

## Switch Box Types NSK and MSK



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## Installation-Instructions with Operating Instructions and Technical Annex

**in accordance with EC Directive Low Voltage Directive 73/23/EEC**  
**in accordance with EC Directive Electromagnetic Compatibility 89/336/EEC**

English Version

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More information and current addresses of our branch offices and resellers can be found under:

[www.ebro-armaturen.com](http://www.ebro-armaturen.com)

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## A) General

### A1 *Explanation of symbols*

Notes in these instructions are indicated by symbols:

 xxxxx	<p><b>Hazard / Caution / Warning</b>                  ... draws attention to a dangerous situation that may cause death or serious injuries to persons and/or damage to the piping system.</p>
	<p><b>Note</b>                  ... draws attention to an imperative instruction.</p>
	<p><b>Information</b>                  ... provides useful tips and recommendations</p>

If these notes, cautions and warnings are not followed, hazards may result and the manufacturer's guarantee may become void.

### A2 *Intended use*

Switch box type NSK / MSK is used in conjunction with pneumatic actuators for valves. It serves signal detection indicating the "Open / Closed" state following attachment to a valve.

The switch box is fitted with initiators or mechanical limit switches according to the customer's specifications – for terminal diagrams of typical position detectors see Annex D2.


To wire up the solenoid valve connection terminals can be fitted afterwards at the customer's request.

The switch boxes and their components conform to the relevant standards EN 60079-0, EN 60079-1, EN 60079-7, IEC 60079-11, EN 60079-18, prEN 61241-0 and EN 61241-1. See D1.

For mechanical connection to the pneumatic actuator there are mounting kits to VDI/VDE 3845 available with various bracket dimensions - see dimension sheet in Annex D3.

The switch box may only be put into operation after compliance with the following documents:

- <Manufacturer's declaration on EC Directives>,
- these assembly / operating instructions that are enclosed with the delivery.

Use of the switch box in a  potentially explosive atmosphere is not permitted.

***Non-compliance with this <Intended use> constitutes gross negligence and relieves the manufacturer, EBRO-Armaturen, of its product liability.***

### A3 Marking of the switch box

Every Ex switch box bears the following data on the enclosure or rating plate:

For	Marking	Remark
Manufacturer	<b>EBRO Armaturen</b>	For address see page 2 <Further information>
Valve type	e.g. MSK04	(Enclosure marks) see overview in section D3
Conformity	<b>CE</b>	Conformity with Pressure Equipment Directive 97/23EC
Code	<b>0032</b>	"Notified body" in accordance with EU Directive
SN (serial no.)	e.g. <b>037574/08</b>	Digits 1-6: consecutive no., digits 7-8: year
max. perm. U	<b>UN max (and numerical value)</b>	Numerical values for upper operating limit
max. perm. I	<b>I<sub>max</sub> (and numerical value)</b>	Numerical values for upper operating limit

\*) **Note:** The year of manufacture is coded in the serial no.

The rating plate should not be covered so that the installed valve remains identifiable.

### A4 Installed components

The switch box is fitted with position indicators according to the customer's specifications.

Extensions to the switch box are only permitted in agreement with the manufacturer. Assembly instructions and safety instructions issued by the manufacturer of the components must be observed.

### A5 Cable entries

When connecting cables and leads to equipment it is necessary to use entries which are suitable for the respective types of cable and lead. They must contain a suitable sealing component to ensure that the control system is provided with at least IP 54 protection. Metal lead entries must be connected to the earthing system.


Any drillholes not required for cable entries must be closed off with plugs certified as being explosion-proof.

When connecting cables and leads to equipment for use in Zones 21 and 22 the minimum IP 65 protection required must remain intact.



### A6 Transport and storage

For storage and transport the switch box must be left in the factory packaging and only unpacked just before installation in the pipe section.

## **B) Assembly and commissioning**



	<p><i>This set of instructions contains safety instructions for foreseeable risks when mounting / connecting up the switch box in a control system.</i></p> <p>It is the user's responsibility to complete these instructions for other specifically local risks. It is assumed that all the requirements for the system are met.</p>
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### **B1 Safety instructions for commissioning**

	<ul style="list-style-type: none"> <li>• Mounting the switch box on the valve and connection to the user's control system may only be performed by qualified staff. Qualified staff, as defined by these instructions, are persons who, on account of their training, special knowledge and professional experience, are able to correctly assess and perform the work entrusted to them as well as recognise and eliminate potential hazards.</li> </ul>
	<ul style="list-style-type: none"> <li>• The function of a fitted switch box must agree with the &lt;Intended use&gt; which is described in section A2. Operating conditions must match the markings on the rating plate of the switch box.</li> </ul>

### **B2 Basic requirements for assembly / dismantling**

- Make sure that only switch boxes are installed whose explosion protection class matches the operating conditions. See the relevant marking on the rating plate (*section A4*).
- The information on the rating plates and on the EC Type Test Certificate must be observed. More technical information about the switch boxes can be obtained from the sources in section A6 and is indicated on the product.
- Components may only be retrofitted in agreement with the manufacturer taking the EC Type Test Certificate into consideration. Conductors must be connected carefully in such a way that the single wires are not damaged.
- When connecting multi-wire or flexible conductors the ends of the conductors must be prepared.

	Attachment of wire end ferrules must always be performed using suitable crimping tools in order to achieve a consistent quality of crimp. All terminals, including ones which are not being used, must be tightened up.
	Screw connections to the valve must be locked to prevent them from coming loose.

### **B3 Installation procedure**

- Examine switch boxes for any damage in transit. Damaged switch boxes must not be installed.
- For enclosures set up outdoors it may be necessary to take precautions which ensure operation conforming to the intended use. These include, for example, rain canopies, and if necessary, outer enclosures with an adequate degree of protection.
- Connection to the user's control system must be performed according to the planner's/user's instructions.  
Terminal diagrams are stuck into the lid of the switch box.

- It is essential that any detectable malfunctions be remedied prior to commissioning. See also section C3 <Troubleshooting>.

#### **B4 Initial commissioning**


- The equipment may only be operated if it is undamaged and clean.
- All electrical connections to the user's control system must be subjected to testing by an electrician before being put into operation for the first time.

## C) Operating instructions



According to Directive 2006/42/EC the planner of the system must conduct a comprehensive risk analysis.

For this purpose the manufacturer, EBRO Armaturen, makes the following documents available:

- these Installation and Operating Instructions,
- the Declaration on EC Directives, enclosed at the beginning.

	<p><i>This set of instructions contains safety instructions for foreseeable risks in using the switch box in industrial applications.</i></p> <p>It is the responsibility of the planner/user to complete these instructions for other, specifically system-related risks.</p>
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### C1 **Safety instructions for operation and maintenance**

  <b>Hazard</b>	<ul style="list-style-type: none"> <li>• The function of a switch box must agree with the &lt;Intended use&gt;, which is described in section A2.</li> <li>• Operating conditions must match the markings on the rating plate of the switch box.</li> <li>• Any work necessary on the switch box may only be performed by qualified staff. Qualified staff, as defined by these instructions, are persons who, on account of their training, special knowledge and professional experience, are able to correctly assess and perform the work entrusted to them as well as recognise and eliminate potential hazards.</li> <li>• The user of an electrical system in a potentially explosive atmosphere must keep the equipment in a proper condition, operate and monitor it properly and perform maintenance and repair work.</li> <li>• When performing maintenance and/or remedying faults, the safety regulations indicated must be observed.</li> </ul>
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### C2 **Automatic mode**

If the switch box has been connected up to the user's control system in accordance with section B, no further measures are required. Section C1 <Safety instructions> must be observed.

**Maintenance:** At suitable intervals check to make sure that screw connections to the valve are OK.

### C3 **Troubleshooting**

Type of fault	Remedy
Fault in electrical components and/or (supply) cables	If faults are diagnosed on the electrical connections in/on the terminal box or its components, they must be remedied by qualified staff in compliance with the information in section D <Planning documents>.

## **D) Technical annex / planning documents**

### ***D1 Technical specification of the switch box***

The switch boxes meet standards EN 60079-0, EN 60079-1, EN 60079-7, IEC 60079-11, EN 60079-18 prEN 61241-0 and EN 61241-1 and were developed, manufactured and tested in accordance with EN ISO 9001 and EN 60 999.

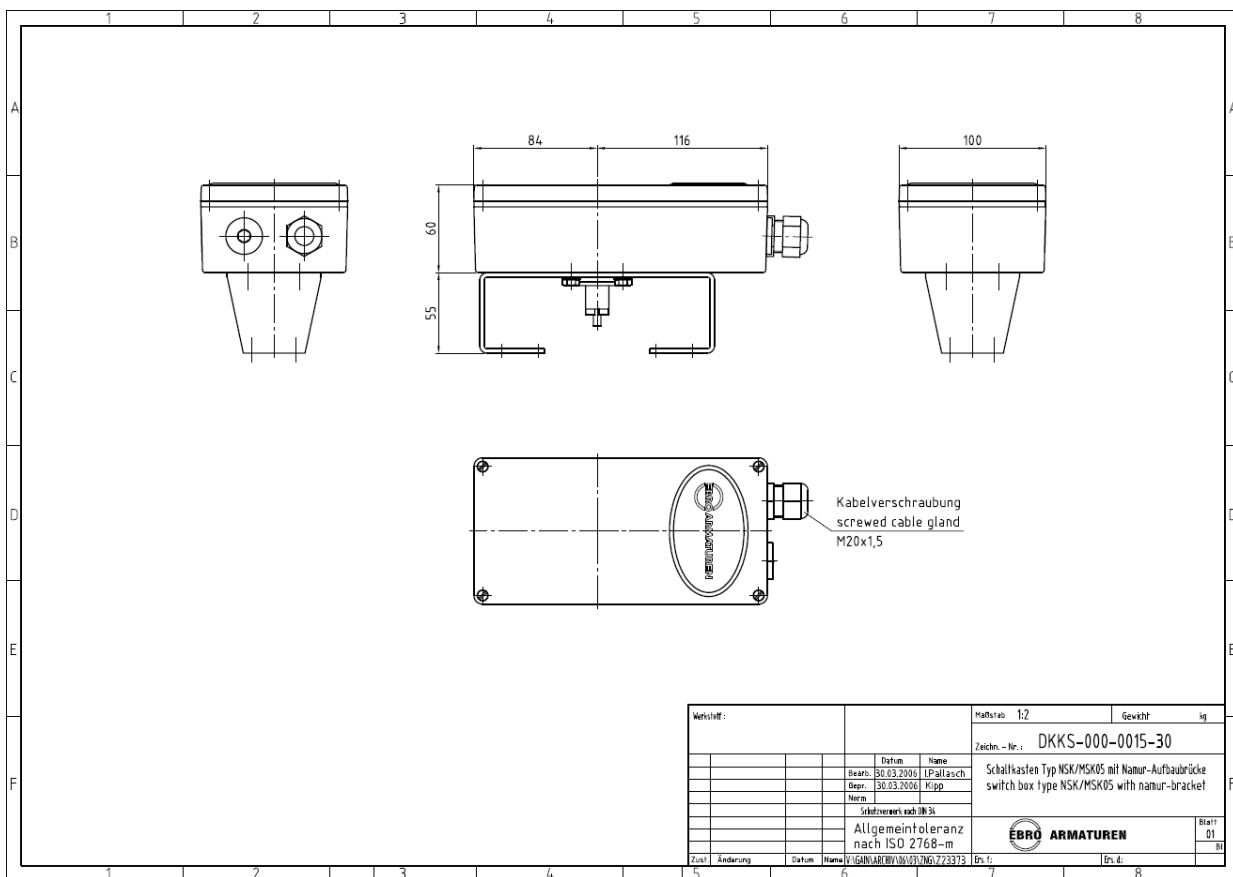
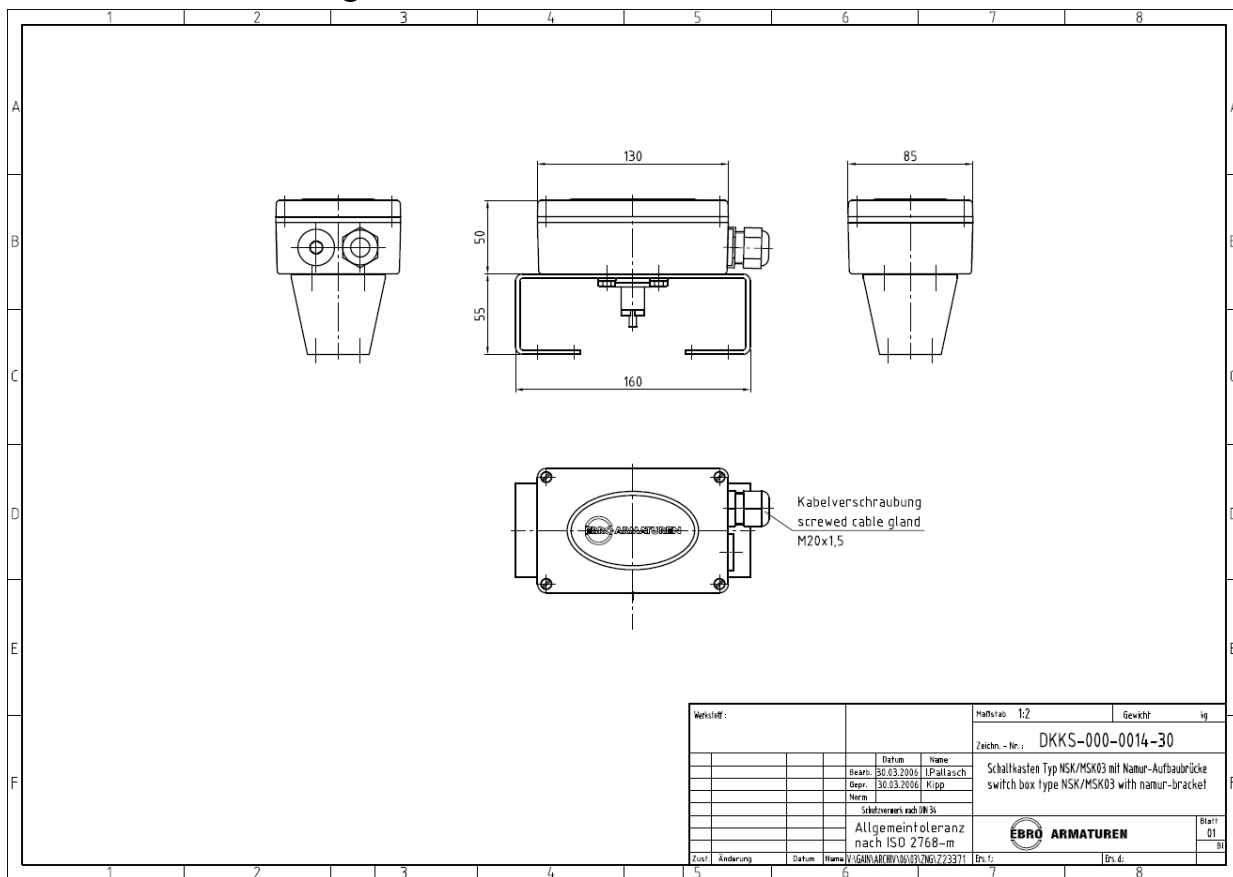
### ***D2 Terminal diagram***

The valid terminal diagram is stuck into the lid of each switch box.  
The valid terminal diagram is annexed as a separate document.

### ***D3 Data sheets of typical position indicators***

The valid data sheet of the position indicator is annexed as a separate document.

**D4 Dimensional drawings**



## Declaration in compliance with EU-Directives

The manufacturer

**EBRO Armaturen**

**Gebr. Bröer GmbH  
Karlstrasse 8  
58135 Hagen  
Deutschland**

declares that the products

**Limiting values transmitter for quarter turn actuators**

**Type: MSK03 / MSK04 / MSK 05 / MSK 06  
NSK 03/ NSK 04 / NSK 05 / NSK 06**

in accordance with the requirements of the following standards:

**EN 60947-5-2**

**Low-voltage switchgear and controlgear**

**EN 60947-5-6**

Product documents are available on the following:

**Planning documentation, Technical datasheets, catalogue pages**

These products comply with the following directives:

**73/23/EEC**

**Directive Low Voltage Directive**

**89/336/EWG**

**Electromagnetic compatibility (EMC)**

Hagen, 4.12.2009

  
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Dirk Mischnick, Managing Director