

GEMÜ 4242 ASi-5

Combi switchbox with integrated pilot valve

EN

Operating instructions

ASi-5



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1 General information

1.1 Information

- The descriptions and instructions apply to the standard versions. For special versions not described in this document the basic information contained herein applies in combination with any additional special documentation.
- Correct installation, operation, maintenance and repair work ensure faultless operation of the product.
- Should there be any doubts or misunderstandings, the German version is the authoritative document.
- Contact us at the address on the last page for staff training information.

1.2 Symbols used

The following symbols are used in this document:

Symbol	Meaning
●	Tasks to be performed
►	Response(s) to tasks
–	Lists

1.3 Definition of terms

Working medium

The medium that flows through the GEMÜ product.

Control function

The possible actuation functions of the GEMÜ product.

Control medium

The medium whose increasing or decreasing pressure causes the GEMÜ product to be actuated and operated.

1.4 Warning notes

Wherever possible, warning notes are organised according to the following scheme:



SIGNAL WORD	
Possible symbol for the specific danger	Type and source of the danger ► Possible consequences of non-observance. ● Measures for avoiding danger.



SIGNAL WORD	
Possible symbol for the specific danger	Type and source of the danger ► Possible consequences of non-observance. ● Measures for avoiding danger.


Warning notes are always marked with a signal word and sometimes also with a symbol for the specific danger.

The following signal words and danger levels are used:

 DANGER	
	Imminent danger! ► Non-observance can cause death or severe injury.

 WARNING	
	Potentially dangerous situation! ► Non-observance can cause death or severe injury.

 CAUTION	
	Potentially dangerous situation! ► Non-observance can cause moderate to light injury.

NOTICE	
	Potentially dangerous situation! ► Non-observance can cause damage to property.

The following symbols for the specific dangers can be used within a warning note:

Symbol	Meaning
	Danger of explosion!
	Risk of electric shock
	Danger of explosion
	Electrostatic discharge!
	Hazardous situation
	Safety notice!

2 Safety information

The safety information in this document refers only to an individual product. Potentially dangerous conditions can arise in combination with other plant components, which need to be

considered on the basis of a risk analysis. The operator is responsible for the production of the risk analysis and for compliance with the resulting precautionary measures and regional safety regulations.

The document contains fundamental safety information that must be observed during commissioning, operation and maintenance. Non-compliance with these instructions may cause:

- Personal hazard due to electrical, mechanical and chemical effects
- Hazard to nearby equipment
- Failure of important functions
- Hazard to the environment due to the leakage of dangerous materials

The safety information does not take into account:

- Unexpected incidents and events, which may occur during installation, operation and maintenance
- Local safety regulations which must be adhered to by the operator and by any additional installation personnel

Prior to commissioning:

1. Transport and store the product correctly.
2. Do not paint the bolts and plastic parts of the product.
3. Carry out installation and commissioning using trained personnel.
4. Provide adequate training for installation and operating personnel.
5. Ensure that the contents of the document have been fully understood by the responsible personnel.
6. Define the areas of responsibility.
7. Observe the safety data sheets.
8. Observe the safety regulations for the media used.

During operation:

9. Keep this document available at the place of use.
10. Observe the safety information.
11. Operate the product in accordance with this document.
12. Operate the product in accordance with the specifications.
13. Maintain the product correctly.
14. Do not carry out any maintenance work and repairs not described in this document without consulting the manufacturer first.

In cases of uncertainty:

15. Consult the nearest GEMÜ sales office.

3 Product description

3.1 Construction



Item	Name	Materials		
		Size 1, 30 mm	Size 2, 75 mm	Size 2, 30 mm
1	Housing cover – standard version:	PC	PC	PC
2	Housing base	Anodized aluminium or stainless steel	Stainless steel	Stainless steel
3	Electrical connection	Threaded piece: Stainless steel (1.4305) Insert: PA	Threaded piece: Stainless steel (1.4305) Insert: PA	Threaded piece: 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, EPDM and VMQ	NBR, EPDM and VMQ

3.2 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.

3.3 Function

The GEMÜ 4242 combi switchbox controls the pneumatic actuator via integrated pilot valves and simultaneously indicates the current position of the valve. Should the valve be opened, the internally installed pilot valves control the pneumatic actuator accordingly. The spindle in the combi switchbox consequently moves upwards and indicates that the valve is OPEN using the high visibility LEDs and communication interface. Should the valve be closed, the internally installed pilot valves control the pneumatic actuator accordingly. The spring in the mounting kit simultaneously pushes the spindle in the

combi switchbox downwards and indicates that the valve is CLOSED using the high visibility LEDs and communication interface.

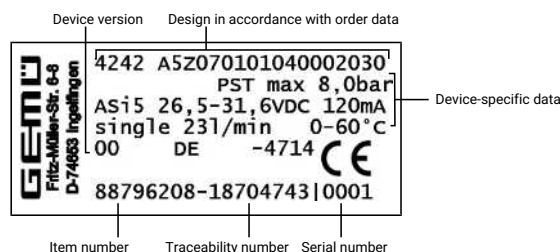
3.4 LEDs



As well as the electrical position indicator and error output, a visual signal of the various operating conditions is emitted by high-visibility LEDs integrated into the housing. The LEDs are arranged so that the transparent cover is illuminated all round, making the condition visible from afar. The following conditions are illustrated here:

Colour of high-visibility LEDs		Function
Standard	Inversed	
Green	Orange	Process valve in OPEN position
Orange	Green	Process valve in CLOSED position
Flashing green	Flashing orange	Movement of process valve in OPEN direction
Flashing orange	Flashing green	Movement of process valve in CLOSED direction
Flashing yellow/white		Initialization active
Flashing white		Localization active
Flashing orange/red		Warning active
Flashing red		Error active
Flashing yellow/turquoise		Maintenance required
Flashing blue (briefly)		Wireless connection established
Flashing purple/green		Internal update process active
Flashing turquoise (briefly)		Device start

3.5 Product label



The manufacturing month is coded under the traceability number and can be requested from GEMÜ. The product was manufactured in Germany.

4 GEMÜ CONEXO

Order variant

In the corresponding design with CONEXO, this product has an RFID chip (1) for electronic identification purposes. The position of the RFID chip can be seen below. The CONEXO pen helps read out information stored in the RFID chips. The CONEXO app or CONEXO portal is required to display this information.



Installing the RFID chip (1)




For further information please read the operating instructions for CONEXO products or the CONEXO datasheet.

Products such as the CONEXO app, the CONEXO portal and the CONEXO pen are not included in the scope of delivery and need to be ordered separately.

5 Correct use

 DANGER	
	Danger of explosion!
	<ul style="list-style-type: none"> ▶ Risk of severe injury or death ● Only versions that have been approved according to their technical data may be used in potentially explosive environments.

 WARNING	
Improper use of the product!	
<ul style="list-style-type: none"> ▶ Risk of severe injury or death ▶ Manufacturer liability and guarantee will be void. ● Only use the product in accordance with the operating conditions specified in the contract documentation and in this document. 	

The GEMÜ 4242 with integrated pilot valve is designed for pneumatic actuators. The product has a microprocessor controlled intelligent position sensor as well as an analogue travel sensor system (potentiometer). It is non-positively connected with the actuator spindle by means of a mounting kit (spring, operating bush). The valve end positions and the integrated travel sensor can be monitored via the electrical connections. The pneumatic actuator is directly operated via an integrated 3/2-way pilot valve. The housing cover must not be removed.

1. Use the product in accordance with the technical data.
2. The product is intended for use in industrial machine applications in accordance with the definition in standard NFPA 79 (only relevant for UL).
3. ATEX/IECEx (hazardous location) was not evaluated by UL.
4. The product's protective function may be adversely affected if the product is used in a way that is not stated.

5.1 Product without special function X

The product is not intended for use in potentially explosive areas.

5.2 Product with special function X

The product with ordering option Special version X is intended for use in potentially explosive areas of zone 2 with gases, mists or vapours and zone 22 with combustible dusts in accordance with EU directive 2014/34/EU (ATEX) and IECEx.

The product has the following explosion protection marking:

ATEX

Gas:  II 3G Ex ec IIC T4 Gc X

Dust:  II 3D Ex tc IIIC T100°C Dc X

IECEx

Gas:  Ex ec IIC T4 Gc

Dust:  Ex tc IIIC T100°C Dc

Certificate: IECEx IBE 19.0011 X

The product has been developed in compliance with the following harmonised standards:

- IEC 60079-0:2017 Edition:7.0 (EN IEC 60079-0:2018)
- IEC 60079-7:2017 Edition:5.1 (EN IEC 60079-7:2015/A1:2018)
- IEC 60079-31:2022 Edition:3.0 (EN 60079-31:2014)

The product can be used in the following ambient temperature ranges: 0 °C to +55 °C

For use in potentially explosive areas, the following conditions or operation limits must be observed:

Index X is applied to the explosion protection marking.

The following special conditions must be complied with:

1. Connection cables and connectors must be protected from damage.
2. Layers of dust > 5 mm must be removed.
3. Warning label "Danger from electrostatic build-up".
4. Warning label "Do not disconnect when live".

The housing must be installed protected from mechanical influences.

RFID chips must not be read out in potentially explosive areas.

6 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.

Information for AS-Interface 5 versions: If there are customer or system restrictions that prohibit the use of a Bluetooth wireless interface, it is recommended to use an order variant with a deactivated BLE interface. For versions without a deactivated BLE interface, the option also exists to deactivate the interface independently later.

The versions with fieldbus ASi-5 are (temporarily) only available in the following basic configuration:

Size 1:

Fieldbus AS-Interface 5, 96 slaves, BLE (code A5),

housing material: Stainless steel base (code 07),

single acting (code 01),

M12 plug, 5-pin (code 01),

pneumatic 6 mm angled connection (code 04),

without manual override (code 01),

23 NI/min flow rate (code 02),

30 mm travel sensor length (code 030),

Special function – no code (code -), ATEX (code X), UL approval (code U) or ATEX, IECEx, NEC and UL approval (code Z)

Size 2:

Fieldbus AS-Interface 5, 96 slaves, BLE (code A5),

housing material: Stainless steel base (code 07),

single acting (code 01),

M12 plug, 5-pin, stainless steel (code S1),

pneumatic 6 mm angled connection (code 04),

no code option (code 00),

145 NI/min flow rate,

travel sensor length of 30 mm (code 030) or 75 mm (code 075),

Special function – no code (code -), ATEX (code X), UL approval (code U) or ATEX, IECEx, NEC and UL approval (code Z)

Order codes

1 Type	Code
Combi switchbox	4242

2 Fieldbus	Code
AS-Interface 5, 96 slaves, BLE	A5
AS-Interface 5, 96 slaves, BLE deactivated	A5D

3 Accessory	Code
Accessories	Z

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

5 Function	Code
Combi switchbox, single acting	01

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

7 Pneumatic connection	Code
M5 connection thread for size 1, G1/8 connection thread 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
M5 connection thread for size 1, G1/8 connection thread for size 2 (for IP 67 or piped air outlet)	E1
Air supply 6 mm angled connection, exhaust air 6 mm angled connection (for IP 67 or piped air outlet)	E4
Air supply 1/4" angled connection, exhaust air 1/4" angled connection	U8

8 Option	Code
No code	00
Manual override	01
Inversed LED colours	40
Inversed LED colours, manual override	41

9 Flow rate	Code
14 NI/min, size 1	01
23 NI/min (Booster), size 1	02
145 NI/min, size 2	R3

10 Travel sensor version	Code
Travel sensor 30 mm in length	030
Travel sensor 75 mm in length	075

11 Special version	Code
Without	
UL/CSA approval	U
ATEX (2014/34/EU), IECEx	X

Order example

Ordering option	Code	Description
1 Type	4242	Combi switchbox
2 Fieldbus	A5	AS-Interface 5, 96 slaves, BLE
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	M5 connection thread for size 1, G1/8 connection thread for size 2
8 Option	01	Manual override
9 Flow rate	01	14 NI/min, size 1
10 Travel sensor version	030	Travel sensor 30 mm in length
11 Special version		Without

7 Technical data

7.1 Medium

Working medium:	Compressed air and inert gases 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 or a minimum of 10 °C below the ambient temperature 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

7.2 Temperature

Ambient temperature:	Standard	0–60 °C
	Special version code X	0–55 °C
Control medium temperature:	0 – 50 °C	
Storage temperature:	-10 – 70 °C	

7.3 Pressure

Operating pressure:	<table border="1"> <thead> <tr> <th>Size 1</th><th>Size 2</th></tr> </thead> <tbody> <tr> <td>1 to 10 bar (at 40 °C) 1 to 8 bar (at 60 °C)</td><td>2 to 7 bar</td></tr> </tbody> </table>	Size 1	Size 2	1 to 10 bar (at 40 °C) 1 to 8 bar (at 60 °C)	2 to 7 bar
Size 1	Size 2				
1 to 10 bar (at 40 °C) 1 to 8 bar (at 60 °C)	2 to 7 bar				

The applied pressure must not exceed the maximum control pressure of the process valve.

Flow rate:	<table border="1"> <thead> <tr> <th>Size 1</th><th>Size 2</th></tr> </thead> <tbody> <tr> <td>Flow rate code 01: 14 NI/min Flow rate code 02 (booster): 23 NI/min</td><td>Flow rate code R3: 145 NI/min</td></tr> </tbody> </table>	Size 1	Size 2	Flow rate code 01: 14 NI/min Flow rate code 02 (booster): 23 NI/min	Flow rate code R3: 145 NI/min
Size 1	Size 2				
Flow rate code 01: 14 NI/min Flow rate code 02 (booster): 23 NI/min	Flow rate code R3: 145 NI/min				

7.4 Product conformity

EMC Directive:	2014/30/EU Class: B Group: 1 Technical standards used:
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AS-Interface 5	
Interference emission:	ASi-5 Spec V1.04
Interference resistance:	ASi-5 Spec V1.04
Interference emission/ interference resistance	EN 62026-2:2013 + A1:2019

RoHS Directive:	2011/65/EU
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Radio Equipment Directive (RED):	2014/53/EU Technical standards used: Standard regarding the use of radio frequencies: EN 300 328 V2.2.2 (2019-07) Electromagnetic compatibility (EMC) for radio devices and services: EN 301 489-1 V2.2.3 (2019-11) EN 301 489-17 V3.2.4 (2020-09) Electrical safety: EN 61010-1:2010 + A1:2019 + A1:2019/AC:2019
Explosion protection:	ATEX (2014/34/EU), order code special version X
ATEX marking:	Ⓜ Gas: II 3G Ex ec IIC T4 Gc X Ⓜ Dust: II 3D Ex tc IIIC T100°C Dc X
IECEx marking:	Gas: Ⓜ Ex ec IIC T4 Gc Dust: Ⓜ Ex tc IIIC T100°C Dc Certificate: IECEx IBE 19.0011 X
Approvals:	AS-Interface certificate no. 137301
FCC:	<p>FCC §15.105 statement:</p> <p>This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:</p> <ul style="list-style-type: none"> - Reorient or relocate the receiving antenna. - Increase the separation between the equipment and receiver. - Connect the equipment into an outlet on a circuit different from that to which the receiver is connected. - Consult the dealer or an experienced radio/TV technician for help. <p>FCC § 15.19 Labelling requirements:</p> <p>This device complies with part 15 of the FCC Rules and ISSED license-exempt RSS standard(s). Operation is subject to the following two conditions:</p> <ol style="list-style-type: none"> (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. <p>FCC § 15.21 Information to user:</p> <p>Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.</p> <p>RF Exposure Requirements:</p> <p>This equipment complies with FCC and IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 20 cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.</p> <p>Contains FCC ID: QOQ-GM220P</p>

IC / ISED (Canada): **IC / ISED (Canada):** (Information in English and French required!)

Canada Class A statement:

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

This device complies with part 15 of the FCC Rules and ISED license-exempt RSS standard(s).

Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'ISED applicables aux appareils radio exempts de licence.

L'exploitation est autorisée aux deux conditions suivantes:

l'appareil ne doit pas produire de brouillage, et

l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

RF Exposure Requirements / Déclaration d'exposition aux radiations :

This equipment complies with Canada radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps. Ce transmetteur ne doit pas être placé au même endroit ou utilisé simultanément avec un autre transmetteur ou antenne.

Contains IC: 5123A-GM220P

UL approval: UL approval (listed): UL 61010-1, CAN/CSA no. 61010-1-12

7.5 Mechanical data

Installation position: Optional

Weight:

	Size 1	Size 2	
		75 mm	30 mm
Housing material code 14 (aluminium base): 320 g		Housing material code 07 (stainless steel base): 1150 g	Housing material code 07 (stainless steel base): 1080 g
Housing material code 07 (stainless steel base): 600 g			

Travel sensor:

	Size 1	Size 2	
		75 mm	30 mm
Minimum stroke:	2 mm	5 mm	2 mm
Maximum stroke:	40 mm	75 mm	30 mm

* limited to 30 mm by the mounting kit

Vibration:

	Size 1	Size 2	
		75 mm	30 mm
3g acc. to EN 60068-2-6:2008 Test FC		5g acc. to EN 60068-2-6:2008 Test FC	5g acc. to EN 60068-2-6:2008 Test FC

Shock:

Size 1	Size 2	
	75 mm	30 mm
15g acc. to EN 60068-2-27:2009 Test Ea	25g acc. to EN 60068-2-27:2009 Test Ea	25g acc. to EN 60068-2-27:2009 Test Ea

7.6 Operating conditions

Ambient conditions: Use indoors and outdoors
 Dry and wet environments
 Use in indoor spaces (only relevant for UL)
 Only use in dry environments (only relevant for UL)

Height: Up to 2000 m (above sea level)

Relative air humidity: 0–100%

Protection class: IP 65/IP 67 acc. to EN 60529
 IP 67 is achieved by piping away the exhaust air
 (Not evaluated by UL) Type rating: 1

Degree of contamination: 4 (pollution degree)

7.7 Electrical data

Electrical connection type: 1 x 5-pin M12 plug (A-coded)

Supply voltage: Information on the supply voltage (only relevant for UL):

- Class 2 power supply units in accordance with UL 1310.
- Safety extra-low voltage/limited power source.
- Safety extra-low voltage/limited energy circuits.

One of the three options listed above **must** be implemented by the customer.
 26.5 to 31.6 V DC (according to AS-Interface specifications)

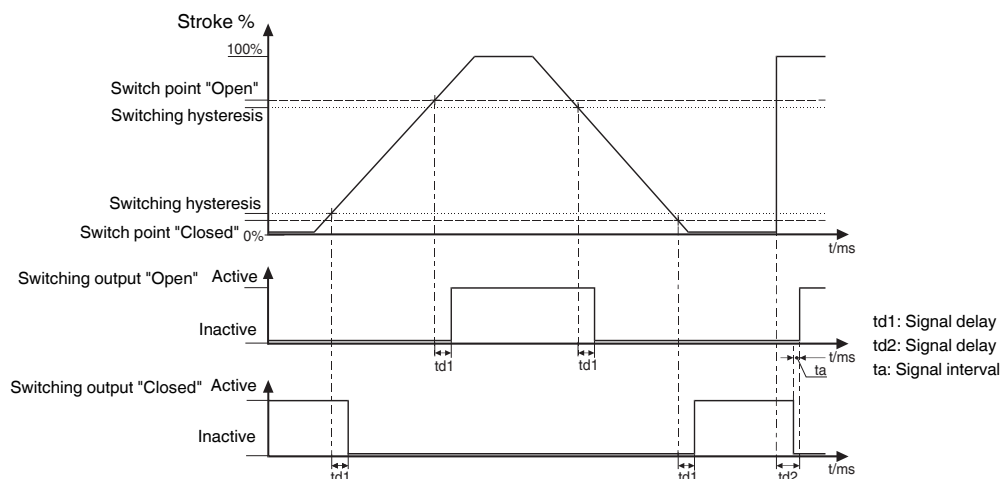
Current consumption:

Flow rate (code)	Current consumption
01	Max. 80 mA
02	Max. 120 mA
R3	Max. 90 mA

Duty cycle: Continuous duty

Electrical protection class: III

Reverse battery protection: yes

Switching characteristic:

Switch points: ASI-5: The data in percent refers to the programmed stroke, with reference to the lower end position (0%)

Switch points:

	Size 1	Size 2	
		75 mm	30 mm
Default setting switch point CLOSED	12%	12%	12%
Default setting switch point OPEN	75%	75%	75%

7.7.1 Wireless-specific parameters

Technology: Bluetooth Low Energy (only possible in conjunction with the GEMÜ app)

Frequency: 2.4 GHz (2.4–2.4835 GHz)

Output power: Max. 11.2 dBm

7.7.2 Sensor system for status monitoring

Value	Value range	Sensor resolution	Deviation	Typical deviation	Long term stability
Internal temperature	-40 to 100 °C	0.01 °C	$\pm 1.60 \text{ °C}^{1)}$	$\pm 0.20 \text{ °C}^{1)}$	$< \pm 0.02 \text{ °C/year}$
Internal humidity	0 to 100%	0.03%	$\pm 3.5\%$ between 20 to 80% $\pm 6.5\%$ between 0 to 100%	$\pm 2\%$ between 20 to 80% $\pm 3.5\%$ between 0 to 100%	$\pm 0.25\%/year$
Internal pressure	260 to 1260 mbar	24 bit	$\pm 1.0 \text{ mbar}$	$\pm 0.1 \text{ mbar}$	-
Control air supply pressure	0 to 30 bar	1.57 mbar	$\pm 213 \text{ mbar}$	$\pm 60 \text{ mbar}$	$\pm 30 \text{ mbar/year}$
Installation position (in two directions)	-180° to 180°	16 bit	$\pm 3.1^\circ^{2)}$		-
Acceleration (in three axes)	-156.96 m/s ² to 156.96 m/s ²	16 bit	$\pm 1.48 \text{ m/s}^2$	$\pm 0.52 \text{ m/s}^2$	-
Current consumption	0 to 375 mA	16 bit	$\pm 1.0 \text{ mA}$	$\pm 0.25 \text{ mA}$	-
Supply voltage	0 to 36 V	16 bit	$\pm 0.6 \text{ V}^{3)}$	$\pm 0.2 \text{ V}^{3)}$	-

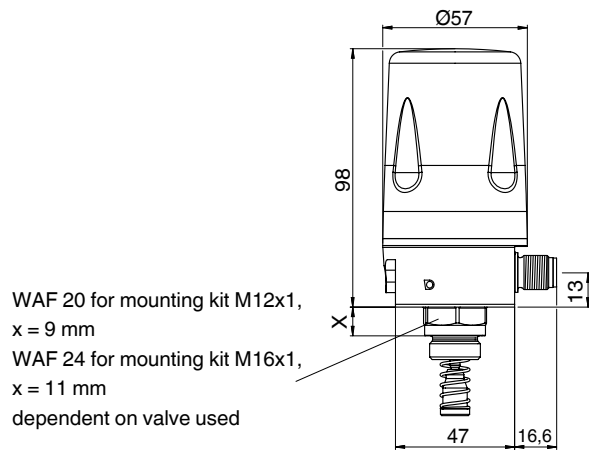
¹⁾ The value is measured on the inside of the housing with the corresponding influences of the device electronics (e.g. heating).

²⁾ The data refers to a vibration-free status. In the case of vibrations, the deviation can be significantly greater or a value can no longer be determined.

³⁾ In the case of increased loads, the outputs in SIO mode can show an additional deviation of max. 0.5 V.

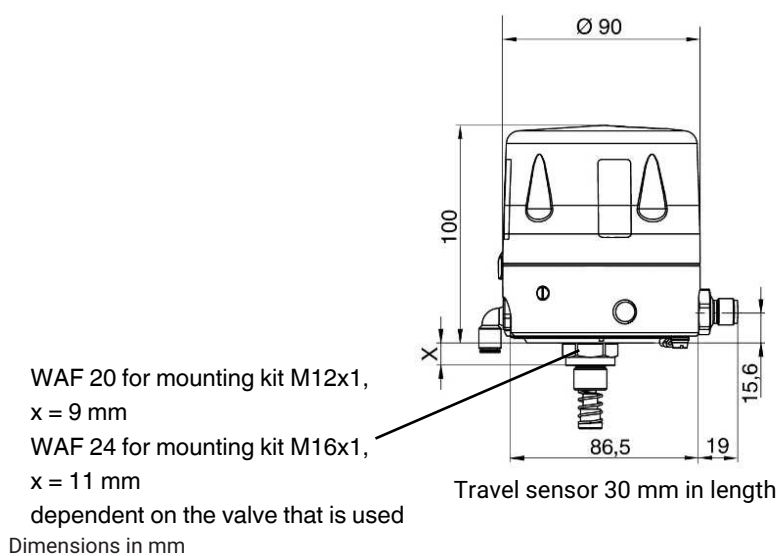
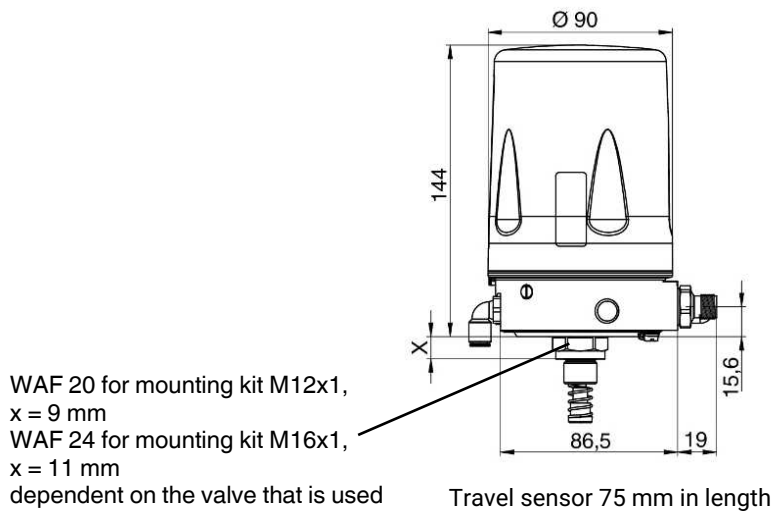
8 Dimensions

8.1 Size 1



Dimensions in mm

8.2 Size 2



Dimensions in mm

9 Assembly and installation

NOTICE

- Pay attention to the information on product labels and in product documentation.
- Connect cable carefully, do not damage individual wires.
- When connecting multiwire or finewire cables, prepare the wire ends.
- Always use suitable pinch tools for pinching wire end ferrules in order to achieve consistent quality.
- Tighten all clamping points, even the ones not being used.

1. Observe the national regulations and provisions.
2. Observe the installer provisions.
3. Protect M12 plugs against electro-static build-up.
4. Protect M12 plugs against damage.
5. Lay cables securely and protect them from damage.

9.1 Mounting kit assembly

Item	Name	Item	Name
1	Spindle	7	Flange plate
2	Spring	8	Screws
3	Operating bush	9	Pressure disc*
4	Distance piece	10	O-ring*
5	O-ring	11	O-ring*
6	Adapter		

* Included depending on version.

⚠ CAUTION

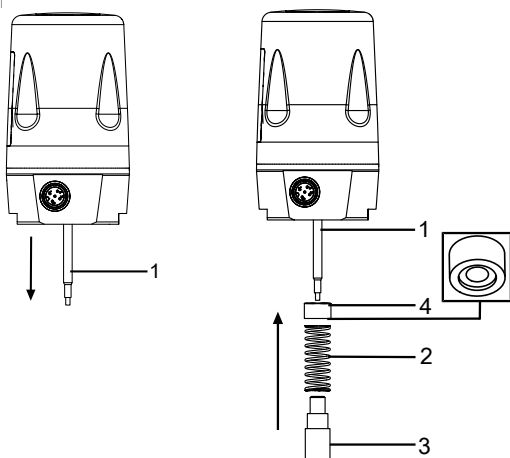
Pretensioned spring!

- Damage to the device.
- Slowly release the tension in the spring.

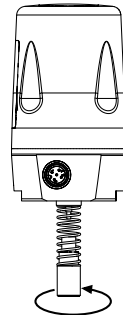
⚠ CAUTION

Do not scratch the spindle!

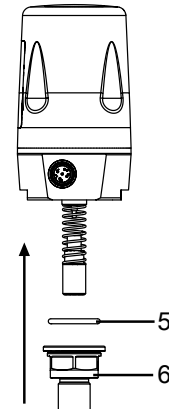
- A damaged spindle surface may cause failure of the travel sensor.



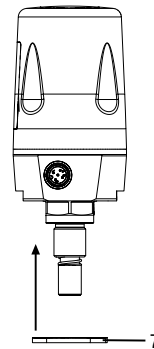
1. Pull out the spindle 1.



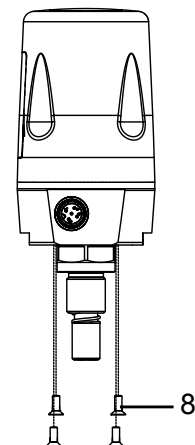
2. Align the indentation of the distance piece 4 to the spring and push it over the spindle 1 using the spring 2 and fix it in place using the operating bush 3.



3. Tighten the operating bush 3 by turning it clockwise.



4. Affix the O-ring 5 and the adapter 6.



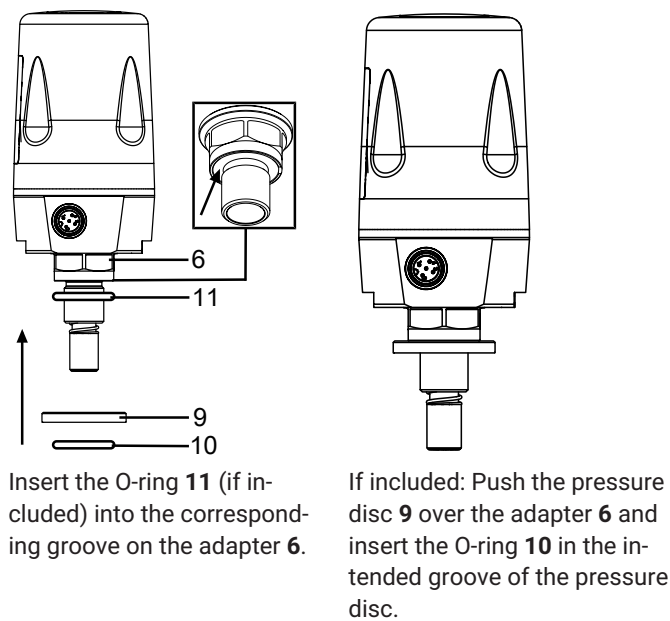
5. Attach the flange plate 7

6. Screw the flange plate on tight using screws 8 (1–1.5 Nm).

- Push in the spindle until it pushes against the spring and then slowly release the pressure on the spring.

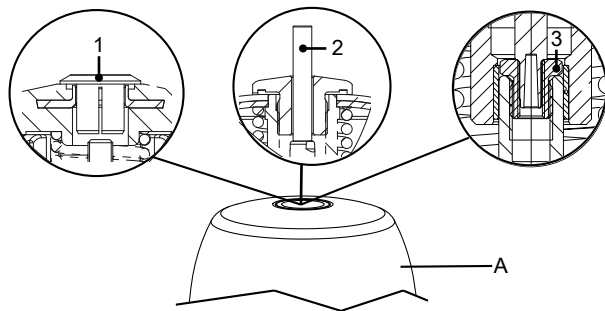
NOTICE

- For some valves (e.g. GEMÜ 650 and GEMÜ 687) it is necessary to fit a pressure disc between the threaded adapter and the actuator head. This is included in the required mounting kits, sometimes with an additional O-ring (only GEMÜ 650 with normally open and double acting control function – code 2+3).
- If the pressure disc does not have a groove for a seal, this will already be inserted in the groove provided at the adapter opening of the actuator head (e.g. GEMÜ 687 with normally open control function – code 2).



9.2 Mounting the combi switchbox on linear actuators

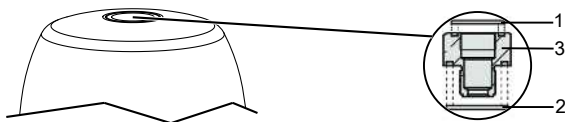
9.2.1 Preparations for installing the valve (linear actuator)



1. Move the actuator **A** into zero position (actuator vented).
2. Remove optical position indicator **2** and / or protective cap **1** from the actuator top.
3. GEMÜ 650/actuator sizes 2, 3 and 4: Use a socket wrench insert (WAF 10) to remove the glued threaded adapter **3** from the drive **A**.

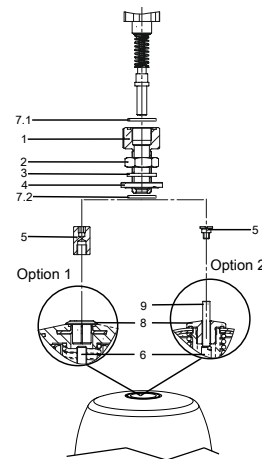
9.2.2 Threaded adapter assembly (linear actuator)

With some mounting kits, it is necessary to install a threaded adapter as well. This threaded adapter is enclosed with the required mounting kits. Valves with a normally open and double acting control function (code 2+3) also include additional O-rings (1+2).



1. Move the actuator to the closed position.
2. Place O-rings **1** and **2** into threaded adapter **3**.
3. Screw threaded adapter **3** into the actuator opening as far as it will go and tighten.

9.2.3 Assembling the stroke limiter (linear actuator)



1. Screw distance piece **5** onto/ into actuator spindle **6**.
2. Move the actuator to the closed position.
3. Insert the O-ring **7.1** in the stroke limiter **1**.
4. Insert the O-ring **7.2** in the washer **4**.
5. Screw stroke limiter **1** with nut **2**, seal **3** and washer **4** into the actuator opening.
6. Set stroke limiter **1** to the required stroke.
7. Make sure that the minimum stroke is reached.
8. Secure stroke limiter **1** with nut **2**.

Key			
1	Stroke limiter	7.1 ¹⁾ 7.2 ¹⁾	O-ring
2	Nut	8	Protective cap
3 ¹⁾	Seal	9	Position indicator
4 ¹⁾	Washer	10	Operating bush
5 ²⁾	Distance piece	11	Spindle
6	Actuator spindle	12	Travel sensor

- 1) Only available for valves with the NO and DA control functions.
- 2) Only included in required mounting kits. The design depends on the valve.

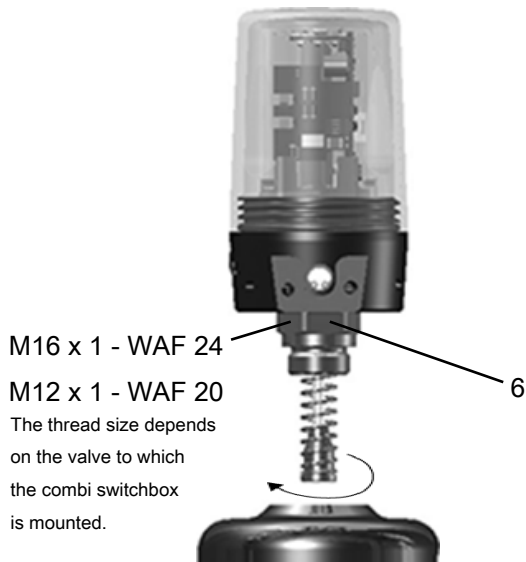
9.2.4 Assembling and installing the combi switchbox (linear actuator)

DANGER



Danger of explosion!

- ▶ Risk of death or severe injury.
- Do not use the product as a step or foothold.
- Prior to commissioning, ensure that the cover is fully closed and that the housing and the O-ring are not damaged.



1. Move the actuator into the OPEN position.
2. Guide the product as far as it will go into the actuator opening, the adapter 3 (see "Threaded adapter assembly (linear actuator)", page 18) or the stroke limiter 1 (see "Assembling the stroke limiter (linear actuator)", page 18) and screw in clockwise against the initial spring tension.
3. Use the spanner flat of the travel sensor to tighten the product.
4. Turn the housing clockwise to align the pneumatic or electrical connections.
5. Connect the product electrically.
6. Connect the product pneumatically.

CAUTION

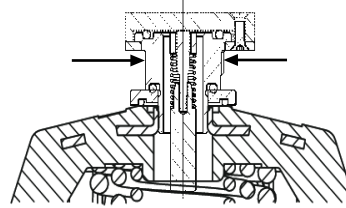
Incorrect installation of the product.

- ▶ Damage to the housing.
- Only tighten the product using the spanner flats provided for this purpose.

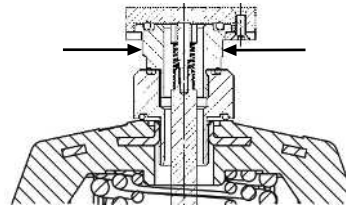
NOTICE

Wrong mounting kit

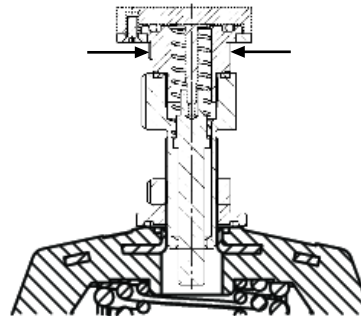
- ▶ If no initial spring tension can be felt, it may be the case that the wrong mounting kit with too short an operating bush has been used.
- ▶ If the spring locks and the positioner cannot be correctly mounted on the valve, it may be the case that the wrong mounting kit with too long an operating bush has been used or that a required adapter has not been used.
- In both cases, check that the mounting kit parts are being used correctly and in their entirety.



7. The product with mounting kit is fully assembled.



8. The product with mounting kit and adapter is fully assembled.



9. The product with mounting kit and stroke limiter is fully assembled.

9.3 Mounting the combi switchbox on quarter turn actuators

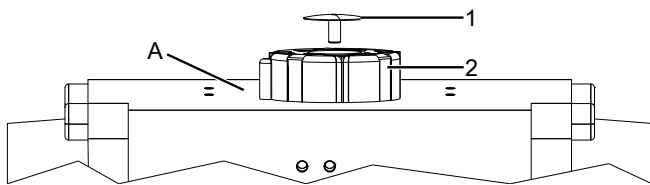
9.3.1 Contents of PTAZ mounting kit for quarter turn actuator

The PTAZ mounting kit contains the following items:

Item
PTAZ adapter
PTAZ mounting kit
Flange plate
O-ring
Screws (4x)
Adapter (M16x1)
Operating bush
Compression spring

9.3.2 Preparations for assembly to the valve (quarter turn actuator)

1. Move the actuator **A** into zero position (actuator vented).



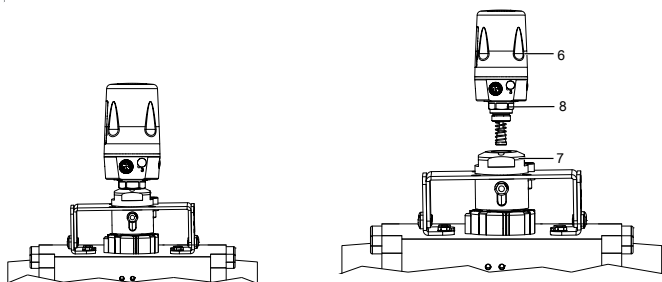
2. Remove the screw **1** from the trigger cam **2**.

9.3.3 Assembling and installing the combi switchbox (quarter turn actuator)

⚠ CAUTION

Incorrect installation of the product.

- Damage to the housing.
- Only tighten the product using the spanner flats provided for this purpose.



1. Screw the product **6** onto the adapter **7**.
2. Use the spanner flat **8** (WAF 27) of the travel sensor to tighten the product.
3. Turn the housing clockwise to align the pneumatic or electrical connections.
4. Connect the product electrically.
5. Connect the product pneumatically.
6. Initialize the product.

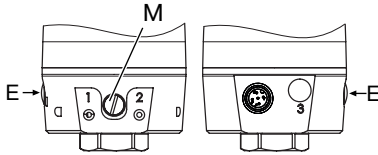
10 Pneumatic connection

⚠ CAUTION

Reduction of the flow at the vent connection 3

- ▶ Increased overpressure in the upper part of the housing
- Do not operate vent connection 3 with chokes, filters or similar.
- Ensure that vent lines are always depressurised.
- Install vent lines free of tension and kinks.

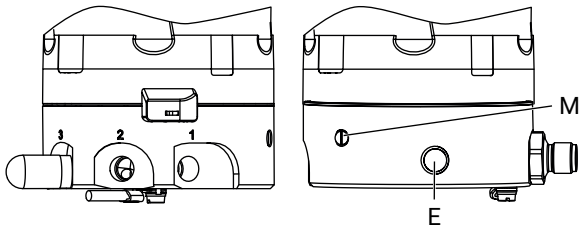
10.1 Size 1, standard, single acting



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
M	Manual override	-

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

10.2 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	G 1/8 ¹⁾
E	Housing ventilation with integrated check valve	M6 x 0.75
M	Manual override	-

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

10.3 Information for use in damp conditions

The following information is intended to help when installing and operating the product in damp conditions.

1. Cables and pipework must be laid so that condensate or rain water that remains on the pipework/cables cannot enter the screw fittings of the product's M12 plugs.
2. Check that all cable glands of the M12 plugs and the fittings are mechanically secured.
3. In case of doubt, the housing protection class should be increased with an exhaust air duct to areas free from moisture. To accomplish this, equip the provided venting connection with suitable pneumatic connections to discharge the exhaust air in a targeted manner via a pneumatic line. Ensure that the ventilation line is always depressurized, that it is not operated with throttles, filters or similar components, and that it is laid in such a way that moisture cannot flow back.

11 Electrical connection

Information on the electrical connection with M12 (only relevant for UL):

- All M12 connectors and cables must be designed for min. 60 V DC and 70 °C.
- All M12 connectors must comply with the standards UL 2237 or UL 2238 (PVVA/7, PVVA2/8, CYJV/7, CYJV2/8)
- The stranded wires used must have a cross-section of 0.14 mm² or AWG26.

DANGER



Risk of electric shock

- Risk of injury or death (if operating voltage is higher than safe extra low voltage).
- Electric shock can cause severe burns and fatal injury.
- Work on electrical connections only by qualified trained personnel.
- Disconnect the cable from the power supply before making the electrical connection.
- Connect the protective earth conductor.

DANGER



Danger of explosion

- Risk of severe injury or death.
- Do not connect or disconnect the device until the power has been switched off or the area has been classified as non-hazardous.
- The standard version of the product (without special function X or Y) must not be used in potentially explosive zones.
- Danger from sparking. Never disconnect the connection cables when live.

NOTICE



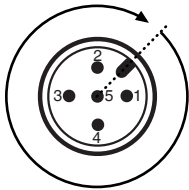
Electrostatic discharge!

- Destruction of electronic components.
- Take the necessary ESD safety precautions during installation of the product.

NOTICE

Risk of cable break

- Overtightening can result in damage to the internal cables.
- Turn electrical connections once by max. 360°.



11.1 AS-Interface, fieldbus ordering option, code A5, A5D

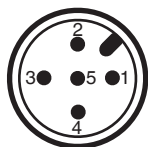
1. Connect the product in accordance with the pin assignment.

For electrical connection special version X, we recommend the M12 connectors for EX areas supplied by IFM, series EVCxxA.

The M12 plugs may only be assembled, connected and commissioned by trained personnel. The trained personnel must have expertise in types of ignition protection, and regulations and provisions for operating media in EX areas.

2. Securely lay the connection cables or ensure sufficient tension relief.
3. Refer to the technical data and cable gland documentation for details of the wire cross-sections.
4. Protect the product and the cables from damage.
5. Only clean the product with an anti-static or damp cloth.
6. Only operate the product when it is fully assembled.

11.1.1 Pin assignment



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

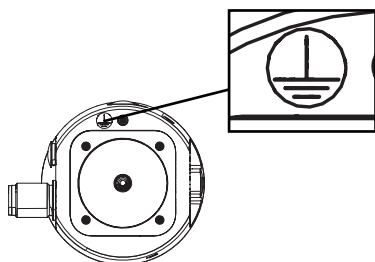
* Pins 2, 4 and 5 are not relevant for the function and may therefore be populated (visible) or not populated (not present).

11.2 Potential equalization – Special function X

The potential equalization can be established using the following methods:

- Pre-assembled earthing kit for the on-site wiring of the earth via a stranded wire, yellow/green H07 V-K 4.0
- Conductive connection via the mechanically coupled valve fitting to the system earth

Connecting the potential equalization device



1. Use an M4x8 screw to attach the potential equalization device to the housing base.
 - ⇒ Potential equalization device for metal housings in potentially explosive areas: Minimum 4 mm².
2. Secure the connection against working itself loose.
 - ⇒ Tighten the screw to a torque of 1.8 Nm.

The potential equalization connection's maximum permissible resistance limit value is defined as $R \leq 100 \Omega$. During the plant-specific maintenance cycle, the potential equalization connection must be checked to ensure that it has been connected correctly and that the maximum resistance limit value has not been exceeded.

12 Commissioning

⚠ CAUTION



Hazardous situation

- ▶ Risk of injury or damage possible.
- For correct commissioning, the product must be calibrated to the process valve via the initialization process.
- During this commissioning, the valve is automatically opened and closed several times. It must therefore be ensured in advance that this does not lead to a dangerous situation.

NOTICE

Incorrect initialization

- Always carry out initialization without operating medium pressure on the process valve. Carry out initialization of the process valve in neutral position (NO/NC).

NOTICE

- For delivery of the product assembled on a valve at the factory, the complete construction is already ready for operation at a control pressure of 5.5 to 6 bar without operating pressure. A reinitialization is recommended if the plant is operated with a different control pressure or if the mechanical end positions have been changed (e.g. seal replacement on the valve or actuator replacement). The initialization is retained even in the event of voltage cutoff.

NOTICE

- For delivery of the product without default setting (e.g. for delivery without valve) initialization must be carried out once for correct operation. This initialization must be repeated every time that the process valve is changed (e.g. seal replacement or actuator replacement).

1. Connect the connection cable tension-free and without any bends or knots.
2. Switch on supply voltage.
3. Use suitable connectors.
4. Connect the control medium lines tension-free and without any bends or knots.
5. Connect the product pneumatically to the process valve.
6. Connect the pneumatic tubes and activate the pneumatic control air supply of max. 7 or 9 bar.

NOTICE

Initialization is active for an unusually long time

- ▶ For actuators with a large air volume (filling volume), in some circumstances it can take several minutes until initialization can be completed. Initialization is only unsuccessful if an error message appears with LED signalling.

12.1 Initialization of end positions

The initialization of the end positions is dependent on the setting of the operating parameter (operating mode). A distinction is made between the **autonomous** and **classic** modes for detection of end positions.

In the **autonomous detection of end positions** mode (default setting), the end positions are determined independently as soon as the valve moves (triggered by the corresponding control command). The valve is therefore ready for operation directly, reports the end positions back after an initial movement cycle, and shows these via the LED display.

In **classic** mode, the end positions must be calibrated via the active triggering of the initialization process, via the communication interface or the on-site option. If correct initialization has not been carried out, then the device is in a warning state (signalling via the corresponding high visibility LEDs).

12.1.1 Autonomous end position process/end position tracking

The autonomous end position process or end position tracking is an intelligent function, with the help of which the end positions of a valve are independently determined (without external triggering). If this function is active, the end positions are automatically determined the first time the valve moves, and the product is ready for operation directly. The end positions are continuously monitored and responded to accordingly in case of deviations.

Explanation of the functional principle:

In the autonomous end position tracking mode, a distinction is made between two different conditions, which have an influence on the behaviour of the function.

No initialization: The device monitors whether two different end positions have been approached at a certain distance. The first two end positions that comply with this condition are calibrated as newly initialized end positions.

Existing initialization: The function determines whether there is a displacement of the end positions over the operating time. If these displacements are outside a certain tolerance range and display a certain consistency, the initialized end positions are overwritten by the adjusted initialization values. If this process is triggered, this is indicated by a corresponding message. The deviations are evaluated alongside here, and allow conclusions to be drawn as to the cause.

A **classic initialization** can also be carried out in the operating mode of autonomous end position tracking. This is recommended after a seal replacement or the like, in order to prevent faulty messages regarding end position changes. If the initialization is successful here, then the currently calibrated end positions are overwritten and the tracking operates against these updated end positions. If the actively triggered initialization process is not successful here, then the most recently calibrated initialization positions are deleted.

12.1.2 Classic initialization process

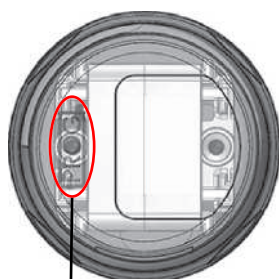
NOTICE

- The initialization must be repeated every time that the process valve is changed (for example, seal replacement or actuator replacement).

The initialisation process must be actively started via the communication interface or the on-site option. The started initialization process is carried out automatically.

After implementation of the initialization, the device checks whether the minimum stroke of the calibrated positions has been complied with. If this condition is complied with, then the initialization has been successfully carried out and the end positions have been successfully calibrated.

12.1.2.1 On-site initialization of the end positions



PROG

NOTICE

- If the magnet is held against the housing cover for too long, the programming mode is left and the previous condition is restored.

1. Connect supply voltage.
2. Briefly (>500 ms) hold a magnet (e.g. 1242000ZMA) at the position labelled "**PROG**" on the housing cover.
 - ⇒ High visibility LEDs light up white (magnet detected)
3. As soon as the high visibility LEDs change colour to yellow, remove the magnet again.
4. Initialization process is started.
 - ⇒ High visibility LEDs flashing alternately (white/yellow).
 - ⇒ The process valve is automatically moved to the OPEN and CLOSED position.
5. Initialization process is automatically ended.
6. After successful termination, the current valve position is signalled directly via the high visibility LEDs (lit green or orange) and electronically reported back.
 - ⇒ The end positions are set.

In the event of deviating status indications, observe the LEDs and Troubleshooting chapters.

12.1.2.2 Initialization of end positions via ASI

NOTICE

- Set the function of digital input 3 (corresponding to bit DO2) to INIT (default setting). Alternatively, any other digital input 1–8 can be assigned to this function. The corresponding bit, DO0 to DO7, must be used depending on the input used.

1. Connect supply voltage.
2. Set DO2 (toggle from 0->1).
3. Initialization process started.
 - ⇒ High visibility LEDs flashing alternately (white/yellow).
 - ⇒ Process valve is automatically moved to the OPEN and CLOSED position.
4. Initialization process is automatically ended (verification via DI2 possible).
5. After successful termination, the current valve position is signalled directly via the high visibility LEDs (lit green or orange) and electronically reported back.
 - ⇒ The end positions are set.
 - ⇒ In the event of deviating status indications, observe the LEDs and Troubleshooting chapters.

13 Operation

13.1 Wireless interface

NOTICE

- For **FIELD BUS Code A5D** order versions, the wireless interface is deactivated by the software ex works. The wireless interface can be managed (activated/deactivated) automatically via a corresponding parameter. If the wireless interface is subsequently activated via a parameter setting, it is recommended to adjust the Bluetooth name and password configuration immediately afterwards. A corresponding setup manager in the app provides support for the configuration process.
- For order versions with the **FIELD BUS Code A5** wireless interface activated, it is recommended to adjust the Bluetooth name and password configuration immediately after commissioning. A corresponding setup manager in the app provides support for the configuration process.

NOTICE

- During an initialization process that is started by the magnetic trigger, no actions can be taken in the app. After ending the process, the app can be used again without restrictions. While the wireless connection is active, starting the initialization via the magnetic trigger is deactivated.

Using an integrated Bluetooth Low Energy interface, the following functions can be used in conjunction with the **GEMÜ app**:

1. Changing the device configuration (parameter settings).
2. Reading out the current device status.
3. Display and evaluation of historic events.
4. Implementation of the initialization.
5. Moving the valve in manual mode.
6. Resetting the device to the default settings.
7. Activating the localization (device detection).
8. Security management (blocking access for a certain group of participants).

NOTICE

- Only one end device can ever be simultaneously connected to the product. For additional participants, this device is not visible during this period.

After starting the app, all compatible GEMÜ products within range are displayed in the connection list. The product that is to be connected can be referenced via the Bluetooth name. In the condition as supplied to the customer, this corresponds to the last four digits of the serial number printed on the digital product label (QR code). The Bluetooth name can optionally be changed at any time after the connection is established (maximum 16 characters).

NOTICE



Safety notice!

- The wireless interface can be activated in the condition as supplied to customer, depending on the order version, and is ready for connection immediately after the product has been electrically commissioned.

In the condition as supplied to the customer, the product is protected against unauthorized access via a unique connection password. The password corresponds to the digital product label (QR code) that is affixed to the product. To enter the password, this can optionally be read via the camera scan function on the smartphone/tablet or entered manually. The password can be managed independently and set to any other password. By amending the original password, you lose the option to read this via the digital product label. The connection password function can be deactivated, but we do not recommend this. Furthermore, a configuration lock can be set up for the product using a separate optional password – providing the product with additional protection. If this function is activated, you cannot implement any changes to the settings without first entering the password (read-only mode). There is an option to reset both passwords if you forget these. The user can define whether one, both or none of the passwords can be reset via the reset mechanism.

Caution! If you forget your passwords and one or both passwords for the reset mechanism are disabled, the product can only be unlocked by GEMÜ.

Caution! If one or both passwords for the reset mechanism are enabled, anyone with access to the digital product label (QR code) can remove the password protection.

Reset mechanism:

There are two options for resetting one of the two passwords (connection or configuration lock password). Both passwords can/must be reset separately from each other.

9. Digital product label (QR code):

- ⇒ By scanning the QR code that is affixed to the product.

10. RFID (optional if integrated)

- ⇒ The optional RFID chip that is integrated into the housing can be read out by additional hardware (Conexo Pen) that is available separately, and this can be used to reset the passwords.

NOTICE

- A setting parameter can be used to block the reset of one or both passwords.

13.2 Basic operation of the app



Messages Information, error and warning messages

Settings Parameter display
Parameter configuration
Search function
Favourite selection
Operating mode settings

Status Operating time display
Bar chart
Sensor values
Status display

Overview Actions (initialization, localization, maintenance)
Favourites

The GEMÜ app consists of several function modules that can be called up via the bottom navigation at the bottom of the display. The functions for operating the product are located in the "Connect" area. The figure above gives a rough overview of the structure. By selecting the tabs "Overview", "Settings" or "Status", it is possible to navigate within the "Connect" area. Important information, error or warning messages can be called up on all pages via the bell symbol.

14 App parameter list

No.	Parameter	Description	Value range	Default setting
P03	Switch point Open	Defines switch point Open	10,0 ... 100,0 %	75,0
P04	Switch point Closed	Defines switch point Closed	0,0 ... 97,0 %	12,0
	Total operating hours	Displays the total operating hours	0 ... 2147483647 s	0
	Localization	Activates/deactivates the location function	...	
S06	Control function	Displays the determined control function of the valve	...	
S07	Firmware version	Displays the firmware revision status	...	
P05	High visibility position indicator	Activates/deactivates or dims the visual end position display	...	
P06	Inversion of LED colours	Activates/deactivates the inversion of LED colours for the end position display	...	
	Operating hours since last start	Displays operating hours since the last start	0 ... 2147483647 s	0
S03	Total switching cycle counter	Displays the total number of counted switching cycles	0 ... 2147483647	0
S02	Warning threshold for user switching cycles	Defines the warning threshold for user switching cycles	1 ... 2147483647	5000000
S01	User switching cycle counter	Displays the number of counted user switching cycles	0 ... 2147483647	0
P01	Detection of end positions mode	Defines the end position detection mode	...	
P02	Initialization via magnet contact	Activates/deactivates initialization via magnet contact	...	
S09	Operating time Open	Displays the duration of opening the valve	0 ... 99,9 s	
S10	Operating time Closed	Displays the duration of closing the valve	0 ... 99,9 s	
S11	Product start counter	Displays the number of product starts	0 ... 2147483647	
	Current absolute position	Displays the absolute position of the travel sensor	0,0 ... 100,0 %	
	Bluetooth product name	Defines the name in the product overview	0 ... 16	
S12	Production ID	Displays the production ID	...	
M01	Operating mode	Defines the operating mode	...	
	Manual valve control	Defines the valve activation	...	
	Valve actuations warning ratio	Displays the relative degree of wear on the pilot valve module	0,0 ... 100,0 %	0,0
S08	Hardware version	Displays the hardware version	...	
P09	Inversion of the travel sensor signal	Activates/deactivates inversion of the travel sensor signal	...	
P14	Digital device input 1 function	Defines the function of device-side digital input 1	...	
P15	Digital device input 2 function	Defines the function of device-side digital input 2	...	
P16	Digital device input 3 function	Defines the function of device-side digital input 3	...	
P17	Digital device input 4 function	Defines the function of device-side digital input 4	...	
P18	Digital device input 5 function	Defines the function of device-side digital input 5	...	
P19	Digital device input 6 function	Defines the function of device-side digital input 6	...	
P20	Digital device input 7 function	Defines the function of device-side digital input 7	...	

No.	Parameter	Description	Value range	Default setting
P21	Digital device input 8 function	Defines the function of device-side digital input 8	...	
P22	Digital device output 1 function	Defines the function of device-side digital output 1	...	
P23	Digital device output 2 function	Defines the function of device-side digital output 2	...	
P24	Digital device output 3 function	Defines the function of device-side digital output 3	...	
P25	Digital device output 4 function	Defines the function of device-side digital output 4	...	
P26	Digital device output 5 function	Defines the function of device-side digital output 5	...	
P27	Digital device output 6 function	Defines the function of device-side digital output 6	...	
P28	Digital device output 7 function	Defines the function of device-side digital output 7	...	
P29	Digital device output 8 function	Defines the function of device-side digital output 8	...	
S04	Absolute travel sensor position Closed/Open	Displays the valve absolute position for the end positions	0,0 ... 100,0 %	0,0
S15	Warning threshold for valve activations user counter	Defines the warning threshold for the user counter for valve activations	1 ... 2147483647 Cycles	5000000
S13	Valve activations total counter	Displays the total number of counted valve activations	0 ... 2147483647 Cycles	0
P08	Error time	Defines the debounce time in the event of error detection	0,1 ... 100,0 s	0,1
	Acceleration in X axis	Indicates the measured acceleration of the X axis	-156,96 ... 156,96 m/s ²	
	Acceleration in Y axis	Indicates the measured acceleration of the Y axis	-156,96 ... 156,96 m/s ²	
	Acceleration in Z axis	Indicates the measured acceleration of the Z axis	-156,96 ... 156,96 m/s ²	
	Frontally inclined installation position	Indicates the frontally inclined installation position detected	-180 ... 180 °	
	Current consumption	Indicates the measured current consumption	0 ... 375 mA	
	Supply voltage	Indicates the measured supply voltage	0,00 ... 36,00 V	
P33	Alarm threshold for min. internal temperature	Defines the threshold from which an alarm signal will be generated to indicate the internal temperature is too low	-40,0 ... 100,0 °C	-5,0
P34	Alarm threshold for max. internal temperature	Defines the threshold from which an alarm signal will be generated to indicate the internal temperature is too high	-40,0 ... 100,0 °C	75,0
P35	Alarm threshold for min. internal humidity	Defines the threshold from which an alarm signal will be generated to indicate the internal humidity is too low	0,0 ... 100,0 %	0,0
P36	Alarm threshold for max. internal humidity	Defines the threshold from which an alarm signal will be generated to indicate the internal humidity is too high	0,0 ... 100,0 %	100,0
	Internal humidity	Indicates the measured relative internal humidity	0,0 ... 100,0 %	
P37	Alarm threshold for min. internal pressure	Defines the threshold from which an alarm signal will be generated to indicate the internal pressure is too low	260 ... 1260 mbar	500

No.	Parameter	Description	Value range	Default setting
P38	Alarm threshold for max. internal pressure	Defines the threshold from which an alarm signal will be generated to indicate the internal pressure is too high	260 ... 1260 mbar	1230
	Control air supply pressure	Indicates the measured supply pressure of the control air	0,0 ... 30,0 bar	
P39	Alarm threshold for high oscillations	Defines the threshold above which an alarm signal will be generated to indicate the oscillations are too high	0,0 ... 100,0 %	0,0
P40	Alarm threshold for max. control pressure	Defines the threshold above which an alarm signal will be generated to indicate the supply pressure of the control air is too high	0 ... 30 bar	8,0
	Laterally inclined installation position	Indicates the laterally inclined installation position detected	-180 ... 180 °	
	Internal pressure	Indicates the measured internal pressure	260 ... 1260 mbar	
	Internal temperature	Indicates the measured internal temperature	-40,0 ... 100,0 °C	
S14	Valve actuations user counter	Displays the number of user valve actuations counted	0 ... 2147483647 Cycles	0
P30	Diagnostic messages	Defines whether a warning message needs to be output for operating performance diagnosed as deviating	...	
P07	Error position	Defines the valve position in the event of error detection	...	

15 Specific data – AS-Interface

AS-Interface specification: ASi-5 Spec. V1.04 Rev. 1

15.1 Cyclical process data**15.1.1 Inputs**

Inputs (Slave → Master)			
Byte (address)	Bit	Default setting	Logic
0	DI0	Indication of OPEN position	0 = process valve not in OPEN position 1 = process valve in OPEN position
	DI1	Indication of CLOSED position	0 = process valve not in CLOSED position 1 = process valve in CLOSED position
	DI2	Indication of operating mode	0 = normal operation 1 = active initialization
	DI3	Off	
	DI4	Off	
	DI5	Off	
	DI6	Off	
	DI7	Off	
1 to 2	DI8 to DI21	Current valve position (0 to 1000)	-

Device-side digital output signals can be used to output various statuses, such as limit values / errors / alarms. → The statuses are set in the corresponding parameters			
Function of digital outputs 1 to 8 (slave outputs)	0	Off	Without function
	1	Indication of OPEN position	Valve position OPEN feedback
	2	Indication of CLOSED position	Valve position CLOSED feedback
	3	Error output	Signals an active error
	4	Warning message output	Signals an active warning
	5	Indication of operating mode	Feedback of the active operating mode → normal operation / initialisation active
	6		

15.1.2 Outputs

Outputs (Master → Slave)			
Byte (address)	Bit	Default setting	Logic
0	D00	Controlling pneumatic outputs	0 = pneumatic outputs vented 1 = pneumatic outputs pressurized
	D01	Off	
	D02	Initialization	0 = normal operation 1 = initialization mode
	D03	Localization	0 = localization inactive 1 = localization active
	D04	Off	
	D05	Off	
	D06	Off	
	D07	Off	
1...2	D08 to D021	Not used	

Device-side digital input signals can be used to start various actions, such as start initialization / pilot valve actuation / approaching a specified position, etc. → The actions are set in the corresponding parameters			
Function of digital inputs 1 to 8 (slave inputs)	0	Off	No function
	1	Controlling pneumatic outputs	Activates the pneumatic output
	2	Unavailable	Unavailable
	3	Initialization	Starting initialization
	4	Localization	Activates the location function
	5	Safe/On	If the signal is not active, the position defined in the "ErrorAction" (0x004F) parameter is approached. If the signal is active, normal operation is carried out in accordance with external signals.
	6		

15.2 Non-cyclical parameter data

Port	Index [Hex]	"Access Rights"	Parameter	"Length"	"Data type"	"Default setting"	"Adjustment facility"	"Description"
0	0x0007	RO	ASI ID	7 byte	-	-	-	0x0191 (Vendor ID) and 5 byte (consecutive numbers)
0	0x0001	RO	Manufacturer device name	10 byte	StringT	-	-	"4242 AS-I5"
0	0x000F	RO	Manufacturer device family	14 byte	StringT	-	-	"4242"
0	0x0031	RO	ASi-5 device Process input data	1 byte	-	-	-	Current input data
0	0x0032	RO	ASi-5 device Process output data	3 byte	-	-	-	Current output data
0	0x0610	RO	Vendor name	5 byte	StringT	-	-	GEMUE Manufacturer's designation
0	0x0614	RO	Product text	13 byte	StringT	-	-	"CombiSwitchbox" Equipment category

Port	Index [Hex]	"Access Rights"	Parameter	"Length "	"Data type"	"Default setting"		"Adjustment facility"	"Description"
0	0x0615	RO	Serial number	15 byte	StringT	-	-	-	"RRRRRRRR/IIII" (traceability number and index)
0	0x0616	RO	Hardware revision	52 byte	StringT	-	-	"Rev. XX/XX"	The revision status of the installed hardware
0	0x0617	RO	Firmware revision	21 byte	StringT	-	-	"V x.x.x.x"	Revision status of the firmware
0	0x0618	RW	Application-specific tag	32 byte	StringT	0x20	-	"*** "	Option to define a designation specific to the application
0	0x0619	RW	Function tag	32 byte	StringT	0x20	-	-	Option to define a functional designation
0	0x061A	RW	Location tag	32 byte	StringT	0x20	-	-	Option to define a location-specific designation
1	0x6421	RW	Digital output 1 function (Defines the behaviour of the output process data bit 0)	8 bit	uint:8	1 (Indication of OPEN position)	0	OFF	No function
							1	Indication of OPEN position	Valve position OPEN feedback
							2	Indication of CLOSED position	Valve position CLOSED feedback
							3	Error output	Signals an active error
							4	Warning message output	Signals an active warning
							5	Indication of operating mode	Feedback of the active operating mode -> normal operation/initialization active
1	0x6431	RW	Digital output 2 function (Defines the behaviour of the output process data bit 1)	8 bit	uint:8	2 (Indication of CLOSED position)	0	OFF	No function
							1	Indication of OPEN position	Valve position OPEN feedback
							2	Indication of CLOSED position	Valve position CLOSED feedback
							3	Error output	Signals an active error
							4	Warning message output	Signals an active warning
							5	Indication of operating mode	Feedback of the active operating mode -> normal operation/initialization active
1	0x6441	RW	Digital output 3 function (Defines the behaviour of the output process data bit 2)	8 bit	uint:8	5 (Indication of operating mode)	0	OFF	No function
							1	Indication of OPEN position	Valve position OPEN feedback

Port	Index [Hex]	"Access Rights"	Parameter	"Length"	"Data type"	"Default setting"		"Adjustment facility"	"Description"
							2	Indication of CLOSED position	Valve position CLOSED feedback
							3	Error output	Signals an active error
							4	Warning message output	Signals an active warning
							5	Indication of operating mode	Feedback of the active operating mode -> normal operation/initialization active
1	0x6451	RW	Digital output 4 function (Defines the behaviour of the output process data bit 3)	8 bit	uint:8	0 (Off)	0	OFF	No function
							1	Indication of OPEN position	Valve position OPEN feedback
							2	Indication of CLOSED position	Valve position CLOSED feedback
							3	Error output	Signals an active error
							4	Warning message output	Signals an active warning
							5	Indication of operating mode	Feedback of the active operating mode -> normal operation/initialization active
1	0x6461	RW	Digital output 5 function (Defines the behaviour of the output process data bit 4)	8 bit	uint:8	0 (Off)	0	OFF	No function
							1	Indication of OPEN position	Valve position OPEN feedback
							2	Indication of CLOSED position	Valve position CLOSED feedback
							3	Error output	Signals an active error
							4	Warning message output	Signals an active warning
							5	Indication of operating mode	Feedback of the active operating mode -> normal operation/initialization active
1	0x6471	RW	Digital output 6 function (Defines the behaviour of the output process data bit 5)	8 bit	uint:8	0 (Off)	0	OFF	No function
							1	Indication of OPEN position	Valve position OPEN feedback
							2	Indication of CLOSED position	Valve position CLOSED feedback
							3	Error output	Signals an active error

Port	Index [Hex]	"Access Rights"	Parameter	"Length"	"Data type"	"Default setting"		"Adjustment facility"	"Description"
							4	Warning message output	Signals an active warning
							5	Indication of operating mode	Feedback of the active operating mode -> normal operation/initialization active
1	0x6481	RW	Digital output 7 function (Defines the behaviour of the output process data bit 6)	8 bit	uint:8	0 (Off)	0	OFF	No function
							1	Indication of OPEN position	Valve position OPEN feedback
							2	Indication of CLOSED position	Valve position CLOSED feedback
							3	Error output	Signals an active error
							4	Warning message output	Signals an active warning
							5	Indication of operating mode	Feedback of the active operating mode -> normal operation/initialization active
1	0x6491	RW	Digital output 8 function (Defines the behaviour of the output process data bit 7)	8 bit	uint:8	0 (Off)	0	OFF	No function
							1	Indication of OPEN position	Valve position OPEN feedback
							2	Indication of CLOSED position	Valve position CLOSED feedback
							3	Error output	Signals an active error
							4	Warning message output	Signals an active warning
							5	Indication of operating mode	Feedback of the active operating mode -> normal operation/initialization active
1	0x64F1	RW	Error time	16 bit	uint:16	0.1 s	-	1 to 1000 (0.1 to 100.0 s)	Defines the delay time between detection of an error or warning and the predetermined response to it.
1	0x64F2	RW	Error position	8 bit	uint:8	3 (Vent valve)	0	Hold valve position	Position of the valve is held in the event of an error
							1	Open valve	Valve is opened in the event of an error
							2	Close valve	Valve is closed in the event of an error

Port	Index [Hex]	"Access Rights"	Parameter	"Length"	"Data type"	"Default setting"		"Adjustment facility"	"Description"
							3	Vent valve (approach safety position)	The valve is vented and thereby moved to the safety position
1	0x64F3	RW	Time-based diagnostic messages	8 bit	uint:8	1 (activated)	1	1 activated 0 deactivated	Diagnostic messages activated Diagnostic messages deactivated
1	0x6501	RW	Inversion of LED colours	1 byte	uint:8	Standard or inversed depending on the order version	0 1	Standard Inversed	CLOSED = green, OPEN = orange CLOSED = orange, OPEN = green
1	0x6503	RW	Detection of end positions mode	1 byte	uint:8	1 (autonomous)	0 1	Classic Autonomous	Classic initialization mode Autonomous end positions tracking
1	0x6504	RW	Initialization via magnetic switch	1 byte	uint:8	1 (activated)*	0 1	Deactivated Activated	Programming procedure starting via reed contact deactivated Programming procedure starting via reed contact possible
1	0x6505	RW	Fieldbus communication	8 bit	uint:8	0 (deactivated)	0 1	Deactivated Activated	Fieldbus communication deactivated Fieldbus communication activated
1	0x6506	RW	Bluetooth interface	1 byte	uint:8	1 (activated) *	0 1	Deactivated Activated	Bluetooth communication option deactivated Bluetooth communication option activated
1	0x6509	RW	High-visibility position indicator	1 byte	uint:8	1 (On)	0 1 2	Off On Dimmed	End position feedback via LEDs deactivated End position feedback via LEDs activated Dimmed end position feedback via LEDs
1	0x6511	RW	Switch point OPEN	2 byte	uint:16	75.0%	-	10.0 to 100.0%	Set switching threshold for Open Must be at least 10.0% higher than switch point Closed
1	0x6512	RW	Switch point CLOSED	2 byte	uint:16	12.0%	-	0.0 to 90.0%	Set switching threshold for Closed Must be at least 10.0% lower than switch point Open
1	0x6531	RO	Absolute travel sensor position OPEN end position	2 byte	uint:16	0	-	0.0 to 100.0%	Initialized travel sensor position OPEN end position

Port	Index [Hex]	"Access Rights"	Parameter	"Length"	"Data type"	"Default setting"		"Adjustment facility"	"Description"
1	0x6532	RO	Absolute travel sensor position CLOSED end position	2 byte	uint:16	0	-	0.0 to 100.0%	Initialized travel sensor position CLOSED end position
1	0x65C1	RO	Control function	1 byte	uint:8	-	0	undefined	No control function recognised
							1	NC	Normally closed control function detected
							2	NO	Normally open control function detected
							3	DA	Double acting control function detected
1	0x6641	RW	Digital input 1 function (Defines the behaviour of the input process data bit 0)	8 bit	uint:8	1 (Controlling pneumatic outputs)	0	Off	No function
							1	Controlling pneumatic outputs	Activates the pneumatic output
							2	-	-
							3	Initialization	Starting initialization
							4	Localization	Activates the location function
							5	Safe/On	If the signal is not active, the position defined in the "Error-Action" (0x004F) parameter is approached. If the signal is active, normal operation is carried out in accordance with external signals.
1	0x6651	RW	Digital input 2 function (Defines the behaviour of the input process data bit 1)	8 bit	uint:8	0 (Off)	0	Off	No function
							1	Controlling pneumatic outputs	Activates the pneumatic output
							2	-	-
							3	Initialization	Starting initialization
							4	Localization	Activates the location function
							5	Safe/On	If the signal is not active, the position defined in the "Error-Action" (0x004F) parameter is approached. If the signal is active, normal operation is carried out in accordance with external signals.
1	0x6661	RW	Digital input 3 function (Defines the behaviour of the input process data bit 2)	8 bit	uint:8	3 (Initialization)	0	Off	No function
							1	Controlling pneumatic outputs	Activates the pneumatic output
							2	-	-

Port	Index [Hex]	"Access Rights"	Parameter	"Length"	"Data type"	"Default setting"		"Adjustment facility"	"Description"
							3	Initialization	Starting initialization
							4	Localization	Activates the location function
							5	Safe/On	If the signal is not active, the position defined in the "Error-Action" (0x004F) parameter is approached. If the signal is active, normal operation is carried out in accordance with external signals.
1	0x6671	RW	Digital input 4 function (Defines the behaviour of the input process data bit 3)	8 bit	uint:8	4 (Localization)	0	Off	No function
							1	Controlling pneumatic outputs	Activates the pneumatic output
							2	-	-
							3	Initialization	Starting initialization
							4	Localization	Activates the location function
							5	Safe/On	If the signal is not active, the position defined in the "Error-Action" (0x004F) parameter is approached. If the signal is active, normal operation is carried out in accordance with external signals.
1	0x6681	RW	Digital input 5 function (Defines the behaviour of the input process data bit 4)	8 bit	uint:8	0 (Off)	0	Off	No function
							1	Controlling pneumatic outputs	Activates the pneumatic output
							2	-	-
							3	Initialization	Starting initialization
							4	Localization	Activates the location function
							5	Safe/On	If the signal is not active, the position defined in the "Error-Action" (0x004F) parameter is approached. If the signal is active, normal operation is carried out in accordance with external signals.
1	0x6691	RW	Digital input 6 function (Defines the behaviour of the input process data bit 5)	8 bit	uint:8	0 (Off)	0	Off	No function

Port	Index [Hex]	"Access Rights"	Parameter	"Length"	"Data type"	"Default setting"		"Adjustment facility"	"Description"
							1	Controlling pneumatic outputs	Activates the pneumatic output
							2	-	-
							3	Initialization	Starting initialization
							4	Localization	Activates the location function
							5	Safe/On	If the signal is not active, the position defined in the "Error-Action" (0x004F) parameter is approached. If the signal is active, normal operation is carried out in accordance with external signals.
1	0x66A1	RW	Digital input 7 function (Defines the behaviour of the input process data bit 6)	8 bit	uint:8	0 (Off)	0	Off	No function
							1	Controlling pneumatic outputs	Activates the pneumatic output
							2	-	-
							3	Initialization	Starting initialization
							4	Localization	Activates the location function
							5	Safe/On	If the signal is not active, the position defined in the "Error-Action" (0x004F) parameter is approached. If the signal is active, normal operation is carried out in accordance with external signals.
1	0x66B1	RW	Digital input 8 function (Defines the behaviour of the input process data bit 7)	8 bit	uint:8	0 (Off)	0	Off	No function
							1	Controlling pneumatic outputs	Activates the pneumatic output
							2	-	-
							3	Initialization	Starting initialization
							4	Localization	Activates the location function

Port	Index [Hex]	"Access Rights"	Parameter	"Length"	"Data type"	"Default setting"		"Adjustment facility"	"Description"
							5	Safe/On	If the signal is not active, the position defined in the "Error-Action" (0x004F) parameter is approached. If the signal is active, normal operation is carried out in accordance with external signals.
1	0x67A1	RW	Alarm threshold for min. internal temperature of housing	2 byte	int:16	-5 °C		-40 to 100 °C	Defines the threshold below which an alarm signal will be generated to indicate the internal temperature of the housing is too low
1	0x67A2	RW	Alarm threshold for max. internal temperature of housing	2 byte	int:16	75 °C		-40 to 100 °C	Defines the threshold above which an alarm signal will be generated to indicate the internal temperature of the housing is too high
1	0x67A3	RW	Alarm threshold for min. humidity of housing	2 byte	int:16	0.0%		0.0 to 100.0%	Defines the threshold below which an alarm signal will be generated to indicate the humidity inside the housing is too low
1	0x67A4	RW	Alarm threshold for max. humidity of housing	2 byte	int:16	100.0 %		0.0 to 100.0%	Defines the threshold above which an alarm signal will be generated to indicate the humidity inside the housing is too high
1	0x67A5	RW	Alarm threshold for high oscillations	2 byte	int:16	0.0%		0.0 to 100.0%	Defines the threshold above which an alarm signal will be generated to indicate the oscillations are too high
1	0x67A6	RW	Alarm threshold for min. internal pressure of housing	2 byte	int:16	500mbar		260–1260 mbar	Defines the threshold below which an alarm signal will be generated to indicate the internal pressure in the housing is too low
1	0x67A7	RW	Alarm threshold for max. internal pressure of housing	2 byte	int:16	1230 mbar		260–1260 mbar	Defines the threshold above which an alarm signal will be generated to indicate the internal pressure in the housing is too high

* These parameters are not reset to default settings with the "Restore Factory Settings" AS-I system command, but instead retain their set values

15.3 Non-cyclical condition monitoring data

Port	Index [Hex]	"Access Rights"	Parameter	"Length"	"Data type"	"Default setting"		"Adjustment facility"	"Description"
1	0x6561	RO	User switching cycle counter	32 bit	uint:32	0 *		0 ... 2.147.483.647	(OPEN -> CLOSED -> OPEN = switching cycle feedback) can be reset (for example, after replacing the diaphragm)
1	0x6562	RO	Total switching cycle counter	32 bit	uint:32	0 *		0 ... 2.147.483.647	(OPEN -> CLOSED -> OPEN = switching cycle feedback) cannot be reset (actuator switching cycles)
1	0x6563	RW	Warning threshold for user switching cycles	32 bit	uint:32	0 *		1 ... 2.147.483.647	Adjustable alarm threshold for user switching cycles (cycle counter user)
1	0x6564	RO	Valve actuations user counter	32 bit	uint:32	0 *		0 ... 2.147.483.647	Counts the actuation pulses (even if they do not result in movement of the actuator). Can be reset (for example, after replacing the pilot valve module)
1	0x6565	RO	Valve actuations total counter	32 bit	uint:32	0 *		0 ... 2.147.483.647	Counts the actuation pulses (even if they do not result in movement of the actuator).
1	0x6566	RW	Warning threshold for valve actuations user counter	32 bit	uint:32	0 *		1 ... 2.147.483.647	Adjustable alarm threshold for actuation pulse counter
1	0x6567	RO	Switching cycles warning ratio	16 bit	uint:16	0 *		0 to 1000 (0 to 100.0%)	Pilot valve wear level in %. Calculated from the actuation counter and the set alarm threshold
1	0x65A1	RO	Total operating hours	32 bit	uint:32	0 *		0 ... 2.147.483.647	Total operating hours counter
1	0x65A2	RO	Operating hours since last start	32 bit	uint:32	0 *		0 ... 2.147.483.647	Operating hours since last device start
1	0x6621	RO	Operating time OPEN	16 bit	uint:16	-		0 to 999 (0.0 to 99.9 s)	Travel time from OPEN to CLOSED end position
1	0x6622	RO	Operating time CLOSED	16 bit	uint:16	-		0 to 999 (0.0 to 99.9 s)	Travel time from CLOSED to OPEN end position

Port	Index [Hex]	"Access Rights"	Parameter	"Length"	"Data type"	"Default setting"		"Adjustment facility"	"Description"
1	0x678 1	RO	Housing internal temperature	16 bit	int:16	0 *		-400 to 1000 (-40.0 °C to 100.0 °C)	Measured housing internal temperature in °C
1	0x678 2	RO	Housing internal pressure	16 bit	int:16	0 *		260 to 1260 (260 mbar to 1260 mbar)	Measured housing internal pressure in mbar
1	0x678 3	RO	Laterally inclined installation position in °	16 bit	int:16	0 *		-1800 to 1800 (-180.0° to 180.0°)	Detected laterally inclined installation position in °
1	0x678 4	RO	Frontally inclined installation position in °	16 bit	int:16	0 *		-1800 to 1800 (-180.0° to 180.0°)	Detected frontally inclined installation position in °
1	0x678 5	RO	Acceleration in X axis	16 bit	int:16	0		-32768 ... 32767	Indicates the measured acceleration of the X axis
1	0x678 6	RO	Acceleration in Y axis	16 bit	int:16	0		-32768 ... 32767	Indicates the measured acceleration of the Y axis
1	0x678 7	RO	Acceleration in Z axis	16 bit	int:16	0		-32768 ... 32767	Indicates the measured acceleration of the Z axis
1	0x678 8	RO	Supply voltage	16 bit	int:16	0 *		0 to 3600 (0.00 V to 36.00 V)	Measured supply voltage in V
1	0x678 9	RO	Current consumption	16 bit	int:16	0 *		0 to 375 (0 mA to 375 mA)	Measured current consumption in mA
1	0x678 A	RO	Humidity of housing	16 bit	int:16	0 *		0 to 1000 (0.0% to 100.0%)	Measured relative humidity in housing in %

* These parameters are not reset to default settings with the "Restore Factory Settings" AS-I system command, but instead retain their set values

15.4 AS-I5 events

Note: Specific error description and troubleshooting measures in accordance with "Messages and troubleshooting" chapter (see "Messages and troubleshooting", page 44).

Event	Mode	Type	Code
Internal device error	Rising / Leaving	Error	0x0001
Temperature exceeded	Rising / Leaving	Error	0x0021 0x03
Temperature not reached	Rising / Leaving	Error	0x0021 0x01
Travel sensor not calibrated	Rising / Leaving	Error	0x0301
Not initialized	Rising / Leaving	Warning	0x0302
End position displacement OPEN	Single Shot	Information	0x0303
End position displacement CLOSED	Single Shot	Information	0x0304
Duration error in the OPEN direction	Rising / Leaving	Warning	0x031C
Duration error in the CLOSED direction	Rising / Leaving	Warning	0x031D
No movement or incorrect movement towards OPEN	Rising / Leaving	Warning	0x031F
No movement or incorrect movement towards CLOSED	Rising / Leaving	Warning	0x0320
Undefined position change in the OPEN direction	Rising / Leaving	Warning	0x0321
Undefined position change in the CLOSED direction	Rising / Leaving	Warning	0x0322
Travel sensor error	Rising / Leaving	Error	0x033C
Travel sensor maximum value exceeded	Rising / Leaving	Warning	0x033E
Travel sensor minimum value not reached	Rising / Leaving	Warning	0x033F
Initialization error	Single Shot	Information	0x03FA
Valve actuations alarm threshold reached	Rising / Leaving	Warning	0x0346
Switching cycles alarm threshold reached	Rising / Leaving	Warning	0x0348
Critical supply voltage	Rising / Leaving	Error	0x036D
Supply voltage exceeded	Rising / Leaving	Warning	0x036E
Supply voltage not reached	Rising / Leaving	Warning	0x036F
Temperature alarm threshold exceeded	Rising / Leaving	Warning	0x0378
Temperature alarm threshold not reached	Rising / Leaving	Warning	0x0379
Humidity alarm threshold exceeded	Rising / Leaving	Warning	0x037A
Humidity alarm threshold not reached	Rising / Leaving	Warning	0x037B
Internal pressure alarm threshold exceeded *	Rising / Leaving	Warning	0x037C
Internal pressure alarm threshold not reached	Rising / Leaving	Warning	0x037D
Vibration alarm threshold exceeded	Rising / Leaving	Warning	0x0382

* Message at size 2 inactive

16 Manual override

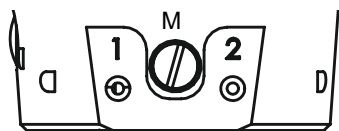
NOTICE

- ▶ Manual override only available for "single acting" version.

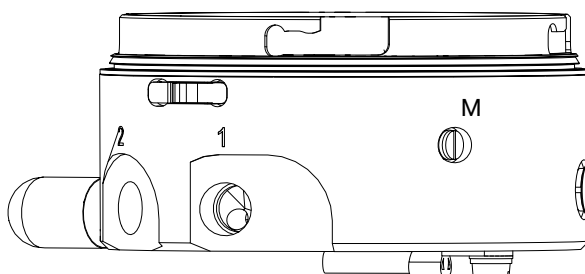
NOTICE

- ▶ Control air and the minimum pressure must be available to use the manual override.

The combi switchbox has a manual override in the corresponding design, which enables manual operation of the process valve.



Size 1



Size 2

Activating the manual override:

Use a flathead screwdriver (maximum slot width of 6 mm) to carefully screw in the manual override screw **M** clockwise as far as it will go or until you feel resistance.

Deactivating the manual override:

Use a flathead screwdriver (maximum slot width of 6 mm) to unscrew the manual override screw **M** anticlockwise as far as it will go.

17 Messages and troubleshooting

Three different conditions are distinguished between in the device, which suggest faults due to internal or external influences. These are made visible via different flashing patterns.

Error: Device can no longer properly carry out its function. The valve is moved to the defined safety position in a controlled manner. The cause of the error must be eliminated for continued operation.

Warning: A warning does not affect the operating mode of the device; however, under certain circumstances, it may not carry out the required function. We recommend checking the cause and, if required, eliminating it.

Info: The status of a temporary function is displayed.

The following warning and error messages are defined for the device, and can be read out on the GEMÜ app:

Message ID and type	Message	Error description	Cause and remedial measures
1	Not calibrated	The product is not calibrated.	Please send the product to GEMÜ for repair. Please contact your GEMÜ representative. Further information can also be found on the product overview in the GEMÜ app under Maintenance.
2	Not initialized	The product is not initialised.	Please perform an initialisation. If autonomous end position detection is activated, both end positions of the valve must be approached once. In the classic end position detection mode, the initialisation must be started manually. This can be done, for example, via the button on the product overview in the GEMÜ app. Alternatively, please note the information in the chapter "Commissioning" in the operating instructions.
3	End position displacement Open	Autonomous detection of end positions recognizes and adjusts a displacement of the Open end position.	No measure required
4	End position displacement Closed	Autonomous detection of end positions recognizes and adjusts a displacement of the Closed end position.	no action required
28	Duration error in the Open direction	The Open end position of the process valve has been reached, but not within the expected time (diagnostic message).	Please ensure an adequate compressed air supply. Check the pneumatic connections. Check the pneumatic connection points. Check that the valve is working correctly.
29	Duration error in the Closed direction	The Closed end position of the process valve has been reached, but not within the expected time (diagnostic message).	Please ensure an adequate compressed air supply. Check the pneumatic connections. Check the pneumatic connection points. Check that the valve is working correctly.
31	No movement or incorrect movement towards Open	The Open end position of the process valve is not reached (diagnostic message).	Please ensure sufficient compressed air supply. Check the pneumatic connections. Check the pneumatic connection points. Check the valve for function.
32	No movement or incorrect movement towards Closed	The Closed end position of the process valve is not reached (diagnostic message).	Please ensure sufficient compressed air supply. Check the pneumatic connections. Check the pneumatic connections. Check the valve for function.
33	Undefined position change in the Open direction	The position of the process valve changes to an undefined position, without actuation in the Open direction (diagnostic message).	Please ensure an adequate compressed air supply. Check the pneumatic connections. Check the pneumatic connection points. Check that the valve is working correctly.
34	Undefined position change in the Closed direction	The position of the process valve changes to an undefined position, without actuation in the Closed direction (diagnostic message).	Please ensure an adequate compressed air supply. Check the pneumatic connections. Check the pneumatic connection points. Check that the valve is working correctly.
60	Travel sensor error	No valid signal from the position transmitter can be read in.	Please send the product to GEMÜ for repair. Please contact your GEMÜ representative. Further information can also be found on the product overview in the GEMÜ app under Maintenance.
62	Travel sensor maximum value exceeded	The position sensor provides values above the maximum valid range.	Please ensure correct mechanical mounting on the valve. Please check all connecting parts (e.g. mounting kits, etc.) between valve and product for correct and complete use.

Message ID and type	Message	Error description	Cause and remedial measures
63	Travel sensor minimum value not reached	The position sensor delivers values below the minimum valid range.	Please ensure correct mechanical assembly on the valve. Please check all connecting parts (e.g. mounting kits, etc.) between valve and product for correct and complete use.
70	Valve activations alarm threshold reached	The number of valve actuations set in parameter "S14: Valve actuations user counter warning threshold" has been reached.	Please check the condition of the wear parts of the valve control. Further information on this can be found on the product overview in the GEMÜ app under Maintenance. If the condition is perfect, you can alternatively adjust the warning threshold in the parameter "S14: Warning threshold user counter valve actuators".
72	Switching cycles alarm threshold reached	The number of switching cycles set in parameter "S02: User switching cycles warning threshold" has been reached.	Please check the condition of the valve wear parts. You can find more information on this on the product overview in the GEMÜ app under Maintenance. If the condition is perfect, you can alternatively adjust the warning threshold in parameter "S02: Warning threshold user switching cycles".
73	Switching cycle counter reset	The user switching cycle counter has been reset	No action necessary
100	Control air supply pressure exceeded	The maximum permissible control pressure has been exceeded	Please reduce the control air supply pressure at the product. Unacceptably high control pressures can permanently damage or destroy the product.
109	Critical supply voltage	The maximum permissible supply voltage has been exceeded	Please check the power source to ensure that the output voltage has been selected and set correctly. Ensure that the power supply is within the permissible range.
110	Supply voltage exceeded	The maximum permissible supply voltage will soon be exceeded	Please check the power source to ensure that the output voltage has been selected and set correctly. Ensure that the power supply is within the permissible range.
111	Supply voltage not reached	The minimum permissible supply voltage has not been reached	Please check the power source to ensure that the output voltage has been selected and set correctly. Ensure that the power supply is within the permissible range.
118	Internal temperature exceeded	The maximum permissible internal temperature has been exceeded	Please reduce the ambient temperature at the product's installation site or establish cooler conditions.
119	Internal temperature has not been reached	The minimum permissible internal temperature has not been reached	Please increase the ambient temperature at the product's installation site or establish warmer conditions.
120	Internal temperature alarm threshold exceeded	The maximum temperature as set in parameter "P34: Alarm threshold for max. internal temperature" has been reached or exceeded.	Please reduce the ambient temperature at the product's installation site or establish cooler conditions. Alternatively, check the maximum permissible temperature range of the product. If this is above the set value in parameter "P34: Alarm threshold for max. internal temperature", it can be increased.
121	Internal temperature alarm threshold has not been reached	The minimum temperature as set in parameter "P33: Alarm threshold for min. internal temperature" has been reached or undershot.	Please increase the ambient temperature at the product's installation site or establish warmer conditions. Alternatively, check the minimum permissible temperature range of the product. If this is below the set value in parameter "P33: Alarm threshold for min. internal temperature", it can be reduced.
122	Internal humidity alarm threshold exceeded	The maximum humidity as set in parameter "P36: Alarm threshold for max. internal humidity of housing" has been reached or exceeded.	Please check that the product housing is fully intact and sealed and that all seals are seated correctly. Please reduce the humidity at the product's installation site or establish dryer conditions. Alternatively, check the maximum permissible humidity range of the product. If this is above the set value in parameter "P36: Alarm threshold for max. internal humidity", it can be increased.
123	Internal humidity alarm threshold not reached	The minimum humidity as set in parameter "P35: Alarm threshold for min. internal humidity of housing" has been reached or undershot.	Please increase the humidity at the product's installation site or establish damper conditions. Alternatively, check the minimum permissible humidity range of the product. If this is below the set value in parameter "P35: Alarm threshold for min. internal humidity", it can be reduced.
124	Internal pressure alarm threshold exceeded	The maximum internal pressure as set in parameter "P38: Max. internal pressure alarm threshold" has been reached or exceeded.	Please check the product for internal leakages. Please check the height above sea level at the product's installation site. Alternatively, check the maximum permissible in-

Message ID and type	Message	Error description	Cause and remedial measures
			ternal pressure/height above sea level of the product. If this is above the set value in parameter "P38: Alarm threshold for max. internal pressure", it can be increased.
125	Internal pressure alarm threshold not reached	The minimum internal pressure as set in parameter "P37: Min. internal pressure alarm threshold" has been reached or undershot.	Please check the height above sea level at the product's installation site. Alternatively, check the minimum permissible internal pressure/height above sea level of the product. If this is below the set value in parameter "P37: Alarm threshold for min. internal pressure", it can be reduced.
130	Vibration alarm threshold exceeded	The maximum vibration set in parameter "P39: Alarm threshold for vibration exceeded" has been reached or exceeded.	Please check the product's installation conditions, specifically for loose screws, fastening components and mounts for fixing the pipeline. Please check the flow velocity in the piping and reduce it if possible. Please check that the process valve is suitable for the prevailing operating parameters.
201	Internal device error	An error has occurred in the unit	Please send the product to GEMÜ for repair. Please contact your GEMÜ representative. Further information can also be found on the product overview in the GEMÜ App under Maintenance.
205	Fieldbus communication error	Fieldbus communication was terminated while the associated parameter "Fieldbus communication" was activated	Fieldbus communication is expected. Please check that the communication interface is wired and configured correctly
250	Initialization error	During initialization, an error occurred which caused it to be terminated	Please ensure that the mechanical assembly on the valve is correct. Please check all connecting components (e.g. mounting kits, etc.) between the valve and product to ensure that they are being used correctly and in their entirety. Please ensure an adequate compressed air supply. Check the pneumatic connections. Check the pneumatic connection points. Check that the valve is working correctly.

Note: Message ID 124 "Internal pressure alarm threshold exceeded" at size 2 inactive

18 Disposal

1. Pay attention to adhered residual material and gas diffusion from penetrated media.
2. Dispose of all parts in accordance with the disposal regulations/environmental protection laws.

19 Returns

Legal regulations for the protection of the environment and personnel require that the completed and signed return delivery note is included with the dispatch documents. Returned goods can be processed only when this note is completed. If no return delivery note is included with the product, GEMÜ cannot process credits or repair work but will dispose of the goods at the operator's expense.

1. Clean the product.
2. Request a return delivery note from GEMÜ.
3. Complete the return delivery note.
4. Send the product with a completed return delivery note to GEMÜ.

20 EU Declaration of Incorporation

Version 1

GEMÜ**Original EU-Einbauerklärung**
EU Declaration of Incorporation

Wir, die Firma

We, the company

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74653 Ingelfingen
Deutschland

erklären hiermit in alleiniger Verantwortung, dass die nachfolgend bezeichneten Produkte den Vorschriften der genannten Richtlinien entspricht.

hereby declare under our sole responsibility that the below-mentioned products complies with the regulations of the mentioned Directives.

Produkt: GEMÜ 4242 ASi-5**Product:** GEMÜ 4242 ASi-5**Produktname:** Ventilanschlaltung mit integriertem Vorsteuerventil**Product name:** Combi switchbox with integrated pilot valve

Die unvollständige Maschine darf erst dann in Betrieb genommen werden, wenn gegebenenfalls festgestellt wurde, dass die Maschine, in die die unvollständige Maschine eingebaut werden soll, den Bestimmungen der Maschinenrichtlinie 2006/42/EG entspricht.

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.

Richtlinien:**Guidelines:**MD 2006/42/EG¹⁾**Folgende harmonisierte Normen (oder Teile hieraus) wurden angewandt:****The following harmonized standards (or parts thereof) have been applied:**

EN ISO 12100:2010

Folgende grundlegenden Sicherheits- und Gesundheitsschutzanforderungen der EG-Maschinenrichtlinie 2006/42/EG, Anhang I wurden angewandt und eingehalten:

The following essential health and safety requirements of the EC Machinery Directive 2006/42/EC, Annex I have been applied or adhered to:

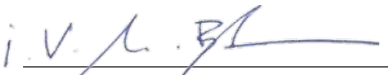
1.1.2.; 1.1.3.; 1.1.5.; 1.3.2.; 1.3.7.; 1.3.9.; 1.5.1.; 1.5.2.; 1.5.4.; 1.5.5.; 1.5.6.; 1.5.7.; 1.6.1.; 1.7.1.; 1.7.1.1.; 1.7.2.; 1.7.3.; 1.7.4.; 1.7.4.1.; 1.7.4.2.; 1.7.4.3.

¹⁾ MD 2006/42/EG**Bemerkungen:**

Ferner wird erklärt, dass die speziellen technischen Unterlagen gemäß Anhang VII Teil B erstellt wurden. Der Hersteller verpflichtet sich, einzelstaatlichen Stellen auf begründetes Verlangen die speziellen technischen Unterlagen zu der unvollständigen Maschine zu übermitteln. Diese Übermittlung erfolgt elektronisch. Die gewerblichen Schutzrechte bleiben hiervon unberührt!

¹⁾ MD 2006/42/EG**Remarks:**

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.


i.V. M. Barghoorn
Leiter Globale Technik
Ingelfingen, 16.12.2024GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG
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21 EU Declaration of Conformity

Version 1



EU-Konformitätserklärung

EU Declaration of Conformity

Wir, die Firma

We, the company

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Deutschland

erklären hiermit in alleiniger Verantwortung, dass die nachfolgend bezeichneten Produkte den Vorschriften der genannten Richtlinien entspricht.

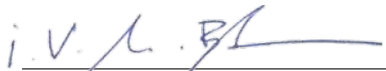
hereby declare under our sole responsibility that the below-mentioned products complies with the regulations of the mentioned Directives.

Produkt: GEMÜ 4242 ASi-5**Product:** GEMÜ 4242 ASi-5**Produktname:** Ventilanschlusung mit integriertem Vorsteuerventil**Product name:** Combi switchbox with integrated pilot valve**Richtlinien:****Guidelines:**

RED 2014/53/EU

Folgende harmonisierte Normen (oder Teile hieraus) wurden angewandt:**The following harmonized standards (or parts thereof) have been applied:**

EN 61010-1:2010/A1:2019/AC:2019-04; EN 301 489-17 V3.2.4: 2020-09; EN 301 489-1 V2.2.3: 2019-11;
EN 300 328 V2.2.2: 2019-07



i.V. M. Barghoorn
Leiter Globale Technik
Ingelfingen, 16.12.2024

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22 EU Declaration of Conformity

Version 1

GEMÜ

EU-Konformitätserklärung EU Declaration of Conformity

Wir, die Firma

We, the company

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erklären hiermit in alleiniger Verantwortung, dass die nachfolgend bezeichneten Produkte den Vorschriften der genannten Richtlinien entspricht.

hereby declare under our sole responsibility that the below-mentioned products complies with the regulations of the mentioned Directives.

Produkt: GEMÜ 4242 ASi-5
Produktnamen: Sonderausführung Code X
Richtlinien: Ventilanschlaltung mit integriertem Vorsteuerventil

Product: GEMÜ 4242 ASi-5
Product name: special version Code X
Guidelines: Combi switchbox with integrated pilot valve

ATEX 2014/34/EU¹⁾

Folgende harmonisierte Normen (oder Teile hieraus) wurden angewandt:

The following harmonized standards (or parts thereof) have been applied:

EN IEC 60079-7:2015/A1:2018; EN IEC 60079-0:2018; EN 60079-31:2014

¹⁾ ATEX 2014/34/EU

Benannte Stelle:
IBExU Institut für Sicherheitstechnik GmbH
Kennnummer der benannten Stelle: 0637

Bemerkungen:

Besondere Bedingungen oder Einsatzgrenzen, siehe Kapitel „Bestimmungsgemäße Verwendung“ der Betriebsanleitung.

Explosionsschutzkennung: Gas:  II 3G Ex ec IIC T4 Gc X

Explosionsschutzkennung: Staub:  II 3D Ex tc IIIC T100°C Dc X

¹⁾ ATEX 2014/34/EU

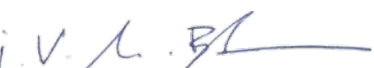
Notified body:
IBExU Institut für Sicherheitstechnik GmbH
ID number of the notified body: 0637

Remarks:

For special conditions or limits of use, see chapter 'Correct use' in the operating instructions.

Explosion protection designation: Gas:  II 3G Ex ec IIC T4 Gc X

Explosion protection designation: Dust:  II 3D Ex tc IIIC T100°C Dc X



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23 Supplier's Declaration of Conformity FCC

24 Supplier's Declaration of Conformity FCC

24 Supplier's Declaration of Conformity FCC



Supplier's Declaration of Conformity

Unique Identifier: GEMÜ 4242 ASI-5

Party issuing Supplier's Declaration of Conformity

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Responsible Party – U.S. Contact Information

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Atlanta, Georgia 30331-6247
Tel.: +1-678-5 53 34 00
Fax: +1-404-3 44 9350
info(at)gemu.com
www.gemu.com

FCC Compliance Statement

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

- this device may not cause harmful interference, and
- this device must accept any interference received, including interference that may cause undesired operation.

M. Barghoorn
Head of Global Technics

Ingelfingen, 24/06/2024

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Subject to alteration

09.2025 | 88894894