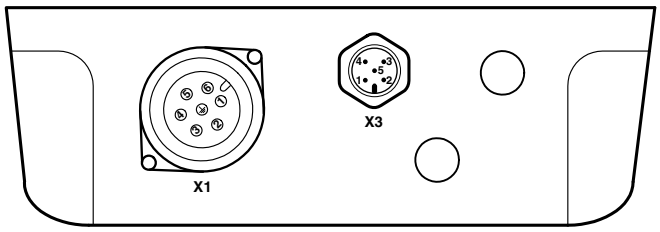
R-Number	Code
Version with regulating cone on request	-

Seat seal	Code
PTFE	5

Actuator version	Code
Actuator size 2, actuating force 4500 N	2D
Actuator size 3, actuating force 7800 N	3F

Order example	548	25	D	1	9	5	C1	A	0	-	2D
Type	548										
Nominal size		25									
Body configuration (code)			D								
Connection (code)				1							
Valve body material (code)					9						
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

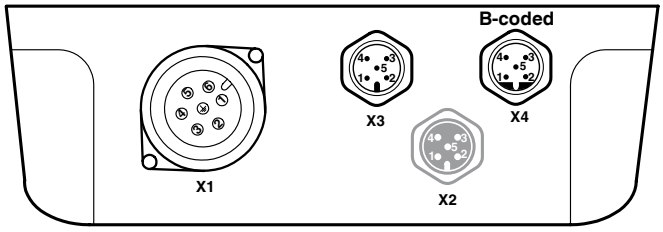
Electrical connection - OPEN/CLOSE Economy



Connection	Pin	Signal name
X 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 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

Electrical connection - OPEN/CLOSE Industrial



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	Common, relay output K1
	4	Make-contact, relay output K1
	5	Common, relay output K2
	6	Make-contact, relay output K2
	PE	Protective earth conductor

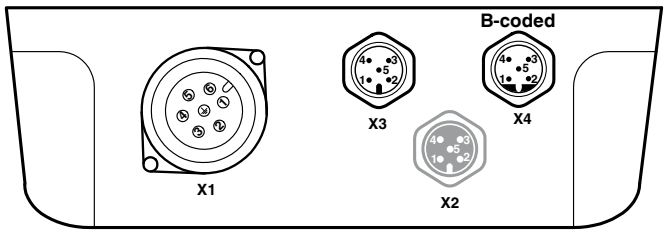
Connection	Pin	Signal name
X 2 * M12 socket A-coded	1	U_V, signal supply, 24V DC
	2	Digital input 1
	3	GND, signal supply
	4	Digital input 2
	5	n.c.

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 1 Connector Binder series 693	1	U_V, L1 / L+ supply voltage
	2	U_V, N / L- supply voltage
	3	Common, relay output K1
	4	Make-contact, relay output K1
	5	Common, relay output K2
	6	Make-contact, relay output K2
	PE	Protective earth conductor

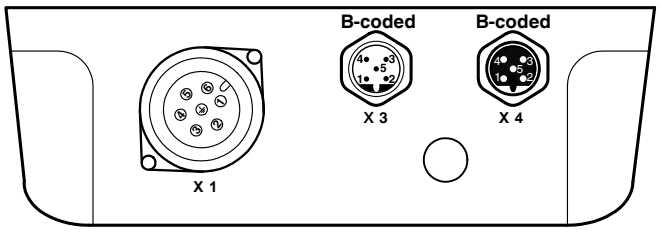
Connection	Pin	Signal name
X 2 * M12 socket A-coded	1	U_V, signal supply, 24V DC
	2	Digital input 1
	3	GND, signal supply
	4	Digital input 2
	5	n.c.

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

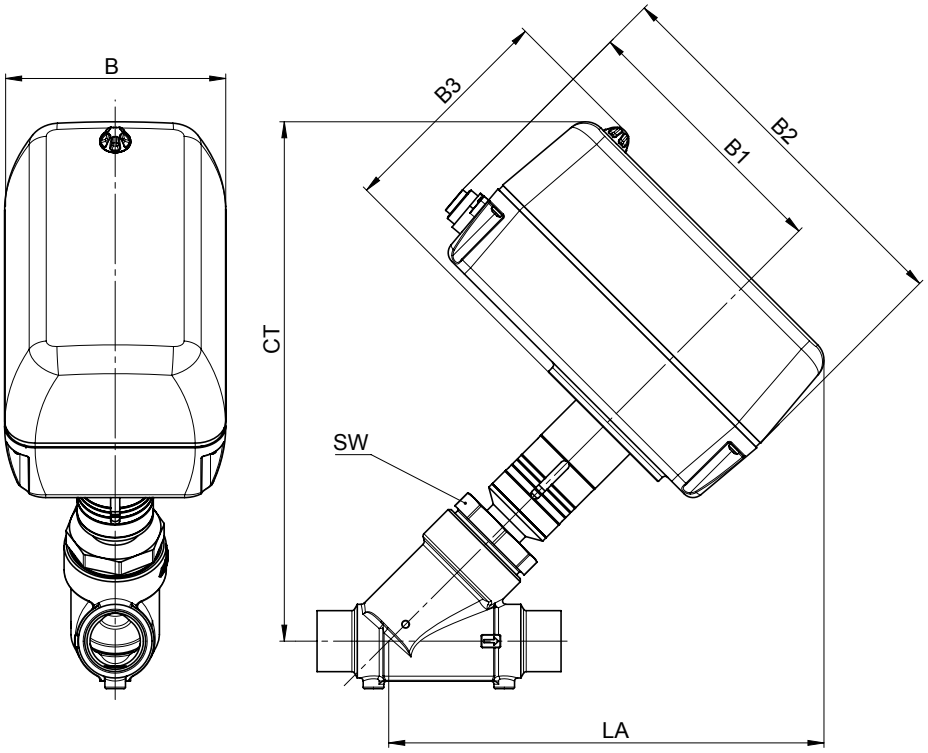
Connection	Pin	Signal name
X 1 Connector Binder series 693	1	U_V, L1 / L+ supply voltage
	2	U_V, N / L- supply voltage
	3	n. c.
	4	n. c.
	5	n. c.
	6	n. c.
	PE	Protective earth conductor

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

Actuator dimensions / Installation dimensions - Valve with 2/2-way body [mm]

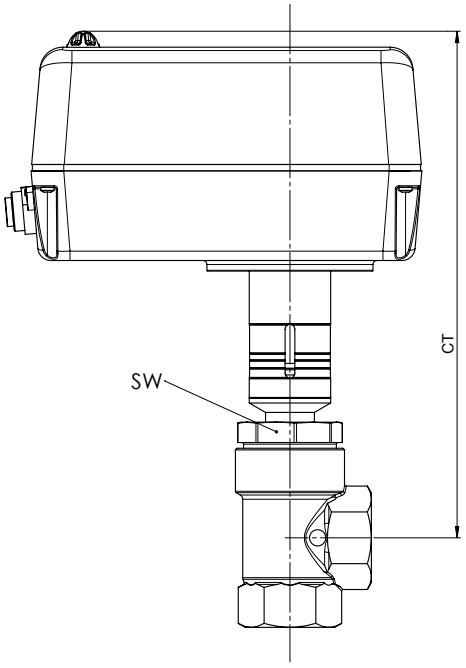
Actuator dimensions				
Actuator size	**B**	**B1**	**B2**	**B3**
2D	145	175	256	148
3F	170	203	296	197

		Installation dimensions - 2/2-way body [mm]				Weight [kg] (actuator only)	
		Actuator version 2D		Actuator version 3F		Actuator version	
DN	**SW1**	**CT**	**LA**	**CT**	**LA**	**2D**	**3F**
25	46	340	273	-	-	6.5	-
32	55	348	281	-	-	6.5	-
40	60	354	287	-	-	6.8	-
50	75	362	295	-	-	7.0	-
65	75	374	307	464	386	7.7	10.0
80	75	391	324	481	403	8.2	10.5



Installation dimensions - Valve with angle body [mm]

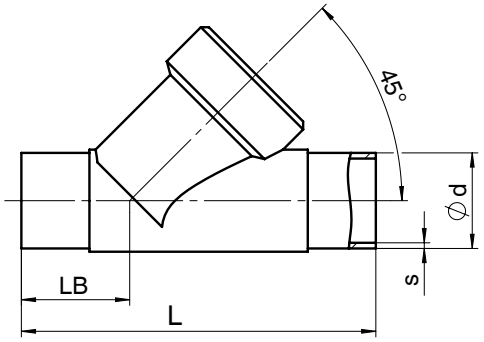
Installation dimensions			
Actuator version 2D			
DN	SW1	CT	Weight [kg] (actuator only)
25	46	301	6.5
32	55	304	6.5
40	60	309	6.8
50	75	316	7.0



Body dimensions [mm]

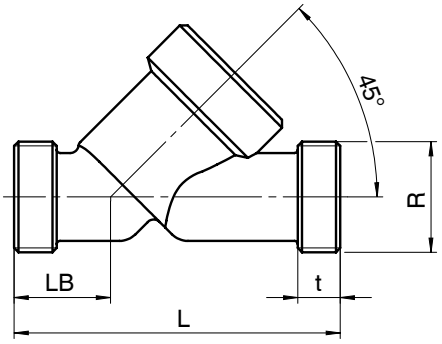
Butt weld spigots, connection code 0, 16, 17, 18, 37, 59, 60 Valve body material: 1.4435 (code 34), 1.4408 (code 37)																		
					Connection code													
	Material code 34		Material code 37		0		16		17		18		37		59		60	
DN	L	LB	L	LB	d	s	d	s	d	s	d	s	d	s	d	s	d	s
25	125	38.5	112	32	28	1.5	28	1.0	29	1.5	30	2.0	25.0	1.2	25.40	1.65	33.7	2.0
32	155	48.0	137	39	-	-	34	1.0	35	1.5	36	2.0	-	-	-	-	42.4	2.0
40	160	47.0	146	40	40	1.5	40	1.0	41	1.5	42	2.0	38.0	1.2	38.10	1.65	48.3	2.0
50	180	48.0	160	38	52	1.5	52	1.0	53	1.5	54	2.0	51.0	1.2	50.80	1.65	60.3	2.0
65	-	-	290	96	-	-	-	-	70	2.0	-	-	63.5	1.6	63.50	1.65	76.1	2.0
80	-	-	310	95	-	-	-	-	85	2.0	-	-	76.1	1.6	76.20	1.65	88.9	2.3

For materials see overview on last page



Threaded spigots, connection code 9 Valve body material: Cast bronze (code 9), 1.4408 (code 37)				
DN	L	LB	t	R
25	118	30	15	G 1 1/4
32	130	38	13	G 1 1/2
40	140	35	13	G 1 3/4
50	175	50	15	G 2 3/8
65	216	52	15	G 3
80	254	64	18	G 3 1/2

For materials see overview on last page



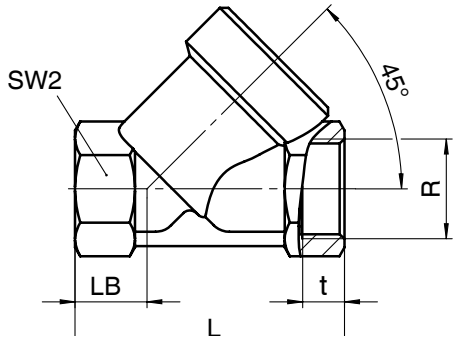
Body dimensions [mm]

Threaded sockets DIN, connection code 1 Valve body material: Cast bronze (code 9), 1.4408 (code 37)						
DN	**L**	**LB**	**R**	**t**	**SW2**	
25	90	24	G 1	19.1	41	hexagonal
32	110	33	G 1 1/4	21.4	50	octagonal
40	120	30	G 1 1/2	21.4	55	octagonal
50	150	40	G 2	25.7	70	octagonal
65	190	46	G 2 1/2	30.2	85	octagonal
80	220	50	G 3	33.3	100	octagonal

For materials see overview on last page

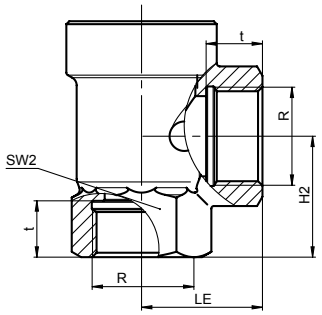
Threaded sockets NPT, BS 21 Rc, connection code 3C, 3D Valve body material: Cast bronze (code 9), 1.4408 (code 37)								
					Connection code 3C		**Connection code 3D**	
DN	**L**	**LB**	**SW2**		**R**	**t**	**R**	**t**
25	90	24	41	hexagonal	Rc 1	19.1	1” NPT	17.0
32	110	33	50	octagonal	Rc 1 1/4	21.4	1 1/4” NPT	18.0
40	120	30	55	octagonal	Rc 1 1/2	21.4	1 1/2” NPT	18.0
50	150	40	70	octagonal	Rc 2	25.7	2” NPT	18.0
65	190	46	85	octagonal	Rc 2 1/2	30.2	2 1/2” NPT	23.7
80	220	50	100	octagonal	Rc 3	33.3	3” NPT	25.8

For materials see overview on last page

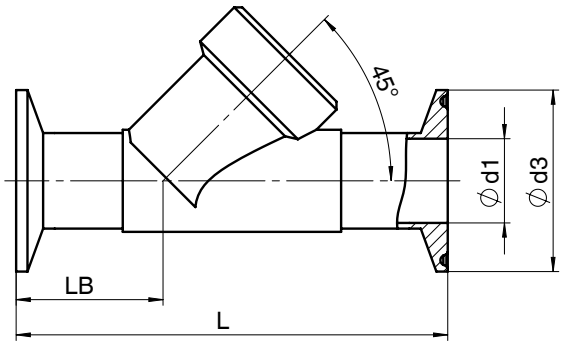


Body dimensions [mm]

Threaded sockets DIN, connection code 1, 3D / Angle body Valve body material: 1.4408 (code 37)							
				Connection code 1		Connection code 3D	
DN	SW2	LE	H2	R	t	R	t
25	41	41	41.0	G 1	19.1	1” NPT	17.0
32	50	50	48.0	G 1 1/4	21.4	1 1/4” NPT	17.5
40	55	50	55.0	G 1 1/2	21.4	1 1/2” NPT	17.3
50	70	60	62.0	G 2	25.7	2” NPT	17.8



Clamp connections, connection code 82, 86, 88 Valve body material: 1.4435 (code 34)									
				Connection code					
				82		86		88	
DN	NPS	LB	LC	d1	d3	d1	d3	d1	d3
25	1”	56.0	160	29.7	50.5	26	50.5	22.1	50.5
32	1 1/4”	60.5	180	38.4	64.0	32	50.5	-	-
40	1 1/2”	67.0	200	44.3	64.0	38	50.5	34.8	50.5
50	2”	73.0	230	56.3	77.5	50	64.0	47.5	64.0



Overview of metal bodies for GEMÜ 548

	Spigots										
Connection code	**0**	**16**	**17**		**18**	**37**		**59**		**60**	
Material code	**34**	**34**	**34**	**37**	**34**	**34**	**37**	**34**	**37**	**34**	**37**
DN 25	X	X	X	X	X	X	-	X	-	X	X
DN 32	-	X	X	X	X	-	-	-	-	X	X
DN 40	X	X	X	X	X	X	-	X	-	X	X
DN 50	X	X	X	X	X	X	-	X	-	X	X
DN 65	-	-	-	X	-	-	X	-	X	-	X
DN 80	-	-	-	X	-	-	X	-	X	-	X

Overview of metal bodies for GEMÜ 548

	Threaded connections									Clamps		
Connection code	**1**			**3C**	**9**		**3D**			**82**	**86**	**88**
Material code	**9**	**37**	**37**	**37**	**9**	**37**	**9**	**37**	**37**	**34**	**34**	**34**
Body configuration		**2/2-way body**	**Angle body**					**2/2-way body**	**Angle body**			
DN 25	X	X	X	X	X	X	X	X	X	X	X	X
DN 32	X	X	X	X	-	X	X	X	X	X	X	-
DN 40	X	X	X	X	X	X	X	X	X	X	X	X
DN 50	X	X	X	X	X	X	X	X	X	X	X	X
DN 65	X	X	-	X	X	X	-	X	-	-	-	-
DN 80	X	X	-	X	X	X	-	X	-	-	-	-

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GEMÜ® VALVES, MEASUREMENT AND CONTROL SYSTEMS

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GEMÜ Gebr.Müller · Apparatebau GmbH & Co.KG · Fritz-Müller-Str. 6-8 · D-74653 Ingelfingen-Criesbach · Telefon +49(0)7940/123-0 · Telefax +49(0)7940/123-192
info@gemue.de · www.gemu-group.com

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