

# CM

SERIES

## Quarter-turn Electric Valve Actuators



## OPERATION MANUAL



SUN YEH ELECTRICAL IND. CO., LTD.

SY06-C001I-EN

## Contents

1	Safety Information .....	1
1.1	Safety Instructions.....	1
1.2	Installation Notices.....	1
1.3	Inspect, Storage, Transport.....	2
2	Product Overview .....	3
2.1	Features .....	3
3	Product Mechanical Data.....	3
3.1	Parts Identification .....	3
3.2	Technical Information .....	4
3.3	Mounting Base Details .....	4
3.4	Sizing.....	5
3.5	Duty Cycle .....	5
4	Mounting and Setup.....	6
4.1	Manual Override Device Setting.....	6
4.2	Valve Mounting Instructions .....	7
4.3	Wiring Instruction .....	8
4.4	Actuator Set-up .....	9
5	Modulating Control Board Adjustment .....	12
5.1	Modulating Control Board Surface .....	12
5.2	Programming.....	12
5.3	Dip Switch Setting (SW1).....	13
5.4	Sensitivity Switch Setting (SW2).....	16
5.5	Signal Setting for Open and Close Position.....	17
5.6	Troubleshooting of Modulating Controller .....	18
6	Trouble Shooting .....	20
7	Warranty.....	23
8	Disposal .....	23



## 1 Safety Information

 **Failure to follow safety instructions may cause serious injury, equipment damage, or voided warranty.**

### 1.1 Safety Instructions

- Installation, maintenance and repair works must be performed by trained personnel.
- The handling shall follow the safety and warning instruction contained in this manual.
- Before operation, the user should read and follow instructions contained in this operation manual. Failure to do this may result in damages and void warranty. Sun Yeh will not be liable for damages due to operator negligence or misuse.
- Local health and safety legislation shall be complied with.
- In a few cases, the surface temperature may exceed 60 °C (140 °F). Please check the surface temperature before operation, using an appropriate thermometer and wearing protective gloves before operation.

### 1.2 Installation Notices

-  **Before operating a three-phase voltage actuator, please manually operate it to mid-travel position and power up to check if it rotates properly in order to verify the phase sequence is correct. If it is incorrect, please correct the phase errors by changing the connection of any two of power supply wires U, V, W to prevent the actuator from mechanical damages.**
-  **Do not use any tools to increase force on manual override device for operating as this can damage the actuator or valve.**

- 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.
- Connect the ground wire to PE point inside the electric actuator.
- To avoid functional failure caused by static, do not touch any components on the PCBA with metal tools or bare hands.
- Do not parallel wire multiple actuators together without using an extra relay.
- Use suitable water-proof cable gland to ensure it fits the conduit entry size, diameter of the cable and the enclosure protection of the actuator when wiring. The water-proof cable gland must be tightened and flattened to the cable after wiring procedure and use original black water-proof plug to seal unused conduit entry and fasten the top cover of the actuator to prevent dust or water from entering the actuator. The red plastic dust-proof plug is not meant for long-term use. Replace it with suitable water-proof connector to ensure the enclosure protection rating.

- Actuator should be installed in an upright or horizontal position. Do not mount upside down or below a horizontal position.
- These units are not designed to operate in vacuum spaces or where an explosive atmosphere exists.
- Periodically inspect actuator enclosure to prevent dust from accumulating.

### 1.3 Inspect, Storage, Transport

#### 1.3.1 Receiving / Inspection

- Carefully inspect the package for any damages resulting from shipping and report all damages to the freight carrier and seller.
- After unpacking the product and information packet, please keep the cartons and any packing materials in case of product return or replacement. Verify that the items on the packing slip or on the bill of lading are the same as what were ordered. If there is any discrepancy, please contact the seller.
- Verify if the technical data on nameplate is accordance with what was ordered.

#### 1.3.2 Storage

- The actuator should be stored in a dry area with relative humidity of less than 90 % and at temperatures between - 20 °C to + 40 °C (- 4 °F to + 104 °F).
- The product shall be stored with suitable protection from corrosive substance that can damage the metal and insulating parts.
- The red dustproof plug and black waterproof plug should not be removed until the actuator is ready to be cabled. Use suitable cable glands with IP67 protection when wiring and seal the unused cable entry with original black waterproof plug.

#### 1.3.3 Transport

- Attach ropes or hooks for the purpose of lifting by hoist only to housing.
- Actuators packaged in cartons can stand up to land, sea, or air transportation.
- Packaged actuators shall avoid of violent impact and strong vibrations and be protected from rain or snow.

#### 1.3.4 Lubrication

- The gear train has been sufficiently lubricated at the factory. No additional lubrication is required.

## 2 Product Overview

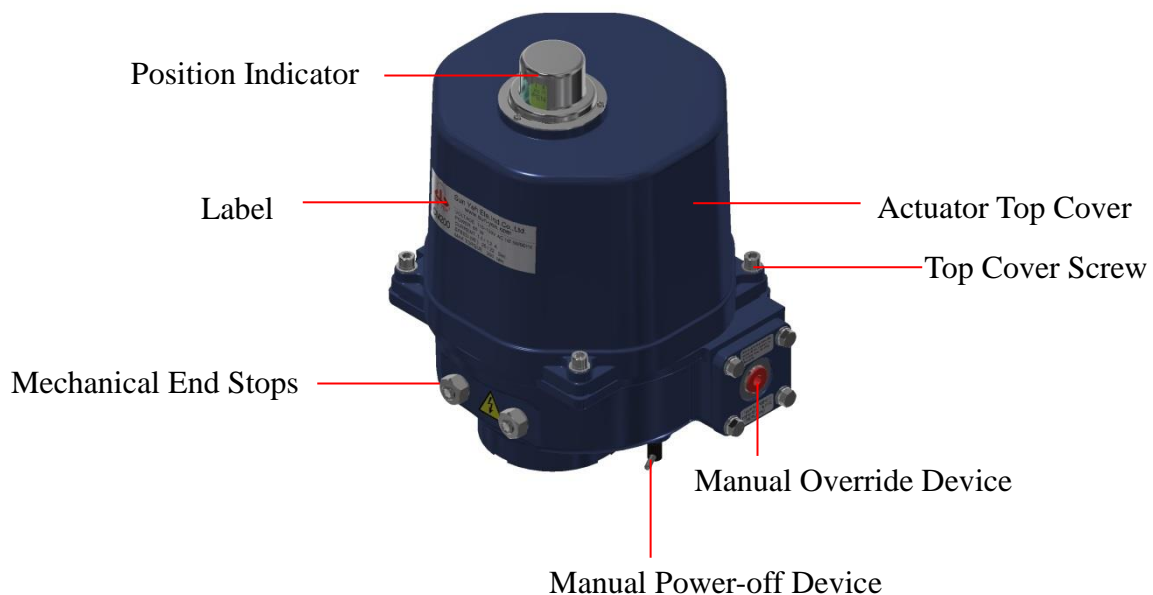
CM series quarter-turn electric actuators offer torque ranges from 100 Nm to 600 Nm (885 in-lb to 5313 in-lb) torque and can be applied to ball valves, plug valves and butterfly valves according to client's demand. CM series can be used for floating or modulating control (optional). All models are ISO 5211 compliant and equipped with a continuous mechanical position indicator and manual override.

### 2.1 Features

- High alloy-steel gear trains with self-locking prevent back-drive.
- ISO 5211 mounting flange.
- Mechanical end stops.
- Domed position indicator.
- Built-in motor thermal protection.

## 3 Product Mechanical Data

### 3.1 Parts Identification



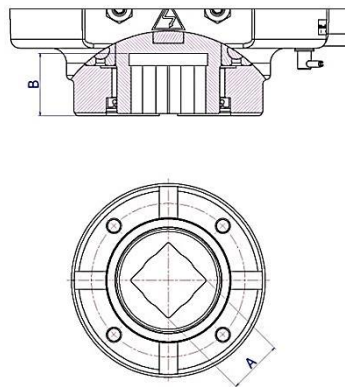


### 3.2 Technical Information

Model	Torque		Weight		Motor Power *	Lever	Flange Type
	Nm	in-lb	kg	lb	W	mm	ISO 5211
CM-100	100	885	7.6	17	50	8	F07
CM-200	200	1770	7.6	17	60		F07
CM-300	300	2655	14	31	80	10	F10
CM-400	400	3540	14	31	80		F10
CM-500	500	4425	14	31	80		F10
CM-600	600	5310	14	31	80		F10

\* Motor Power is based on 110 - 120 VAC.

### 3.3 Mounting Base Details



Model	Flange Type	Shaft (A)		Depth of Shaft (B)	
	(ISO 5211)	mm	inch	mm	inch
CM-100	F07	22	0.866	30	1.181
CM-200	F07	22	0.866	30	1.181
CM-300	F10	36	1.417	40	1.574
CM-400	F10	36	1.417	40	1.574
CM-500	F10	36	1.417	40	1.574
CM-600	F10	36	1.417	40	1.574

### 3.4 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  $\rightarrow 80 \times 1.3$  (safety factor) = 104 Nm  
**104 Nm < 200 Nm (CM-200)  $\rightarrow$  OK!**  
 104 Nm > 100 Nm (CM-100)  $\rightarrow$  Not OK!

- b. In cases where the actuator does not directly fit 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.

### 3.5 Duty Cycle

- The standard duty cycle for CM series is 30%. The duty cycle is the relationship between the running time and resting time. It is calculated as below:

$$\text{Duty Cycle} = \frac{\text{Running Time (Sec)}}{\text{Running Time (Sec)} + \text{Rest Time (Sec)}} \times 100 \%$$

$$\Rightarrow \text{Rest Time (Sec)} = \frac{\text{Running Time (Sec)} \times (1 - \text{Duty Cycle})}{\text{Duty Cycle}}$$

- If the running time for CM-200 is 25 sec, 30 % duty cycle, the rest (off) time shall be calculated as below:

$$\rightarrow 25 \times [ ( 1 - 30 \% ) ] / 30 \% = 59 \text{ The rest time will be 59 sec.}$$

 **One cycle consists of open-rest-close-rest.**

## 4 Mounting and Setup

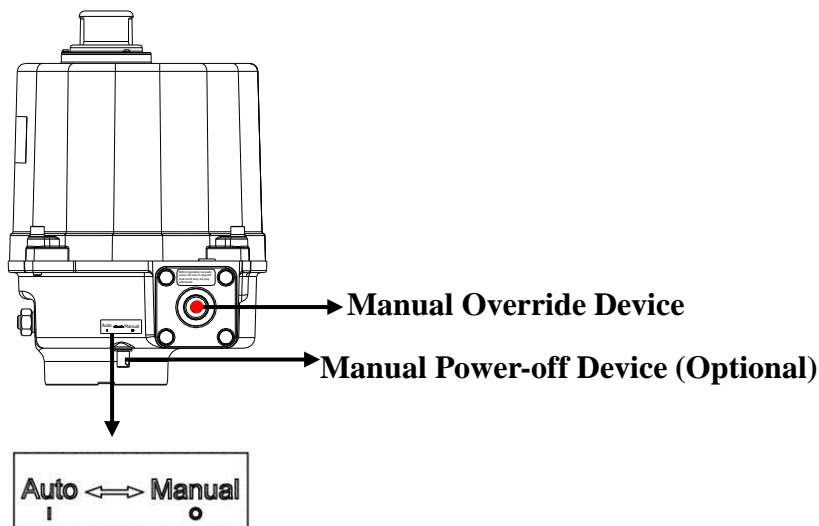
### 4.1 Manual Override Device Setting

- ⚠ **Ensure power is OFF before operating the manual override device if manual power-off device is not equipped.**
- ⚠ **If manual power-off device is equipped, ensure the switch is in 【Manual】 mode before operating manually. Switch back to 【Auto】 mode before operating electrically again.**
- ⚠ **Reconfirm it switches to 【Auto】 mode if the actuator didn't react after supplying power.**

Users can open or close the actuator with the manual override device. Please remove the red dust-proof plug on the manual override device when manual operation is required and put the red dust-proof plug back after finishing the manual operation.

- a. Use the tool to insert the manual power-off device to switch the actuator from electrical operation 【Auto】 to manual operation 【Manual】.
- b. Remove the red dust-proof plug from the manual override device and refer the table below to open or close the actuator.

Model No.	Allen Key	Fully-open → Fully-closed
CM-100 to CM-200	8 mm	10 turns
CM-300 to CM-600	10 mm	8.5 turns

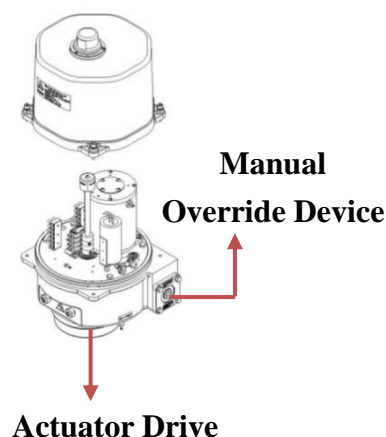


- c. After finishing the manual override device operation, switch the actuator from manual operation 【Manual】 back to electrical operation 【Auto】.





## 4.2 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.
  - ⚠ **The power must be off before removing the cover.**
- e. Refer to section 4.3 (P.8) for wiring notices and connect the wires according to the wiring diagram labeled inside the cover of actuator.
  - ⚠ **Before operating a three-phase voltage actuator, please manually operate it to mid-travel position by the manual override device and power up to check if it rotates properly in order to verify the phase sequence is correct. If it is incorrect, please correct the phase errors by changing the connection of any two of power supply wires U, V, W to prevent the actuator from mechanical damages.**
- 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 4.4.2 (P.10) for further instructions.
- h. For modulating units, refer to 5 (P.12 - P.18) setting instructions.
  - ⚠ **Use 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.
  - ⚠ **Please ensure that the O-ring is in good condition prior to cover installation.**



### 4.3 Wiring Instruction

 **Turn power off before making the electrical connection!**

- Connect the ground wire to PE point placed on middle metal plate inside the electric actuator ( a green screw) and wiring according to the wiring diagram inside the top cover.
- Each actuator is attached with a black water-proof plug and a temporary red dust-proof plug to conduit entries.
-  **Use correct size of fittings so as to not damage the threads.**
- Verify the supply power is in accordance with the data on the nameplate to prevent a short circuit and an electrical shock.
-  **Do not apply power to actuator before wiring, otherwise it can cause an electrical shock or damage components of the actuator.**
- The red plastic dustproof plug is not meant for long-term use. Use suitable cable glands with IP 67 protection when wiring and seal the unused cable entry with original black waterproof plug.

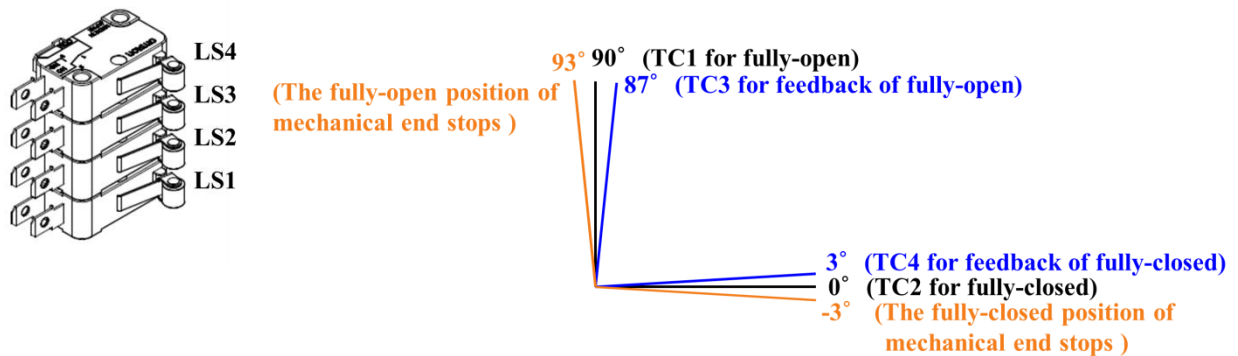
## 4.4 Actuator Set-up

- ⚠ **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.**

The actuators have been set and calibrated at the factory. Most of products will not require recalibration of these settings. However these are general settings. After valve and actuator are bolted together, apply power to verify the end positions are correct. If an adjustment is required, please follow steps below. When the actuator is equipped with modulating controller, signal setting for open and close position has to be re-set accordingly, please refer to 5.5.

### 4.4.1 Instruction

- The travel cams are set to control the open and closed position of the actuator. The position is set to stop the travel of the actuator when the travel cams don't activate the limit switch.
- The standard is with two limit switches (LS1 & LS2).  
 LS1 & LS2 : LS1 is for open and LS2 is for close. 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.



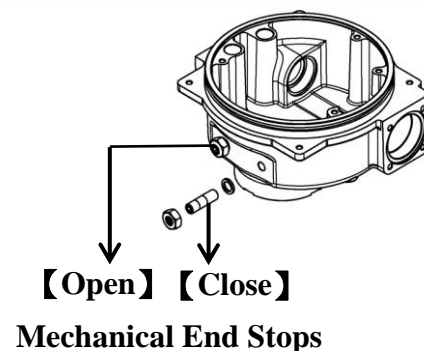
- Instructions – Dry contact sequence diagram:

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

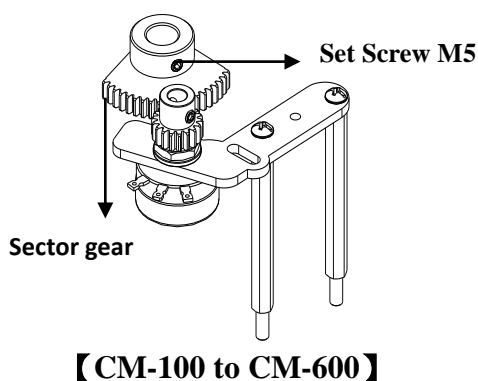
- Solid line (—): Dry contact in conductive state.
- Dotted line (----): Dry contact in non-conductive state.

## 4.4.2 Adjustment Steps

- a. Turn power off.
- b. Loosen the locknut and unwind both Open and Close Mechanical end stops screws for 7 turns.



- c. For modulating units, loosen the M5 set screw on the sector gear.



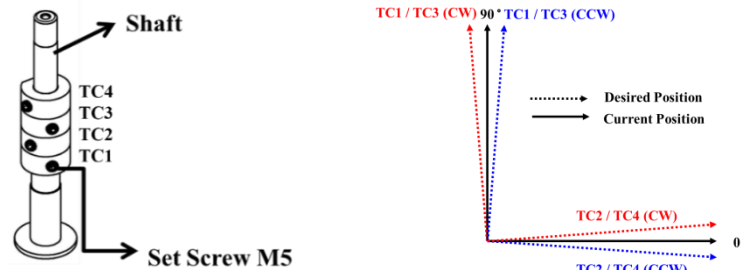
- d. Adjust the **fully-open** position
  1. Use manual override to turn valve to the fully-open position.
  2. Remove the cover and loosen the M5 set screw of cam TC1 with a 2.5 mm Allen Key.
  3. Adjust the travel cam
    - Rotate the cam TC1 **counter-clockwise** to contact the switch arm.
    - Slowly rotate the cam TC1 **counter-clockwise** until a light click is heard.
  4. Securely tighten the M5 set screw and apply power to check if the fully-open position is correct. If it is not correct, please repeat steps 1 to 3.
  5. Use the same method to reset the cam TC3.  
**⚠ Adjust cam TC3 so it trips just before cam TC1 does.**
  6. After the adjustment is completed, check again that the M5 set screw is securely tightened.
- e. Adjust **fully- closed** position
  1. Use the manual override to turn the valve to the fully-closed position.
  2. Loosen the M5 set screw of cam TC2 with a 2.5 mm Allen key.
  3. Adjust the travel cam
    - Rotate the cam TC2 clockwise to contact the switch arm.
    - Slowly rotate the cam TC2 **clockwise** until a light click is heard.
  4. Securely tighten the M5 set screw and apply power to check if the fully-closed position is correct, please repeat steps 1 to 3.

## 【CM Series】 Quarter-turn Actuator

5. Use the same method to reset the cam TC4.

**⚠ Adjust cam TC4 so it trips just before cam TC2 does.**

6. After the adjustment is completed, check again that the M5 set screw is securely tightened.



**TC 2 “CLOSE”** ➤ **Clockwise: decrease closing degree.**

**TC 4 (Optional Item)** ➤ **Counter-clockwise: increase closing degree.**

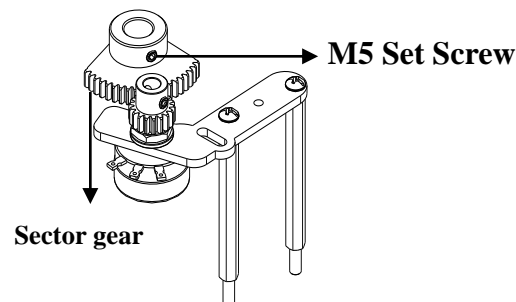
**TC 1 “OPEN”** ➤ **Clockwise: increase opening degree**

**TC 3 (Optional Item)** ➤ **Counter-clockwise: decrease opening degree.**

- f. Supply the power and unwind the mechanical end stop screws to the **fully-open** position for 1 turn.
- g. Tighten the locknut.
- h. Supply the power and unwind the mechanical end stop screws to the **fully-closed** position for 1 turn.
- i. Tighten the locknut of mechanical end stops.
- j. Supply the power to confirm that the limit switches achieve the fully open-close stroke.
- k. Modulating units :

After completing the fully-open and fully-closed calibration, run the actuator to the fully-closed position, and then adjust the gear and the set screws as the steps below according to the corresponding actuator model.

CM-100 to CM-600      Rotate sector gear counterclockwise to the end and tighten M5 set screw.

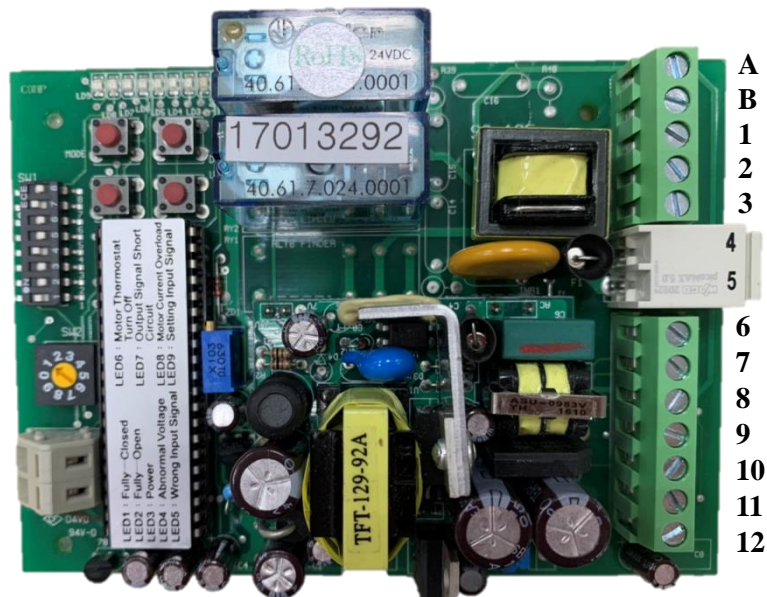


- l. The setting procedure is now completed.

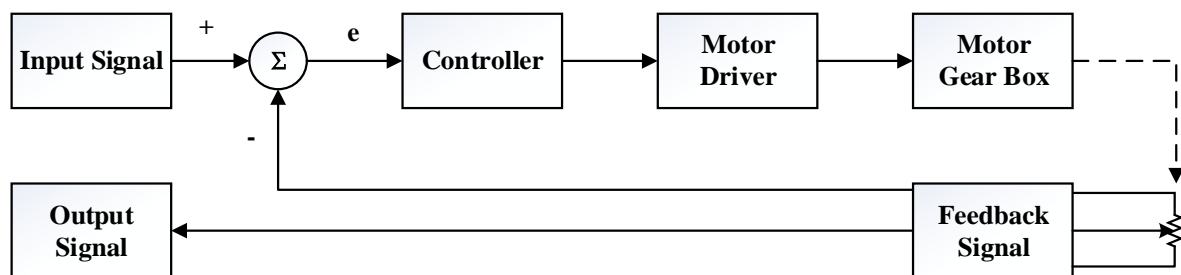
## 5 Modulating Control Board Adjustment

### 5.1 Modulating Control Board Surface

**The layout is based on 110 / 220 V AC.**



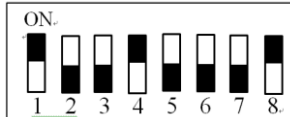
### 5.2 Programming





### 5.3 Dip Switch Setting (SW1)

The Dip Switch SW1 is a combination of 8 switches and equally divided in two rows. It is utilized to select signal type of input as well as output and fail positioning when the signal input fails. The sliders can be placed at either ON (upper) or OFF (lower) state position. Factory settings are switches 1, 4, 8 at ON state and switches 2, 3, 5, 6, 7 at OFF state.

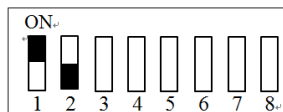


Please follow steps below if an adjustment of these settings are required.

⚠ Please restart the actuator after adjusting.

	1	2	3	4	5	6	7	8
<b>Factory Setting</b>	ON	OFF	OFF	ON	OFF	OFF	OFF	ON
4 - 20 mA input	ON	OFF						
1 - 5 V input	OFF	OFF						
2 - 10 V input	OFF	ON						
4 - 20 mA output			OFF	ON	OFF			
2 - 10 V output			ON	OFF	ON			
Closed direction setting: CW						OFF		
Closed direction setting: CCW						ON		
When signal input failed, driving valve to fully-open							ON	OFF
When signal input failed, driving valve to fully-closed							OFF	ON
When signal input failed, valve stays at the last position							ON	ON
							OFF	OFF

a. Input signal setting (1 - 2)



Input Signal	State of Switches
4 - 20 mA	1 at ON, 2 at OFF
1 - 5 V	1 at OFF, 2 at OFF
2 - 10 V	1 at OFF, 2 at ON

## 【CM Series】 Quarter-turn Actuator

### b. Output signal setting (3 - 5)

- Output signal can be fine-tuned by VR2.
- When resetting the Output Signal, be sure to fine-tune VR2 to match the setting either 2 - 10 V or 4 - 20 mA.

Output Signal	State of Switches
4 - 20 mA	3 at OFF, 4 at ON, 5 at OFF
2 - 10V	3 at ON, 4 at OFF, 5 at ON

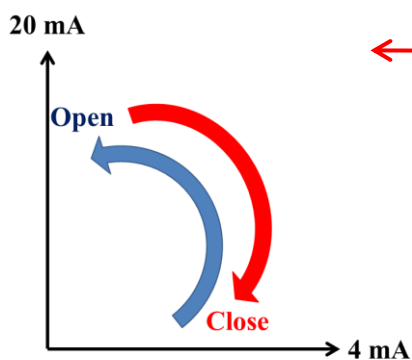
### c. Close direction setting (switch 6)

- 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.**

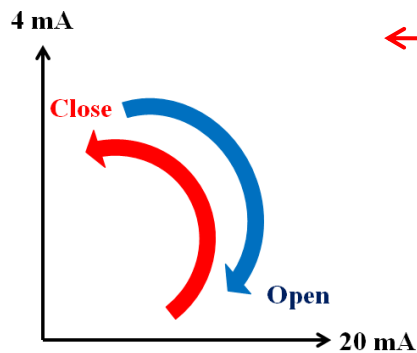
When S6 is set to **OFF**



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

## 【CM Series】 Quarter-turn Actuator

When S6 is set to **ON**



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

d. Failed position setting while the input signal failed. (switches 7 and 8)

- When a low signal value is received, the actuator operates toward fully-open position and when a high signal value is received, the actuator operates toward fully-open position.

Input Signal	Fully-Open	Fully-Closed
4 - 20 mA	4 mA	20 mA
1 - 5 V	1 V	5 V
2 - 10 V	2 V	10 V

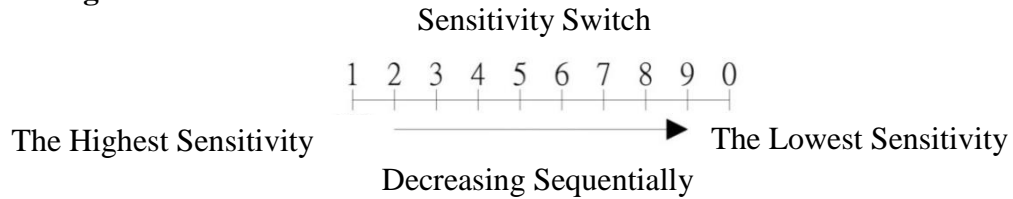
- The selection of the fail position while the input signal failed, please follow table below:

Signal Failed Position	State of Switch
Fully-Open	7 at ON, 8 at OFF
Fully-Closed	7 at OFF, 8 at ON
The Last Position	7 at ON, 8 at ON 7 at OFF, 8 at OFF

## 5.4 Sensitivity Switch Setting (SW2)

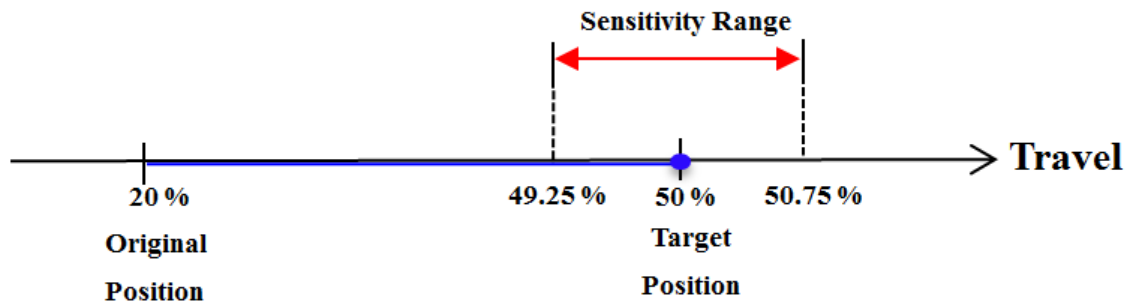
When the value of sensitivity (%) is lower, the resolution of the input signal will be higher, and relatively the dead band will be smaller. Excessive high resolution may cause the actuator to keep hunting and could not run to the desired position which will lead to the thermostat inside the motor to trip because of overheating, and finally the actuator will shut down. If this situation happens, it is suggested to adjust the sensitivity setting.

### a. Setting



Setting Value	1	2	3	4	5	6	7	8	9	0
Sensitivity (%)	0.25	0.5	0.75	1	1.25	1.5	1.75	2	2.25	2.5

- When switched to “1”: The Highest Sensitivity.
- When switched to “0”: The Lowest Sensitivity.
- For example: When the sensitivity switch is set to “3” (0.75%) and the target position is 50%, the valid sensitivity range will be from 49.25% to 50.75% ( $50\% \pm 0.75\%$ ) as shown in the figure below.



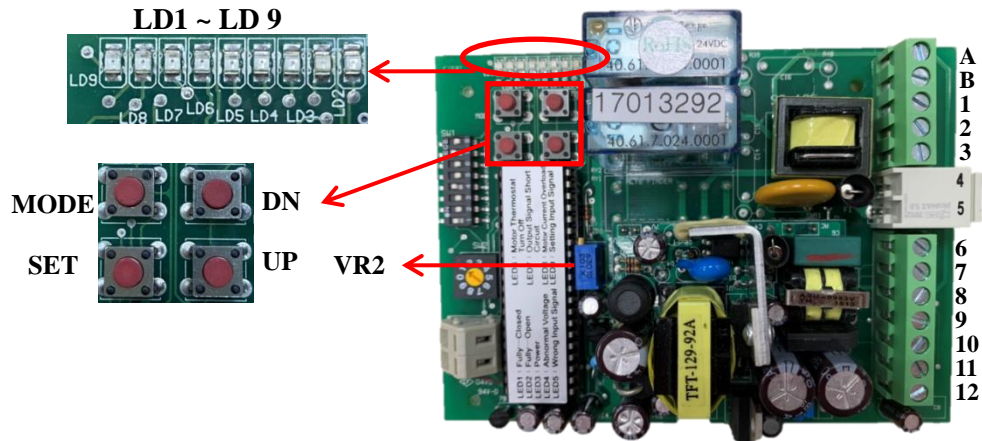
### b. Original Factory Setting

- CM-100 to CM-600 : 3



## 5.5 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.**
  - Using UP, DN, MODE, SET buttons to set the open and close position.





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		

Press and hold "SET" button for 2 seconds until LD 9 lights to enter local setting mode.

- **Signal setting for Fully-OPEN position**
  - a. 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.
  - b. Press "MODE" button for 2 seconds until LD2 flashes to complete the setting of fully-open position.
- **Signal setting for Fully-CLOSED position**
  - a. 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.
  - b. Press "MODE" button for 2 seconds until LD1 flashes to complete the setting of fully-closed position.

ⓘ 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**

## 5.6 Troubleshooting of Modulating Controller

- ⚠ In case LD3 does not light or any of LD4 to LD9 lights when the actuator is motorized, please refer to steps below for basic troubleshooting.**
- ⚠ Please do the troubleshooting when LD4 to LD8 lights, and then restart the power to turn the lights off.**

Status of LEDs	Possible problems	Solution
LD3 does not go on	a. No power supplied. b. Modulating controller failed.	a. Check the power supply as well as wires connected to terminals #4 & #5, please refer to 5.1 (P.12) b. Send back to factory for inspection.
LD4 goes on (for 24V units)	The voltage is under 19.8 V DC.	Verify that the input voltage is within the allowable voltage deviation.
LD5 goes on	a. An incorrect signal type inputted. For example, preset with 2-10 V input but input 4-20 mA. b. Input a voltage exceeding the rated. For example, preset with 2-10 V input but input 13.5V. c. An incorrect signal type inputted. For example, preset with 4 - 20 mA input but input 2 - 10V. In this case, the actuator still works in 2 - 7V. When the signal is over 7.2 V, the LD5 lights.	Verify if the switch 1 is set in accordance with the type of input signal. Please refer to 5.3 (P.13 - P.15).
LD6 goes on	Motor thermal protector started.	a. The duty cycle exceeded the rated, please refer to 3.5 (P.5). b. The contact of motor thermal protector (MOT) disconnected.



## 【CM Series】 Quarter-turn Actuator

Status of LEDs	Possible problems	Solution
LD7 goes on	a. Signal output short circuits.  b. Both DIP switch #3 and #4 are set at ON or OFF.	a. Verify if the signal output with reversed polarity. The negative pole should be connected to terminal #11 and the positive pole should be connected to terminal #12.  b. Reset the dip switches per actual output signal. Please refer to 5.3 (P.13 - P.15)
LD8 goes on	Motor over-current.	a. Duty cycle exceeded the rated, please refer to 3.5 (P.5) and reduce the duty rating. b. Check the load. c. Check if the motor rotor is locked (For example: Valve is stuck by foreign objects).
LD9 goes on	Local setting mode - Setting position for open & close.	After completing the settings, press "SET" button to quit.

## 6 Trouble Shooting

### Floating Control

#### Motor can not operate or overheats

Possible problems	Solution
a. The limit switch for fully-closed does not trip.	a. Operate the actuator manually to fully-closed position and confirm if the limit switch trips.
b. Motor shaft or bearing were stuck.	b. Replace a new motor.
c. Power applied to terminals #3 and #4 simultaneously (Abnormal Wiring).	c. Follow the wiring diagram inside the cover to connect wires and make sure the wiring is correct.
d. Jammed pipe or stuck valve seat.	d. Check if any blockage or obstacle in pipe and remove.
e. The seating torque of valve increased due to oxidized seals and has resulted in a torque overload on actuator.	e. Manual operate to check if it can be operated, if not, replace the valve.

#### The actuator operates but the motor is hot.

Possible problems	Solution
a. The mechanical stop screws ran into the output drive gearing.	a. Reset the mechanical end stops and travel cams, please refer to 4.4 (P.9 - P.11).
b. A torque overload caused by the valve.	b. This situation occurs frequently after the valve has been operating for a period of time. It is suggested to replace with a new valve.
c. Wrong power supply.	c. Check the power supply.
d. Actuator operates too frequently and exceeded duty cycle rating.	d. Adjust the system bandwidth or reduce the frequency of operation, please refer to 3.5 (P.5).

#### To control two or more actuators, sometimes the actuator works abnormally and the motor is getting hot.

Possible problems	Solution
Parallel connection.	a. Install Isolating Relay Module (Optional). b. Please contact your distributor to acquire the wiring diagram for parallel connection.

**The valve cannot operate either electrical operation or manual operation.**

Possible problems	Solution
a. The actuator was mounted to the valve improperly.	a. Please refer to 4.2 (P.7) valve installation instructions..
b. The set screw of the cam loosened and resulted in that the travel end positions misaligned.	b. Readjust the mechanical end stops and limit switches, please refer to 4.4 (P.9- P.11).
c. The torque of valve is larger than the torque of actuator.	c. Replace with a new valve or a larger size actuator.
d. The actuator was mounted to the valve improperly.	d. Disassemble the actuator from the valve and reassemble them to verify that they are installed properly.

**None of the LED indicators on the PCBA lit up after power is supplied.**

Possible problems	Solution
a. Blown fuse.	a. Replace a new fuse.
b. PCBA failed.	b. Replace a new PCBA.
c. Wrong supply voltage.	c. Check the power supply.

**The capacitor is faulty.**

Possible problems	Solution
The ambient temperature is too high or too low.	The actuator should be installed within the rated ambient temperature range of -30 °C to +65 °C (-22 °F to + 149 °F).

## Modulating Control

The LED indicators (LD4 - LD9) flash.

Solution
Please refer to 5.6 (P.18 - P. 19).

The LED indicators on the modulating board are normal, but the actuator cannot operate or can only operate in either the fully-open or fully-closed position.

Possible problems	Solution
The input signal with a reversed polarity, it means a signal failure.	Verify if the negative pole of signal input connected to terminal #6 and the positive pole connected to terminal #7.

### Modulating control is not functioning

Possible problems	Solution
<ul style="list-style-type: none"> <li>a. The modulating board is faulty, and the actuator cannot operate or can only operate in one direction.</li> <li>b. Input wrong signal type.</li> <li>c. Modulating board failed and causes actuator cannot operate or only operate in a single direction.</li> </ul>	<ul style="list-style-type: none"> <li>a. Replace a new modulating board</li> <li>b. Check if the input signal is correct, please refer to 5.3 (P.13 - P.15).</li> <li>c. Replace a new modulating board.</li> </ul>

## 7 Warranty

Sun Yeh Ele. Co. Ltd warrants that for a period of twelve months from the date of manufacture it will either repair or replace, at its option, any of its products which prove to be defective in material or workmanship. This warranty does not cover damage resulting from causes such as abuse, misuse, modification or tampering by users. This warranty is extended only to the immediate purchaser of the Sun Yeh product and is not transferable. To obtain service under this warranty, the purchaser must first acquire a return authorization from Sun Yeh. Products must be returned to Sun Yeh under freight prepaid.

This warranty is in lieu of all other obligations, liabilities or expressed warranties. Any implied warranties, including any implied warranty of merchantability are hereby expressly excluded. In no event shall Sun Yeh be liable for special, incidental or consequential damages arising in connection with the use of its products, or for any delay in the performance of this warranty due to cause beyond its control.

## 8 Disposal

Please obey the local environment regulation for equipment scrapping.



**SUN YEH ELECTRICAL IND. CO., LTD.**

No.68, Ln. 854, Sec. 1, Shatian Rd., Dadu Dist.,  
Taichung City 432403, Taiwan  
Tel: +886-4-26985666 Fax: +886-4-26983668  
E-mail: [service@sunyeh.com](mailto:service@sunyeh.com)



[www.sunyeh.com](http://www.sunyeh.com)