

# VA-7000 SERIES ACTUATOR

## DESCRIPTION

VA-7000 series actuator is electromechanical product, and can be mounted on VB-7000 series valves. If with different connectors, it can be fitted with other kinds of valve bodies.

VA-7000 series actuator has 3 basic types:

1. VA-7100 (VA-7200) reversible motor operation and provide increasing control;
2. VA-7101 (VA-7201) can accept input 0~10V DC or 4~20mA DC control signal and provide proportional control, and also can provide 0~10V DC feedback signal to indicate the position of the actuator;
3. VA-7102 (VA-7202) can accept input 0~10V DC or 4~20mA DC control signal and provide proportional control.



(Fig. 1)

## CHARACTERISTICS

4. Low AC voltage synchronic reversible motor.
5. The action uses gear to transit. Output gear rollers are supported by surface rolling bearing, which rotate around the central bearing.
6. Valve working position indicator.
7. Fireproof ABS plastic casing.
8. Conveniently mounting.
9. 0~10V DC or 4~20mA DC control (For VA-7101 (VA-7201) and VA-7102 (VA-7202) only)
10. Working state (DA or RA) can be selected by jumper.
11. Apply to 24mm, 36mm, 40mm, or 42mm stroke can be selected by jumper.
12. Have overtime protection function, and failure protection function when without control signal.
13. Have 0~10V DC feedback signal.
14. Have manual open or close valve function (only for VA-7XXXM)

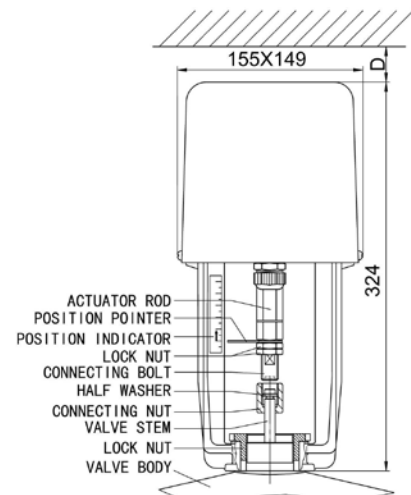


Fig.2

\*Note: "D" in Fig. 2 should be more than 160mm for installation and maintenance.

## OPERATION

15. Actuator is driven by reversible synchronous motor. Valve stem upward or downward operation makes the valve open or close. When the valve is fully opened or closed, it will create a counterforce against the actuator, and make the internal micro-switch of the actuator power off and the actuator will stop operation. When the actuator receives a control signal, it will make the valve open to a certain angle and stop at any position when there is no signal.
16. The signal of the increasing or proportional type controller can make the motor rotate clockwise or anti-clockwise.
17. Ex-factory setting for VA-7101 (VA-7201) and VA-7102 (VA-7202) are: 42mm stroke, 0~10V DC mode, DA working state, UP direction failure protection. If the manufacturer has already mounted the actuator on the valve body, it will fit with the valve's stroke. Furthermore, it can select direct (DA) or reversible (RA) working mode. The two modes are just opposite. When there is no control signal, it can select DOWN/UP jumper to select the working direction. For VA-7101 (VA-7201) model, it also has 0~10V DC feedback signal output. Since the 0~10V DC and 4~20mA DC control signals are quite different, so if need 4~20mA DC mode, please indicate when ordering, and the factory will adjust the parameter of the PCB.

## INSTALLATION

18. Install the actuator bracket on the valve body. Mount the connecting nut on the valve stem. Put the two half washer into the groove of the top of valve stem, then screw the connecting bolt into the connecting nut. The degree of tightness depends on whether the valve stem and other parts can rotate correspondingly and without axis clearance. And then lock the nut tightly. Finally use lock nut to tighten the actuator. (See Fig. 2)
19. Give priority to vertically installation, and the lean should not more than 30°, remain enough space for maintenance use. (See Fig. 2)

20. Connect the wires according to the Wiring Diagram. (See Fig. 3)
21. Power supply test: For VA-7100 (VA-7200) actuator, make the valve stem move upward to the top end (fully-close) or downward to the bottom end (fully-open), the motor will be powered off and stop operation. If the valve stem has not moved to the top or bottom end but the motor has been locked (the main axis of the motor is shaking continuously), readjust the connecting length between the connecting bolt and actuator rod until they are fitted each other very well. (The connecting bolt and actuator rod have been adjusted in suitable length and tightened when ex-factory, it is not necessary to adjust them if there is no special requirement.) For VA-7101 (VA-7201) and VA-7102 (VA-7202) actuator, it should select the STROKE jumper (J5) according to the valve's stroke, then provide fully-close signal, for example, if provide 0V signal when at 0~10V mode, actuator will move upwards till the red indicator lamp turns dark. If the indicator lamp is still on, it needs to decrease a little the threads' depth of connecting bolt and nut till the lamp turns dark, this is the fully-close position of the valve. Provide 10V fully-open signal, actuator will move downwards till the indicator lamp turns dark. If happens the gears of the actuator have stopped, but the indicator lamp is still on, it means the set stroke is a little more than the valve's actual stroke, it needs to anticlockwise micro-adjust the stroke potentiometer PT1 (STROKE) till the indicator lamp turns dark, this is the fully-open position of the valve. Finally operating a working circle to ensure fully-open and fully-close will make the indicator lamp turns dark.
- 22.

## SPECIFICATIONS AND TECHNICAL DATA

| MODEL                    |                 | VA-7100X* (VA-7200X*)   | VA-7101X* (VA-7201X*)   | VA-7102X* (VA-7202X*)   |
|--------------------------|-----------------|---|---|---|
| OPERATION/CONTROL        |                 | Reversible and increasing control                                     | Proportional control, direct or reversible  |   |
| MOTOR ELECTRICAL RATING  |                 | 24VAC $\pm$ 10%, 50 / 60Hz, 10VA<br>230VAC $\pm$ 10%, 50 / 60Hz, 10VA | 24VAC $\pm$ 10%, 50 / 60Hz, 10VA  |   |
| ELECTRICAL CIRCUIT       |                 | —   | Power: 24V AC $\pm$ 10%, 50/60Hz, Input signal range: 0~10V DC or 4~20mA DC<br>Feedback signal: 0~10V DC (5mA)        | Power: 24V AC $\pm$ 10%, 50/60Hz, Input signal range: 0~10V DC or 4~20mA DC |
| MOTOR TYPE               |                 | Bi-directional AC Synchronous motor.                                  |   |   |
| POWER CONSUMPTION OF PCB |                 | —   | 2VA   |   |
| NORMAL TORQUE            |                 | 2500N (#4000N)  |   |   |
| MATERIAL                 | GEAR            | Stainless steel, Brass  |   |   |
|                          | REDUCER CHASSIS | Zinc-plated steel   |   |   |
|                          | BRACKET         | Die-casting aluminum alloyed  |   |   |
|                          | CASING          | Fire-proof ABS engineering plastic (UL94V-0)                          |   |   |
| OPERATION TIME           |                 | 50Hz: 4.6s/mm (# 50Hz: 8.3s/mm)<br>60Hz: 3.8s/mm (# 60Hz: 6.9s/mm)    |   |   |
| ROOM TEMP.               | OPERATION       | 2~55 $^{\circ}$ C   |   |   |
|                          | STORAGE         | -20~65 $^{\circ}$ C   |   |   |
| MAX. RH                  |                 | <90% no condensation  |   |   |
| CONNECTING WIRES         |                 | 0.5~1 mm <sup>2</sup>   |   |   |
| EX-FACTORY SETTING       |                 | Move downwards to fully-open position                                 | Stroke: 42mm; Input signal: 0~10V DC; Working mode: DA; Failure protection: UP; Move downwards to fully-open position |   |
| ACCESSORIES              |                 | Lock nut, connecting nut, half washer, position indicator             |   |   |
| NET WEIGHT               |                 | 4.1kg   | 4.3kg   |   |

23. The "X" with "\*" is additional code: M-with manual switch; omitted-standard type

24. The data with “#” is the data of VA-72XXX

**NOTE**

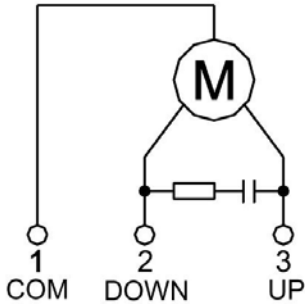
- 25. Actuator must be protected and prevented from water dripping.
- 26. Actuator can't be covered with adiabatic material.

**CAUTION**

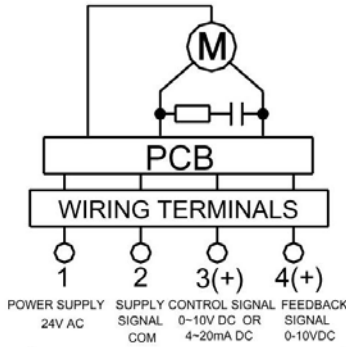
- 27. Cut off power supply when repair the actuator, to avoid destroying elements or cause casualty because of leakage of electricity.
- 28. When power is on, don't try to connect or disconnect the electrical wires.

**WIRING DIAGRAM AND SETTING DIAGRAM**

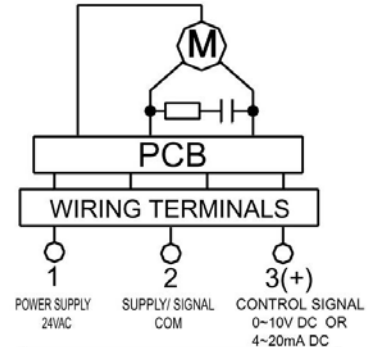
VA-7100X (VA-7200X) WIRING DIAGRAM    VA-7101X (VA-7201X) WIRING DIAGRAM    VA-7102X (VA-7202X) WIRING DIAGRAM



| TERMINAL | ACTUATOR ROD |
|----------|--------------|
| 1-2      | DOWN EXTEND  |
| 1-3      | UP CONTRACT  |

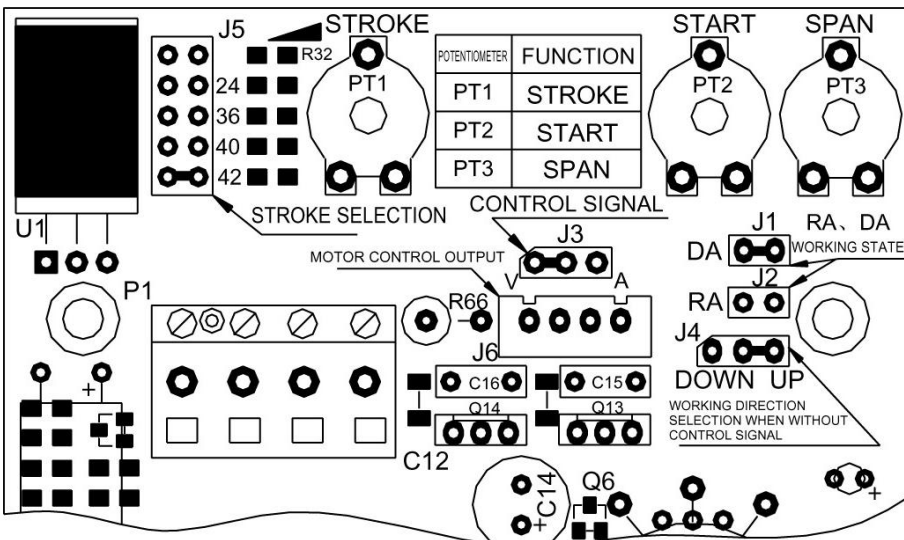


| INPUT CONTROL SIGNAL |          | ACTUATOR ROD |
|----------------------|----------|--------------|
| DA                   | RA       |              |
| INCREASE             | DECREASE | DOWN         |
| DECREASE             | INCREASE | UP           |



| INPUT CONTROL SIGNAL |          | ACTUATOR ROD |
|----------------------|----------|--------------|
| DA                   | RA       |              |
| INCREASE             | DECREASE | DOWN         |
| DECREASE             | INCREASE | UP           |

**PCB SETTING DIAGRAM (IF ANY)**



**VA-7XXXM MANUAL SWITCH**

