Explosion-proof Quarter-turn Electric Valve Actuator - Floating Control

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℃ Db IP66, IP68

OME series Explosion-proof Quarter-turn Electric Valve Actuator (referred as "actuator") 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 ℃ to +70 ℃ (-22 ℉ to +158 ℉)
Relative humidity：Not more than 95 % (+25 ℃ / 77 ℉)
The actuator can operate normally within tolerated variation of ±10 % of rated supply voltage or ±1 % of rated frequency.

UKCA II 2 GD Ex db IIB T4 Gb, Ex tb IIIC T130℃ Db IP66, IP68

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TD0404XY Ex db IIB T4 Gb, Ex tb IIIC T130℃ Db IP66, IP68

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Division System where is classified as North American Division 1 or Division 2 of hazardous location, contains Group C and Group D gases and temperature group T1 - T4; or contains one or several flammable dusts with minimum flaming point over 130 ℃; or include both above flammable gases and dusts.

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 ℃; or include both above flammable gases and dusts.

This product is certified to be used in the following locations:
Class I, Division 1, Groups C, D T4
Class II, Division 1, Groups E, F, G T130℃
Type 4X
Ex db IIB T4 Gb (For Canada)
Class I, Zone 1, AEx db IIB T4 Gb (For US)
Ex tb IIIC T130˚C Db (For Canada)
Zone 21, AEx tb IIIC T130˚C Db (For US)
IP66, IP68 (72h, 7m)

JPEx Ex db IIB T4 Gb, Ex tb IIIC T130 ℃ Db IP66, IP68

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Atmospheric pressure：80 - 110 kPa.
Ambient temperature：-30 ℃ to +70 ℃ (-22 ℉ to +158 ℉).
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The actuator can operate normally within tolerated variation of ±10 % of rated supply voltage or ±1 % of rated frequency.

Installation Notices

a. DO NOT install in ambient temperatures that exceed 70 ℃ (158 ℉).
b. 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 of a hazardous atmosphere.
c. 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.
d. Mount, test, and calibrate actuators in non-hazardous location.
e. When removing 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.
f. The explosion-proof electric actuator is shipped with mating surfces 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.
g. Please read operation manual and wiring diagram carefully before installation.
h. 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.
i. Turn power off before wiring or maintenance.
j. There are grounding devices both inside and outside of the actuator and the ground wires should be connected properly.
k. 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 temperature105 ℃ (221℉). Please refer to operation manual section 1.2.3 (P.3).
   ⚠ **Relating to Japanese explosion-proof certification, it is mandatory to select the cable gland of A2F series made by CMP Products Ltd to meet Japanese explosion-proof standards.**
   ⚠ **Loctite 577 sealant is recommended for NPT metal plugs or cable glands to achieve IP rating.**
l. To avoid functional failure caused by static, do not touch any components on the PCBA with metal tools or bare hands.
m. Do not parallel wire multiple actuators together without using an extra relay.
n. 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.
o. Actuator should be installed in an upright or horizontal position. Do not mount upside down or below a horizontal position.
p. Periodically inspect actuator enclosure to prevent dust from accumulating.
q. Please obey the local environment regulation for equipment scrapping.
r. 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 ≥ 450 Mpa.**
   ✓ All the explosion-proof parts should be made without cracks or functional defects.
s. CSA Certification Considerations
   ✓ KEEP COVER TIGHT WHILE CIRCUITS ARE ALIVE.
   ⚠ **AFTER DE-ENERGIZING, DELAY 10 MINUTES BEFORE OPENING THE COVER.**
   ✓ SEAL REQUIRED WITHIN 18 INCHES (450 mm) OF ENCLOSURE (for Divisions only).
   ✓ SEAL REQUIRED WITHIN 2 INCHES (50 mm) OF ENCLOSURE (for Zones only).

CAUTION !

a. **Please ensure that the O-ring seal is in good condition prior to cover installation.**
b. **Installation, maintenance and repair works must be performed by trained personnel.**
c. **Do not use any tools to increase force on handwheel for operating as this can damage the actuator or valve.**

Sizing

a. The actuator shall be sized to ensure that its torque output meets the load requirements of valve and its ability to overcome the required duty cycle of application (As a MINIMUM, a 30% safety factor is suggested for the calculation of torque requirement).

- If the maximum torque of 5" valve is 80 Nm
  → 80 × 1.3 (safety factor) = 104 Nm
  104 Nm < 150 Nm (OME-3) →OK!
  104 Nm > 90 Nm (OME-2) → **Not OK**!

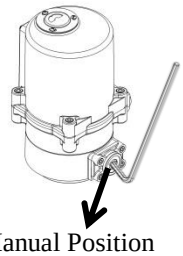
b. In cases where the actuator does not fit directly onto the valve, a mounting kit is required. Please ensure the bracket and coupling are properly designed and manufactured to withstand the torque output of the actuator.

Manual Device Installation

● OME-1 & OME-AM

Manual Position

- Use a 8 mm wrench to rotate the shaft.
- Max. torque：5 Nm

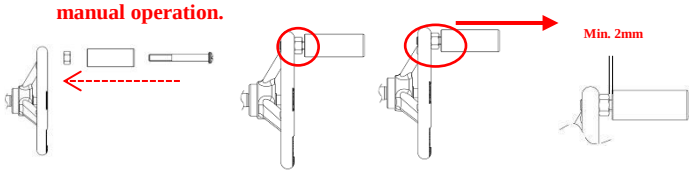


Manual Position

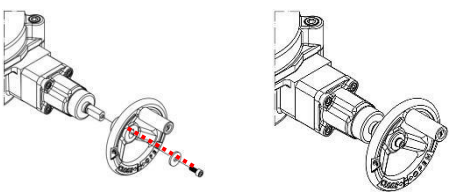
- Use a 5 mm wrench to rotate the shaft.
- Max. torque：5 Nm

● OME-2 to OME-8

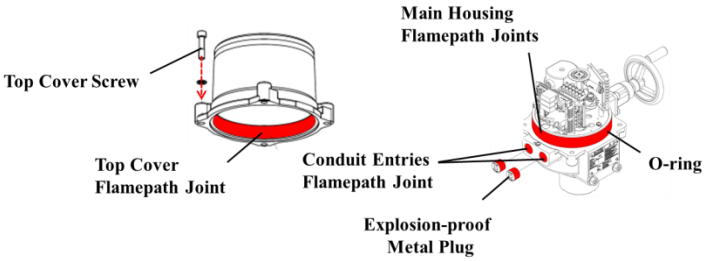
a. Pass the screw through the handle and tighten the nut onto handwheel.
   ⚠ **Do not overtighten.**
b. Secure the handle to the wheel with the slotted screw and tighten the locknut all the way down to the wheel. Ensure that the locknut is locked between the wheel and the handle.
   ⚠ **Leave a 2 mm 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.**



c. Slide fixing screw through washers and handwheel and secure them to override shaft as shown in the figure below.
   ⚠ **Turn off power when installing handwheel.**
d. Assembly completed as shown in the figure below.



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 screw：

Model	Screw	Allen Key	Torque
		mm	Nm
OME-A,OME-AM & OME-1	M6	5	8
OME-2 to OME-3	M10	8	43
OME-4 to OME-8	M12	10	75

Valve Mounting Instructions

a. Make sure both the valve and actuator are in the same position before mounting, either fully-open or fully-closed. If not, use the manual override to correct this.

b. Once mounted together, either directly or with a mounting kit, ensure that they are properly secured together and all fasteners are tightened.

⚠ **Remove all of valve handle parts, for example, the handle or open/close mechanical stops so as to not interfere with the actuator.**

c. Check again that the valve and actuator are in the same position.

d. 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, please refer to Flamepath joint section for cover installation.

⚠ **The power must be off before removing the cover.**

⚠ **AFTER DE-ENERGIZING, DELAY 10 MINUTES BEFORE OPENING THE COVER.**

e. Refer to operation manual section 4.3 (P.16) for wiring notices and connect the wires according to the wiring diagram labeled inside the cover of actuator.

f. Supply power to actuator.

⚠ **Care must be taken at all times as there are live circuits present that may cause electrical shock.**

g. Re-calibration may be required for the end positions, refer to Actuator Set-up section for further instructions.

h. Assemble the cover and secure cover screws firmly after setting.

⚠ **Refer to Flamepath joint section for installation and check if there is any foreign object between top cover flamepath joint and base.**

⚠ **Please ensure that the O-ring seal is in good condition prior to cover installation.**

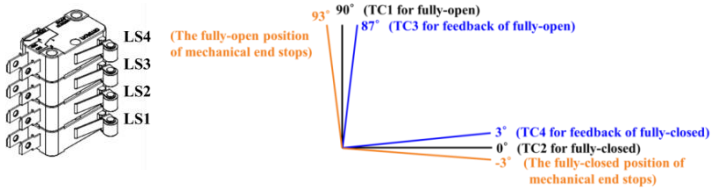
⚠ **The explosion-proof enclosures are labeled with a QA code on both of the middle plate and the cover, please verify the QA code inside the cover is the same as the one on middle plate when installation. The cover is not interchangeable.**

Actuator Set-up

CAUTION:
- **The power must be off during this procedure so as to avoid damage to the actuator.**
- **Do not make adjustments to the mechanical end stops when actuator is in motion.**
- **All steps below must be completed before normal operation.**

Instructions - Fully-open and fully-closed position limit switches

- Actuators come standard with two limit switches, LS1 for fully-open and LS2 for fully-closed positioning.
  Two auxiliary limit switches (LS3 & LS4) are optional for fully-open and fully-closed position feedback.
  LS1& LS2: LS1 is for fully-open and LS2 is for fully-closed. They limit the fully-open and fully-closed travel range by disabling the electric motor.
  LS3 & LS4 are optional. They allow external equipment to confirm that the valve has reached the fully-open and fully-closed positions.



Instructions – Dry contact sequence diagram:

- The state of dry contact feedback signal：
  - Solid line (—)：Dry contact in conductive state.
  - Dotted line (---)：Dry contact in non-conductive state.

【OME-1, OM-A, OM-AM】

Symbol	Contact	Position 100% — 0%
LS4 (Dry Contact)	A - F	——
	A - E	----------
LS3 (Dry Contact)	A - C	——
	A - B	----------

【OME-2 to OME-8】

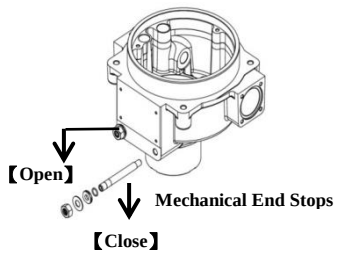
Symbol	Contact	Position 100% — 0%
LS4 (Dry Contact)	D - F	----------
	D - E	——
LS3 (Dry Contact)	A - C	----------
	A - B	——

Adjustment Steps:

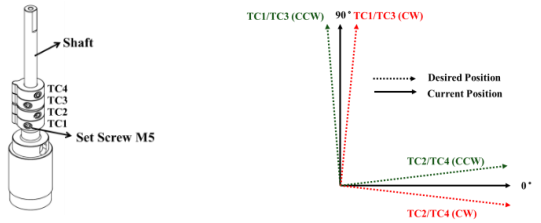
a. Turn power off.

b. Loosen the locknut and unwind both Open and Close Mechanical end stop screws based on the actuator model listed below.
   - OME-2 to OME-6：25 turns
   - OME-7 to OME-8：Remove the mechanical end stop screws completely.

c. Refer to below illustrations to adjust the TC1 - TC4 to set the fully-open and fully-closed position.

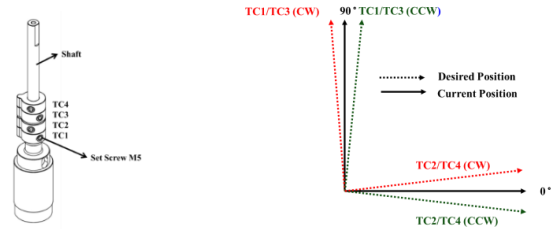


【OME-A and OME-AM】 **Tool: 2.5 mm Allen Key**



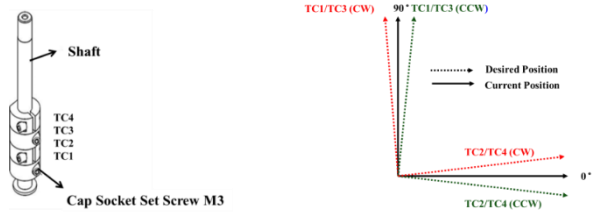
TC2"CLOSE" ↻ **Clockwise：increase closing degree.**
TC4 (Optional Item) ↺ **Counter-clockwise：decrease closing degree.**
TC1"OPEN" ↻ **Clockwise： decrease opening degree.**
TC3 (Optional Item) ↺ **Counter-clockwise：increase opening degree.**

【OME-1】 **Tool: 2.5 mm Allen Key**



TC2"CLOSE" ↻ **Clockwise：decrease closing degree.**
TC4 (Optional Item) ↺ **Counter-clockwise： increase closing degree.**
TC1"OPEN" ↻ **Clockwise：increase opening degree.**
TC3 (Optional Item) ↺ **Counter-clockwise：decrease opening degree.**

【OME-2 to OME-8】 **Tool: 2.5 mm Allen Key**



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TC4 (Optional Item) ↺ **Counter-clockwise：ncrease closing degree.**
TC1"OPEN" ↻ **Clockwise：increase opening degree.**
TC3 (Optional Item) ↺ **Counter-clockwise：decrease opening degree.**

d. Supply power to the fully-open position. Screw in the Open (left) Mechanical end stop screw until it bottoms out, and then turn back for 1/2-1 turn based on the actuator model listed below.
   ⚠ **Do not remove the cover to supply power if the actuator is located in a hazardous environment. If so, for the following steps, operate the unit manually.**
   - OME-2 to OME-3：1 turn.
   - OME-4 to OME-8：1/2 turn.

e. Tighten the locknut.
f. Supply power to the fully-closed position. Screw in the Close (right) Mechanical end stop screw until it bottoms out, and then turn back for 1/2-1 turn based on the actuator model listed below.
   ⚠ **Do not remove the cover to supply power if the actuator is located in a hazardous environment. If so, for the following steps, operate the unit manually.**
   - OME-2 to OME-3：1 turn.
   - OME-4 to OME-8：1/2 turn.

g. Tighten the locknut of mechanical end stops.
h. Supply the power to confirm that the limit switches achieve the fully open-close stroke.
i. The setting procedure is now completed.