

## 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

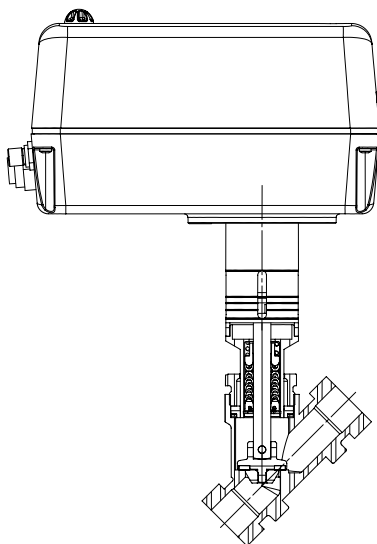
- OPEN/CLOSE function or CONTROL version
- Actuating speed and control parameters easily adjustable
- Optimized initialisation and valve control
- Parameterisation during operation
- Torque limitation
- Electronic limitation of opening and closing stroke
- Positioner and process controller are synchronized 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.s<sup>y</sup>-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 mm <sup>2</sup> /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	$U_V = 24V DC \pm 10\%$ 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 (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"	$14V DC \leq U_H \leq 28V DC$
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 $\Omega$
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	
Number of guaranteed switching cycles at full load	max. 3 A 1 switching cycle

## Technical data

### Mechanical actuator data

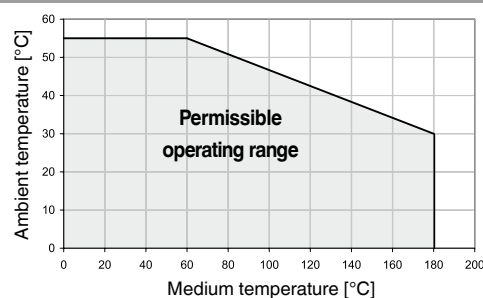
#### Actuator version 2D

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, 3C, 3D, 9 (up to DN 50)	9	16.0	16.0	16.0	16.0	13.5	-	-
1, 3C, 3D, 9 (from DN 65)	9	10.0	10.0	10.0	10.0	8.5	-	-
1, 9, 10, 17, 37, 59, 60, 3C, 3D	37	25.0	23.7	21.3	19.2	17.7	16.4	15.4
0, 13, 16, 17, 18, 37, 59, 60	34	25.0	24.2	21.2	19.3	17.9	16.8	15.9
88	34	13.8	13.1	11.9	11.4**	-	-	-
82, 86	34	16.0	16.0	16.0	16.0***	-	-	-

\* The valves can be used down to -10°C  
All pressures are gauge pressures.

\*\* max. temperature 121 °C

\*\*\* max. temperature 140 °C

RT = Room Temperature

### Max. operating pressure [bar] / Kv value [m<sup>3</sup>/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%.

### 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

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

Connection	Code
<b>Butt weld spigots</b>	
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
<b>Threaded connections</b>	
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
<b>Flanges</b>	
Flanges EN 1092 / PN25 / form B length EN 558, series 1	10
Flanges EN 1092 / PN25 / form B	13
<b>Clamp connections</b>	
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 $\cong$ 316L), Investment casting	34
1.4408, Cast stainless steel	37

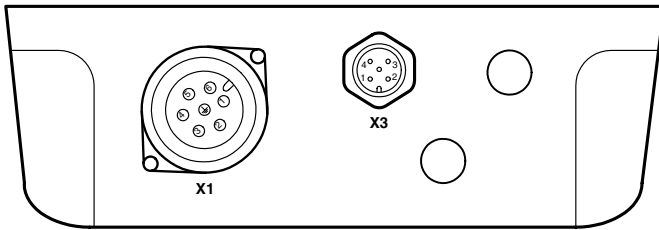
R-Number	Code
Version with regulating cone on request	-

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

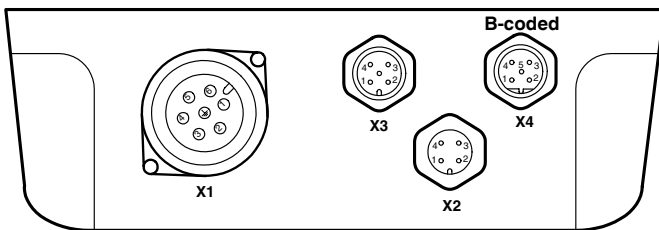
## Electrical connection - OPEN/CLOSE Economy



Connection	Pin	Signal name
X3 M12 plug A-coded	1	U <sub>v</sub> , 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
X1 Connector Binder series 693	1	U <sub>v</sub> , L1 / L+ supply voltage
	2	U <sub>v</sub> , 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



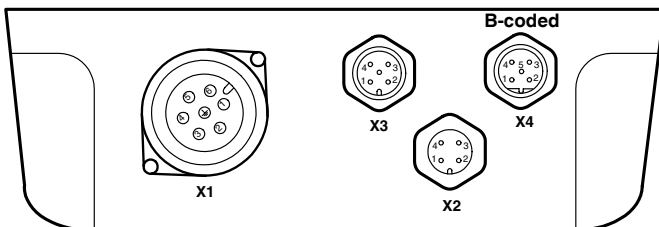
Connection	Pin	Signal name
X2 M12 socket A-coded	1	U <sub>v</sub> , signal supply, 24V DC
	2	Digital input 1 (optional)
	3	GND, signal supply
	4	Digital input 2 (optional)

Connection	Pin	Signal name
X3 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
X1 Connector Binder series 693	1	U <sub>v</sub> , L1 / L+ supply voltage
	2	U <sub>v</sub> , 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
X4 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

## Electrical connection - Positioner / process controller



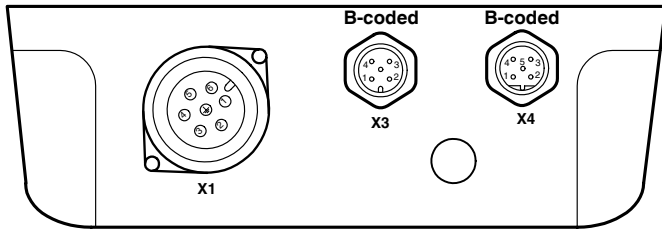
Connection	Pin	Signal name
X2 M12 socket A-coded	1	U <sub>v</sub> , signal supply, 24V DC
	2	Digital input 1 (optional)
	3	GND, signal supply
	4	Digital input 2 (optional)

Connection	Pin	Signal name
X3 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
X1 Connector Binder series 693	1	U <sub>v</sub> , L1 / L+ supply voltage
	2	U <sub>v</sub> , 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
X4 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

## Electrical connection - Profibus DP

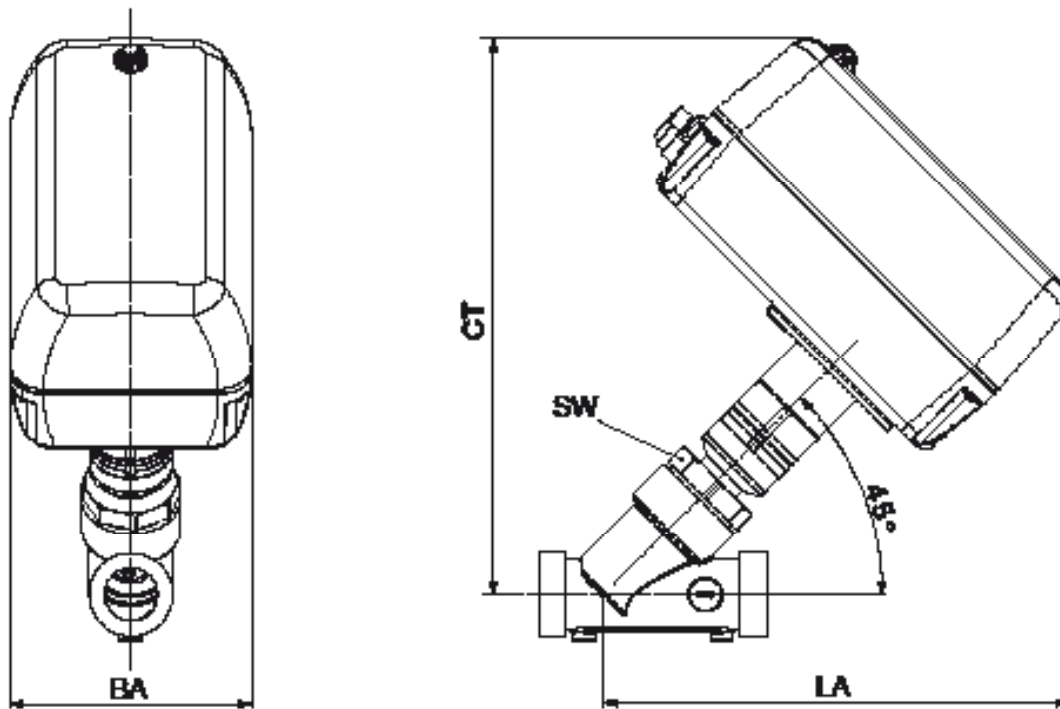


Connection	Pin	Signal name
X3 M12 plug B-coded	1	n.c.
	2	RxD / TxD-N
	3	n.c.
	4	RxD / TxD-P
	5	Shield

Connection	Pin	Signal name
X1 Connector Binder series 693	1	Uv, L1 / L+ supply voltage
	2	Uv, N / L- supply voltage
	3	n.c.
	4	n.c.
	5	n.c.
	6	n.c.
	PE	Protective earth conductor

Connection	Pin	Signal name
X4 M12 socket B-coded	1	BUS-VDC, +5V DC
	2	RxD / TxD-N
	3	GND
	4	RxD / TxD-P
	5	Shield

## Installation dimensions [mm]



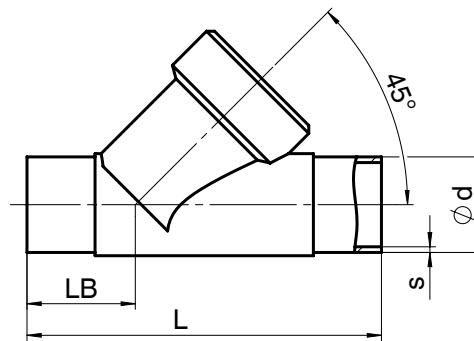
		Installation dimensions [mm]						Weight [kg] (actuator only)	
		Actuator version 2D			Actuator version 3F			Actuator version	
DN	SW1	BA	CT	LA	BA	CT	LA	2D	3F
25	45	145	329	273	-	-	-	6.5	-
32	55	145	337	281	-	-	-	6.5	-
40	60	145	343	287	-	-	-	6.8	-
50	75	145	351	295	-	-	-	7.0	-
65	75	145	363	307	170	451	395	7.7	10.0
80	75	145	380	324	170	468	401	8.2	10.5

## 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

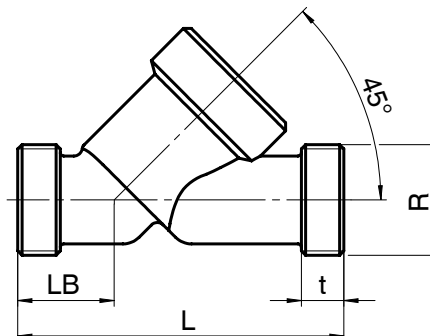
For materials see overview on last page



**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

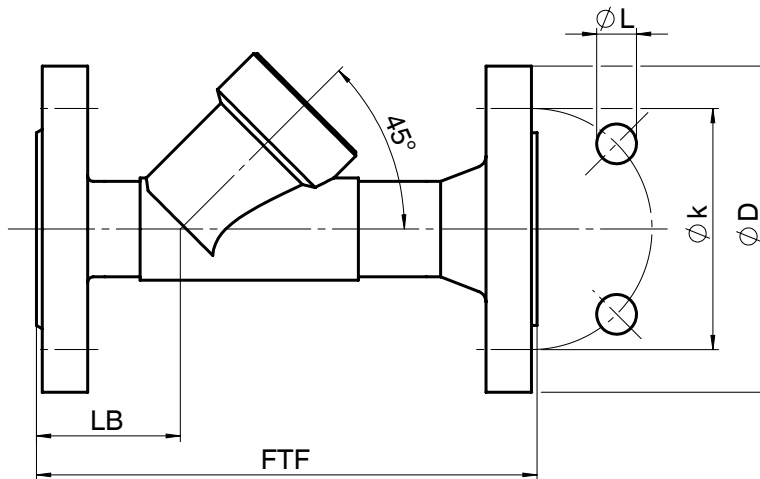
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**Body dimensions [mm]**

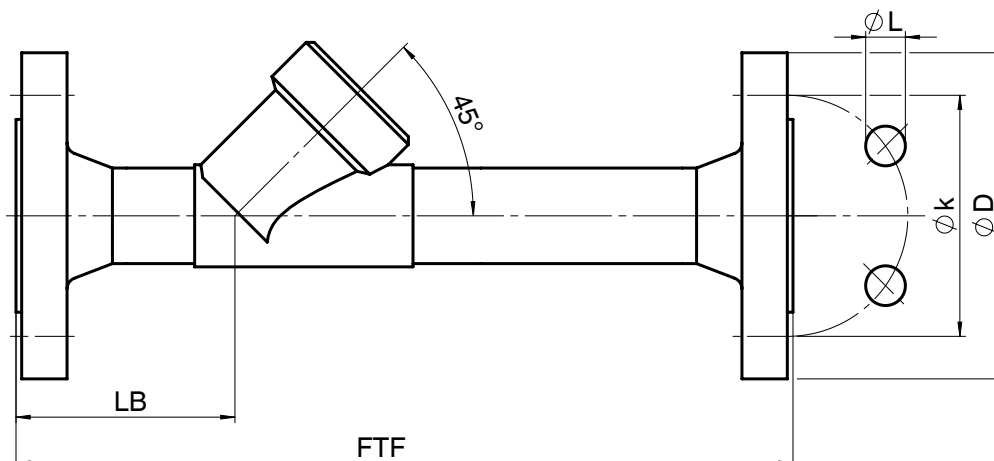
**Flanges, connection code 10  
Valve body material: 1.4408 (code 37)**

DN	FTF	LB	$\varnothing D$	$\varnothing d$	$\varnothing K$	Number of bolt holes
25	160	44	115	14	85	4
32	180	51	140	18	100	4
40	200	52	150	18	110	4
50	230	50	165	18	125	4



**Flanges, connection code 13  
Valve body material: 1.4435 (code 34)**

DN	FTF	LB	$\varnothing D$	$\varnothing d$	$\varnothing K$	Number of bolts holes
25	280	77	115	14	85	4
32	310	89	140	18	100	4
40	320	91	150	18	110	4
50	333	95	165	18	125	4





## Body dimensions [mm]

### Threaded sockets DIN, connection code 1 Valve body material: Cast bronze (code 9), 1.4408 (code 37)

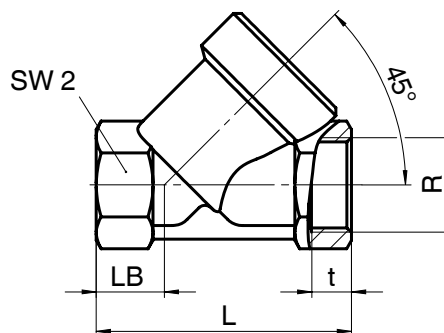
DN	L	LB	R	t	SW2	
25	90	24	G 1	19.1	41	hexagonal
32	110	33	G 1 1/4	21.4	50	octagonal
40	120	30	G 1 1/2	21.4	55	octagonal
50	150	40	G 2	25.7	70	octagonal
65	190	46	G 2 1/2	24.0	85	octagonal
80	220	50	G 3	27.0	100	octagonal

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)

DN	L	LB	SW2		Connection code 3C		Connection code 3D	
			R	t	R	t	R	t
25	90	24	41	6	Rc 1	19.1	1" NPT	17
32	110	33	50	8	Rc 1 1/4	21.4	1 1/4" NPT	18
40	120	30	55	8	Rc 1 1/2	21.4	1 1/2" NPT	18
50	150	40	70	8	Rc 2	25.7	2" NPT	18

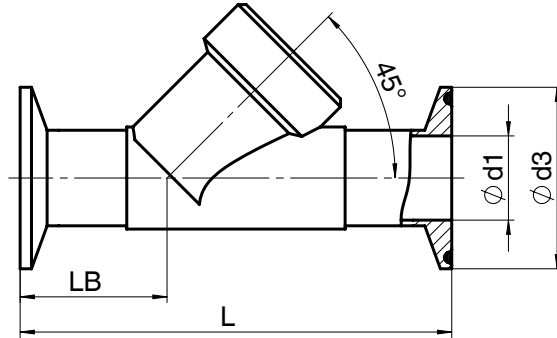
For materials see overview on last page



## Body dimensions [mm]

**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

Connection code	Threaded connections								Spigots								Clamps			Flanges				
	1		3C		9		3D		0	16	17	18	37	59	60	82	86	88	10	13				
Material code	9	37	9	37	9	37	9	37	34	34	34	37	34	34	37	34	37	34	34	34	37	34		
DN 25	X	X	X	X	X	X	X	X	X	X	X	X	X	-	X	-	X	X	X	X	X	X	X	
DN 32	X	X	X	X	-	X	X	X	-	X	X	X	X	-	-	-	-	X	X	X	X	-	X	X
DN 40	X	X	X	X	X	X	X	X	X	X	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	X	-	X	-	X	X	X	X	X	X	X	X
DN 65	X	X	-	-	X	X	-	-	-	-	-	X	-	-	X	-	X	-	-	-	-	-	-	
DN 80	X	X	-	-	X	X	-	-	-	-	-	X	-	-	X	-	X	-	-	-	-	-	-	

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

