

Original Assembly and Operating Manual

Switch box SBU IO-LINK

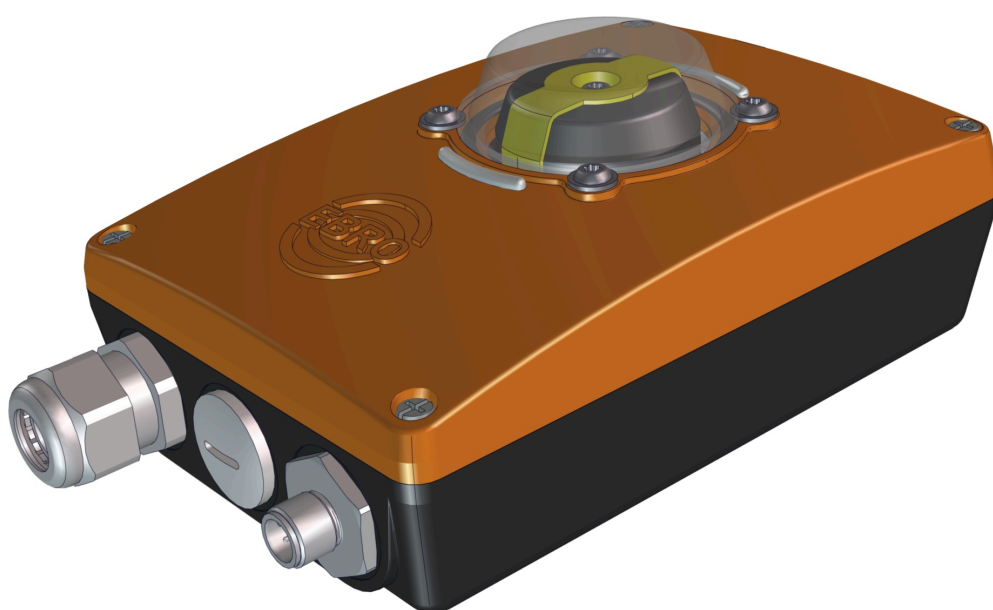


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1 ABOUT THIS OPERATING MANUAL

This is the assembly and operating manual of EBRO ARMATUREN Gebrüder Bröer GmbH for:

- Switch box of the type SBU IO-LINK

Hereinafter:

- EBRO ARMATUREN Gebrüder Bröer GmbH ► EBRO
- Switch box of the type SBU IO-LINK ► Switch box
- Assembly and operating manual ► Operating manual

This operating manual provides important safety and warning information. In addition to other useful information, this operating manual provides particular support during the product life cycle phases of transport, installation, operation, maintenance, and decommissioning to ensure efficient and reliable operation.

Read the operating manual with care and keep it in a safe place. EBRO shall not be liable for any damage caused by failure to observe the operating manual.

The operating manual must be available at the site of use of the switch box. The operating manual must be passed on if the site of use or the owner changes.

All rights and technical changes reserved.

1.1 Copyright

No part of this documentation must be reproduced or made accessible to any third parties without the explicit permission of EBRO ARMATUREN Gebr. Bröer GmbH.

This documentation, including all of its parts, is protected by copyright. Reproduction, translation, microfilming, as well as storage and processing in electronic systems require the written consent of EBRO ARMATUREN Gebr. Bröer GmbH.

Violations are punishable by law and shall obligate to compensation for damages. EBRO ARMATUREN Gebr. Bröer GmbH reserves all rights to exercise industrial property rights.

1.2 Warranty and liability

Warranty and liability shall be subject to the contractually agreed terms and conditions (for warranty terms and conditions, see Terms of Sale and Delivery of EBRO ARMATUREN Gebr. Bröer GmbH). Report any guarantee or warranty claims to EBRO ARMATUREN Gebr. Bröer GmbH at post@e-bro-armaturen.com immediately after discovering the defect or fault.

Any liability and warranty claim shall lapse in the event of software modifications without the knowledge and approval of EBRO ARMATUREN Gebr. Bröer GmbH.

EBRO ARMATUREN Gebr. Bröer GmbH accepts no liability for damage caused by improper use, improper storage or improper transportation.

1.3 Figures

All figures in this operating manual are schematic diagrams and serve to clarify the text. The figures only show the switch box to the extent necessary for understanding the text.

Figures may show product variants or accessories that are not included in the scope of delivery. Figures never justify any claim for subsequent delivery or modification of the delivered switch box.

1.4 Target groups

The target groups of these operating instructions are specialists who carry out activities on the component in the respective life phases.

A specialist is a person who is able to assess the work assigned to them and recognize potential hazards based on their specialist training, knowledge, and experience. Furthermore, the specialist has knowledge of the relevant regulations.

Only suitably qualified and trained specialists must work on the switch box. Persons who are still being trained or instructed must only work on the switch box under the constant supervision of a trained or instructed specialist.

Every person who works with the switch box or who performs work on the switch box must know and apply the content of the operating manual. The owner of the switch box is responsible for granting access to the operating manual and conveying its content by way of training and instruction.

1.4.1 Definition of the target groups

Transport personnel

Specialists responsible for the safe and efficient transportation of machines, systems, or components.

Assembly personnel

Specialists responsible for the professional assembly and installation as well as dismantling (decommissioning) of machines, systems, or components.

There may be overlaps with the “commissioning” phase during work of the assembly personnel.

Commissioning personnel

Specialists who are responsible for transferring machines, systems, or components from assembly to operating condition. The tasks of the commissioning personnel include testing, adjusting, and optimizing the systems to ensure safe and efficient operation.

Operating personnel

Specialists who are responsible for the use of machines, systems or components.

The work of operating personnel may overlap with the “commissioning” life phase.

Maintenance personnel

Specialists responsible for extending the service life and maintaining operational safety.

1.4.2 Definition of life phases

Transport

The component is transported to the place of use after production. Suitable transportation methods must be selected at this stage to avoid damage or malfunctions. This shall include packaging, load securing, compliance with transportation regulations, and, if necessary, climatic protection measures.

Assembly

The component is assembled and installed on site. This includes assembling individual parts, connecting them to supply networks (electricity, water, compressed air, etc.), and integrating them into existing production processes. Correct assembly is essential for subsequent functionality and safety of the component.

Commissioning

In this phase, the component is switched on and tested for the first time. This involves making settings, configuring control systems and performing safety checks. Any adjustments or optimizations are made before the component goes into regular operation.

Operation

This phase comprises the actual use of the component for the intended purpose. The focus here is on efficiency, productivity, and safety. Regular monitoring, documentation of operating data, and, if necessary, minor adjustments are required to ensure optimum performance.

Maintenance

Regular maintenance is required to ensure the service life and functionality of the component. This may include inspections, cleaning, lubrication, replacement of wear parts, and preventive maintenance measures.

Decommissioning

If the component is no longer economically or technically viable, it is decommissioned. This includes shutdown, emptying of operating equipment, and possibly temporary storage. We also check whether it makes sense to reuse or sell the product during this phase.

1.4.3 Who-does-what matrix

	Transport personnel	Assembly personnel	Commissioning personnel	Operating personnel	Maintenance personnel
Transport	●				
Assembly		●			
Commissioning		●	●	●	
Operation				●	
Maintenance					●
Decommissioning	●	●			

Tab. 1: Who-does-what matrix

1.5 Notices

Warnings serve to raise awareness of a possible hazardous situation, its avoidance and the physical integrity of persons.

General notices are aimed at preventing material damage or provide useful additional information for better understanding.

Use of mandatory, desired, and optional provisions

Expression	Conclusion on compliance
Mandatory	A mandatory provision contains clearly defined instructions that must be followed, i.e., it does not grant any discretionary space.
Desired	A desired provision is a recommendation. Although a desired provision contains instructions for action, there is a certain amount of discretionary space for exceptions or atypical situations.
Optional	A may-provision contains an option for action that the owner can consider, but do not necessarily have to follow.

Tab. 2: Mandatory, desired, and optional provisions

1.5.1 Meaning of the requirement and warning signs

Mandatory sign

Sign	Meaning
	Use head protection Protects from head injuries caused by objects falling on the head or hitting the head against objects

Sign	Meaning
	Use eye protection Protects from eye injuries due to mechanical, optical, chemical, thermal, biological, electrical hazards
	Use hand protection Protects from hand injuries caused by objects or contact with hot materials or chemicals
	Use foot protection Protects from foot injuries caused by objects or contact with hot materials or chemicals

Tab. 3: Mandatory sign

Warning signs

Sign	Meaning
	General warning sign Observe the danger conveyed by the additional sign.
	Warning of electrical voltage Take care not to come into contact with electrical voltage.
	Warning of suspended load Take care not to be hit by or run into a suspended load.
	Warning about hot surfaces Take care not to come into contact with hot surfaces.
	Warning of automatic start-up Be careful around machines with mechanical parts that start moving automatically and unexpectedly.
	Warning against hand injuries Take care to avoid hand injuries caused by closing mechanical parts of a machine/component.
	Warning of falling objects Take care to avoid being hit by falling objects.

Tab. 4: Warning signs

1.5.2 Definitions and structure of warnings

The purpose of warning notices is to inform users of potential dangers, raise their awareness, and provide safety-related information to prevent accidents or injuries.

Definition of warnings

DANGER	
	The signal word "DANGER" designates a hazard with a high degree of risk. The hazard will result in death or serious injury if it is not avoided.

WARNING



The signal word **"WARNING"** designates a hazard with a medium degree of risk. The hazard may result in death or serious injury if it is not avoided.

CAUTION



The signal word **"CAUTION"** designates a hazard with a low degree of risk. The hazard may result in a minor or moderate injury if it is not avoided.

Structure of warnings

①

CAUTION



② **Medium may escape in an uncontrolled manner and be inhaled.**

③ Irritation of the respiratory tract.



➤ Check the valve for leaks.



➤ Observe the safety data sheet.

Position	Explanation
1	Signal word: The corresponding signal word for the degree of danger is used to emphasize the urgency and nature of the danger.
2	Source of the danger: A clear and concise description of the danger in simple and easily comprehensible terms.
3	Consequence of non-compliance: Possible consequences or effects if the security instructions are not complied with.
4	Risk prevention: Instructions on how the user can avoid the consequences of non-compliance.
5	Pictogram: A pictogram is placed next to the source of the danger to reinforce the warning and emphasize the significance of the danger.

Tab. 5: Structure of warnings

1.5.3 Definition of general notices

NOTICE



A notice with the signal word **"NOTICE"** provides important information for the proper handling of the product.

Non-observance of such notices may cause faults in the product or affect its environment.

1.5.4 Symbols

Sign	Meaning
1. Screw ...	Instructions with step sequence
➤ Observe the safety data sheet.	Instructions without step sequence
• The switch box ...	Bullet point
①	Item number in figures for assignment to a list or supplementary information

Tab. 6: Symbols

1.6 Applicable documents

Always also observe the statutory provisions applicable at the site of use of the switch box and the owner's instructions in addition to the documentation provided by EBRO.

Also observe any supplier instructions, in particular their safety and warning notices.

1.6.1 Declaration of Conformity/Declaration of Incorporation

The switch box may be subject to a directive giving rise to a presumption of conformity. In this case, a supplementary EBRO Declaration of Conformity or an EBRO Declaration of Incorporation is also applicable.

The owner of the switch box is responsible for requesting and, if necessary, carrying out the conformity assessment procedure.

1.6.2 Use in potentially explosive atmospheres

The owner must place an explicit order and the manufacturer must take structural precautions and perform tests for use in potentially explosive atmospheres. A supplementary ATEX operating manual is also applicable for the configuration intended for use in potentially explosive atmospheres.

1.7 Contact details

- ✉ EBRO ARMATUREN Gebr. Bröer GmbH
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Germany
- ☎ +49 2331 904-0
- @ post@ebro-armaturen.com
- 🌐 www.ebro-armaturen.com



2 IMPORTANT SAFETY INSTRUCTIONS

2.1 Intended use

The switch box of type SBU IO-LINK is used for signal acquisition of the "OPEN" and "CLOSED" status of pneumatically actuated valves and gate valves for flow control of media. The switch box is intended exclusively for use in industrial applications.

Observe the limits of the switch box for intended use. Limits can be found in the technical data and on the identification plate of the switch box.

2.1.1 Reasonably foreseeable misuse

The following items constitute misuse:

- The switch box may be used in potentially explosive areas.
- The switch box may be used outside of its limits.

2.2 Markings

NOTICE



Ensure that all markings remain preserved and legible at all times.

NOTICE



Not all information and symbols are used at all times, depending on the type and configuration of the component.

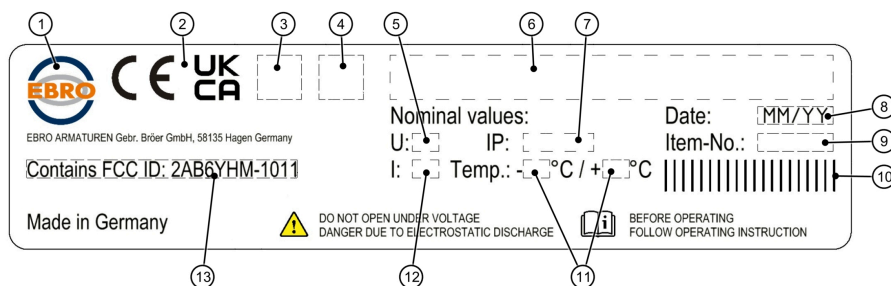


Fig. 1: Identification plate with switch box

Item	Data item	Example	Comment
1	Manufacturer with address	EBRO-Armaturen Gebr. Bröer GmbH 58135 Hagen, Germany	
2	Conformity	CE	Certifies conformity with at least one relevant EU directive requiring a CE conformity assessment procedure (if applicable). Other conformity markings are possible.

Item	Data item	Example	Comment
3	IO-Link symbol		only with SBU IO-Link
4	FCC symbol		only with SBU Advanced
5	Voltage (U)	24V DC	U=electrical voltage in volts
6	SBU name and type	SBU-H105-KS11-IO-Link	
7	Protection class (IP)	IP 65/67	"Ingress Protection" Degree of protection against solid foreign bodies (1st digit) and water (2nd digit).
8	Production month and year	02/23	
9	Ident. no.	6175582	EBRO internal identification number for traceability.
10	Bar code		Contains the ID no.
11	Temperature range	-20 °C/+70 °C	The temperature limits refer to the maximum or minimum temperature range in which safe and efficient operation of the switch box is possible.
12	Current (I)	200 mA	I=electrical current in milliamperes
13	FCC-ID	2AB6YHM-1011	Approval ID for the US market (only for SBU Advanced)

Tab. 7: Markings on the switch box

2.2.1 Type code

SBU-H105-KS11-IO-Link

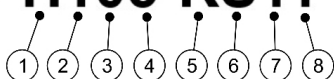


Fig. 2: Example type code

Example	Position	Feature	Characteristic	Abbreviation
H	1	Sensor type	Angle sensor, non-contact	H
1	2	Number of sensors	without	0
			1	1
			2	2
			3 (only in connection with 5 terminals for solenoid valve connection)	3
0	3	Ex-configuration	without	0
			ATEX (upon request)	1-5
5	4	Terminal points for solenoid valve connection	3 terminals (one coil)	3
			5 terminals (two coils, prepared for the third V3 sensor or switch)	5

Example	Position	Feature	Characteristic	Abbreviation
	5	Screw type	Plastic	K
			Metal	M
	6	Cable glands/ electrical connections	without	0
			M20x1.5 blind screw connection	1
			M20x1.5 line diameter 6-12 mm	2
			M20x1.5 line diameter 5-9 mm	3
			M12 plug	S
	7	Cable glands/ electrical connections	without	0
			M20x1.5 blind screw connection	1
			M20x1.5 line diameter 6-12 mm	2
			M20x1.5 line diameter 5-9 mm	3
			Valve plug build A	4
	8	Cable glands/ electrical connections	without	0
			M20x1.5 blind screw connection	1
			M20x1.5 line diameter 6-12 mm	2
			M20x1.5 line diameter 5-9 mm	3
			Valve plug build A	4

Tab. 8: Type code SBU IO-LINK

2.3 Operationally safe condition

The switch box must only be operated when in impeccable technical condition. This includes in particular:

- The switch box must be fully assembled and properly commissioned.
- The switch box must only be operated within its limits.
- All functional tests must have been successfully completed.
- The signage (identification plates, warning stickers, etc.) must be present and recognizable.
- Cable entries must be used that are suitable for the respective cable and line types when connecting cables and lines. They must contain a suitable sealing element. Unused holes for cable entries must be sealed with plugs.
- Structural changes are not allowable.
- The switch box must be kept closed at all times while in operation.

Shut down the switch box immediately if any damage or faults occur. Only put the switch box back into operation once you have repaired all damage and malfunctions.

Spare parts and accessories not supplied by EBRO may change the characteristics of the switch box. Use of such parts may lead to hazards and damage. Only use genuine spare parts from EBRO and install them correctly.

2.4 Owner's obligations

Everyone charged with any work on the switch box must know and apply the relevant contents of the operating manual. The owner of the switch box is responsible for permitting access to the operating manual and conveying its content by way of training and instruction.

The owner must ensure that the operating manual is available at the place of use of the switch box.

The owner must ensure that only sufficiently qualified and experienced persons with the corresponding specialist knowledge work on the switch box.

Any hazard for the health and safety of personnel must be avoided. The owner must take appropriate organizational measures or use suitable work equipment.

The owner must perform hazard assessments etc. for the personnel based on national laws and regulations.

The owner must instruct the personnel in particular on the following items:

- Intended use and limits of the switch box
- Danger points
- Function, position, and operation of the protective devices
- Operation and monitoring

2.4.1 Checking the scope of delivery and configuration

The owner must verify that the switch box is complete and undamaged after delivery.

The owner is responsible for ensuring that the switch box configuration corresponds to its application.

2.4.2 Risk assessment/hazard assessment

The switch box as an attachment is a machine component.

The owner must perform a risk assessment and take protective measures if necessary.

2.4.3 Residual risks

Despite proper design, careful manufacture and compliance with the applicable standards and directives, residual risks cannot be completely ruled out when operating the switch box. It is the responsibility of the owner to complete information for other, specifically local risks.

- Special ambient conditions (e.g. extreme temperatures, dust, humidity, potentially explosive atmospheres)
- Location-related mechanical or electrical hazards
- Operational or process-specific risks
- Dangers during maintenance work due to adjacent machines or systems
- Commissioning of the SBU IO-Link at maintenance, re-equipment, or troubleshooting.

3 DESCRIPTION OF THE COMPONENTS

The switch box comprises several components that are mechanically connected to each other for the intended use.

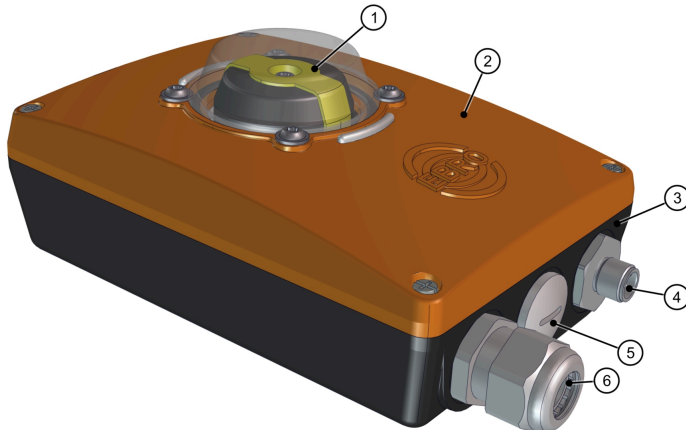


Fig. 3: Components SBU IO-link

Switch box with position indicator

The switch box uses sensors to record the status of the “valve disc on/off”. A terminal point is installed in the switch box to pass electrical signals from the superordinate control system to the connected solenoid valve when the valve disc is to move to the other position. The switch box transmits the signal to the superordinate control system once the end position is reached. The position indicator shows these states visually. The yellow fields are parallel to the valve disc.

The SBU IO-Link switch box also has an IO-Link communication interface that enables access to process data, switching setup, and diagnostic data. IO-Link makes it possible to parameterize and configure the device during operation. Operation of the SBU IO-Link via the IO-Link interface requires a suitable IO-Link master.

The SBU IO-Link switch box has a radio-based communication channel - Bluetooth Low Energy (LE) - as an additional communication interface. In parallel with IP link, the communications channel provides process and diagnostic parameters in parallel with IO-Link, which can be called up using the EBRO Plus app. This interface serves as an additional communication channel and is operated independently. Simultaneous access to the device is not possible.

End position monitoring, integrated temperature sensor, and acceleration sensor increase operational reliability and process availability. Service and maintenance management can be optimized and faults and anomalies can be detected directly.

3.1 Technical data

SBU IO-LINK

Designation	Description
Valve body	Powder-coated aluminum
Seal	NBR
Connection type	M12 Class A Device, optional terminal connection
Communication	IO-Link, SIO mode, and Bluetooth®
Power supply	24 V DC $\pm 10\%$
Maximum current consumption	<200 mA

Designation	Description
Temperature range	-20 °C to +70 °C
Sensors	Position recording (angle sensor, non-contact) acceleration, temperature
Adjustment range	Angle of rotation from 0 to 240°
Output signals	3x programmable NO / NC contact (position closed, open and fault)
Solenoid valve connections	2x24 V DC, 2.1 W controllable via IO-Link or external 24 V control signal
Acceleration sensor	0 to 160 m/s ² (independent of direction)
Reverse polarity protection	Yes

Tab. 9: Technical data SBU IO-LINK

3.2 Dimensions and weights

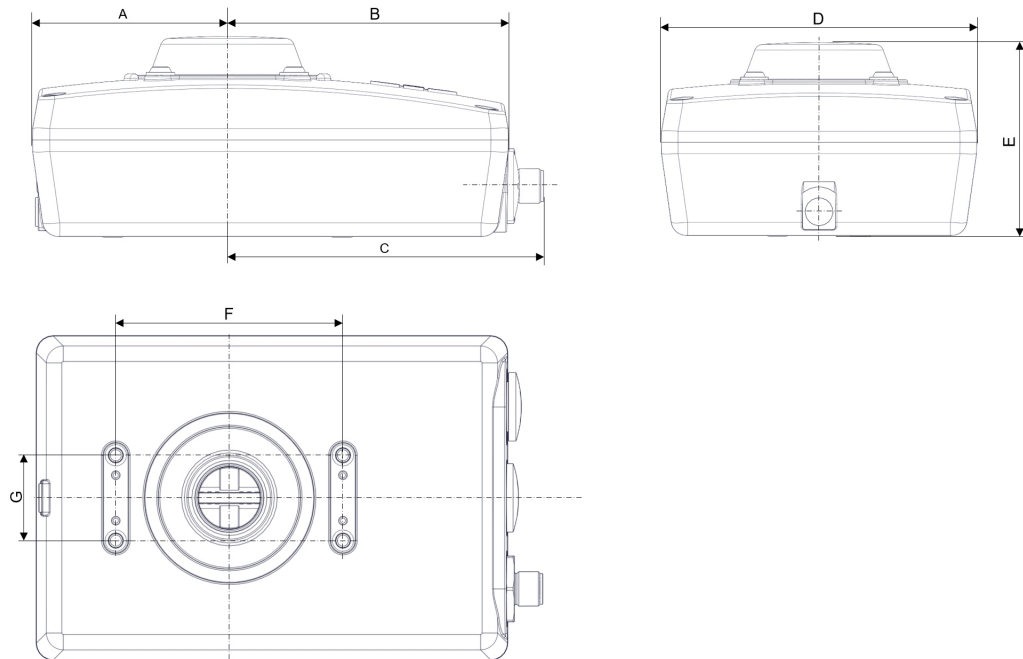


Fig. 4: Dimensions

Type	Main dimensions [mm]							Weight [kg]
	A	B	C	D	E	F	G	
SBU IO-LINK	68	98	111	114	70	80	30	1.5

Tab. 10: Main dimensions SBU IO-LINK

Type	Main dimensions [mm]		
	H	I	J
SBU IO-LINK	202	66	81

Tab. 11: Main dimensions SBU IO-LINK

4 TRANSPORT AND ASSEMBLY

WARNING



Parts may start moving unexpectedly.

Injuries caused by crushing, pulling in, catching, grabbing, or rubbing and scraping as well as cutting.

- Only perform assembly work while the system is depressurized.
- Only perform assembly work while the device is de-energized.

Wear personal protective equipment!



General rules for storage, transport, and assembly

- Recommended storage conditions:
Room temperature >5 °C, <25 °C (>41 °F, <77 °F)
Relative humidity 50-60%
Avoid condensation
Protection against direct sunlight
- Leave the components secured in the factory packaging until assembly.
- Protect the components from dirt and moisture.
- Leave all connections and electrical plug contacts closed until assembly.
- Check the switch box for damage before assembly.

4.1 Transporting components

NOTICE



You can find the weight of your assembly in chapter "Dimensions and weights".

1. Carry the switch box to its place of use.

4.2 Mounting components

The mechanical adaptation to the pneumatic actuator is immediately at the connection point for positioners and signaling devices in accordance with VDI/VDE 3845 Blatt 1:2010-09AA2 80 mm x 30 mm and 30 mm shaft height (Ømax. 30 mm). Attachment sets for other attachments in accordance with VDI/VDE 3845 Blatt 1:2010-09 with different bracket dimensions are available.

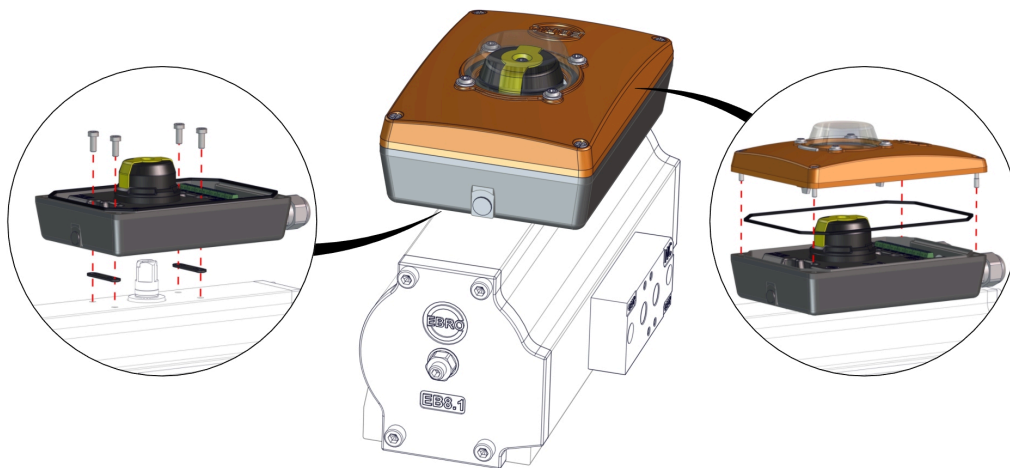


Fig. 5: Mounting the switch box

1. Open the switch box cover.
2. Screw the switch box to the actuator from above with 4 hexagon socket screws ($3.7 \text{ Nm} \pm 0.2 \text{ Nm}$).
Ensure correct seat of the two gaskets between the switch box and the part-turn actuator.
3. Close the cover of the switch box and screw it down ($2 \text{ Nm} \pm 0.2 \text{ Nm}$).
Ensure correct a seat of the seal between the switch box bottom and the switch box top.

4.3 Connecting components

WARNING



Parts may start moving unexpectedly.

Injuries caused by crushing, pulling in, catching, grabbing, or rubbing and scraping as well as cutting.

- Only perform assembly work while the system is depressurized.
- Only perform assembly work while the device is de-energized.

DANGER



Danger to life due to electrical voltage!

Burns, unconsciousness, muscle cramps, cardiac arrhythmia, and even cardiac arrest.

- Ensure that there is no voltage pending.
- Ensure that the protective earth is properly connected.
- Secure the switch box against reactivation.

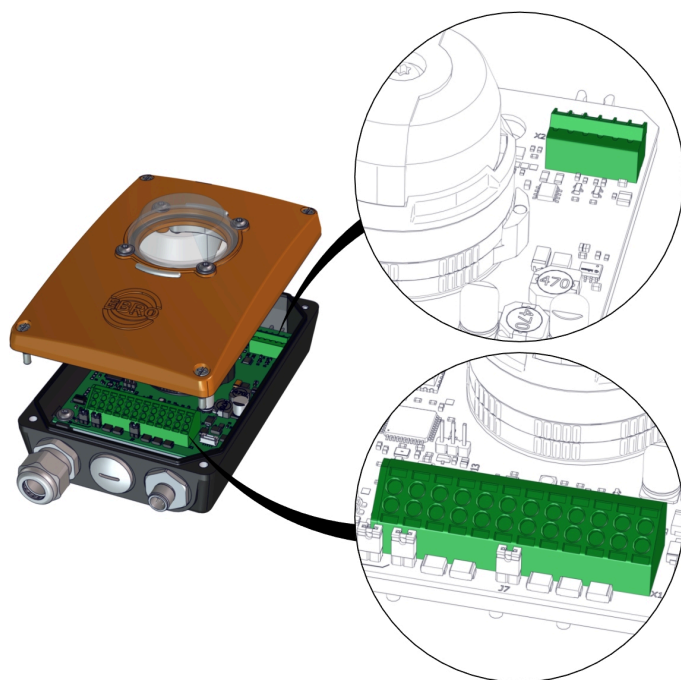


Fig. 6: Connector strip SBU IO-link

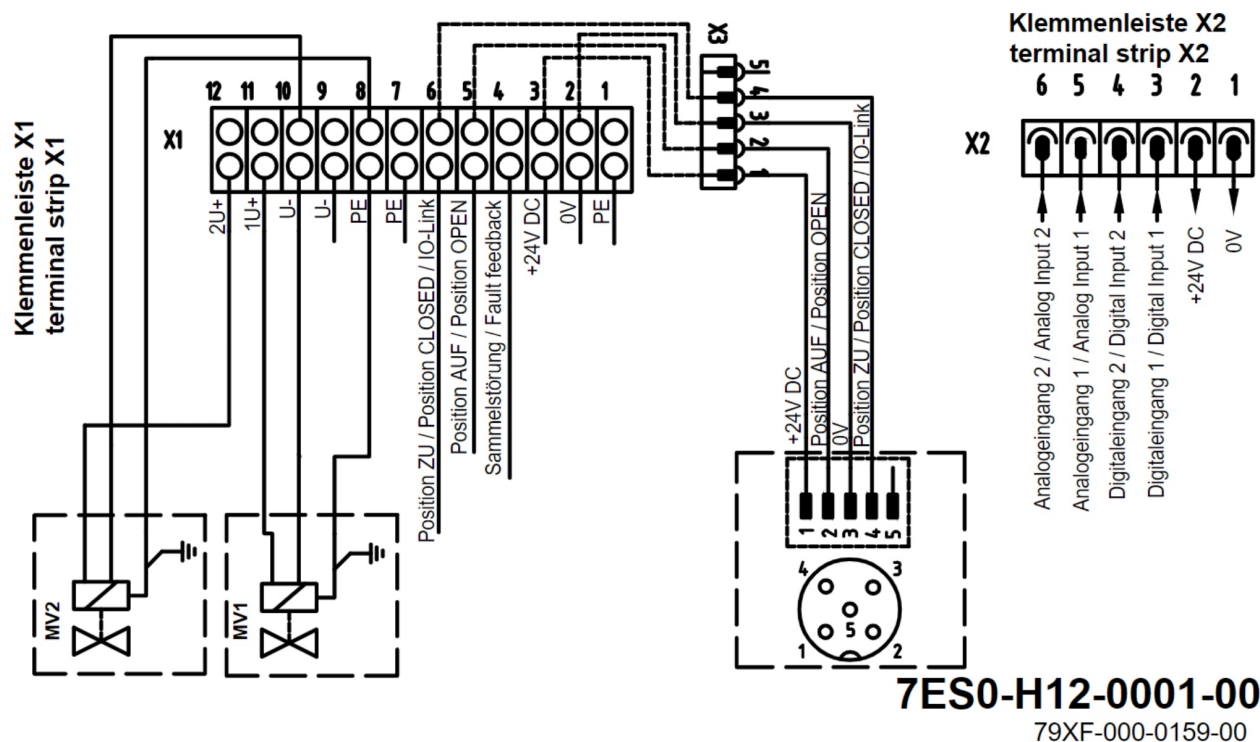


Fig. 7: Circuit diagram SBU IO-link

NOTICE



The SBU IO-Link must not be connected directly to a class B master.

Connecting the signal lines on the owner side

Ter- minal	Assignment	Signal
X1.1	Equipotential bonding	PE
X1.2	Operating voltage -	GND
X1.3	Operating voltage +	+ 24V DC $\pm$ 10% (max. 200mA)

Tab. 12: IO-Link connection operating voltage

Ter- minal	Assignment	Signal
X1.4	Switching output – collective fault	+ 24V DC referred to GND (max. 100mA)
X1.5	Switching output – valve is OPEN	+ 24V DC referred to GND (max. 100mA)
X1.6	Switching output – valve is CLOSED / IO-Link (C)	+ 24V DC referred to GND (max. 100mA) IO-Link signal communication

Tab. 13: Connection IO-Link signal outputs

Ter- minal	Assignment	Signal
X1.7	Equipotential bonding	PE
X1.8	Equipotential bonding	PE
X1.9	Power supply solenoid valve GND	GND / GND external
X1.10	Power supply solenoid valve GND	GND / GND external
X1.11	Switching output / input solenoid valve 1 (max. 2.1 W)	+24 V DC via IO-Link / external signal
X1.12	Switching output / input solenoid valve 2 (max. 2.1 W)	+24 V DC via IO-Link / external signal

Tab. 14: IO-Link valve connection

Ter- minal	Assignment	Signal
X2.1	Sensor supply -	referring to operating voltage GND
X2.2	Sensor supply +	+ 24V DC referred to GND (max. 80mA)
X2.3	Digital input 1	Low / high signal level
X2.4	Digital input 2	Low / high signal level

Ter- minal	Assignment	Signal
X2.5	Analog input 1	Standard signal 4-20 mA
X2.6	Analog input 2	Standard signal 4-20 mA

Tab. 15: Connection IO-Link signal inputs

Grounding the switch box

NOTICE



This device has a protective earth connection. Ensure that the protective earth is properly connected. An improperly connected protective earth may lead to dangerous contact voltages in case of error.

5 COMMISSIONING

Wear personal protective equipment!



NOTICE



Also observe chapter "Target groups".

5.1 Settings

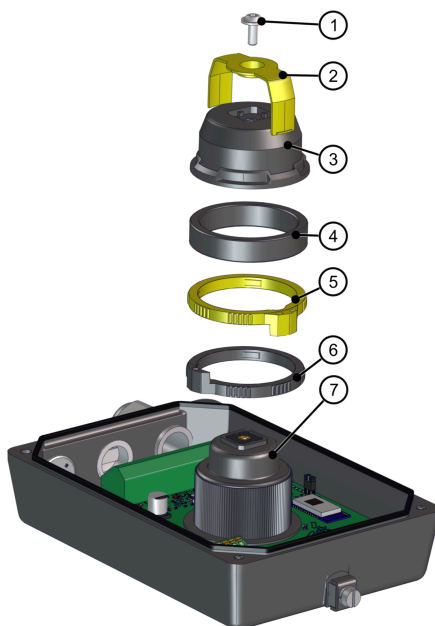


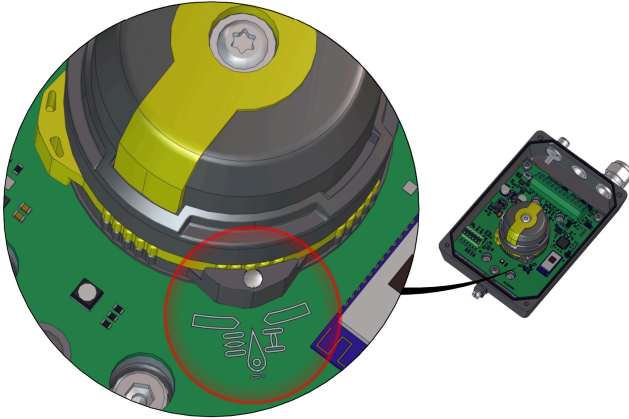
Fig. 8: Cam setting components IO-Link

Position	Component
1	Fixing screw
2	Position indicator
3	Cap
4	Spacer ring
5	Actuating ring yellow "OPEN"
6	Actuating ring black "CLOSED"
7	Carrier shaft

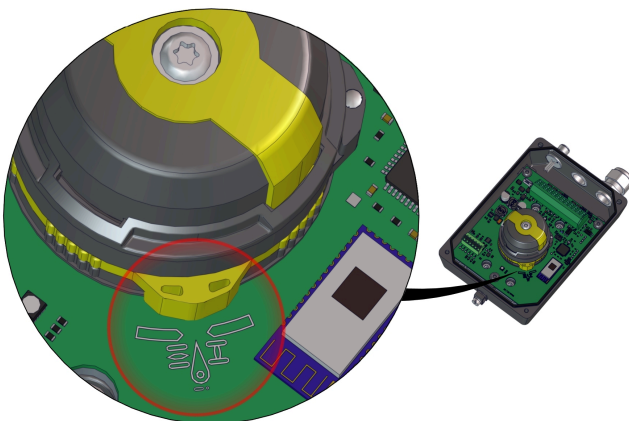
Tab. 16: Cam setting components

Setting the cam

1. Close the valve manually or move the part-turn actuator to its "CLOSED" position.
2. Loosen the fixing screw (item 1).



3. Place the black actuating ring (item 6) on the carrier shaft (item 7) so that the actuating magnet is positioned directly above the sensor.
4. Open the valve manually or move the part-turn actuator to its "OPEN" position.



5. Place the yellow actuating ring (item 5) on the carrier shaft (item 7) so that the actuating magnet is positioned directly above the sensor.
6. Slide the spacer ring (item 4) onto the carrier shaft (item 7).
7. Slide the cap (item 3) onto the carrier shaft (item 7) so that the cap snaps into place with the square and the indicator matches the position of the valve disc.
8. Tighten the fixing screw (item 1).

Functions

NOTICE



Parameterization may be performed while the process is running with IO-Link.

NOTICE



A detailed description of the parameters and process data of the IODD is available at www.ebro-armaturen.com.

IO-Link

The SBU IO-Link has two terminal points for solenoid valve coils. These can be controlled directly via IO-Link. Otherwise, the connected solenoid valve coils can be operated by an externally applied signal. Simultaneous activation of the solenoid valve coils is not possible in the case of control via IO-Link. This restriction does not apply in the case of external control. Only valves with a control voltage of 24 V DC and no more than 2.1 Watt are allowable for control via the SBU IO-Link. Coils with maximal outputs of 5 Watt can be connected at external control of the solenoid coils.

Bluetooth® LE

The switch box has a radio-based communication channel as an additional communication interface. This provides process and diagnostic parameters in parallel with IO-Link, allowing the diagnostic parameters to be called up using the EBRO Plus app. This interface serves as an additional communication channel and is operated independently. Simultaneous access to the device is not possible.

Parameterizing

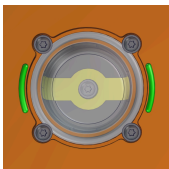
The switch box can be configured via Bluetooth® and the EBRO Plus app (restricted mode) or via IO-Link (extended mode).

Process inputs

The switch box has 4 process inputs. 2 digital inputs and 2 analogue inputs (4-20mA). This interface can be used to wire, for example, nearby sensors in the switch box, put them into operation, and retrieve the states (high/low (digital) or 4-20mA (analogue)) via the IO-Link.

Meaning of the LED display

The colors can be freely adjusted via IO-Link.

Figure	LED color (factory setting)	Description
	Green permanently lit	Status feedback "Position CLOSED"
	Yellow permanently lit	Status feedback "Position OPEN"
	Red 1Hz flashing	Status feedback "Fault"

Tab. 17: Meaning of the LED colors

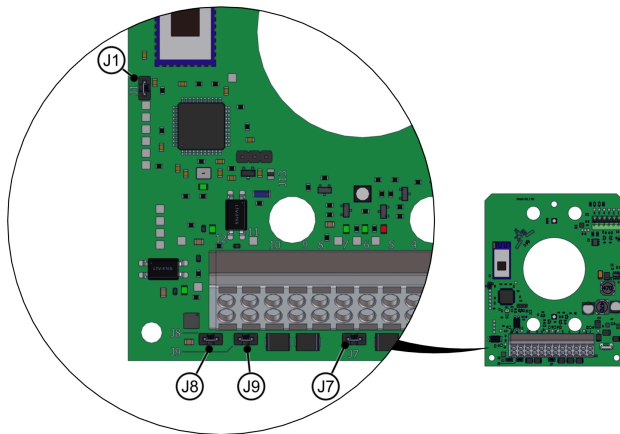


Fig. 9: Jumpers IO-link

Position	Function	set	not set
J1	Bluetooth power supply® module +3.3V	Bluetooth® module active	Bluetooth® module inactive
J7	GND reference for power supply solenoid valves GND	GND referring to operating voltage GND	0 V potential for the MV connections must be applied separately to the respective terminal (see wiring diagram).
J8	MV1 activation via IO-Link / external	Activation via IO-Link	Activated via external signal
J9	MV2 activation via IO-Link / external	Activation via IO-Link	Activated via external signal

Tab. 18: Jumpers IO-Link PCB

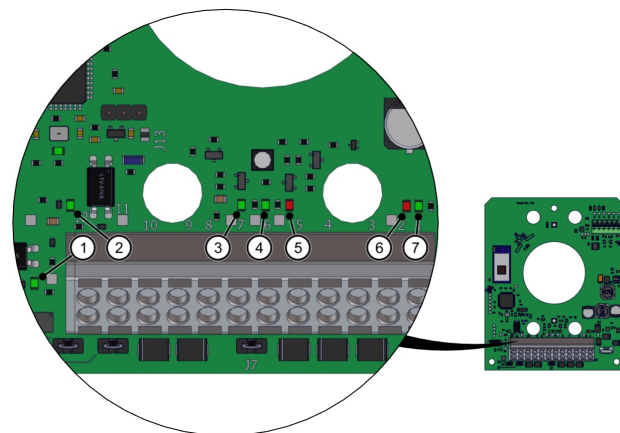


Fig. 10: LED IO-Link

Position	Function
1	MV2 activated (green)
2	MV1 activated (green)
3	OPEN position (green)
4	CLOSED position (green)
5	Collective fault (red)
6	Voltage reverse polarity (red)
7	Voltage OK (green)

Tab. 19: LED PCB IO-Link

5.2 Checks

Protective earth

- This device has a protective earth connection. Ensure that the protective earth is properly connected. An improperly connected protective earth may lead to dangerous contact voltages in case of error.

The SBU IO-Link supplied was manufactured, adjusted, and tested at the factory for the technical data specified in the order. Nevertheless, you must ensure that the SBU IO-Link functions correctly once it has been fully installed.

- Check that all SBU IO-Link components are assembled correctly.
- Check that the switch box is correctly assembled on the pneumatic part turn actuator.
- Check earthing.
Ensure that the SBU IO-Link is connected via an electrostatically conductive pipe connection or a separate earthing point.

Release the electrical connection.

- Perform a test run.
Check that the valve moves to the intended end position with the corresponding control commands.

6 OPERATION

Wear personal protective equipment!



NOTICE



Also observe chapter "Target groups".

The position indicator visually shows the position of the valve disc. The yellow fields are parallel to the valve disc.

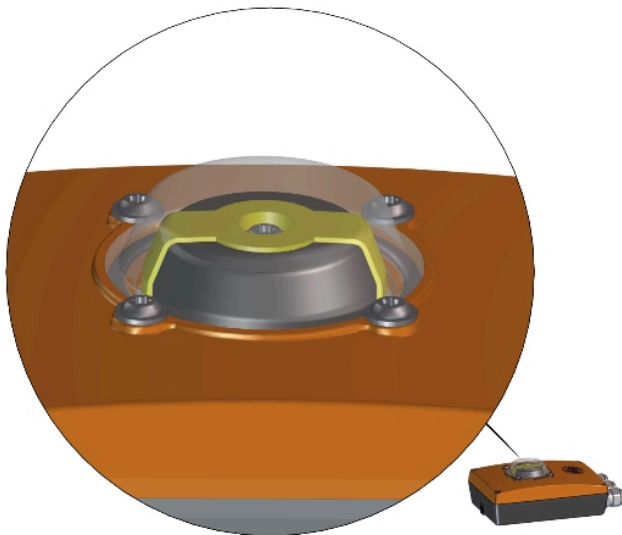


Fig. 11: Position indicator

Meaning of the LED colors

The colors can be freely adjusted via IO-Link.

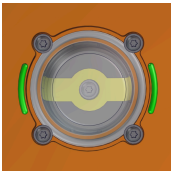
Figure	LED color (factory setting)	Description
	Green permanently lit	Status feedback "Position CLOSED"

Figure	LED color (factory setting)	Description
	Yellow permanently lit	Status feedback "Position OPEN"
	Red 1Hz flashing	Status feedback "Fault"

Tab. 20: Meaning of the LED colors

7 MAINTENANCE

WARNING



Parts may start moving unexpectedly.

Injuries caused by crushing, pulling in, catching, grabbing, or rubbing and scraping as well as cutting.

- Only perform assembly work while the system is depressurized.
- Only perform assembly work while the device is de-energized.

NOTICE



Maintenance depends on various factors, such as the local environment, medium, temperature, and actuation. The owner will determine maintenance intervals in accordance with operational conditions and requirements.

Wear personal protective equipment!



NOTICE



Also observe chapter "Target groups".

Maintenance work is limited to an external inspection of the switch box:

- Keep the switch box free from deposits.
Use mild water-based cleaning products. Do not use any aggressive, solvent-containing, or organic cleaning products.
- Check the switch box for leaks.
- Check the cable entries and cable connections for tight fit.
- Check that the signage (identification plate / warning and mandatory stickers, if applicable) is complete and intact.

Troubleshooting SBU IO-LINK

Faults are signaled by flashing of the fault LED in red and switching of the output X1.6 collective fault. All faults do not affect the current program sequence. The fault will be reset when the cause of the fault has been removed.

All fault messages have been deactivated at the setting value "0". Other logical links can be added to or removed from the collective fault. For this, also observe the IODD interface description.

Type of fault	Cause	Measure
Collective fault	Runtime monitoring: Exceeding the set runtime (default value: 0 s ► deactivated)	Check the following components: • Fitting valve actuated • Actuator function • Compressed air supply • Position of the cam disc • Jamming in the piping Fault is automatically reset as soon as the repeated trip is within the time tolerance.
	Max. duty cycles: Reach the maximum set duty cycles. (default value: 0 n ► deactivated)	Check the duty cycles performed. Reset or increase the counter.
	Temperature exceeded / Temperature undercut	Check the environment of the SBU IO-Link.

Tab. 21: Troubleshooting SBU IO-LINK

Contact

☎ +49 2331 904-0
 @ service@ebro-armaturen.com



8 DECOMMISSIONING/DISASSEMBLY

DANGER



Danger to life due to electrical voltage!

Burns, unconsciousness, muscle cramps, cardiac arrhythmia, and even cardiac arrest.

- Ensure that there is no voltage pending.
- Ensure that the protective earth is properly connected.
- Secure the switch box against reactivation.

WARNING



Parts may start moving unexpectedly.

Injuries caused by crushing, pulling in, catching, grabbing, or rubbing and scraping as well as cutting.

- Only perform disassembly work while the system is depressurized.
- Only perform disassembly work while the device is de-energized.
- Do not reach between the valve body and the valve disc.

Wear personal protective equipment!



NOTICE



Also observe chapter "Target groups".

For extended deactivation:

- Protect the switch box from dirt and dust.
Also observe the general rules for storage, transportation and assembly in the chapter "Transport and assembly".
- Check the switch box for damage and function at recommissioning.

For permanent decommissioning:

- Dispose of the components in an environmentally friendly and professional manner in accordance with local regulations.
- Look out for oily residues in actuators and bearings.

For disassembly, refer to chapter "Transport and assembly" et seq.

EC Declaration of Conformity

The manufacturer

**EBRO Armaturen
Gebr. Bröer GmbH
Karlstraße 8
58135 Hagen
Germany**



declares that the products of the series
EBRO SBU IO-link
Type SBU-xxxx-xxxx-IO-link

are manufactured in accordance with the requirements of the following standards:

DIN EN 301489-1:2020-06
DIN EN 55032:2016-02
DIN EN 300328:2019-10
IEC 60950-1:2005 (2nd Ed.) + Am1:2009 + Am2:2013
DIN EN 62368-1 ; VDE 0868-1:2016-05
DIN EN ISO 12100:2011-03

The following product documentation is available:

Planning documents, technical data sheets, catalog sheets

These products comply with the following directives:

Radio Equipment Directive 2014/53/EU
Machinery Directive 2006/42/EC

1. The products are "partly completed machinery" within the meaning of Art. 2 g) of this directive.
2. This declaration is the declaration of incorporation within the meaning of this directive.

The following applies to compliance with the above directives:

1. The user must comply with the <intended use> as defined in the "Original assembly and operating manual" (BA SBU IO-link) enclosed with the delivery and must observe all notices in these instructions.
Failure to comply with this instruction may – in important cases – release the manufacturer from their product liability.
2. Commissioning of the product is prohibited until the system in which the switch box is installed has been declared compliant with all applicable EU directives mentioned above by the person responsible for it.
3. The manufacturer EBRO ARMATUREN Gebr. Bröer GmbH has performed and documented the necessary risk analyses.
The employee responsible for this available documentation is Mr. Matthias Jortzik, EBRO ARMATUREN Gebr. Bröer GmbH, Karlstraße 8, 58135 Hagen, Germany.

Hagen, May 2021

.....
Peter Bröer, management

Notice:

This is a translated version of the original document. Only the signed original document in German is legally binding.

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The manufacturer

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Hagen, May 2021

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Peter Bröer, management

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THE WORLD OF EBRO ARMATUREN

Our international network



- Subsidiaries
- Representative offices

Since the company was founded in 1972, EBRO ARMATUREN has been developing, producing and selling shut-off and control valves as well as automation technology for industrial applications. More than 1,000 employees at two domestic and 30+ international subsidiaries ensure that EBRO products are available in over 100 countries worldwide. Within the global network, production takes place at the headquarters in Germany and in Italy, Sweden, China and Thailand with uniformly high manufacturing and quality standards.

In 2005, the Swedish manufacturer Stafsjö Valves AB was acquired and the product range was extended by an extensive portfolio of knife gate valves.

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A company of the Bröer Group



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www.ebro-armaturen.com