

USER MANUAL



THANK YOU for buying FLOWX series electric actuators of our company.

Before you install and connect parts and install the equipment on site and conduct control operation, please carefully read this manual.

Follow various instructions in the manual and you will get convenience and excellent performance at work.

Cautions

Make sure you observe them

1. When it is energized, it is forbidden to operate it manually.
2. Inside the actuator, there is a over temperature protection device, so when electromotor temperature rises beyond 125°C, the overheat protector will turn off the power automatically.
3. When using it, you must mount an electricity leakage protection device.
4. Please make sure the input voltage and wiring connection points are correct.
5. You must not link the power lines of 2 or more electric drive devices in parallel connection. You must not control several electric drive devices from one single connection point. Or else, it may get out of control and the electromotor may superheat.
6. The in-leads of wiring must have the sealing for waterproof cable connector according to operation manual. Or else, the electric drive device may be damaged due to intrusion of water or filthy mud.
7. The intelligent regulation type must be wired and commissioned according to operation manual, to avoid damage.
8. Installation and commissioning staff must have related operation qualification.
9. Electric drive devices must not be used under overload.
10. The manufacturer does not bear responsibility for improper change or repair of electric drive device.

Product Overview

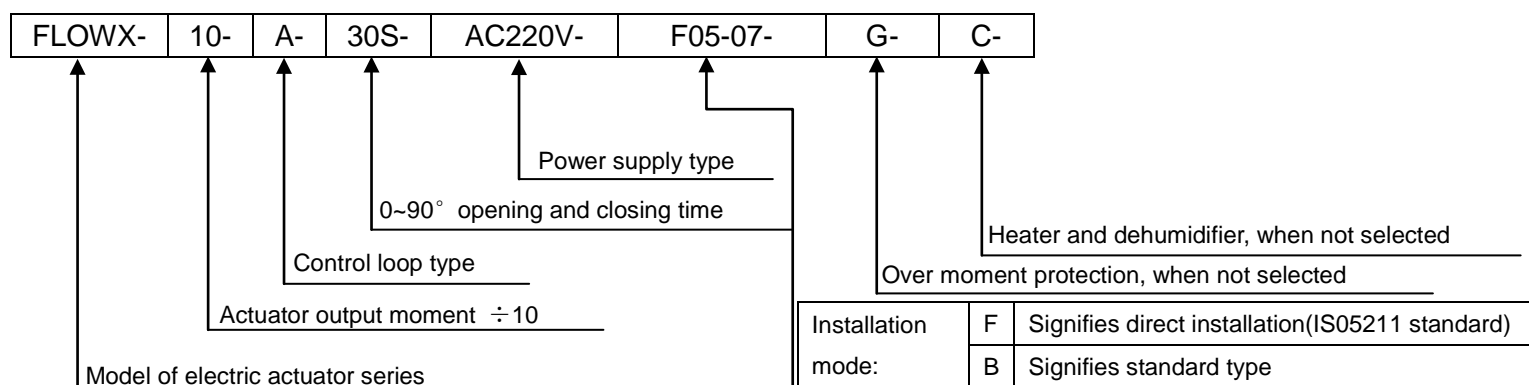
FLOWX series electric actuators are new generation products we develop after importing foreign latest technology. 90 % of its components are imported with original packaging. So they have adequate assurance of stability of performance .FLOWX series electric actuators have high intelligence, high guarding ability, compactness, high degree of integration, long performance life, stable performance and other merits.

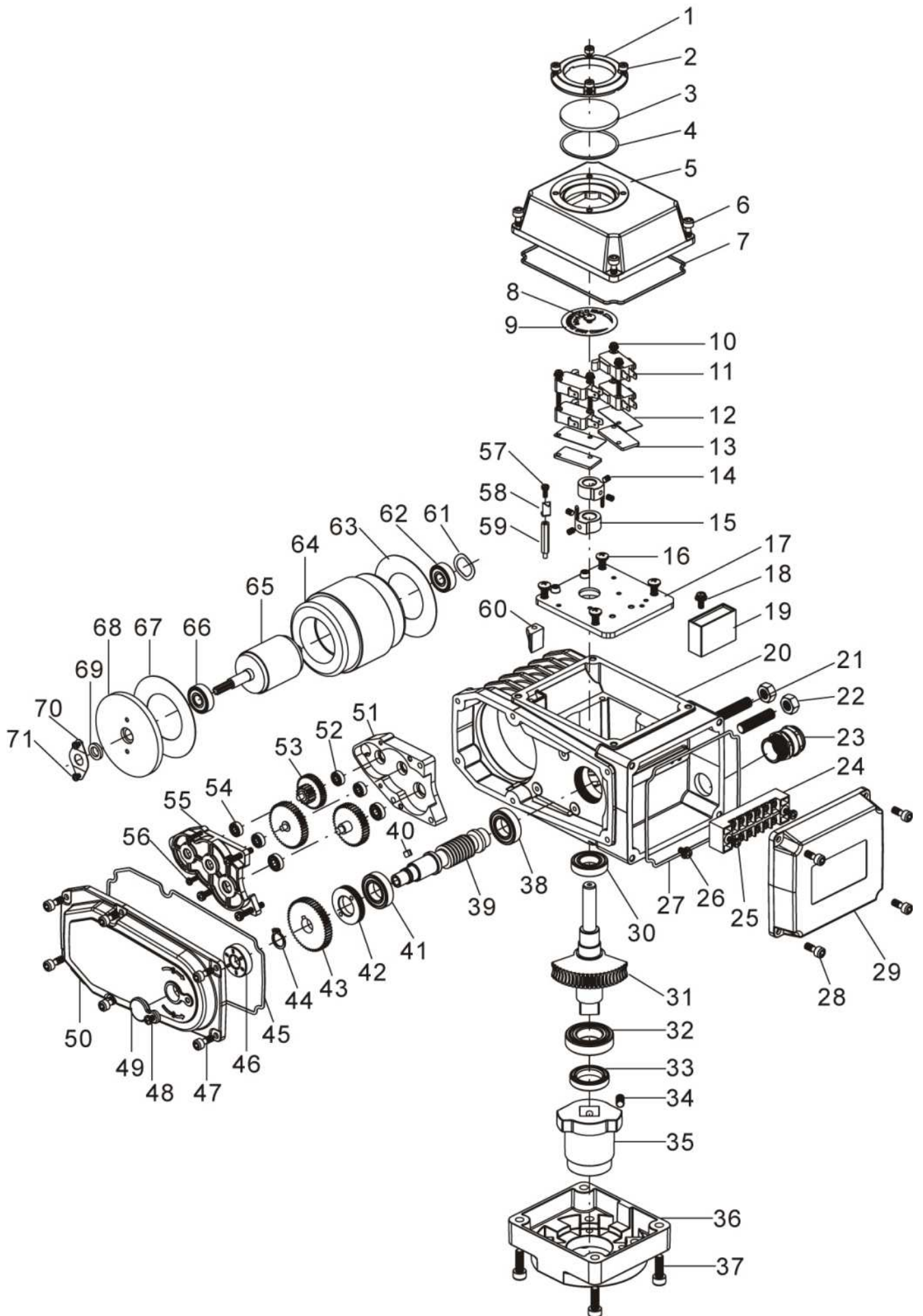
It allows operation on site. it also allows remote control .It suits ball valve, butterfly valve, throttle valve separating wall and other equipment that rotate by 90 degrees. It can satisfy various requirements of in dustier automation piping control. It has widespread use in many industries. Including: metallurgy, petroleum, chemical engineering, generating station, printing and dyeing, water treatment, shipbuilding, paper-making, food processing, pharmacy and building automation system etc.

Product Features

1. Strong features: intelligent regulation type, proportion type, switch type various signal output type, everything that you expect to find;
2. Small and light: it's volume and weight are merely equal to about 35% of traditional products;
3. Elegant appearance: aluminum alloy cast shell refined and fluent reducing electromagnetic interference;
4. Reliable performance: key components like shaft bearings and electrical elements are imported famous-brand produces;
5. High protection standard: IP 68 high standard protection level [detected by Shanghai instrumentation and autonomous system inspection and test institute);
6. Precise and wear resistant: The worm wheel output shaft adopts integrated forging from special copper base alloy, and has high strength and good wearability;
7. Extremely small return difference: its integrated structure avoids the gap of key-joints, and has high driving accuracy;
8. Safety guarantee: it has passed 1500 V voltage endurance detection, it has class F insulation electromotor, and it has CE accreditation, so it has higher safety guarantee;
9. Simple to mate: it adopts single phase power supply and simple connection loop, and we can also make it 380 V or DC
10. Convenient to use: no need to oil and no need to make spot-check, and it is waterproof and rust-proof, and can install at any angle;
11. Multi-speed: its whole range time is 9 Seconds, 13 Seconds, 15 Seconds, 30 Seconds, 50 Seconds, 100Seconds, and 150 Seconds (already set when leaving factory);
12. Intelligent digital control: the intelligent control module is integrated in the electric actuator, so it need not connect an external localizer; digital setting, digital calibration, high precision, self-diagnosis, and multiple - feature in one device.

Coding of the model





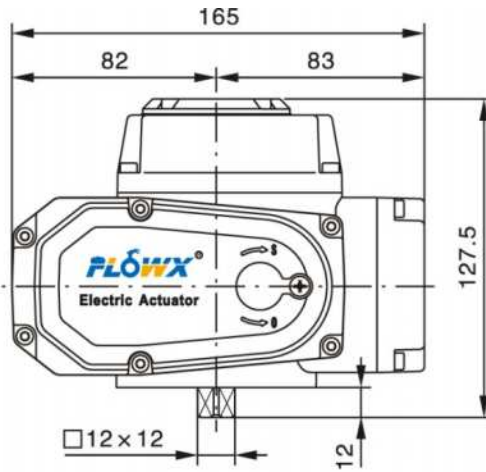
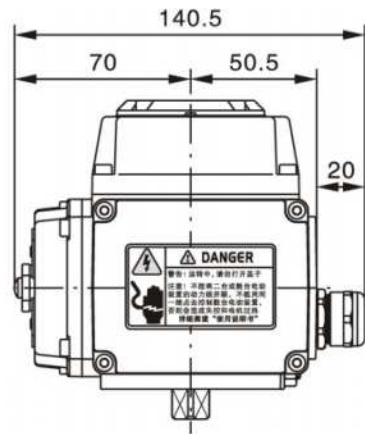
Spare and reserve parts

| No. | Qty | Part name | No. | Qty | Part name |
|-----|-----|--|-----|-----|--|
| 1 | 1 | Indication window hood | 37 | 4 | Internal hexangular fillister head screw |
| 2 | 4 | internal hexangular fillister head screw | 38 | 1 | Bearing |
| 3 | 1 | Viewing glass | 39 | 1 | Worm screw |
| 4 | 1 | O-ring | 40 | 1 | Flat key |
| 5 | 1 | Electric fitting: top cap | 41 | 1 | Bearing |
| 6 | 4 | Anti-break off hex type socket screw | 42 | 1 | Locknut |
| 7 | 1 | O-ring | 43 | 1 | Gear on worm |
| 8 | 1 | Cross bolt | 44 | 1 | Axis shield ring |
| 9 | 1 | Dial | 45 | 1 | O-ring |
| 10 | 4 | Cross bolt(component) | 46 | 1 | Oil seal |
| 11 | 4 | Travel switch | 47 | 6 | Anti-break off hex type socket screw |
| 12 | 2 | insulation plate guard | 48 | 1 | Cross bolt(component) |
| 13 | 2 | insulation pad | 49 | 1 | Dustproof end plug |
| 14 | 4 | hex type socket holding screw | 50 | 1 | Electric fitting: front cap |
| 15 | 2 | Stroke dog | 51 | 1 | Electric fitting: speed-down case 1 |
| 16 | 4 | Cross bolt(component) | 52 | 3 | Bearing |
| 17 | 1 | Electric fitting: inner cap | 53 | 3 | Electric fitting: reduction gear component |
| 18 | 1 | Cross bolt(component) | 54 | 3 | Bearing |
| 19 | 1 | Electric capacitor | 55 | 1 | Electric fitting: speed-down case |
| 20 | 1 | Electric fitting: case body | 56 | 5 | Cross bolt(component) |
| 21 | 2 | Limit bolt | 57 | 1 | Cross bolt(component) |
| 22 | 2 | Hexagonal nut | 58 | 1 | Dial needle |
| 23 | 1 | Waterproof cable joint | 59 | 1 | Pointer rod |
| 24 | 1 | Connecting terminal | 60 | 1 | Rubber end plug |
| 25 | 2 | Cross bolt | 61 | 1 | Wavy spring washer |
| 26 | 1 | Cross bolt | 62 | 1 | Bearing |
| 27 | 1 | O-ring | 63 | 1 | Insulating division board |
| 28 | 4 | Anti-break off hex type socket screw | 64 | 1 | Electromotor stator |
| 29 | 1 | Electric fitting: lead-in cap | 65 | 1 | Electromotor rotor |
| 30 | 1 | Bearing | 66 | 1 | Bearing |
| 31 | 1 | Worm wheel | 67 | 1 | Insulating division board |
| 32 | 1 | Bearing | 68 | 1 | Electromotor cap |
| 33 | 1 | Oil seal | 69 | 1 | Oil seal |
| 34 | 1 | hex type socket holding screw | 70 | 1 | Oil seal stop plate |
| 35 | 1 | Connecting bushing (ISO5211) | 71 | 2 | Cross bolt(component) |
| 36 | 1 | Fixing base (ISO5211) | | | |

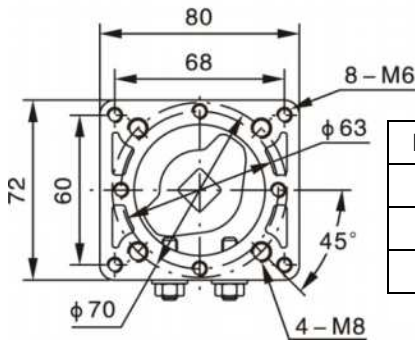
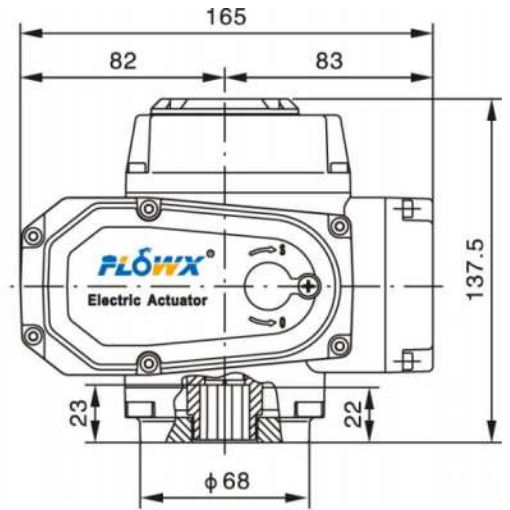
Note: This structure diagram is for FLOWX-10B-30S-AC220V-F05-07-NN (power-less contact point type)

FLOWX-05 series dimensions and performance parameters

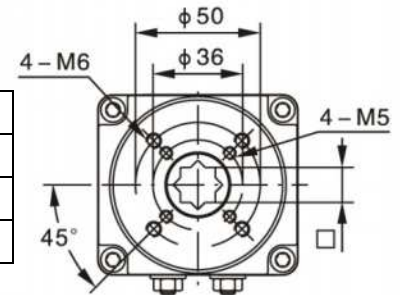
Standard type



Direct installation type(ISO5211 standard)



| Direct-installation type parameters(ISO5211 standard) | | | |
|---|--------------|-------|-------|
| Square socket | 9*9 | 11*11 | 14*14 |
| Flange | F03 | | F05 |
| Valve rod | Height ≤20mm | | |

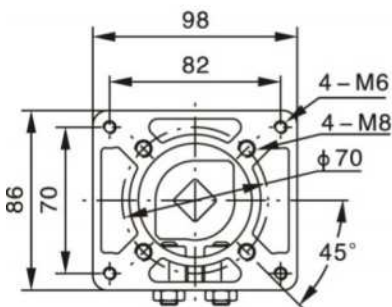
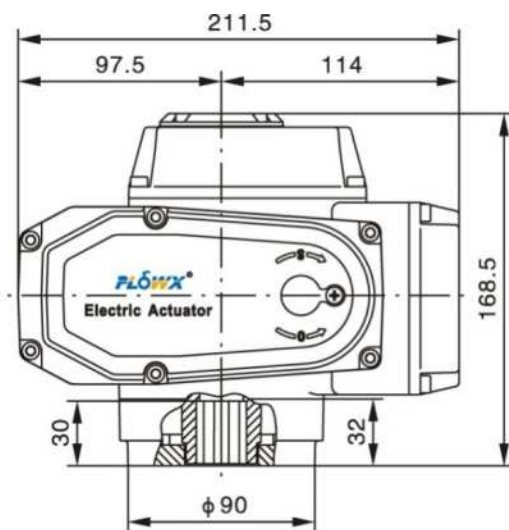
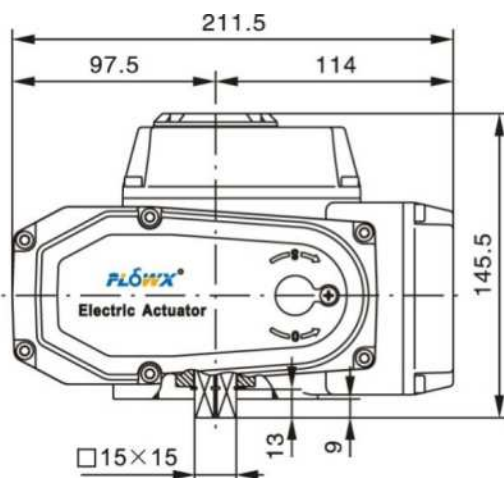
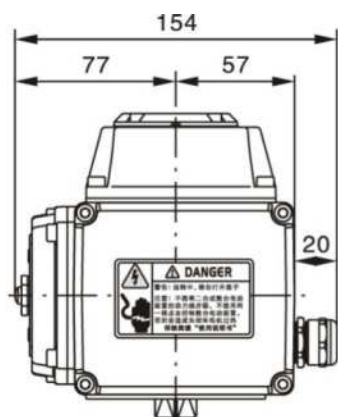


| Model | FLOWX-05 | | | | | | |
|--------------------------|--|-------|--------|-----------------|--------|--------|--------|
| Power supply | DC12V | DC24V | DC220V | AC24V | AC110V | AC380V | AC220V |
| Power | 20W | | | 10W | | | |
| Rated current | 3.8A | 2A | 0.21A | 2.2A | 0.48A | 0.15A | 0.24A |
| Output moment | 30Nm/50Nm | | | 15Nm/30Nm/50Nm | | | |
| Running time | 6S/10S | | | 10S/20S/30S | | | |
| Control loop | Type A,B,C,D,E,F,G,H | | | | | | |
| Rotation angle | 0-360° adjustable | | | | | | |
| Whole machine weigh | 2.4kg | | | | | | |
| Insulation resistance | 100MΩ/300VDC | | | 100MΩ/500VDC | | | |
| Voltage endurance level | 500VAC/1 minute | | | 500VAC/1 minute | | | |
| Protection level | IP67 | | | | | | |
| Ambient temperature | -25°C~60°C (other temperature range is open for customizing) | | | | | | |
| Installation angle | 360°,any angle | | | | | | |
| Shell material | Aluminum alloy precision press-forged piece | | | | | | |
| Optional features heater | Dehumidifier | | | | | | |

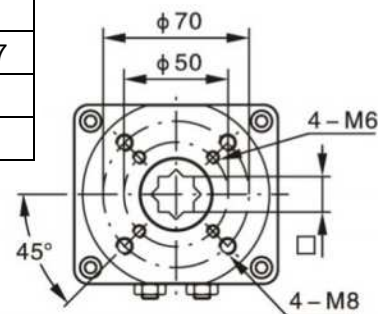
FLOWX-10 series dimensions and performance parameters

Standard type

Direct installation type(ISO5211 standard)



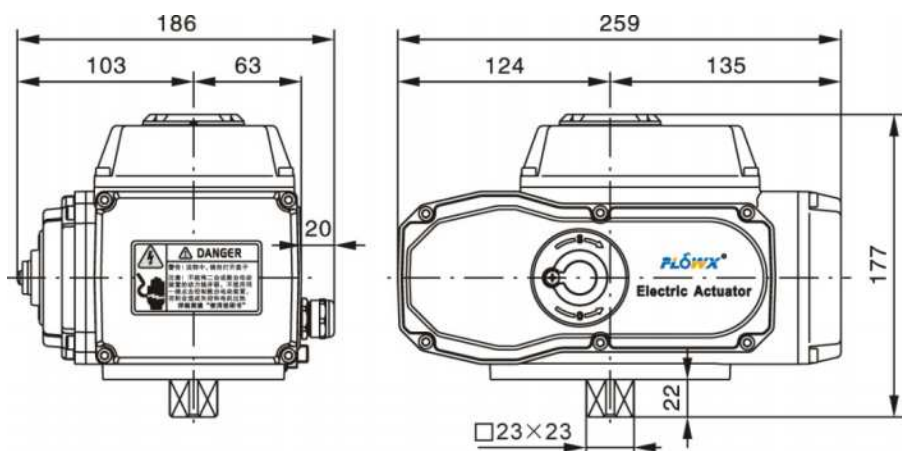
| Direct-installation type parameters(ISO5211 standard) | | | | |
|---|--------------|-------|-------|-------|
| Square socket | 9*9 | 11*11 | 14*14 | 17*17 |
| Flange | F05 | | F07 | |
| Valve rod | Height ≤28mm | | | |



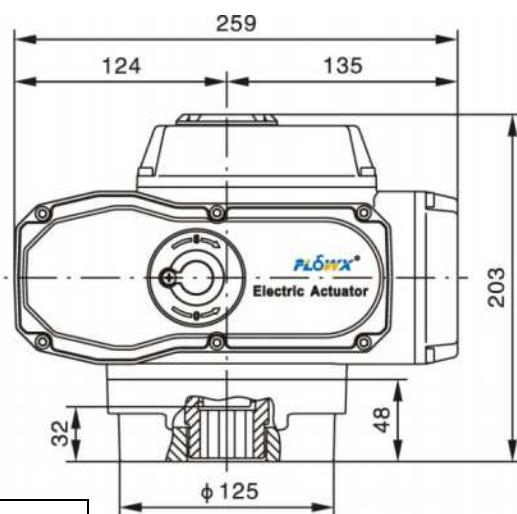
| Model | FLOWX-10 | | | | | | |
|--------------------------|--|-------|--------|------------------|--------|--------|--------|
| Power supply | DC12V | DC24V | DC220V | AC24V | AC110V | AC380V | AC220V |
| Power | 40W | | | 23W | | | |
| Rated current | 4.8A | 2.4A | 0.32A | 3A | 0.64A | 0.19A | 0.32A |
| Output moment | 100Nm | | | 50Nm/60Nm/100Nm | | | |
| Running time | 10S | | | 13S/15S/20S/30S | | | |
| Control loop | Type A,B,C,D,E,F,G,H | | | | | | |
| Rotation angle | 0-90° adjustable | | | | | | |
| Whole machine weigh | 4.2kg | | | | | | |
| Insulation resistance | 100MΩ/300VDC | | | 100MΩ/500VDC | | | |
| Voltage endurance level | 500VAC/1 minute | | | 1500VAC/1 minute | | | |
| Protection level | IP67 | | | | | | |
| Ambient temperature | -25°C~60°C (other temperature range is open for customizing) | | | | | | |
| Installation angle | 360°, any angle | | | | | | |
| Shell material | Aluminum alloy precision press-forged piece | | | | | | |
| Optional features heater | Over-moment protection, heater dehumidifier | | | | | | |

FLOWX-20/40/50/60 series dimensions and performance parameters

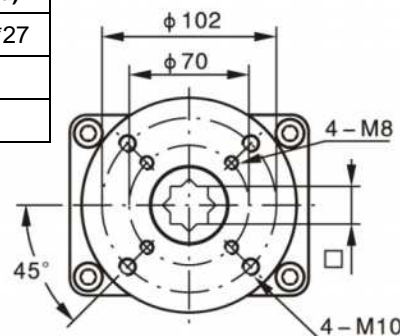
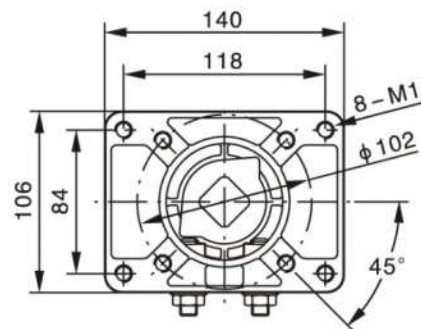
Standard type



Direct installation type(ISO5211 standard)



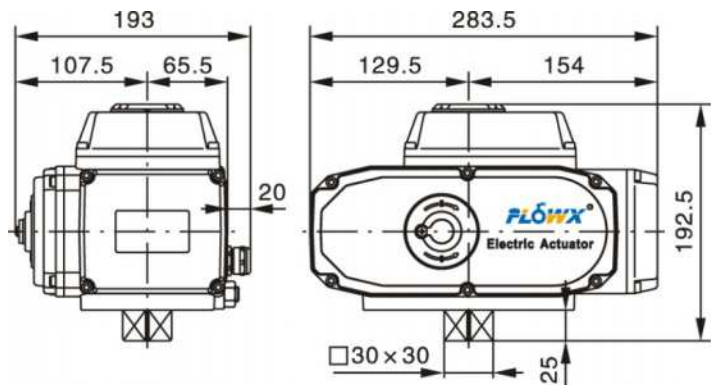
| Direct-installation type parameters(ISO5211 standard) | | | | |
|---|--------------|-------|-------|-------|
| Square socket | 14*14 | 17*17 | 22*22 | 27*27 |
| Flange | F07 | | F10 | |
| Valve rod | Height ≤30mm | | | |



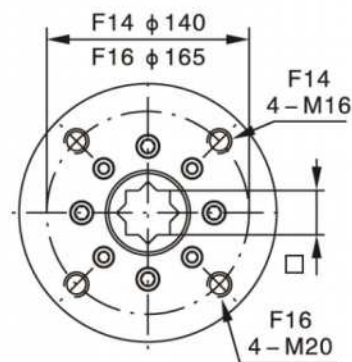
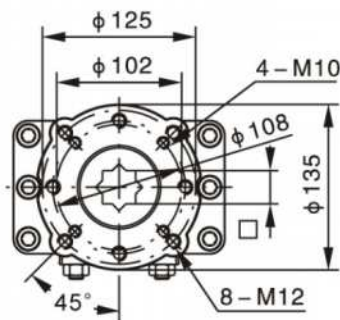
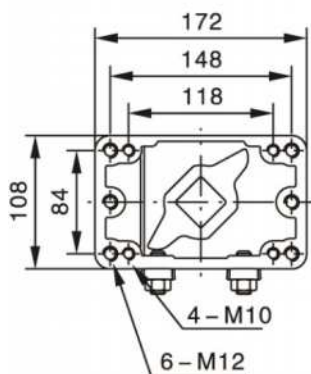
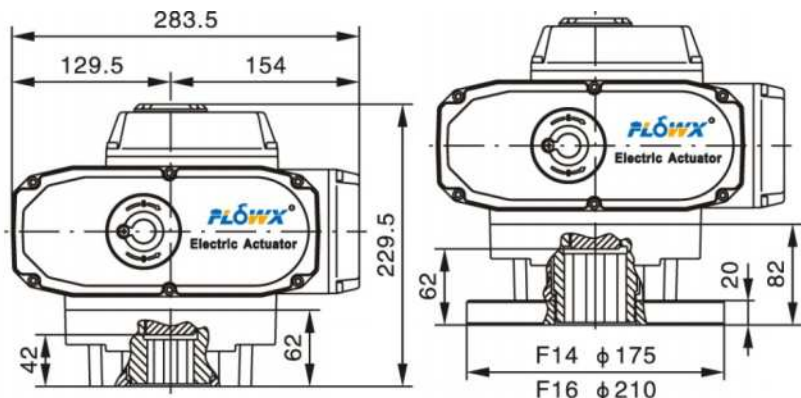
| Model | FLOWX-20/40 | | | | | | FLOWX-50/60 | | | | | |
|--------------------------|--|-------|------------------|-------|--------|--------|-----------------|-------|------------------|-------|--------|--------|
| | Power supply | DC24V | DC220V | AC24V | AC110V | AC380V | AC220V | DC24V | DC220V | AC24V | AC110V | AC380V |
| Power | 40W/60W | | | | | | 90W | | | | | |
| Rated current | 8A | 0.35A | 5A | 0.9A | 0.25A | 0.48A | 7A | 0.9A | 8A | 2A | 0.45A | 0.92A |
| Output moment | 200Nm | | 200Nm/400Nm | | | | 500Nm/600Nm | | | | | |
| Running time | 10S | | 15S/30S/60S | | | | 15S/30S/60S | | | | | |
| Control loop | Type A,B,C,D,E,F,G,H | | | | | | | | | | | |
| Rotation angle | 0-90° adjustable | | | | | | | | | | | |
| Whole machine weigh | 7.2KG | | | | | | 8KG | | | | | |
| Insulation resistance | 100MΩ/300VDC | | 100MΩ/500VDC | | | | 100MΩ/300VDC | | 100MΩ/500VDC | | | |
| Voltage endurance level | 500VAC/1 minute | | 1500VAC/1 minute | | | | 500VAC/1 minute | | 1500VAC/1 minute | | | |
| Protection level | IP67 | | | | | | | | | | | |
| Ambient temperature | -25℃~60℃(other temperature range is open for customizing) | | | | | | | | | | | |
| Installation angle | 360°,any angle | | | | | | | | | | | |
| Shell material | Shell material Aluminum alloy precision press-forged piece | | | | | | | | | | | |
| Optional features heater | Over-moment protection, heater dehumidifier | | | | | | | | | | | |

FLOWX-100/200 series dimensions and performance parameters

Standard type



Direct installation type(ISO5211 standard)



Direct-installation type parameters(ISO5211 standard)

| | | | | |
|---------------|--------------|-----|--------------|-----|
| | 100 | | 200 | |
| Square socket | 22*22 | | 27*27 | |
| | 27*27 | | 36*36 | |
| Flange | F10 | F12 | F14 | F16 |
| Valve rod | Height ≤40mm | | Height ≤60mm | |

| Model | FLOWX-100 | | | | FLOWX-200 | | | |
|--------------------------|--|-------|--------|--------|-----------|-------|--------|--------|
| | Power supply | AC24V | AC110V | AC380V | AC220V | AC24V | AC110V | AC380V |
| Power | 100W | | | | 100W | | | |
| Rated current | 9A | 2.2A | 0.48A | 1.2A | 9A | 2.2A | 0.48A | 1.2A |
| Output moment | 300Nm/800Nm/1000Nm | | | | 2000Nm | | | |
| Running time | 15S/30S/50S | | | | 100S | | | |
| Control loop | Type A,B,C,D,E,F,G,H | | | | | | | |
| Rotation angle | 0-90° adjustable | | | | | | | |
| Whole machine weigh | 11.5Kg | | | | 12.1Kg | | | |
| Insulation resistance | 100M/500VDC | | | | | | | |
| Voltage endurance level | 1500VAC/1 minute | | | | | | | |
| Protection level | IP67 | | | | | | | |
| Ambient temperature | -25℃~60℃(other temperature range is open for customizing) | | | | | | | |
| Installation angle | 360°,any angle | | | | | | | |
| Shell material | Shell material Aluminum alloy precision press-forged piece | | | | | | | |
| Optional features heater | Over-moment protection, heater dehumidifier | | | | | | | |

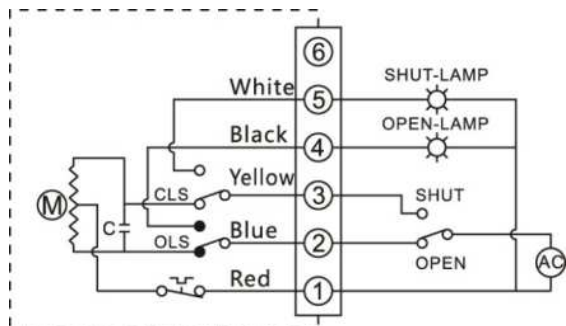
Intelligent adjustment type (E type) performance parameters

| Model | FLOWX-05E | FLOWX-10E | FLOWX-20E | FLOWX-40E | FLOWX-50E | FLOWX-60E | FLOWX-100E | FLOWX-200E |
|-------------------------|---|---------------|---------------|-----------------------|---------------|---------------|--------------|--------------|
| Power supply | DC12V,DC24V,DC220V,AC24V,AC110V,AC220V,AC380V; 50/60Hz | | | | | | | |
| Electromotor power | 10W | 23W | 40W | 40W | 90W | 90W | 100W | 100W |
| Rated current | 0.24A(AC220V) | 0.32A(AC220V) | 0.48A(AC220V) | 0.48A(AC220V) | 0.92A(AC220V) | 0.92A(AC220V) | 1.0A(AC220V) | 1.2A(AC220V) |
| Output moment | 50Nm | 100Nm | 200Nm | 400Nm | 500Nm | 600Nm | 1000Nm | 2000Nm |
| Running time | 30S | 30S | 30S | 30S | 30S | 30S | 50S | 100S |
| Rotation angle | 0-90° | 0-90° | 0-90° | 0-90° | 0-90° | 0-90° | 0-90° | 0-90° |
| Whole machine weight | 2.4Kg | 4.2Kg | 7.2Kg | 7.2Kg | 8Kg | 8Kg | 11.5Kg | 12.1Kg |
| Input signal | 4-20mA DC, 1-5VDC, 0- 10VDC (others can be selected before leaving factory) | | | | | | | |
| Output signal | 4-20mA DC (others can be selected before leaving factory) | | | | | | | |
| Basic deviation | *no greater than $\pm 1\%$ | | | | | | | |
| Return difference | *Less than 0.3% | | | | | | | |
| Dead zone | 0.4%-1.5% adjustable | | | | | | | |
| Damping feature | 0 times | | | | | | | |
| Device repetitive error | 0% | | | | | | | |
| Insulation resistance | DC24V: 100M Ω /300VDC | | | 100M Ω /500VDC | | | | |
| Voltage endurance level | DC24V: 500VAC/1 minute | | | 1500VAC/1 minute | | | | |
| Protection level | IP67 | | | | | | | |
| Ambient temperature | -25°C - +60°C(other temperature range is open for customizing) | | | | | | | |
| Installation angle | 360°, any angle | | | | | | | |
| Shell material | Aluminum alloy precision press-forged piece | | | | | | | |
| Optional features | Over-moment protection, heater dehumidifier, power-less contact point type | | | | | | | |

Control Loop

Common switch type (A)

Valve open/close operation is realized by switch loop, and a set of powered position signal is output to signify the valve being full-open or full-shut.

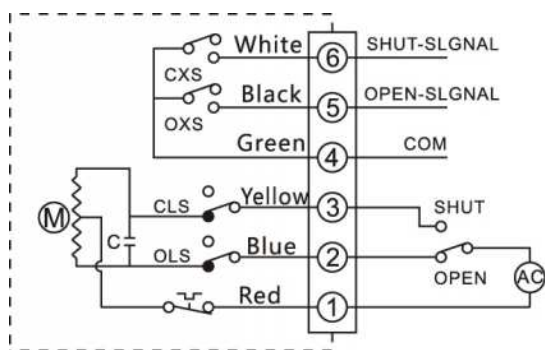


Wiring method:

1. Terminal 1 connects zero line of the power supply;
2. When power supply phase line connects to terminal 2, it runs "ON", till the travel switch OLS acts;
3. When power supply phase line connects to terminal 3, it runs "OFF", till the travel switch CLS acts;
4. When power supply phase line connects to terminal 2, it runs "ON", and when it runs in place, The "full-open signal" indicator connected to terminal 4 lights up;
5. When power supply phase line connects to terminal 3, it runs "OFF", and when it runs in place, the "full-shut" indicator connected to terminal 5 lights up.

Power-less contact point type (B)

Valve open/close operation is realized by switch loop, and a set of powered position signal is output to signify the valve being full-open or full-shut.

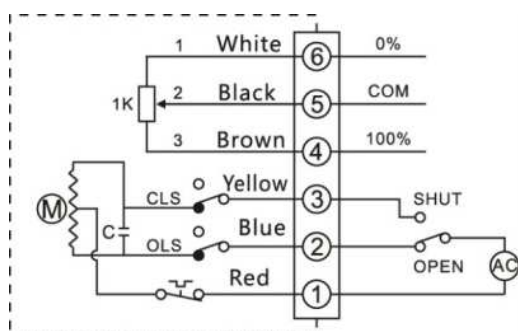


Wiring method:

1. Terminal 1 connects zero line of the power supply;
2. When power supply phase line connects to terminal 2, it runs "ON", and when it runs till travel switch OLS acts;
3. When power supply phase line connects to terminal 3, it runs "OFF" till travel switch CLS acts;
4. Terminal 4 is power-less contact point common terminal;
5. When "ON" runs in place, the terminal 5 outputs "full-open signal";
6. When "OFF" runs in place, the terminal 6 outputs "full-shut signal";

Openness degree signal type (C)

Valve open/close operation is realized by switch loop, and electric resistance signal is output corresponding to the openness position.



Wiring method:

1. Terminal 1 connects zero line of the power supply;
2. When power supply phase line connects to terminal 2, it runs "ON", and when it runs till travel switch OLS acts;
3. When power supply phase line connects to terminal 3, it runs "OFF" till travel switch CLS acts;
4. Terminal 4 is the low end of the potentiometer, so when running "ON", the impedance between terminal 4 and terminal 5 increases with the valve opening;
5. Terminal 5 is the movable arm of potentiometer;
6. Terminal 8 is the high end of the potentiometer, so when running "OFF", the impedance between terminal 5 and terminal 6 increases with the valve closing;

Note: In the control loop, the part inside the dotted line is the internal loop of the electric-driven device, and the part outside is for reference by the user while wiring.

Caution!: Never connect the power cords of two or more electric-driven devices in parallel, never control multiple electric-driven devices with one single contact point, or else the system may malfunction or the electromotor may overheat.

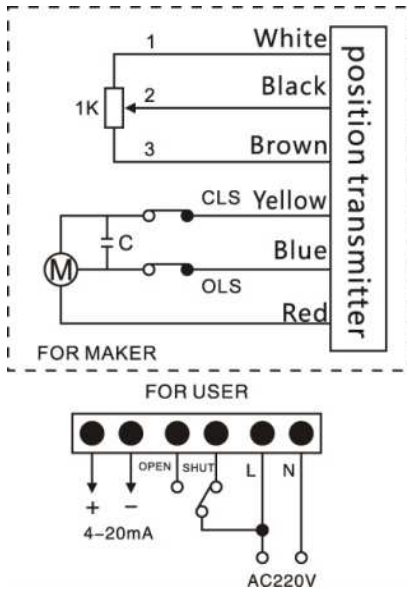
With position transmitter (D)

Valve open/close operation is realized by switch loop, and electric current signal is output corresponding to the valve openness angle.

4-20mA DC valve-location signal is output (to exercise travel feedback to valve location).

Wiring method:

1. On the power input side "N" is the zero line, and, " L" links to phase conductors;
2. When " L" on the power input side links to "ON ", it runs to the direction of opening the valve;
3. When " L" on the power input side links to "OFF ", it runs to the direction of closing the valve;
4. The "+" on the "output signal" side links to the positive pole of the output signal, and" - " links to the negative pole of output signal.

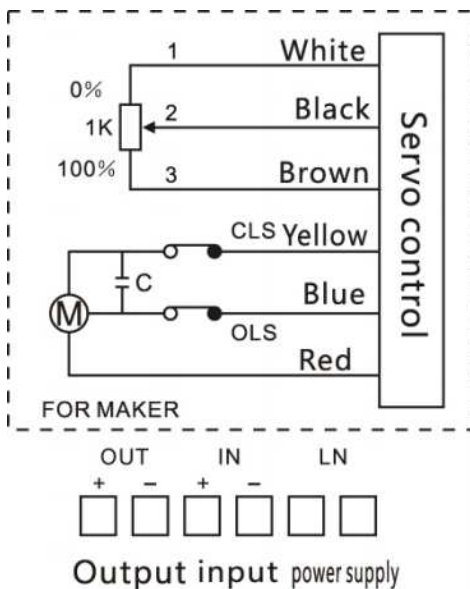


Intelligent adjustment type (E)

The external computer or industrial instrument inputs a standard signal to control the open/shut degree of the valve and meanwhile feedbacks the corresponding standard signal.

Wiring method:

1. On the power input side "N" links to the zero line, and, " L" links to phase conductors;
2. The "+" on the "external control" side links to the positive pole of the input signal, and" - " links to the negative pole of input signal.
3. The "+" on the "feedback" side links to the positive pole of the output signal, and" - " links to the negative pole of output signal.

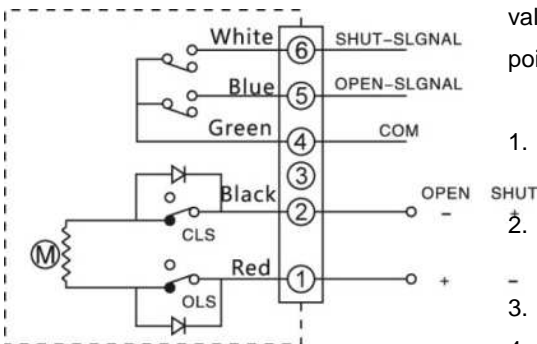


DC switch type (F)

By switching over the positive/negative polarity of the external DC power supply, the valve "OPEN" or "SHUT" operation is realized, and meanwhile a set of power-less contact point signal is output to signify the value being full-open or full-shut.

Wiring method:

1. When terminal 1 links to power supply positive pole, terminal 2 links to the power supply negative pole, and that is "ON" operation;
2. When terminal 1 links to power supply negative pole, terminal 2 links to the power supply positive pole, and that is "OFF" operation;
3. Terminal 4 is power-less contact point common terminal;
4. When " ON " runs in place, the terminal 5 outputs "full-open signal";
5. When " OFF " runs in place, the terminal 6 outputs "full-shut signal";



Note: In the control loop, the part inside the dotted line is the internal loop of the electric-driven device, and the part outside is for reference by the user while wiring.

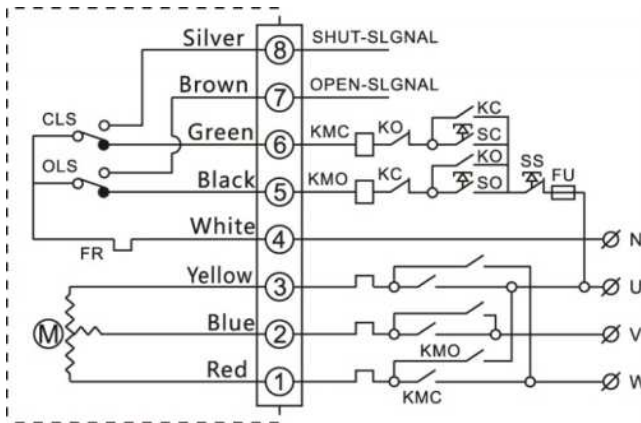
Caution!: Never connect the power cords of two or more electric-driven devices in parallel, never control multiple electric-driven devices with one single contact point, or else the system may malfunction or the electromotor may overheat.

3-Phase switch type (G)

Valve open /close operation is realized by switch loop, and a set of powered position signal is output to signify the valve being full-open or full-shut.

Wiring method:

1. Terminal 1, 2, 3 link to three-phase alternating current, and external phase inverting circuit is used to realize positive and negative rotation of electromotor;
2. Terminal 4 is the common point of external control loop;
3. Terminal 5 is " ON" operation control;
4. Terminal 6 is " OFF" operation control;
5. When " ON " runs in place, the terminal 7 outputs "full-open signal";
6. When " OFF" runs in place, the terminal 8 outputs "full-shut signal";

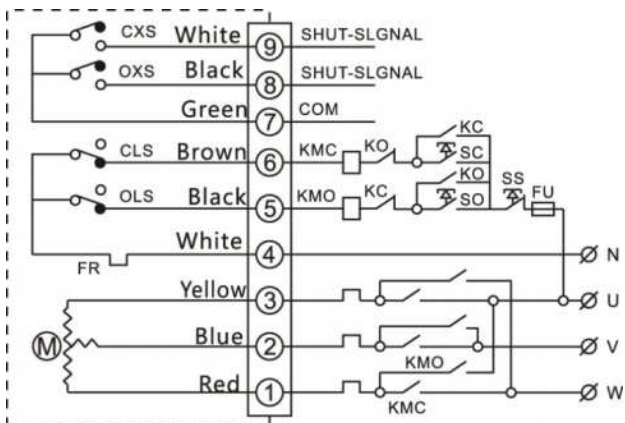


3-Phase power-less contact-point type (H)

Valve open /close operation is realized by switch loop, and a set of powerless position signal is output to signify the value being full-open or full-shut.

Wiring method:

1. Terminal 1, 2, 3 link to three-phase alternating current, and external phase inverting circuit is used to realize positive and negative rotation of electromotor;
2. Terminal 4 is the common point of external control loop;
3. Terminal 5 is " ON" operation control;
4. Terminal 6 is " OFF" operation control;
5. Terminal 7 is power-less contact point common terminal;
6. When " ON " runs in place, the terminal 8 outputs "full-open signal";
7. When " OFF" runs in place, the terminal 9 outputs "full-shut signal";



Note: In the control loop, the part inside the dotted line is the internal loop of the electric-driven device, and the part outside is for reference by the user while wiring.

Caution!: Never connect the power cords of two or more electric-driven devices in parallel, never control multiple electric-driven devices with one single contact point, or else the system may malfunction or the electromotor may overheat.

Use requirements

Installation environment requirement

1. The product can be installed indoors or outdoors;
2. The product is not explosion protection product so please avoid flammable and explosive environment;
3. In an environment where there is rainwater, raw material splatter, and sunlight direct radiation on long term, you must install a protective hood to shield over the whole electric actuator.
4. Please reserve room for wiring, manual operation and installation and repair work;
5. Periphery environmental temperature should keep in 30 - 60°C range;

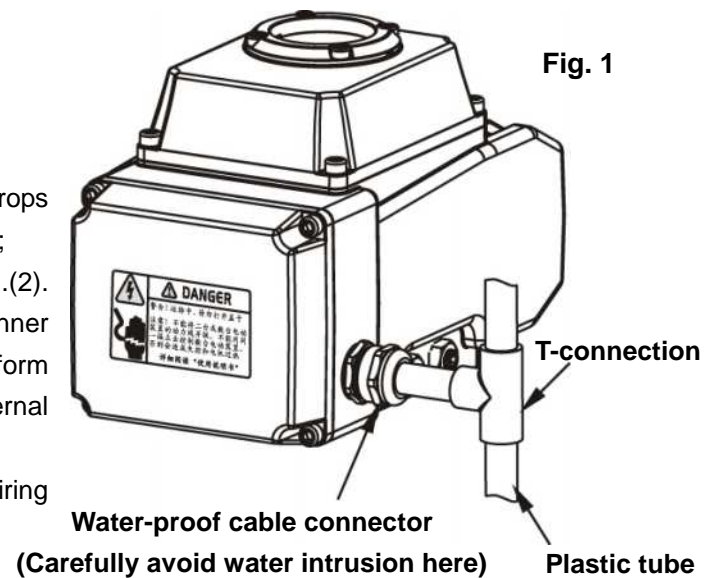
Note: when using it in environment of big temperature difference or below zero point, you should use the model which has heater dehumidifier to prevent moisture condensation.

Working medium temperature requirement

1. When mating with valve, the working medium temperature is transmitted to actuator, and make its temperature rise;
2. When the working medium has high temperature, the bracket linking to valve works to reduce heat conducting;
3. When the working medium temperature is below 0°C, please select standard bracket;
4. When the working medium temperature is above 80°C, please select high temperature bracket;

On-site cable lines, wiring tubes installation requirement

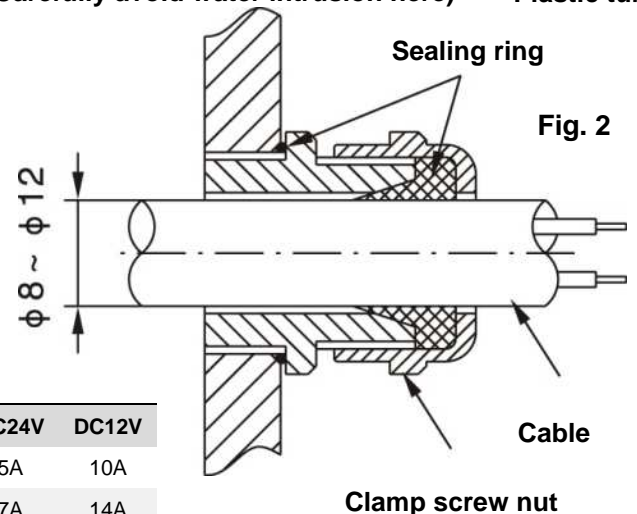
1. When using wire tube, please install as per Fig.(1)
 - a) wiring tube outer diameter Φ 8-12
 - b) It should have adequate waterproof countermeasure
 - c) The actuator shall be higher than wiring tube, so the water drops in wiring tube can't flow into actuator, thus ensuring its safety;
2. When using cable, its outer diameter is Φ 8-12. See Fig.(2). Cable that mismatch the waterproof cable connector inner diameter must not be adopted, or else the water can flow form waterproof cable connector into actuator and damage all internal components;
3. Signal wire in principle shall adopt shrouding wire, and its wiring should be separate from power line wiring.



Power supply requirement

1. According to power supply type of the model you order, you provide relevant on-site power supply;
2. The voltage of on-site power supply shall comply with the following requirements:

AC380V \pm 10% 50/60Hz AC220V \pm 10% 50/60Hz
 AC110V \pm 10% 50/60Hz AC24V \pm 10% 50/60Hz
 DC24V \pm 5%



Selection of breaker switch fuse:

| Model | Voltage | AC380V | AC220V | AC110V | AC24V | DC220V | DC24V | DC12V |
|-------------------|---------|--------|--------|--------|---------|--------|-------|-------|
| FLOWX-05 | | 2A | 2A | 3A | 5A | 2A | 5A | 10A |
| FLOWX-10 | | 2A | 3A | 5A | 7A | 3A | 7A | 14A |
| FLOWX-20/40/50/60 | | 3A/5A | 5A/7A | 7A/10A | 10A/11A | 5A/7A | 15A | |
| FLOWX-100/200 | | 5A | 7A | 10A | 20A | 20A | | |

Actuator and valve installation

Actuator and valve installation (Fig. 3)

1. Manually operate the valve, make sure there is no abnormal condition, turn the valve to full-shut position;
2. Lightly fix the bolt to the valve with a bracket;
3. Fit one end of the coupler over the valve stem;
4. Drive the electric actuator by manual handle to the full-shut position (Pointer just points to SHUT, 0 mark), insert the output shaft in the square hole of coupler;
5. Lightly fix the electric actuator to the bracket with a bolt;
6. Drive the electric actuator by manual handle through its full travel range. Make sure the operation is smooth, without deviation from center, and without skew or blockage, and examine whether the valve can realize full-shut and full-open within the openness indication range of the actuator.

Note: Don't use forcibly strong force, or else the actuator may run beyond limit and be damaged.

Special hints:

If you prepare your bracket or coupler by yourself, please notice:

1. Bracket and coupling shall be designed and processed by specialized technicians and conform to remark requirements in Fig. 4;
2. The axis hole processing on both ends of coupling shall guarantee necessary precision, and remove transmission gap as far as possible, in case the valve has return difference while working;
3. You shall strictly guarantee position of axis holes on both ends of coupling. Or else it may go beyond actuator's designed scope of work .And the result is actuator travel range can't adjust and thus the valve cannot work normally.

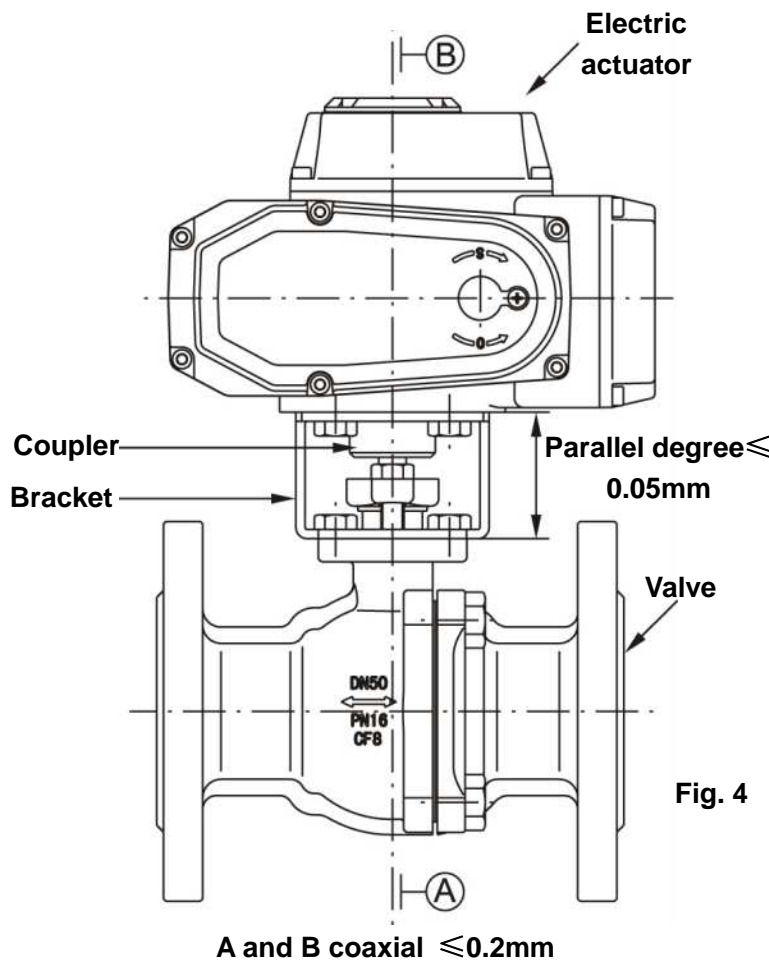


Fig. 4

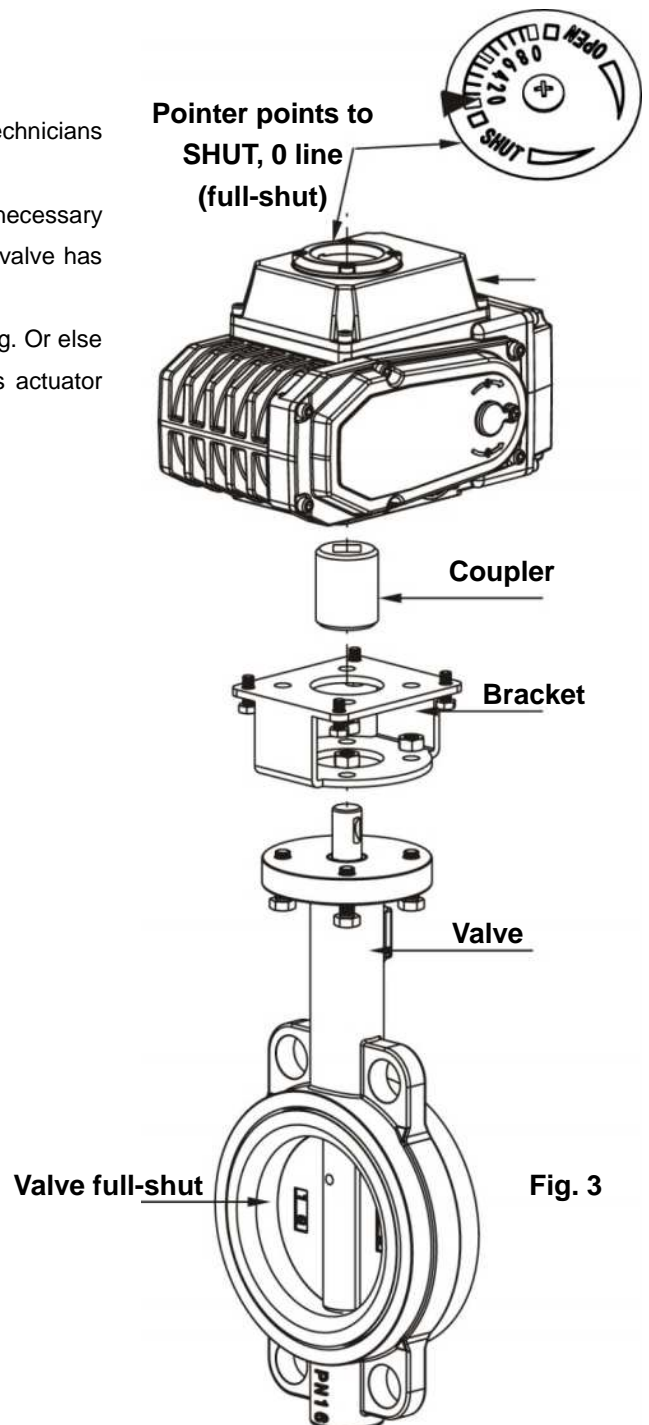


Fig. 3

Complete-machine debugging of electric valve

Switch type adjustment

1. Electric limiter adjustment

- Before adjusting the electric limiter, you shall loosen adjusting screw of mechanical limiter, and when the electric limiter is adjusted, retighten the mechanical limiter, to avoid mechanical blockage;
 - Loosen the screw of stroke dog, and tap the stroke dog with screwdriver, so you can adjust the angle of stroke dog, thereby change the switch angle of electric limiter, and when travel switch acts, it gives the "kata" noise. In the end, firmly fasten the screw of stroke dog.
- ✧ When it is energized, it is forbidden to operate it manually.
 - ✧ When you adjust the actuator whose angle of rotation adjustment range is 0~90 degrees. You should not adjust beyond range, or randomly enlarge the rotating angle.

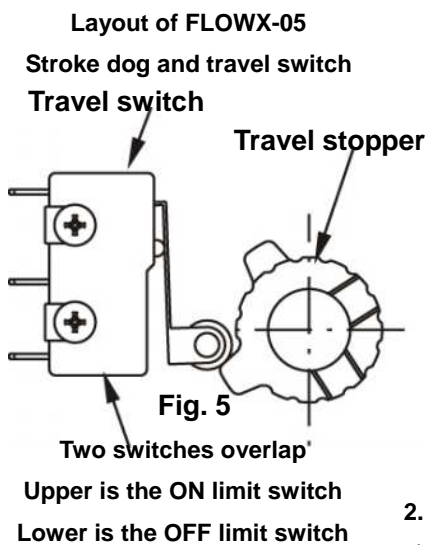


Fig. 5

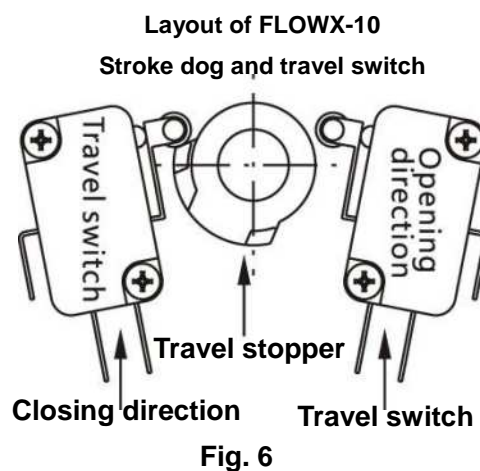


Fig. 6

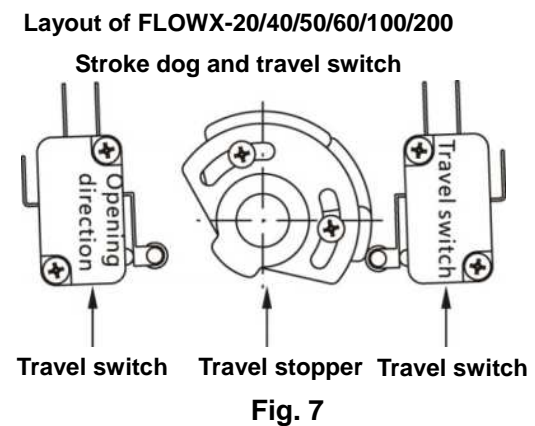


Fig. 7

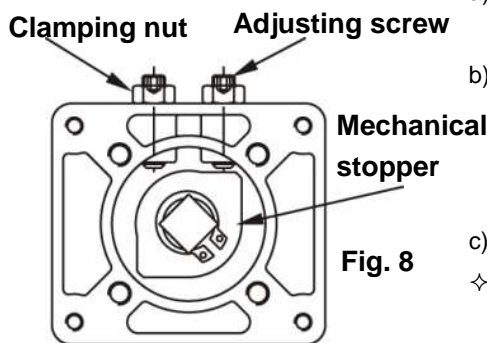


Fig. 8

2. Mechanical limiter adjustment (Fig. 8)

- Drive the actuator by manual handle to the full-shut position (when travel switch acts, it gives "kata" sound);
 - Loosen locknut, clockwise turn the adjusting screw, to make it contact with mechanical stopper, and then counterclockwise turn the screw for half-lap, to let the mechanical limiter at the full-shut position lag behind the electric limiter by about 2~3° angular distance, and fasten the nut;
 - In the same method, you can adjust the mechanical stopper at the full-open position.
- ✧ The electric limiter position and mechanical limiter position of the actuator must meet the requirement of (Fig. 9). If mechanical limiter is ahead of or coincides with electric limiter, actuator electromotor may be blocked. It can heat up and even burn the electromotor.

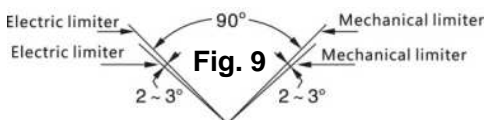


Fig. 9

3. Adjustment of potentiometer (Fig. 10), suitable for Type C, E (generally, no need to adjust)

- Resistance value of potentiometer is: 1KΩ (5KΩ);
 - Drive the actuator by manual handle to its full-shut position;
 - Loosen the screw of openness degree gear, and turn the openness degree gear. Adjust the potentiometer, measure the resistance between connecting terminals 4~5 with universal meter, make the resistance about 100. Fasten the openness degree gear locknut. (if it is the adjustment type seven-line plug-and-socket connection, please measure resistance corresponding to two jack holes RV and RS).
- ✧ You can also directly loosen potentiometer to adjust, but when fixing it, please notice the engagement between potentiometer gear and openness degree gear, and the gap shall not be too big or too tight, or else the actuator's complete machine precision will be directly affected.

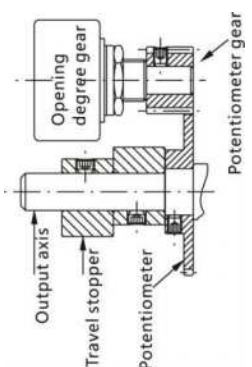


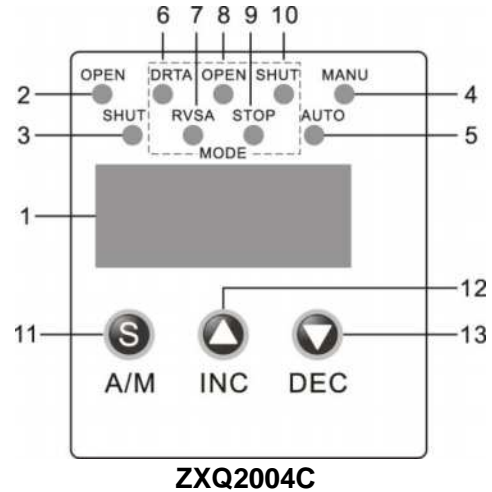
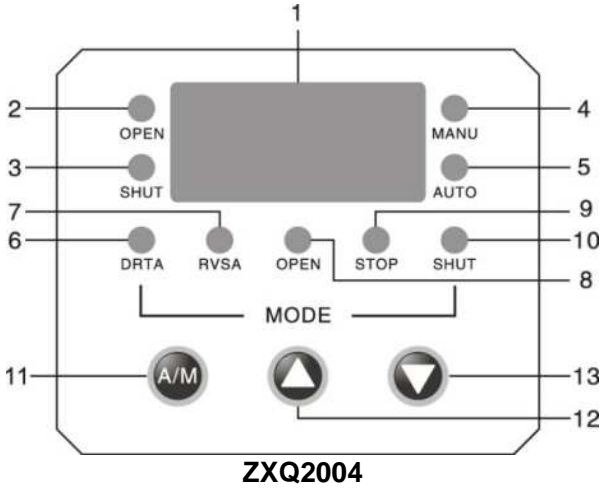
Fig. 10

Debugging of the adjustment type (E)

A. How to adjust the adjustment type

Adjustment of actuator

- Before you adjust the intelligent locator, please understand the adjusting method of switching angle, and adjust the actuator electric limiter and potentiometer mechanical limiter according to valve full-shut and full-open.



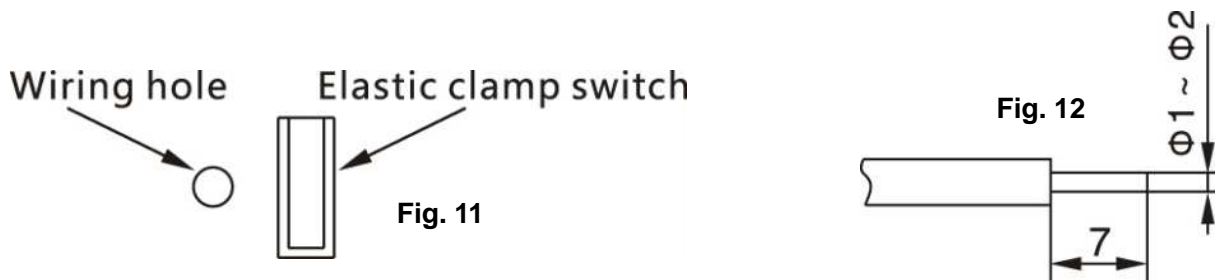
B. locator panel

| | | | | |
|-----------------------------|--------------------------|----------|--|---|
| Parameter indication | 1 | LED view | By pushing buttons, you toggle from indication of valve actual openness value, valve setting openness value, locator shell inside temperature to setting parameters | |
| | Status indication | 2 | OPEN | Output controls" OPEN" current-breaker to close |
| | | 3 | SHUT | Output controls" SHUT" current-breaker to close |
| | Mode indication | 4 | MANU | Manual operation status |
| | | 5 | AUTO | Automatic status |
| Button | 6 | DRTA | Positive act mode, the input signal corresponds to output as follows: 4 mA --- Fullness position (generally calibrated as full-open); 20 mA--- zero position (generally calibrated as full-shut) | |
| | 7 | RVSA | Negative act mode, the input signal corresponds to output as follows: 4 mA --- zero position (generally calibrated as full-shut; 20 mA---fullness position(generally calibrated as full-open) | |
| | 8 | OPEN | When input signal gets interrupted, it is "OPEN", to open the actuator till the maximum opening limit | |
| | 9 | STOP | When input signal gets interrupted, it is 'HALT', to stop the actuator at current position | |
| Button | 10 | SHUT | When input signal gets interrupted, it is 'SHUT " to open the actuator to the minimal opening limit | |
| | 11 | A/M | Manual operation / auto operation switchover; the button to access modification of and toggle between parameters | |
| | 12 | ▲ | Value increase button; in the automatic status it also toggle to indicate valve location setting openness value, and in manual operation status, it is "OPEN" | |
| | 13 | ▼ | Value decrease button; in the automatic status it also toggle to indicate temperature inside locator shell, and in manual operation status, it is "SHUT" | |

C. Wiring explanation

ZXQ2004 intelligent locator and electric actuator link up through a seven-line plug-and-socket connection.

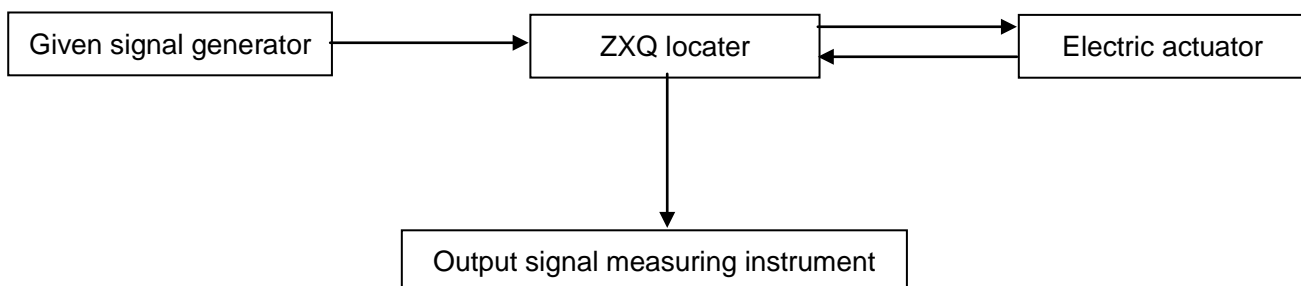
- On the locator, there is a six-line elastic clamp line contact bank (Fig. 11). N, L link to mean line and phase line of 220VAC Single-phase power, two IN terminals 4~20mA (or 1~5V) link to control current (voltage), two terminals 4~20mA link to current meter, to indicate actual valve opening and they may also be idle, not linked. Connecting wire can use single core or multi-core infrared insulated wire of conductor core 1~2mm (Fig.12), and remove the 7 mm insulation skin. If you use multi-core line, you would better twist tight and apply tin to it, thus the connection is easier, and when wiring you can insert single core wire or tinned multi-wire to the hole, and after sensing a resistance you continue to insert 4~5 mm, and that is enough; if the wire is too soft, you can put the wire in hole, and after sensing resistance, you use flat tip screwdriver to press the elastic clamp switch on rim of the corresponding hole, and then insert the line by 4~5 mm, and then loosen the elastic clamp switch, thus clamp the wire. After wire is clamped, it can't slip out normally. If you need to pull it out, use flat tip screwdriver to press the elastic clamp switch on the corresponding hole rim. Then you can pull wire out.



D. The setting and operating method for intelligent locator

According to the wiring diagram, link up the given signal source, locator, electric actuator, output signal measuring instrument and wires between power supply.

- Power on, and now it indicates the actual openness degree of valve location, and locator is in the automatic detection and control status;
- Press A/M button to switch to manual operation status, and respectively press \blacktriangle and \blacktriangledown buttons, and the detection actuator now shall correspond to "open" and "shut" action;
- In automatic status, press \blacktriangle to check the valve location setting openness value, and now you can examine the change trend and stability of input signal;
- In automatic status, press \blacktriangledown to check the temperature inside locator shell, and when temperature exceeds 70°C (you can correct it), the locator stops control over the open or shut of actuator.
- In automatic status, press A/M button for 4 seconds, to access parameter setting as shown in the next table. Parameters values can be modified by \blacktriangle and \blacktriangledown button, as detailed in the operation flowchart.



Parameters list

| Parameter | Indicated value | Description | Ex-works value |
|-----------|-----------------|--|----------------|
| U0 | 00x.0 | X = 1 allows electric brake, x=0 disallow electric brake 1 | 1 |
| | 000.X | (1) x = 0 disallow change of positioning accuracy, yet allows change and reset of time (2) x = 1,2,3 does not change or reset time, but allows change of positioning accuracy | 0 1 |
| U1 | 00x.0 | Set the positive and negative action.; x=0 is positive, x=1 is negative | 2 |
| | 000.x | Interrupt signal mode. X = 0 (neglect) x=1(open) x=2 (halt) x=3 (shut) | 0 |
| U2 | xxx.x | Controls the output lower limit value $0 \leq U2 < 100$, 0; manual operation and the process of calibrating zero position and fullness position are not restricted by this parameter | 100 |
| U3 | xxx.x | Controls the output upper limit value $0 < U2 < U3 \leq 100$, 0; manual operation and the process of calibrating zero position and fullness position are not restricted by this parameter | 0.4 |
| U4 | 00x.x | Precision tunable, equal to $x.x / 100$ | 0.5 |
| U5 | xxx.x | Operation password, (U5 = 003.1, access the actuator openness degree calibration) | |
| U6 | xxx.x | Confirm actuator zero position, operate ▲▼key, and when reaching the setting zero position, press A/M button to confirm zero position, then access | |
| U7 | xxx.x | Confirm actuator zero position, operate ▲▼key, and when reaching the setting fullness position, press A/M button to confirm fullness position | |

Note: other parameters are reserved by the company's use, and if you need them, please refer to the appendixes.

Actuator already finishes calibration before it leaves factory. User need only link the power supply, signal source and output signal measuring instrument (or idle it) .Then you can use it directly. No need to calibrate again. If you really need re-calibrate, you can follow the next steps to operate.

Calibrating the zero position and full-position of the actuator does not influence the input and output signals of locator. After actuator is readjusted, we must calibrate the actuator turning angle, and thereafter the locator can work normally. There are two methods of calibration:

Method 1 (manual calibration) (refer to operation flowchart 13):

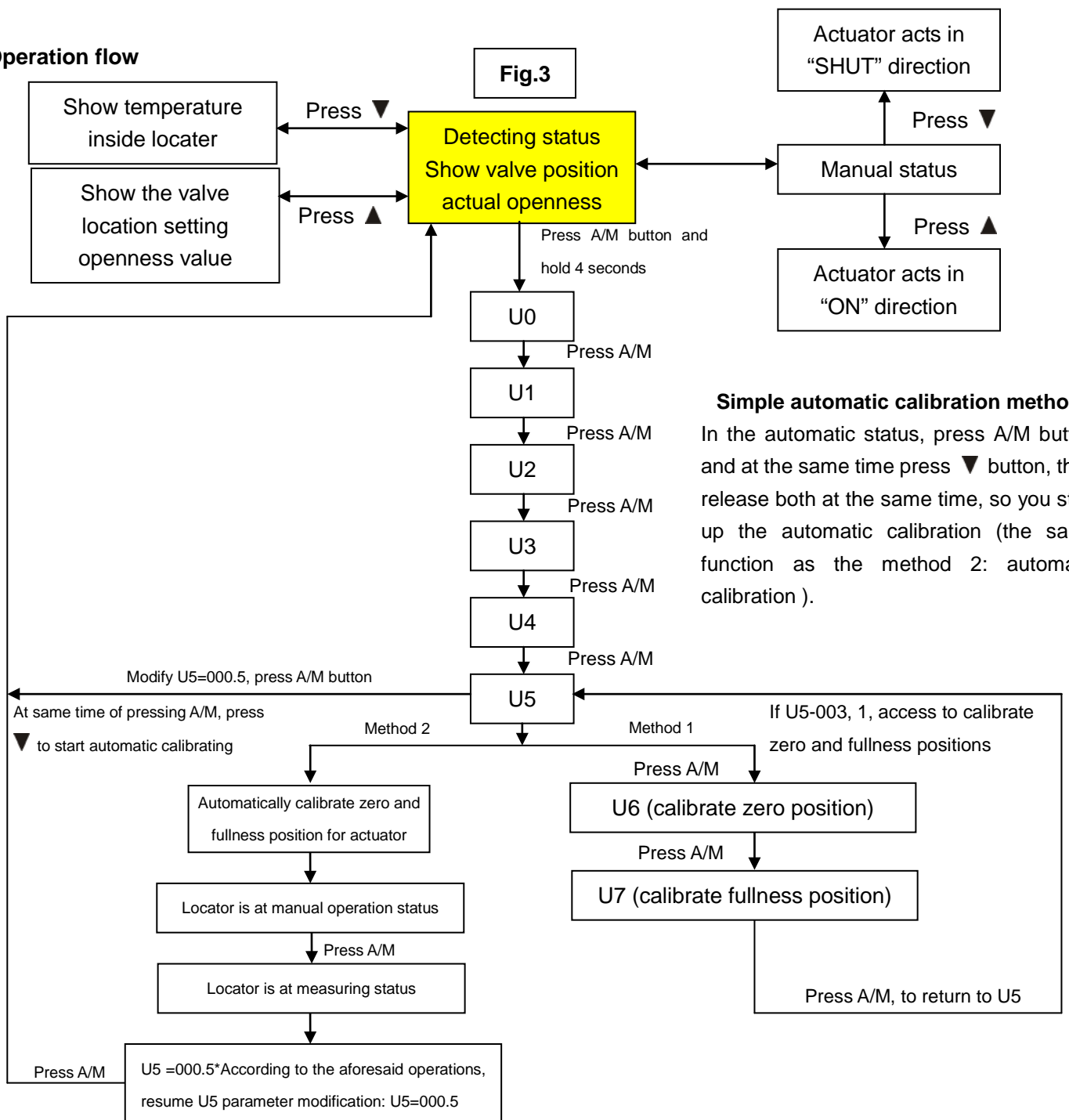
1. Access U5, modify U5= 003.1, then press A/M button again. Access U6 parameter (calibrate the zero position). Press ▲ or ▼, and actuator runs to "OPEN" or "SHUT" direction correspondingly, and meanwhile it shows the valve location actual openness value which gradually increases or decreases. When reaching expected zero position (normally the full-shut position), press A/M button to confirm zero position, and access U7 parameter;
2. Access U7 parameter (calibrate the full position), likewise, press ▲ or ▼ to the expected full position (normally the full-open position), and press A/M button to confirm full position, and the actuator automatically returns to 90 % position and return to U5;
3. Modify U5 = 000.5, return to the detection and control status.

Method 2 (Automatic calibration):

1. Access U5, modify U5= 003.1, press A/M button, and at the same time push down ▼ button, then release both, so you start up the automatic calibration. At this moment, the locators first calibrate the zero position, and then calibrate the full position. After calibration finishes, the locator is in the manual operation status. again access parameter us .Modify U 5 = 000.5(default value) and then press A/M button, and then the calibration result is saved;
2. During detection control process of locator, actuator may oscillate and heat up due to input signal quality and external Electro-Magnetic interference, so to avoid continued oscillation of actuator, you can modify U0 (000.x): set X= 0. Then when the actuator oscillates, the positioning accuracy keeps the setting precision. Yet, the actuator reset time will keep enlarging to 7 seconds, thereby reaching the requirement of exact positioning and intermittent work of actuator.
X = 1, 2, 3, then when actuator oscillates the reset time remains unchanged (about 2 seconds), but the actuator precision will keep minimizing, thereby reaching the requirement of working at most suitable precision.

Note: During the parameter modification process.

E. Operation flow



Error code list

| Error code | Meaning |
|------------|---|
| E-01 | Control signal interrupted or lower than 0.3 mA |
| E-03 | Signal feedback line between locator and actuator or the OPEN-SHUT line is connected in the reverse way, or the program operation is in error |
| E-05 | Actuator has great oscillation, maybe due to instable input signal or feedback signal or too high precision |
| E-06 | Actuator is blocked when moving to shutdown direction |
| E-07 | Actuator is blocked when moving to opening direction |
| E-08 | Locator shell internal temperature exceeds 70°C |

Other calibrating operation --- input signal, output signal calibrating method (Fig. 14)

After it leaves factory, normally you need not operate this .If you really need please use it under engineer guidance.

1. Input signal calibration

- When locator is in normal detection control status, press A/M button for 4 seconds, to access setting parameter status; it shows "U0" parameter value. Press A/M button and select U5" parameter Press ▲,▼ to modify" U5" value, to make it 011.1: (value meaning is given in next table)
 - Access" U8 " parameter value, to calibrate input current zero point: when calibrating, use an external meter to input the zero point signal (normally 4 mA), and press A/M button to confirm .Then access" U9 " parameter;
 - Access" U9" parameter value to calibrate input current full range: when calibrating, use an external meter to input the full range signal (normally 20 mA), and press A/M button to confirm .Then access "U5" parameter: modify U5 = 000.5, press A/M button to confirm and exit, and thus the calibration finishes.
- The aforesaid operation process must ensure input signal is clean and stable.

2. Output signal calibration

- Access U5 parameter, modify U5= 001.1, then press A/M button to access U6 parameter; skip parameters U6, U7, U8, U9, and access "Ua";
- "Ua " calibrates output current zero point: when calibrating, operate ▲,▼ button, to calibrate output to 4 mA or other value, which corresponds to actuator zero position output signal value, and press A/M button to confirm; then access" Ub " parameter;
- "Ub " calibrates output current full range: when calibrating, operate ▲,▼ button, to calibrate output to 20 mA or other value, which corresponds to actuator full-position output signal value, and press A/M button to confirm; then access" Uc " parameter;
- " Uc" parameter modifies temperature inside shell; operate ▲,▼ button to modify it; Press A/M button to confirm, and then return to " U5 " parameter, and modify" U5" numerical value U5= 000.5, press A/M button to confirm, and return to detection and control status.

| Parameter | Indication value | Meaning |
|-----------|------------------|---|
| U5 | 0XX.X | Access the calibration password: U5=011 .1 ,access input current calibration; U5=001.1, access output current calibration; U = 003.1, access actuator zero and fullness positions calibration |
| U6 | XXX.X | Actuator zero position parameter confirmation |
| U7 | XXX.X | Actuator fullness position parameter confirmation |
| U8 | XXX.X | Calibrate input current zero point parameter |
| U9 | XXX.X | Calibrate input current full range parameter |
| Ua | XXX.X | Calibrate output current zero position parameter |
| Ub | XXX.X | Calibrate output current full range parameter |
| Uc | 0.XX.X | Modify shell inside temperature |

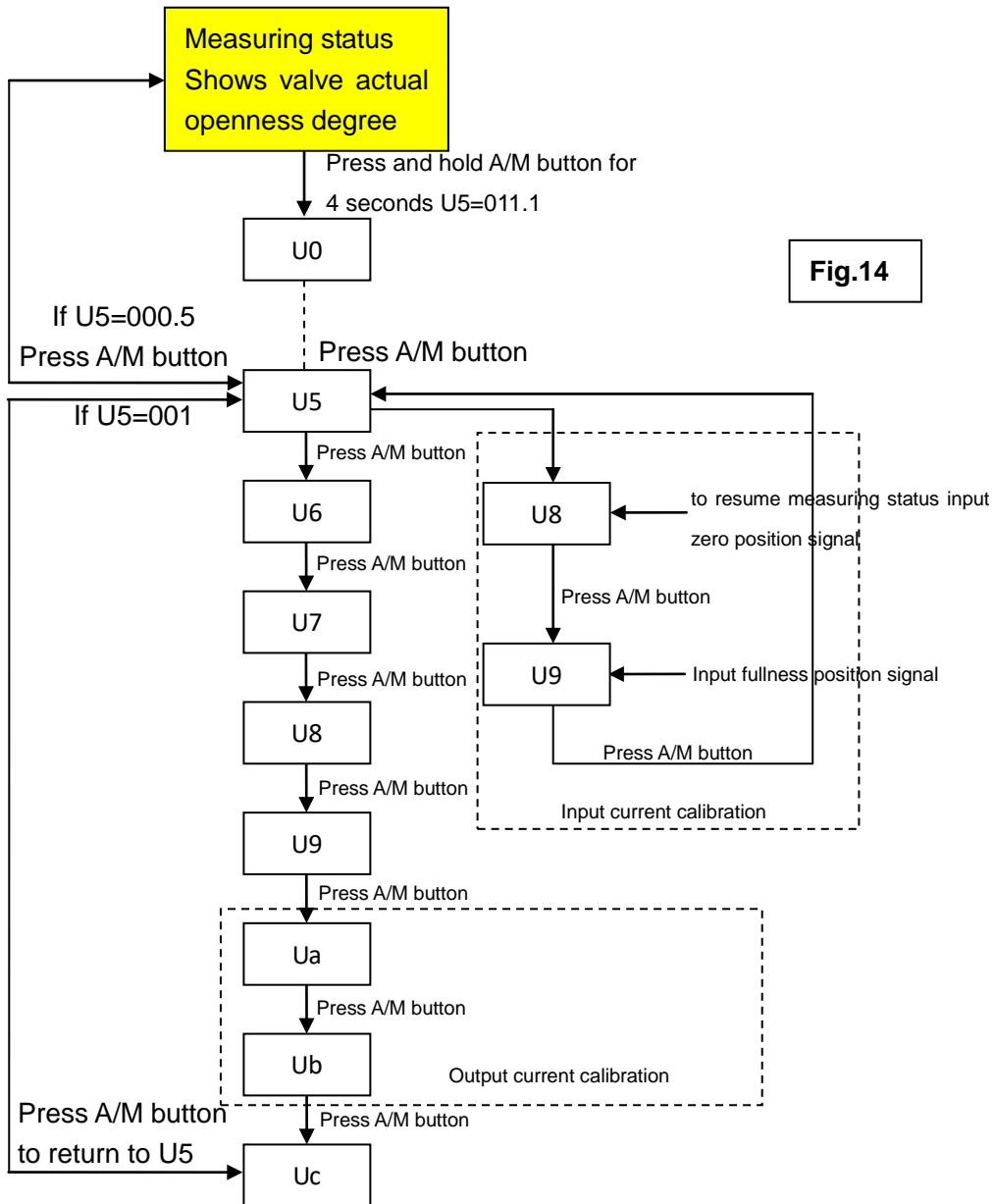


Fig.14

Use and maintenance

Note: before the product leaves factory, it has already passed comprehensive debugging and examination.

When installing and connecting the product and valve, for reason of valve coupling etc., the valve may not be able to do full-open, full-shut, and so it need readjustment.

When adjusting, please follow following steps:

1. Install and connect the actuator and valve correctly;
2. Manually operate trial run;

Take off the dustproof end plug from front cover; insert the attached handle in the hexangular hole. Clockwise turn it, and valve openness degree shall decrease; when the valve is full-shut, observe whether the travel switch in the shutting direction acts (when the switch acts, it gives "kata" sound) and then turn the handle, examine whether the mechanical stopper touches the adjusting screw; counterclockwise turn the handle, and valve openness degree shall increase; in the same method, examine the travel switch and mechanical stopper in the opening direction, and after the manual operation trial run finishes, plug back the dustproof end plug.

3. Electric drive trial run:

Demount the lead-in cap .Wire up according to wiring diagram;

Electrify and conduct a trial run. Pay attention to observe whether the actuator and valve work normally.

A. Maintenance and service

- As the product has compact structure, it uses in particular long life high pressure-resistant top grade molybdenum lubricating grease, so it needn't spot-check or oiling.
- When electric valve does not work for long time or seldom works, please regularly drive the actuator to examine whether it malfunctions.

B. Malfunction and countermeasure

| Breakdown phenomena | Cause | Countermeasure |
|--|---|---|
| Electromotor does not turn | Not linked to power supply | Connect power supply well |
| | Power supply voltage wrong or too low | Examine whether supply voltage is normal |
| | Broke wire, connector breaks away from terminal | Connect wire well, correctly connect the fastening terminal |
| | Overheat protector acts(is environmental temperature too high? is valve blocked?) | Lower the surrounding environment temperature, and examine valve open/close action by manual method to see whether it runs normally |
| | | Reduce frequency of use |
| | | Too heavy load |
| Switch pilot lamp does not light up | Travel switch already acts; | Adjust the stroke dog |
| | Electromotor phase-advancer capacitor broken | Contact manufacturer to replace capacitor |
| | DC actuator diode broken | Contact manufacturer to replace diode |
| | Pilot lamp broken | Replace pilot lamp |
| When running to limit position, the electromotor does not stop turning | Travel switch acts abnormally; | Replace travel switch |
| | Travel switch acts abnormally; | Replace travel switch |
| | Three-phase alternating-current supply has reversely connected phase sequence | Adjust three-phase alternating-current supply phase sequence |
| | Travel switch has error when connecting into control loop | Adjust wiring |
| | Mechanic limiter acts ahead of the electric limiter | Readjust mechanic stopper according to the adjustment direction of mechanic limit stopper |
| Actuator is intruded by water | Electric fitting viewing mirror broken | Contact manufacturer for repair |
| | Electric fitting top-cap, lead-in cap, front cap etc. | |
| | Has a bolt not clamped. | |
| | Lead-in cable is not normal, or in-lead connection position does not follow the user manual requirement of water-proof treatment. | |

LEADING OUT OF PROFESSIONALISM

