Pneumatic linear actuators

Supplementary ATEX operating instructions BA 6.4 – ATEX/MRL



Explosion Protection Directive 2014/34/EU

Product: **Pneumatic linear actuators**

Type: **Double-acting**

Series: **SCxxx-xxx**

Area of application:	Group II Equipment category 2GD	
Applicable in zones	1 and 2	Gases and vapours
	21 and 22	Dust

These instructions, which supplement the standard operating instructions, are intended to support and instruct users in the operation and maintenance of EBRO **SC** series pneumatic actuators in potentially Ex atmospheres.

This is in accordance with Directive 2014/34/EU, Annex VIII of the European Parliament and of the Council, dated 26 February 2014.

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Explosion Protection Directive 2014/34/EU

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1. General

These supplementary ATEX operating instructions provide additional information on the use of EBRO pneumatic actuators in potentially explosive atmospheres.

Before commissioning, read these operating instructions carefully and follow all notes.

The user is responsible for complying with regulations on operational safety, explosion protection and occupational safety.

All regulations concerning explosion protection and occupational safety must be observed.

2. Explanation of symbols

In these operating instructions, notes are indicated by the following symbols:

 ***xxxxxxx***	**Danger/warning** ... indicates an imminently dangerous situation which could cause fatal or serious injury if ignored.
	**Note** ... indicates an instruction which must be strictly observed.
	**Information** ... offers useful tips and recommendations.
 **operation**	The following safety instructions for explosion protection must be strictly observed. Failure to observe the hazard warnings and "Intended use" section may result in a risk to persons, equipment and plant, and may void the manufacturer's warranty. If you have any questions, please contact the manufacturer. See the last section for addresses.

3. Intended use

Pneumatic linear actuators, type SCxxx-xxx, are intended to be used:

with a gaseous control medium (usually compressed air) with a control pressure according to the type plate,

under ambient conditions, between -20 °C and +80 °C (standard), or between -40 °C and +120 °C (special designs),

to actuate gate valves with a specific stroke to the positions "OPEN", "CLOSED" or intermediate positions.

The actuating force and characteristic curve of the actuator – see technical appendix/catalogue page – must be adjusted to the gate valve.

The quality of the compressed air should comply with ISO 8573-1, Class 3. The compressed air must be lightly oiled for switching cycles > 4x/min.

If the compressed air has a relatively high humidity level, the compression within the cylinder will increase the dew point temperature. For this reason, we recommend the use of dried compressed air to operate the linear actuator.

Solenoid valves usually require a filter with a mesh size of 40 µm (ISO 8573-1, Class 5).

Atmospheric ambient conditions apply for use in ATEX areas. The ambient temperature is limited to between -20 °C and +60 °C according to EN ISO 80079-36:2016, identified with X. Deviations must be assessed by the user.

The actuator must not be commissioned until the following documents have been observed:

- the "declarations of conformity with EC directives" included with the delivery
- product datasheets
- installation instructions BA 6.4_SC – MRL

The safety instructions in the installation instructions BA 6.4_SC – MRL in sections B1 and C1 must be observed when assembling and operating the actuator.

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*1 If media other than compressed air are used, please contact our customer service department before use.

operation	**Safety instructions for operation in a potentially explosive atmosphere:** • **The pneumatic linear actuator is suitable and identified for use in equipment category 2 GD.** • **When used in potentially explosive atmospheres in zones 1 and 2 or 21 and 22, the user must strictly observe the instructions identified with operation. Use in hybrid mixtures is not permitted.** • **The user must ensure that the compressed air is drawn from a non-potentially explosive atmosphere.**

In potentially explosive atmospheres, the actuator must not be commissioned until these supplementary ATEX operating instructions and the following additional documents have been observed:

- **Installation instructions BA 6.4_SC – MRL!**

The safety instructions must be observed when assembling and operating the actuator.

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Note 1:

These instructions apply together with the instructions for the gate valve on which the actuator is mounted. The instructions for the gate valve must be observed.

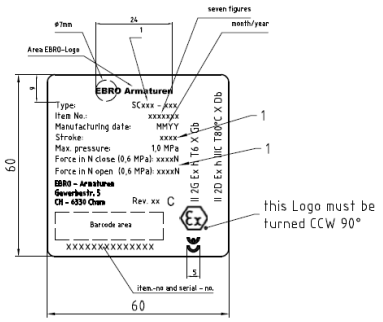
Note 2:

The user is responsible for assigning each individually supplied actuator to a gate valve.

4. Actuator identification

Each actuator is identified by a standard type plate:

See installation instructions BA 6.4_SC – MRL.



The Ex identification is attached to the type plate:

The surface temperature does not depend on the actuator itself but on the operating conditions (medium, compressed air, atmosphere). The max. surface temperature is specified as temperature class **T6** and temperature range **T80 °C**. This must not be exceeded.

The type plate on the actuator housing must not be painted or covered, so that the actuator remains identifiable.

Please state the type designation and serial number when contacting the EBRO sales or service department.

Danger	Exceeding the maximum pressure and/or surface temperature specified on the type plate will create a hazard during subsequent operation.

5. Assembly, installation and disassembly

5.1. Mounting the actuator on the gate valve and connecting additional modules

	These instructions contain safety instructions for foreseeable risks when mounting the actuator on a gate valve. It is the user's responsibility to add further instructions for other risks which are typically associated with gate valves. All requirements for this system must be observed.

The connection of any additional electrical/electro-pneumatic modules supplied with the unit is described in the documentation provided. These documents apply in addition to these instructions and must be observed. The suitability for use in potentially explosive atmospheres must be checked and assessed by the user prior to use.

operation	**The actuator must be included in the system's equipotential bonding.**

5.2 Safety instructions for assembly and connection

operation	**Additional safety instructions for installation in a potentially explosive atmosphere:** • During installation and commissioning, the relevant occupational safety guidelines must be observed by fully qualified personnel (see installation instructions BA 6.4_SC – MRL, section B1). • Ensure that the actuator is permanently earthed in accordance with local regulations. • Ensure that both the ambient temperature and the temperature of the supply air are limited to ≤ 60 °C. • The actuator housing is constructed from light metal. To prevent ignition sparks when installing in a potentially explosive atmosphere, avoid any shock or impact to the housing – especially with oxidised steel tools. • Impact speed < 1 m/s • Impact energy < 500 J • The user must assess whether actuator pipework consisting of plastic hose for the compressed air supply could pose an ignition risk. • There must be no strong charge-generating processes.

5.3. If required: connecting additional electrical/pneumatic modules

If such modules are connected to the compressed air supply and/or the control unit, the instructions supplied by the component manufacturer must be observed.

operation	**Additional safety instructions for installation in a potentially explosive atmosphere:** Each additional electrical module must have the necessary Ex protection and be identified accordingly.

5.4 Test run: test steps to complete assembly and connection

operation	**Additional safety instructions for test runs in a potentially explosive atmosphere:** • Check that the actuator is permanently earthed in accordance with regulations. • Check that the actuator and each additional **electrical** module has the necessary Ex protection and is identified accordingly.

5.5 Additional information: disassembling the actuator

operation	**Additional safety instructions for disassembly in a potentially explosive atmosphere:** • Disconnect the power supply from all sources. • Reduce the potentially explosive atmosphere. • The actuator housing is constructed from light metal. To prevent ignition sparks when disassembling in a potentially explosive atmosphere, avoid any shock or impact to the housing – especially with oxidised steel tools. • Impact speed < 1 m/s • Impact energy < 500 J • The use of suitable austenitic steel tools is highly recommended. • There must be no strong charge-generating processes.

5.6 Safety instructions for operation

	• The function of a pneumatic actuator mounted on a gate valve must comply with its "Intended use". • The operating conditions must correspond to the identification on the actuator type plate. • The actuator must only be operated under atmospheric conditions (see "Intended use" section). • All work on the actuator must only be carried out by fully qualified personnel. For the purposes of these instructions, "fully qualified" refers to persons who, on the basis of their training, expertise and professional experience, are able to correctly assess the work assigned to them, carry it out correctly and identify and eliminate possible risks.
 **Crushing hazard!**	An actuator mounted on a gate valve may only be activated as long as the gate valve is enclosed on both sides by a section of pipe or apparatus – any other activation prior to this creates a crushing hazard and is the sole responsibility of the user.

5.7 Automatic operation/manual operation

When the actuator is correctly connected, it operates automatically via the control unit and is designed for continuous operation.

	• To function properly in pneumatic operation, the actuator requires a permanent supply of compressed air.

5.8 Use in a potentially Ex atmosphere

Prior to and during operation in potentially explosive atmospheres in ATEX zones 1 and 2 or 21 and 22, the user must strictly observe the following notes and have taken the following measures:

- The additional safety instructions for operation in potentially explosive atmospheres of the above zones. The actuator is **not** approved for use with hybrid mixtures.
- The warnings must be observed during installation.
- The compressed air should be lightly oiled to prevent functional parts in the actuator running dry.

- The atmosphere **–** in particular the medium in the gate valve on which the actuator is mounted **–** must not emit any heat radiation which would heat the actuator to above 60 °C in continuous operation.
  If necessary, appropriate measures must be taken on site to provide thermal insulation or to shield the actuator from overheating and direct insolation. If thermal insulation is applied between the actuator and gate valve, the electrostatic charge must be diverted away from the actuator by earthing.
- Sufficient ventilation must be provided by cool air.
- When used in potentially explosive atmospheres, dust layers > 1 mm must be removed immediately.
- Operating temperatures below -20 °C are not permissible in order to prevent embrittlement (and thus functional failure of the plastic parts in the cylinder).
- To prevent an ignitable brush discharge on the non-conductive paint coating, the thickness of the applied paint layer is < 0.2 mm, which does not present any risk in the case of static charge.
- If a further coat of paint is applied, the thickness of the layer must not exceed the permissible layer thickness of 0.2 mm.

Depending on the frequency of actuation, check at least every 2 - 4 weeks that:
- in a pipe section with a medium > 60 °C, the actuator does not exceed 60 °C (on the actuator housing) through heat transfer. If necessary, provide appropriate **shielding**

- all screw connections between the valve/gate valve and actuator are tightened firmly

- the valve plate (gate valve) moves freely into both end positions

- no control medium (compressed air) escapes from the actuator

6. Maintenance and repair in a potentially explosive atmosphere

The type SC pneumatic actuator requires the following maintenance when operated in potentially explosive atmospheres: The actuator must be inspected at least twice per year; it must be permanently earthed and not covered with a dust layer.

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7. Troubleshooting

The safety instructions in the standard operating instructions must be observed when rectifying faults. Repairs must only be carried out by fully trained personnel.

The tools used must comply with the relevant regulations and be in perfect condition.

operation	**Additional safety instructions for working in a potentially explosive atmosphere:** The actuator housing is constructed from light metal. To prevent ignition sparks when disassembling in a potentially explosive atmosphere, avoid any shock or impact to the housing – especially with oxidised steel tools. The use of austenitic steel tools is highly recommended. If the O-rings (or guide belt) need replacing (see drawing in the standard operating instructions), **they must be made from special conductive material (< 10^4 Ohm)**, to prevent a static charge on the piston/actuator shaft assembly. Only use original spare parts.

8. Solenoid valve

operation	**Additional safety instructions for use in a potentially explosive atmosphere:** The solenoid valve must be suitable for the potentially explosive zone.

9. Further information

Instructions, data sheets, maintenance and installation instructions, as well as further information can be found in the documents download area at **www.ebro-armaturen.com**.

If you have any further questions, you can find a list of national and international contacts at **www.ebro-armaturen.com**.

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