

RCEL

SA PCU

Manual



CAUTION



ELECTRICAL SHOCK HAZARD. To avoid serious personal injury, property damage, turn off ALL power to the actuator before removing the cover.

Before installation or use, verify the nameplate information information to insure the correct model number, torque, voltage and enclosure type.

Be sure to completely review the actuator manual prior to operation.

Final limit switch adjustment **MUST** be done after mounting the actuator to the valve. Incorrect adjustment may cause actuator failure.

Over torque switches are factory set, tampering with the over torque switch settings may damage the actuator and void the warranty.

The actuator must be properly grounded. Use the grounding lugs provided on the inside and outside of the actuator body.

To minimize the possible damage caused by condensation, be sure to energize the heater.

Specifications

Input Power	90~230V AC \pm 10%, 50/60Hz DC 24V / AC 24V Input Power must match motor Ratings
Command Signal	4~20mA DC (Default), 0~5VDC, 0~10VDC, 1~5VDC, 2~10VDC
Dead Band	1 ~ 7,5% (1 scale 0,5%)
Output Signal	4~20mA DC
Load Resistance	750 Ω
Wiring Terminals	YW 396 2P(3EA), 3P, 5P connector
Visual Indicators	4 LEDS, Power (Blue), Fault (Yellow), Open (Red), Close (Green)
Calibration Method	ASCN (Autoscan) Button
Output Contact	Relay Contact 250V AC 16A MAX. (Inductive Load)
User Adjustable	Delay Time: 0.5 Sec (Step)
Parameters	Dead Band: 0.2mA(Step) Fail operation (during loss of command signal) Select input signal. A FULL Set or Clear
Resolution	Min 1/1,000
Ambient Temperatur	-10 °C ~ +60 °C
Ambient Humidity	90% RH MAX. (Non-Condensing)
Dielectric Strenght	1,500V AC 1 MIN. (Input to Output to Power to Ground)
Insulation Resistance	500V DC 30M Ω MIN.

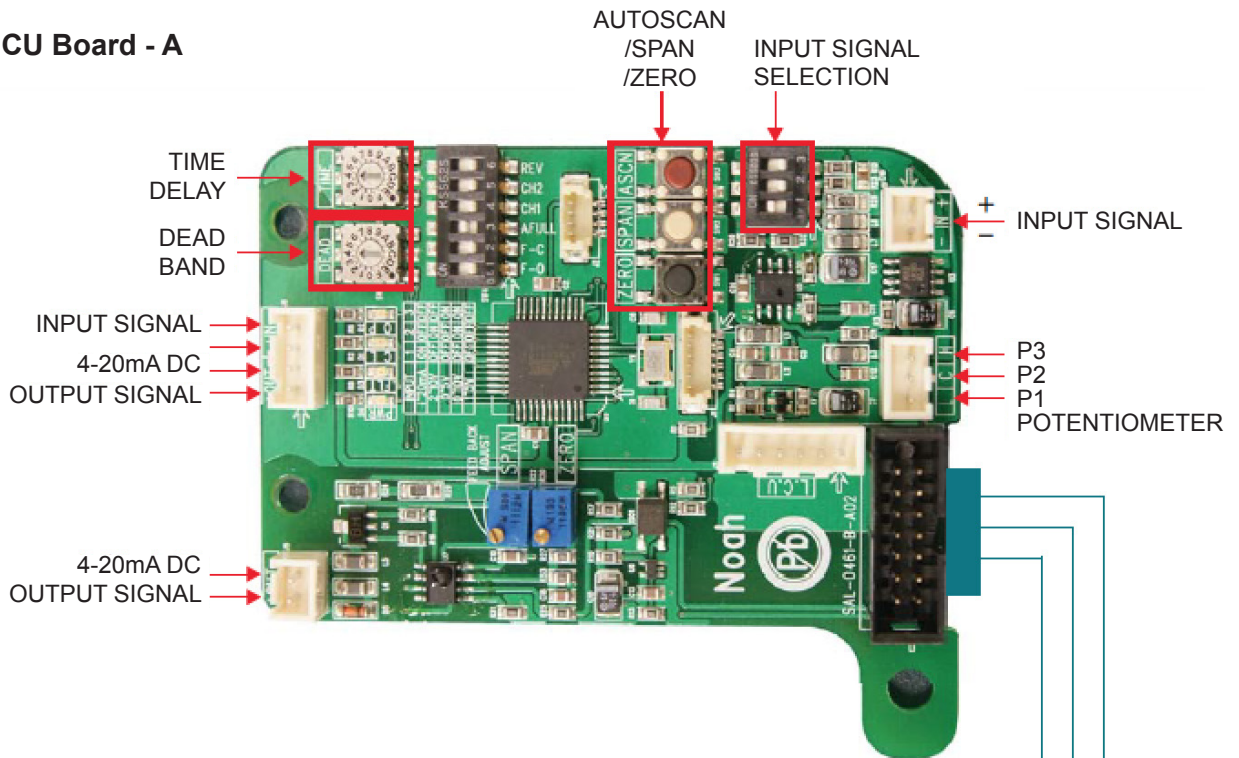
Warranty Information

The warranty will be void under the following conditions:

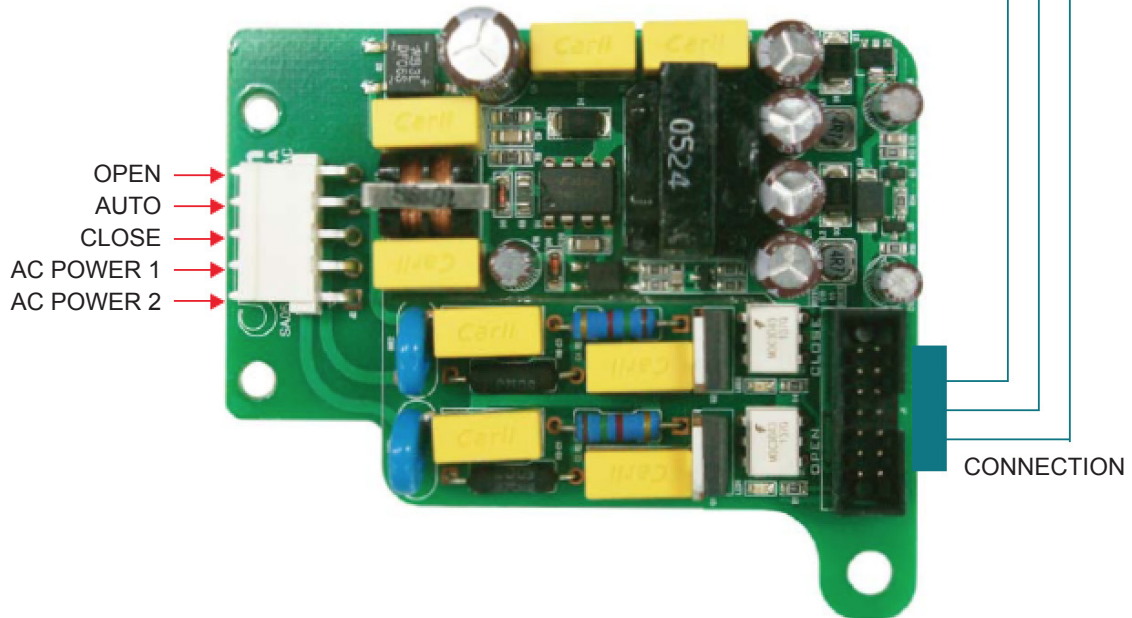
1. Failure or damage caused by misuse or abuse.
2. Failure or damage caused by unauthorized modifications or repairs done to the actuator.
3. Failure caused by the unauthorized modification / change or the wiring.
4. Failure caused by a reverse phase mis-wire when using three phase power.
5. Failure caused by water leakage due to the improper sealing of the actuator conduit entries or by failure to install the cover properly.
6. Failure caused by improperly set limit switches.
7. Failure caused by fire, flood damage or other natural disasters.
8. Failure occuring more than one year after shipment date.

PCU Board Specification

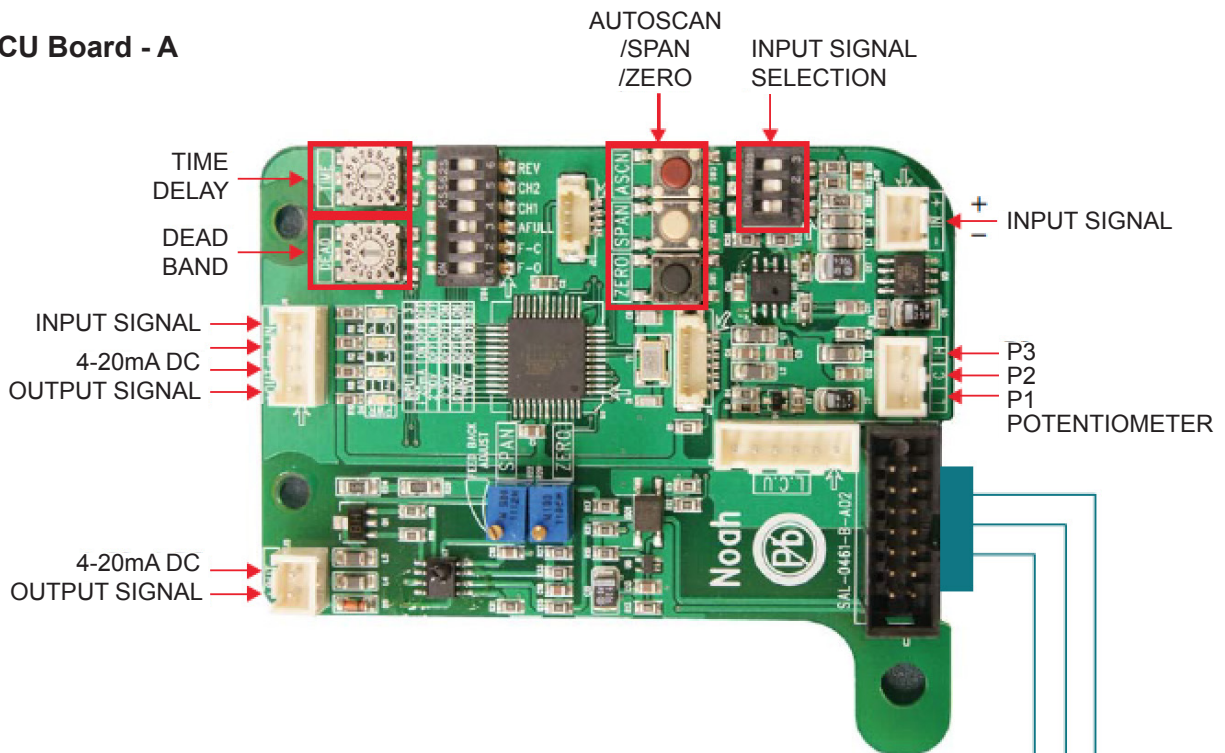
PCU Board - A



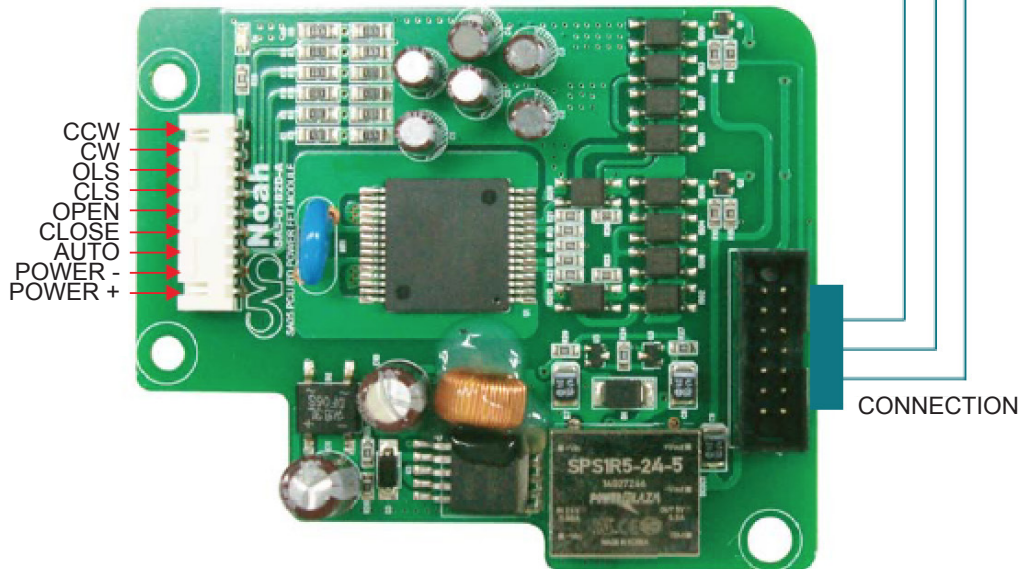
PCU Board - B (AC)

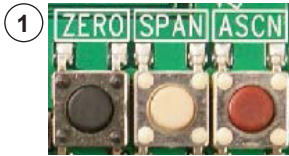


PCU Board - A

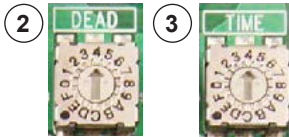


PCU Board - B (DC)





Name	Spec.
ZERO	Close manual control button / Input module button
SPAN	Open manual control button / Input module button
ASCN	AUTO SCAN BUTTON (ACTUATOR automatic control button) delivered from the factory the resistance value of potentiometer may can be changed if the user modifies its limit setting. Please make sure to press the autoscan button for at least 2 seconds before operating proportional control.



Name	Spec.
DEAD BAND	Mechanical steps at least (0.2ma)
TIME DELAY	Modulating starting time (1sec)

What is DEAD BAND ?

It's an area/band where no action occurs due to the actuator input.

If the user inputs 12mA (50%), the actuator is supposed to stop exactly at 50% position. The actuator repeats from open to close in order to stop at 50% position at this point.

This is what we call hunting, and if the hunting effect repeatedly occurs the motor can be damage. Therefore a dead band is set to have some area in order to prevent this from happening.

It's set to have 0.05mA per gradation. If it is at 1PH when shipped from the factory, it is set to have a 0.2mA dead band. If it is at 3PH, on the other hand, it is set to have a 0.3mA dead band.

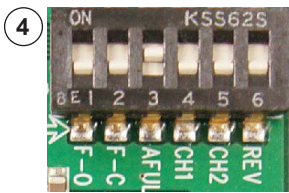
ex) If it is set to have a 0.2mA dead band, the actuator is positioned between 11.8mA to 12.2mA.

In case the actuator stops at the position of 12.1mA, the second least movement area will be at 12.3mA. At this position no action occurs even when there is the input signal.

What is DELAY TIME ?

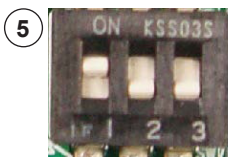
This is when there is an instant noise or disturbance from the outside affectin the input signal and therefore the ACTUATOR can't function. The delay time setting is to prevent this from happening. If the input signal does not change for more than the time set, the ACTUATOR will kick in. The setting for the delay time is 0.5 seconds per gradation. When shipped from the factory the delay time is set at 1 second.

DIP SWITCH



No.	Name	Spec.
1	F O	Fail Open
2	F C	Fail Close
3	A FULL	A Full 3.8 ~ 4.3 Input Fully Close 19.7 ~ 20.2 Input Fully Open
4	CH1	Discretion Setting
5	CH2	Manual Setting
6	REV	Reverse Action

INPUT SIGNAL SELECTION



INPUT	1	2	3
4-20mA	ON	OFF	OFF
2 - 10V	OFF	ON	OFF
0 - 5V	OFF	OFF	ON
0 - 10V	OFF	ON	ON
1 - 5V	OFF	OFF	OFF

CONTROL / WARNING LAMP



Power On	Main Power Input
Power On / Off Flickering	CH1, CH2 in case of optional setting
Fault On / Off Flickering	Input defect/disconnection
Close On Lighting	Full Close
Open On Lighting	Full Open
Fault On Lighting & Close On / Off Flickering	Potentiometer disconnection
Fault On Lighting & Open On / Off Flickering	Potentiometer P1, P3 Inverse Disconnection
Fault On Lighting & Close On Lighting	When manual control of the handle exceeds the close limit setting
Fault On Lighting & Open On Lighting	When manual control of the handle exceeds the open limit setting

Set up and Order

- ① **ACTUATOR FULL CLOSE**

ACTUATOR manually using the lever on the handle and you will FULL CLOSE.
(Refer to page 6)
- ② **CLOSE LIMIT SETTING**

Set the CLOSE LIMIT SWITCH ACTUATOR.
(Refer to page 6)
- ③ **POTENTIOMETER CHECK**

When the ACTUATOR FULL CLOSE status, POTENTIOMETER to determine the value.
* The factory is set to 80 ~ 120Ω. If you have not been set 80 ~ 120Ω, please reset.
(Refer to page 6)
- ④ **ACTUATOR FULL OPEN & OPEN LIMIT SETTING**

Using the manual lever or handle to the FULL OPEN ACTUATOR then, in the same way to set the OPEN LIMIT SWITCH.
(Refer to page 6)
- ⑤ **Electric Wiring and Power Input**

Caution!
1. Confirm that the wiring diagram located in the ACTUATOR and Wiring No. on the nameplate match with each other.
2. INPUT and OUTPUT of the +, - if the substrate is changed, so Please be sure to break.
(Refer to page 7)
- ⑥ **AUTO SCAN**

Please make sure to press the autoscan button for at least 2 seconds before operating proportional control.
ACTUATOR automatically CLOSE, OPEN, while the behavior is to automatically check for abnormalities.
(Refer to page 8)
- ⑦ **4-20mA INPUT**

After entering the 4-20mA INPUT, ACTUATOR make sure that the normal operation.
Determine when the problem occurred after the warning lamp to reset the settings of its contents.
(Refer to page 8)
- ⑧ **4-20mA OUTPUT**

4-20mA OUTPUT not fit, the volume is set using switches..
(Refer to page 8)

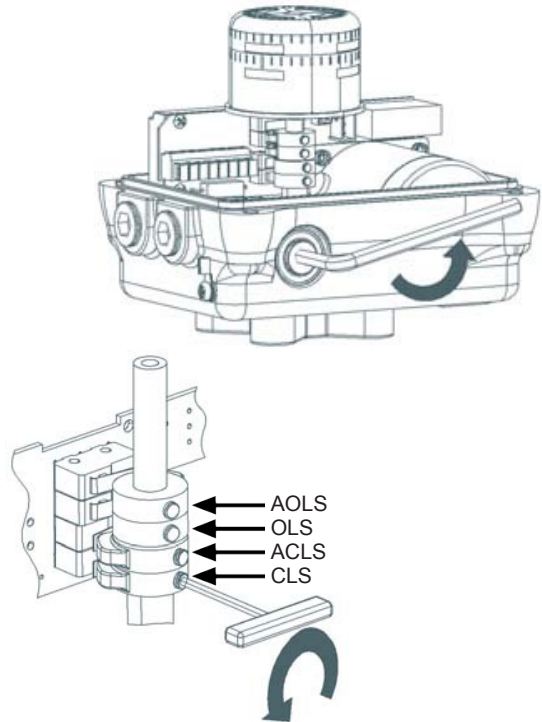
LIMIT SWITCH Setting

Close / Open Limit Cam Switch Setting

1. With the power off, remove the cover and manually rotate the ACTUATOR to the closed, clockwise, position.
2. Loosen the close cam set screw and rotate the cam in a clockwise direction to actuate the close limit switch. Also, the close auxiliary switch cam can be adjusted at this time too.

AOLS	Dry Open Limit Switch
ACLS	Dry Close Limit Switch
OLS	Open Limit Switch
CLS	Close Limit Switch

3. Firmly tighten the cam set screws.
4. To set the open cam switches, repeat the previous instructions except rotate the ACTUATOR to the open, counter-clockwise position and rotate the open cams in the counter-clockwise direction to actuate the open switches.



POTENTIOMETER Setting



- Actuator delivered full close at 80 ~ 120Ω
- After limit setting it should check at closed 80 ~ 120Ω
- Make actuator full closed and power off by moving of gear

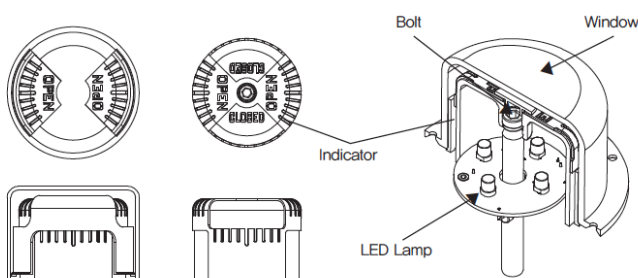


Warning when setting the POTENTIOMETER:
When setting the resistance value on the POTENTIOMETER, always operate when the ACTUATOR power is OFF.
If the power is on, the resistance value on the calibrator will not show accurately.

- When finished setting the device, fix the mudu bolt so that the gear will not move.

Indicator Setting

The position of the valve is indicated by the visual DOME indicator.



LED lights illuminate to allow for easy visual confirmation of valve position.

* If the position of the indicator is not aligned correctly, an adjustment can be made by simply loosening the bolt and manually turning the indicator to the proper location, then re-tightening the bolt.

Wire Connection

The two conduit entries on the SA-Series ACTUATOR are PF1/2". The ACTUATOR is sold worldwide, so there maybe some differences as to the thread and pitch standards. Check with your supplier to confirm which standard is supplied in your area.

Korea, Japan, China	PF 1/2"
Europe, UK, Australia, NZ	M20
US, Canada	NPT 1/2"

- Standard conduit and conduit seal fittings may be used when installing and wiring the ACTUATOR. To prevent moisture and humidity from entering the ACTUATOR, it is highly recommended that a seal fitting be installed in the ACTUATOR conduit entry. After all the conduit and wiring has been completed, then the seal fitting can be sealed with packing and or a potting material.
- Any unused conduit entry must remain plugged with the pipe plug provided with the ACTUATOR. Do not remove the remaining plug as it is already sealed.

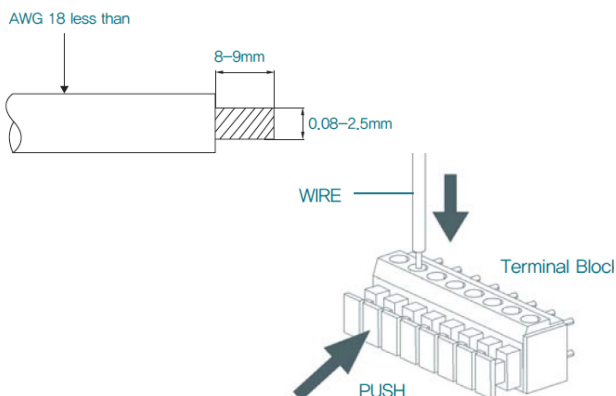
- Be sure to wire and energize the heater as shown in the wiring diagram.
- Each ACTUATOR must be powered by their own individual relays to prevent voltage feedback and ACTUATOR damage.
- After the wiring is completed in the ACTUATOR, use wire ties to group the wires together and clean up their appearance. Be certain that the wires are secure and away from any moving parts. Remove any loose debris before replacing the cover.
- When all the work is completed, replace the top cover and secure it using the four cover screws.
- Apply power and do a final check to confirm proper operation.



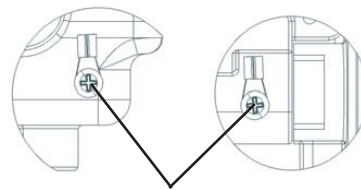
Main Power must only be applied when the top cover is re-installed on the actuator body. If the main power is on while wiring the actuator stop work immediately and turn the power off. Only then it is safe to proceed.

Electrical wiring

- Remove the ACTUATOR cover by loosening the four captive cover bolts.
- Confirm that the wiring diagram located in the ACTUATOR and the wiring number on the nameplate match with each other.
- Confirm that the main power and supply described on the nameplate of the ACTUATOR match with each other.
- Connect the wire to the terminal strip according to the wiring diagram provided. The SA- Series ACTUATOR uses the push type WAGO brand terminal strip. The push type strip makes wiring connections easy and also helps to protect against pipeline vibration.



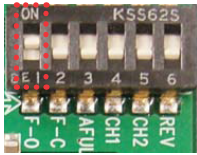
- Be sure to properly ground the ACTUATOR by using the grounding lugs provided on the inside and outside of the ACTUATOR body.



Interior/Exterior earth / ground terminal

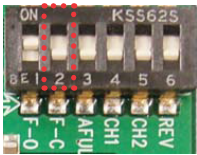
Other Settings

- 1 INPUT in case of error, ACTUATOR FULL OPEN automatically when



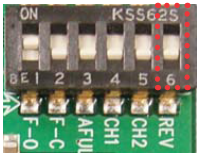
DIP SWITCH No.1 Button ON

- 2 INPUT in case of error, ACTUATOR FULL CLOSE automatically when



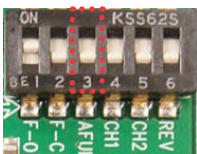
DIP SWITCH No.2 Button ON

- 3 When the ACTUATOR reverse setting



DIP SWITCH No.6 Button ON

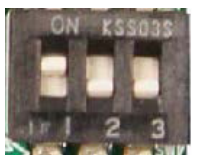
- 4 A FULL function is used



DIP SWITCH No.3 Button ON
If the input signal is at 3.8~4.3mA, the ACTUATOR turns to a FULL CLOSE.
If the input signal is at 19.7~20.2mA, the ACTUATOR turns to a FULL OPEN.

- 5 INPUT is at 4-20mA 0-10V or 0-5V when change

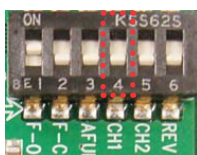
1. DIP SWITCH Change



INPUT	1	2	3
4-20mA	ON	OFF	OFF
2 - 10V	OFF	ON	OFF
0 - 5V	OFF	OFF	ON
0 - 10V	OFF	ON	ON
1 - 5V	OFF	OFF	OFF

DIP SWITCH setting to change to fit the table

2. Optional Modulation



DIP SWITCH No.4 Button ON

3. 0V input, Push the ZERO BUTTON



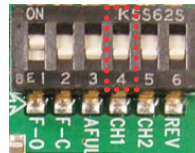
ACTUATOR CLOSE

4. After the 5V or 10V input, SPAN BUTTON push



ACTUATOR OPEN

- 5.

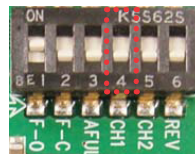


DIP SWITCH No.4 Button OFF

6. 0-10V or 0-5V input, to verify that the normal operation.

- 6 INPUT 4-20mA (0-10V) or 0-5V and 6-18mA (1-9V) If you want to change a current signal

1. Optional Modulation



DIP SWITCH No.4 Button ON

2. 6mA input, Push the ZERO BUTTON



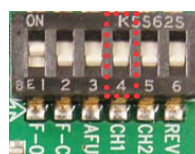
ACTUATOR CLOSE

4. After the 18mA input, SPAN BUTTON push



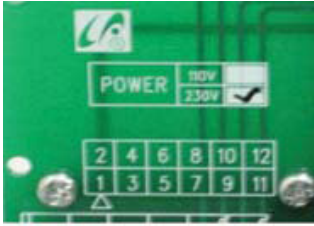
ACTUATOR OPEN

- 5.



DIP SWITCH No.4 Button OFF

ACTUATOR Setting & Test (AC230V Power)



Check the Main Power



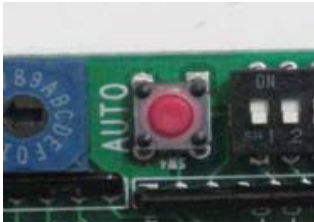
Check the Close Limit



Power input
Wage terminal
No.2, No.5 Jump



Check the resistive value of PIU
(The resistant value when
closed: 80~120Ω)



(ACTUATOR automatic close / open)
AUTO Button push (25sec)



(4mA: Close, 20mA: Open)
4-20mA INPUT (ACTUATOR Operation)

*In case of reverse operation
4mA: Open, 20mA: Close
Refer to page 1 for reverse setting

Maintenance

It is recommended that the ACTUATOR be cycled every two weeks after purchase.
To minimize the effects of condensation in the ACTUATOR, it is recommended that the cable entries to be sealed at the ACTUATOR and that the heater is energized.

Troubleshooting

If the ACTUATOR fails to function correctly, first check for any mechanical / alignment problems, then check for any electrical problems. See chart below for more information.

Problem	Cause	Sollution
Manual override not functioning	Gear failure	Disassemble the ACTUATOR and replace the gear
When the motor does not operate	Main power failure	Main power check
	Motor/ Condenser damage	Replace Motor/ Condenser
	Motor over heated and thermal protector disengaged	Check frequency of operation or JAMMED gears.
	Wiring failure	Confirm unit is properly wired per wiring diagram
	Main board failure	Replace main board
LED lights not operating	LED board failure	Replace LED board
	Main board failure	Replace main board
Actuator continues to move even after the cam has tripped the limit switch.	Main board failure	Replace main board

* In addition to the above described mechanical / electric failures, other causes may be the reason for a failure based on the site conditions. For more information please contact Rotork Sweden AB for consultation.
For faster service, please have all of the nameplate information available.

