GEMÜ 1235/1236

24V / IO-Link, 3E, 4E

Electrical position indicator

EN **Operating instructions**

IO-Link

LISTED

further information
webcode: GW-1235/1236

Contents

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

The following LED symbols are used in the documentation:

Symbol	LED conditions
○	Off
●	Lit (on)
☀	Flashing

1.3 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.

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!

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 substances.

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:

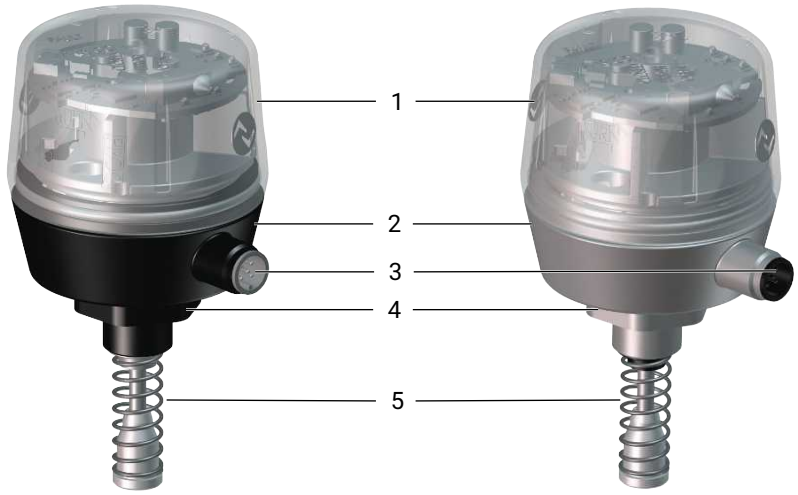
9. Keep this document available at the place of use.
10. Observe the safety information.
11. Operate the product in accordance with this document.
12. Operate the product in accordance with the specifications.
13. Maintain the product correctly.
14. Do not carry out any maintenance work and repairs not 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

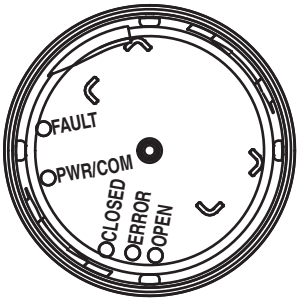


GEMÜ 1235 GEMÜ 1236

Item	Name	Materials
1	Housing cover	PPR
2	Housing base	GEMÜ 1235: PVDF GEMÜ 1236: SS
3	Electrical connection	PVDF
4	Adapter piece	PVDF
5	Mounting kit, valve-specific	Valve-specific materials
	Seals	EPDM, PUR

3.2 Status LEDs

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



LED	Colour		Function
	Standard [1]	Inversed [2]	
FAULT	red	red	Communication error
PWR/COM	green	green	Power / communication
CLOSED	green	orange	Process valve in CLOSED position
ERROR	red	red	Error
OPEN	orange	green	Process valve in OPEN position
High visibility LED	green	orange	Process valve in CLOSED position
	orange	green	Process valve in OPEN position
	Alternating green/orange	Alternating green/orange	Programming mode
	Flashes orange	Flashes orange	Error
	Flashes green	Flashes green	Location function*

*The location function is used for the optical identification of a device in a plant. In this case, all high visibility LEDs flash green. The location function can always be started and overrides all other flash codes of the high visibility LEDs.
The rest of the device function is not affected..

1) **Device version**
Code 3E: Open/Closed position feedback, programming input, high visibility optical position indicator, IO-Link communication
Code 3S: Open/Closed position feedback, high visibility optical position indicator

2) **Device version**
Code 4E: Open/Closed position feedback inversed, programming input, high visibility optical position indicator, IO-Link communication
Code 4S: Open/Closed position feedback inversed, high visibility optical position indicator

For order codes see chapter "Order data"

3.2.1 LED conditions

Function – Device version 3E / 4E	FAULT	PWR/COM	CLOSED	ERROR	OPEN
Valve in OPEN position	~	~	○	○	●
Valve in CLOSED position	~	~	●	○	○
Programming mode	~	~	☀	○	☀
			OPEN and CLOSED flash alternately		

LED conditions							
●	lit (on)	~	irrelevant	☀	flashes	○	off

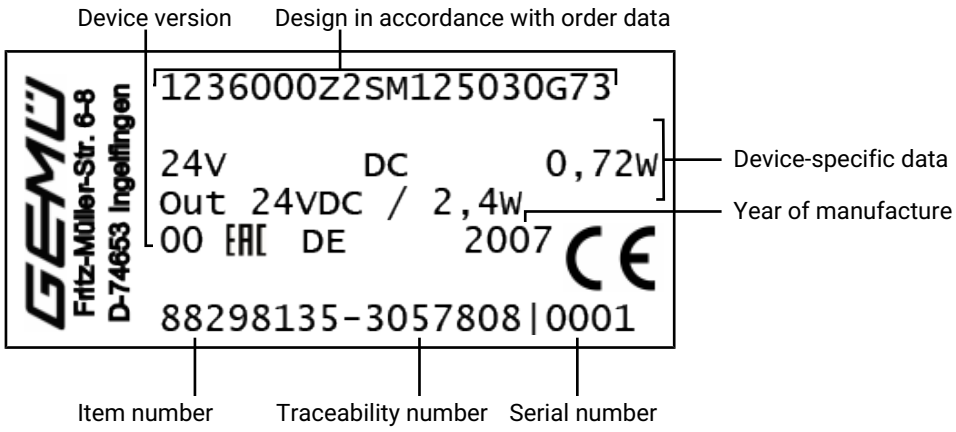
3.3 Description

GEMÜ 1235 / 1236 electrical position indicators are suitable for mounting on pneumatically operated actuators. The position of the valve spindle is reliably electronically detected and evaluated using play-free and non-positive mounting. 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.

3.4 Function

The GEMÜ 1235_1236 electrical position indicator shows the position of the valve. When the valve is opened, the spindle in the electrical position indicator moves upwards and indicates that the valve is OPEN using the high visibility LEDs and communication interface. When the valve is closed, the spring in the mounting kit pushes the spindle in the electrical position indicator downwards and indicates that the valve is CLOSED using the high visibility LEDs and communication interface.

3.5 Product label

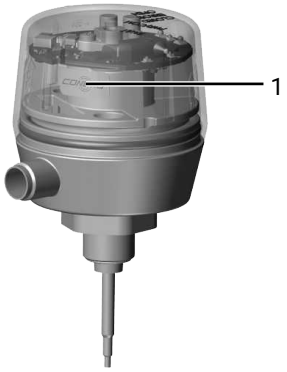


The manufacturing month is coded under the traceability number and can be requested from GEMÜ. The product was manufactured in Germany.

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.



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!

► Risk of death or severe injury

● Do **not** use the product in potentially explosive zones.

⚠ WARNING

Improper use of the product!

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

The product is designed for fitting to a GEMÜ valve in order to detect the position of linear actuators visually and electrically. The product has a microprocessor controlled intelligent position sensor as well as an analogue travel sensor system (potentiometer) which is 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 controlled via the electrical connections.

● Use the product in accordance with the technical data.

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.

Order codes

1 Type	Code
Electrical position indicator	1235
Electrical position indicator	1236

2 Fieldbus	Code
Without	000

3 Accessory	Code
Accessory	Z

4 Device version	Code
Open/Closed position feedback, programming input, high visibility optical position indicator, IO-Link communication	3E
Open/Closed position feedback, high visibility optical position indicator	3S
Open/Closed position feedback programming input, IO-Link communication	3W
Open/Closed position feedback	3X
Open/Closed position feedback inversed, programming input, high visibility optical position indicator, IO-Link communication	4E
Open/Closed position feedback inversed, high visibility optical position indicator	4S

4 Device version	Code
Open/Closed position feedback inversed programming input, IO-Link communication	4W
Open/Closed position feedback inversed	4X

5 Electrical connection	Code
M12 plug, 5-pin	M125

6 Travel sensor version	Code
Potentiometer, 30 mm length	030
Potentiometer, 50 mm length	050
Potentiometer, 75 mm length	075

7 Housing material	Code
PVDF base, black, PPR natural cover, M16 thread PEEK	G10
Base 1.4301, PP cover, M16 thread, 1.4305	G70
Base 1.4301, PP cover, M16 thread, 1.4305, (for GEMÜ 650, actuator size 1, 2, 3 control function 1)	G73

8 Special version	Code
UL approval	U

Order example

Ordering option	Code	Description
1 Type	1236	Electrical position indicator
2 Fieldbus	000	Without
3 Accessory	Z	Accessory
4 Device version	3E	Open/Closed position feedback, programming input, high visibility optical position indicator, IO-Link communication
5 Electrical connection	M125	M12 plug, 5-pin
6 Travel sensor version	030	Potentiometer, 30 mm length
7 Housing material	G70	Base 1.4301, PP cover, M16 thread, 1.4305
8 Special version	U	UL approval

7 Technical data

7.1 Temperature

Ambient temperature: -10 — 70 °C

Storage temperature: -20 — 70 °C

7.2 Product compliance

RoHS Directive: 2011/65/EU

Machinery Directive: 2006/42/EC

EMC Directive: 2014/30/EU

Interference resistance: DIN EN 61000-6-2 (Nov. 2019)

Interference emission: DIN EN 61000-6-3

SIL:

Product description: Electrical position indicator GEMÜ 1235_1236
Device type: B
Valid software version: V1.0.0.4
Safety function: The safety function is defined as a High (24 V DC) signal at pin 5 (device version 3S/4S) and at pin 4 (device version 3E/4E), if the current position of the integrated travel sensor is smaller than the switch point CLOSED (default setting 12 %).
HFT (Hardware Fault Tolerance): 0
MTTR (Mean Time To Restoration): 24 hours
MTBF (Mean Time Between Failures): 346 years

Further information, see SIL safety manual

UL listed for Canada and USA

Certificate: E515574

7.3 Mechanical data

Installation position: Optional

Weight:

Travel length code 030: 115 g
Travel length code 050: 138 g
Travel length code 075: 160 g

Protection class: IP 67

Travel sensor:

	Travel sensor version Code		
	Code 030	Code 050	Code 075
Minimum stroke:	2.0 mm	3.5 mm	5.0 mm
Maximum stroke:	30.0 mm	50.0 mm	75.0 mm
Hysteresis:	0.2 mm	0.4 mm	0.5 mm
Accuracy:	0.2% Full Scale		

7.4 Operating conditions

Ambient conditions: Use in indoor spaces
(only relevant for UL)

7.5 Electrical data

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

Supply voltage Uv: 24 V DC (18 to 30 V DC)

Current consumption: typically 30 mA

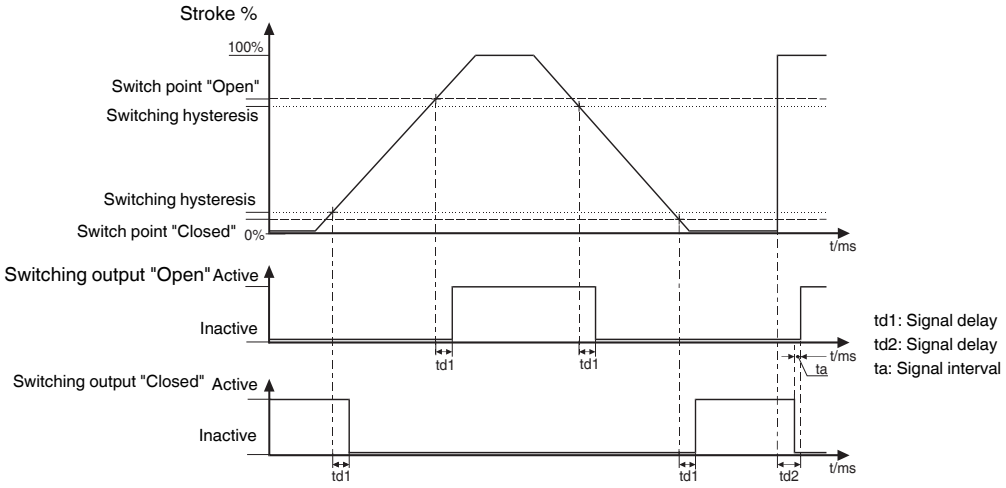
Duty cycle: Continuous duty

Electrical protection class: III

Reverse battery protection: yes

Line fuse 630 mA medium time lag (not applicable for operation with IO-Link Master)

Switching characteristic:



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

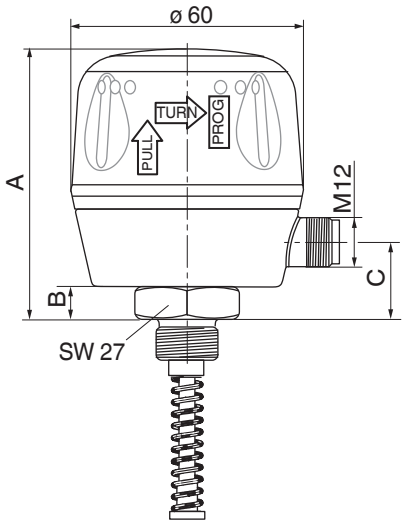
Switch points:

	Travel sensor version Code		
	030	050	075
Default setting switch point CLOSED	12 %		
Default setting switch point OPEN	25 %		
Min. switch point CLOSED	0.8 mm	1.4 mm	2.0 mm
Min. switch point OPEN	0.5 mm	0.9 mm	1.25 mm

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

8 Dimensions

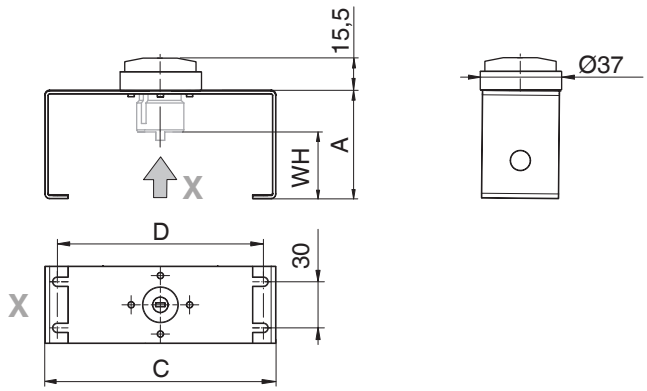
8.1 1235/1236 electrical position indicator



	Travel sensor version code		
	030	050	075
A	65.5	87.5	112.5
B	8.5	30.5	55.5
C	19.0	41.0	66.0

Dimensions in mm

8.2 1235/1236 PTAZ mounting bracket for direct mounting on quarter turn actuators



Shaft height WH	Hole spacing D	A	C
20.0	80.0	40.0	100.0
30.0	80.0	50.0	100.0
50.0	130.0	70.0	150.0

Dimensions in mm

9 Manufacturer's information

9.1 Delivery

- Check that all parts are present and check for any damage immediately upon receipt.

The product's performance is tested at the factory. The scope of delivery is apparent from the dispatch documents and the design from the order number.

9.2 Packaging

The product is packaged in a cardboard box which can be recycled as paper.

9.3 Transport

1. Only transport the product by suitable means. Do not drop. Handle carefully.
2. After the installation dispose of transport packaging material according to relevant local or national disposal regulations / environmental protection laws.

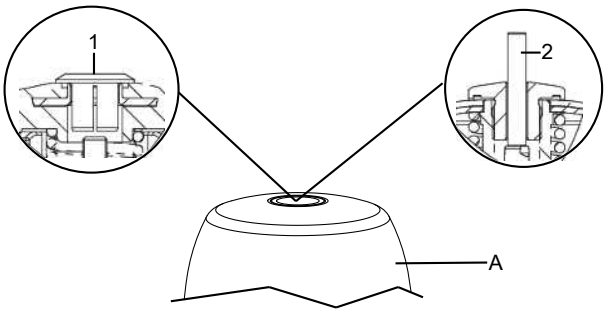
9.4 Storage

1. Store the product free from dust and moisture in its original packaging.
2. Avoid UV rays and direct sunlight.
3. Do not exceed the maximum storage temperature (see chapter "Technical data").
4. Do not store solvents, chemicals, acids, fuels or similar fluids in the same room as GEMÜ products and their spare parts.

10 Assembly and installation

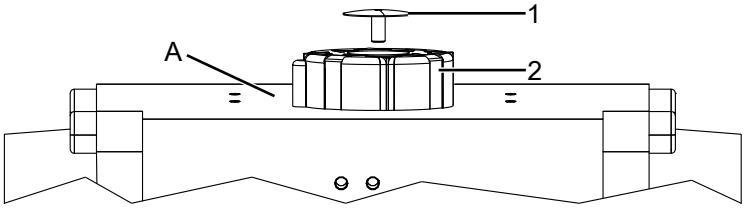
10.1 Preparations for installing the valve (linear actuator)

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.



10.2 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**.

10.3 Mounting kit assembly on electrical position indicator

⚠ CAUTION

Do not scratch the spindle!

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

⚠ CAUTION

Pretensioned spring!

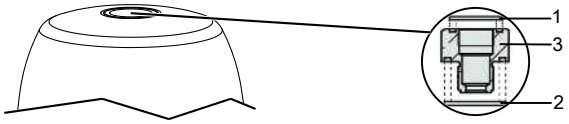
► Damage to the device.

● Slowly release the tension in the spring.

1. Pull out spindle **1** as far as it will go.
2. Push spring **2** over spindle **1**.
3. Mount operating spindle **3**.
4. Push in spindle **1** until it pushes against spring **2**.

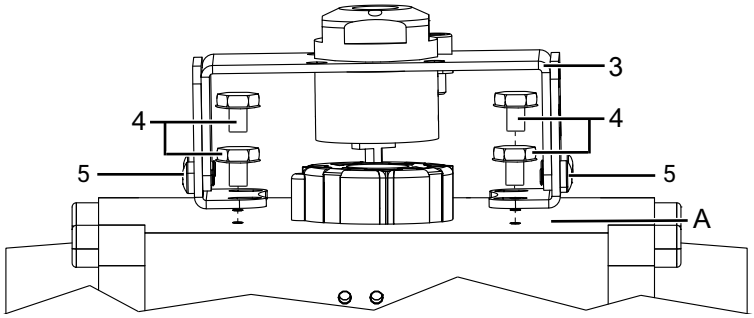
10.4 Threaded adapter assembly (linear actuator)

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).



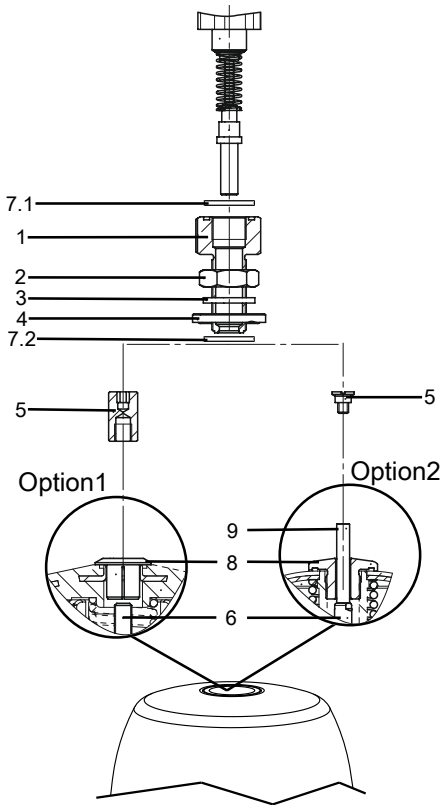
1. Move the actuator to the closed position.
2. Place O-rings **1** and **2** into threaded adapter **3**.
3. Screw threaded adapter **3** into the actuator opening as far as it will go and tighten.

10.5 Mounting kit assembly (quarter turn actuator)



1. Adjust the mounting bracket to the required borehole pattern.
   ⇨ To do this, loosen the side screws **5** and set the retaining feet onto the thread of the actuator, and install it using screws **4**.
2. Secure the bracket **3** to the retaining feet as shown. In doing so, the tap shaft must sit free of play in the shaft of the actuator.

10.6 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.

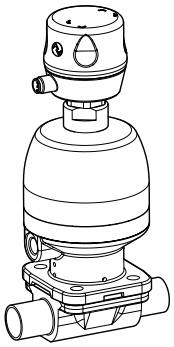
10.7 Installing the electrical position indicator (linear actuator)

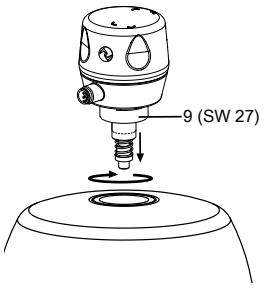
⚠ CAUTION

Incorrect installation of the product.

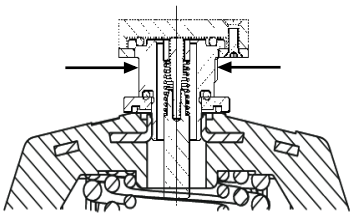
► Damage to the housing.

● Only tighten the product using the spanner flats provided for this purpose.

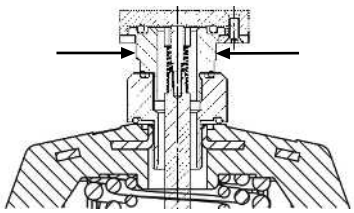




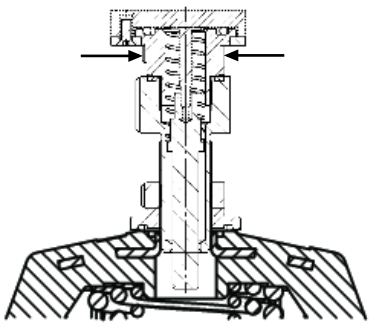
1. Move the actuator to the OPEN position.
2. Guide the product as far as it will go into the actuator opening, the adapter 3 (see “Threaded adapter assembly (linear actuator)“, page 17) or the stroke limiter 1 (see “Assembling the stroke limiter (linear actuator)“, page 18), and screw it in clockwise 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. Initialize the product.



6. The product with mounting kit is fully assembled.



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



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

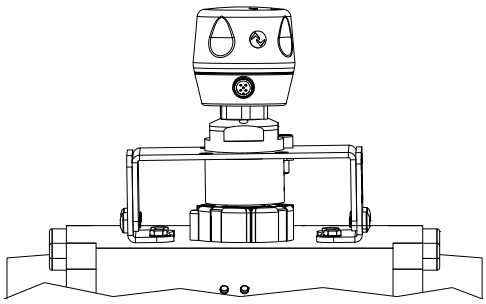
10.8 Installing the electrical position indicator (quarter turn actuator)

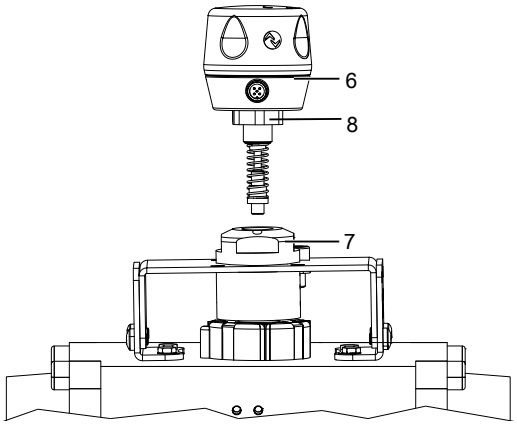
⚠ CAUTION

Incorrect installation of the product.

► Damage to the housing.

● Only tighten the product using the spanner flats provided for this purpose.



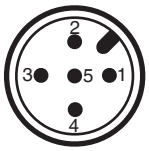


1. Screw the electrical position indicator **6** onto the adapter **7**.
2. Use the spanner flat **8** (WAF 27) of the travel sensor to tighten the electrical position indicator.
3. Turn the housing clockwise to align the pneumatic or electrical connections.
4. Initialize the product.

11 Electrical connection

11.1 24 V/IO-Link, ordering option device version, code 3E/4E/3W/4W

11.1.1 Pin assignment



	Description
1	U, 24 V DC, supply voltage
2	24 V DC, Open end position output
3	U, GND
4	24 V DC, Closed end position output, C/Q IO-Link
5	24 V DC, programming input (speed^{AP} function)

Device version 3S / 4S is pin compatible with the previous version 2SM125, pin 5 is highly active but without potential-free contacts. The device has 24 V DC Push-Pull outputs

11.1.2 Input (pin 5)

Input impedance: min. 27 kΩ

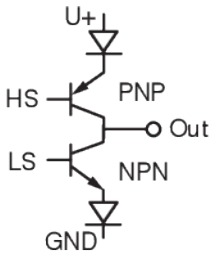
Input voltage: max. 30 V DC

High level: > 18 V

Low level: < 5 V

11.1.3 Output (pin 2, 4)

Internal wiring:



Type of contact:	Push-Pull
Max. switching current:	± 100 mA
Max. voltage drop Vdrop:	3 V at 100 mA
Switching voltage:	$+U_v$ - V_{drop} push high $-U_v$ + V_{drop} pull low

12 Programming the end positions

The end positions must be programmed under the following conditions:

- Retrofitting the electrical position indicator
- Replacing the actuator
- Replacing the diaphragm

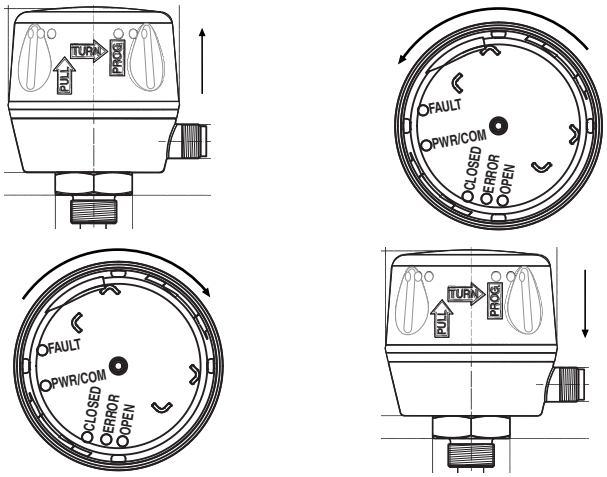
If electrical position indicators have been fitted to the process valve at the factory, the end positions will already have been programmed.

The end positions can be programmed as follows (depending on the order version):

- On-site programming
- Programming input (pin 5)
- Communication interface

When programming via the communication interface, automatic programming is recommended.

12.1 On-site end position programming



1. Pull the housing cover of the electrical position indicator up (approx. 2 mm).
2. Turn the housing cover anticlockwise (until it stops).
3. Electrical position indicator is in the programming mode.
   ⇨ OPEN and CLOSED LEDs flash alternately
   ⇨ High visibility LED flashes alternately green / orange
4. Open valve until end position is reached.
5. Close valve until end position is reached.
6. Turn the housing cover back clockwise and press it down.

⇨ The end positions are set.

12.2 Initialization of the end positions via IO-Link

1. Select automatic programming mode (parameter data "Programming mode").
2. Briefly (>100 ms) activate programming mode (process data "Programming mode").
   ⇨ OPEN and CLOSED LEDs flash alternately

⇨ High visibility LED flashes alternately green / orange

3. Open valve until end position is reached.
4. Close valve until end position is reached.
5. Programming mode is automatically terminated if the valve does not move for 5 seconds.

⇨ The end positions are set.

12.3 End position programming via programming input (pin 5)

1. Connect supply voltage.
2. Briefly connect a 24 V DC signal (>100 ms) to programming input (pin 5).
   ⇨ OPEN and CLOSED LEDs flash alternately.
   ⇨ High visibility LED flashes alternately green / orange.
3. Open valve until end position is reached.
4. Close valve until end position is reached.
5. Programming mode is automatically terminated if the valve does not move for 5 seconds.

⇨ The end positions are set.

13 Specific data IO-Link (pin 4)

Physics: Physics 2 (3-wire design)

Port configuration: Port type A

Transmission rate: 38400 baud

Frame type in Operate: 2.5

Min. cycle time: 2.3 ms

Vendor-ID: 401

Device-ID: 123501

Product-ID: 1235IOL

ISDU support: yes

SIO operation: yes

IO-Link specification: V1.1 when using IODD 1.1 [1)]

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

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

13.1 Process data

Device → Master

Bit	Default	Designation	Function	Logic
0	0	Valve position	Feedback OPEN position	0 = process valve **not** in OPEN position 1 = process valve in OPEN position
1	0	Valve position	Feedback CLOSED position	0 = process valve **not** in CLOSED position 1 = process valve in CLOSED position
2	0	Programing mode	Indication of operating mode	0 = normal operation 1 = programming mode
3...7	not used			

Master → Device

Bit	Default	Designation	Function	Logic
0	0	Programing mode	Selection of operating mode	0 = normal operation 1 = programming mode
1	0	Location function	Location function	0 = inactive 1 = active
2 … 7	not used			

13.2 Parameter overview

The integrated IO-Link interface offers further functions in combination with an IO-Link master.

If the electrical position indicator is operated with standard I/O assemblies, these functions do not apply.

Index [Hex]	Sub-bindex	Access rights	Parameter	Length	Data type	Default settings	Setting options
0x10	0	ro	Vendor name	6 bytes	StringT	GEMUE	-
0x12	0	ro	Product name	18 bytes	StringT	1235/1236 IO-Link	-
0x13	0	ro	Product ID	8 bytes	StringT	1235 IO-LINK	-
0x16	0	ro	Hardware version	8 bytes	StringT	Rev. xx	-
0x17	0	ro	Firmware version	10 bytes	StringT	V x.x.x.x	-
0x50	1	rw	Inversion of LED colours	1 bit	Boolean	0	0 = standard 1 = inversed
	2	rw	Inversion of feedback signals	1 bit	Boolean	0	
	3	rw	Function of high visibility position indicator	3 bits	UIntegerT	3	0 = off 1 = open/closed (33%) 2 = open/closed (66%) 3 = open/closed (100%) 4 = open (0%)/ closed (100%) 5 = open (100%)/ closed (0%)
	4	rw	Programming mode	1 bit	Boolean	0	0 = automatic 1 = manual
	5	rw	On site programming	1 bit	Boolean	0	0 = enabled 1 = disabled
	6	rw	Inversion of outputs	1 bit	Boolean	0	0 = standard 1 = inversed
0x51	1	rw	Threshold OPEN request	8 bits	UIntegerT	25%	3%–97%
	2	rw	Threshold CLOSED request	8 bits	UIntegerT	12%	
	3	ro	Threshold OPEN real	8 bits	UIntegerT	25%	Display of values 3%–97%
	4	ro	Threshold CLOSED real	8 bits	UIntegerT	12%	
0x52	1	rw	Alarm stroke reduction open	4 bits	UIntegerT	1	0 = disabled 1 = 25% of Switch Point 2 = 50% of Switch Point 3 = 75% of Switch Point
	2	rw	Alarm stroke reduction closed	4 bits	UIntegerT	1	
	3	rw	Alarm opening time	8 bits	UIntegerT	0	0 = disabled 1–255 s
	4	rw	Alarm closing time	8 bits	UIntegerT	0	
0x53	1	ro	Programmed position OPEN	16 bits	UIntegerT	0	Display of numerical values 0–4092
	2	ro	Programmed position CLOSED	16 bits	UIntegerT	0	
	3	ro	Programmed position STROKE	16 bits	UIntegerT	0	
0x54	1	ro	Last position OPEN	16 bits	UIntegerT	0	Display of numerical values 0–4092
	2	ro	Last position CLOSED	16 bits	UIntegerT	0	
	3	ro	Last position STROKE	16 bits	UIntegerT	0	

Index [Hex]	Sub-bindex	Access rights	Parameter	Length	Data type	Default settings	Setting options
0x55	1	ro	Travel sensor calibration min	16 bits	UIntegerT	0–1000	
	2	ro	Travel sensor calibration max	16 bits	UIntegerT	3092–4092	
0x56	1	rw	Valve cycles user	24 bits	UIntegerT	0	Resettable to 0, display of numerical values 0–16,777,215
	2	ro	Valve cycles total	24 bits	UIntegerT	0	Display of numerical values 0–16,777,215
0x57	1	ro	Counter Powerfail	16 bits	UIntegerT	0	Display of numerical values 0–65,535
	2	ro	Counter Power on	16 bits	UIntegerT	0	
	3	ro	Counter Programming	16 bits	UIntegerT	0	
	4	ro	Counter Travel Sensor calibration	16 bits	UIntegerT	0	
	5	ro	Counter Prog error no stroke	16 bits	UIntegerT	0	
	6	ro	Counter Prog error less stroke	16 bits	UIntegerT	0	
	7	ro	Counter Prog error after sensor error	16 bits	UIntegerT	0	
	11	ro	Counter Sensor error OPEN	16 bits	UIntegerT	0	
	12	ro	Counter Sensor error CLOSED	16 bits	UIntegerT	0	
	16	ro	Counter Over temperature	16 bits	UIntegerT	0	
0x60	0	ro	Actual AD-value	16 bits	UIntegerT	0	Display of numerical values 0–4092

13.3 Description of parameter values

Inversion of LED colours

Inversion of the LED colours for the OPEN/CLOSED feedback. (see “Status LEDs“, page 8)

Inversion of feedback signals

Inversion of optical and electrical feedback for OPEN/CLOSED feedback.

Travel sensor position	Feedback	
	Standard	Inversed
Travel sensor retracted (valve spindle is up)	OPEN	CLOSED
Travel sensor extended (valve spindle is down)	CLOSED	OPEN

Function of high visibility position indicator

The function of the high visibility position indicator can be set to six stages. The setting is used to change the light intensity.

Setting	Function
Stage 1	High visibility position indicator off
Stage 2	High visibility position indicator on (33%)
Stage 3	High visibility position indicator on (66%)
Stage 4	High visibility position indicator on (100%)
Stage 5	High visibility position indicator OPEN position: 0%/CLOSED position: 100%
Stage 6	High visibility position indicator OPEN position: 100%/CLOSED position: 0%

Error messages and location function are not affected by the setting and always remain active (100%).

Programming mode

Selection of programming mode. (see “Initialization of the end positions via IO-Link“, page 21)

On site programming

On-site programming can be disabled to prevent unauthorized activation.

Setting	Programming mode	Status
On-site programming enabled	On-site programming	enabled
	Remote programming	enabled
On-site programming disabled	On-site programming	disabled
	Remote programming	enabled

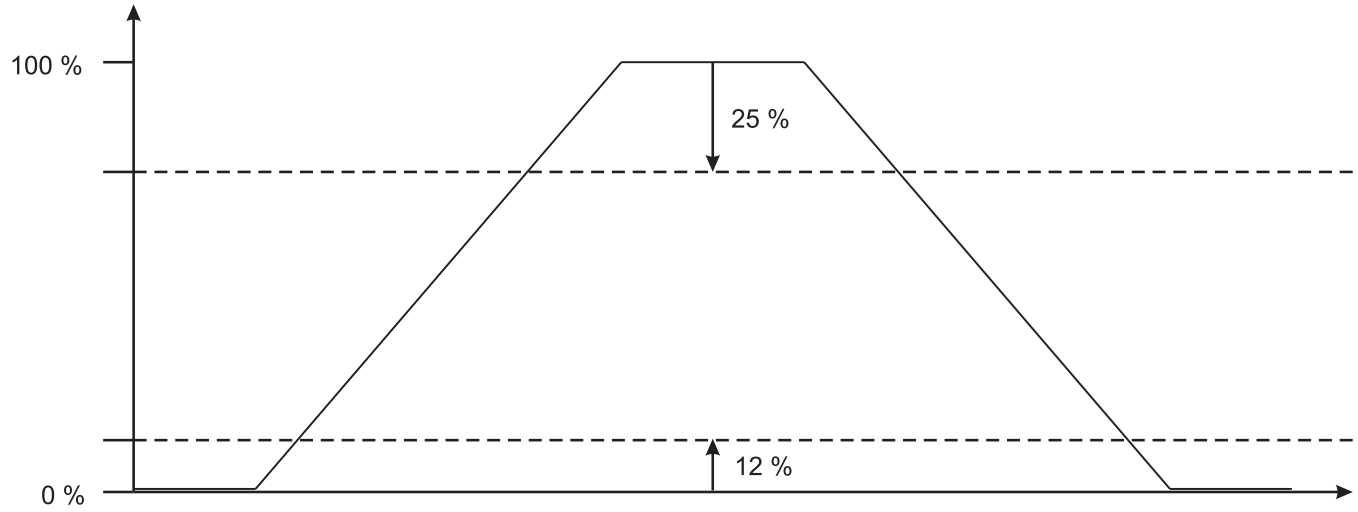
Inversion of outputs

Inversion of electrical feedback for OPEN/CLOSED feedback.

Threshold OPEN request

Desired switch point setting for OPEN feedback as a percentage of the programmed stroke.

Example: Switch point OPEN 25%, switch point CLOSED 12%



These tolerances enable operational changes e.g. compensation of diaphragm swelling during sterilization to ensure reliable end position feedback.

In the event of overlapping of the set value for CLOSED feedback or if the minimum possible switch point is fallen below, the maximum possible value is used. The value used can be read out from the parameter "Threshold open real".

Threshold CLOSED request

Corresponds to "Threshold open request" but for CLOSED feedback.

Threshold OPEN real

Value actually used for the switch point for OPEN feedback.

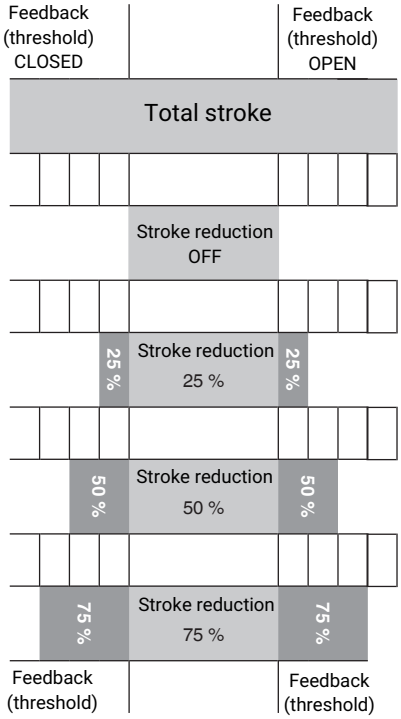
Threshold CLOSED real

Corresponds to "Threshold open real" but for CLOSED feedback.

Alarm stroke reduction open

Setting for the alarm "Stroke reduction" for OPEN position.

The alarm is triggered if the valve stroke changes beyond the set tolerance in the OPEN position. The alarm is reset automatically as soon as the value returns to within the valid tolerance range. End position feedback takes place independently of the warning as long as the valve is within the set tolerance range for feedback (threshold). If the end position changes, a warning is therefore triggered first before the end position feedback is lost.



The setting is a percentage of the set switch point tolerance (threshold).

Setting	Function
Off	Warning deactivated
25%	Warning becomes active 25% before loss of end position feedback
50%	Warning becomes active 50% before loss of end position feedback
75%	Warning becomes active 75% before loss of end position feedback

The delay time before the warning occurs corresponds to the time of the parameter **Alarm opening time**.

NOTICE

► If the parameter **Alarm opening time** is deactivated (setting 0), the alarm **Stroke reduction** is deactivated.

Alarm stroke reduction closed

Corresponds to **Alarm stroke reduction open** but for CLOSED position.

The delay time before the warning occurs corresponds to the time of the parameter **Alarm closing time**.

NOTICE

► If the parameter **Alarm closing time** is deactivated (setting 0), the alarm **Stroke reduction** is deactivated.

Programmed position OPEN

AD value of the OPEN position of the last correctly executed end position programming.

Programmed position CLOSED

AD value of the CLOSED position of the last correctly executed end position programming.

Programmed STROKE

Determined stroke of the linear actuator during the last correctly executed end position programming (in AD values). The change in valve stroke can be calculated in conjunction with the parameter "Last position stroke".

Last position OPEN

AD value of the last approached OPEN position.

Last position CLOSED

AD value of the last approached CLOSED position.

Last position STROKE

Determined stroke of the linear actuator during the last correctly approached end position (in AD values). The change in valve stroke can be calculated in conjunction with the parameter "Programmed stroke".

Travel sensor calibration min

AD value of the potentiometer for calibration at the factory in the CLOSED position.

Travel sensor calibration max

AD value of the potentiometer for calibration at the factory in the OPEN position.

Valve cycles user

Customer-adjustable switching cycle counter. Counts the switching cycles carried out.

A switching cycle is valid if the valve travels from one defined end position to the other defined end position and returns to the original end position. If an end position is not reached, the switching cycle is invalid and is not counted.

Valve cycles total

Factory-set total switching cycle counter (cannot be reset). Counts the switching cycles carried out.

A switching cycle is valid if the valve travels from one defined end position to the other defined end position and returns to the original end position. If an end position is not reached, the switching cycle is invalid and is not counted.

Counter Powerfail

Power failure counter.

Counter Power on

Power on counter.

Counter Programming

Executed end position programming processes counter.

Counter Travel Sensor calibration

Executed travel sensor calibrations counter.

Counter Prog error no stroke

Programming error counter/no stroke.

Counter Prog error less stroke

Programming error counter/stroke < min. stroke.

Counter Prog error after sensor error

Programming error counter/after sensor error.

Counter Sensor error OPEN

Sensor error counter/OPEN position.

Counter Sensor error CLOSED

Sensor error counter/CLOSED position.

Counter over temperature

Over-temperature counter.

Actual AD-value

Current value of AD converter.

14 Troubleshooting

14.1 LED error message

If an error occurs, the high visibility LED flashes orange and the ERROR LED flashes red.

Function		FAULT	PWR/COM	CLOSED	ERROR	OPEN
Programming error	No stroke	~	~	☀	●	○
	Stroke < min. stroke	~	~	☀	●	●
	Sensor error	~	~	☀	●	☀
				OPEN and CLOSED flash alternately		
Sensor error	OPEN position	~	~	○	●	☀
	CLOSED position	~	~	●	●	☀
Short-circuit signal output	Output OPEN	~	~	○	☀	●
	Output CLOSED	~	~	●	☀	○
	OPEN+CLOSED	~	~	●	☀	●
Internal error		~	~	☀	●	☀
				OPEN and CLOSED flash simultaneously		
Supply voltage too low		●	○	○	●	○

●	lit (on)	~	irrelevant	☀	flashes	○	off

14.2 Troubleshooting

Error	Error cause	Troubleshooting
Programming error no stroke	No compressed air supply during the programming procedure	Ensure the compressed air supply availability, re-programme
	Compressed air supply during the programming procedure not sufficient	Ensure the compressed air supply availability, re-programme
	No mounting kit available or faulty	Check the mounting kit, re-programme
Programming error stroke < min. stroke	Minimum stroke was not reached (e.g. due to stroke limiter)	Ensure minimum stroke, re-programme
	Shut off diaphragm compressed too much (diaphragm size 8)	Ensure correct compression of the shut off diaphragm, re-programme
Programming error after sensor error	The sensor range was exceeded during the programming procedure. Currently the process valve is in the valid sensor range.	Check the mounting kit, re-programme. Note the maximum stroke (see "Technical data")
Sensor error CLOSED or OPEN position	Sensor limit exceeded	Check the mounting kit, re-programme. Note the maximum stroke (see "Technical data")
Short-circuit - signal output OPEN or CLOSED	Short-circuit	Check the wiring and device version
Communication error	Communication disturbed or interrupted	Check the wiring
Supply voltage too low	Supply voltage too low	Ensure supply voltage in accordance with chapter "Technical data"
Internal error	Memory error	Return device

15 Inspection and maintenance

NOTICE

Exceptional maintenance work!

► Damage to the GEMÜ product

● Any maintenance work and repairs not described in these operating instructions must not be performed without consulting the manufacturer first.

The operator must carry out regular visual examinations of the products, depending on the operating conditions and the potentially hazardous situations, in order to prevent leakage and damage.

1. Have servicing and maintenance work performed by trained personnel.
2. Wear appropriate protective gear as specified in the plant operator's guidelines.
3. Shut off plant or plant component.
4. Secure the plant or plant component against recommissioning.
5. Depressurize the plant or plant component.
6. Actuate products which are always in the same position four times a year.

15.1 Spare parts

No spare parts are available for this product. If it is faulty, please return it to GEMÜ for repair.

15.2 Cleaning the product

- Clean the product with a damp cloth.
- Do **not** clean the product with a high pressure cleaning device.

16 Disassembly

1. Disassemble in reverse order to assembly.
2. Unscrew the electrical wiring.
3. Disassemble the product. Observe warning notes and safety information.

17 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.
3. Dispose of electronic components separately.

18 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.

19 EU Declaration of Incorporation according to the EC Machinery Directive 2006/42/EC, Annex II B

EU Declaration of Incorporation

according to the EC Machinery Directive 2006/42/EC, Annex II B

We, the company

GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG
Fritz-Müller-Strasse 6–8
74653 Ingelfingen-Criesbach, Germany

hereby declare under our sole responsibility that the below-mentioned product complies with the relevant essential health and safety requirements in accordance with Annex I of the above-mentioned Directive.

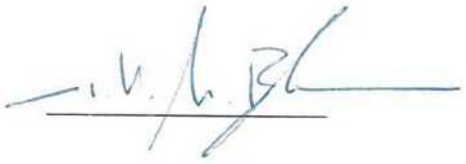
Product:	GEMÜ 1235/1236
Product name:	Electrical position indicator
The following essential health and safety requirements of the EC Machinery Directive 2006/42/EC, Annex I have been applied or adhered to:	1.1.2.; 1.1.3.; 1.1.5.; 1.3.2.; 1.3.4.; 1.3.7.; 1.5.1.; 1.5.5.; 1.6.1.; 1.6.3.; 1.6.4.; 1.7.1.; 1.7.1.1.; 1.7.2.; 1.7.3.; 1.7.4.
The following harmonized standards (or parts thereof) have been applied:	EN ISO 12100:2010

We also declare that the specific technical documents have been created in accordance with part B of Annex VII.

The manufacturer undertakes to transmit relevant technical documents on the partly completed machinery to the national authorities in response to a reasoned request. This communication takes place electronically.

This does not affect the industrial property rights.

The partly completed machinery may be commissioned only if it has been determined, if necessary, that the machinery into which the partly completed machinery is to be installed meets the provisions of the Machinery Directive 2006/42/EC.



M. Barghoorn
Head of Global Technics

Ingelfingen, 21/08/2023

20 EU Declaration of Conformity in accordance with 2014/30/EU (EMC Directive)

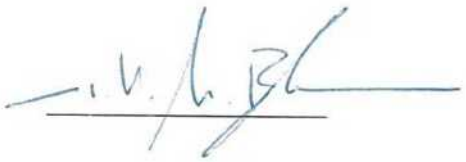
EU Declaration of Conformity

in accordance with 2014/30/EU (EMC Directive)

We, the company	GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG Fritz-Müller-Strasse 6–8 74653 Ingelfingen-Criesbach, Germany

hereby declare under our sole responsibility that the below-mentioned product complies with the regulations of the above-mentioned Directive.

Product:	GEMÜ 1235/1236
Product name:	Electrical position indicator
The following harmonized standards (or parts thereof) have been applied:	EN 61326-1:2013; EN 61000-6-2:2005/AC:2005



M. Barghoorn
Head of Global Technics

Ingelfingen, 21/08/2023

21 EU Declaration of Conformity in accordance with 2011/65/EU (RoHS Directive)

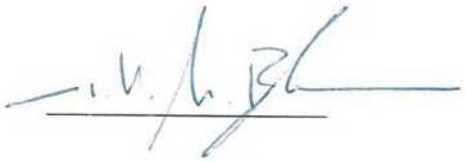
EU Declaration of Conformity

in accordance with 2011/65/EU (RoHS Directive)

We, the company	GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG Fritz-Müller-Strasse 6–8 74653 Ingelfingen-Criesbach, Germany

hereby declare under our sole responsibility that the below-mentioned product complies with the regulations of the above-mentioned Directive.

Product:	GEMÜ 1235/1236
Product name:	Electrical position indicator
The following harmonized standards (or parts thereof) have been applied:	EN IEC 63000:2018



M. Barghoorn
Head of Global Technics

Ingelfingen, 21/08/2023

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22 UL certificate

CERTIFICATE OF COMPLIANCE

Certificate Number	E515574
Report Reference	E515574-20200630
Issue Date	2020-JULY-08
Issued to:	GEMU VALVES INC Suite 110-112, Bldg 2600 3800 Camp Creek Pky Atlanta GA 30331
This certificate confirms that representative samples of	PROCESS CONTROL EQUIPMENT, ELECTRICAL Open Type Electro-Pneumatic Positioner/Controller models: 1235, 1236, and 1436 Eco Have been investigated by UL in accordance with the Standard(s) indicated on this Certificate.
Standard(s) for Safety:	UL 61010-1 Safety Requirements For Electrical Equipment For Measurement, Control, And Laboratory Use - Part 1: General Requirements CSA C22.2 NO. 61010-1-12 Safety Requirements For Electrical Equipment For Measurement, Control, And Laboratory Use - Part 1: General Requirements
Additional Information:	See the UL Online Certifications Directory at https://iq.ulprospector.com for additional information.

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Bruce Mahrenholz, Director North American Certification Program

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Subject to alteration

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