

Original Assembly and Operating Manual

Sensor locking lever

- Locking lever with integrated end position feedback

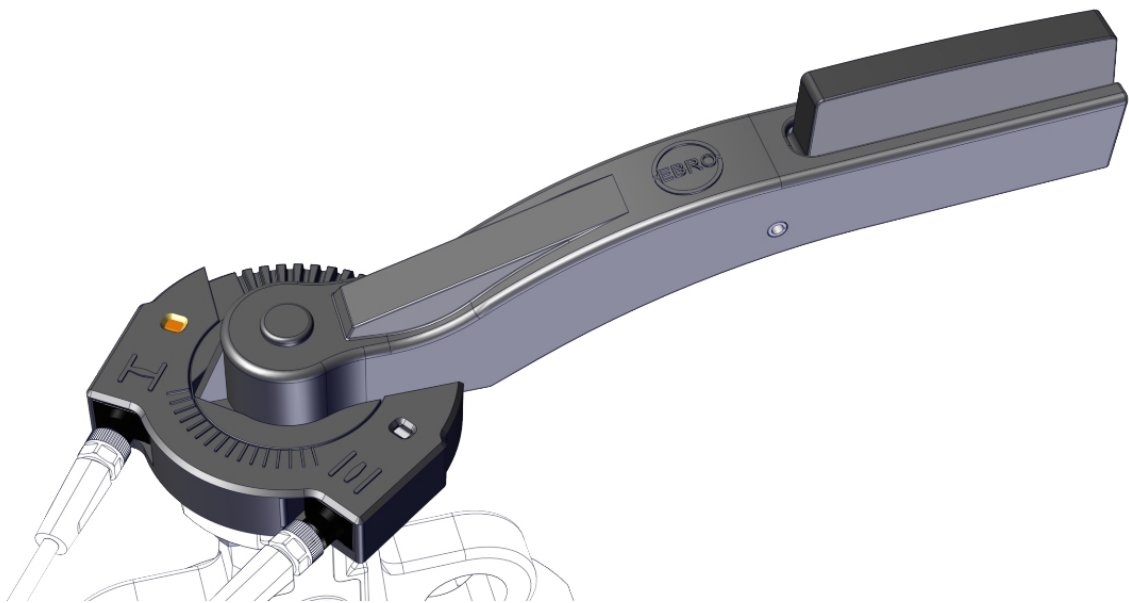


TABLE OF CONTENTS

1	About this operating manual.....	5
1.1	Copyright.....	5
1.2	Warranty and liability.....	5
1.3	Figures.....	5
1.4	Target groups.....	5
1.4.1	Definition of the target groups.....	6
1.4.2	Definition of life phases.....	6
1.4.3	Who-does-what matrix.....	7
1.5	Notices.....	7
1.5.1	Meaning of the requirement and warning signs.....	7
1.5.2	Definitions and structure of warnings.....	8
1.5.3	Definition of general notices.....	9
1.5.4	Symbols.....	10
1.6	Applicable documents.....	10
1.6.1	Use in potentially explosive atmospheres.....	10
1.7	Contact details.....	10
2	Important safety instructions.....	11
2.1	Intended use.....	11
2.1.1	Reasonably foreseeable misuse.....	11
2.2	Operationally safe condition.....	11
2.3	Owner's obligations.....	11
2.3.1	Checking the scope of delivery and configuration.....	12
2.3.2	Risk assessment/hazard assessment.....	12
2.3.3	Residual risks.....	12
3	Description of the components.....	13
3.1	Technical data.....	14
3.2	Dimensions and weights.....	15
3.3	Conversion tables.....	15
4	Transport and assembly.....	17
4.1	Transporting components.....	17
4.2	Mounting components.....	17
5	Commissioning.....	19
5.1	Checks.....	19
6	Operation.....	20
7	Maintenance.....	21
7.1	Bill of materials.....	22

8	Decommissioning/disassembly.....	23
----------	---	-----------

LIST OF FIGURES AND TABLES

List of figures

Fig. 1:	Components.....	13
Fig. 2:	Dimensions sensor locking lever.....	15
Fig. 3:	Assembly.....	18
Fig. 4:	Position indicator with end position feedback.....	20
Fig. 5:	Bill of materials.....	22

List of tables

Tab. 1:	Who-does-what matrix.....	7
Tab. 2:	Mandatory, desired, and optional provisions.....	7
Tab. 3:	Mandatory sign.....	7
Tab. 4:	Warning signs.....	8
Tab. 5:	Structure of warnings.....	9
Tab. 6:	Symbols.....	10
Tab. 7:	Designation the components.....	13
Tab. 8:	Technical data sensor locking lever.....	14
Tab. 9:	Main dimensions sensor locking lever.....	15
Tab. 10:	Conversion table for mass m.....	15
Tab. 11:	Conversion table for temperature t.....	16
Tab. 12:	Bill of materials sensor locking lever.....	22

1 ABOUT THIS OPERATING MANUAL

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

- Manual actuator of the type sensor locking lever

Hereinafter:

- EBRO ARMATUREN Gebrüder Bröer GmbH ► EBRO
- Manual actuator of the type sensor locking lever ► Sensor locking lever
- 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 sensor locking lever. 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.

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 sensor locking lever 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 sensor locking lever.

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 sensor locking lever. Persons who are still being trained or instructed must only work on the sensor locking lever under the constant supervision of a trained or instructed specialist.

Every person who works with the sensor locking lever or who performs work on the sensor locking lever must know and apply the content of the operating manual. The owner of the sensor locking lever 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 sensor locking lever ...	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 sensor locking lever 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 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
Karlstraße 8
58135 Hagen
Germany

☎ +49 2331 904-0

@ post@ebro-armaturen.com

🌐 www.ebro-armaturen.com



2 IMPORTANT SAFETY INSTRUCTIONS

2.1 Intended use

The manual actuator of the sensor locking lever type is designed and built to manually adjust the butterfly disc of a shut-off valve. The "OPEN" or "CLOSED" positions of the valve disc can be detected by inductive proximity sensors and forwarded as a signal to the control unit. The sensor locking lever is intended exclusively for use in industrial applications.

For proper use, observe the limits of the sensor locking lever. Limits can be found in the technical data of the sensor locking lever.

2.1.1 Reasonably foreseeable misuse

The following items constitute misuse:

- The sensor locking lever may be used in potentially explosive areas.
- The sensor locking lever may be used outside of its limits.
- The sensor locking lever may be used as a stepping aid and break off.

2.2 Operationally safe condition

The sensor locking lever must only be operated if it is in perfect technical condition. This includes in particular:

- The sensor locking lever must be fully assembled and correctly commissioned.
- The sensor locking lever must only be operated within its limits.
- All functional tests must have been successfully completed.
- Structural changes are not allowable.

Shut down the sensor locking lever immediately if any damage or faults are present. Do not return the sensor locking lever back to operation until you have eliminated all damage and malfunctions.

Spare parts and accessories not supplied by EBRO may change the properties of the sensor locking lever. Use of such parts may lead to hazards and damage. Only use genuine spare parts from EBRO and install them correctly.

2.3 Owner's obligations

Everyone charged with any work on the sensor locking lever must know and apply the relevant contents of the operating manual. The owner of the sensor locking lever 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 sensor locking lever.

The owner must ensure that only sufficiently qualified and experienced persons with the corresponding specialist knowledge work on the sensor locking lever.

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 sensor locking lever
- Danger points

- Function, position, and operation of the protective devices
- Operation and monitoring

2.3.1 Checking the scope of delivery and configuration

The owner must verify that the sensor locking lever is complete and undamaged after delivery.

The owner is responsible for ensuring that the sensor locking lever configuration corresponds to its application.

2.3.2 Risk assessment/hazard assessment

The sensor locking lever as an attachment is a machine component.

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

2.3.3 Residual risks

3 DESCRIPTION OF THE COMPONENTS

The sensor locking lever comprises several components that are mechanically connected to each other for the intended use.

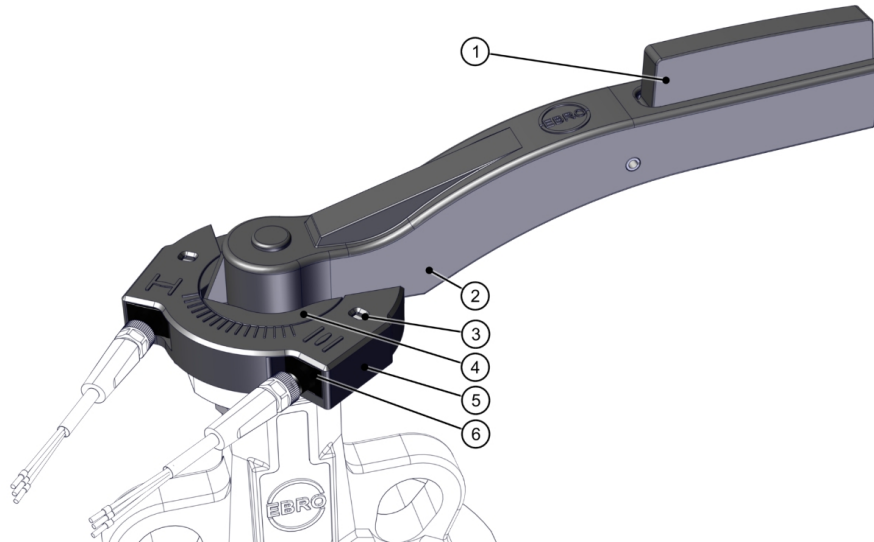


Fig. 1: Components

Position	Component
1	Unlocking mechanism
2	Indexing lever
3	Light emitting diode
4	Actuator ring
5	Sensor locking disc
6	Proximity switch

Tab. 7: Designation the components

Unlocking mechanism

When actuated, the locking lever for manual adjustment of the valve disc is released.

Locking lever with position indicator

The locking lever is used for manual adjustment of the valve disc. The valve disc may be opened, closed, or adjusted in between depending on the configuration.

The indicator tip on the locking lever serves as a position indicator.

Light emitting diode

The LED is an integral part of the proximity switch. The LED lights up as soon as the ball built into the actuator ring comes into contact with the proximity switch and triggers.

Actuator ring

The actuator ring is rotated when the locking lever is adjusted so that the installed balls trigger the corresponding proximity switch in the two positions "OPEN" and "CLOSED".

Sensor locking disc

The sensor locking disc shows the scale for the position of the valve disc and has the latches for the locking lever. In addition, the sensor locking disc forms the receptacle for the sensors and the actuator ring. The sensor locking disc is firmly screwed to the top flange of the valve.

Proximity switch

The proximity switch trips as soon as the ball built into the actuator ring comes into contact with the proximity switch. The proximity switch transmits the signal (damped/non-damped) to the control unit.

3.1 Technical data

Designation	Description
Valve interface	F04, F05, F07 DIN EN ISO 5211:2024-10
Temperature range	-20 °C to +70 °C
Electrical data	
Switching function	Normally open (NO)
Output type	PNP
Output type	3-wire
Operating voltage	10 ... 30 V DC
Protection class	IP68
Switching status display	Light emitting diode
Connection type	M8 plug, others upon request
Explosion protection	upon request

Tab. 8: Technical data sensor locking lever

3.2 Dimensions and weights

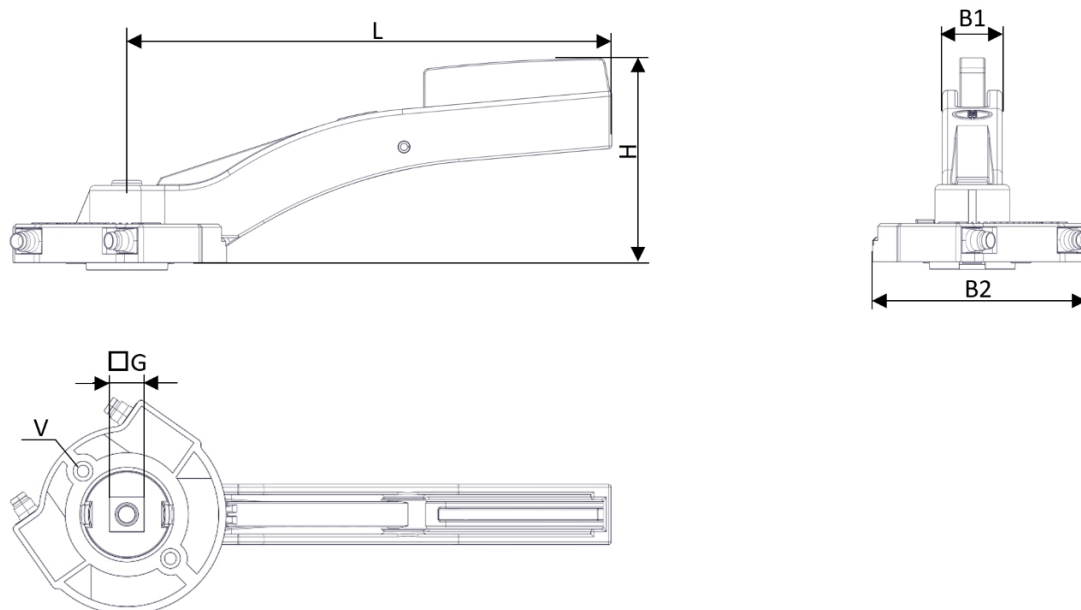


Fig. 2: Dimensions sensor locking lever

Flange	H [mm]	L [mm]	B1 [mm]	B2 [mm]	V	□ G [mm]	Weight [kg]
F04 (up to DN 65)	72	167	20	77	M5x5 mm	11	0.215
F05 (up to DN 125)	82	196	24	82	M6x5 mm	14	0.300
F07 (up to DN 200)	100	276	30	92	M8x6 mm	17	0.520

Tab. 9: Main dimensions sensor locking lever

3.3 Conversion tables

Mass m

	kg	lb	cwt	t	sh ton
kg	1	2.205	0.0197	0.001	0.0011
lb	0.454	1	0.0089	4.54x10 ⁻⁴	5.0x10 ⁻⁴
cwt	50.802	112	1	0.0508	0.056
t	1000	2204.6	19.684	1	1.1023
sh ton	907.2	2000	17.857	0.9072	1

Tab. 10: Conversion table for mass m

Temperature t

°C	°F	°C	°F	°C	°F	°C	°F
-140	-220	-40	-40	60	140	160	320
-135	-211	-35	-31	65	149	165	329
-130	-202	-30	-22	70	158	170	338
-125	-193	-25	-13	75	167	175	347
-120	-184	-20	-4	80	176	180	356
-115	-175	-15	5	85	185	185	365
-110	-166	-10	14	90	194	190	374
-105	-157	-5	23	95	203	195	383
-100	-148	0	32	100	212	200	392
-95	-139	5	41	105	221	205	401
-90	-130	10	50	110	230	210	410
-85	-121	15	59	115	239	215	419
-80	-112	20	68	120	248	220	428
-75	-103	25	77	125	257	225	437
-70	-94	30	86	130	266	230	446
-65	-85	35	95	135	275	235	455
-60	-76	40	104	140	284	240	464
-55	-67	45	113	145	293	245	473
-50	-58	50	122	150	302	250	482
-45	-49	55	131	155	311	255	491

Tab. 11: Conversion table for temperature t

4 TRANSPORT AND ASSEMBLY

Wear personal protective equipment!



General rules for storage, transport, and assembly

- Recommended storage conditions:
Room temperature $>5\text{ °C}$, $<25\text{ °C}$ ($>41\text{ °F}$, $<77\text{ °F}$)
Relative humidity 50-60%
Avoid condensation
Protection against direct sunlight
- Leave the components secured in the factory packaging until assembly.
- Actuate components in bearings at regular intervals to ensure that they move freely. Integrate the stored components into the operational maintenance concept.
- Protect the components from dirt and moisture.
- Protect flanges and unprotected parts with suitable grease or oil.
- Leave all connections and electrical plug contacts closed until assembly.
- Check the sensor locking lever 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 sensor locking lever to its place of use.

4.2 Mounting components

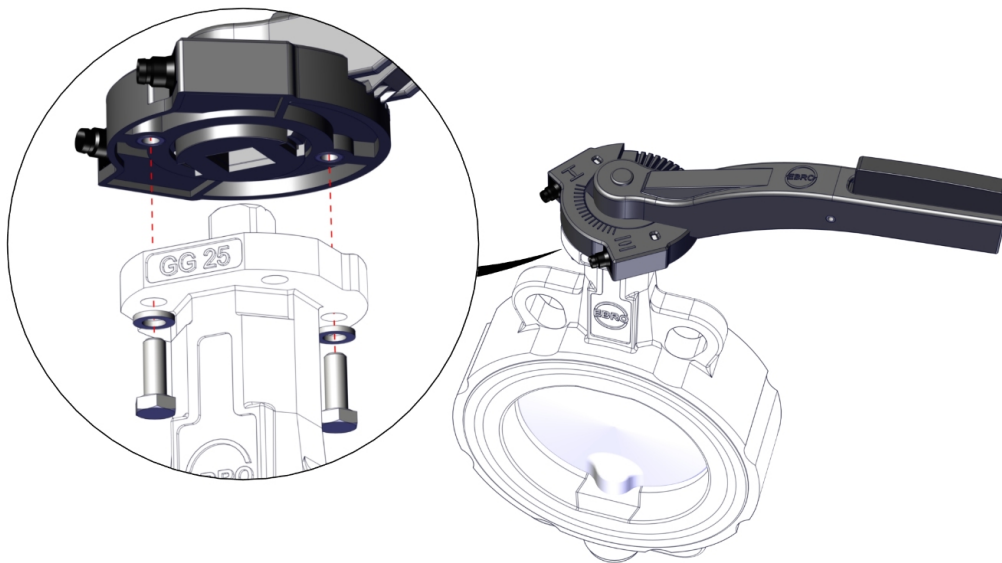


Fig. 3: Assembly

1. Screw the sensor locking lever to the top flange of the valve from below.
Pay attention to the correct position of the valve disc in relation to the sensor locking disc and the locking lever.

F04	F05	F07
3-4 Nm	5-7 Nm	10-15 Nm

5 COMMISSIONING

Wear personal protective equipment!



NOTICE



Also observe chapter "Target groups".

5.1 Checks

NOTICE



Ensure

- that the unlocking mechanism is activated during adjustment.
- that no excessive forces are applied when adjusting to an end position.
- that the locking lever is engaged after adjustment.

NOTICE



Do not use extensions on the latching lever to open or close the door. This may destroy the sensor locking lever or the butterfly valve.

1. Slowly and carefully check the movement of the valve disc. The valve disc must be able to move freely in the piping.
2. Check that the corresponding LED lights up in the open and closed position.

6 OPERATION

Wear personal protective equipment!



NOTICE



Also observe chapter "Target groups".

NOTICE



Ensure

- that the unlocking mechanism is activated during adjustment.
- that no excessive forces are applied when adjusting to an end position.
- that the locking lever is engaged after adjustment.

1. Press the unlocking mechanism on the locking lever downwards to adjust the valve disc.
2. Turn the locking lever to the desired position.
3. Release the locking lever with the unlocking mechanism.

The proximity switch LED lights up when an end position is reached.

The end position feedback is not an indicator of the tightness of the valve. Tightness must be ensured due to the manual actuation of the hand lever.

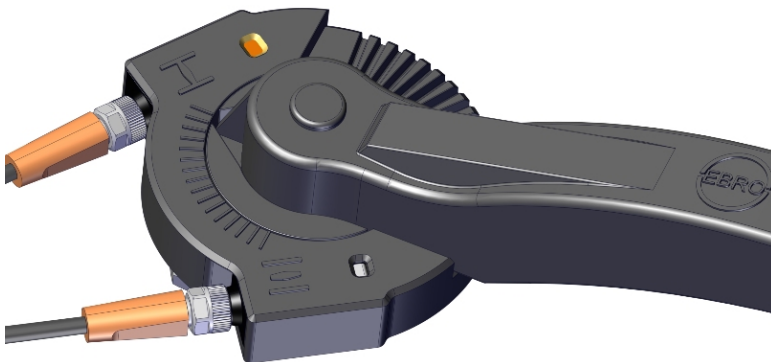


Fig. 4: Position indicator with end position feedback

7 MAINTENANCE

CAUTION



Assembly and disassembly of actuators when the valve is under pressure.

Parts may be accelerated in an uncontrolled manner.

- Only perform assembly and disassembly work when the valve is depressurized.

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 part-turn actuator:

- Keep the sensor locking lever free of deposits.
- Check the sensor locking lever for ease of movement.

Contact



+49 2331 904-0



service@ebro-armaturen.com



7.1 Bill of materials

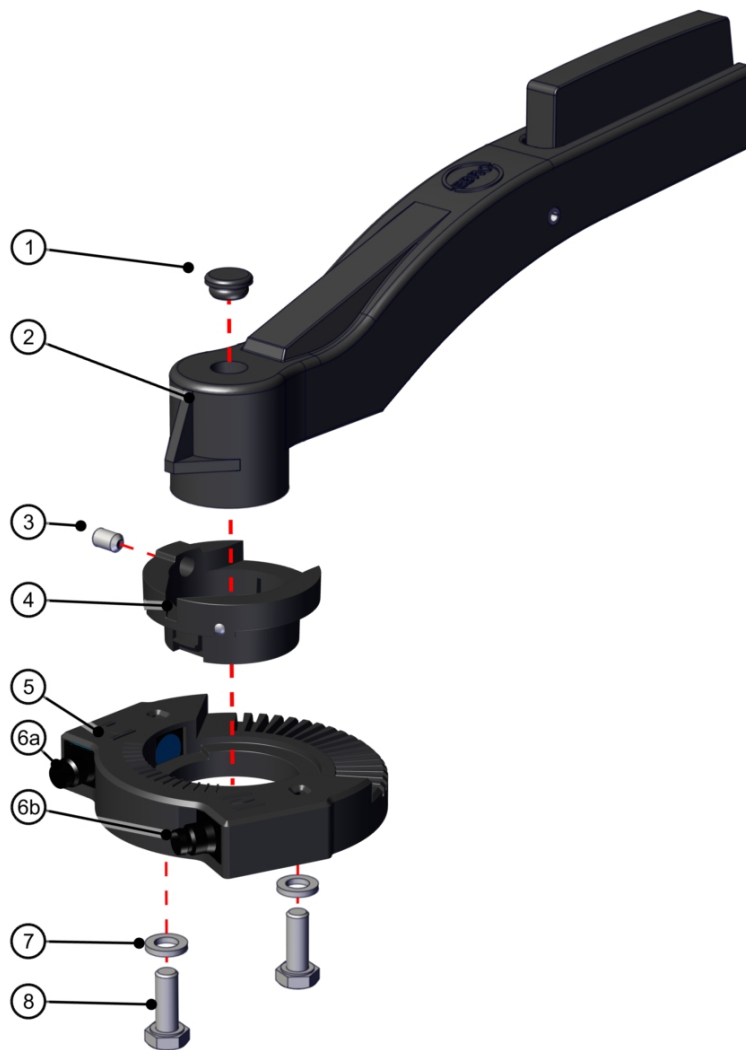


Fig. 5: Bill of materials

Item	Naming	Piece	Material group	Material no.
1	Covering cap	1		
2	Locking lever	1	Aluminum	G-ALSi9Cu3
3	Threaded pin	1	Steel	
4	Actuator ring	1	Polyamide	PA12
5	Sensor locking disc	1	Polyamide	PA12
6a	Inductive proximity switch "CLOSED"	1/2		
6b	Inductive proximity switch "OPEN"			
7	Washer	2	Steel	
8	Screw	2	Steel	

Tab. 12: Bill of materials sensor locking lever

8 DECOMMISSIONING/DISASSEMBLY

Wear personal protective equipment!



NOTICE



Also observe chapter "Target groups".

For extended deactivation:

- Protect the sensor locking lever from soiling and dust.
Also observe the general rules for storage, transport, and assembly in the chapter "Transport and assembly".
- Check the sensor locking lever for damage and function at recommissioning.

For permanent decommissioning:

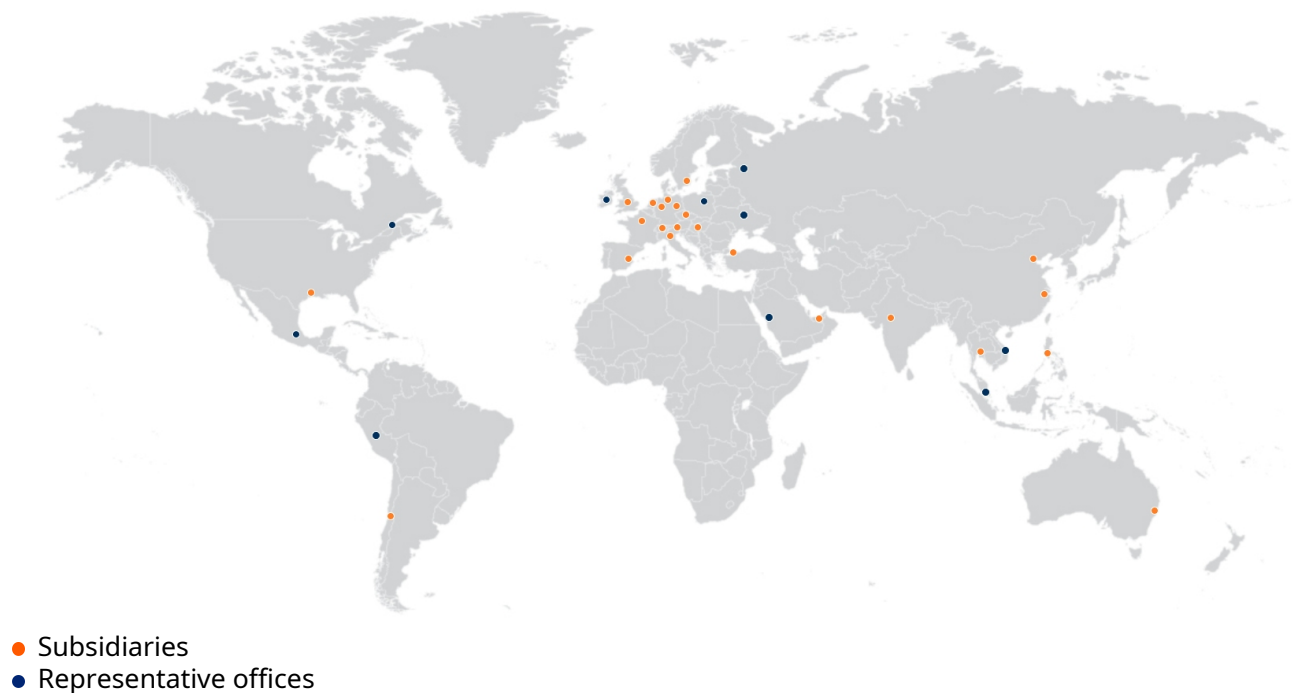
- Dispose of the components in an environmentally friendly and professional manner in accordance with local regulations.
- Look out for oily residues in actuators and bearings.

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

For disposal of the individual parts in accordance with type, refer to chapter "Bill of materials".

THE WORLD OF EBRO ARMATUREN

Our international network



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.

EBRO ARMATUREN
Gebr. Bröer GmbH

Karlstraße 8
D-58135 Hagen

☎ +49 (0)2331 / 904 - 0
✉ post@ebro-armaturen.com

A company of the Bröer Group



You can find current addresses at
www.ebro-armaturen.com