GEMÜ 4242

Combi switchbox with integrated pilot valve

Features

- Fieldbus connection AS-Interface and DeviceNet (optional)
- Communication and programming interface IO-Link
- Adjustable switch point tolerances
- Speed-AP function for fast mounting and initialization
- High visibility position indicator by LED
- Can be fitted to GEMÜ valves or third-party actuators
- On-site or remote end position programming via programming input
- Integrated manual override

Description

The GEMÜ 4242 combi switchbox is suitable for installation on pneumatically operated linear actuators. The position of the valve spindle is reliably electronically detected and evaluated using play-free and non-positive mounting. Integrated pilot valves enable direct activation of the process valve connected to them. Intelligent microprocessor-controlled functions facilitate commissioning and support during operation. The current position of the valve is displayed via high-visibility LEDs and fed back via electrical signals.

Technical specifications

- **Ambient temperature:** 0 to 60 °C
- **Linear measuring range:** 2 to 75 mm
- **Flow rate:** 14 Nl/min l 23 Nl/min l 250 Nl/min
- **Supply voltage:** 24 V DC
- **Mode of action:** Double acting l Single acting
- **Communication modes:** AS-Interface l DeviceNet l IO-Link
- **Electrical connection types:** M12 plug
- **Protection class:** IP 65. IP 67
- **Conformities:** ATEX l EAC l ETL Listed C US l Functional safety l IECEx

Technical data depends on the respective configuration

IO-Link

further information
webcode: GW-4242

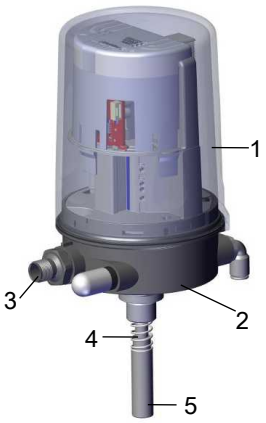
Product line

	GEMÜ 4240	GEMÜ 4241	GEMÜ 4242
Linear measuring range	5 to 75 mm	5 to 75 mm	2 to 75 mm
Radial measuring range	0 - 90°	0 - 90°	0 - 90°
Ambient temperature	0 to 60 °C	0 to 50 °C	0 to 60 °C
Flow rate			
14 Nl/min	-	-	●
23 Nl/min	-	-	●
250 Nl/min	●	●	●
Electrical connection types			
Cable gland	●	●	-
Connectors	-	-	●
Switch types			
2-wire proximity switch (NAMUR)	●	●	-
Microswitch	●	-	-
3-wire proximity switch	●	-	-
Communication modes			
AS-Interface	-	-	●
DeviceNet	-	-	●
IO-Link	-	-	●
Supply voltage			
24 V DC	●	-	●
250 V AC	●	-	-
8 V DC	●	●	-
Conformities			
ATEX	-	●	●
EAC	-	●	●
ETL Listed C US	-	-	●
Functional safety	-	-	●
IECEx	-	●	●

Product description

Size 1, 30 mm

Size 2, 75 mm

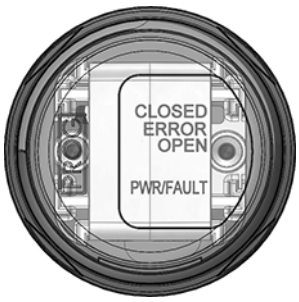


Size 2, 30 mm

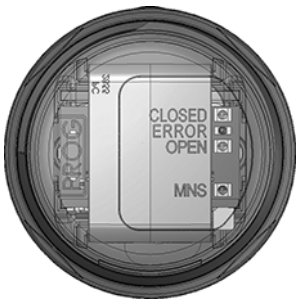
Item	Name	Materials		
		Size 1, 30 mm	Size 2, 75 mm	Size 2, 30 mm
1	Housing cover – standard version:	PC	PC	PC
	Housing cover – compact version:	PP	-	-
2	Housing base	Anodized aluminium or stainless steel	PPS	PPS
3	Electrical connection	Threaded piece: Stainless steel (1.4305) insert: PA	Threaded piece: PPS or stainless steel (1.4305) insert: PA	Threaded piece: PPS or stainless steel (1.4305) insert: PA
4	Adapter piece	Stainless steel (1.4305)	Stainless steel (1.4305)	Stainless steel (1.4305)
5	Mounting kit, valve specific	Valve-specific materials	Valve-specific materials	Valve-specific materials
	Seals	EPDM and NBR	NBR	NBR

Status LEDs

As well as the electrical position feedback and error analysis, a visual signal is emitted by LEDs that can be seen from above as well as a high visibility LED.



24 V / AS-Interface / IO-Link version



DeviceNet version

LED	Colour		Function
	Standard [1]	Inversed [2]	
CLOSED	Green	Orange	Process valve in CLOSED position
ERROR	Red	Red	Error
OPEN	Orange	Green	Process valve in OPEN position
High visibility LED	Green	Orange	Process valve in CLOSED position
	Orange	Green	Process valve in OPEN position
	Alternating green/orange	Alternating green/orange	Programming mode
	Flashes orange	Flashes orange	Error
PWR/FAULT (24 V version, code 000)	Green		Power on
	Red		Supply voltage too low
PWR/FAULT [3] (ASi version, code A2, A3, A4)	Green		Communication active
	Red		Communication error/address 0
	Flashes red		Device error
PWR/FAULT (IO-Link version, code IOL)	Green		SIO operation
	Flashes green		Communication active
	Red		Communication error or supply voltage too low
MNS [4] (DeviceNet version, code DN)	Flashes green		Ready for communication
	Green		Communication active
	Flashes red		Communication error

LED	Colour		Function
	Standard [1]	Inversed [2]	
	Red		Communication error, device has disconnected independently from the bus

1) **Option**
Code 00: Without
Code 01: Manual override

2) **Option**
Code 40: Inversed LED colours
Code 41: Inversed LED colours, manual override

3) The flash codes of the PWR/FAULT LED are specified according to AS-Interface and provide feedback about the status of AS-Interface communication.

4) The flash codes of the MNS LEDs are specified according to DeviceNet and give feedback about the status of the DeviceNet communication.

For order codes see chapter "Order data"

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.

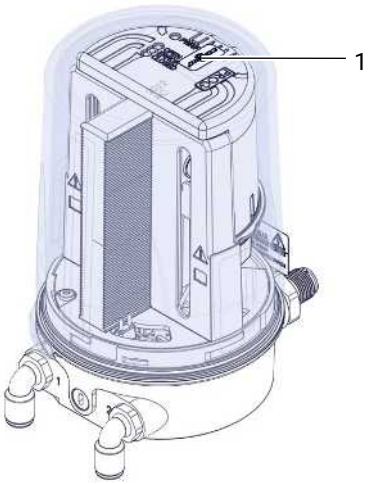
For further information on GEMÜ CONEXO please visit:
www.gemu-group.com/conexo

Ordering

GEMÜ Conexo must be ordered separately with the ordering option "CONEXO" (see order data).

Installing the RFID chip (1)

Size 1, 30 mm



Size 2, 75 mm

Size 2, 30 mm

Availability

Option	Code	Size 1	Size 2	
			75 mm	30 mm
Housing material [1]	**01**	-	X	
	07	X	-	
	14	X	-	
Function [2]	**01**	X	X	
	02	X	X	-
	K1	X	X	
Flow rate [3]	**01**	X	-	
	02	X	-	
	03	-	X	
Special version [4]	**Y**	X	X	On request
	X	X	X	On request

1) **Housing material**
Code 01: PPS base, PC cover
Code 07: Stainless steel base, PC cover
Code 14: Aluminium base, PC cover

2) **Function**
Code 01: Combi switchbox, single acting
Code 02: Combi switchbox, double acting
Code K1: Combi switchbox, compact version, single acting

3) **Flow rate**
Code 01: 14 Nl/min, size 1
Code 02: 23 Nl/min (Booster), size 1
Code 03: 250 Nl/min, size 2

4) **Special version**
Code Y: NEC 500 and UL/CSA approval

Overview of available functions

Function	Version					
	24 V	IO-Link	AS-Interface			DeviceNet
			A2	A3	A4	
Optical high visibility position indicator	X	X	X	X	X	X
Deactivation of high visibility position indicator	-	X	-	-	X	X
Manual override	X	X	X	X	X	X
On-site programming	X	X	X	X	X	X
Deactivation of on-site programming	-	X	-	-	X	X
Position feedback Open	X	X	X	X	X	X
Position feedback Closed	X	X	X	X	X	X
Feedback for operating mode	-	X	X	X	X	X
Location function	-	X	-	-	X	X
Inversion of LED colours	-	X	-	-	X	X
Inversion of feedback signals	-	X	-	-	X	X
Switch point setting (tolerance)	-	X	X	X	X	X
Setting stroke reduction alarm	-	X	-	-	-	X
Feedback stroke reduction alarm	-	X	-	-	X	X
Feedback programmed positions	-	X	-	-	-	X
Feedback current positions	-	X	-	-	-	X
Feedback internal error	-	X	X	X	X	X
Feedback sensor error	-	X	X	X	X	X
Feedback programming error	-	X	X	X	X	X
Setting pneumatic fault time	-	X	-	-	-	X
Feedback pneumatic fault	-	X	X	X	X	X
Feedback over-temperature	-	X	-	-	-	-
Counter Powerfail	-	X	-	-	-	-
Counter Power on	-	X	-	-	-	-
Programming counter	-	X	-	-	-	-
Counter programming error	-	X	-	-	-	-
Counter pneumatic fault	-	X	-	-	-	-
Counter sensor error	-	X	-	-	-	
Counter over-temperature	-	X	-	-	-	-
Cycle counter (on-site)	-	X	-	-	-	X
Total cycle counter	-	X	-	-	-	X
Default	-	X	-	-	-	Via DeviceNet

Order data

The order data provide an overview of standard configurations.

Please check the availability before ordering. Other configurations available on request.

Note: A valve specific mounting kit is required for assembly. For designing the mounting kit, the valve type, nominal size, control function and actuator size must be stated.

Order codes

1 Type	Code
Combi switchbox	4242

2 Fieldbus	Code
Without, 24 V version	000
AS-Interface, 31 Slaves, 4E/4A	A2
AS-Interface, 62 Slaves, 4E/3A	A3
AS-Interface, 62 slaves, 8I/8O	A4
DeviceNet	DN
IO-Link	IOL

3 Accessory	Code
Accessories	Z

4 Housing material	Code
Stainless steel base, PC cover	07
Aluminium base, PC cover	14
PPS base, PC cover	01

5 Function	Code
Combi switchbox, single acting	01
Combi switchbox, double acting	02
Combi switchbox, compact version, single acting	K1

6 Electrical connection	Code
M12 plug, 5-pin	01
M12 plug, 8-pin	02
M12 plug, 5-pin, stainless steel, size 2	S1
M12 plug, 8-pin, stainless steel, size 2	S2

7 Pneumatic connection	Code
Connection thread M5 for size 1, connection thread G1/8 for size 2	01
Air supply 4 mm angled connection, exhaust air 4 mm angled connection	02
Air supply 4 mm T-connection, exhaust air 4 mm angled connection	03
Air supply 6 mm angled connection, exhaust air 6 mm angled connection	04
Air supply 6 mm T-connection, exhaust air 6 mm angled connection	05
Connection thread M5 for size 1, connection thread G1/8 for size 2 (for IP67 or piped air outlet)	E1
Air supply 6 mm angled connection, exhaust air 6 mm angled connection (for IP67 or piped air outlet)	E4

7 Pneumatic connection	Code
Air supply 1/4" angled connection, exhaust air 1/4" angled connection	U8

8 Option	Code
Without	00
Manual override	01
Inversed LED colours	40
Inversed LED colours, manual override	41
Inversion of LED colours deactivation of high visibility position indicator	80

9 Flow rate	Code
14 Nl/min, size 1	01
23 Nl/min (Booster), size 1	02
250 Nl/min, size 2	03

10 Travel sensor version	Code
Potentiometer 30 mm length, size 1 and 2	030
Potentiometer 75 mm length, size 2	075

11 Special version	Code
Without	
ATEX(2014/34/EU), IECEx	X
NEC 500 and UL/CSA approval	Y

Order example

Ordering option	Code	Description
1 Type	4242	Combi switchbox
2 Fieldbus	000	Without, 24 V version, with IO-Link
3 Accessory	Z	Accessories
4 Housing material	07	Stainless steel base, PC cover
5 Function	01	Combi switchbox, single acting
6 Electrical connection	01	M12 plug, 5-pin
7 Pneumatic connection	01	Connection thread M5 for size 1, connection thread G1/8 for size 2
8 Option	01	Manual override
9 Flow rate	01	14 Nl/min, size 1
10 Travel sensor version	030	Potentiometer 30 mm length, size 1 and 2
11 Special version		Without

Technical data

Medium

Working medium: Quality classes to DIN ISO 8573-1

Dust content: Class 3, max. particle size 5 µm, max. particle density 5 mg/m³

Pressure dew point:

Size 1

Class 3, max. pressure dew point -20 °C

Size 2

Class 4, max. pressure dew point +3 °C

Oil content:

Size 1

Class 3, max. oil concentration 1 mg/m³

Size 2

Class 5, max. oil concentration 25 mg/m³

Temperature

Ambient temperature:

Standard or with special version code Y	0–60 °C
Special version code X	0–50 °C

Control medium temperature: 0 — 50 °C

Storage temperature: -10 — 70 °C

Pressure

Operating pressure:

Size 1	Size 2
1 to 10 bar (at 40 °C) 1 to 8 bar (at 60 °C)	2 to 7 bar

Observe the maximum control pressure of the valve actuator.

Flow rate:

Size 1	Size 2
14 Nl/min 23 Nl/min	250 Nl/min

Product conformities

EMC Directive: 2014/30/EU

Technical standards used:

	24 V	AS-Interface	IO-Link	DeviceNet
Interference emission	EN 61000-6-3	acc. to AS-Interface Spec. 3.0	EN 61000-6-3	EN 61000-6-3
Interference resistance	EN 61000-6-2	acc. to AS-Interface Spec. 3.0	EN 61000-6-2	EN 61000-6-2

Explosion protection: ATEX (2014/34/EU) and IECEx, order code Special version X

NEC 500 (ISA 12.12.01), order code Special version Y

ATEX marking: Gas: Ⓔx II 3G Ex ec nC IIC T4 Gc X

Dust: Ⓔx II 3D Ex tc IIIC T 80 °C Dc X

IECEx marking:

Gas: Ex ec nC IIC T4 Gc

Dust: Ex tc IIIC T80°C Dc

Certificate: IECEx IBE 19.0011 X

NEC marking:

Class I, Division II, Groups C & D, T4

Approvals:

	24 V	AS-Interface	IO-Link	DeviceNet
Fieldbus/ Communication	-	Travel sensor version 030: AS-Interface certificate No. 96001 Travel sensor version 075: AS-Interface certificate No. 125601	Travel sensor version 030: IO-Link specification V 1.1 Travel sensor version 075: IO-Link specification V 1.1	n.n.

SIL:

Product description: GEMÜ electrical position indicator 4242
Device type: B
Valid software version: V1.1.X.X
Safety function: The fail-safe state is defined as a High (24 V DC) signal at pin 4 (device version 24 V IO-Link), if the current position of the integrated travel sensor is smaller than the switch point CLOSED (default setting 12%).
HFT (Hardware Fault Tolerance): 0
MTTR (Mean Time To Restoration): 24 hours
MTBF (Mean Time Between Failures): 232 years

Further information, see SIL safety manual

Mechanical data

Installation position: Optional

Weight:

Size 1	Size 2	
	75 mm	30 mm
Aluminium: 320 g Stainless steel: 600 g	420 g	350 g

Protection class:

IP 65

IP 67 is achieved by piping away the exhausting air

IP NEMA 4X (UL 61010-1, UL 50E), only available as special version code Y

Travel sensor:

	Size 1	Size 2	
		75 mm	30 mm
Minimum stroke:	2 mm	5 mm	2 mm
Maximum stroke:	30 mm	75 mm	30 mm
Hysteresis:	0.2 mm	0.5 mm	0.2 mm
Accuracy:	0.2% Full Scale		

Electrical data

Electrical connection type:

24 V	IO-Link / AS-Interface / DeviceNet
1 x 8-pin M12 plug (A-coded)	1 x 5-pin M12 plug (A-coded)

Supply voltage:

24 V DC (18 to 30 V DC) (according to IO-Link specifications)
26.5 to 31.6 V DC (according to AS-Interface specifications)
11 to 25 V DC (according to DeviceNet specifications)

Current consumption:

Flow rate code	24 V	IO-Link	AS-Interface	DeviceNet
01	typically 80 mA	typically 80 mA	typically 100 mA	typically 65 mA
02	typically 120 mA	typically 120 mA	typically 150 mA	typically 100 mA
03	typically 100 mA	typically 100 mA	typically 120 mA	typically 85 mA

Duty cycle:

Continuous duty

Electrical protection class:

III

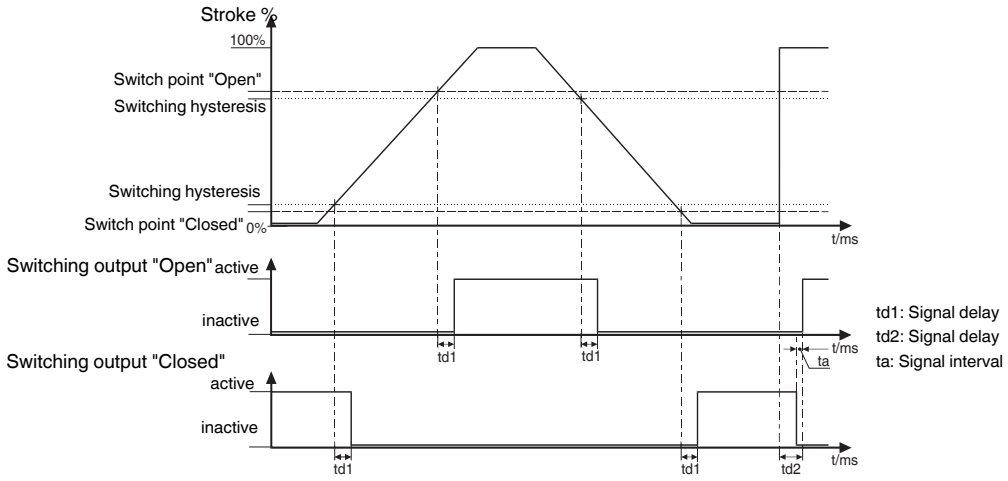
Reverse battery protection:

yes

Line fuse:

630 mA medium time lag, for order code Fieldbus 000

Switching characteristic:



Switch points: The data in percent refer to the programmed stroke, before each end position

Switch points:

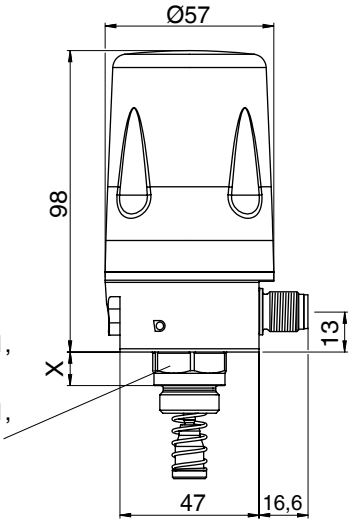
	Size 1	Size 2	
		75 mm	30 mm
Default setting switch point CLOSED	12%	12%	12%
Default setting switch point OPEN	25%	25%	25%
Min. switch point CLOSED	0.8 mm	2 mm	0.8 mm
Min. switch point OPEN	0.5 mm	1.25 mm	0.5 mm

If the percentage switch points dependent on the programmed stroke are smaller than the permissible min. switch points, the min. switch points apply automatically.

Dimensions

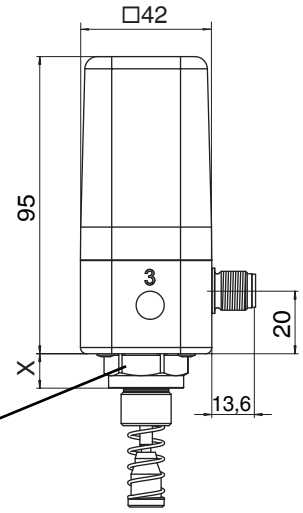
Size 1

Only 30 mm potentiometer length available



WAF 20 for mounting kit M12x1,
x = 9 mm
WAF 24 for mounting kit M16x1,
x = 11 mm
dependent on valve used

Standard

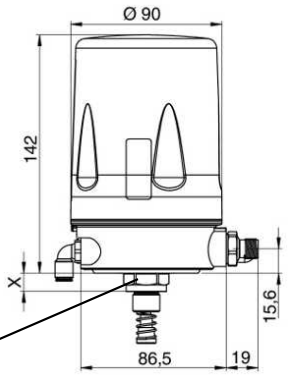


WAF 20 for mounting kit M12x1,
x = 9 mm
WAF 24 for mounting kit M16x1,
x = 11 mm
dependent on valve used

Compact

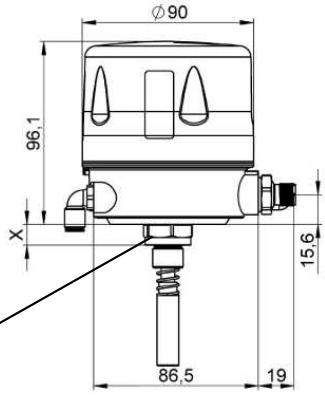
Dimensions in mm

Size 2



WAF 20 for mounting kit M12x1,
x = 9 mm
WAF 24 for mounting kit M16x1,
x = 11 mm
dependent on valve used

Potentiometer, 75 mm length



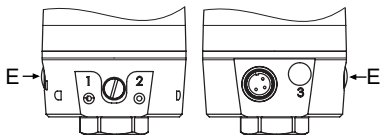
WAF 20 for mounting kit M12x1,
x = 9 mm
WAF 24 for mounting kit M16x1,
x = 11 mm
dependent on valve used

Potentiometer, 30 mm length

Dimensions in mm

Pneumatic connection

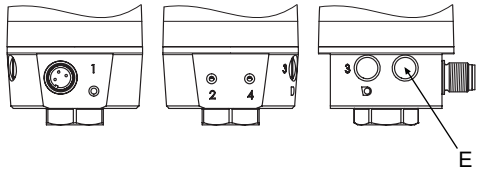
Size 1, standard, single acting



Connection	Designation	Connection size
1	Air supply connection	M5
2	Working connection for process valve	M5
3	Venting connection with integrated check valve	M6 x 0,75 [1)]
E	Housing ventilation with integrated check valve	M6 x 0.75

1) only relevant for exhaust air duct and/or increase of protection class

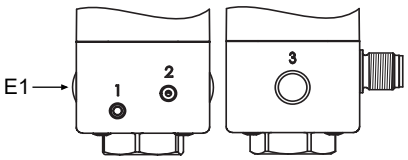
Size 1, standard, double acting



Connection	Designation	Connection size
1	Air supply connection	M5
2	Working connection for process valve	M5
3	Venting connection with integrated check valve	M6 x 0,75 [1)]
4	Working connection for process valve	M5
E	Housing ventilation with integrated check valve	M6 x 0.75

1) only relevant for exhaust air duct and/or increase of protection class

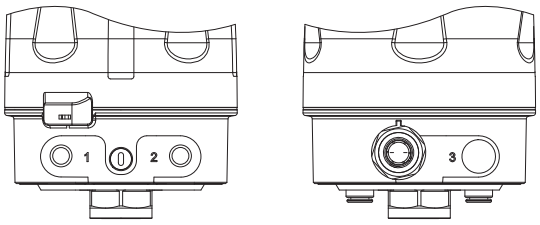
Size 1, compact version



Connection	Designation	Connection size
1	Air supply connection	M5
2	Working connection for process valve	M5
3	Venting connection with integrated check valve	M6 x 0,75 [1)]
E1	Housing ventilation with integrated check valve	M6 x 0.75

1) only relevant for exhaust air duct and/or increase of protection class

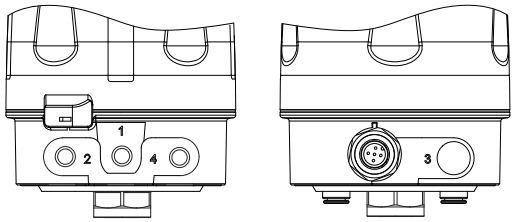
Size 2, standard, single acting



Connection	Designation	Connection size
1	Air supply connection	G 1/8
2	Working connection for process valve	G 1/8
3	Venting connection with silencer (integrated housing ventilation)	G 1/8 [1)]

1) only relevant for exhaust air duct and/or increase of protection class

Size 2, standard, double acting (only available for 75 mm version)



Connection	Designation	Connection size
1	Air supply connection	G 1/8
2	Working connection for process valve	G 1/8
3	Venting connection with silencer (integrated housing ventilation)	G 1/8 [1)]
4	Working connection for process valve	G 1/8

1) only relevant for exhaust air duct and/or increase of protection class

Electrical connection

24 V, ordering option Fieldbus, code 000

Pin assignment

Pin	Signal name
1	U, 24 V DC, supply voltage
2	24 V DC, Open end position output
3	U, GND
4	24 V DC, Closed end position output
5	24 V DC, programming input
6	24 V DC, control input
7	24 V DC, error output
8	n.c.

Pin 5 and pin 6 are highly active. If not used, connect to GND or leave open.
The following errors are indicated via pin 7 (error output): Sensor error, pneumatic error, programming error, internal error

Inputs (pin 5, 6)

Input impedance: min. 27 kΩ

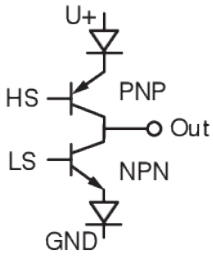
Input voltage: max. 30 V DC

High level: ≥ 18 V DC

Low level: ≤ 5 V DC

Outputs (pin 2, 4, 7)

Internal wiring:



Push-Pull

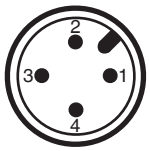
Max. switching current: ± 100 mA

Max. voltage drop Vdrop: 3 V DC at 100 mA

Switching voltage: $+U_v - V_{drop}$ push high
$-U_v + V_{drop}$ pull low

IO-Link, ordering option Fieldbus, code IOL

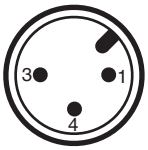
Pin assignment



Pin	Signal name
1	U, 24 V DC, supply voltage
2	n.c.
3	U, GND
4	C/Q IO-Link
5	-

AS-Interface, ordering option Fieldbus, code A2, A3, A4

Pin assignment

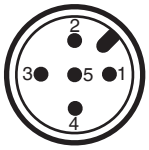


Pin	Signal name
1	AS-Interface +
2	-
3	AS-Interface -
4	n.c.
5	-

Carry out potential equalisation via pre-assembled earthing kit.
Connect yellow/green stranded wire H07 V-K 4.0 on site.

DeviceNet, ordering option Fieldbus, code DN

Pin assignment



Pin	Signal name
1	Shield
2	V+
3	V-
4	CAN_H
5	CAN_L

Specific data - IO-Link

Physics: Physics 2 (3-wire design)

Port configuration: Port type A

Transmission rate: 38400 baud

Frame type in Operate: 2.5

Min. cycle time: 2.3 ms

Vendor-ID: 401

Device-ID: 424201

Product-ID: 4242 IO-LINK

ISDU support: yes

SIO operation: yes

IO-Link specification:

Size 1	Size 2
V1.1	V1.1 when using IODD 1.1 [1)]

1) When using IODD 1.0.1 the device works in accordance with IO-Link specification V1.0 (compatibility mode)

Note for IO-Link: IODD files can be downloaded via the hyperlinks https://ioddfinder.io-link.com/%20oder%20www.gemu-group.com, https://ioddfinder.io-link.com or www.gemu-group.com.

Process data

Device → Master

Name	Bit	Values
Valve position Open	0	0 → Process valve not in Open position
		1 → Process valve in Open position
Valve position Close	1	0 → Process valve not in Closed position
		1 → Process valve in Closed position
Programming mode	2	0 → Normal operation
		1 → Programming mode

Master → Device

Name	Bit	Values
Pneumatic outlet (single acting valve)	0	0 → Pneumatic outlet 2 vented
		1 → Pneumatic outlet 2 pressurized
Pneumatic outlet (double acting valve)	0	0 → Pneumatic outlet 2 vented, pneumatic outlet 4 [1)] pressurized
		1 → Pneumatic outlet 2 pressurized, pneumatic outlet 4 [1)] vented
Programming mode	1	0 → Normal operation
		1 → Programming mode
Locate	2	0 → Off
		1 → On

1) Activation of outlet 4, only for double acting function (code 02)

Parameter overview

NOTICE

All IO-Link parameters that contain sub-indexes can also be addressed in bundles via sub-index 0.

Index [Hex]	Sub-bindex	Access rights	Parameters	Length	Data type	Default settings	Setting options
0x10	0	ro	Vendor Name	6 byte	StringT	GEMUE	-
0x12	0	ro	Product Name	13 byte	StringT	4242 IO-Link	-
0x13	0	ro	Product ID	8 byte	StringT	4242 IO-LINK	-
0x15	0	ro	Serial number	9 byte	StringT	0–4294967296	-
0x16	0	ro	Hardware Revision	8 byte	StringT	Rev. xx	-
0x17	0	ro	Firmware Revision	10 byte	StringT	V x.x.x.x	-
0x50	1	rw	Inversion of LED colours	1 bit	Boolean	0	0 = standard 1 = inversed
	2	rw	Inversion of feedback signals	1 bit	Boolean	0	0 = standard 1 = inversed
	3	rw	Function of high visibility	3 bit	UIntegerT	3	0 = off 1 = open/closed (33%) 2 = open/closed (66%) 3 = open/closed (100%)
	4	rw	Programming mode	1 bit	Boolean	0	0 = automatic 1 = manual
	5	rw	On site programming	1 bit	Boolean	0	0 = enabled 1 = disabled
	6	rw	Inversion of outputs	1 bit	Boolean	0	0 = standard 1 = inversed
0x51	1	rw	Switch Point OPEN request	8 bit	UIntegerT	25%	3%–97%
	2	rw	Switch Point CLOSED request	8 bit	UIntegerT	12%	3%–97%
	3	ro	Switch Point OPEN real	8 bit	UIntegerT	25%	Display of values 3%–97%
	4	ro	Switch Point CLOSED real	8 bit	UIntegerT	12%	Display of values 3%–97%
0x52	1	rw	Alarm Stroke reduction OPEN	4 bit	UIntegerT	1	0 = disabled 1 = 25% of Switch Point 2 = 50% of Switch Point 3 = 75% of Switch Point
	2	rw	Alarm Stroke reduction CLOSED	4 bit	UIntegerT	1	0 = disabled 1 = 25% of Switch Point 2 = 50% of Switch Point 3 = 75% of Switch Point
	3	rw	Alarm opening time	8 bit	UIntegerT	0	0 = disabled 1–255 s
	4	rw	Alarm closing time	8 bit	UIntegerT	0	0 = disabled 1–255 s
	5	rw	Valve type	8 bit	UIntegerT	0	0 = unknown 1 = normally closed 2 = normally open

Index [Hex]	Su-bindex	Access rights	Parameters	Length	Data type	Default settings	Setting options
0x53	1	ro	Programmed position OPEN	16 bit	UIntegerT	0	Display of numerical values 0–4092
	2	ro	Programmed position CLOSED	16 bit	UIntegerT	0	
	3	ro	Programmed position STROKE	16 bit	UIntegerT	0	
0x54	1	ro	Last position OPEN	16 bit	UIntegerT	0	
	2	ro	Last position CLOSED	16 bit	UIntegerT	0	
	3	ro	Last position STROKE	16 bit	UIntegerT	0	
0x56	1	rw	Valve cycles user	24 bit	UIntegerT	0	Resettable to 0, display of numerical values 0–16777215
	2	ro	Valve cycles total	24 bit	UIntegerT	0	Display of numerical values 0–16777215
0x57	1	ro	Counter Powerfail	16 bit	UIntegerT	0	Display of numerical values 0–65535
	2	ro	Counter Power on	16 bit	UIntegerT	0	
	3	ro	Counter Programming	16 bit	UIntegerT	0	
	4	ro	Counter Sensor calibration	16 bit	UIntegerT	0	
	5	ro	Counter Prog error no stroke	16 bit	UIntegerT	0	
	6	ro	Counter Prog error less stroke	16 bit	UIntegerT	0	
	7	ro	Counter Prog error after sensor error	16 bit	UIntegerT	0	
	8	ro	Counter Pneumatic fault OPEN	16 bit	UIntegerT	0	
	9	ro	Counter Pneumatic fault CLOSED	16 bit	UIntegerT	0	
	10	ro	Counter Pneumatic fault middle position	16 bit	UIntegerT	0	
	11	ro	Counter Sensor error OPEN	16 bit	UIntegerT	0	
	12	ro	Counter Sensor error CLOSED	16 bit	UIntegerT	0	
	16	ro	Counter Over temperature	16 bit	UIntegerT	0	
0x60	0	ro	Actual AD-value	16 bit	UIntegerT	0	Display of numerical values 0–4092

Events

Event	Mode	Type	Code
Internal error	Appear/Disappear	Error	0x8CA2
Sensor error in position OPEN	Appear/Disappear	Error	0x8CA4
Sensor error in position CLOSED	Appear/Disappear	Error	0x8CA5
Programming error with no stroke	Appear/Disappear	Error	0x8CA6
Programming error with to less stroke	Appear/Disappear	Error	0x8CA7
Programming error after sensor error	Appear/Disappear	Error	0x8CA8
Not calibrated	Appear/Disappear	Error	0x8CA9
Pneumatic error in position OPEN	Appear/Disappear	Warning	0x8CB0

Event	Mode	Type	Code
Pneumatic error in position CLOSED	Appear/Disappear	Warning	0x8CB1
Pneumatic error between position	Appear/Disappear	Warning	0x8CB2
Stroke reduction OPEN	Appear/Disappear	Warning	0x8CB5
Stroke reduction CLOSED	Appear/Disappear	Warning	0x8CB6
Parameter value out of Range	Single Shot	Notification	0x8DE0
Parameter value changed	Single Shot	Notification	0x8DE1

Specific data - AS-Interface

	A2 version	A3 version	A4 version
AS-Interface specification	3.0; max. 31 slaves	3.0; max. 62 slaves	3.0; max. 62 slaves
AS-Interface profile	S 7.F.E (4I/4O)	S 7.A.E (4I/3O)	S 7.A.A (8I/8O)
I/O configuration	7	7	7
ID code	F	A	A
ID2 code	E	E	A
AS-Interface approval	Size 1: AS-Interface certificate No. 96001 Size 2: AS-Interface certificate No. 125601		

Inputs

Bit		Default	Function	Version			Logic
				A2	A3	A4	
DI0	0	Indication of OPEN position		X	X	X	0 = process valve not in OPEN position 1 = process valve in OPEN position
DI1	0	Indication of CLOSED position		X	X	X	0 = process valve not in CLOSED position 1 = process valve in CLOSED position
DI2	0	Indication of operating mode		X	X	X	0 = normal operation 1 = programming mode
DI3	0	Error 2		X	X	X	see error analysis
DI4	0	Error 3		-	-	X	
DI5	0	Error 4		-	-	X	
DI6, DI7	not used			-	-	X	
PF	0	Error 1		X	X	X	see error analysis

Outputs

Bit	Default	Function	Version			Logic
			A2	A3	A4	
DO0	0	Activation of pneumatic outlet 2	X	-	-	0 = pneumatic outlet 2 vented 1 = pneumatic outlet 2 pressurized
	0	Activation of pneumatic outlet 2 / 4	X	X	X	0 = pneumatic outlet 2 vented, pneumatic outlet 4 [1] pressurized 1 = pneumatic outlet 2 pressurized, pneumatic outlet 4 [1] vented
DO1	0	Activation of pneumatic outlet 4 [1] (pilot valve 2)	X	-	-	0 = pneumatic outlet 4 [1] vented 1 = pneumatic outlet 4 [1] pressurized
		not used	X	-	-	
	0	Programming mode	-	X	-	0 = manual programming 1 = automatic programming

Bit	Default	Function	Version			Logic
			A2	A3	A4	
	0		-	-	X	0 = automatic programming 1 = manual programming
DO2	0	Setting slave in programming mode	X	X	X	0 = normal operation 1 = programming mode
DO3	0	Programming mode	X	-	-	0 = manual programming 1 = automatic programming
	0	Function of high visibility position indicator	-	-	X	0 = activated 1 = deactivated
DO4	0	Inversion of feedback signals	-	-	X	0 = standard 1 = inversed
DO5	0	Inversion of LED colours	-	-	X	0 = standard 1 = inversed
DO6	0	Location function	-	-	X	0 = deactivated 1 = activated
DO7	0	On-site programming	-	-	X	0 = enabled 1 = disabled

1) Activation of outlet 4, only for double acting function (code 02)

Specific data - DeviceNet

General data

Communication modes: Function, Polling, Change of state, Cyclic, Bit strobe

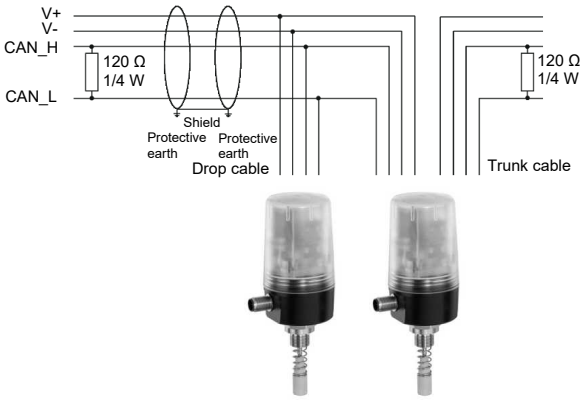
Identity				
Class	Inst.	Attr.	Function	Value
1h	1h	1h	Vendor ID	869
		2h	Product Type	48
		3h	Product Code	4242
		4h	Rev.	2.2 [1)]
		5h	Status	Device status according to DeviceNet specifications
		6h	Series No.	Continuous serial number
		7h	Name	4242 DN combi switchbox

1) Use EDS file in accordance with revision status of the device

Note: Download EDS files from www.gemu-group.com

Net topology - DeviceNet system

To avoid malfunction the trunk cable is fitted with resistors on both sides. The drop cables do not require bus ends.



Maximum cable length

Baud rate [kBaud]	Trunk cable		Drop cable	
	Thick cable	Thin cable	Max. cable length per drop cable	Max. drop cable accumulated length
125	500 m	100 m	6 m	156 m
250	250 m	100 m	6 m	78 m
500	100 m	100 m	6 m	39 m

Inputs

Bit	Default	Designation	Function	Logic
0	0	State Valve 1	Status query pneumatic outlet 2 (pilot valve 1)	0 = pneumatic outlet 2 vented 1 = pneumatic outlet 2 pressurized
1	0	State Valve 2	Status query pneumatic outlet 4 (pilot valve 2)	0 = pneumatic outlet 4 vented 1 = pneumatic outlet 4 pressurized
2	0	Programmingmode	Feedback for operating mode	0 = normal operation 1 = programming mode
3	0	Position Closed	Feedback CLOSED position	0 = process valve not in CLOSED position 1 = process valve in CLOSED position
4	0	Position Open	Feedback OPEN position	0 = process valve not in OPEN position 1 = process valve in OPEN position
5	0	Calibrationmode	Feedback calibration mode	0 = normal operation 1 = calibration mode
6	0	Global warnings	General warning	0 = warning not active 1 = warning active
7	0	Global errors	General error	0 = error not active 1 = error active

As seen from the DeviceNet master, Class 64h, Inst. 1h, Attr. 1h

Outputs

Bit	Default	Designation	Function	Logic
0	0	active valve 1	Activation of pneumatic outlet 2 (pilot valve 1)	0 = pneumatic outlet 2 vented 1 = pneumatic outlet 2 pressurized
1	0	active valve 2	Activation of pneumatic outlet 4 [1] (pilot valve 2)	0 = pneumatic outlet 4 [1] vented 1 = pneumatic outlet 4 [1] pressurized

Bit	Default	Designation	Function	Logic
2	not used			
3	0	Location function	Location function	0 = location function not active 1 = location function active
4	not used			
5	0	Manual programming	Manual programming mode	0 = manual programming mode not active 1 = manual programming mode active
6	0	Automatic programming	Automatic programming mode:	0 = automatic programming mode not active 1 = automatic programming mode active
7	not used			

As seen from the DeviceNet master, Class 64h, Inst. 1h, Attr. 1h

1) Activation of outlet 4, only for double acting function (code 02)

Parameter overview

Class	Inst.	Access rights	Attr.	Parameters	Length	Data type	Default setting	Setting options
Fh	1h	Get/Set	1h	Inversion of LED colours	1 byte	Boolean	0	0 = standard 1 = inversed
Fh	2h	Get/Set	1h	Inversion of signals	1 byte	Boolean	0	0 = standard 1 = inversed
Fh	3h	Get/Set	1h	Function of high visibility	1 byte	USINT	3	0 = OFF 1 = 33% 2 = 66% 3 = 100% 4 = Closed 100%; Open OFF 5 = Closed OFF; Open 100%
Fh	4h	Get/Set	1h	On site programming	1 byte	Boolean	0	0 = enabled 1 = disabled
Fh	5h	Get/Set	1h	Switch Point OPEN request	1 byte	USINT	25	3%–97%
Fh	6h	Get	1h	Switch Point OPEN real	1 byte	USINT	0	Display of values 0%–100%
Fh	7h	Get/Set	1h	Switch Point CLOSED request	1 byte	USINT	12	3%–97%
Fh	8h	Get	1h	Switch Point CLOSED real	1 byte	USINT	0	Display of values 0%–100%
Fh	9h	Get/Set	1h	Alarm stroke reduction OPEN	1 byte	USINT	1	0 = disabled 1 = 25% 2 = 50% 3 = 75%
Fh	Ah	Get/Set	1h	Alarm stroke reduction CLOSED	1 byte	USINT	1	0 = disabled 1 = 25% 2 = 50% 3 = 75%
Fh	Bh	Get/Set	1h	Alarm opening time	1 byte	USINT	0	0–255 (0 = off)
Fh	Ch	Get/Set	1h	Alarm closing time	1 byte	USINT	0	0–255 (0 = off)

Class	Inst.	Access rights	Attr.	Parameters	Length	Data type	Default setting	Setting options
Fh	Dh	Get/Set	1h	Valve type	1 byte	USINT	0	0 = disabled 1 = valve NC 2 = valve NO
Fh	Eh	Get/Set	1h	Fail state	1 byte	USINT	0	0 1 2
Fh	Fh	Get	1h	Programmed position OPEN	2 byte	UINT	0	Display of numerical values 0–4092
Fh	10h	Get	1h	Programmed position CLOSED	2 byte	UINT	0	
Fh	11h	Get	1h	Programmed stroke	2 byte	UINT	0	
Fh	12h	Get	1h	Last position OPEN	2 byte	UINT	0	
Fh	13h	Get	1h	Last position CLOSED	2 byte	UINT	0	
Fh	14h	Get	1h	Last stroke	2 byte	UINT	0	
Fh	15h	Get	1h	Valve position	2 byte	UINT	0	
Fh	16h	Get	1h	Sensor error	1 byte	USINT	0	0 = Sensor OK 1 = Sensor error position closed 2 = Sensor error position open
Fh	17h	Get	1h	Programming error	1 byte	USINT	1	0 = Programming OK 1 = not calibrated 2 = no stroke 3 = stroke < min. stroke 4 = Sensor error position closed 5 = Sensor error position open 6 = Sensor error position closed + open
Fh	18h	Get	1h	Pneumatic error	1 byte	USINT	0	0 = Pneumatic OK 1 = Pneumatic error position closed 2 = Pneumatic error position open 3 = Pneumatic error middle position
Fh	19h	Get	1h	Internal error	1 byte	USINT	0	0 = Device OK 1 = un-valid crc-check 2 = un-valid serial number 3 = Memory error

Class	Inst.	Access rights	Attr.	Parameters	Length	Data type	Default setting	Setting options
Fh	1Ah	Get	1h	Stroke reduction warning	1 byte	USINT	0	0 = Stroke OK 1 = Stroke reduction position closed 2 = Stroke reduction position open 3 = Stroke reduction position closed + open
Fh	1Bh	Get/Set	1h	Valve cycles user	4 byte	UDINT	0	Resettable to 0, display of numerical values 0–429496729
Fh	1Ch	Get	1h	Valve cycles total	4 byte	UDINT	0	Display of numerical values 0–429496729

Accessories

GEMÜ 4242000ZMA

Programming magnet

The programming magnet is used to start automatic initialization.

Ordering information

Order number: 88377537

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.

Ordering information

Description	Length	Order number
5-pin, angle	without cable	88205545
	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
8-pin, angle	5 m cable	88374574
8-pin, straight	without cable	88304829

GEMÜ 4150

AS-Interface extension plug

The extension plug serves to extend the network cable length from the current 100 m to 200 m without a repeater for the AS-Interface fieldbus system. With the integrated LED, the extension plug is used for power monitoring. In standard networks, the signal quality can be improved and the telegram error rate reduced.

Ordering information

Order number: 88262994

GEMÜ 4180

AS-Interface connector

AS-Interface connector (M12 on AS-Interface, flat cable)

Ordering information

Order number: 88073531

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.

Ordering information

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

Subject to alteration | 10.2022 | 88345121

GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG
Fritz-Müller-Straße 6-8, 74653 Ingelfingen-Criesbach, Germany
Phone +49 (0) 7940 1230 · info@gemue.de
www.gemu-group.com