GEMÜ Q50 eSyStep

Motorized pinch valve

Features

- Fast, safe tube replacement
- Minimized strain on the tube due to the optimized compressor
- Open/close function or with integrated positioner
- Parameterisable and controllable via IO-Link
- On-site or remote end position programming via programming input
- Simple replacement of inserts and compressors for various tube sizes with the same actuator
- Several installation options possible in the plant thanks to the mounting flange or female thread on the body

Description

The GEMÜ Q50 eSyStep 2/2-way pinch valve is motorized. The eSyStep electric actuator is available as ON/OFF or with integrated positioner. The valve guides a tube which is compressed from above by a compressor to control and regulate media. The compressor's specially developed contour and the tube holder's contour minimize the strain on the tube and thus increase the tubes' service life. Tubes can be safely inserted and removed in simple steps and without tools. An optical and electrical position indicator is integrated as standard.

Technical specifications

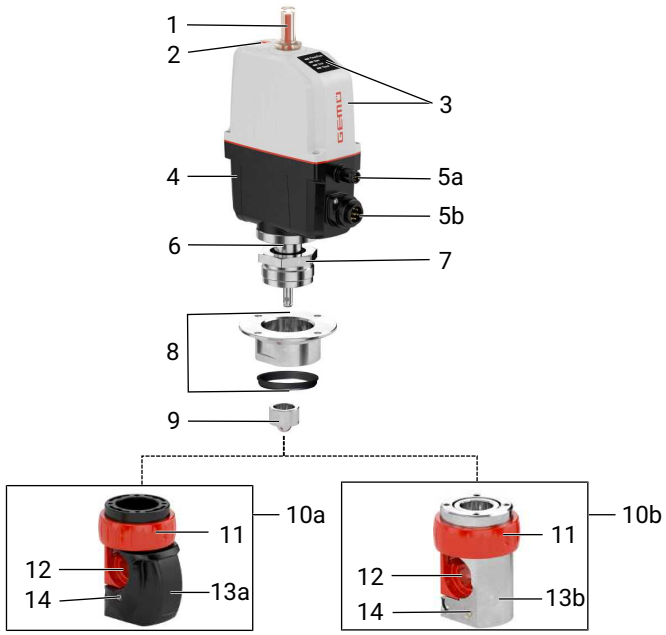
- **Media temperature:** Please observe the tube manufacturer's specifications
- **Ambient temperature:** Actuator: 32 Up to 140 °F, Tube: Please observe the tube manufacturer's specifications
- **Tube outside diameter:** 1/4" I 3/8" I 7/16" I 1/2" I 5/8" I 3/4" I 7/8" I 1 1/8" I 1 3/16" I 1 13/32" I 1 3/7" I 1 1/2"
- **Tube's inside diameter:** 1/8" I 1/4" I 3/8" I 1/2" I 3/4" I 1"
- **Body materials:** 1.4404/PA6 I PA6
- **Supply voltage:** 24 V DC
- **Actuating speed:** max. 3 mm/s
- **Protection class:** IP 65
- **Conformity:** EAC I EMC Directive I RoHS

Technical data depends on the respective configuration

further information
webcode: GW-Q50

Product description

Construction



Item	Name	Materials
1	Optical position indicator	PA 12
2	Manual override	
3	Actuator top with LED display	Polyamide, 50% glass fibre
4	Actuator base	Polyamide, 50% glass fibre
5a	Electrical connection X2 (only for positioner design)	
5b	Electrical connection X1	
6	Distance piece	Stainless steel
7	Union nut	Stainless steel
8	Distance piece with mounting flange including EPDM seal	Stainless steel
9	Compressor	Stainless steel
10a	Valve body	PA6
10b	Valve body	Stainless steel/PA6
11	Locking ring	PA6
12	Tube holder	PA6
13a	Tube carrier	PA6
13b	Tube carrier	Stainless steel
14	CONEXO RFID chip (see “GEMÜ CONEXO“, page 17)	

Overview of available functions

Function	Control module – OPEN/CLOSE control (Code AE, A5, A6)	Control module – positioner (Code S0, S5, S6)
OPEN/CLOSE control	X	X
Positioner	-	X
Manual override	X	X
Optical status and position indicator	X	X
On-site initialization	X	X
Deactivation of on-site initialization	X	X
Initialization via digital input	X	X
Initialization via IO-Link	X	X
Feedback for operating mode	X	X
Actuation OPEN	X	X
Actuation CLOSED	X	X
Actuation, analogue	-	X
Position feedback OPEN	X	X
Position feedback CLOSED	X	X
Position feedback analogue	-	X
Location function	X	X
Error output	X	X
Actuating speed adjustable	X	-
Actuating force adjustable	X	X
Inversion of LED colours	X	X
Cycle counter	X	-
Error counter	X	-
Operating time determination	X	X
Switch point setting (tolerance)	X	X
Inversion input/output logic	X	X
Adjustable error action	X	X
Safe/On	X	X
Direction reversal	-	X
Open tight	-	X
Close tight	-	X
Split range	-	X
Stroke limiter/seal adjuster	-	X
Operating range	-	X

Availability

Valve body

Tube outside diameter	Tube holder	
	Stainless steel/PA6 (code 7P)	PA6 (code PA)
Code DA to DE	X	-
Code DF to DI	X	X
Code DK to DN	X	-

Tube sizes

D1 = diameter without seal

AG	ØD1	Tube inside diameter				Tube outside diameter									
					OD	1/4"	3/8"	7/16"	1/2"	9/16"	5/8"	3/4"	7/8"	1 1/8" – 1 3/16"	1 13/32" – 1 1/2"
					inch	0.25	0.375	0.438	0.5	0.563	0.625	0.75	0.875	1.13–1.18	1.405 –1.5
					mm	6.35	9.53	11.1	12.7	14.3	15.8	19.1	22.3	28.58 – 29.97	35.69 –38.1
	mm	ID	inch	mm	Code	DA	DC	DD	DE	DF	DG	DH	DI	DK	DN
0A	39.0	1/8"	0.125	3.180	2	X	X	-	-	-	-	-	-	-	-
		1/4"	0.250	6.350	4	-	X	X	X	-	-	-	-	-	-
0A	56.0	3/8"	0.375	9.530	6	-	-	-	-	X	X	-	-	-	-
		1/2"	0.500	12.700	8	-	-	-	-	-	-	X	X	-	-
1A	3.15	3/4"	0.750	19.050	12	-	-	-	-	-	-	-	-	X	-
		1"	1.000	25.400	16	-	-	-	-	-	-	-	-	-	X

AD = outside diameter
ID = inside diameter

Tube replacement function

With the tube replacement function A order code, the valve is supplied with an operating range adapted to the hose diameter and a separate tube replacement function. This setting increases the control accuracy. This function is only available with the control module S0 order code.

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
Pinch valve, electrically operated, eSyStep	Q50

2 Tube inside diameter	Code
3.180 mm (1/8") inside diameter	2
6.350 mm (1/4") inside diameter	4
9.530 mm (3/8") inside diameter	6
12.700 mm (1/2") inside diameter	8
25.400 mm (1") inside diameter	16

3 Tube outside diameter	Code
6.350 mm (1/4") outside diameter	DA
9.530 mm (3/8") outside diameter	DC
11.110 mm (7/16") outside diameter	DD
12.700 mm (1/2") outside diameter	DE
14.300 mm (9/16") outside diameter	DF
15.880 mm (5/8") outside diameter	DG
19.100 mm (3/4") outside diameter	DH
22.230 mm (7/8") outside diameter	DI
28.580–29.970 mm (1 1/8–1 3/16") outside diameter	DK
35.690–38.100 mm (1 13/32–1 1/2") outside diameter	DN

4 Tube carrier version	Code
Plastic design, stainless steel tube carrier and PA tube holder	7P
Plastic design, PA tube carrier and PA tube holder	PA

5 Voltage/Frequency	Code
24 V DC	C1

6 Control module	Code
ON/OFF actuator, additional end position indicator configured for emergency power supply module (NC)	A5
ON/OFF actuator, additional end position indicator configured for emergency power supply module (NO)	A6
ON/OFF actuator, additional end position indicators	AE
Positioner	S0
Positioner, configured for emergency power supply module (NC)	S5
Positioner, configured for emergency power supply module (NO)	S6

7 Tube replacement function	Code
Without	
Higher accuracy and separate tube replacement function	A

8 Mounting option	Code
Without mounting flange, with 4 x threaded holes in the body	0
With mounting flange below	FB
With mounting flange above	FT

9 Actuator version	Code
Actuator size 0	0A
Actuator size 1	1A

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

Order example

Order option	Code	Description
1 Type	Q50	Pinch valve, electrically operated, eSyStep
2 Tube – inside diameter	8	12.700 mm (1/2") inside diameter
3 Tube – outside diameter	DH	19.100 mm (3/4") outside diameter
4 Tube carrier version	7P	Plastic design, stainless steel tube carrier and PA tube holder
5 Voltage/Frequency	C1	24 V DC
6 Control module	S0	Positioner
7 Tube replacement function		Without
8 Mounting option	FT	With mounting flange above
9 Actuator version	0A	Actuator size 0
10 CONEXO		Without

Technical data

The media-conveying tubes are not part of the scope of delivery. All technical data applies solely to the valve itself. The suitability and selection of the media-conveying tubes for the intended process is the user's responsibility. For tested tube combinations that are compatible with the valve, please refer to the chapter "Tested tube combinations" (see “Tested tube combinations“, page 7).

Medium

Working medium: Please observe the tube manufacturer's specifications

Temperature

Media temperature: Please observe the tube manufacturer's specifications

Ambient temperature: Actuator: 32 °F — 140 °F, Tube: Please observe the tube manufacturer's specifications

Storage temperature: 32 — 104 °F

Pressure

Operating pressure: max. 6 bar
Please observe the tube manufacturer's specifications

Product compliance

Machinery Directive: 2006/42/EC

EMC Directive: 2014/30/EU

RoHS Directive: 2011/65/EU

Mechanical data

Protection class: IP 65 acc. to EN 60529

Actuating speed: Max. 3 mm/s

Weight:

Tube outside diameter	Mounting flange	Tube holder	
		Stainless steel/PA6 (code 7P)	PA6 (Code PA)
DA, DC, DD, DE	FT	3.64	-
	0	3.68	-
DF, DG, DH, DI	FT	4.63	4.28
	0	4.39	4.06
DK, DN	FB	11.86	-
	0	11.16	-

Weight in lb

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

Tested tube combinations

The following tube combinations have been tested taking into account the specifications of the respective tube manufacturer and have been found to be suitable for use in our pinch valves.*
However, the versions below are not a substitute for testing the tube for its suitability for the intended process by the user.

Inside diameter (order code)	Inside diameter [inch]	Inside diameter [mm]	Outside diameter (order code)	Outside diameter [inch]	Outside diameter [mm]	Tube type	Clocking	Pressure [bar]	Service life until breakage
2	1/8”	3.18	DA	1/4”	6.35	Silicone	2/2 s	1.6	10,000 cycle duties
2	1/8”	3.18	DC	3/8”	9.53	reinforced	2/2 s	6.0	7250 cycle duties
4	1/4”	6.35	DD	7/16”	11.11	Silicone	2/2 s	1.2	10,000 cycle duties
4	1/4”	6.35	DE	1/2”	12.70	reinforced	2/2 s	6.0	1 x 3200 cycle duties 1 x 7700 cycle duties
5	5/16”	7.94	DE	1/2”	12.70	Silicone	2/2 s	1.2	20,000 cycle duties
5	5/16”	7.94	DE	1/2”	12.70	TPE	2/2 s	1.6	15,000 cycle duties
6	3/8”	9.53	DF	9/16”	14.30	Silicone	2/2 s	1.1	8900 cycle duties
6	3/8”	9.53	DG	5/8”	15.88	TPE	2/2 s	1.6	25,000 cycle duties
6	3/8”	9.53	DG	5/8”	15.88	reinforced	2/2 s	6.0	4750 cycle duties
8	1/2”	12.70	DH	3/4”	19.05	TPE	2/2 s	1.5	25,000 cycle duties
8	1/2”	12.70	DI	7/8”	22.32	reinforced	2/2 s	6.0	4750 cycle duties
12	3/4”	19.05	DK	1 1/8”	28.58	reinforced	2/2 s	6.0	1650 cycle duties
12	3/4”	19.05	DK	1 1/8”	28.58	Silicone	2/2 s	1.0	25,000 cycle duties
12	3/4”	19.05	DK	1 1/6”	29.97	double reinforced	2/2 s	6.0	2000 cycle duties
16	1”	25.4	DN	1 13/32”	35.69	reinforced	2/2 s	4.0	3000 cycle duties
16	1”	25.4	DN	1 7/16”	36.32	double reinforced	2/2 s	6.0	3150 cycle duties

* Test medium: Water. The results in use may vary from those of the test environment due to the influence of deviating media.

Actuator's duty cycle and service life

If there is inadequate force to compress the tube, the force of the actuator can be adapted via the IO-Link using the config files.

Service life:

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

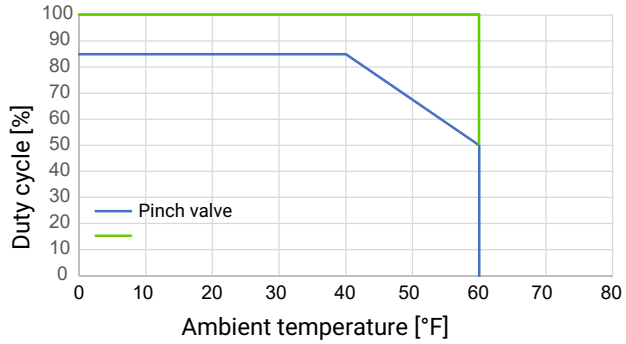
Open/Close duty, actuator size 0 – Minimum 500,000 switching cycles at room temperature and permissible duty cycle.

Open/Close duty, actuator size 1 – Minimum 100,000 switching cycles at room temperature and permissible duty cycle.

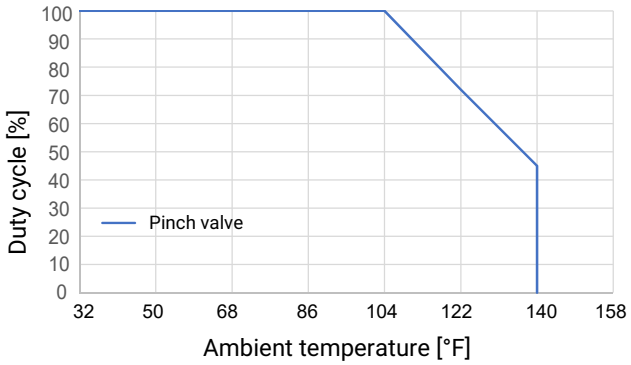
Duty cycle:

Control module – Open/Close control (code A5, A6, AE)

Duty cycle at full valve stroke and 10 minutes cycle time.



Positioner control module (code S0, S5, S6), Open/Close duty



Positioner control module (code S0, S5, S6), control operation – class C acc. to EN 15714-2 up to an ambient temperature of 60 °C

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 Uv:	24 V DC ± 10%	
Rating:	Actuator size 0 (code 0A) Actuator size 1 (code 1A)	20 W 60 W
Operation:	Stepper motor, self-locking	
Reverse battery 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 Ω
Accuracy/linearity:	≤ ±0.3% of full flow
Temperature drift:	≤ ±0.1% / 10°K
Resolution:	12 bit
Reverse polarity protection:	Yes (up to ± 24 V DC)

Digital input signals

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

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

Actual value

Output signal:	0/4 - 20 mA; 0 - 10 V (function selectable via IO-Link)
Output type:	Active
Accuracy:	≤ ±1% of full flow
Temperature drift:	≤ ±0.1% / 10°K
Load resistor:	≤ 750 kΩ
Resolution:	12 bit
Short-circuit proof:	Yes

Digital output signals

Outputs:	Function selectable via IO-Link (see table Overview of available functions – Input and output signals)
Type of contact:	Push-Pull
Switching voltage:	Power supply Uv
Switching current:	≤ 140 mA
Short-circuit proof:	Yes

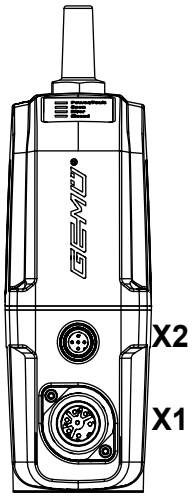
Communication

Interface:	IO-Link
Function:	Parameterization/process data
Transmission rate:	38400 baud
Frame type in Operate:	2.5 (eSyStep ON/OFF, code AE, A5, A6) 2.V (eSyStep positioner, code S0, S5, S6), PDout 3Byte; PDin 3 Byte; OnRequestData 2 Byte
Min. cycle time:	2.3 ms (eSyStep ON/OFF, code AE, A5, A6) 20 ms (eSyStep positioner, code S0, S5, S6)
Vendor-ID:	401
Device-ID:	1906701 (eSyStep ON/OFF, code AE, A5, A6) 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)
Product-ID:	eSyStep On/Off (code AE, A5, A6) eSyStep Positioner (code S0, S5, S6)
ISDU support:	Yes
SIO operation:	Yes
IO-Link specification:	V1.1

IODD files can be downloaded via https://ioddfinder.io-link.com/ or www.gemu-group.com.

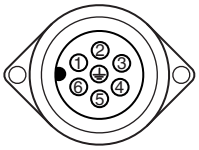
Electrical connection

Position of the connectors



Electrical connection

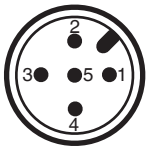
Connection X1



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)

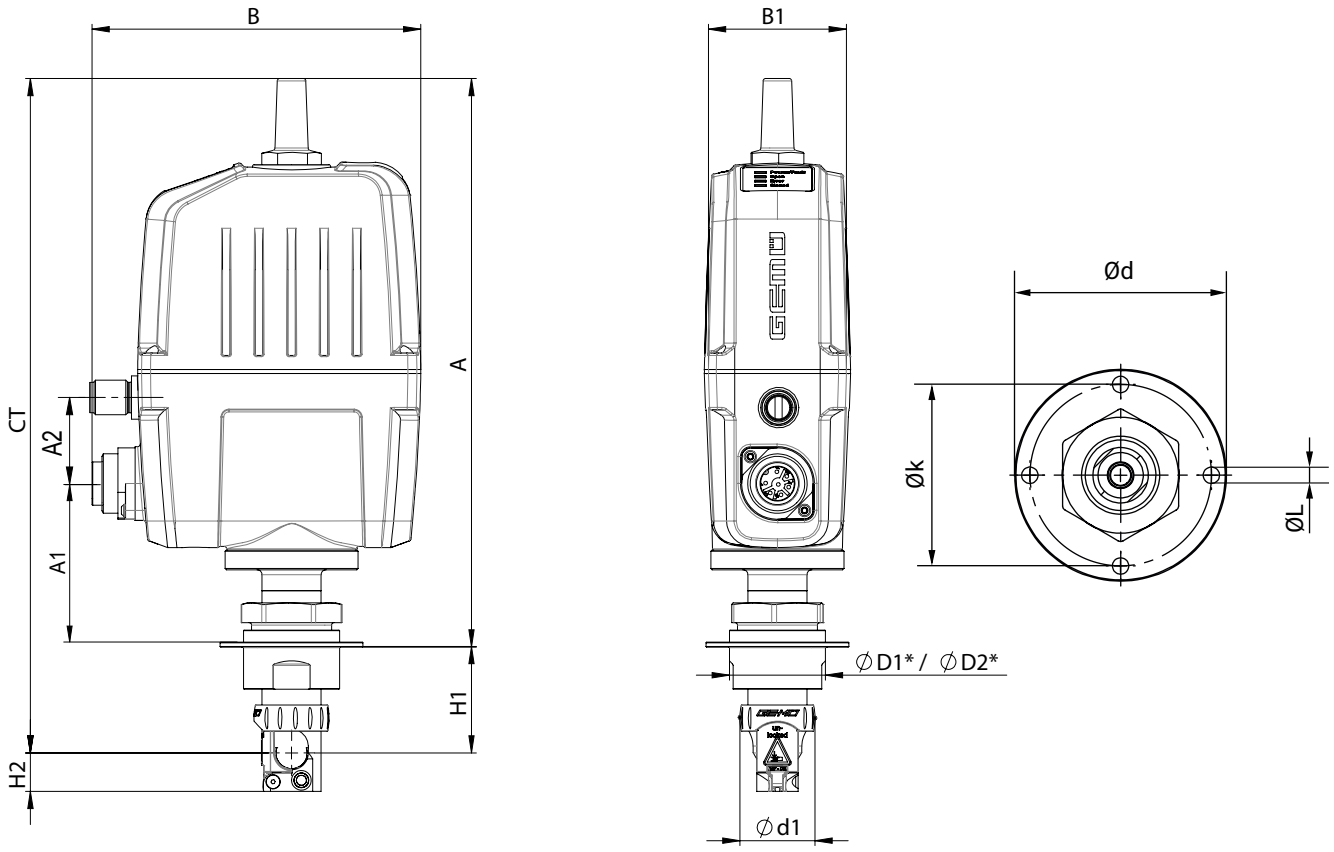


5-pin M12 plug, A-coded

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.

Dimensions

Actuator for tube outside diameter, code DA to DE

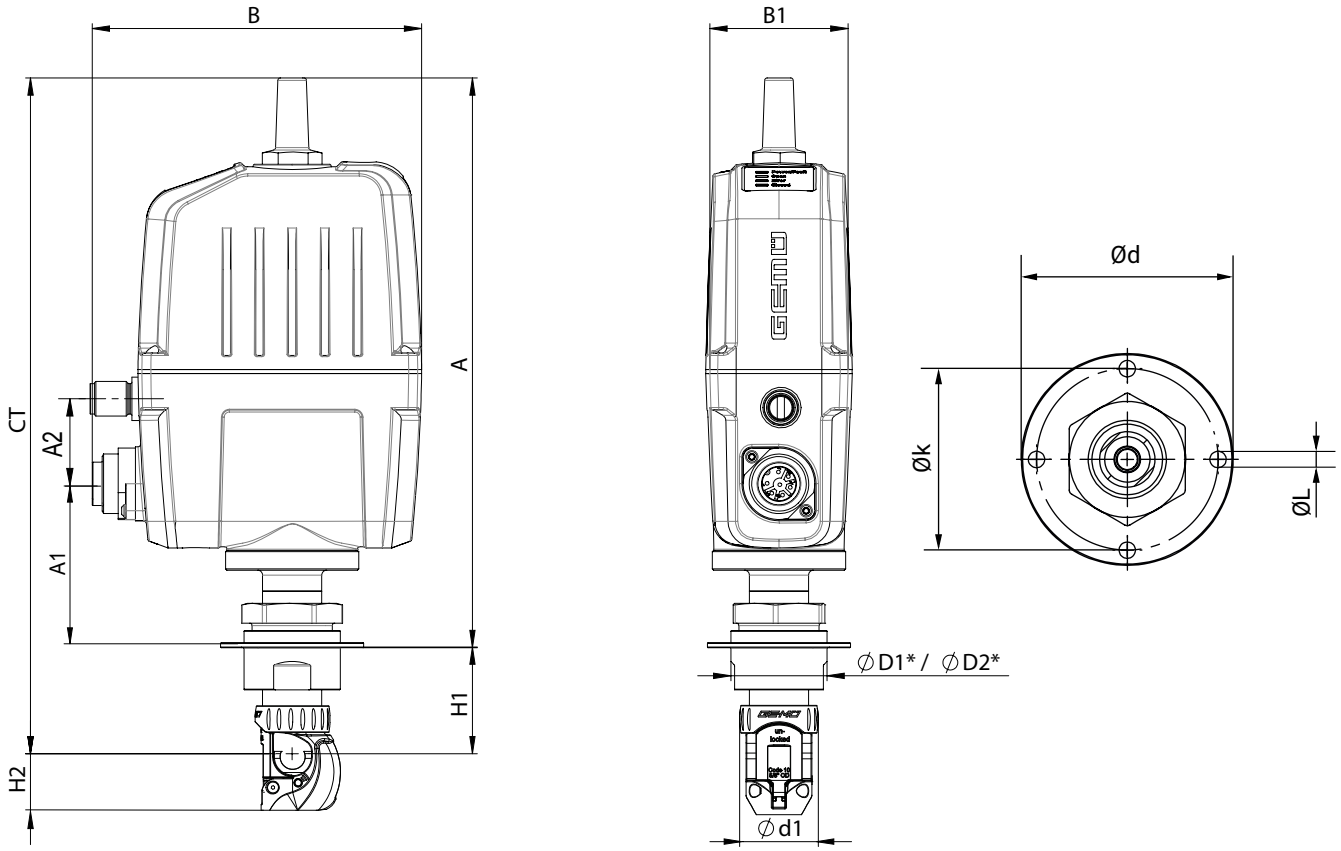


A	A1	A2	B	B1	CT	Dia. D1*	Dia. D2*	Dia. d	Dia. d1	H1	H2	Dia. k	Dia. L
9.09	2.61	1.31	5.26	2.34	10.78	1.54	1.65	2.28	1.20	1.69	0.61	1.93	0.18

Dimensions in inch

* D1 = diameter without seal, D2 = diameter with seal

Actuator for tube outside diameter, code DF to DI

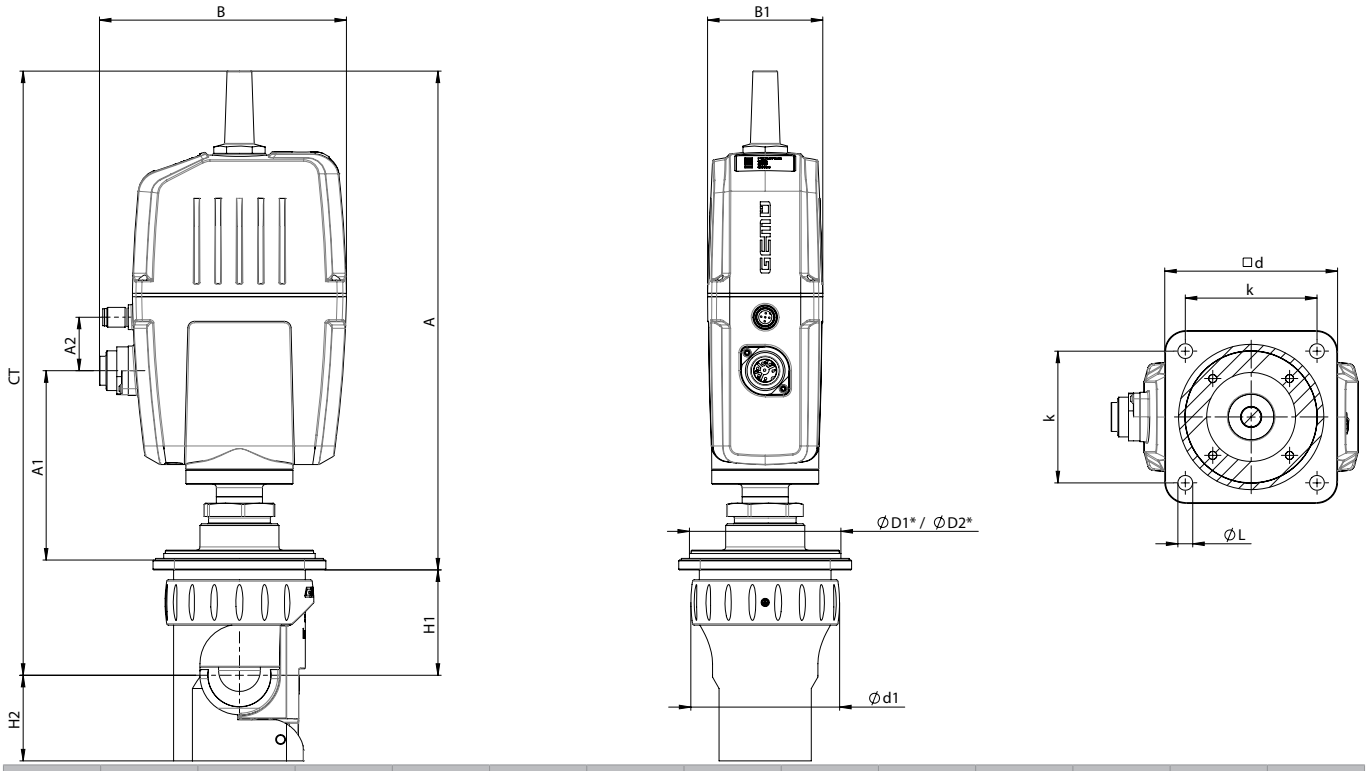


A	A1	A2	B	B1	CT	Dia. D1*	Dia. D2*	Dia. d	Dia. d1	H1	H2	Dia. k	Dia. L
7.48	2.61	1.31	5.26	2.34	11.30	2.20	2.36	3.31	1.88	2.48	1.34	2.83	0.26

Dimensions in inch

* D1 = diameter without seal, D2 = diameter with seal

Actuator for tube outside diameter, code DK to DN

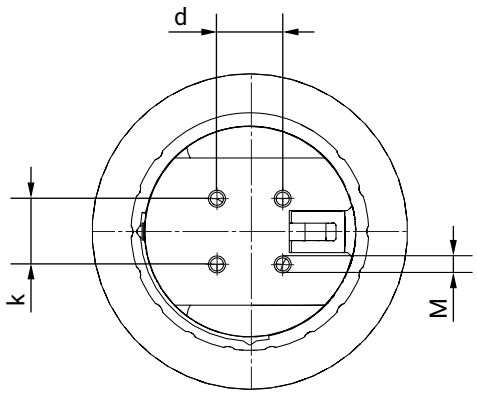


A	A1	A2	B	B1	CT	ØD1*	ØD2*	Ød	Ød1	H1	H2	Øk	ØL
11.93	115.0	1.28	5.91	70.0	367.0	3.15	3.62	4.13	3.56	2.52	2.05	3.15	0.35

Dimensions in inch

* D1 = diameter without seal, D2 = diameter with seal

Valve body, without mounting flange



Tube outside diameter	d	k	M
≤ 1/2"	0.28	0.28	M2
≥ 5/8"	0.47	0.47	M4

Dimensions in inch

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 [1)]
		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 [1)]
	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

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

Ordering

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

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