

**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 2GD Ex db IIB T4 Gb, Ex tb IIIC T130°C Db 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 °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 ±10 % of rated supply voltage or ±1 % of rated frequency.



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

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 °C; 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 °C; 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°C

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)

IP68 (72h, 7m)



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

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TD040XY

Ex db IIB T4 Gb, Ex tb IIIC T130°C Db

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JPEX Ex db IIB T4 Gb, Ex tb IIIC T130°C Db

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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 ±10 % of rated supply voltage or ±1 % of rated frequency.

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 of 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 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.
 - 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 1.2.3 (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.**
- To avoid functional failure caused by static, do not touch any components on the PCB with metal tools or bare hands.
 - Do not parallel wire multiple actuators together without using an extra relay.
 - 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 ≥ 700Mpa.**
 - ✓ 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 18 INCHES (450 mm) OF ENCLOSURE (for Divisions only).
 - ✓ SEAL REQUIRED WITHIN 2 INCHES (50 mm) OF ENCLOSURE (for Zones only).



CAUTION !

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

Sizing

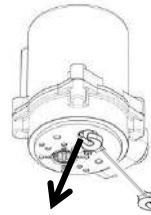
- The actuator shall be sized to ensure that its torque output meets the load requirements of valve and its ability to overcome the required duty cycle of application (As a MINIMUM, a 30% safety factor is suggested for the calculation of torque requirement).

- If the maximum torque of 5" valve is 80 N·m
 $\rightarrow 80 \times 1.3$ (safety factor) = 104 N·m
104 N·m < 150 N·m (OME-3) → OK!
 104 N·m > 90 N·m (OME-2) → **Not OK!**

- 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 N·m

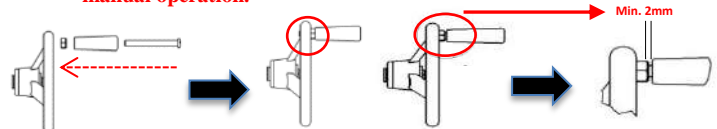


Manual Position

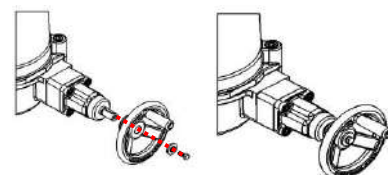
- Use a 5 mm wrench to rotate the shaft.
- Max. torque : 5 N·m

• OME-2 to OME-8

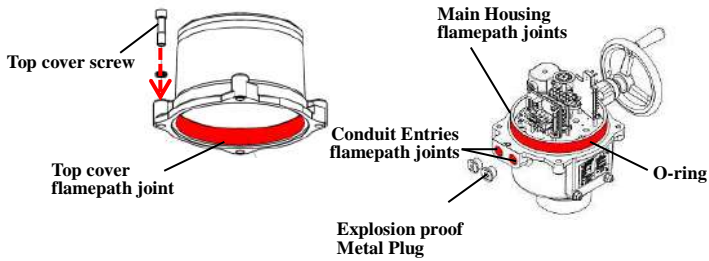
- Pass the screw through the handle and tighten the nut onto handwheel.
 - ⚠ Do not overtighten.**
- Secure the handle to the wheel with the slotted screw and tighten the locknut all the way down to the wheel. Ensure that the locknut is locked between the wheel and the handle.
 - ⚠ Leave a 2 mm gap between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



- 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.**
- 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	N·m
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

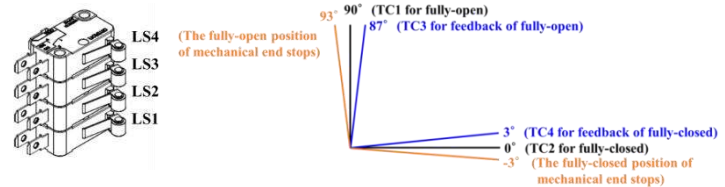
Valve Mounting Instructions

- 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.15) 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. Refer to Modulating Control Board Adjustment.
 - ⚠ Use the insulated wires and length should be less than 30 m.
 - ⚠ A minimum of 18 AWG wire is recommended for all field wiring.
 - ⚠ Turn power off before changing any settings.
- i. 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 – 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】

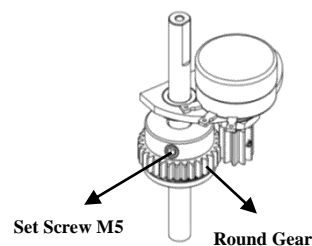
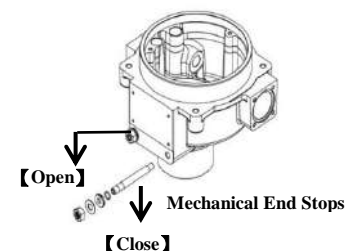
Symbol	Contact	Position	
		100%	0%
LS4 (Dry Contact)	A - F	—	---
	A - E	---	—
LS3 (Dry Contact)	A - C	---	—
	A - B	—	---

【OME-2 to OME-8】

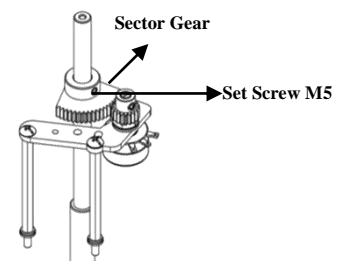
Symbol	Contact	Position	
		100%	0%
LS4 (Dry Contact)	D - F	---	—
	D - E	—	---
LS3 (Dry Contact)	A - C	---	—
	A - B	—	---

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. Loosen the M5 set screw on the sector gear or round gear.



【OME-1, OME-A and OME-AM】

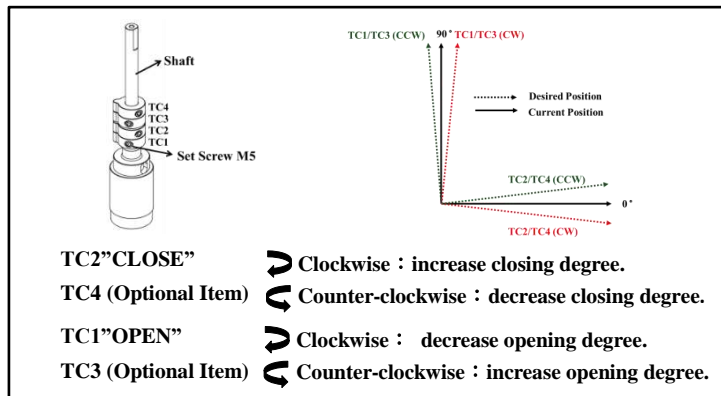


【OME-2 to OME-8】

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

【OME-A and OME-AM】

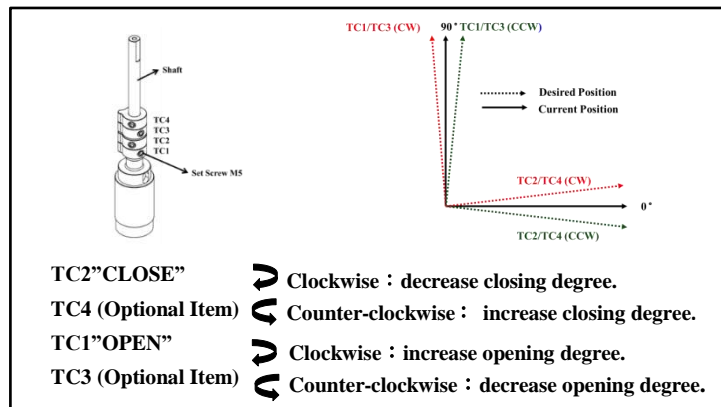
Tool: 2.5 mm Allen Key



- j. Supply power to run the actuator to the fully-closed position. Adjust the gear and the set screws based on the actuator model listed below.
- OME-A and OME-AM : Rotate the round gear counter-clockwise to the end and tighten the M5 set screw
 - OME-1 : Rotate the round gear clockwise to the end and tighten the M5 set screw
 - OME-2 to OME-8 : Rotate the sector gear clockwise to the end and tighten the M5 set screw
- k. The setting procedure is now completed.

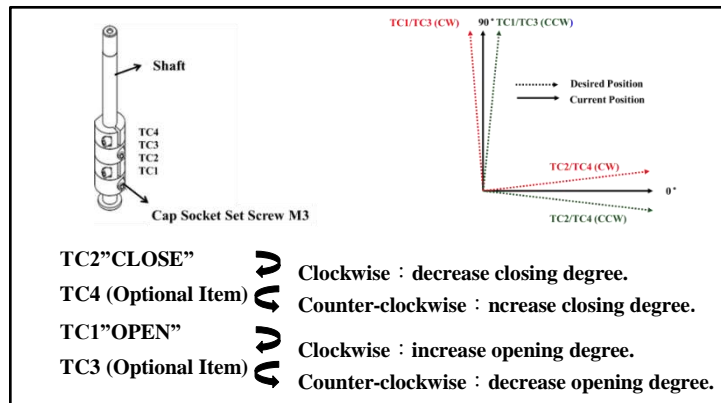
【OME-1】

Tool: 2.5 mm Allen Key



【OME-2 to OME-8】

Tool: 2.5 mm Allen Key



e. 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.

f. Tighten the locknut.

g. 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.

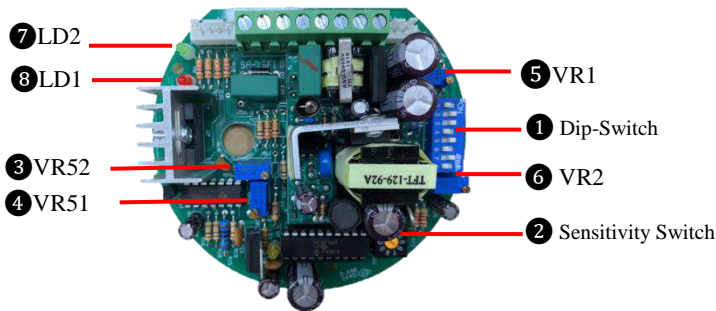
h. Tighten the locknut of mechanical end stops.

i. Supply the power to confirm that the limit switches achieve the fully open-close stroke.

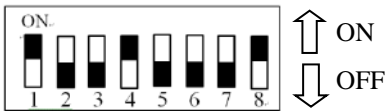
Modulating Control Board Adjustment (OME-A, OME-AM and OME-1)

3. 4. 5. 6Signal Setting for Open and Close Position

▲ Turn power off before adjusting below settings.



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



Analog Signal Setting

* 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

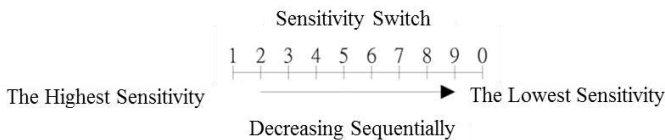
* S6, S7 & S8 : Setting of fail position when input signal fails.

- ⚠ The input signal type is set by switches 1 and 2. And switch 6 is used to set the corresponding relationship between the input signal value and the angle of the actuator.
- ⚠ If you require S6 to be set at ON and Clockwise to open, please specify in purchase order to modify the internal wiring during production; otherwise, the output signal will be opposite to the input signal.

Symbol	S6	S7	S8	Signal Failed Position
 90° Signal	ON	OFF	ON	Fully-Open (90°)
		ON	OFF	Fully-Closed (0°)
		ON	ON	The Last Position
 90° Signal	OFF	ON	OFF	Fully- Open (90°)
		OFF	ON	Fully- Closed (0°)
		ON	ON	The Last Position

2 Sensitivity Switch Setting (SW2)

- a. When switched to “1”: The Highest Sensitivity.
When switched to “0”: The Lowest Sensitivity.
- b. Original factory setting
➢ OME-A, OME-AM and OME-1: 3.



- ⚠ These settings are set and calibrated at the factory. Be sure to reset the Signal Setting for Open and Close Position when recalibrating TC1 and TC2 for fully-open and fully-closed position or other signal types are required.
- ⚠ Use a multimeter to measure the output signal in accordance with the selected signal type.

Variable Resistor	Signal type to be adjusted	Position to be adjusted
VR1	To adjust 5 V, 10 V, 20 mA input signal	Fully-Open
VR51	To adjust 10 V, 20 mA output signal	Fully-Open
VR2	To adjust 1 V, 2 V, 4 mA input signal	Fully-Closed
VR52	To adjust 2 V, 4 mA output signal	Fully-Closed

- ⚠ If VR51 and VR52 are adjusted, VR1 and VR2 must be adjusted accordingly.

Signal setting for Fully-OPEN position

Rotate VR1 counter-clockwise until a light click is heard, then apply 5 V, 10 V or 20 mA to the modulating board. After that, slightly rotate VR1 clockwise until the LD2 goes on and then adjust VR51 to complete the setting. When adjusting VR51, if the LD2 is off, keep rotating VR1 clockwise until the LD2 goes on.

VR51 : Clockwise : decreasing signal value.
 Counter-clockwise : increasing signal value.

Signal setting for Fully-CLOSED position

Rotate VR2 clockwise until a light click is heard, then apply 1 V, 2 V or 4 mA to the modulating board. After that, slightly rotate VR2 counter-clockwise until the LD1 goes on and then adjust VR52 to complete the setting. When adjusting VR52, if the LD1 is off, keep rotating VR2 counter-clockwise until the LD1 goes on.

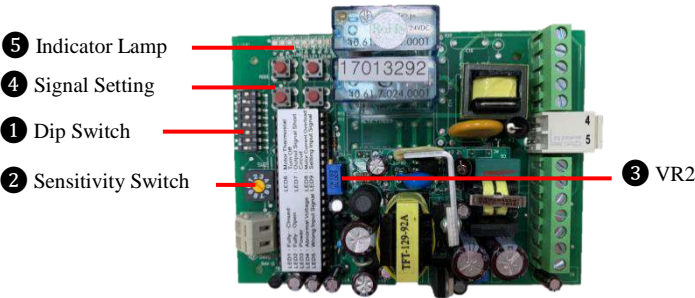
VR52 : Clockwise : decreasing signal value.
 Counter-clockwise : increasing signal value.

7. 8 Indicator Lamp (LD1 ~ LD2)

Lamp	Status
LD1	Fully-closed
LD2	Fully-open

Modulating Control Board Adjustment (OME-2 to OME-8)

▲ Turn power off before adjusting below settings.



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



Analog Signal Setting

* 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

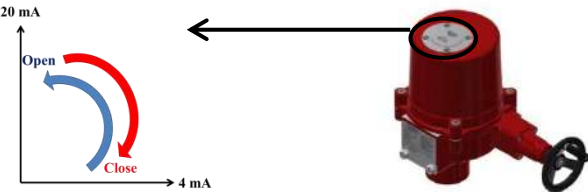
Output Signal	S3	S4	S5
4 - 20 mA	OFF	ON	OFF
2 - 10 V	ON	OFF	ON

* S6 : Close direction setting

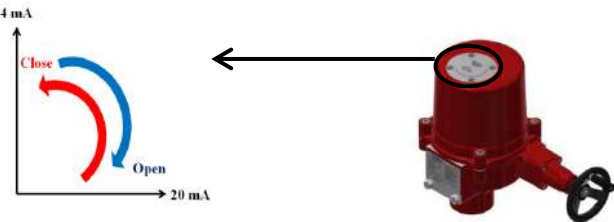
- When S6 is set to OFF, the close direction is CW (clockwise).
- When S6 is set to ON, the close direction is CCW (counterclockwise).

⚠ 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 as shown in the figure below, e.g., 4 - 20 mA input signal.

⚠ The operating direction of the actuator has been set and calibrated at the factory. Be sure to change the direction of the position indicator if different operating direction is required.



S6	Position Indicator (Fully-Open→Fully-Closed)	Operating Position	Input Signal	LED	Output Signal
OFF	CW	Fully-Closed	1 V, 2 V, 4 mA	LD1 ON	2 V, 4 mA
		Fully-Open	5 V, 10 V, 20 mA	LD2 ON	10 V, 20 mA



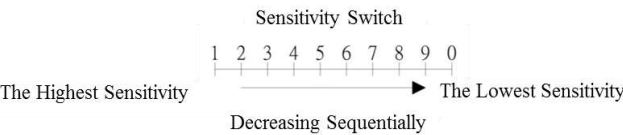
S6	Position Indicator (Fully-Open→Fully-Closed)	Operating Position	Input Signal	LED	Output Signal
ON	CCW	Fully-Closed	1 V, 2 V, 4 mA	LD1 ON	2 V, 4 mA
		Fully-Open	5 V, 10 V, 20 mA	LD2 ON	10 V, 20 mA

* S7 & S8 : Setting of fail position when input signal failed.

Signal Failed Position	S7	S8
Fully-Open	ON	OFF
Fully-Closed	OFF	ON
The Last Position	ON	ON
	OFF	OFF

2 Sensitivity Switch Setting (SW2)

- When switched to "1": The Highest Sensitivity.
When switched to "0": The Lowest Sensitivity.
- Original factory setting
➢ OME-2 ~ OME-8 : 3



4 Signal Setting for Open and Close Position

⚠ These settings are set and calibrated at the factory. Be sure to reset the Signal Setting for Open and Close Position when recalibrating TC1 and TC2 for fully-open and fully-closed position or other signal types are required.

⚠ Use a multimeter to measure the output signal in accordance with the selected signal type.
Press and hold "SET" button for 2 seconds until LD9 lights to enter local setting mode.

Signal setting for Fully-OPEN position

- Press and hold "UP" button to operate the actuator to open until it has reached fully-open position and LD2 lights and then input a signal 5 V or 10 V or 20 mA.

- Press "MODE" button for 2 seconds until LD2 flashes to complete the setting of fully-open position.

Signal setting for Fully-CLOSED position

- Press and hold "DN" button to operate the actuator to close until it has reached fully-closed position and LD1 lights and then input a signal 1 V or 2 V or 4 mA.

- Press "MODE" button for 2 seconds until LD1 flashes to complete the setting of fully-closed position.

① See below description for VR2 adjustment :

- VR2 : ↻ Clockwise: decreasing signal value.
↻ Counter-clockwise: increasing signal value.

After completing the above settings, press "SET" button to quit local setting.

5 Indicator Lamp (LD1 - LD9)



Lamp	Status	Lamp	Status
LD1	Fully-closed	LD6	Motor thermal protector activated
LD2	Fully-open	LD7	Output signal short circuit
LD3	Power	LD8	Overcurrent in motor
LD4	Abnormal input voltage	LD9	Local setting mode
LD5	Wrong input signal		