## Warnings

- The product should be operated as a single unit. Do not connect multiple units in parallel or serial.
- If two sets or more are used at the same time, please install relay for each unit to ensure the safety of the operation.
- Please shut down power supply before any installation or maintenance operation, or when actuator is used in manual mode.
- Do not use this product in presence of explosive gas or any other chemical active substance.
- Never modify the electric circuit/board to avoid electric shocks.

Installation

- Before installing, make sure nothing is clogging the pipeline.
- Open the housing carefully, in order to avoid damages to the O-ring and internal parts.
- The indicator shows the status of the valve (O=Open, S=Shut). Please mount the valve accordingly.
- Please follow the wiring diagram printed on the external label on the actuator case or in the next pages to connect the wires. Do not touch any other internal electric component.
- After connecting the wires, make sure O-ring is in the groove before fastening the housing screws to insulate from dust or rain.
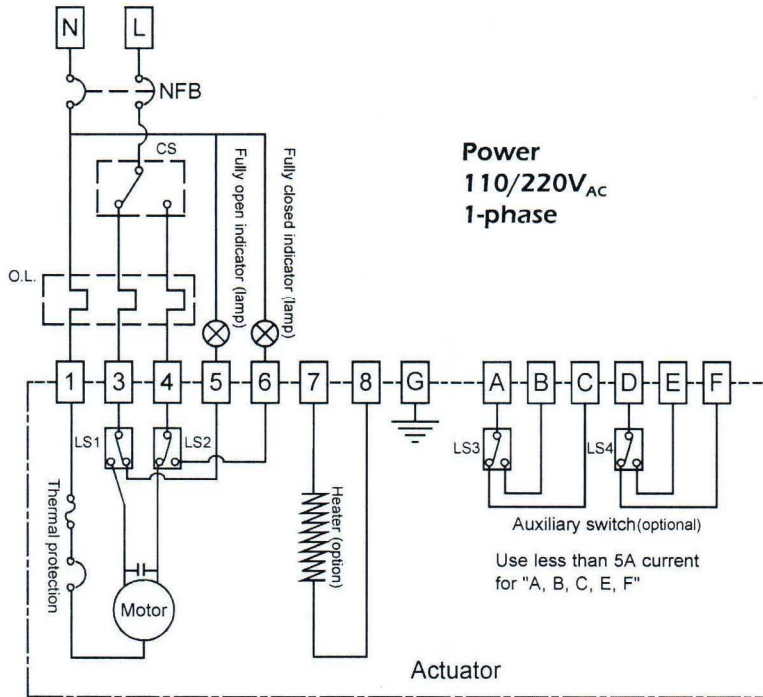- Always verify input voltage before power up.

Wiring Diagram

ON / OFF Type for $12V_{DC}$, and $24\ V_{DC}/V_{AC}$
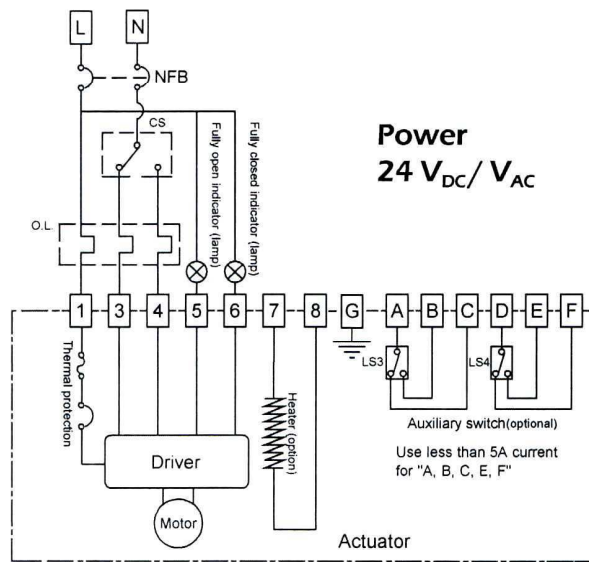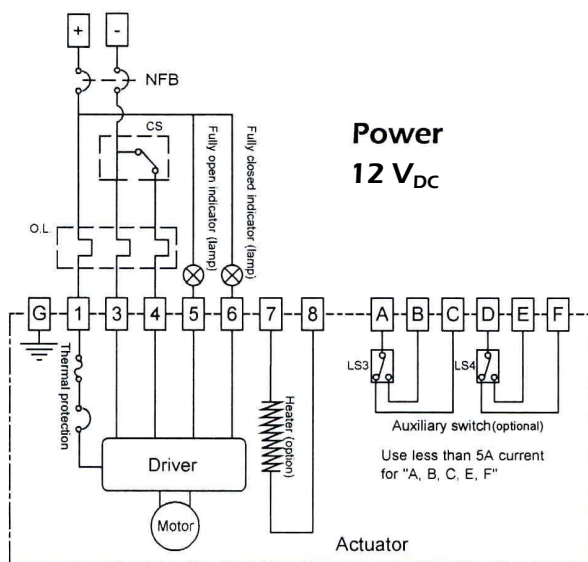
Wiring Diagram

ON / OFF Type for 110 / 220 V$_{AC}$

Operation

- Follow "Duty Cycle" indication for rest times (the "special type" does not receive this restriction)
  Acc. to IEC 60034, AE actuators are classified as "S4 Duty Type", with "activation", "running" and "rest" times.
  On the labels, "cycle time" identifies the time needed to complete a rotation: "activation" + "running" times.
  "Duty Cycle" value, expressed in %, is the ratio between (operation time) / (operation time + rest time).
  For example:
  25% "Duty Cycle" = during continuous work (do not exceed 3 min of continuous operation), actuator must be at rest for at least 3/4 of the time. For example, after 3 min of work, actuator should be at rest for 9 min;
  50% "Duty Cycle" = during continuous work, actuator must be at rest for at least 1/2 of the time;
  100% "Duty Cycle" = no need for rest time (in this case, information isn't shown on labels).
- The AC110V/220V mainboard has overheat protection.
- DC12V and AC/DC 24V mainboards do not have overheat protection. For PCB series, there is a fuse on the board.
- Use only fuse specification listed in the manual. Do not use other spec for replacement.
- AE01A, AE02A, AE03, AE03H~AE06H series can be used with proportion controller.
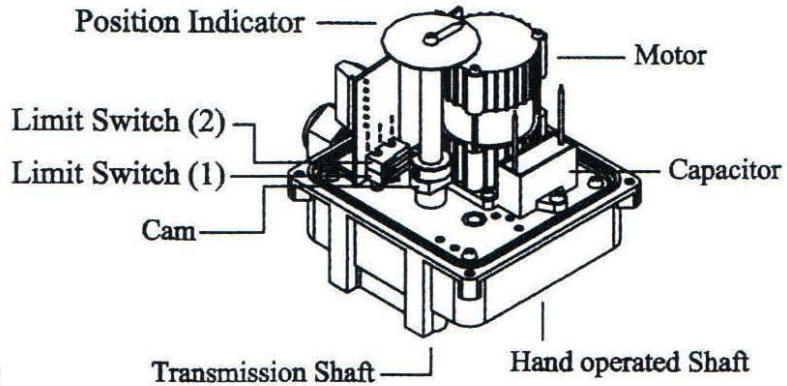
Manual Operation

- Be sure to shut down power supply before any manual operation or maintenance.
- Also, shut down power supply to operate AE03H~AE06H models in manual mode. Push down the handwheel to engage the shaft. It will be disengaged automatically when released.
- In manual mode, if abnormal friction is felt in turning the valve, please do not exert excess force to avoid damages on the parts.
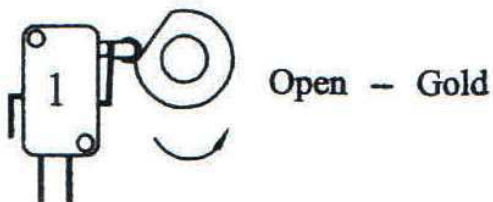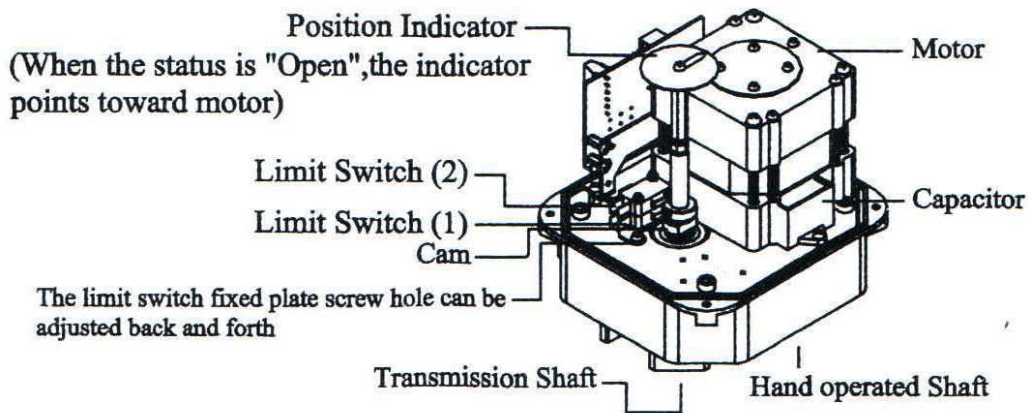
Cam Adjustment

If not strictly necessary, please do not dismount the electric actuator to avoid problems with the position (cam) regulation.

If the position regulation isn't ok, please consider to following diagrams and instructions to adjust the regulation cams.

AE01 - AE02 Models

Position Indicator

Motor

Limit Switch (2)

Limit Switch (1)

Capacitor

Cam

Transmission Shaft

Hand operated Shaft

AE03 Model

Position Indicator

(When the status is "Open", the indicator points toward motor)

Motor

Limit Switch (2)

Limit Switch (1)

Capacitor

Cam

The limit switch fixed plate screw hole can be adjusted back and forth

Transmission Shaft

Hand operated Shaft

1   Open -- Gold

2   Shut -- Black

- The cams are fixed on the main shaft by means of a set screw. Use a hex wrench 2.5x1 to fasten/unfasten the set screw.
- While the shaft turns counterclockwise, the valve opens; when the limit switch box rebounds in the flat section of the cam, the opening phase stops.
- While the shaft turns clockwise, the valve closes; when the limit switch box rebounds in the flat section of the cam, the closing phase stops.

AE03H ~ AE06H Models
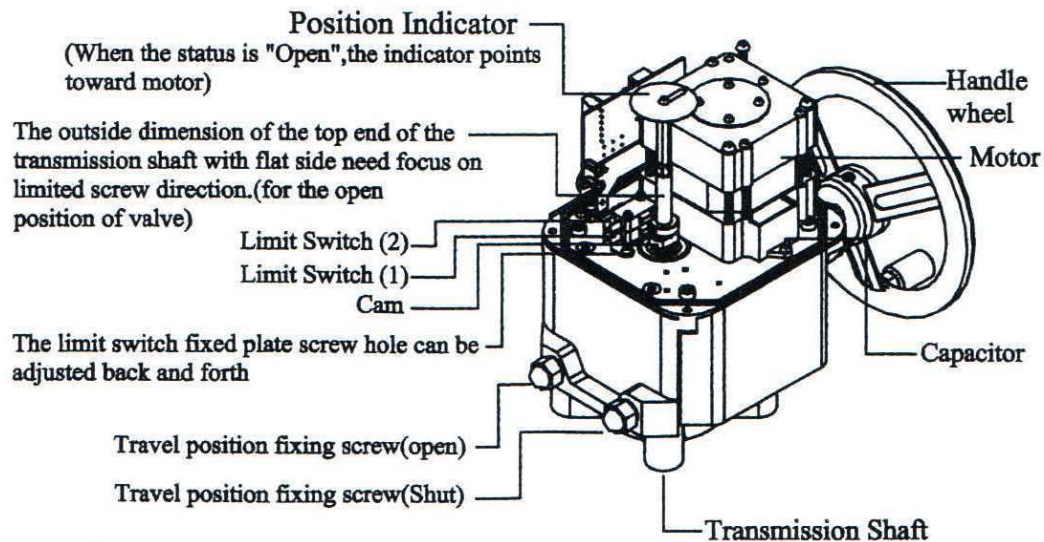
Cam Regulation for automatic operation works as in the previous cases; for Manual Operation please screw or unscrew the front travel position screws:
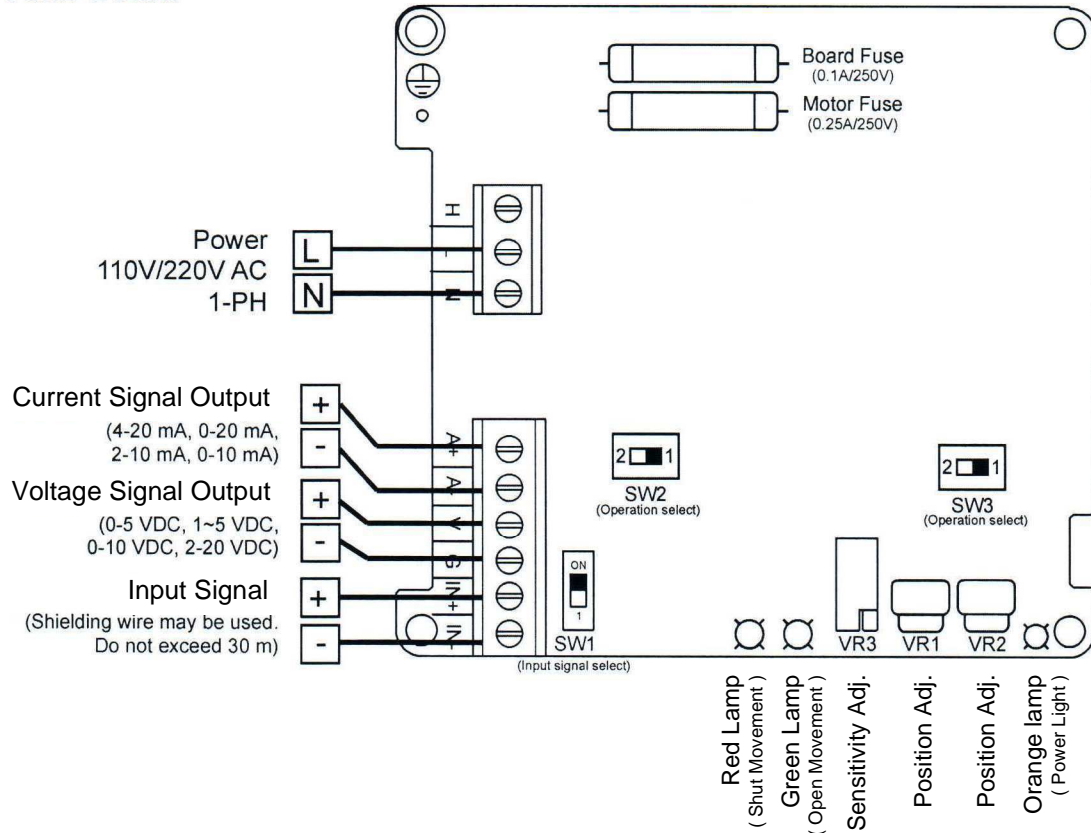
- Before adjusting the valve open/close position, let the travel position fixing screws (open and shut) turn counterclockwise to give room to following regulations. Energize and close / open the actuator: if no problems happens, go on with following steps. If there are problems (motor doesn't stop), further unscrew the corresponding travel stop.
- With valve in full "Open" position, turn the travel position (open) clockwise until it touches the top end limited plate and make the screw cap tightly locked.
- With valve in full "Close" position, turn the travel position (shut) clockwise until it touches the top end limited plate and make the screw cap tightly locked.

Modulating Board

WARNINGS

- Main board and motor should have the same voltage. Please do not modify the voltage of a main board freely. Verify the input voltage is correct for board and do not wield two kinds of voltage at the same time.
- Please do not modify any layout or component on the main board.
- The input signal should be continuous to avoid the frequent switching of the relay, which will cause the damage of the contact.
- Fuse: Motor (0.25A/250V); Board (Ø5x20mm Slow-Blow 0.15A/250VAC).

Max-Air TECHNOLOGY

AMD Board

Board Fuse (0.1A/250V)
Motor Fuse (0.25A/250V)

Power 110V/220V AC 1-PH
L
N

Current Signal Output
(4-20 mA, 0-20 mA, 2-10 mA, 0-10 mA)
+
−

Voltage Signal Output
(0-5 VDC, 1~5 VDC, 0-10 VDC, 2-20 VDC)
+
−
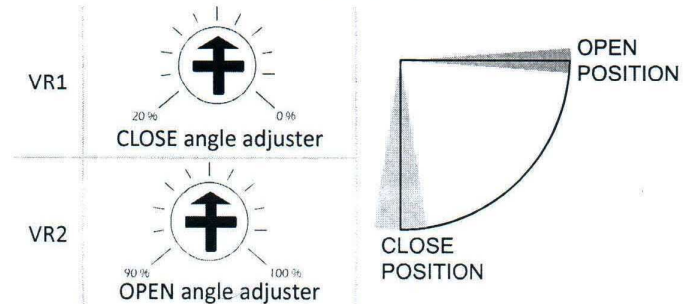
Input Signal
(Shielding wire may be used. Do not exceed 30 m)
+
−

A+
A−
V
G
IN+
IN−

SW2 (Operation select)
SW3 (Operation select)
SW1 (Input signal select)

Red Lamp (Shut Movement)
Green Lamp (Open Movement)
Sensitivity Adj.
VR3
Position Adj. VR1
Position Adj. VR2
Orange lamp (Power Light)

BMD Board

Yellow Lamp (Power light)
VR3 (Sensitivity Adjustment)
VR1 (Position Adjustment)
VR2 (Position Adjustment)
Red Lamp (Shut Movement)
Green Lamp (Open Movement)

Current Signal Output
(4-20 mA, 0-20 mA, 2-10 mA, 0-10 mA)
+
−

Voltage Signal Output
(0-5 VDC, 1~5 VDC, 0-10 VDC, 2-20 VDC)
+
−

Input Signal
(Shielding wire may be used. Do not exceed 30 m)
+
−

A+
A−
V
G
IN+
IN−

SW1 (Input signal select)
SW2 (Operation select)
SW3 (Operation select)

Power 110V/220V AC 1-PH
L
N

L
N

Board Fuse (0.1A/250V)
Motor Fuse (0.25A/250V)

Switch & Adjustment Settings

SW1 Input Signal Selection

SW1	ON	OFF (1)
	Current Input Signal	Voltage Input Signal
	4 ~ 20 mA	2~10 V 0~10 V 1~5 V 0~5 V

VR1 & VR2 Position Adjustment

VR1 — CLOSE angle adjuster (20 %, 0 %)

VR2 — OPEN angle adjuster (90 %, 100 %)
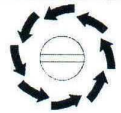
OPEN POSITION

CLOSE POSITION

SW2 & SW3 Operation Selection

		SW2	
		1	2
SW3	1	MODE A Valve is fully closed when the input signal is 4mA, 2V, 1V, or 0V	X
	2	X	MODE B Valve is fully open when the input signal is 4mA, 2V, 1V, or 0V

VR3 Sensitivity Adjustment

Rotation	Result
Clockwise	Increase sensitivity
Counter-clockwise	Decrease sensitivity

Troubleshooting

- Power is on, but the power indicator is off.
  Check if the voltage is correct.
  Check if the fuse is broken.

- Signal input is connected, but there is no movement.
  Check if the setting of SW1 is correct.
  Check if the mode setting is correct.
  Check if the positive/negative pole of the signal input cable is correct.

- Relay is active, but the actuator isn't.
  Check if the fuse of the motor is burn out.
  Check if the contact of the relay is broken.

- The value of voltage output or current output is negative.
  Check if the positive/negative pole of the output cable is correct.