

CAUTION !



The applicable place of the product should be based on the nameplate and followed our safety instructions, explosion-proof standards and local relevant specifications. The explosion-proof standards and important notices are not universal.



II 2 GD Ex db IIB T4 Gb, Ex tb IIIC T130°C Db IP68

LE series Explosion-proof Liner Electric Valve Actuator (referred as "actuator"). It is a control device for valves and can be used in the places, where is classified as Zone 1 or Zone 2, contained Group II A and Group II B gases, Zone 21 or Zone 22, contained the combustible dust atmosphere or the mixture circumstance with the explosive gas atmospheres and the combustible dust atmospheres. Temperature group T1-T4.

This product is certified to be used in the following locations:

Atmospheric pressure : 80 - 110 kPa.

Ambient temperature : -30°C to +70°C (-22°F ~+158°F).

Relative humidity : Not more than 95% (+25°C / 77°F).

The actuator can operate normally within tolerated variation of $\pm 10\%$ of rated supply voltage or 1% of rated frequency.



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TD0404XY

Ex db IIB T4 Gb, Ex tb IIIC T130°C Db

LE series Explosion-proof Liner Electric Valve Actuator (referred as "actuator"). It is a control device for valves and can be used in the places, where is classified as Zone 1 or Zone 2, contained Group II A and Group II B gases, Zone 21 or Zone 22, contained the combustible dust atmosphere or the mixture circumstance with the explosive gas atmospheres and the combustible dust atmospheres. Temperature group T1 - T4.

This product is certified to be used in the following locations:

Atmospheric pressure : 80 - 110 kPa.

Ambient temperature : -30°C to +70°C (-22°F to +158°F).

Relative humidity : Not more than 95% (+25°C / 77°F).

The actuator can operate normally within tolerated variation of $\pm 10\%$ of rated supply voltage or 1% of rated frequency.



C US

LE series Explosion-proof Liner Electric Valve Actuator (referred as "actuator"). It is a control device for valves and can be used in following places:

Zone System where is classified as North American Zone 1 or Zone 2 of hazardous location, contains Group II A and Group II B gases and temperature group T1 - T4; or in Zone 21 or Zone 22, contained one or several flammable dusts with the minimum flaming point over 130 °C; or include both above flammable gases and dusts.

This product is certified to be used in the following locations:

Ex db IIB T4 Gb (For Canada)

Ex tb IIIC T130 Db (For Canada)

Type 4X

Class I, Zone 1, AEx db IIB T4 Gb (For US)

Zone 21, AEx tb IIIC T130°C Db (For US)

IP68 (72h, 7m)

Installation Notices

- DO NOT install in ambient temperatures that exceed 70 °C (158 °F).
- DO NOT, under any circumstances, remove the cover of the actuator while in a hazardous location when the power is still live inside the actuator. This could cause ignition in a hazardous atmosphere.
- DO NOT, under any circumstances, use an explosion-proof electric actuator in a hazardous location that does not meet the specification which the actuator was designed for.
- Mount, test, and calibrate actuators in non-hazardous location.
- When handling the actuator, care must be taken not to scratch, scar or deform the flame path of the cover or base of the actuator. That will negate the protection rating of the enclosure in a hazardous location.
- The explosion- proof electric actuator is shipped with mating surfaces of the cover and base. When assembling them, pay attention to the mating number (QA code) to assure the protection rating in a hazardous location.
- Please read operation manual and wiring diagram carefully before installation.
- Verify that supply voltage is in accordance with the data on nameplate to prevent short circuit or electrical/electronic parts damage caused by incorrect power input.
- Turn power off before wiring or maintenance.
- There are grounding devices both inside and outside of the actuator and the ground wires should be connected properly.
- The metal plugs in conduit entries are for transit only. For long term protection fit suitable flameproof cable gland and power cable should be with a minimum withstand temperature 105 °C (221 °F). Please refer to operation manual section 1.2.2 .
- Running time and rest time should be based on the 75% duty cycle or the motor may overheat and stop running.
- To avoid functional failure caused by static, do not touch any components on the PCB with metal tools or bare hands.
- Use suitable explosion-proof and water-proof cable glands to ensure it fits the conduit entry size, diameter of the cable and the enclosure protection of the actuator when wiring. The explosion-proof and water-proof cable glands must be tightened and flattened to the cable after wiring procedure. Do not remove the explosion-proof and water-proof metal plugs from unused conduit entry, be sure to fasten the top cover of the actuator to reach explosion-proof and water-proof function.
- Actuator should be installed in an upright or horizontal position. Do not mount upside down or below a horizontal position.
- Periodically inspect actuator enclosure to prevent dust from accumulating.
- Please obey the local environment regulation for equipment scrapping.
- Perform below inspections prior to installation. Not allowed to adopt if any item is unqualified.
 - ✓ Check the marking and certificate number to see if it conforms to the indicated application.
 - ✓ All the parts of the housing are assembled in the right manner and fastened.
 - ⚠ **USE FASTENERS WITH YIELD STRESS $\geq 700\text{Mpa}$.**
 - ✓ All the explosion-proof parts should be made without cracks or functional defects.
- CSA Certification Considerations
 - ✓ KEEP COVER TIGHT WHILE CIRCUITS ARE ALIVE.
 - ⚠ **AFTER DE-ENERGIZING, DELAY 10 MINUTES BEFORE OPENING THE COVER.**
 - ✓ SEAL REQUIRED WITHIN 2 INCHES (50 mm) OF ENCLOSURE (for Zones only).

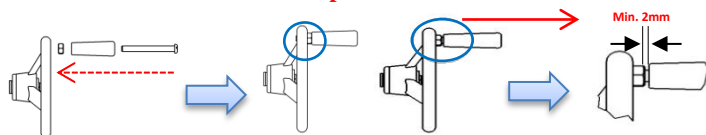


CAUTION !

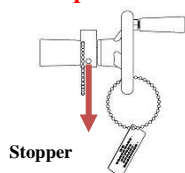
- All setting of opening the cover must be made in the safe place, prevent the spark from making the possibility of explosion.
- Operating by handwheel: Do not use any tools to increase force on handwheel for operating as this can damage the actuator or valve.
- Remove the stopper and press the handwheel toward the actuator before handwheel operation. After manual operation, pull the handwheel out to disengage the manual override and re-place the stopper to enable the electrical control.

Manual Device Installation

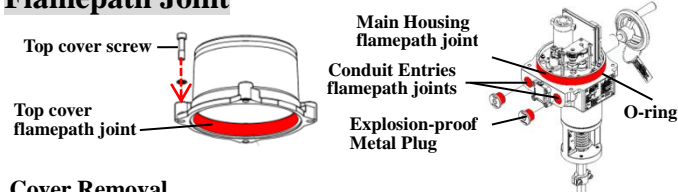
- Pass the screw through the handle and tighten the nut onto handwheel.
⚠ Do not overtighten.
- Secure the handle to the wheel with the slotted screw and tighten the locknut all the way down to the wheel. Ensure that the locknut is locked between the wheel and the handle.
⚠ Leave a 2 mm gap between the locknut and the handle as the figure below to allow the handle free to rotate and then to have a smooth manual operation.



- Assembly completed as shown in the figure below.
⚠ Remove the stopper and press the handwheel toward the actuator before handwheel operation. After manual operation, pull the handwheel out to disengage the manual override and re-place the stopper to enable the electrical control.



Flamepath Joint



Cover Removal

Remove the conduit entry metal plugs to relieve the pressure inside the actuator for the ease of the top cover removal and gently remove the cover. DO NOT attempt to remove the top cover with a screwdriver as it will damage the surfaces.

Cover Installation

- ⚠ Please ensure that the O-ring seal is in good condition prior to cover installation. Slowly re-install the cover while being careful not to pinch the O-ring seal.
- ⚠ The explosion-proof enclosures are labeled with a QA code on both of the middle plate and the cover, please verify the QA code inside the cover is the same as the one on middle plate when installation. The cover is not interchangeable.

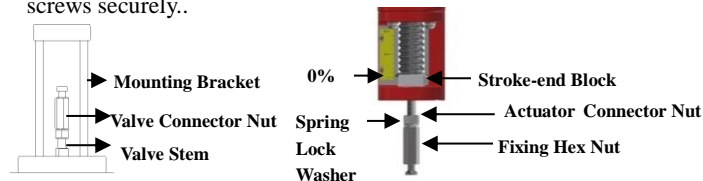
Please follow this table to tighten the cover screws :

Model	Screw	Allen Key	Torque
		mm	N·m
LE-250 to LE-500	M8	6	20
LE-1000 to LE-2000	M12	10	75

Valve Mounting Instructions

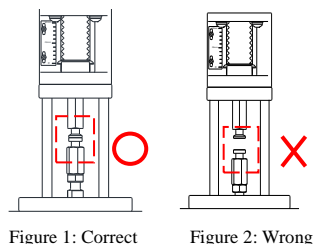
- ⚠ **DO NOT remove the stroke end block before completing installation.**

- The actuator shall be sized to ensure that its thrust force output and stroke length meet the load and stroke requirements of valve and its ability to overcome the required duty cycle of application. Before mounting, verify that the valve connecting nut fits with size of valve stem and the actuator is in its fully-closed position (stroke position 0%).
- Operate the valve to the fully-closed position.
- Remove the fixing screws from the clamp fastener and lock the valve connector nut onto the valve stem.
- Lock the actuator connector nut, spring lock washer, and fixing hex nut to the output shaft of the actuator as shown in figure below.
- Install the actuator onto the mounting bracket and tighten the fixing screws securely..



- Mount the actuator with bracket onto the valve and make sure the actuator connector nut connects the valve connector nut properly as figure below, and then tighten the fixing screws of clamp fastener securely.

- ⚠ **The tightening torque for both of the fixing screws must be the same to ensure the force applied evenly.**



Note:

Rotate the valve connector nut until it touches the surface of actuator connector nut. (Figure 1)

- ⚠ **Valve Connector Nut must have a minimum thread engagement of 1 x the valve stem diameter. If not, adjust the Actuator Connector Nut accordingly.**

- Tighten the valve nut with the Valve Connector Nut mutually.

- ⚠ **Fasten the Valve Connector Nut with wrench and tighten the valve nut toward the Valve Connector Nut. (Figure 3).**

- Remove the conduit entry plug to relieve the pressure inside the actuator for the ease of the top cover removal and gently remove the cover.

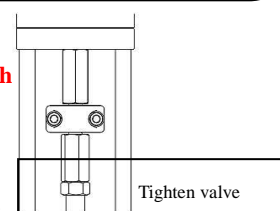


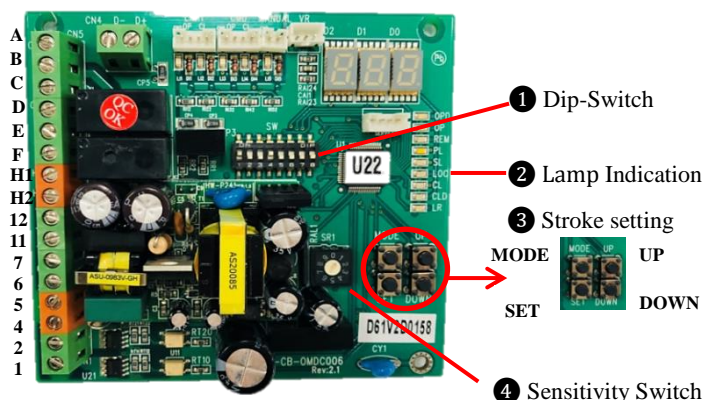
Figure 3

- ⚠ **The power must be off before removing the cover.**
- ⚠ **AFTER DE-ENERGIZING, DELAY 10 MINUTES BEFORE OPENING THE COVER.**

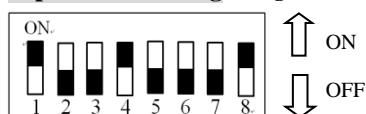
- Refer to operation manual section 4.2 for wiring notices and connect the wires according to the wiring diagram labeled inside the cover of actuator.
- Supply power to actuator.
⚠ **Care must be taken at all times as there are live circuits present that may cause electrical shock.**
⚠ **Do not remove the cover to supply power if the actuator is located in a hazardous environment. If so, please operate the unit manually.**
- Assemble the cover and secure cover screws firmly after setting.
⚠ **Please refer to Flamepath Joint and check whether there is any objects on the top cover flamepath joint and actuator.**
⚠ **Please ensure that the O-ring seal is in good condition prior to cover installation. Slowly re-install the cover while being careful not to pinch the O-ring seal.**
⚠ **The explosion-proof enclosures are labeled with a QA code on both of the middle plate and the cover, please verify the QA code inside the cover is the same as the one on middle plate when installation. The cover is not interchangeable.**

Modulating Control Board Adjustment

The layout is based on 110 / 220V voltage.



① Dip-Switch Setting (Original Factory Setting : 1, 4, 8 ON)



* S1, S2 : Input Signal Setting

Input Signal	S1	S2
4 - 20 mA	ON	OFF
1 - 5 V	OFF	OFF
2 - 10 V	OFF	ON

* S3, S4 & S5 : Output Signal Setting

Output Signal	S3	S4	S5
4 - 20 mA	OFF	ON	OFF
2 - 10 V	ON	OFF	ON

* S6, S7 & S8 : Setting of fail position when input signal fails.

⚠ The input signal type is set by switches 1 and 2. And switch 6 is used to set the corresponding relationship between value of input signal and operation direction of actuator.

Symbol	S6	S7	S8	Signal Failed Position
	ON	OFF	ON	Fully-Open (100%)
		ON	OFF	Fully-Closed (0%)
		ON	ON	The Last Position
	OFF	ON	OFF	Fully- Open (100%)
		OFF	ON	Fully- Closed (0%)
		ON	ON	The Last Position

② LED Indication

Lamp	Actuator Status
OPD	Fully-Open Position
OP	Opening Direction
REM	Remote Control Mode
PL	Alerting Signal
SL	Setting Mode
LOC	Local Control Mode
CL	Closing Direction
CLD	Fully-Closed Position
LR	MCU Indication

③ Stroke Setting

- Press "MODE" 5 times to get into **AUTO**.
- Press and hold "SET" around 5 sec until "LOC" comes on to enter Auto setting mode.
- When the Auto setting is completed, "LOC" comes off and the actuator stops running. The travel setting is completed.

④ Sensitivity Switch Setting (SR1)

- Factory setting :
Select "MODBUS" control, the sensitivity is preset to 1.
Select "analog signal" control, the sensitivity is preset to 7.
- When analog signal is selected:
Switch to 1: the highest sensitivity.
Switch to 0: the lowest sensitivity

MODBUS Setting

⚠ MODBUS and modulating control cannot service at the same time.

- Set the dip switches 1 -2 at "ON" state and 3 - 8 at "OFF" state.
- Baud rate setting.
 - Press "MODE" twice until **PAR** displays.
 - Press "SET" once, then **SPd** will display.
 - Press "DOWN" 10 times until **BAU** displays.
 - Press and hold "SET" around 3 sec until the LED indicator flashes to enter setting mode.
 - Press "UP" or "DOWN" to set the required baud rate. (default value #4)

Setting Value	Baud Rate
4 (default)	9600
5	19200

- Press "SET" once to complete the

● Station Setting

- Press "DOWN" once, then **Id** will display.
- Press and hold "SET" around 3 sec until the LED indicator flashes to enter setting mode.
- Press "UP" or "DOWN" to select the required station (Station Range : 1 to 127, default Station: 1).
- Press "Set" once to complete the setting.
- Press "Mode" 4 times to get back to the home page.

● MODBUS Parameter Address

Parameter Address (Hexadecimal)	Function	Setting range (Hexadecimal)
5	Station setting for MODBUS	1 to 127 station
6	Baud rate setting for MODBUS	4 to 5
8	Position setting (%)	0 to 64
9	Position feedback setting (%)	0 to 64