

Safety Instructions for Use in (Potential) Explosive Atmosphere

Section 1: Intended Use

The actuator series have been designed to comply with the explosion safety requirements in the Explosive Atmospheres-standards ISO 80079-36:2016 (1st edition), ISO 80079-37:2016 (1st edition) and IEC 60079-0:2017 (7th edition). These standards contain the requirements for non-electrical equipment in potentially explosive atmospheres.

The actuators comply with the constructional safety type “c” requirements. The actuators are designed for gas group IIB or IIC and dust group IIIC applications and are applicable in temperature classes T6 to T4 depending on model. The Equipment Protection Level is Gb for gas and Db for dust, so the actuators can be used in Explosive Atmospheres classified hazardous zones 1/21.

Section 2: Explosive Atmosphere Marking

Complete Explosive Atmosphere Marking:

Ex h IIB or IIC T6 to T4 Gb

Ex h IIIC T85 °C to T135 °C Db

Ambient Temperature Ranges (T_{amb}):

- Standard Temperature: -29 to 100 °C / -20 to 210 °F
- Low Temperature: -40 to 100 °C / -40 to 210 °F

Notes:

1. The minimum and maximum temperatures can vary according to the project design (gaskets, O-rings and grease used), as well as other certifications within the given range. Please refer to the special conditions for safe use.
2. Hazardous area is likely to occur in normal operation occasionally in greater than 10 and less than 1000 hours/year.

Section 3: Safety Instructions

1. Before the installation, please carefully read the service instructions. Emerson is not responsible for damages caused by operations not complying with the instructions contained in such manuals.
2. All the operations shall be done by a trained and qualified operator. All maintenance operations must be performed in accordance with the instructions detailed in the maintenance manual.
3. The assembly cannot be installed and used in classified areas as zone 0 to 20, mines (group I).
4. The equipment shall be installed in a place where the risk of lightning is covered by the relevant industrial code of practice.
5. Assembly, disassembly and maintenance is only allowed at the actuator, when at the time of the activity, there are no explosive mixtures.
6. During maintenance operations, the user must take all appropriate measures to prevent risks related to the toxicity of substances, using appropriate protective equipment (e.g., gloves, goggles, face mask), according to the extent provided the technical and organizational point of use and the recommendations provided in the specifications of the used substances.
7. All the mechanical components do not have ignition sources during the normal working process. The user shall check periodically the vibration presences and/or abnormal noises and it must stop the unit immediately, check the causes and contact the manufacturer.

8. Actuators do not have an inherent ignition source due to electrostatic discharge, but explosion hazards may be present due to the discharge of static electricity from other valve assembly components.
 - a. To avoid personal injury or property damage, make sure that the valve is grounded to the pipeline before placing the valve assembly into service.
 - b. Use and maintain alternate shaft-to-valve body bonding, such as a shaft-to-body bonding strap assembly.
 - c. The equipment must be earthed through an anti-loosening and anti-rotation device. The user must regularly check the effectiveness of the ground connection.
 - d. A warning is present into the label: “Potential electrostatic charging hazard”.
9. When equipment is installed in a hazardous area location (potentially explosive atmosphere), prevent sparks by proper tool selection and avoiding other types of impact energy.
10. It is the end user’s responsibility to avoid allowing the explosive mixture from entering the actuator. As such, safe air from outside of the Explosive Atmosphere-zone (Safe Area) must be used to feed the pneumatic cylinder.

Note: For single acting actuators, a closed-loop control system is one of the options that can be used to avoid allowing the explosive mixture from entering the actuator.

11. Regularly clean dust deposits from the actuator to minimize the risk of explosion due to dust.
12. Proper care must be taken to avoid generation of static electricity on the non-conductive external surfaces of the equipment (e.g., rubbing of surfaces, etc.).
13. The paint protection must not exceed 200 µm if the actuator is used in a group IIC atmosphere. For group IIA or IIB atmospheres, the paint protection must not exceed a thickness of 2 mm / 0.08 in.
14. After maintenance operations are carried out, perform a few actuator operations to check that its movement is regular and that there is no air/oil leakage through the seals/gaskets.

15. It is under end user responsibility to make sure the electrical equipment installed on the actuators have a separated Explosive Atmosphere evaluation and they are designed according to the Explosive Atmosphere Directive/Regulation, and they are suitable for the installation zone, group of gas, temperature class, maximum surface temperature, EPL and range of temperature.
16. Using this equipment in ways not specified in the instruction manual is not permitted. Emerson is not liable for any damages resulting from improper or hazardous use.

Section 4: Maximum Temperatures

! WARNING

The actuator’s surface temperature is dependent upon process operating conditions. Personal injury or property damage caused by fire or explosion can result if the actuator’s surface temperature exceeds the acceptable temperature for the hazardous area classification. To avoid an increase of instrumentation and/or accessory surface temperature due to process operating conditions, ensure adequate ventilation, shielding or insulation of these actuator components installed in a potentially hazardous or explosive atmosphere.

Table 1. Temperature Range for (Potential) Explosive Areas

Temperature			Valid Actuator Trim
Ambient Range	Explosive Atmosphere Class	TX (Explosive Atmosphere Surface Temperature)	
-29 to +75 °C	T6	T85 °C / T185 °F	Standard Temperature Trim
-29 to +90 °C	T5	T100 °C / T212 °F	
-29 to +100 °C	T4	T110 °C / T212 °F	
-40 to +75 °C	T6	T85 °C / T185 °F	Low Temperature Trim
-40 to +90 °C	T5	T100 °C / T212 °F	
-40 to +100 °C	T4	T110 °C / T212 °F	

Notes:

- The specified values are valid with condition: Maximum cycle frequency of actuator is less than 1 Hz at a maximum of 50 cycles per hour and at maximum load.