

GEMÜ 1231

Electrical position indicator

EN

Operating instructions



further information
webcode: GW-1231



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Keep the document for future reference.

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19.10.2023

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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 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 from potentially explosive atmosphere

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:

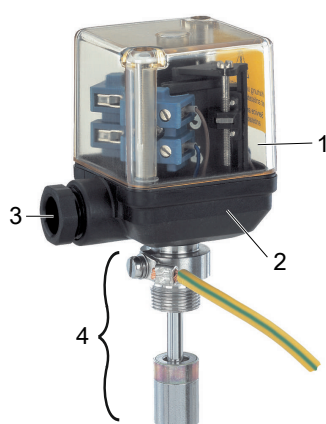
1. Transport and store the product correctly.
2. Do not paint the bolts and plastic parts of the product.
3. Carry out installation and commissioning using trained personnel.
4. Provide adequate training for installation and operating personnel.
5. Ensure that the contents of the document have been fully 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**

Item	Name	Materials
1	Housing cover	PSU
2	Housing base	PP
3	Electrical connection	PP
4	Mounting kit, valve specific (must be ordered separately)	SS
	Seals	NBR

3.2 Description

The GEMÜ 1231 electrical position indicator is suitable for mounting to pneumatically operated linear actuators. The position of the valve spindle is reliably detected electronically and fed back via proximity switches through play-free and non-positive mounting. GEMÜ 1231 has been designed specially for valves with a stroke of 2 to 20 mm.

3.3 Function

The GEMÜ 1231 electrical position indicator is used for reporting and controlling the position of valves that are actuated with pneumatic linear actuators. The spindle of the electrical position indicator is positively connected to the spindle of the linear actuator and is moved with the linear movement of the actuator. The cam fixed to the spindle then actuates the integ-

rated proximity switches, which are used to transmit the electronic signal. Depending on the version, the electrical position indicator is equipped with one to two proximity switches.

3.4 Product label

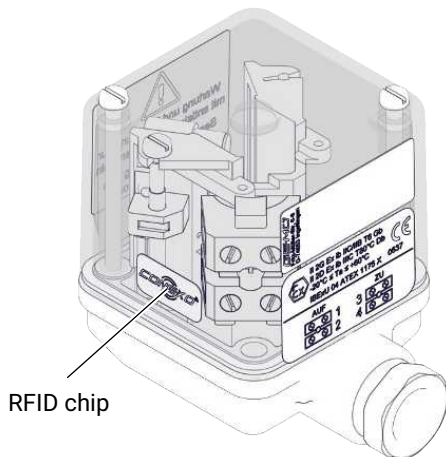
Device version	Design in accordance with order data	
1231000ZA002071110203	NAMUR	
8V	DC	
00	DE	2019
88573061-12103529 0001		
Item number	Traceability number	Serial number

The month of manufacture is encoded in the traceability number and can be obtained 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.

ATEX:

Gas: II 2G Ex ib IIC T6 Gb

Dust: II 2D Ex ib IIIB T80°C Db

EU type examination certificate: IBExU04ATEX1175 X

Notified body: IBExU, No. 0637

IECEX:

Gas: Ex ib IIC T6 Gb

Dust: Ex ib IIIB T80°C Db

Certificate: IECEx IBE 21.0030 X

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

- EN IEC 60079-0:2019 (IEC 60079-0, edition 7)
- EN 60079-11:2012 (IEC 60079-11, edition 6)

Use of the product is permissible in the following ambient temperature ranges: -20 °C to +60 °C

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

- When using the M12 connector, the differential voltage for isolated intrinsically safe electric circuits must not exceed 30 V. The requirements for cables and lines from EN 60079-14, section 16.2.2, must be taken into account.
- Connectors that are not used must be protected against dust penetration.

5 Correct use

DANGER



Danger of explosion

- Danger of death or severe injury.
- Only use the product in potentially explosive zones confirmed in the declaration of conformity.

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 GEMÜ 1231 is designed to be fitted on a GEMÜ valve for electrical detection of the position of the linear actuators. The product works with 2-wire NAMUR proximity switches. The product is non-positively connected to the actuator spindle by means of a mounting kit.

The product GEMÜ 1231 is intended for use in potentially explosive areas of zones 1 and 2 with gases, mists or vapours and zones 21 and 22 with combustible dusts in accordance with EU directive 2014/34/EU (ATEX).

The product has the following explosion protection marking:

6 Order data

The order data provide an overview of standard configurations.

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

Note: Mounting kit 1231 S01 Z...dependent on valve type. Please order separately. Data required on valve type, DN, control function and actuator size.

For possible combinations see availability table.

Order codes

1 Type	Code
Electrical position indicator ATEX	1231
2 Fieldbus	Code
Without	000
3 Accessory	Code
Accessory	Z
4 Device version	Code
Open/Closed	A00
Open	A01
Closed	A02
5 Switch	Code
Proximity switch, 2-wire, NAMUR P+F, NJ1,5-6,5-15-N-Y180094	207

6 Electrical connection	Code
M16 cable gland	1101
M16 Skintop cable gland	1103
M12 plug connector, 4-pin	1110
7 Connection diagram	Code
Terminals, NAMUR	202
M12 plug, 4-pin	203
8 CONEXO	Code
Without	
Integrated RFID chip for electronic identification and traceability	C

Order example

Ordering option	Code	Description
1 Type	1231	Electrical position indicator ATEX
2 Fieldbus	000	Without
3 Accessory	Z	Accessory
4 Device version	A00	Open/Closed
5 Switch	207	Proximity switch, 2-wire, NAMUR P+F, NJ1,5-6,5-15-N-Y180094
6 Electrical connection	1101	M16 cable gland
7 Connection diagram	202	Terminals, NAMUR
8 CONEXO		Without

7 Technical data

7.1 Temperature

Ambient temperature: -20 – 60 °C

Storage temperature: 0 – 40 °C

7.2 Product conformity

EMC Directive: 2014/30/EU

Explosion protection: ATEX (2014/34/EU)
IECEX

ATEX marking: **ATEX:**
Gas:  II 2G Ex ib IIC T6 Gb
Dust:  II 2D Ex ib IIIB T80°C Db
EU type examination certificate: IBExU04ATEX1175 X
Notified body: IBExU, No. 0637

IECEX marking: Gas:  Ex ib IIC T6 Gb
Dust:  Ex IIIB T80°C Db
Certificate: IECEX IBE 21.0030 X

7.3 Mechanical data

Installation position: Optional

Weight: 420 g

Protection class: IP 65

Travel sensor: 2 – 20 mm

7.4 Electrical data

Electrical connection type: M12 plug, 4-pin (code 1110)
M16x1.5 cable gland for cable dia. 4.5 to 7 mm, recommended wire cross section 0.75 mm² (code 1101)
M16x1.5 Skintop cable gland for cable dia. 4 to 10 mm, recommended wire cross section 0.75 mm² (code 1103)

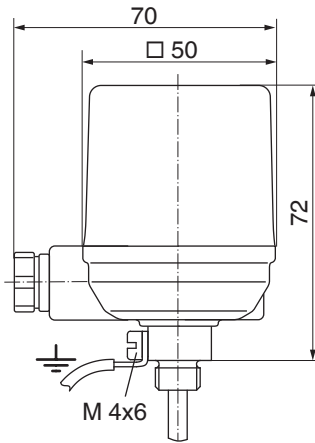
7.4.1 2-wire proximity switch

Switch type: 2-wire, NAMUR, switch (code 207)

Supply voltage: 8 V DC

Current consumption: ≤ 0.1 mA (damped)
≥ 3 mA (undamped)

Max. switching frequency: 1 kHz

8 Dimensions

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

⚠ CAUTION

Fitted electrical position indicator

- Destruction of the electrical position indicator when disassembling the valve body
- Disassemble the electrical position indicator **before** disassembling the valve body

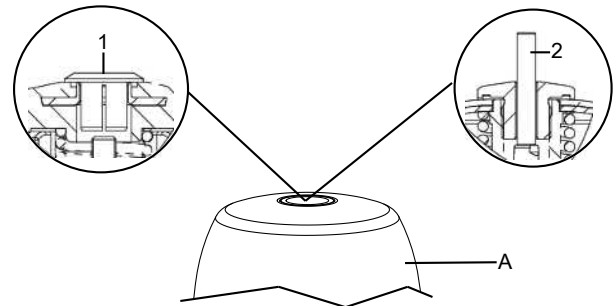
NOTICE

- Pay attention to the information on product labels, in product documentation and EC type examination certificate.
- 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 electrostatic build-up.
4. Protect M12 plugs against damage.
5. Lay cables securely and protect them from damage.
6. Differential voltage for two intrinsically safe electric circuits: maximum 30 V.
7. Connect open wire ends in a junction box with protection class IP20 and higher or outside the EX area.

10.1 Preparations for assembly to the valve

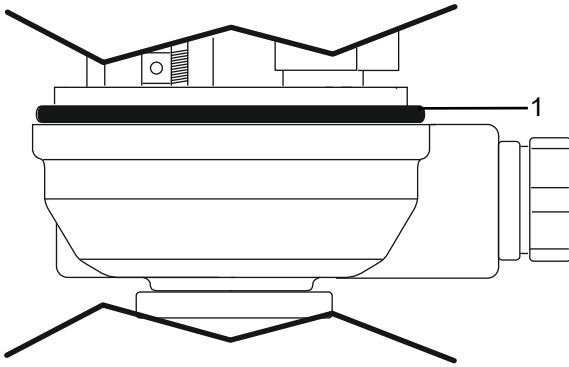
1. Move the actuator **A** into zero position (actuator vented).
2. Remove optical position indicator **2** and / or protective cap **1** from the actuator top.



10.2 Information on use in damp conditions

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

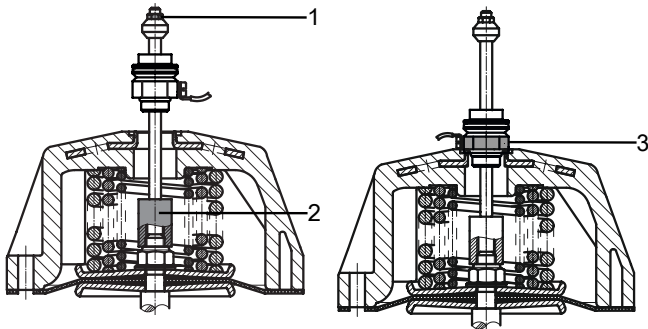
1. Lay cables and pipework so that no condensate or rain water that remains on the pipework / cables can enter the cable glands or plugs of the product.
2. Check that all cable glands or plugs are positioned correctly
3. Check the sealing ring **1** for any damage and correct positioning before tightening the cover.



10.3 Assembly of mounting kit with thread

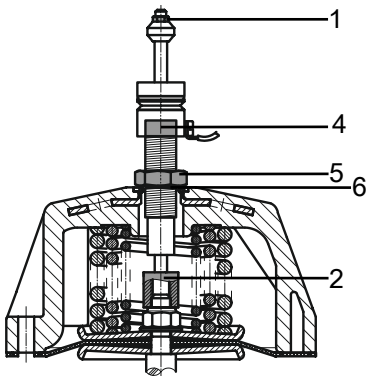
1. Before beginning assembly, check the type of mounting kit.
 - Without stroke limiter (see "Assembly of mounting kit without stroke limiter", page 11).
 - With stroke limiter (see "Assembly of mounting kit with stroke limiter", page 11).
 - Without thread (see "Assembly of mounting kit without thread", page 11).

10.3.1 Assembly of mounting kit without stroke limiter



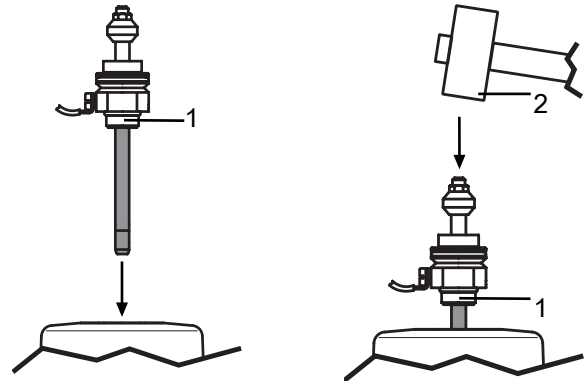
1. Screw in adapter 2 using wrench surface 1.
2. Screw in guide piece 3 using the wrench surface.

10.3.2 Assembly of mounting kit with stroke limiter

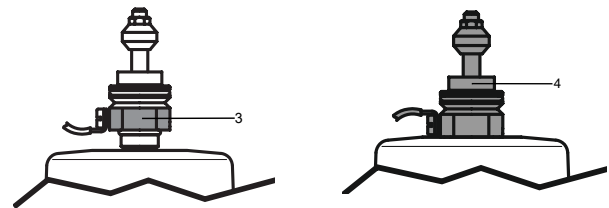


1. Screw in adapter 2 using wrench surface 1.
2. Set stroke limiter to the desired height using wrench surface 4.
3. Secure nut 5 against the actuator top.
4. Only use thread sealing ring 6 for installation of stroke limiters in case of control functions 2 and 3

10.4 Assembly of mounting kit without thread



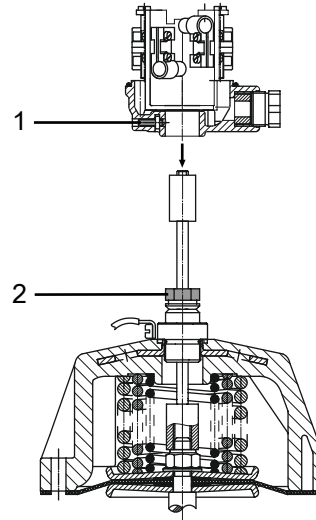
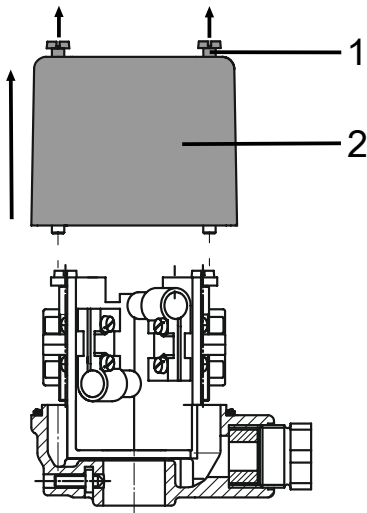
1. Insert spindle of mounting kit 1 into actuator.
2. Carefully knock down the spindle of mounting kit 1 with an appropriate tool 2 until it stops.



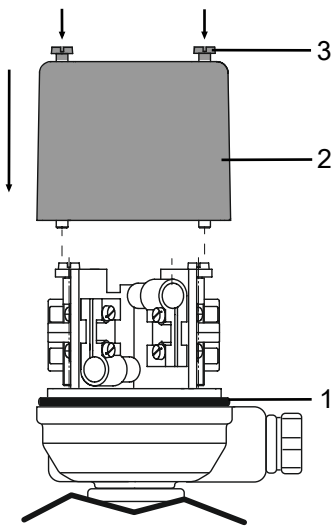
3. Screw in guide piece 3 using the wrench surface.
4. Mounting kit 1 is correctly assembled.

10.5 Assembly and installation of the electrical position indicator**⚠ 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.

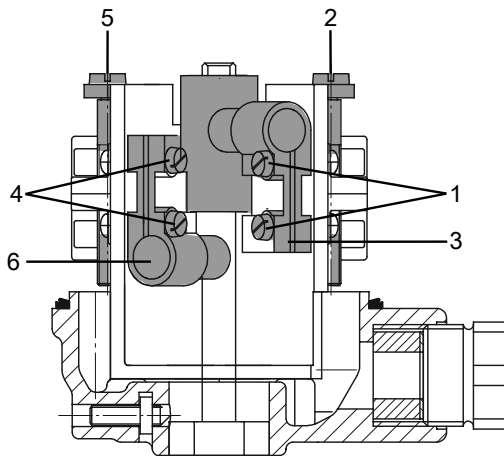


1. Disconnect the power supply and secure against reconnection.
2. Undo screws 1.
3. Remove cover 2.
4. Undo grub screw 1 (do not unscrew completely).
5. Carefully attach the base of the electrical position indicator onto guide piece 2 so that switches are not damaged by trip cams!
6. Turn the electrical position indicator into the desired connection direction and fix the position with grub screw 1.
7. Make the electrical connection.



8. After completing the electrical connection, carefully pull the connection cable taut.
9. Ensure that the O-ring has been mounted properly and is not damaged.
10. Fit the cover **2** with screws **3**.
11. Screw in and tighten screws **3**.
12. Ensure all seals and threaded connections are correctly installed.
13. Restore the power supply.
14. For function control, open and close the valve and pay attention to signalling.
15. If the settings need to be readjusted again, switch off power to the electrical position indicator and repeat the steps of the chapter "Setting the switching positions".

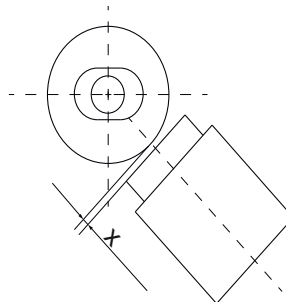
10.6 Setting the switching positions



Picture 1: Setting the switching position

Setting the upper switching position:

1. Move the valve to the OPEN position.
2. Undo screws **1**.
3. With the left screw **2**, move switch **3** to the desired position.
 - ⇒ The switch can be aligned axially and radially.
4. Check the switch distance:
 - $x = 0.7 - 1.1 \text{ mm}$
5. Tighten screws **1**.
 - ⇒ The upper switching position is set.



Picture 2: Setting the switch distance

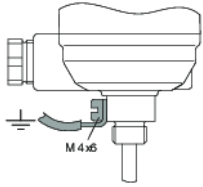
Setting the lower switching position:

6. Move the valve to the CLOSED position.
7. Undo screws **4**.
8. With the right screw **6**, move switch **5** to the desired position.
 - ⇒ The switch can be aligned axially and radially.
9. Check the switch distance:
 - $x = 0.7 - 1.1 \text{ mm}$
10. Tighten screws **4**.
 - ⇒ The lower switching position is set.

11 Electrical connection

11.1 Potential equalisation

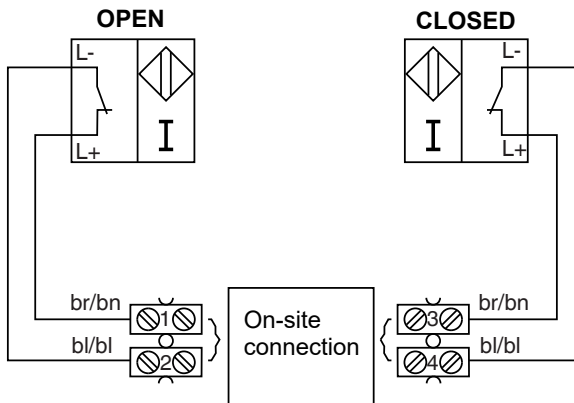
Connecting the potential equalisation device



1. Use a screw M4x6 to attach the potential equalisation device to the electrical position indicator.
⇒ Potential equalisation for metal housings in potentially explosive areas: At least 4 mm².
2. Secure the connection against independently becoming loose.

11.2 Electrical connection with cable gland (code 1101) or Skintop cable gland (code 1103)

11.2.1 Connection diagram (code 202)



11.2.2 Electrical connection

1. Insert the connection cable through the cable gland.
2. Only strip the connection cable directly before switch mounting plate.
3. Lay individual wires to the terminals.
4. Cut the individual wires to the appropriate length in order to avoid having unnecessarily long cable loops.
5. Compress the individual wires with wire end ferrules.
6. Connect the individual wires to the terminals in accordance with the connection diagram.

11.3 Electrical connection with M12 plug (code 1110)

DANGER

Danger of explosion

- ▶ Risk of severe injury or death.
- Danger from sparking. Never disconnect the connection cables when live.

11.3.1 Connection diagram (code 203)



Pin	Signal name
1	L+, OPEN
2	L-, OPEN
3	L+, CLOSED
4	L-, CLOSED
5	n.c. *

* Pin 5 is not connected.

11.3.2 Electrical connection

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.

1. Securely lay the connection cables or ensure sufficient tension relief.
2. Refer to the technical data and cable gland documentation for details of the wire cross sections.
3. Protect the product and the cables from damage.
4. Only clean the product with an anti-static or damp cloth.
5. Only operate the product when it is fully assembled.
6. Only connect the product to intrinsically safe electric circuits that are approved with an EC type examination certificate and which do not exceed the maximum values of the respective sensors for Ui, Ii, Pi, Ci and Li.

12 Troubleshooting

Error	Error cause	Error clearance
No stroke	No mounting kit available	Check mounting kit
	Process valve faulty	Replace process valve
	Wrong mounting kit installed	Replace mounting kit
No feedback	Incorrect assembly	Check assembly, wiring and connection
	Switch not set	Set switch
	Wrong mounting kit installed	Replace mounting kit
	Voltage is not connected	Connect voltage
Cover cannot be attached	Sealing ring inserted incorrectly	Insert sealing ring correctly
	Sealing ring damaged	Replace sealing ring
	Cables protruding over the edge of the base	Check the cable routing and shorten the cables if necessary
Grub screw not working	Grub screw unscrewed too far, nut fell out	Reinsert the nut, screw in the grub screw (during assembly, only undo the grub screw, do not unscrew it completely)

13 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.
7. Carry out inspection and maintenance for products in the potentially explosive area to DIN EN 60079-17.

13.1 Spare parts

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

13.2 Setting the switching positions

For limit switch setting see chapter "Assembly and installation of the electrical position indicator" steps 1 to 14.

13.3 Cleaning the product

DANGER



Danger of explosion

- Risk of death or severe injury.
- Danger from sparking. Only clean the product with an anti-static or damp cloth.

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

14 Disassembly

1. Switch off power to the product.
2. Remove the potential equalisation device.
3. Remove the cover **2**.
4. Remove the individual wires from the terminal strip.
5. Remove the connection cable.
6. Dismantle the mounting kit/product in the opposite order to that described in the Assembly chapter.

15 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.

16 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.

17 Declaration of Incorporation according to 2006/42/EC (Machinery Directive)



Declaration of incorporation

according to the EC Machinery Directive 2006/42/EC, Annex II, 1.B for partly
completed machinery

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

declare that the following product complies with the essential requirements of the Machinery Directive
2006/42/EC.

Product:	GEMÜ 1231
Product name:	Electrical position indicator
From production date:	21st October 2021
Essential requirements of the Machinery Directive 2006/42/EC	1.3., 1.3.7, 1.3.8, 1.3.9, 1.5.1, 1.5.2, 1.5.3, 1.5.14, 1.5.16, 1.6.1, 1.6.3;
Technical standard used in parts:	ISO 12100

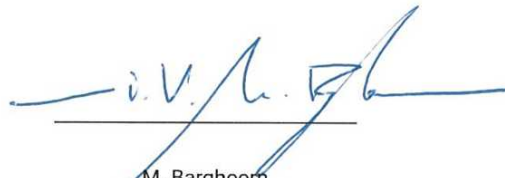
We also declare that the specific technical documentation has been compiled in accordance with part
B of Annex VII.

The manufacturer, or their authorised representative, undertakes to transmit, in response to a
reasoned request, relevant documents on the partly completed machinery to the national authorities.
This transmission takes place electronically.

Authorised documentation officer: GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG
Fritz-Müller-Straße 6-8
74653 Ingelfingen-Criesbach, Germany

This does not affect the industrial property rights.

**Important note! The valve must only be commissioned in machinery that comply with the provisions
of this Directive.**



M. Barghoorn
Head of Global Technics

Ingelfingen, 25th November 2021

18 Declaration of Conformity in accordance with 2014/34/EU (ATEX)



Declaration of conformity

in accordance with 2014/34/EU (ATEX)

We, **GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG**
Fritz-Müller-Straße 6-8
74653 Ingelfingen-Criesbach, Germany

declare that the product listed below complies with the requirements of directive 2014/34/EU for intended use in potentially explosive areas.

Product:	GEMÜ 1231
Product name:	Electrical position indicator
Explosion protection designation	Gas: II 2G Ex ib IIC T6 Gb Dust: II 2D Ex ib IIIB T80°C Db
EU type examination certificate:	IBExU04ATEX1175 X
Notified body:	IBExU, Nr. 0637
Explanations:	For special conditions or operation limits see chapter "Correct use" in the operating instructions.

The Essential Safety and Health Requirements are met by compliance with the standards listed below that are applicable for the above mentioned product:

- EN IEC 60079-0:2018
- EN 60079-11:2012

The sole responsibility for issuing this declaration of conformity lies with the company GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG.

M. Barghoorn
Head of Global Technics

Ingelfingen, 25th November 2021

19 Declaration of conformity according to 2014/30/EU (EMC Directive)



Declaration of conformity

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

We,

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

declare that the product listed below complies with the safety requirements of the EMC Directive 2014/30/EU.

Product:	GEMÜ 1231
Product name:	Electrical position indicator
Technical standard used in parts:	EN 60947-5-2:2007/A1:2012
	EN 60947-5-6:2000-01
	EN IEC 60947-5-2:2020

Pursuant to Article 2 (2 d i) and (2 d ii) of EMC Directive 2014/30/EU, device variants that have such a low electromagnetic emission level due to their physical properties or that contribute to electromagnetic emissions to such a low extent that radio and telecommunication equipment and other equipment can operate as intended, and that operate without unacceptable degradation in the presence electromagnetic disturbance normally consequent upon its intended use, do not fall under this Directive.

Note:

The standards are only applied to products with a motorized actuator.

A handwritten signature in blue ink, appearing to read "i.v. l. B.", written over a horizontal line.

M. Barghoorn
Head of Global Technics

Ingelfingen, 25th November 2021



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Subject to alteration

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