

Switch box type SBU-xx0x-...



Translation of the assembly instructions with operating instructions and technical appendix

In accordance with EU Low Voltage Directive 2014/35/EU
In accordance with EU Electromagnetic Compatibility Directive 2014/30/EU
In accordance with EC Machinery Directive 2006/42/EC

Language version: English

Contents

	Page
A) GENERAL	3
A1 EXPLANATION OF SYMBOLS	3
A2 CORRECT USE	3
A3 LABELLING OF THE SWITCH BOX	4
A4 INSTALLED COMPONENTS	4
A5 CABLE GLANDS	4
A6 TRANSPORT AND STORAGE FOR UPGRADE OR REPLACEMENT	4
B) ASSEMBLY AND COMMISSIONING	4
B1 SAFETY INSTRUCTIONS FOR COMMISSIONING	5
B2 PREREQUISITES FOR ASSEMBLY/DISASSEMBLY	5
B3 WORKING STEPS DURING ASSEMBLY	5
B4 COMMISSIONING	5
C) OPERATING INSTRUCTIONS	6
C1 SAFETY INSTRUCTIONS FOR OPERATION AND MAINTENANCE	6
C2 AUTOMATIC OPERATION	6
C3 TROUBLESHOOTING	6
D) TECHNICAL APPENDIX/PLANNING DOCUMENTS	7
D1 TECHNICAL SPECIFICATIONS OF THE SWITCH BOX	7
D2 TERMINAL DIAGRAM	7
D3 DATA SHEETS FOR TYPICAL POSITION DETECTORS	7
D4 DIMENSIONAL DRAWINGS	7
DECLARATION OF CONFORMITY WITH EC DIRECTIVES	8

Additional information and up-to-date addresses for our offices and trading partners can be found here:




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A) General

A1 Explanation of symbols

In this operating manual, notes are marked with the following symbols:

 xxxxx	<p>Danger/ Caution/ Warning ... indicates a dangerous situation that could lead to death or severe injury and/or damage to the piping system.</p>
	<p>Note ... indicates an instruction that should be obeyed without fail.</p>
	<p>Information ... indicates useful tips and recommendations.</p>

Ignoring these notes, cautions and warnings could result in danger and the manufacturer's warranty may become void.

A2 Correct use

The SBU switch box is used in conjunction with pneumatic rotary actuators for operating valves. It is used to signal the states "on/off" after having been fitted to a valve. The switch box is equipped with proximity switches or mechanical limit switches depending on the customer's specifications – terminal diagrams for typical position indicators can be found in Appendix D.

Connection terminals are provided for wiring a solenoid valve coil.

Optionally, it is possible to provide connection terminals for wiring a second solenoid valve, as well as a third position sensor.

The switch boxes and their components correspond to the relevant standards EN 60947-5-2 and EN 60947-5-6. See D1

The mechanical adaptation of the pneumatic actuator is to be made directly at the connection point for position controllers and signal devices in accordance with VDI/VDE 3845 using the hole pattern 80 x 30 mm and a 30 mm shaft height (\varnothing_{\max} 30 mm). Attachment sets in accordance with VDI/VDE 3845 with various console dimensions are available for other fitments – see the dimensional data sheet in Appendix D3.

The switch box may not be operated until the following documents have been observed:

- <Manufacturer declaration on EC guidelines>.
- These assembly/operating instructions, which are supplied with the product.

The switch box is not to be used in an environment that is susceptible to ☉.

Failure to comply with this <correct use> represents gross negligence and releases the manufacturer, EBRO-Armaturen, from any product liability.

A3 Labelling of the switch box

Every switch box is labelled with the following data on its housing or type plate:

For	Labelling	Remarks
Manufacturer	EBRO Armaturen	Address see page 2 <further information>
Valve type	e.g. SBU-M203-K211-M01	(Casing labelling) see overview in Section D3
Conformity	CE	Conformity with the Machinery Directive 2006/42/EC
IP protection class	e.g. IP67	Protection class of the electrical equipment
Permitted temp.	T (and value)	Numerical values for operational limits
Permitted U	U (and value)	Numerical values for operational limits
Max. permitted I	I (and value)	Numerical value for upper operational limit
Item no.	e.g. 4182647	EBRO item number

The type plate should not be covered so that the installed switch box remains identifiable.

A4 Installed components

The switch box is equipped with position detectors in accordance with the customer's requirements.

Any customisation of the switch box is only permissible after consultation with the manufacturer. The assembly instructions and safety instructions supplied by the manufacturer of these components are to be observed.

A5 Cable glands


When connecting cables and wires to operating equipment, cable glands must be used that are suitable for the respective type of cable/wire. They must include a suitable sealing element in order to ensure that at least protection class IP 67 is maintained for the control system. Metallic cable glands must be earthed.

Bore holes for cable glands that are not required must be closed with sealing plugs.



A6 Transport and storage for upgrade or replacement

During storage and transport, the switch box should be kept in the factory packaging and not unpacked until directly before its assembly onto the pneumatic rotary actuator.

B) Assembly and commissioning



	<p><i>These instructions contain safety instructions for foreseeable risks during the assembly/connection of the switch box to a control system.</i></p> <p>It is the user's responsibility to supplement these instructions for other risks specifically linked to the location. It is assumed that all requirements for this system have been complied with.</p>
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B1 Safety instructions for commissioning

	<ul style="list-style-type: none"> The assembly of the switch box onto the valve and connection to the user's control system may only be carried out by qualified personnel. For the purposes of this manual, qualified personnel are persons who, on the basis of their training, specialist knowledge and professional experience, can correctly assess and execute the work assigned to them and can identify and avoid potential risks.
	<ul style="list-style-type: none"> The function of a fitted switch box must comply with the <Correct use>, which is described in Section A2. The conditions of use must comply with the specifications labelled on the switch box type plate.

B2 Prerequisites for assembly/disassembly

- Ensure that only those switch boxes are fitted that comply with the conditions of use. See the corresponding labelling on the type plate (Section A4).
- The specifications on the type plates are to be observed. Further technical information about the switch boxes can be found in the sources given in Section A6 and on the product.
- Any upgrades to the components may only be carried out after consultation with the manufacturer. The wire connection is to be completed carefully so that the individual strands are not damaged.
- When connecting multiple or fine gauge wires, the wire ends need to be prepared.

	The attachment of wire-end sleeves must always be carried out with the appropriate crimpers to ensure a consistent quality of compression. All terminal connections, including those that are not in use, are to be firmly tightened.
	The screw connection to the valve must be secured against working loose.

B3 Working steps during assembly

- Inspect the switch box for transport damage. Damaged switch boxes must not be installed.
- For casings set up outdoors, special measures are to be taken, where necessary, to ensure correct operation. This includes, for example, using protective rain covers or, if required, protective casings with a sufficient protection class.
- Connection to the user-side control must be made in accordance with the planners/ user's specifications. Terminal plans are affixed to the cover of the switch box.
- Any identifiable system malfunctions must be resolved before commissioning See also Section C3 <Troubleshooting>.

B4 Commissioning


- The equipment should only be operated in an undamaged and clean state.
- All electrical connections to user-side control systems should be checked by a qualified electrician before putting into operation.

C) Operating instructions



In accordance with the provisions of Directive 2006/42/EC, the planner of the system must draw up a comprehensive risk analysis.

To this end, the manufacturer EBRO Armaturen provides the following documentation:

- these mounting and operating instructions,
- the declaration on EC Directives included at the beginning.

	<p><i>These instructions include safety notices for foreseeable risks arising when using the switch box in industrial applications.</i></p> <p>It is the planner's/operator's responsibility to supplement these instructions for other risks specifically linked to the system.</p>
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C1 **Safety instructions for operation and maintenance**

  Danger	<ul style="list-style-type: none"> • The function of a switch box must comply with the <Correct use>, which is described in Section A2. • The conditions of use must comply with the specifications shown on the switch box type plate. • All necessary maintenance work to be carried out on the switch box is to be completed by qualified personnel only. For the purposes of this manual, qualified personnel are persons who, on the basis of their training, specialist knowledge and professional experience, can correctly assess and execute the work assigned to them and can identify and avoid potential risks. • The operator of an electrical system is required to maintain the equipment properly, operate the equipment properly, to monitor it and carry out maintenance and repairs. • The specified safety regulations are to be observed during any maintenance or repair work.
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C2 **Automatic operation**

If the switch box is connected to the user's control system as described in Section B then no further action is required. Section C1 <Safety instructions> is to be observed.

Maintenance: At suitable intervals, check whether the screw connections to the valve are OK.

C3 **Troubleshooting**

Type of problem	Countermeasure
Malfunction of electrical components and/or (feed) lines	If malfunctions in the electrical connections in/at the terminal box or its components are diagnosed these are to be corrected – in compliance with the information in Section D <Planning documents> – by qualified personnel.

D) Technical appendix/planning documents

D1 Technical specifications of the switch box

The switch boxes correspond to the standards EN 60947-5-2 and EN 60947-5-6 and have been developed, manufactured and inspected in accordance with EN ISO 9001 and EN 60 999.

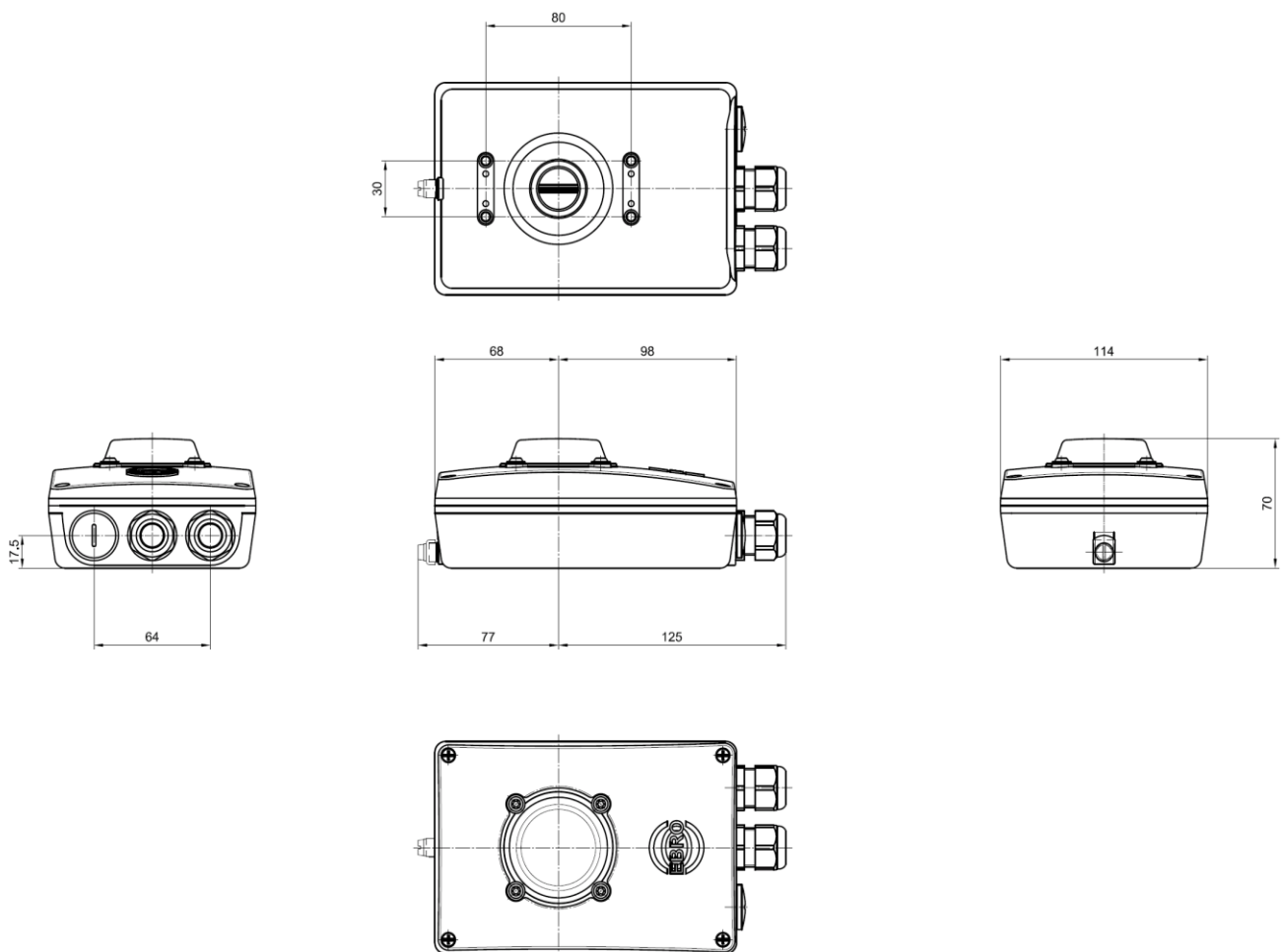
D2 Terminal diagram

The relevant terminal diagram is affixed to the cover of every switch box. The relevant terminal diagram is provided as a separate document.

D3 Data sheets for typical position detectors

The relevant data sheet for the position detector is available as a separate document in the appendix.

D4 Dimensional drawings



Declaration in accordance with EC Directives

KE_SBU01

Rev01/2017-02/AF

The manufacturer

EBRO Armaturen

Gebr. Bröer GmbH
Karlstrasse 8
58135 Hagen
Deutschland



Declares that the switchbox unit
series SBU-XX0X-XXXX-XX

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

- | | |
|-----------------------|---|
| EN 60947-5-2 :2014-01 | Low-voltage switchgear and controlgear - Part 5-2: Control circuit devices and switching elements - Proximity switches (IEC 60947-5-2:2007 + A1:2012) |
| EN 60947-5-6 :2000-12 | Low-voltage switchgear and controlgear - Part 5-6: Control circuit devices and switching elements, DC interface for proximity sensors and switching amplifiers (NAMUR) (IEC 60947-5-6:1999) |
| EN 12100 :2011-03 | Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010) |

The following product documents are available:

Planning documents, technical data sheets, catalogue pages

These products conform to the following directives:

**Low-voltage directive 2014/35/EU
Electromagnetic compatibility 2014/30/EU (EMC)
Machinery Directive 2006/42/EC**

1. The products are an "incomplete machine" in the sense of article 2 g) of this directive
2. The table overleaf lists whether and how the requirements of this directive are fulfilled
3. This declaration is the mounting declaration in the sense of this directive

For conformity with the above- named directives, the following apply:

1. The user must comply with the <correct use> as defined in the "Original mounting and operating instructions" (BA SBU) included in the delivery and must follow all notices in these instructions. Failure to comply with these instructions can – in serious cases – release the manufacturer from product liability.
2. Commissioning of the Limit Switches Box is not permitted until conformity of the system in which the Limit Switches Box is installed with all the above- mentioned EU directives is declared by the person responsible. A specific declaration is included in delivery for the above - named actuator.

Hagen, February 2017

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