

OPERATION MANUAL

Electrical Actuator

Spring Return Actuator

Overview

Sun Yeh electric spring return actuators in addition to the normal function (floating control, on-off control, modulating control), these actuators are designed to provide fail-safe positioning of valves and dampers upon loss of supply voltage. A mechanical spring set is utilized to position the controlled device to either the fully OPEN or fully CLOSED position without any external power source. For ON-OFF type, a mechanical BUFFER employed at the end of the spring stroke in order to reduce the dynamic effects of the spring return system. Except the standard units, it can provide with a clutch-less and lever-less manual override. It provides full-time manual positioning of the controlled device. This design has already won the new Patent in Taiwan, U.S.A., Japan and China.

All the drawings and information are based on actuator in power fail clockwise position.

| Model | Max. Torque | | Weight | | | | Standard Mounting | | | | |
|--------------|-------------|-------|----------|-----|--------------------|-----|------------------------------|-------|------|----------------|------|
| | N.m | lb.in | Standard | | w/ Manual Override | | Mounting Flange (ISO5211) | Shaft | | Depth of Shaft | |
| | | | Kg | lb | Kg | lb | | mm | inch | mm | inch |
| S500 | 50 | 443 | 27 | 60 | 37 | 82 | F07 | 17 | 0.67 | 30 | 1.18 |
| S1300 | 130 | 1151 | 57 | 126 | 74 | 163 | F10 | 22 | 0.87 | 39 | 1.54 |
| S2000 | 200 | 1771 | 95 | 209 | 135 | 298 | F12 | 27 | 1.06 | 45 | 1.77 |
| S2600 | 260 | 2302 | 95 | 209 | 135 | 298 | F12 | 27 | 1.06 | 45 | 1.77 |

Important Notices



CAUTION:

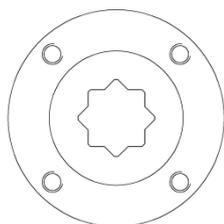
Manual Override

After using the manual override for positioning, the user must manually drive the actuator back to its fully-closed position before the actuator restarts. This is a safety feature.

- a. Check for correct voltage prior to wiring.
- b. Turn power off before servicing or for maintenance purpose.
- c. Use sealant to seal conduit connections after wiring to prevent dusting or water contamination.
- d. The angle of electrical actuator installation must be between 0~180 degree. Do not install upside down or below the horizontal.
- e. Not intended for vacuum spaces and avoid installing near explosive atmospheres.
- f. Actuator should be placed at clean and dry place for storage, and protected with outer carton from being affected by great temperature difference or serious vibration.
- g. Please connect the ground wire to PE inside the electric actuator.
- h. The warranty period is one year.

Standard Mounting

| Model | Mounting Flange (ISO 5211) | Shaft | | Depth of Shaft | |
|-------|-------------------------------|-------|------|----------------|------|
| | | mm | inch | mm | inch |
| S500 | F07 | 17 | 0.67 | 30 | 1.18 |
| S1300 | F075 | 22 | 0.87 | 39 | 1.54 |
| S2000 | F12 | 27 | 1.06 | 45 | 1.77 |
| S2600 | F12 | 27 | 1.06 | 45 | 1.77 |



Specification

110/120VAC

| Model | Max. Torque | | Motor Power | Operating Time (sec. / 90°) | | Current Ratings 110VAC/ 1 Phase | | Current Ratings 120VAC/ 1 Phase | |
|--------------|-------------|-------|-------------|-----------------------------|--------|---------------------------------|---------------|---------------------------------|--------------|
| | N.m | lb.in | | Motor | Spring | Run | Lock | Run | Lock |
| | | | | | | | | | |
| S500 | 50 | 443 | 50W | 7 / 9 | 3 | 1.0 A / 1.3A | 2.0 A / 2.2A | 1.0 A / 1.3A | 2.0 A / 2.2A |
| S1300 | 130 | 1151 | 130W | 7 / 9 | 8 | 2.6A / 4.5A | 10.0A / 10.5A | 3.8A / 6.9A | 11 A / 11.5A |
| S2000 | 200 | 1771 | 130W | 11 / 13 | 12 | 2.6A / 4.5A | 10.0A / 10.5A | 3.8A / 6.9A | 11 A / 11.5A |
| S2600 | 260 | 2302 | 130W | 14 / 17 | 12 | 2.6A / 4.5A | 10.0A / 10.5A | 3.8A / 6.9A | 11 A / 11.5A |

220/240VAC

| Model | Max. Torque | | Motor Power | Operating Time (sec. / 90°) | | Current Ratings 220VAC/ 1 Phase | | Current Ratings 240VAC/ 1 Phase | |
|--------------|-------------|-------|-------------|-----------------------------|--------|---------------------------------|--------------|---------------------------------|-------------|
| | N.m | lb.in | | Motor | Spring | Run | Lock | Run | Lock |
| | | | | | | | | | |
| S500 | 50 | 443 | 50W | 7 / 9 | 3 | 0.6A / 0.7A | 1.0 A / 1.2A | 0.7 A / 0.8A | 1.3A / 1.5A |
| S1300 | 130 | 1151 | 130W | 7 / 9 | 8 | 1.5 A / 2.2A | 5.0A / 5.1A | 2.1A / 3.8A | 5.6A / 5.7A |
| S2000 | 200 | 1771 | 130W | 11 / 13 | 12 | 1.5 A / 2.2A | 5.0A / 5.1A | 2.1A / 3.8A | 5.6A / 5.7A |
| S2600 | 260 | 2302 | 130W | 14 / 17 | 12 | 1.5 A / 2.2A | 5.0A / 5.1A | 2.1A / 3.8A | 5.6A / 5.7A |

380/440VAC 3 Phase

| Model | Max. Torque | | Motor Power | Operating Time (sec. / 90°) | | Current Ratings 380VAC/ 3 Phase | | Current Ratings 440VAC/ 3 Phase | |
|--------------|-------------|-------|-------------|-----------------------------|--------|---------------------------------|--------------|---------------------------------|--------------|
| | N.m | lb.in | | Motor | Spring | Run | Lock | Run | Lock |
| | | | | | | | | | |
| S500 | 50 | 443 | 50W | 7 / 8.5 | 3 | 0.4 A / 0.4A | 0.5A / 0.6A | 0.3A / 0.4A | 0.5 A / 0.6A |
| S1300 | 130 | 1151 | 130W | 7 / 8.5 | 8 | 1.0A / 1.5A | 2.8 A / 3.0A | 0.7A / 1.0A | 2.1A / 2.2A |
| S2000 | 200 | 1771 | 130W | 11 / 13.0 | 12 | 1.0A / 1.5A | 2.8 A / 3.0A | 0.7A / 1.0A | 2.1A / 2.2A |
| S2600 | 260 | 2302 | 130W | 14 / 17.0 | 12 | 1.0A / 1.5A | 2.8 A / 3.0A | 0.7A / 1.0A | 2.1A / 2.2A |

24V DC/AC

| Model | Max. Torque | | Motor Power | Operating Time (sec. / 90°) | | Current Ratings 24V DC/AC 1 Phase | |
|--------------|-------------|-------|-------------|-----------------------------|--------|--------------------------------------|-------|
| | N.m | lb.in | | Motor | Spring | Run | Lock |
| S500 | 50 | 443 | 50W | 7 | 3 | 3.0A | 4.0A |
| S1300 | 130 | 1151 | 130W | 8 | 3 | 9.0A | 19.0A |
| S2000 | 200 | 1771 | 130W | 11 | 3 | 9.0A | 19.0A |
| S2600 | 260 | 2302 | 130W | 17 | 3 | 9.0A | 19.0A |

Note :

Run: Full Load Ampere
 Lock : Locked Rotor Ampere

Storage Information

Receiving /Inspection

Carefully inspect for shipping damage. Damage to the shipping carton is usually a good indication that it has received rough handling. Report all damage immediately to the freight carrier and your seller.

Unpack the product and information packet taking care to save the shipping carton and any packing material should return be necessary. Verify that the items on the packing list or bill of lading agree with your own documentation.

Storage

If your actuator cannot be installed immediately, store it in a dry place, it must be protected from excess moisture, dust, and weather until you are ready to connect cables.

If the actuator has to be installed but cannot be cabled, please don't remove the plastic transit cable entry plugs. When the actuator has to be cabled, it is recommended to replace to suitable water-proof plugs with IP protection.

Lubrication

The gear train has been permanently lubricated at the factory sufficiently.

Installation Procedures

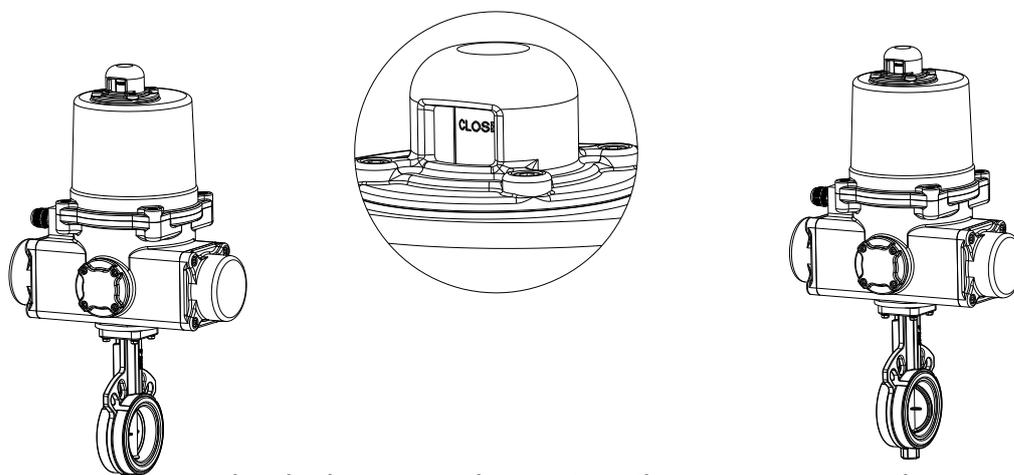


CAUTION:

For the safety reason, do not remove or inspect the **SPRING STRUCTURE** in any cases. That can cause seriously injured if the applicable tools are not used.

The actuator is shipped in the designated fail position from the factory. Make sure the valve and actuator are in the same position before mounting.

1. If the actuator is to fail close on loss of power, the valve must be in the closed position when mounting the actuator. On the other hand, if the actuator is to fail open on loss of power, the valve must be in the open position when mounting the actuator.



2. Remove valve mechanical stops and mount on the proper connection.
CAUTION: Do NOT remove any parts necessary for the proper operation of the valve.
3. Check again that the valve and actuator are in the same position.
4. Install the actuator to valve directly or with mounting kits, then tighten all screws and nuts.
5. Remove actuator cover.
CAUTION: Be sure power is off at the main power box.
6. Wire actuator using the wiring diagram inside cover.
7. Supply power to actuator.
CAUTION: Use remarkable mark warning “ there are live circuits that could cause electrical shock or death”.
8. Make sure if it is needed to calibrate the fully-open or fully-closed position of the actuator. Refer to page 24~25 to set the fully -open or fully-closed position.
9. Replace cover and secure cover screws.

Wiring Diagram

Abbreviation Illustration

1. N.F.B : No fuse breaker.
2. C.S. : Control switch.
3. S1 : Switch.
4. H : Heater.
5. LS1 : Limit switch for open.
LS2 : Limit switch for ZERO degree.
6. Duty cycle: 50%.
7. The usage for 2 additional limit switches :
LS3 Fully-open : Terminal "A" connects to terminal "C".
LS4 Fully-closed : Terminal "D" connects to terminal "F".

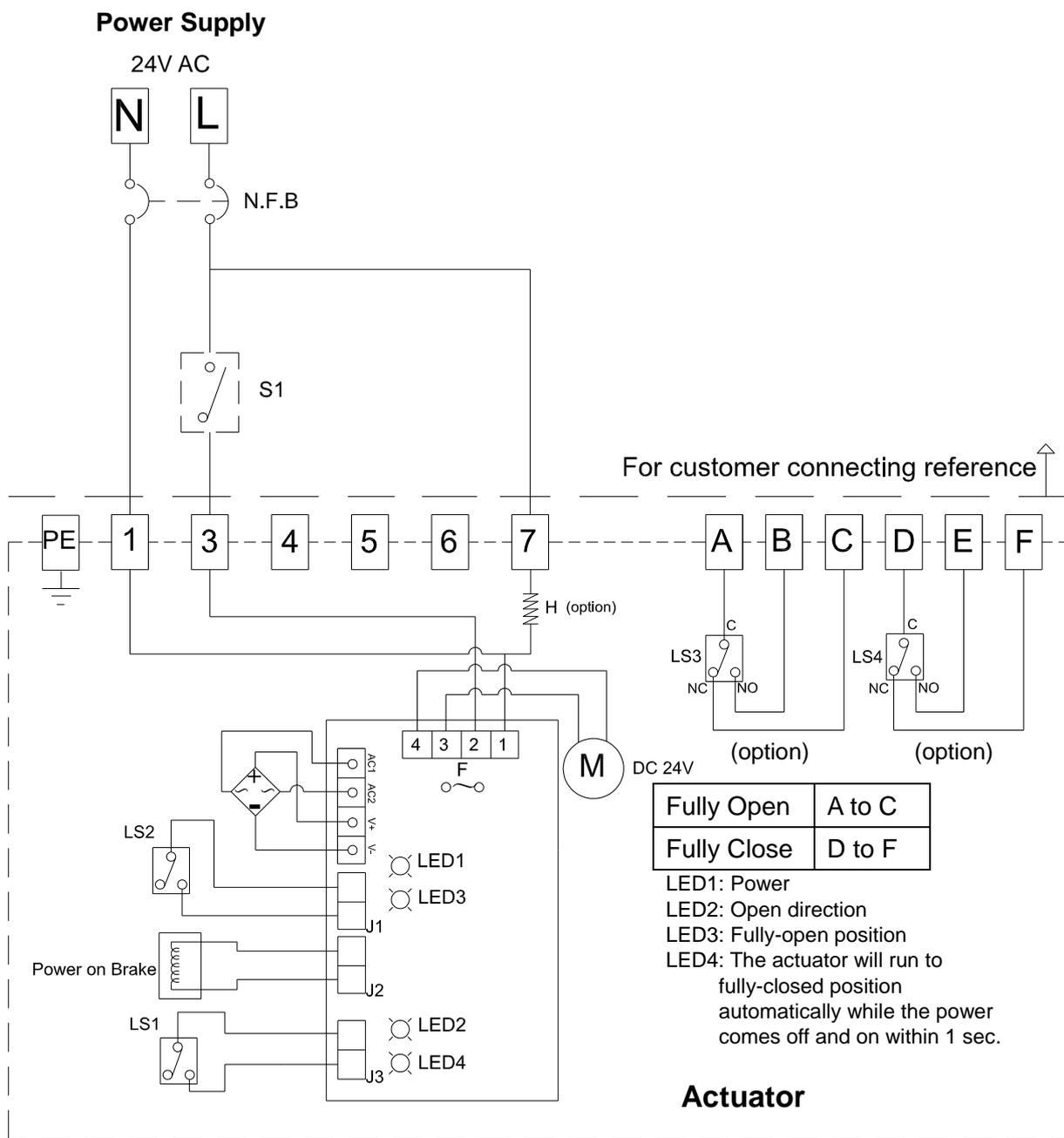
Options Table

| Controller | Voltage | Options |
|-------------------|------------|---|
| 2-Position | ALL | Heater Heater Thermostat 2 extra limit switches Operating Direction to fail (CW/CCW) Manual Override Potentiometer Unit (1K or 5K Ohm) |
| Floating | 110/220VAC | Heater Heater Thermostat 2 extra limit switches Operating Direction to fail(CW/CCW) Manual Override Potentiometer Unit (1K or 5K Ohm) Current Position Transmitter (4-20mA) |
| Modulating | 110/220VAC | Heater Heater Thermostat 2 extra limit switches Operating Direction to fail(CW/CCW) Manual Override |

Wiring Diagram – Spring Return Actuator

S500 24V AC

On-Off Controller (two- position)



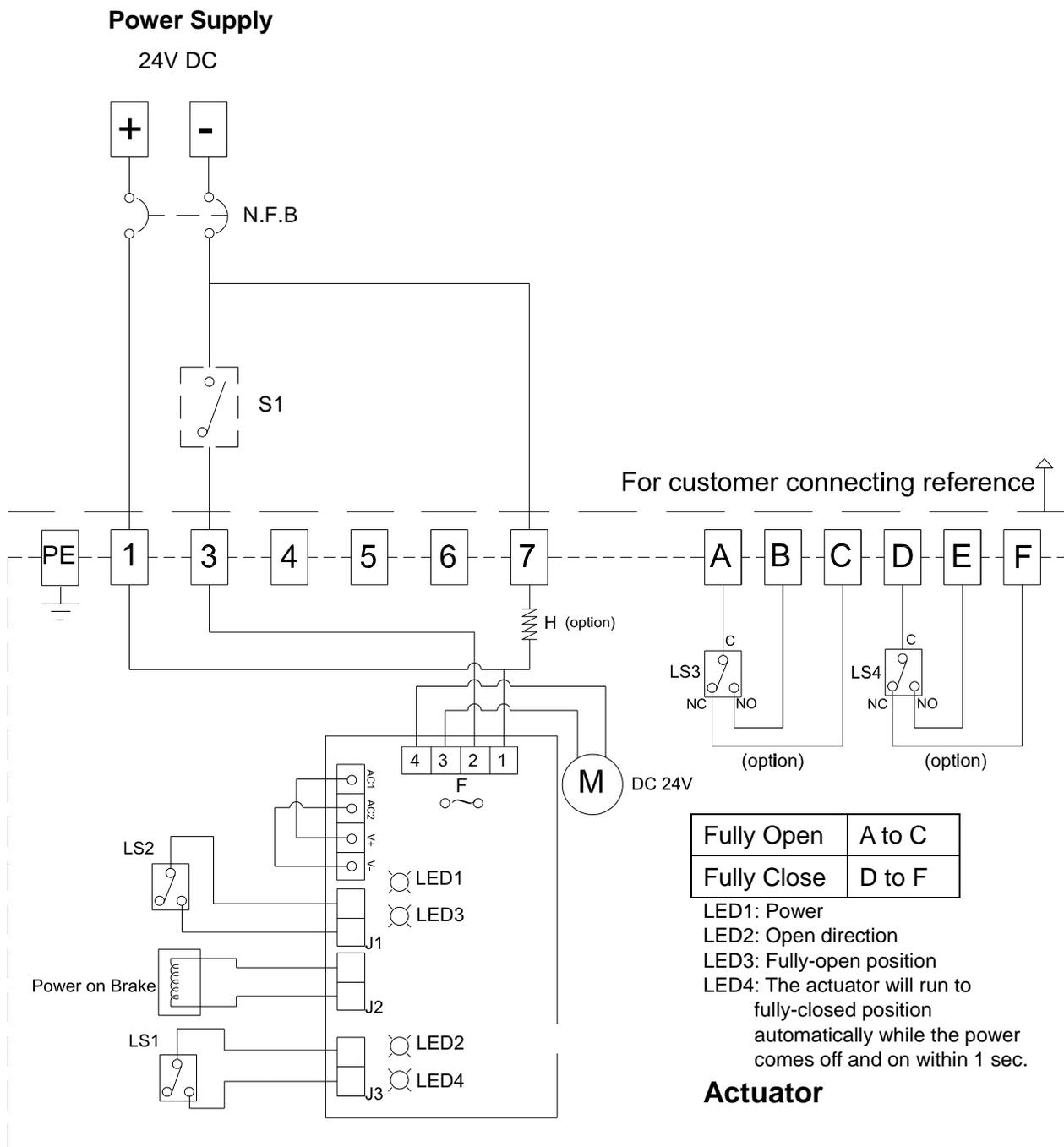
NOTE:

1. "N" connects to #1 , "L" connects to #3.
2. Heater (option) : "L" connects to #7.
3. S1 connects to "OPEN" and disconnects to "CLOSE".
4. Using less than 5A current for "A~F".

Wiring Diagram – Spring Return Actuator

S500 24V DC

On-Off Controller (two- position)



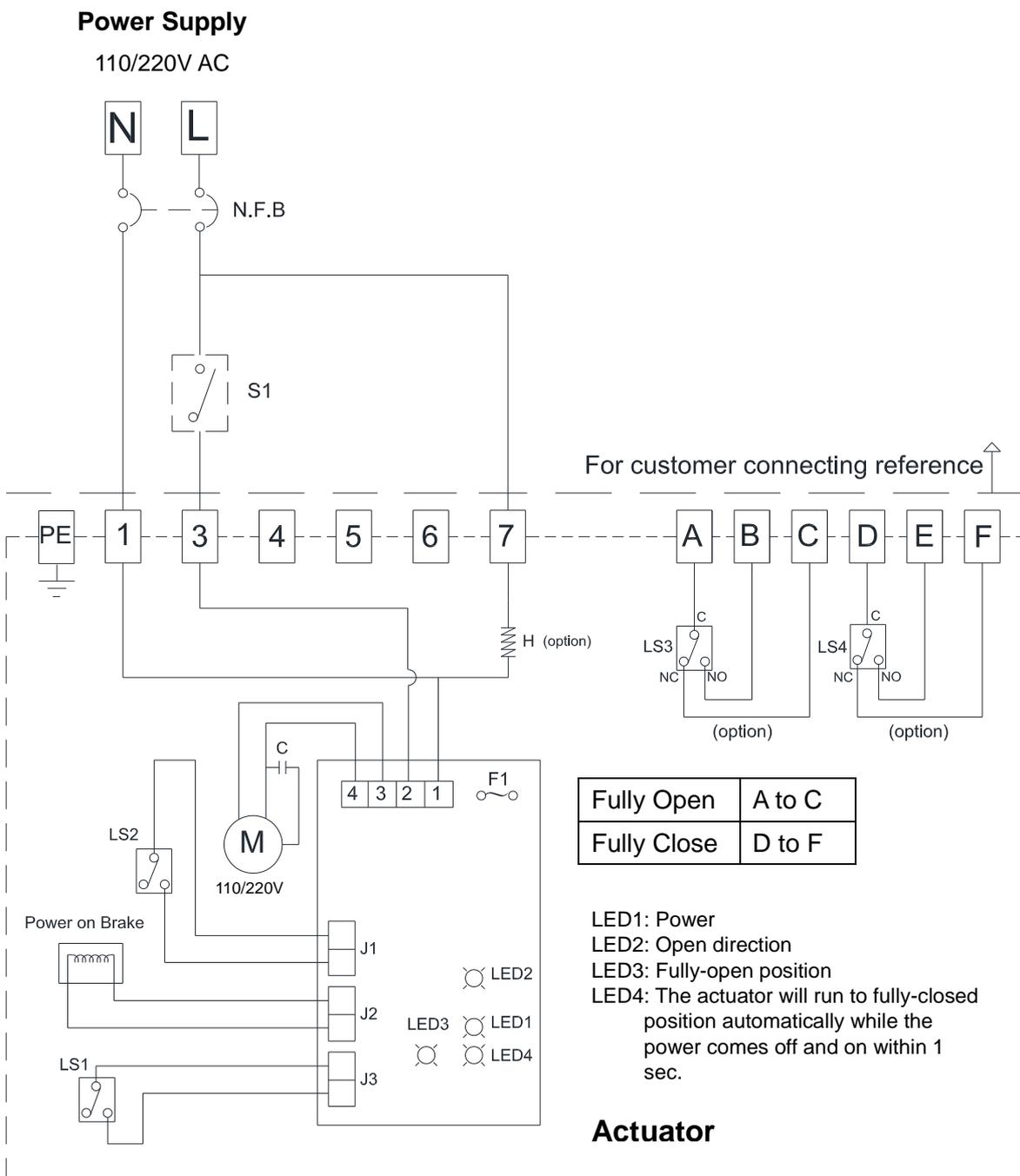
NOTE:

1. “+” connects to #1 , “-” connects to #3.
2. Heater (option) : “-” connects to #7.
3. S1 connects to “OPEN” and disconnects to “CLOSE”.
4. Using less than 5A current for “A~F”.

Wiring Diagram – Spring Return Actuator

S500 110, 220V AC 1-Phase

On-Off Controller (two- position)



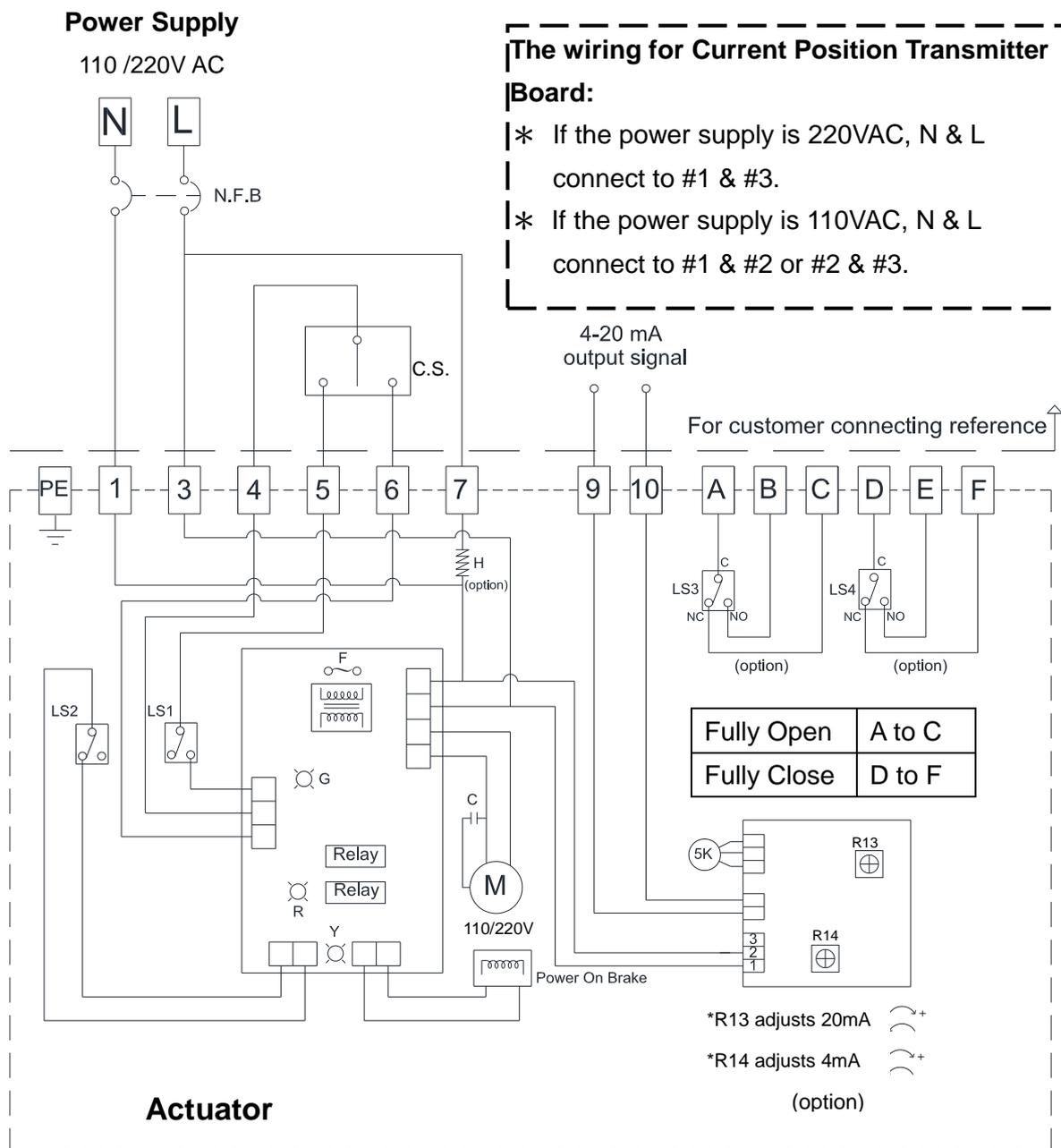
NOTE:

1. "N" connects to #1 , " L " connects to #3.
2. Heater (option) : "L" connects to #7.
3. S1 connects to "OPEN" and disconnects to "CLOSE".
4. Using less than 5A current for "A~F".

Wiring Diagram – Spring Return Actuator

S500 110, 220V AC 1-Phase

Floating Control, Current Position Transmitter



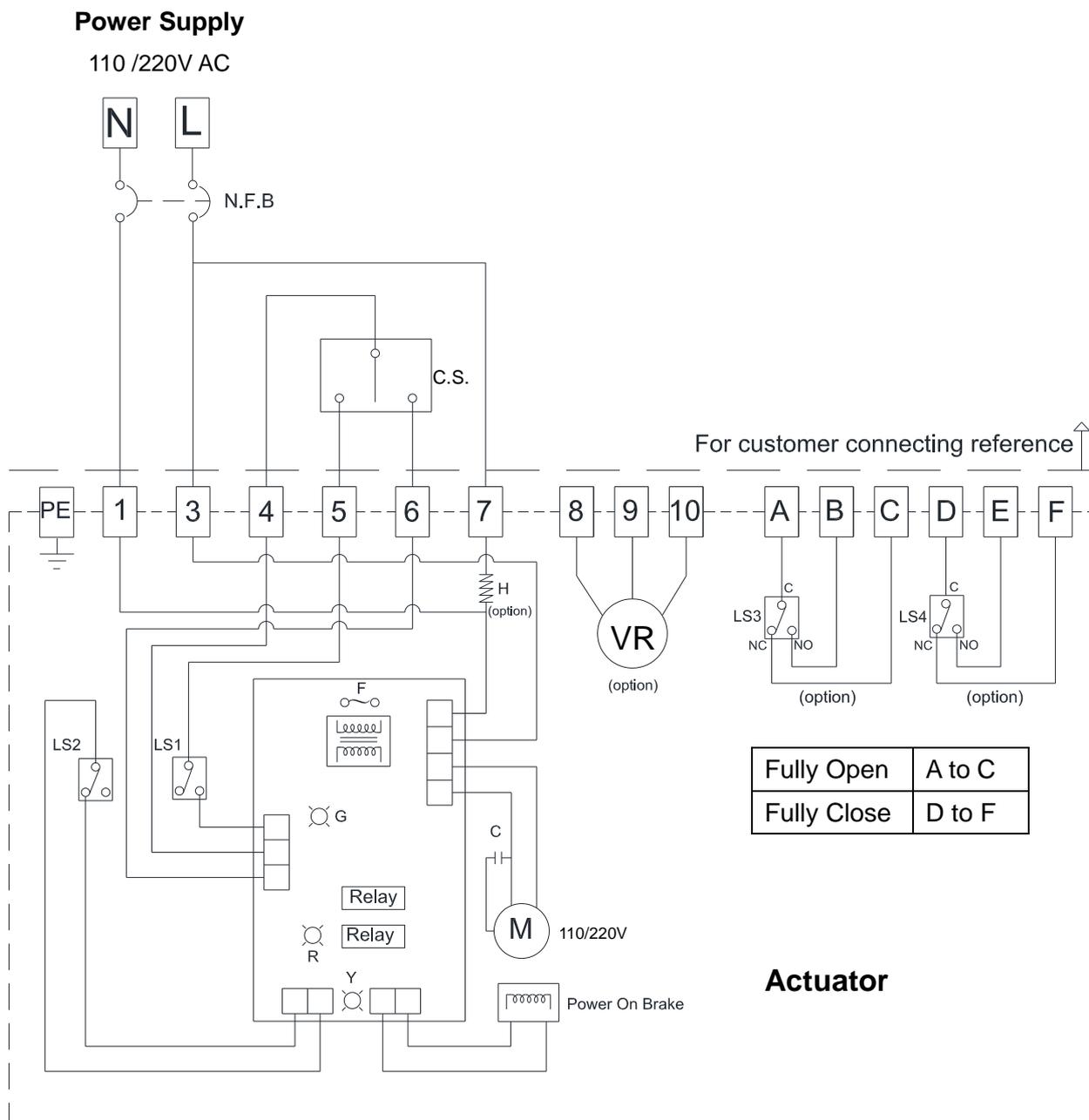
NOTE:

1. "N" connects to #1 , " L " connects to #3.
2. Heater (option) : "L" connects to #7.
3. OPEN: #4 connects to #5.
CLOSE: #4 connects to #6.
4. Using less than 5A current for "A~F".

Wiring Diagram – Spring Return Actuator

S500 110, 220V AC 1-Phase

Floating Controller, Potentiometer Unit



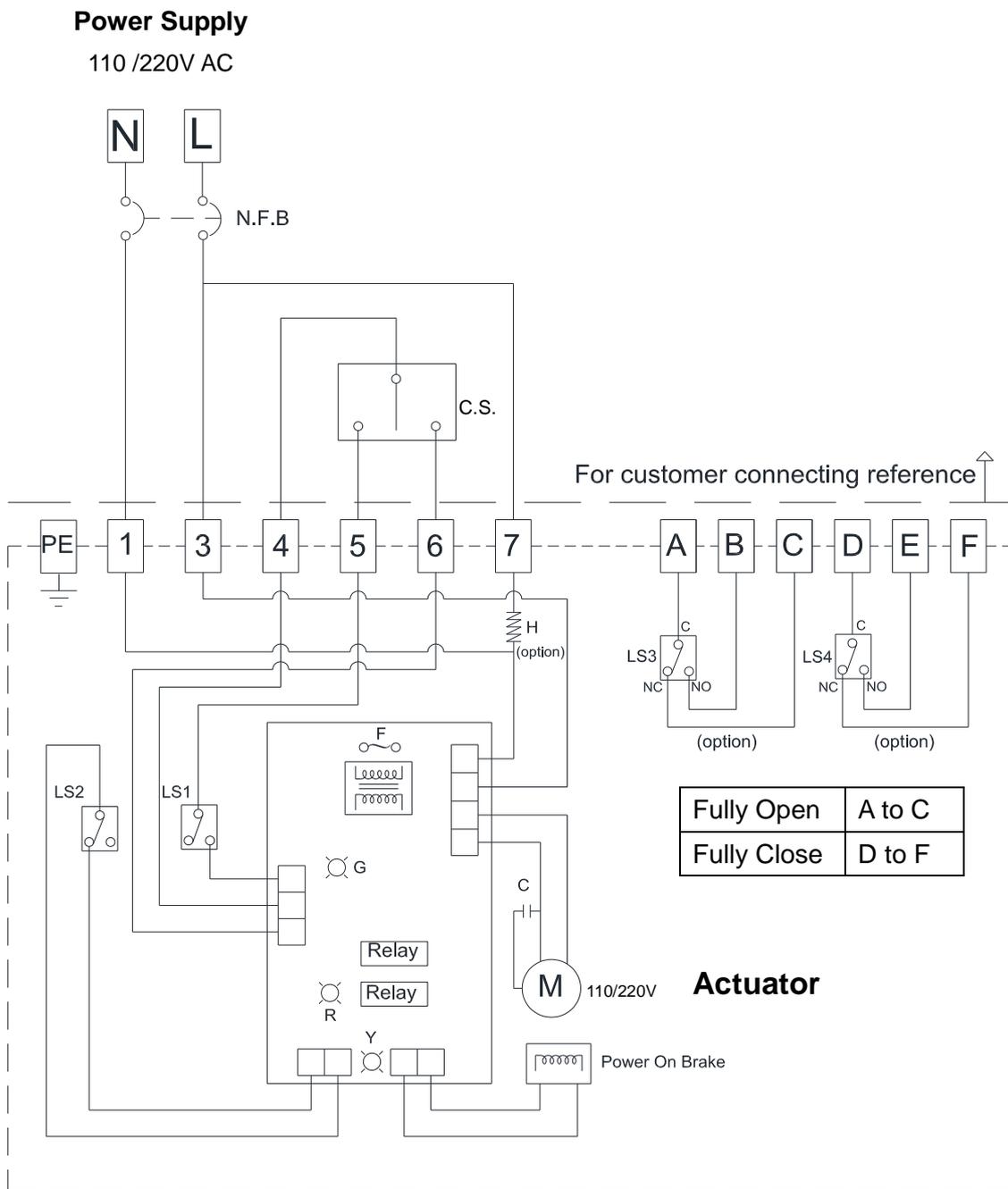
NOTE:

1. "N" connects to #1 , " L " connects to #3.
2. Heater (option) : "L" connects to #7.
3. OPEN: #4 connects to #5.
CLOSE: #4 connects to #6.
4. Using less than 5A current for "A~F".

Wiring Diagram – Spring Return Actuator

S500 110, 220V AC 1-Phase

Floating Controller



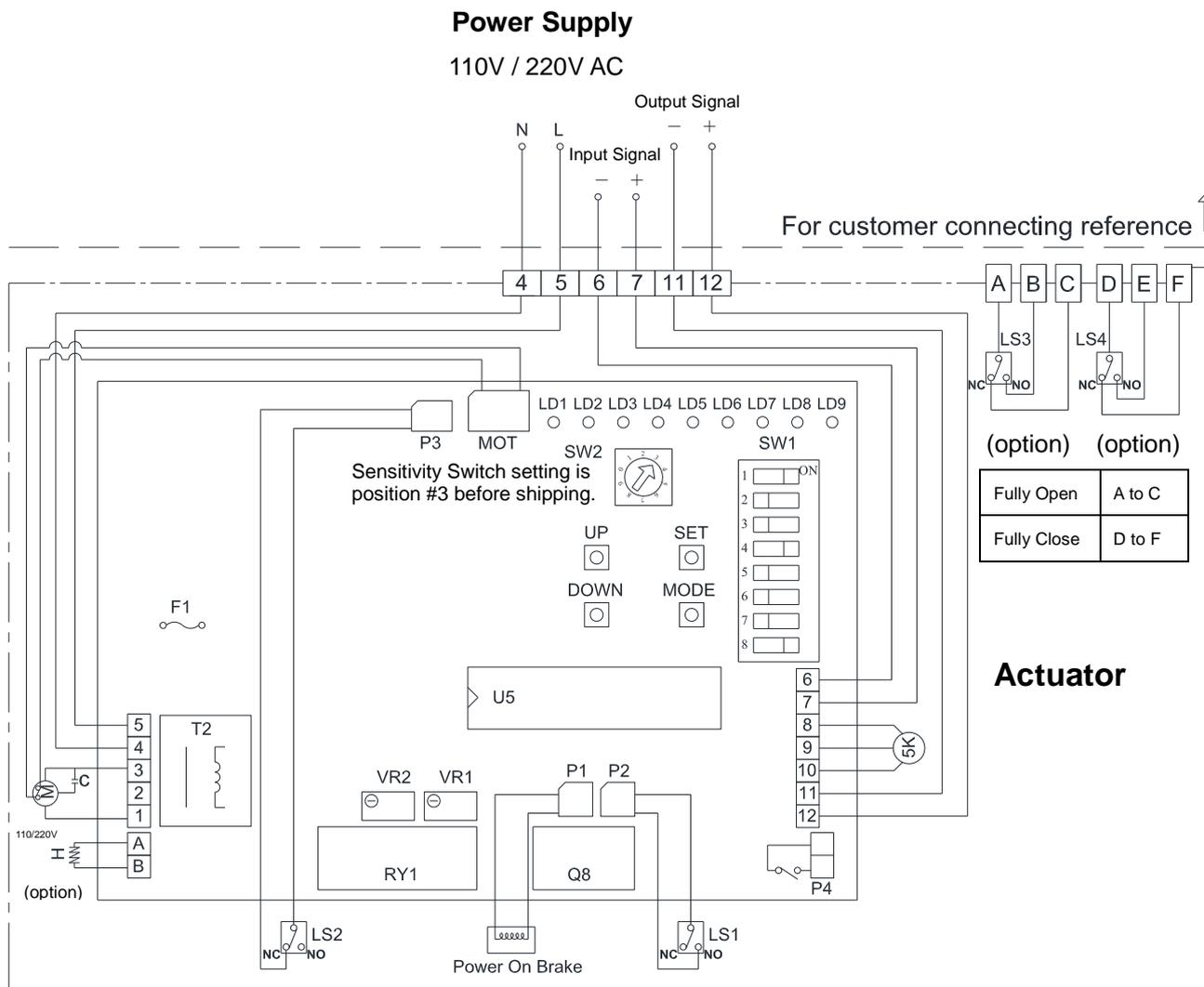
NOTE:

1. "N" connects to #1 , " L " connects to #3.
2. Heater (option) : "L" connects to #7.
3. OPEN: #4 connects to #5.
CLOSE: #4 connects to #6.
4. Using less than 5A current for "A~F".

Wiring Diagram – Spring Return Actuator

S500 110V, 220V AC 1-Phase

Modulating Controller



NOTE :

1. Modulating board

Input Signal: 4-20mA, 1-5V, 2-10V

(It is suggested to use the shielding wire and its length should not exceed 30m.)

Output Signal : 4-20mA, 2-10V

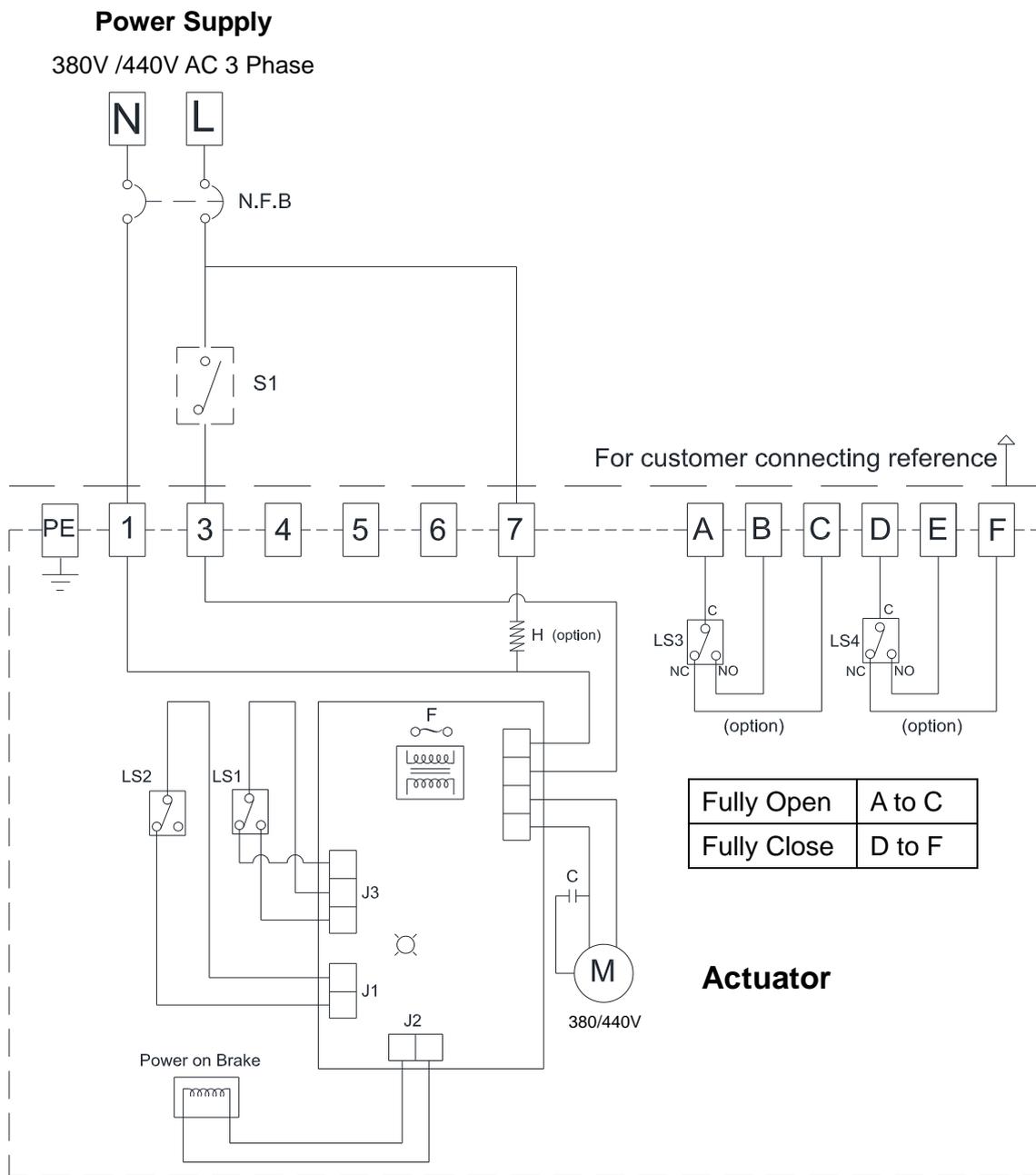
2. Using less than 5A current for “A ~ F”.

3. P4 will connect when the actuator doesn't reach the (normal) end of travel previously set within 15 sec.

Wiring Diagram – Spring Return Actuator

S500 380, 440V AC 3-Phase

On-Off Controller (two-position)



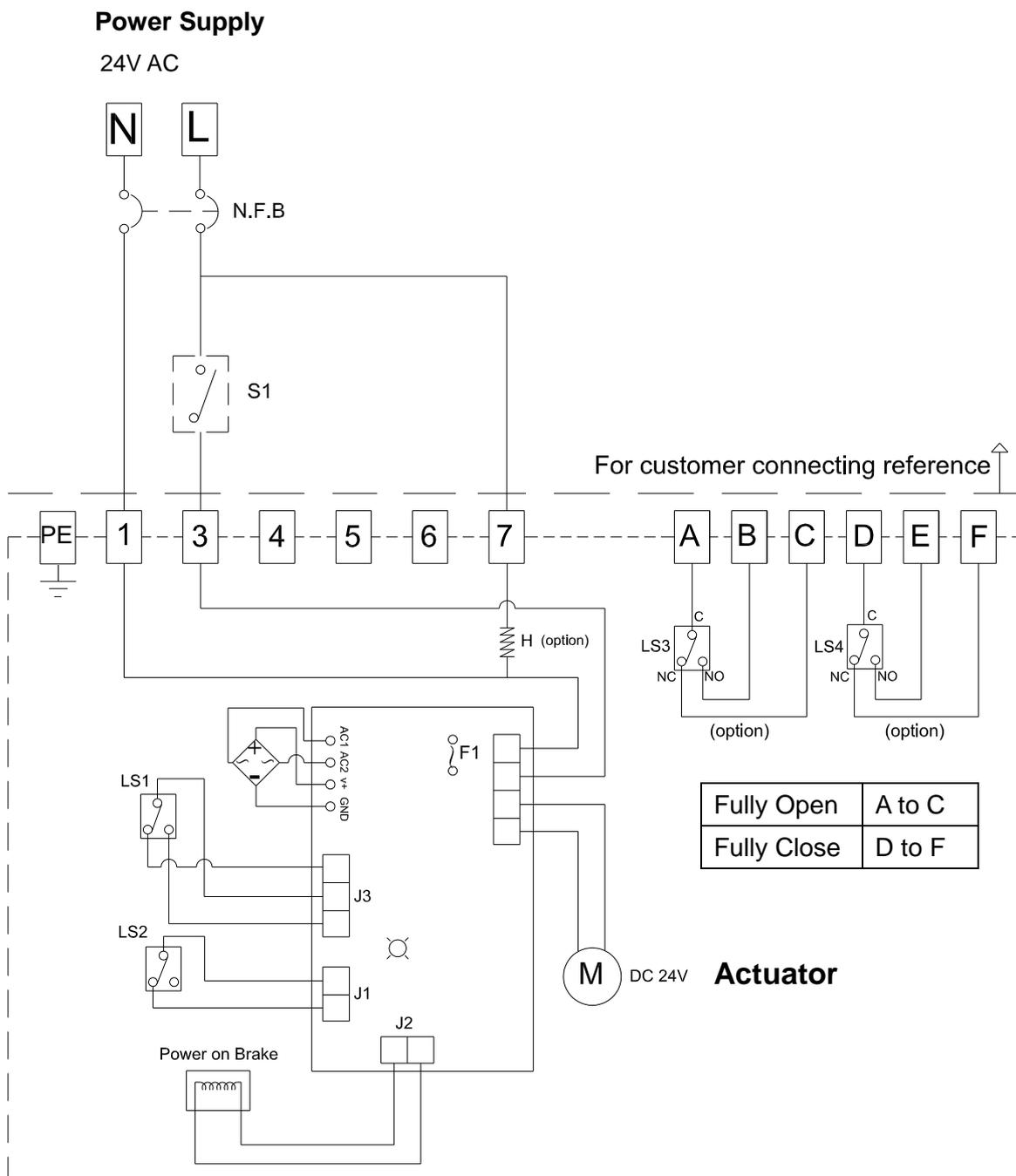
NOTE:

1. "N" connects to #1 , " L " connects to #3.
2. Heater (option) : "L" connects to #7.
3. S1 connects to "OPEN" and disconnects to "CLOSE".
4. Using less than 5A current for "A~F".
5. For 3-Phase voltage, connect any two of the U, V, W to #1 & #3.

Wiring Diagram – Spring Return Actuator

S1300 ~ S2600 24V AC

On-Off Controller (two- position)



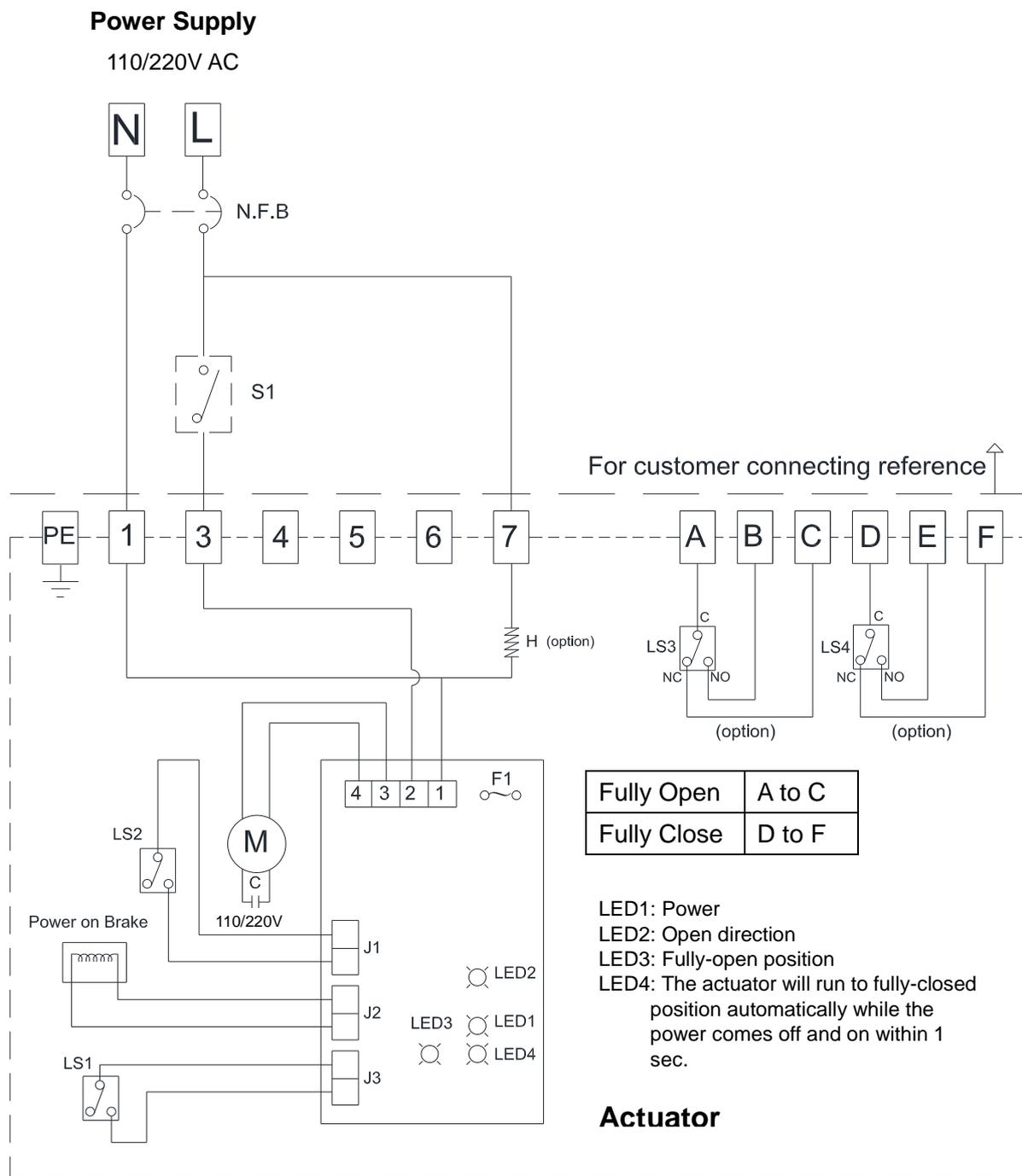
NOTE:

1. "N" connects to #1 , " L " connects to #3.
2. Heater (option) : "L" connects to #7.
3. S1 connects to "OPEN" and disconnects to "CLOSE".
4. Using less than 5A current for "A~F".

Wiring Diagram – Spring Return Actuator

S1300 ~ S2600 110, 220V AC 1- Phase

On-Off Controller (two-position)



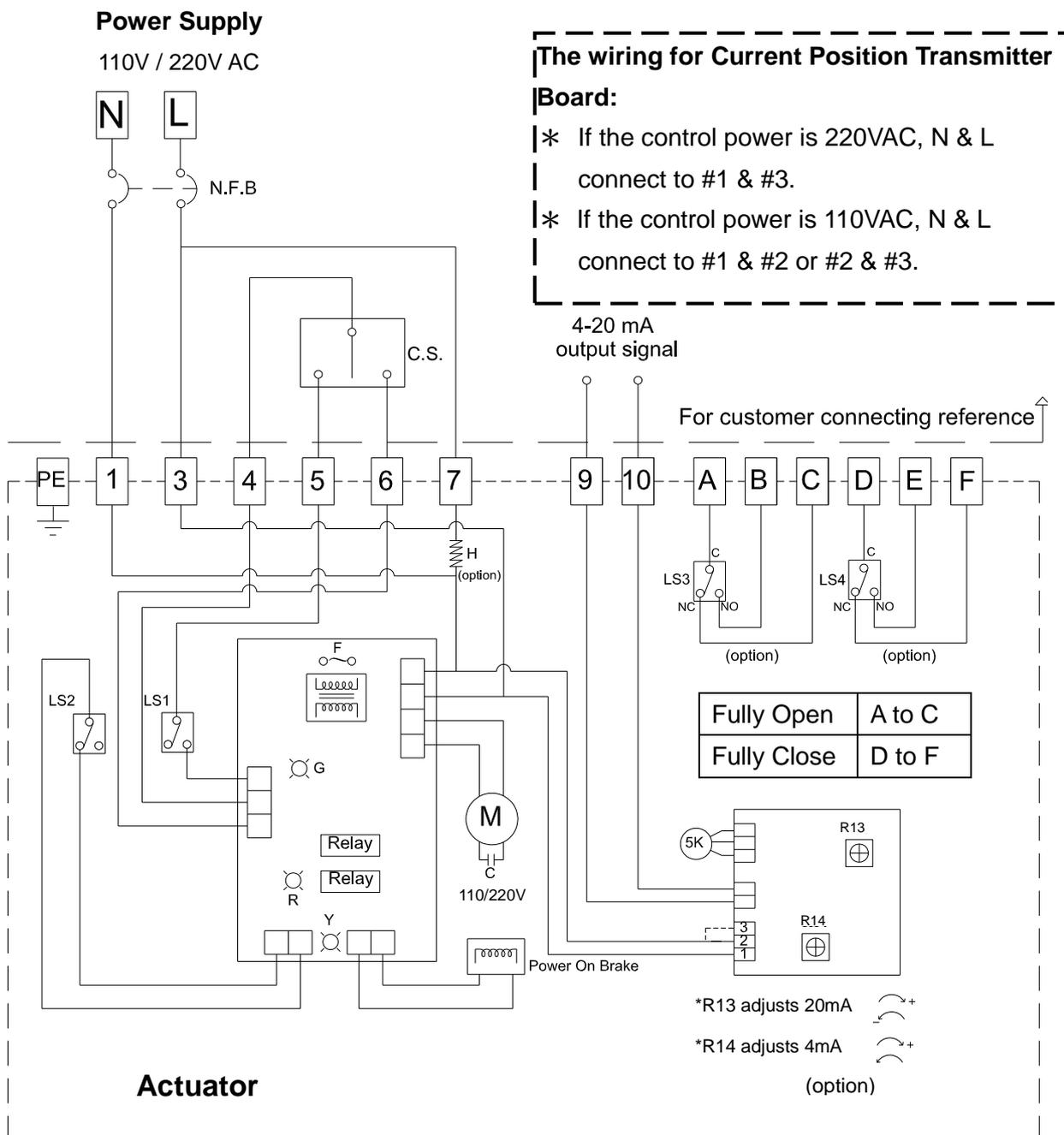
NOTE:

1. "N" connects to #1 , " L " connects to #3.
2. Heater (option) : "L" connects to #7.
3. S1 connects to "OPEN" and disconnects to "CLOSE".
4. Using less than 5A current for "A~F".

Wiring Diagram – Spring Return Actuator

S1300 ~ S2600 110V, 220V AC 1-Phase

Floating Controller, Current Position Transmitter



The wiring for Current Position Transmitter Board:

- * If the control power is 220VAC, N & L connect to #1 & #3.
- * If the control power is 110VAC, N & L connect to #1 & #2 or #2 & #3.

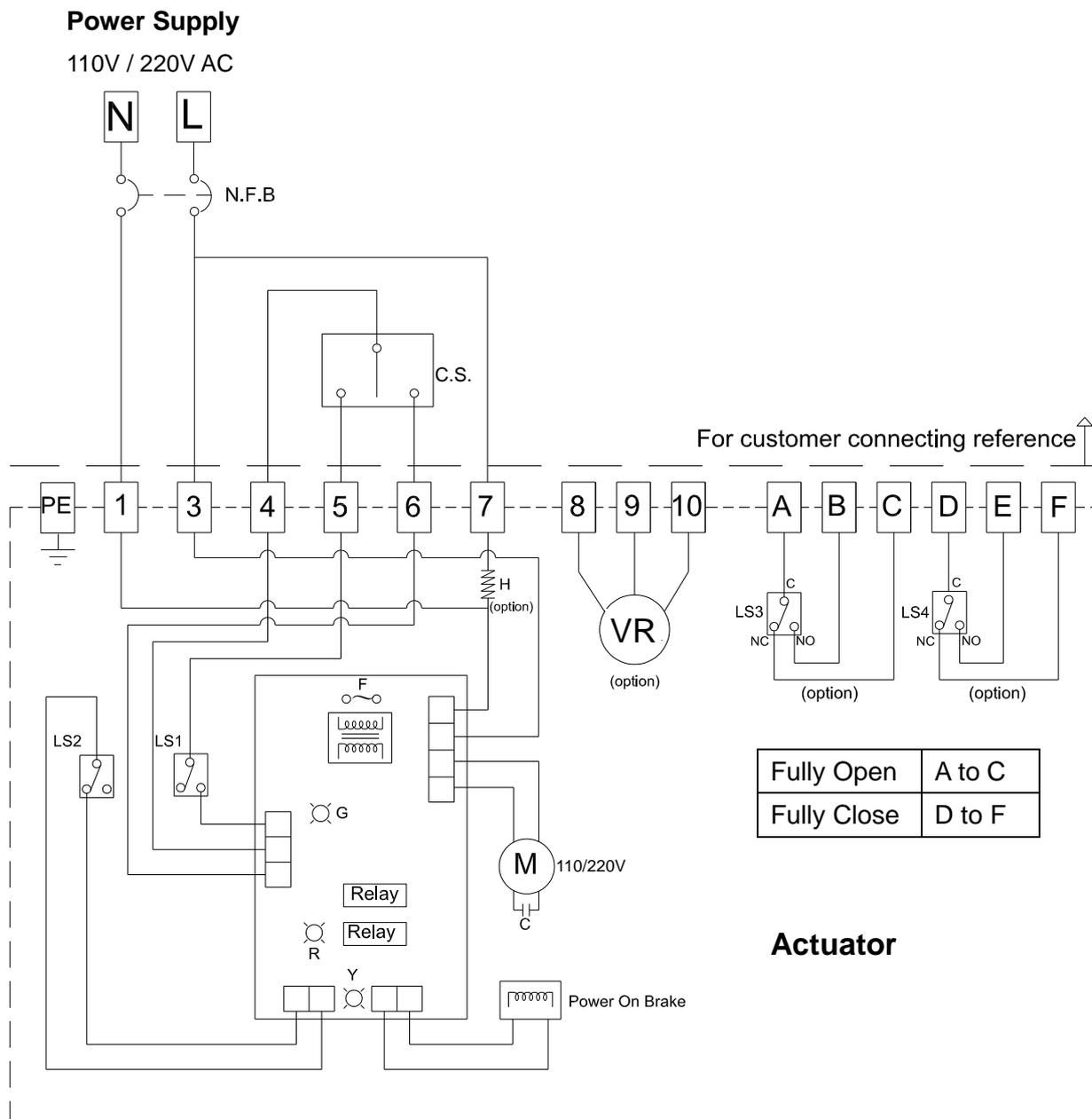
NOTE:

1. "N" connects to #1 , " L " connects to #3.
2. Heater (option) : "L" connects to #7.
3. OPEN: #4 connects to #5.
CLOSE: #4 connects to #6.
4. Using less than 5A current for "A~F".

Wiring Diagram – Spring Return Actuator

S1300 ~ S2600 110V, 220V AC 1-Phase

Floating Controller, Potentiometer Unit



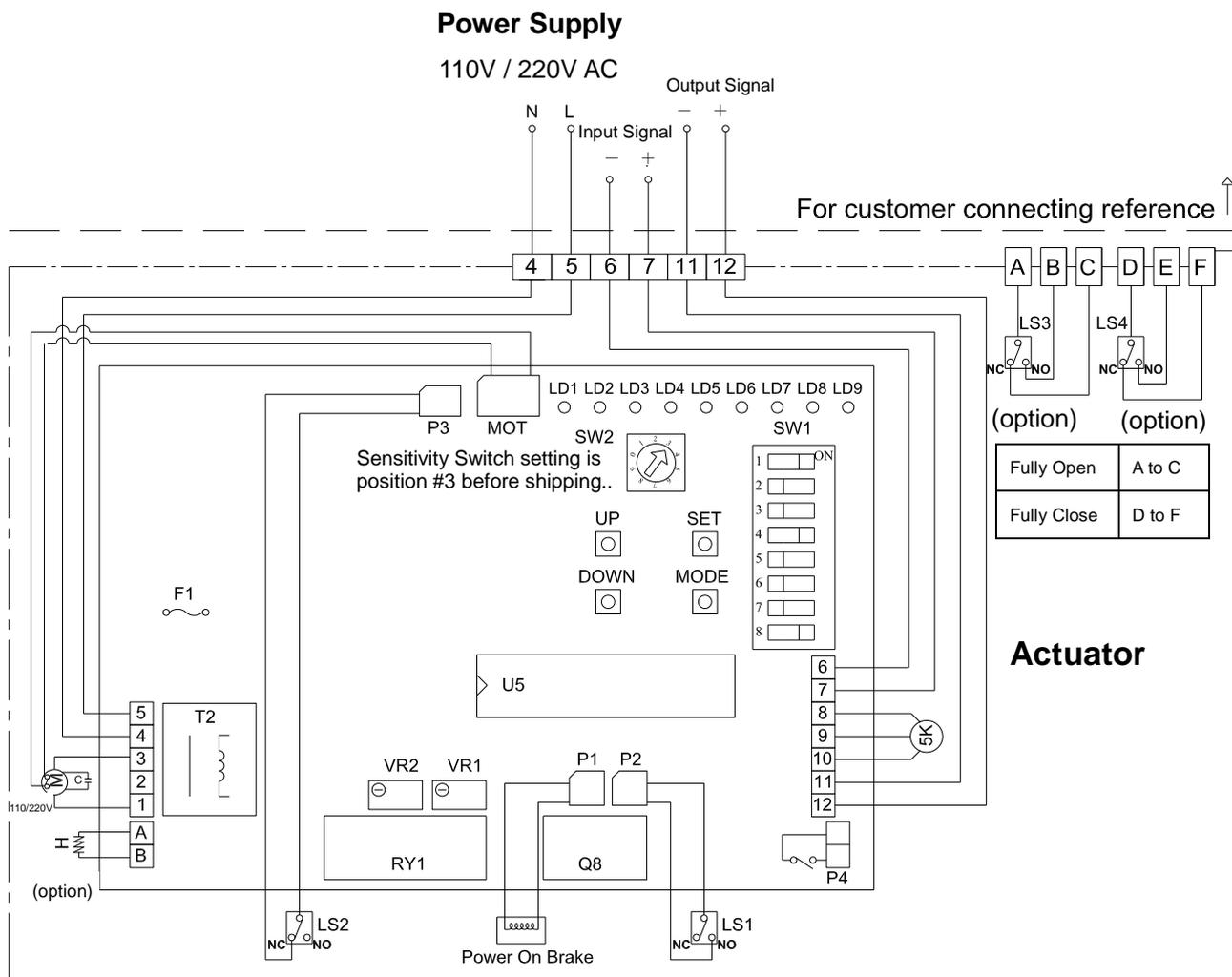
NOTE:

1. "N" connects to #1 , " L " connects to #3.
2. Heater (option) : "L" connects to #7.
3. OPEN: #4 connects to #5.
CLOSE: #4 connects to #6.
4. Using less than 5A current for "A~F".

Wiring Diagram – Spring Return Actuator

S1300 ~ S2600 110V, 220V AC 1-Phase

Modulating Controller



NOTE :

1. Modulating board

Input Signal: 4-20mA, 1-5V, 2-10V

(It is suggested to use the shielding wire and its length should not exceed 30m.)

Output Signal : 4-20mA, 2-10V

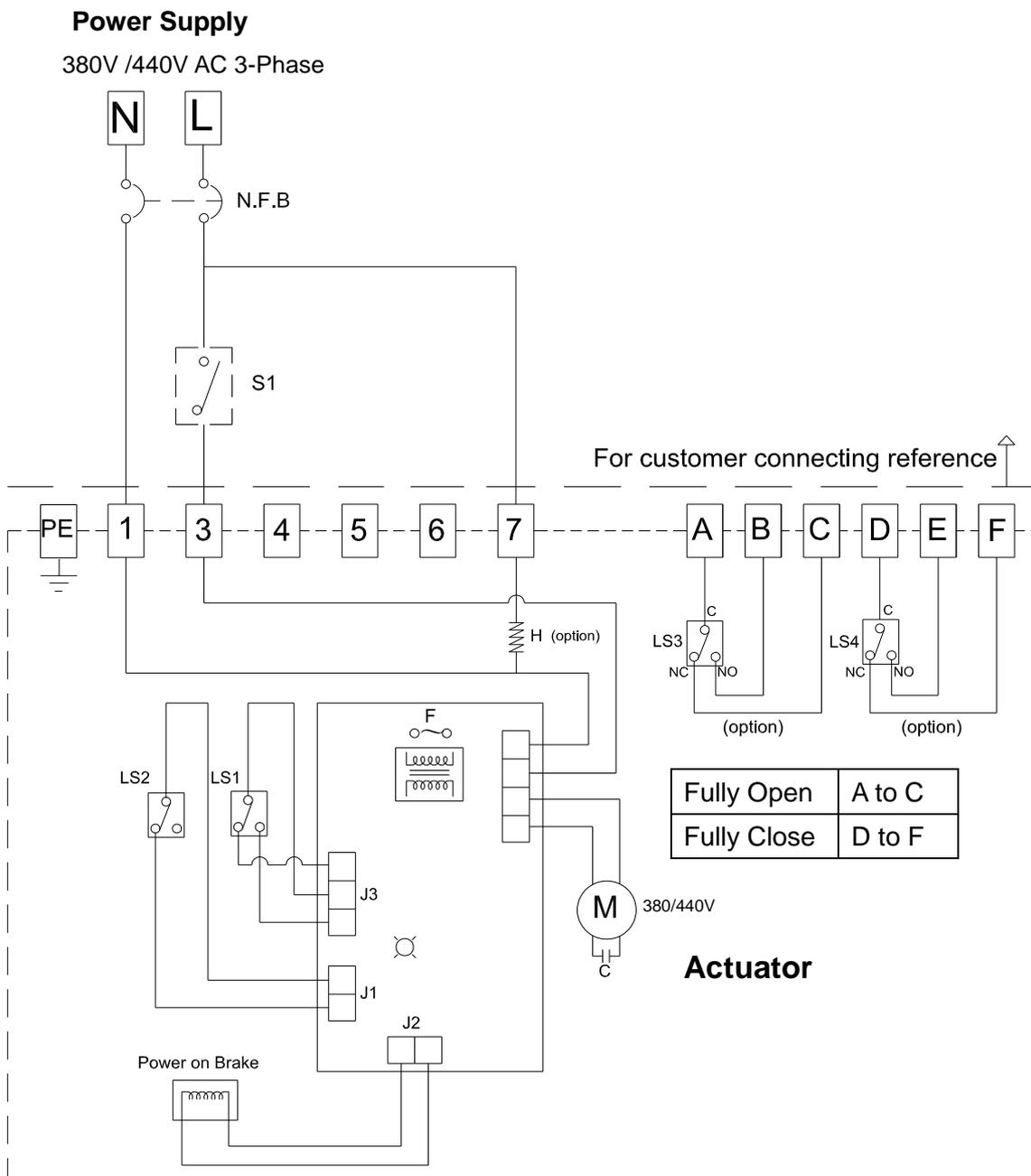
2. Using less than 5A current for "A ~ F".

3. P4 will connect when the actuator doesn't reach the (normal) end of travel previously set within 15 sec.

Wiring Diagram – Spring Return Actuator

S1300 ~ S2600 380, 440V AC 3-Phase

On-Off Controller (two-position)



NOTE:

1. "N" connects to #1 , " L " connects to #3.
2. Heater (option) : "L" connects to #7.
3. S1 connects to "OPEN" and disconnects to "CLOSE".
4. Using less than 5A current for "A~F".
5. For 3-Phase voltage, connect any two of the U, V, W to #1 & #3.

Calibration

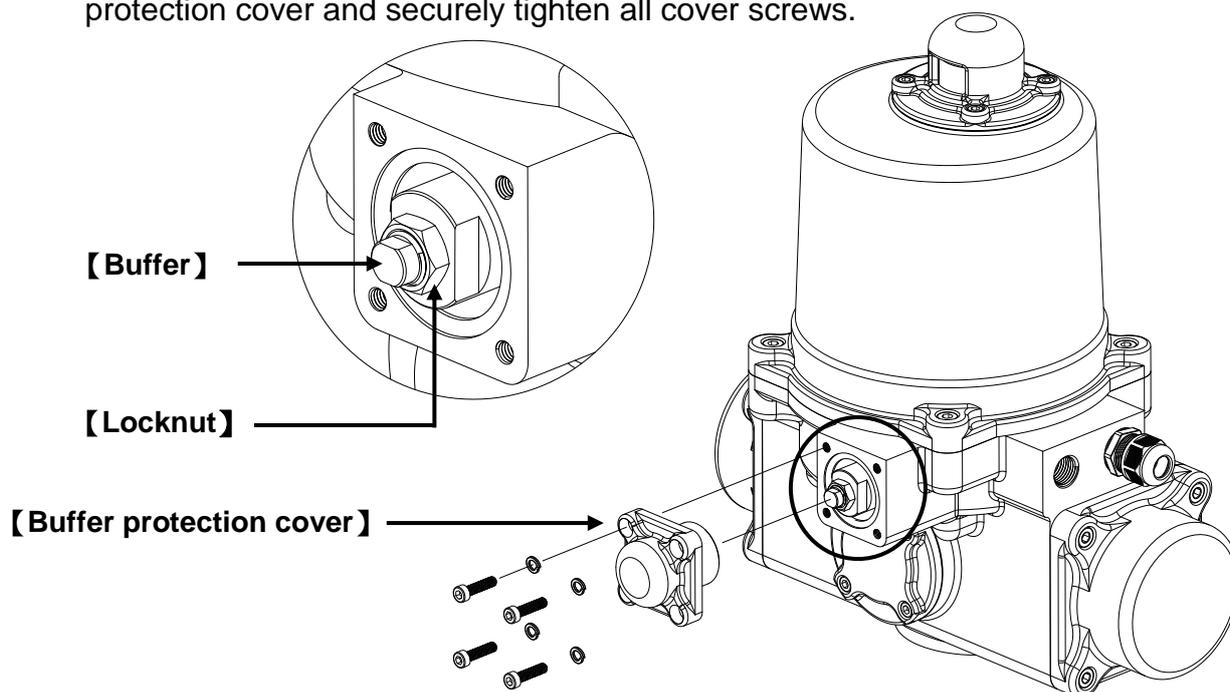
NOTE:

1. Manually rotate the actuator back to its fully closed position before the actuator will function again under power.
2. Securely tighten the grommets.

Sun Yeh Spring return actuator provides fail-safe positioning which controlled by buffer or mechanical stops. (ON-OFF type is controlled by buffer. / Floating and Modulating type are controlled by mechanical stops.) When you supply power for operating, the end position is controlled by limit switches.

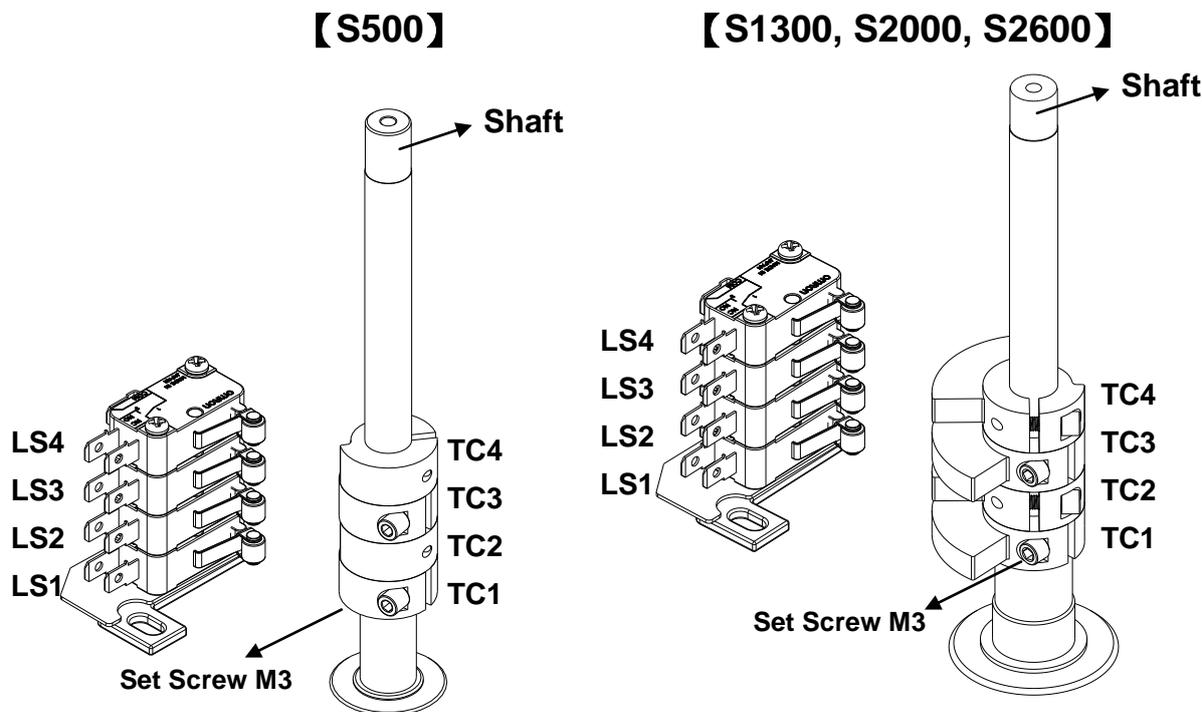
1. To set the fail-safe position:

- a. Power off and take off **buffer protection cover**.
- b. Loosen the **locknut**.
- c. Calibrate the **buffer** position.
 - (i) Forward: Rotate clockwise. (increase 1.5mm which corresponding to 1 turn).
 - (ii) Backward: Rotate counter-clockwise. (decrease 1.5mm which corresponding to 1 turn.)
- d. After the adjustment is completed, tighten the locknut and then replace the buffer protection cover and securely tighten all cover screws.



2. To set the end position under power supply:

- a. Supply power to operate actuator to fully-open position.
- b. Turn off the power.
- c. Loosen the M3 set screw on the cam with 2.5mm Hex Spanner.
- d. Adjust the travel cam (TC1) :
 - (i) Increase the degree: Rotate clockwise.
 - (ii) Decrease the degree: Rotate counter-clockwise.
- e. Securely tighten the set screw and supply power to check the traveling position. If the position is not correct, please repeat step a~d.
- f. After the adjustment is completed, tighten the M3 set screw.



TC 4 Synchronous turn with TC2 (option).

TC 3 Synchronous turn with TC1 (option).

TC 2 Detect the “0°” : The actuator can’t operate again when the spring doesn’t reach the 0° in the fully-closed position.

TC1 “ OPEN” **Clockwise : Increase opening degree to fully open.**
Counter Clockwise: Decrease opening degree.

Adjustment - Potentiometer Unit

Potentiometers turn with the output shaft to provide feedback for position indication.

The Modulating Controller works with 5K ohm potentiometer.

Potentiometer points 1, 2, 3 are wired to terminal blocks 10, 9, 8.

When a valve is closed:

8, 9 → 1K or 5K Ohm.

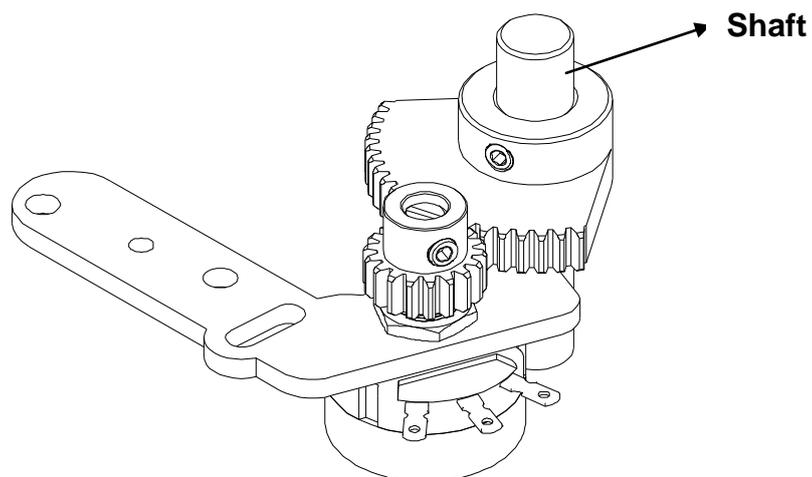
9, 10 → 0K Ohm.

When a valve is opened:

8, 9 → 0K Ohm.

9, 10 → 1K or 5K Ohm.

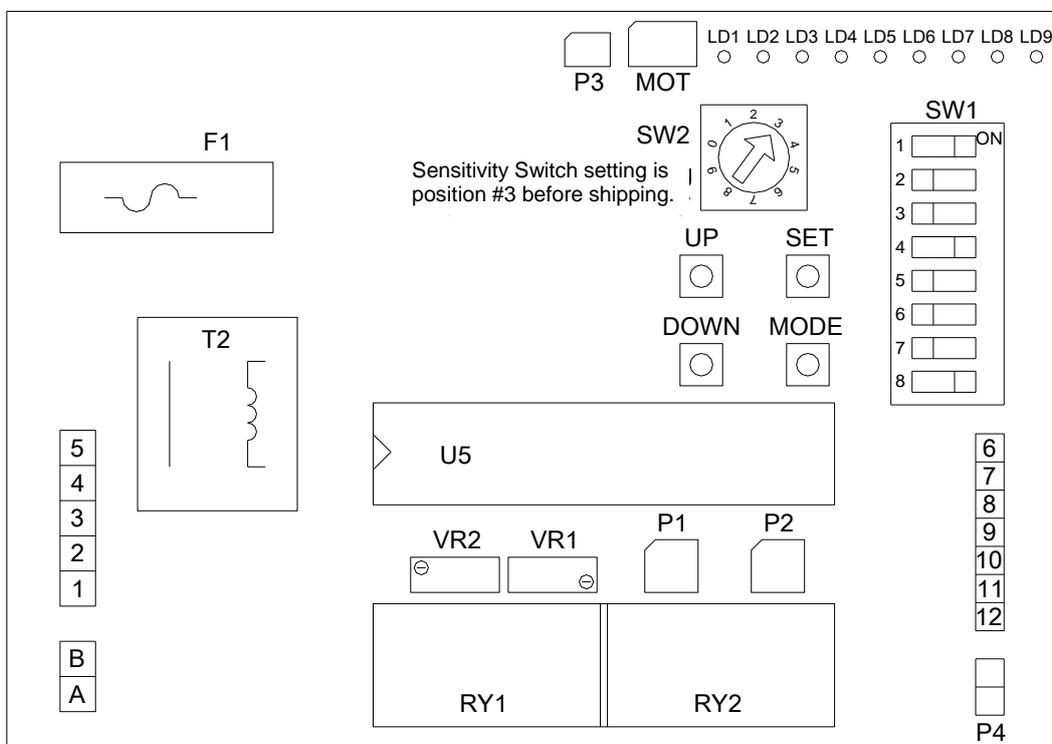
Note : The value is opposite to standard unit (fails clockwise) when the actuator is power fails counter-clockwise.



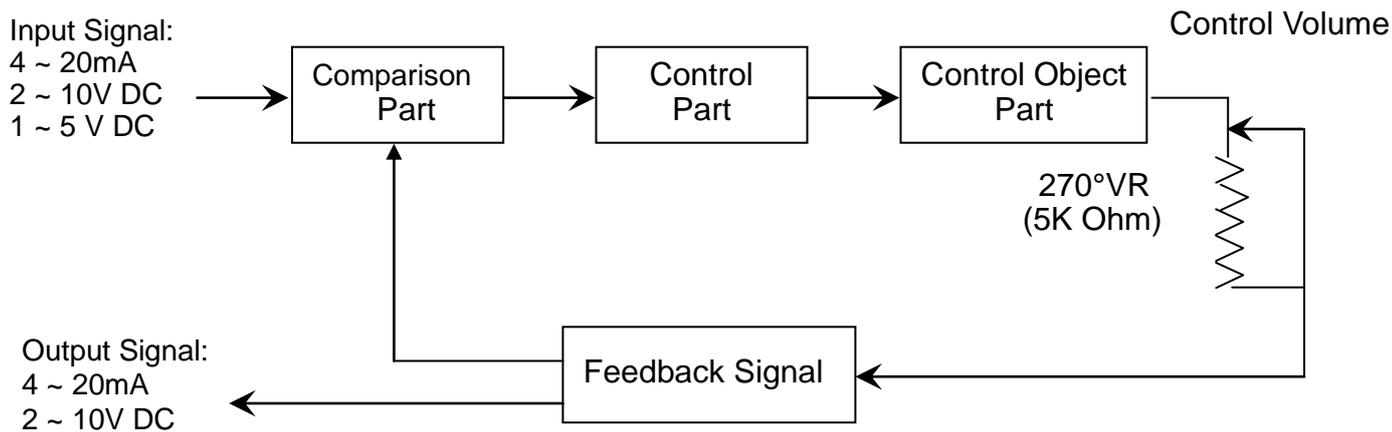
Adjustment – Modulating Board

1. Layout

The layout is based on the actuator in 110 / 220V AC.



2. Procedure

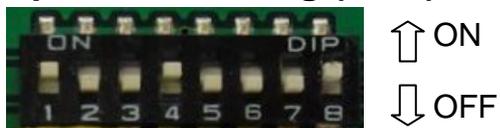


Supplied Voltage : 110V / 220V AC 1- Phase

Adjustment – Modulating Board

CAUTION: Turn power off before alter dip-switch settings.

3. Dip-switch Setting (SW1)



| 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | |
|-----|-----|---|--|-----|-----|-----|-----|-----------------|
| ON | OFF | OFF | OFF | ON | OFF | OFF | ON | Factory setting |
| | | | | | | OFF | ON | 4-20mA input |
| | | | | | | OFF | OFF | 1-5V input |
| | | | | | | ON | OFF | 2-10V input |
| | | | OFF | ON | OFF | | | 4-20mA output |
| | | | ON | OFF | ON | | | 2-10V output |
| | | OFF | 20mA / 5V / 10V means valve fully-open | | | | | |
| | | ON | 20mA / 5V / 10V means valve fully-closed | | | | | |
| ON | OFF | Close valve if input signal disconnected (when S6 sets “ OFF”) | | | | | | |
| OFF | ON | Open valve if input signal disconnected (when S6 sets “ OFF”) | | | | | | |
| ON | ON | Actuator will not operate if input signal disconnected | | | | | | |
| OFF | OFF | (when S6 sets “ OFF”) | | | | | | |

Adjustment – Modulating Board

| | FUNCTION | SETTING |
|-----------------|--------------------------|--|
| S1, 2 | INPUT SIGNAL SELECTION. | “ 4~20mA ” set 1-ON / 2-OFF. “ 1~5V ” set 1-OFF / 2-OFF. “ 2~10V ” set 1-OFF / 2-ON. |
| S3, 4, 5 | OUTPUT SIGNAL SELECTION. | “4-20mA” set 3-OFF / 4-ON / 5-OFF. “2-10V” set 3-ON / 4-OFF / 5-ON. |

When S6 sets “ ON ”

| | | |
|--------------|---|--|
| S6 | INPUT SIGNAL SELECTION : 4mA, 2V, 1V →valve fully-open 20mA, 10V, 5V→valve fully-closed | Set 6-ON. |
| S7, 8 | POSITION SELECTION (When the feedback signal fails) | “valve fully-closed” set 7-ON / 8-OFF. “valve fully-open” set 7-OFF / 8-ON. “valve stops” set 7-ON / 8-ON. Or 7-OFF/ 8-OFF. |

When S6 sets “ OFF ”

| | | |
|--------------|---|---|
| S6 | INPUT SIGNAL SELECTION : 4mA, 2V, 1V →valve fully-closed 20mA, 10V, 5V→valve fully-open | Set 6-OFF. |
| S7, 8 | POSITION SELECTIONION (When the feedback signal fails) | “valve fully-closed” set 7-OFF 8-ON. “valve fully-open” set 7-ON / 8-OFF. “valve stops” set 7-ON / 8-ON. Or 7-OFF / 8 - OFF. |

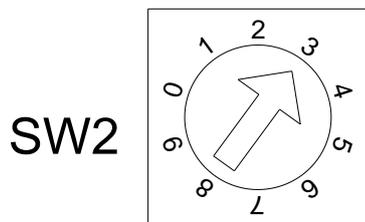
- ※ **Note:**
1. The standard factory presetting is 1, 4, 8 ON and 2, 3, 5, 6, 7 OFF.
 2. **Even if S6 is adjusted, the feedback signal will not change.**

Adjustment – Modulating Board

4. P4 Terminal (Contact Rating : 3A/250V)

P4 is a contact for warning. You can connect with alarm or similar components. If the microprocessor sees the actuator doesn't reach the (normal) end of travel previously set within 15 seconds, this would cause the microprocessor to set the P4 (Alarm) output status to ON.

5. Sensitivity Switch (Factory setting: 3)



SW2: 1,2,3~ 0 Sensitivity switch :

Switch at "1": The highest sensitive and the 0~90 degree can be divided up to around 76 times movement.

Switch at "0": The lowest sensitive and the 0~90 degree can be divided up to around 17 times movement.

The sensitivity decreases 6 times movement by sectors from 1 to 2, 2 to 3, 3 to 4 and so on.

Adjustment – Modulating Board

6. Settings for OPEN and CLOSE (OM-2~ OM-13)

NOTE:

Without customer's specific request, the factory presetting is 4-20mA. When either 1-5V or 2-10V is required, refer to page 29 to reset the dip-switch and complete below procedures.

OPEN setting

- a. Keep pressing "**SET**" for 2 seconds, then LD 9 comes on, it will enter the manual mode.
- b. Keep pressing "**UP**" and let the actuator run to fully-open position (LD2 comes on), then supply the input signal (5V or 10V or 20mA).
- c. Press "**MODE**" once. The OPEN setting is completed.

CLOSE setting

- a. Keep pressing "**DOWN**" and let the actuator run to fully-closed position (LD1 comes on), then supply the input signal (1V or 2V or 4mA).
- b. Press "**MODE**" once. The CLOSE setting is completed.

After completing the above settings, press "**SET**" once to back to auto mode (LD9 off).

Adjustment – Modulating Board

7. Lamp Indication (OM-2~ OM-13)

- | | |
|---------------------------|---------------------------------|
| LD1 Fully-closed position | LD6 Motor thermostat turn off |
| LD2 Fully-open position | LD7 Output signal short circuit |
| LD3 Power | LD8 Motor current is excessive |
| LD5 Wrong input signal | LD9 Manual Mode |

If the LED(LD5~9) is flashing after the operating check is completed, refer to the following “Modulating Board Trouble Shooting”

| Lamp | Possibilities | Solution |
|----------------------|--|--|
| No Lamp (LD3 off) | a. No power supply. b. The voltage is over 260V to cause the board burn out. c. Wrong connecting for the #8, #9 of the VR. d. Faulty Modulating board. | a. Check the power supply and wiring. (terminal #4 & #5 ;refer to page 27) b. Check the voltage. c. Check the wiring. d. Send back to the factory for inspection. |
| LD5 | a. Setting in 2-10V input signal but supply 4-20mA. b. Setting in 2-10V input signal but the input signal is over 13.5V. *Setting in 4-20mA but supply 2-10V signal. The actuator could still be operated within 2-7V. But if the signal is over 7.2V, the LED5 will come ON. | Confirm if the input signal is the same as dip switch setting. (refer to page 27~29) |
| LD 6 | Motor thermostat turns off. | a. Too high frequency for rated duty cycle. b. Motor thermostat (MOT) is not connected. |
| LD7 | a. Output signal short circuit. b. Wrong connecting of the 2-10V input signal. | a. Confirm the wiring of output signal #11(-) & #12 (+). b. Confirm the input signal for #6(-) & #7(+). (refer to page 27~28) |
| LD8 | Motor current is excessive. | a. Too high frequency for rated duty cycle. b. Check the load. (refer to page 3~4) c. Check if the motor rotor is locked. |
| LD9 | Manual Mode - Setting position for open & close. | After completing the settings, press “SET” once. |

TROUBLE SHOOTING

ON-OFF Controller

a. Motor does not operate and overheats

| Possibilities | Solution |
|--|--|
| a. The capacitor failed. (whether the surface of the capacitor deforms) | a. Replace to a new part. |
| b. Valve’s rubber is getting hardened or the valve’s torque is excessive. It takes longer time to reach fully-closed position. | b. Use hand-wheel for test or change to a new valve. |
| c. Foreign objects in the flow stream. | c. Check if any obstructions. |
| d. Broken motor stem or bearing. | d. Replace to a new part. |
| e. The limit switch for fully-closed does not trip. | e. Operate the actuator manually to fully-closed position and confirm if the limit switch trips. |

b. The actuator operates well but the motor is hot.

| Possibilities | Solution |
|--|---|
| a. Actuator operates too frequently. (Starting frequency is too high.) | a. Reduce the duty cycle of actuator. |
| b. Overload. | b. This situation often happens after operating for a period of time. It is suggested to replace a new valve. |
| c. Under or over rated voltage. | c. Check if the current is too high. (refer to page 3~4) |
| d. Wrong power supply. | d. Check the power supply. |

c. The valve can’t fully open or close by either power supply or hand-wheel.

| Possibilities | Solution |
|--|---|
| a. The actuator does not mount with the valve tightly during installation process. | a. Contact technical department to solve the problem. |
| b. The torque of valve is larger than the torque of actuator. | b. Replace to a new valve or a larger actuator. |
| c. The set screw of the cam is loose. | c. Readjust the limit switches. (refer to page 24~25) |
| d. The installing angle of actuator and valve is not fit. | d. Check the angle of the valve and actuator. |

d. The capacitor is failed.

| Possibilities | Solution |
|--|---|
| a. Overload (exceed the rated torque of actuator). | a. Replace to a new part. It’s suggested to change to a new valve or a larger actuator. |
| b. Over service life. | b. Check the capacitance and surface every year. |

TROUBLE SHOOTING

Modulating Controller

- a. The LED (LD5~LD9) is flashing after the operating check is completed.

| Solution |
|---------------------------|
| Refer to page 32 . |

- b. The lamps on the modulating board are normal but the actuator can't work properly during test or it only can run to fully-open/closed position.

| Possibilities | Solution |
|--|---|
| The signal is connected oppositely. (means to signal failure) | a. Confirm if the input signal and the wiring are correct. (refer to page 27~29) |

- c. Can't operate by modulating controller.

| Possibilities | Solution |
|---|---|
| a. Faulty VR. b. The sector gear of the VR is loose. | a. Replace to a new VR. b. Remove the input signal wires. Operate the actuator to fully-closed. Then readjust the VR. (refer to page 26) |
| c. Wrong input signal. d. Faulty modulating board. | c. Check if the input signal is correct. (refer to page 27~29) d. Send back to factory for inspection. |

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 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.