

# **GEMÜ 566 eSyStep**

## **Motorized control valve**



### **Description**

The GEMÜ 566 eSyStep 2/2-way straight seat control valve has a body with an integrated control mechanism. Pneumatic and motorized actuator types are available. The GEMÜ 566 eSyStep control valve was specially developed for controlling small volumes and allows flow rates from 63 l/h to 2500 l/h.

### **Technical specifications**

- **Media temperature:** 0 to 90 °C
- **Ambient temperature:** 0 Up to 60 °C
- **Operating pressure :** 0 Up to 6 bar
- **Nominal sizes:** DN 8 to 20
- **Body configurations:** 2/2-way body
- **Connection types:** Clamp | Threaded connection
- **Connection standards:** ASME | DIN | EN | ISO
- **Body materials:** 1.4435, investment casting material
- **Seat seal materials:** EPDM | FKM
- **Supply voltage:** 24 V DC
- **Actuating speed:** max. 3 mm/s
- **Protection class:** IP 65
- **Conformities:** EAC | FDA | Regulation (EC) No. 1935/2004

Technical data depends on the respective configuration

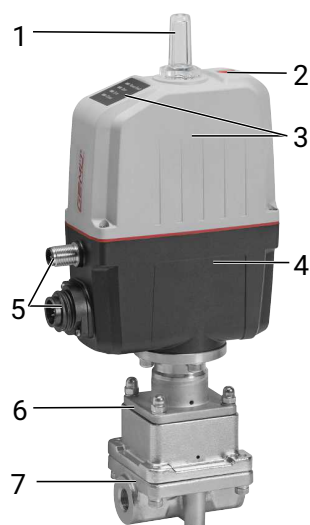


further information  
webcode: GW-566





## Product description



[www.gemu-group.com](http://www.gemu-group.com)

## GEMÜ CONEXO

The interaction of valve components that are equipped with RFID chips and an associated IT infrastructure actively increase process reliability.



Thanks to serialization, every valve and every relevant valve component such as the body, actuator or diaphragm, and even automation components, can be clearly traced and read using the CONEXO pen RFID reader. The CONEXO app, which can be installed on mobile devices, not only facilitates and improves the "installation qualification" process, but also makes the maintenance process much more transparent and easier to document. The app actively guides the maintenance technician through the maintenance schedule and directly provides him with all the information assigned to the valve, such as test reports, testing documentation and maintenance histories. The CONEXO portal acts as a central element, helping to collect, manage and process all data.

**For further information on GEMÜ CONEXO please visit:**

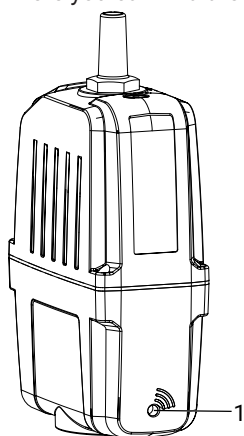
[www.gemu-group.com/conexo](http://www.gemu-group.com/conexo)

### Ordering

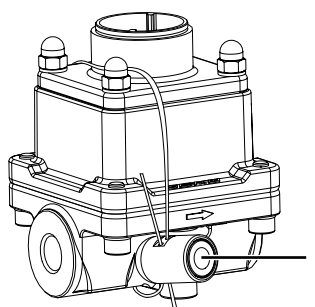
GEMÜ Conexo must be ordered separately with the ordering option "CONEXO".

In the corresponding design with CONEXO, this product has an RFID chip for electronic identification purposes. The position of the RFID chip can be seen below.

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.



Actuator RFID chip



Valve body RFID chip

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

## Availability

### Availability of valve bodies

#### Threaded connection / Clamp

DN	Connection type code 1 <sup>1)</sup>	Connection type code 88 <sup>1)</sup>
	Material code C1 <sup>2)</sup>	
8	X	-
10	X	-
15	X	X
20	-	X

X = Standard

1) **Connection type**

Code 1: Threaded socket DIN ISO 228

Code 88: Clamp ASME BPE, face-to-face dimension FTF EN 558 series 7

2) **Valve body material**

Code C1: ASTM A 351 CF3M, investment casting

## Order data - motorized valve

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
Control valve	566
2 DN	Code
DN 8	8
DN 10	10
DN 15	15
DN 20	20
3 Body configuration	Code
2/2-way body	D
4 Connection type	Code
Threaded socket DIN ISO 228	1
Clamp ASME BPE, face-to-face dimension FTF EN 558 series 7	88
5 Valve body material	Code
ASTM A 351 CF3M, investment casting	C1
6 Seal material	Code
EPDM	19
7 Voltage/frequency	Code
24 V DC	C1

8 Control module	Code
Positioner	S0
Positioner, configured for emergency power supply module (NC)	S5
Positioner, configured for emergency power supply module (NO)	S6
9 Control characteristic	Code
Modified equal-percentage	G
linear	L
10 Kv value	Code
63 l/h	63
100 l/h	100
160 l/h	160
1000 l/h	1000
1600 l/h	1600
2500 l/h	2500
11 Actuator version	Code
Actuator size 0	0A
12 CONEXO	Code
Without	
Integrated RFID chip for electronic identification and traceability	C

### Order example

Ordering option	Code	Description
1 Type	566	Control valve
2 DN	8	DN 8
3 Body configuration	D	2/2-way body
4 Connection type	1	Threaded socket DIN ISO 228
5 Valve body material	C1	ASTM A 351 CF3M, investment casting
6 Seal material	19	EPDM
7 Voltage/frequency	C1	24 V DC
8 Control module	S0	Positioner
9 Control characteristic	G	Modified equal-percentage
10 Kv value	63	63 l/h
11 Actuator version	0A	Actuator size 0
12 CONEXO	C	Integrated RFID chip for electronic identification and traceability

## Technical data

### Medium

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

### Temperature

**Media temperature:** Standard: 0 °C – 90 °C  
CIP max. 30 min. 85 °C  
(isolating diaphragm material code 19)

**Ambient temperature:** 0 – 60 °C (code S0, S5, S6)\*  
\* depending on version and/or operating parameters (see chapter Duty cycle and service life)

**Storage temperature:** 0 – 40 °C

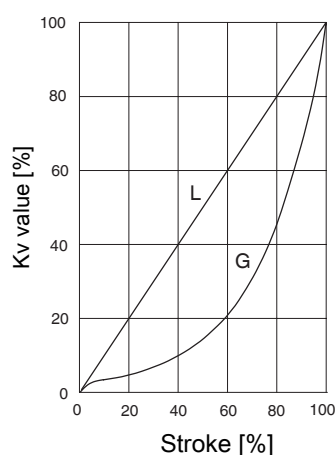
### Pressure

**Operating pressure:** 0 – 6 bar  
All pressures are gauge pressures.

**Leakage rate:**

Seat seal	Standard	Test procedure	Leakage rate	Test medium
Metal	DIN EN 60534-4	1	IV	Air

**Kv values:**



Equal-percentage (connection code 1) / linear (connection code 1)

Control characteristic	Seat Ø [mm]	Kv value	DN 8	DN 10	DN 15
G	3	63	X	-	-
G, L	3	100	X	-	-
G	3	160	X	-	-
G, L	6	250	X	-	-
G	6	400	X	-	-
G, L	6	630	X	-	-
G	11	1000	-	X	-
G, L	11	1600	-	X	-
G, L	15	2500	-	-	X

G = equal-percentage, L = linear

**Kv values:****Equal-percentage (connection code 88) / linear (connection code 88)**

Control characteristic	Seat Ø [mm]	Kv value	DN 15	DN 20
G	3	63	X	-
G, L	3	100	X	-
G	3	160	X	-
G, L	6	250	X	-
G	6	400	X	-
G, L	6	630	X	-
G	11	1000	X	-
G, L	11	1600	X	-
G, L	15	2500	-	X

G = equal-percentage, L = linear

**Product conformities****Machinery Directive:** 2006/42/EC**EMC Directive:** 2014/30/EU**EAC:** TR CU 010/2011  
TR CU 004/2011**Food:** only for seal material code 19  
FDA 21 CFR 177.2600  
USP Class VI Title 87  
USP Class VI Title 88 (50 °C and 121 °C)  
Regulation (EC) No. 1935/2004  
Regulation (EC) No. 2023/2006**BSE/TSE:** EMA/410/01**RoHS Directive:** 2011/65/EU**Mechanical data****Protection class:** IP 65 acc. to EN 60529**Actuating speed:** Max. 3 mm/s**Stroke:** 5 mm

<b>Weight:</b>	DN 8	4.0
	DN 10	4.0
	DN 15	3.5
	DN 15, code 88	4.2
	DN 20, code 88	4.2

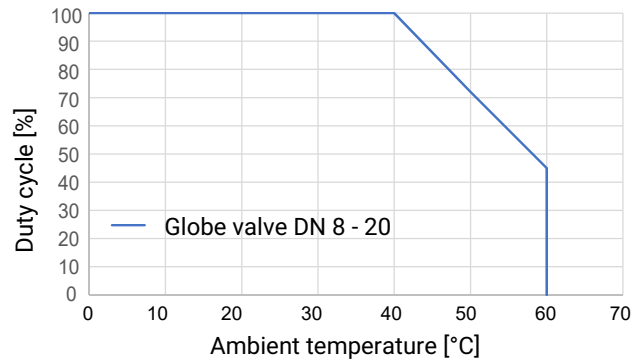
Weights in kg

**Mechanical environmental conditions:** Class 4M8 acc. to EN 60721-3-4:1998**Vibration:** 5g acc. to IEC 60068-2-6 Test Fc**Shock:** 25g acc. to 60068-2-27 Test Ea

## Duty cycle and service life

**Service life:** **Control operation** - Class C according to EN 15714-2 (1,800,000 starts and 1200 starts per hour).  
**Open/Close duty** - At least 500,000 switching cycles at room temperature and permissible duty cycle.

**Duty cycle:** Control module positioner (code S0, S5, S6), Open/Close duty cycle at full valve stroke and 10 minutes cycle time.



Control module positioner (code S0, S5, S6), control operation - class C acc. to EN 15714-2  
 - DN 8 - 20 up to 50 °C ambient temperature

The specified characteristics and values apply to the default setting.

With reduced forces, higher duty cycles and/or higher ambient temperatures are possible. At higher force settings the duty cycle and/or ambient temperature is reduced (for IO-Link parameters see operating instructions).

## Electrical data

**Supply voltage U<sub>v</sub>:** 24 V DC  $\pm$  10%

**Rating:** Actuator size 0 (code 0A) 20 W

**Operation:** Stepper motor, self-locking

**Reverse polarity protection:** Yes

### Analogue input signals – Control module Positioner (code S0, S5, S6)

#### Set value

**Input signal:** 0/4 - 20 mA; 0 - 10 V (function selectable via IO-Link)

**Input type:** passive

**Input resistance:** 250  $\Omega$

**Accuracy/linearity:**  $\leq \pm 0.3\%$  of full flow

**Temperature drift:**  $\leq \pm 0.1\%$  / 10°K

**Resolution:** 12 bit

**Reverse polarity protection:** Yes (up to  $\pm$  24 V DC)



**Digital input signals**

<b>Inputs:</b>	Function selectable via IO-Link (see table Overview of available functions – Input and output signals)
<b>Input voltage:</b>	24 V DC
<b>Logic level "1":</b>	> 15.3 V DC
<b>Logic level "0":</b>	< 5.8 V DC
<b>Input current:</b>	typically < 0.5 mA

**Analogue output signals – Control module Positioner (code S0, S5, S6)****Actual value**

<b>Output signal:</b>	0/4 - 20 mA; 0 - 10 V (function selectable via IO-Link)
<b>Output type:</b>	Active
<b>Accuracy:</b>	$\leq \pm 1\%$ of full flow
<b>Temperature drift:</b>	$\leq \pm 0.1\% / 10^\circ\text{K}$
<b>Load resistor:</b>	$\leq 750\text{ k}\Omega$
<b>Resolution:</b>	12 bit
<b>Short-circuit proof:</b>	Yes

**Digital output signals**

<b>Outputs:</b>	Function selectable via IO-Link (see table Overview of available functions – Input and output signals)
<b>Type of contact:</b>	Push-Pull
<b>Switching voltage:</b>	Power supply $U_v$
<b>Switching current:</b>	$\leq 140\text{ mA}$
<b>Short-circuit proof:</b>	Yes

**Communication**

<b>Interface:</b>	IO-Link
<b>Function:</b>	Parameterization/process data
<b>Transmission rate:</b>	38400 baud
<b>Frame type in Operate:</b>	2.V (eSyStep positioner, code S0, S5, S6), PDout 3Byte; PDin 3 Byte; OnRequestData 2 Byte
<b>Min. cycle time:</b>	20 ms (eSyStep positioner, code S0, S5, S6)
<b>Vendor-ID:</b>	401
<b>Device-ID:</b>	1906801 (eSyStep position controller code S0, S5, S6), 1906802 (eSyStep position controller code S0, S5, S6) from software version V1.0.3.3 (from Nov 2024)

<b>Product-ID:</b>	eSyStep Positioner (code S0, S5, S6)
<b>ISDU support:</b>	Yes
<b>SIO operation:</b>	Yes
<b>IO-Link specification:</b>	V1.1

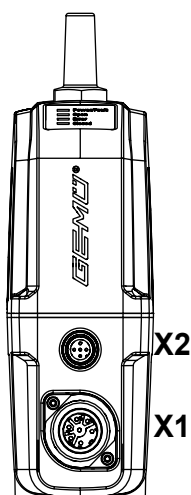
IODD files can be downloaded via <https://ioddfinder.io-link.com/> or [www.gemu-group.com](http://www.gemu-group.com).

## Behaviour in the event of an error

<b>Function:</b>	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.
<b>Error position:</b>	Closed, open or hold (adjustable via IO-Link).

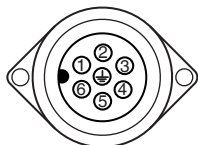
## Electrical connection

### Position of the connectors



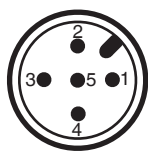
## Electrical connection

### Connection X1



7-pin plug, Binder, type 693

Pin	Signal name
1	Uv, 24 V DC supply voltage
2	GND
3	Digital input 1
4	Digital input 2
5	Digital input/output
6	Digital output, IO-Link
7	n.c.

**Connection X2 (only for positioner design)**

5-pin M12 plug, A-coded

Pin	Signal name
1	I+/U+, set value input
2	I-/U-, set value input
3	I+/U+, actual value output
4	I-/U-, actual value output
5	n.c.

## Overview of available functions – Input and output signals

### NOTICE

The factory default setting "Configured for emergency power supply module" is reset to default settings when a reset is carried out.

### NOTICE

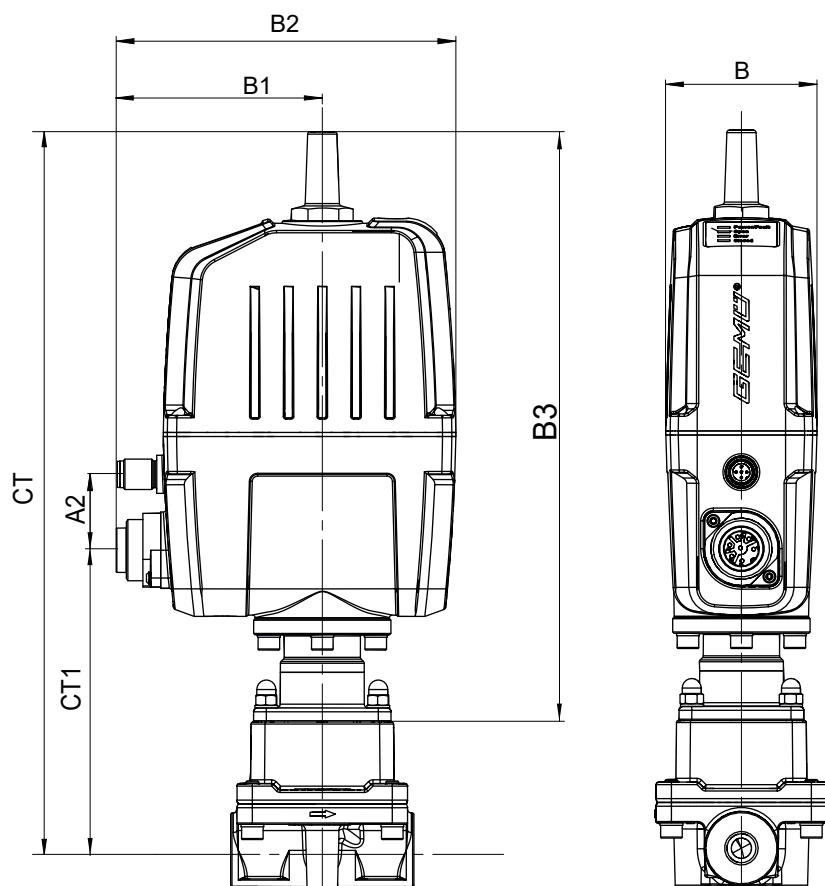
When the digital inputs for OPEN and CLOSE are activated simultaneously, the defined error position is approached.

	Function	Tube replacement function A	Control module S0	Control module S5, S6
		Factory preconfiguration for tube replacement function	Default settings	Factory default setting "Configured for emergency power supply module"
Digital input 1	Off / Open / Closed / Safe/On / Initialization	Initialization	Initialization	Initialization
Digital input 2	Off / Open / Closed / Safe/On / Initialization	Tube replacement function (Open Total)	Off	Safe/On
Digital input/output	Open / Closed / Error / Error and warning / Initialization	Error	Error	Error
Digital output	Open / Closed / Error / Error and warning	Closed	Closed	Closed
Analogue input	4–20 mA/0–20 mA/0–10 V	4–20 mA	4–20 mA	4–20 mA
Analogue output	4–20 mA/0–20 mA/0–10 V	4–20 mA	4–20 mA	4–20 mA

## Dimensions

### Installation and actuator dimensions

#### Valve with threaded sockets, code 1



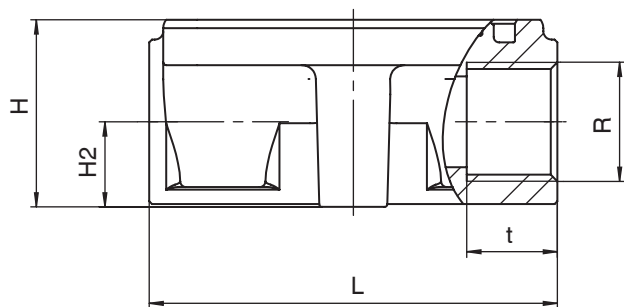
A2	B	B1	B2	B3	CT	CT1
32.0	59.4	81.0	133.5	197.7	282.2	117.7

Dimensions in mm

Dimension A2 only for control module – positioner (code S0, S5, S6)

## Body dimensions

### Threaded socket



DN	Connection type code 1 <sup>1)</sup>				
	Material code C1 <sup>2)</sup>				
	R	t	H	H2	L
8	G 1/4	16.0	33.0	15.0	72.0
10	G 3/8	16.0	33.0	15.0	72.0
15	G 1/2	16.0	33.0	15.0	72.0

Dimensions in mm

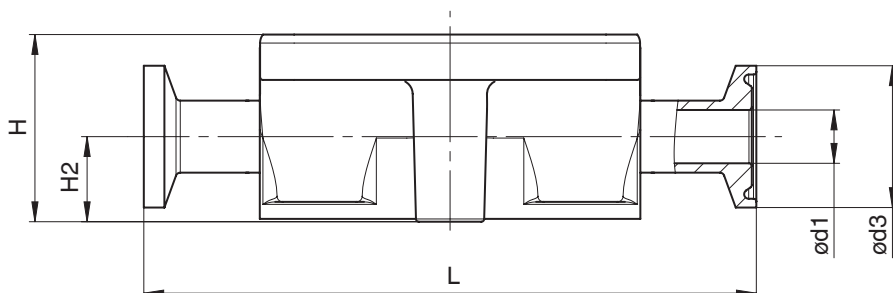
#### 1) Connection type

Code 1: Threaded socket DIN ISO 228

#### 2) Valve body material

Code C1: ASTM A 351 CF3M, investment casting

### Clamp



DN	Connection type code 88 <sup>1)</sup>				
	Material code C1 <sup>2)</sup>				
	L	H	H2	ød1	ød3
15	108.0	33.0	15.2	9.40	25.0
20	117.0	33.0	15.2	15.75	25.0

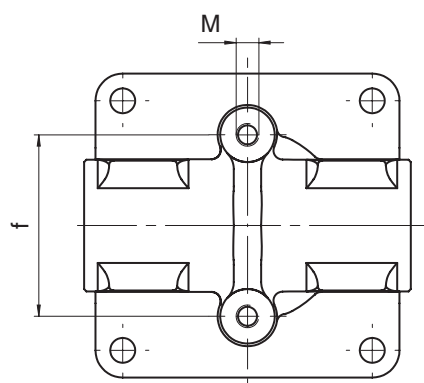
Dimensions in mm

#### 1) Connection type

Code 88: Clamp ASME BPE, face-to-face dimension FTF EN 558 series 7

#### 2) Valve body material

Code C1: ASTM A 351 CF3M, investment casting

**Valve body mounting**

DN	f	M
8,10,15,20	40	M5

Dimensions in mm

## Accessories



### GEMÜ 1218

#### Connector

GEMÜ 1218 is a connector (cable socket/cable plug), 7-pin. Straight or 90° angled plug type.

GEMÜ 1218 Binder connector			
Connection X1 – supply voltage, relay outputs			
Binder plug	468/eSy series mating connector	Terminal compartment/ screws, 7-pin	88220649
		Terminal compartment/ screws, 7-pin, 90°	88377714 <sup>1)</sup>
		Terminal compartment/ screws, 7-pin, 90°, fitted with a 2 metre cable set	88770522

1) provided in the scope of delivery



### GEMÜ 1219

#### Cable socket / cable plug M12

The GEMÜ 1219 is a connector (cable socket / cable plug) M12, 5-pin. Straight and/or 90° angled plug type. Defined cable length or with threaded connection without cable. Various materials available for the threaded ring.

Suitable for electrical connection of the connector X2

Description	Length	Order number
5-pin, angle	without cable	88205545 <sup>1)</sup>
	2 m cable	88205534
	5 m cable	88205540
	10 m cable	88210911
	15 m cable	88244667
5-pin, straight	without cable	88205544
	2 m cable	88205542
	5 m cable	88205543
	10 m cable	88270972
	15 m cable	88346791

1) provided in the scope of delivery for control module code S0



**GEMÜ 1560****IO-Link master**

The GEMÜ 1560 IO-Link master is used for parametrization, actuation, commissioning and for evaluating process and diagnostics data on products with IO-Link interface with communication standard in accordance with IEC 61131-9. The IO-Link master is available with USB port for use on a computer or with a Bluetooth or WLAN interface for use on mobile devices (iOS and Android). GEMÜ 1560 can be ordered separately or as a set for GEMÜ products including the required adapter.

Description	Order designation	Order number
IO-Link master kit (adapter plus cable)	1560USBS 1 A40A12AU A	99072365
IO-Link master kit (adapter plus cable)	1560 BTS 1 A20A12AA A	99130458

**GEMÜ 1571****Emergency power supply module**

The GEMÜ 1571 capacitive emergency power supply module is suitable for valves with motorized actuators such as GEMÜ eSyStep and eSyDrive as well as the GEMÜ C53 iComLine control valve. In the event of a power failure, the product provides an uninterrupted power supply so that the valve can be moved to the safety position. The emergency power supply module is available individually or with an expansion module and can supply several valves. The input and output voltage is 24 V.

GEMÜ 1571 emergency power supply module			
Input voltage	Output voltage	Capacity	Item number
24 V	24 V	1700 Ws	88660398
24 V	24 V	13200 Ws	88751062

**GEMÜ 1573****Switching power supply unit**

The GEMÜ 1573 switching power supply unit converts unstable input voltages from 100 to 240 V AC into a continuous DC voltage. It can be used as an accessory for valves with motorized actuators e. g. GEMÜ eSyLite, eSyStep und eSyDrive and for additional devices with a 24 V DC power supply. Different power levels, output currents and a 48 V DC version for servoDrive actuators are available.

GEMÜ 1573 switching power supply unit			
Input voltage	Output voltage	Output current	Item number
100 - 240 V AC	24 V DC	5 A	88660400
		10 A	88660401

**Specification | GEMÜ regulating cones for globe valves**

Customer/Project \_\_\_\_\_ Contact person \_\_\_\_\_

Date \_\_\_\_\_ Phone \_\_\_\_\_

Contact person (GEMÜ) \_\_\_\_\_ E-mail \_\_\_\_\_

**Technical requirements**Medium <sup>1)</sup>

Requirement characteristic	1st operating point maximum flow	2nd operating point medium flow	3rd operating point minimum flow
Media temperature <sup>4)</sup>			
Inlet pressure			
Outlet pressure			
<b>Flow rate</b> <sup>2, 3)</sup>			
in [m³/h] for liquids			
for gases <sup>6)</sup>			
in [kg/h] for steam			

<b>Operation</b>	<b>Manual</b>					
	<b>Pneumatic</b>	Control function	NC (normally closed)	NO (normally open)	DA (double acting)	Double acting (normally open)
	<b>Motorized</b>	Voltage	24 V DC	Other		
<b>Control fitting</b>		Set value information	0-10 V	0/4-20 mA		
	Feature		linear	modified equal-percentage		

<b>Valve body</b>	Type	
	Required valve DN	
	Max. operating pressure (bar)	
	Ambient temperature <sup>4)</sup>	
	Max. media temperature	
	Connection type	
	Body material	
	Seat seal <sup>7)</sup>	PTFE      Other
	Control pressure	min      max

**1) Liquid or gas?**

For media other than water or air, it is useful to give data for the density and viscosity of the medium (with unit of measurement). Otherwise we will assume data for standard conditions.

**2) For steam especially, the minimum or maximum flow rate should be assigned to the appropriate inlet or outlet pressure. The temperature of the medium should also be taken into account.****3) GEMÜ recommends a positioning ratio of 1 : 10 (e.g. minimal flow rate is 10 m³/h and the maximum flow rate is 100 m³/h). Please note that the valve only controls reliably from a flow of about 10% of the max. Kv value on account of the valve opening behaviour. Other positioning ratios are possible on request or in the selection of standard regulating cones.****4) The media temperature range must be specified for steam applications. T = 20 °C is assumed unless specified otherwise.****5) This data is not absolutely necessary. A room temperature of 20 °C is assumed unless specified otherwise.****6) Basis: standard conditions 0 °C, 1013.25 mbar. If conditions differ, please specify them.****7) The seat seal is made of PTFE as standard. For regulating needles with a Kv value between 0.1 and 1.0 m³/h, only a metal seal is possible. Other materials possible on request.**

The technical details of each enquiry must be checked by GEMÜ.

Comment:

# 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 566

**Product name:** Motorized control valve

**Product version:** GEMÜ 566 eSyStep Code S0

**The following essential health and safety requirements of the EC Machinery Directive 2006/42/EC, Annex I have been applied or adhered to:** 1.1.3.; 1.1.5.; 1.3.2.; 1.3.4.; 1.3.7.; 1.3.8.; 1.5.1.; 1.5.2.; 1.5.3.; 1.5.5.; 1.5.6.; 1.5.7.; 1.6.1.; 1.6.3.

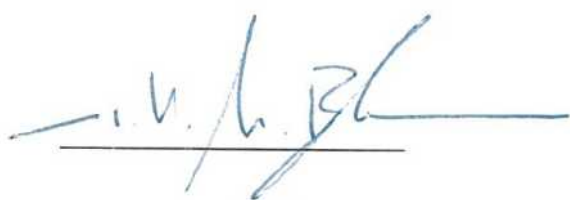
**The following harmonized standards (or parts thereof) have been applied:** EN ISO 12100:2010

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, 25/09/2023



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