Explosion-Proof Electrical Actuator

Description

The explosion-proof electrical actuator electrically operates a total flooding fire suppression system container.

A voltage signal from the fire suppression control and releasing panel activates the explosion-proof electrical actuator. The voltage signal de-energizes the permanent magnet, allowing the spring to push and latch the actuator pin into the fire position. The electrical actuator can be reset using the supplied reset tool (Part No. 454646) when the voltage signal terminates.

The explosion-proof electrical actuator connects to the top of the container discharge valve, between the valve and the manual actuator and is fitted with an internal placement switch to provide a fault indicating supervisory signal at the panel if incorrectly installed.

Installation instructions

Mechanical installation: Before installing the electrical actuator onto the discharge valve ensure the unit is reset in the non-fire position, at a distance from the end of the pin to the actuator base of 4.02 mm to 4.78 mm (0.158 in. to 0.188 in.). Place the electrical actuator on the discharge valve and install until hand-tight. To confirm correct installation, the internal placement switch must be engaged, and the fault indicating supervisory signal shall be clear.

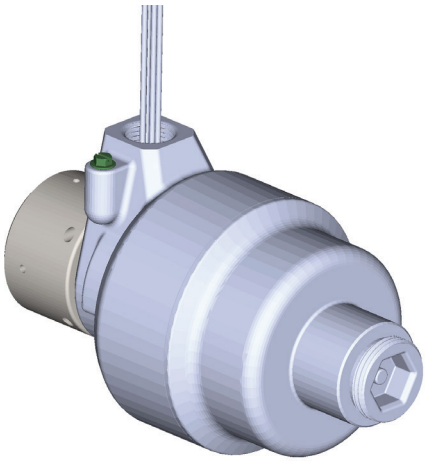
Electrical installation: The electrical actuator is supplied with a 1/2 in. NPT conduit connection. Due to the design of the bridge rectifier, the positive supply from the control panel can be connected to either terminal 1 or 2 with the reverse for the negative supply. The nominal supply is 24 VDC with maximum monitoring current of 30 mA.

Manual actuation: A manual actuator can be installed on the top of the explosion-proof electrical actuator to allow mechanical operation of the system at the container location. Before installing the manual actuator ensure it is reset in the non-fire position. When fitting the manual actuator it is only necessary the actuator to be hand-tight. The manual actuator should be fitted to the explosion-proof electrical actuator before it is fitted to the container valve.

Note: If no additional actuator is fitted to the top of the explosion-proof electrical actuator, the protection cap must remain in place.

Operating instructions

The electrical actuator operates after receiving a 24 VDC nominal voltage signal from the fire suppression control and releasing panel. The electrical actuator latches in the fire position after the signal terminates. The electrical actuator requires a manual reset. Remove the unit from the valve and insert or screw in the reset tool.



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Maintenance instructions

Remove the actuator from the valve assembly. Apply 24 VDC and observe the correct functionality (energized pin position 0.6 mm to 1.01 mm (0.023 in. to 0.040 in.) from the base of the actuator). Terminate the supply voltage and reset the electrical actuator by fitting (screwing in) the reset tool into base. When reset, remove the reset tool, and reinstall on the valve assembly. The explosion-proof electrical actuator is not field repairable. In case of faults or suspected faults contact LPG customer services to organize a replacement.

System operating conditions (temperature range)

The 25 bar SAPPHIRE®, 70 bar SAPPHIRE® PLUS, and 25 bar FM-200™ fire suppression systems are UL Listed and operate under the following temperature ranges:

- 70 bar SAPPHIRE PLUS system: -18 °C to 65 °C (0 °F to 149 °F)*
- 25 bar SAPPHIRE system: -18 °C to 54 °C (0 °F to 130 °F)**
- 25 bar FM-200 system: 0 °C to 54 °C (32 °F to 130 °F)

* For SAPPHIRE PLUS 70 bar systems the temperature range for standard coverage is -18 °C to 50 °C (0 °F to 122 °F). For extended coverage the temperature range is 0 °C to 65 °C (32 °F to 149 °F).

** For SAPPHIRE 25 bar systems the temperature range for standard coverage is -18 °C to 54 °C (0 °F to 130 °F). For extended coverage the temperature range is 0 °C to 54 °C (32 °F to 130 °F).

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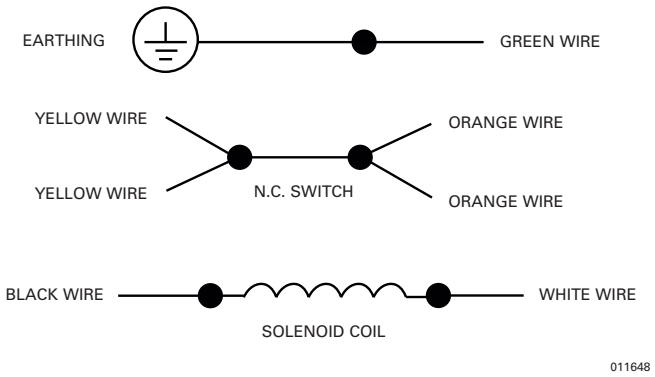
Specification

Electrical actuator part no.	453978
Reset tool part no.	454646
Body	316 or 304 stainless steel, no painted surfaces
Actuation pin	304 stainless steel
Loose nut (threaded swivel)	304 stainless steel
Actuation type	Latching
Reset requirement	Manually via the reset tool
Connection	1 in. BSPP male
Nominal voltage	24 VDC
Current supply	0.5 A
Monitoring current	<30 mA
Electrical connection	1/2 in. NPT female conduit with inbuilt bridge rectifier
Back EMF protection	Bridge rectifier
Placement switch:	Integral to unit
Lead wire	Thermoplastic flexible fixture nylon (TFFN) 6000 V, 90 °C temperature
Minimum duration of trigger signal	1 s
Duty	Continuous
Nominal pin travel	5 mm (0.2 in.)
Firing force	Minimum 180 N at 1.5 mm Stroke or 7.10 mm pin position (Minimum 40.45 lb at 0.059 in. stroke or 0.280 in. pin position)
Manual actuation force	50 N (11.24 lb) minimum
Working temperature range	Various (see system operating conditions)
Life span	25 years
Testing	100% check on start / finish position
Maximum humidity	80% to 90% RH, non-condensing
Enclosure type	Type 4X
Ingress protection class	IP66
Approvals and listings	UL, ATEX and IECEx
Certification	ATEX/IECEx Haz-loc: II 2 G Ex db IIC T5 Gb
	UL Haz-loc: Class I division I groups A, B, C and D, T5 Class I zone 1 AEx db IIC T5 Gb
Method of marking	Laser or engraved
Overall size	182.8 mm x 101.6 mm (L x Dia) (7.20 in. x 4.0 in.)
Weight	5.5 kg (12 lb)

Note: This electrical actuator is designed to be used with the FM-200, SAPPHIRE and SAPPHIRE PLUS fire suppression systems.

Wiring diagram



⚠ WARNING

Failure to reset the actuator prior to fitting onto the container valve results in the immediate operation of the container valve and the potentially hazardous discharge of the container.

⚠ WARNING

To reduce the risk of ignition of hazardous atmospheres, conduit runs must have a sealing fitting connected within 457 mm (18 in.) of the enclosure.

⚠ WARNING

For use in Zone 1 a sealing device must be installed within 50 mm (2 in.) of the enclosure.

⚠ WARNING

Do not repair flameproof joints or attempt to open the actuator. Attempts to open the actuator or repair its components may result in severe or fatal injury or introduce risk of explosion in hazardous environments.

Safety Data Sheets (SDS) are available at www.lpgfiresuppression.com

Note: The converted values in this document are provided for dimensional reference only and do not reflect an actual measurement.

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