

Product overview

- Rated voltage: AC230V, AC110V, AC24V
- Rated torque: **20Nm**
- Running time: **about 15s**
- Install below **15Nm** valves: 2-way, 3-way ball valve and butterfly valve
- Wiring and feedback model: B3, BD3, B3S, BD3S, B3P, B3R (Customized)
- Adopted high-performance Synchronous Motor
- It can be used 20,000 times.*1
- It is forbidden to use 2 or more actuators in parallel



Technical Data

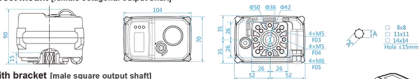
| | | | | |
|---------------------|---------------------------|---|----------------------------|------------------------------|
| Electrical data | Rated voltage | AC230V 50/60Hz | AC110V 50/60Hz | AC24V 50/60Hz |
| | Rated voltage range | AC190-250V | AC90-130V | AC22-28V |
| | Power consumption | 13.2W@running 0.5W@holding | 15W@running 0.5W@holding | 10.8W@running 0.5W@holding |
| | Peak current | 60mA@5ms | 135mA@5ms | 450mA@5ms |
| | Fuse | 1A | 1A | 2A |
| Functional data | Connecting cable | 7*0.2mm ² cable, voltage withstand AC300V (Length 800mm) | | |
| | Rated torque | 20Nm@rated voltage | | |
| | Angle of rotation | 90±2° | | |
| | Max angle of rotation | 360° | | |
| | Manual operation | ※ Matching hexagon wrench, using at no power | | |
| | Running time | About 15s (per 90°) | | |
| | Operating frequency | Not continuous operation operating cycle ≥1min | | |
| | Sound power level | Max50dB(A) | | |
| Working conditions | Position indicator | Mechanical | | |
| | Electricity safety level | I Type (ground protection) | I Type (ground protection) | II Type (safety low voltage) |
| | Inflaming retarding level | 1.6mmHB/ UL94 test method | | |
| | Enclosure | IP67 As Per EN60529/GB4208-2008 (all directions) F type can add bracket or dehumidifying heater | | |
| | Insulation resistance | 100MΩ/1500VDC | 100MΩ/1500VDC | 100MΩ/1500VDC |
| | Withstand voltage | 1500VAC@1Min | 1500VAC@1Min | 500VAC@1Min |
| | Medium temperature | ≤80°C can install to actuator directly ※ >80°C need to install heat radiation stand | | |
| | Working environment | ※ Indoor or outdoor; if exposed to the rain or sunshine, need to install protective device for the actuator | | |
| | Explosion-proof level | ⚠ Not explosion proof products, do not use them in flammable and explosive environment | | |
| | Ambient temp | -20°C — 60°C (ABS) -20°C — 80°C (Casting aluminum) | | |
| | Non-operation temp | ≤-40°C or ≥80°C | | |
| | Ambient humidity | 5-95%RH non-condensing | | |
| | Shock resistance | ≤300m/s ² | | |
| | Vibration | ※ 10 to 55 Hz, 1.5 mm double amplitude | | |
| | Installation notes | 360° any angle, need manual operation or allow for wiring space | | |
| Dimensions / weight | Maintenance | Free maintenance | | |
| | Certification | CE | | |
| | Dimensions (L×W×H) | See "Dimensions" | | |
| | Connection standard | ISO5211 F03, F04, F05 | | |
| | Output axis specification | Female octagonal or male square | | |
| | Hole deepness | ≤15mm (Female octagonal) / 6.5mm (Male square) | | |
| | Weight | ABS material 0.78kg, Casting aluminum 0.98kg | | |

*1 test condition: Rated load, test at under 25°C working temperature and 50% humidity/lead the result from 2 times switching cycle, which will be influenced by different load and working environment.

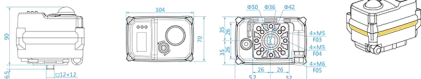
Dimension 【TCN-02X-ABS-Ⅱ / Die-casting Aluminum】

unit: mm

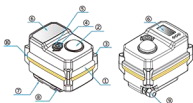
Direct mount [female octagonal output shaft]



With bracket [male square output shaft]

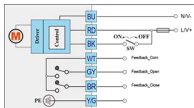


Main parts

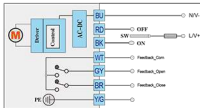


| Parts | Material | Parts | Material |
|----------------|-----------------------------------|------------------------------|---------------|
| 1 Actuator | Heatproof ABS or Casting aluminum | 6 Label | PVC |
| 2 Indicator | Transparent AS | 7 Wrench fixed | Heatproof_ABS |
| 3 Screw X 4 | 304 | 8 Hexagon wrench | Tool steel |
| 4 Manual shaft | 304 | 9 Waterproof cable connector | Nylon |
| 5 Oil seal | NBR | 10 Lid seal | NBR |

Wiring diagrams

BD3S

Control instructions:

- ☐ SW is connected with **RD** the actuator will rotate clockwise →. When the valve is closed, **WT** is connected with **BK** giving signal of closing.
- ☐ SW is connected with **WT** the actuator will rotate anticlockwise ←. When the valve is open, **WT** is connected with **GY** giving signal of opening.
- Notice 1: **WT** is not connected with **WT** and **WT** when the actuator is rotating.
- Notice 2: The feedback signal is a little earlier than the actual position, so please do not cut power immediately when you get the feedback signal.

B3S

Control instructions:

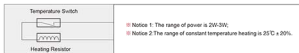
- ☐ SW is connected with **RD** the actuator will rotate clockwise →. When the valve is closed, **WT** is connected with **BK** giving signal of closing.
- ☐ SW is connected with **WT** the actuator will rotate anticlockwise ←. When the valve is open, **WT** is connected with **GY** giving signal of opening.
- Notice 1: **WT** is not connected with **WT** and **WT** when the actuator is rotating.
- Notice 2: The feedback signal is a little earlier than the actual position, so please do not cut power immediately when you get the feedback signal.

Wiring instructions:

1. Fuse please refer to manual for more parameters.
2. SW switching capability please refer to manual for more parameters.
3. Feedback signal contact load capacity: 0.1A/250VAC 0.5A/30VDC.
4. Please make sure actuator connect ground reliably.



Anti-condensation heater 【Accessory】



- Notice 1: The range of power is 2W-3W;
- Notice 2: The range of constant temperature heating is 25°C ± 20%.

Mounting instructions

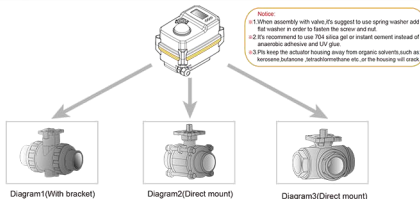


Diagram1 UPVC plastic ball valve+bracket assembly

Diagram2 3piece stainless steel ball valve assembly

Diagram3 3piece stainless steel 3way ball valve assembly

Installed valve technical requirements

- 1. When installing ball valve, the max torque $\leq 15\text{Nm}$. If the ball valve is out of operation for a long time, and the torque value of first on or off is the max torque. Or you can choose ball valve with elastic sealing.
- 2. When installing butterfly valve, the max torque $\leq 13\text{Nm}$. Because the torque value will increased by 10-20% after installing.
- 3. When installing direct mount model valve, the hole deep $\leq 15\text{mm}$. It requires cutting if the output shaft is longer than 17mm.
- 4. Pls pay attention to the following items if you install the bracket and coupling by yourself:
 - ※ The intensity of bracket should meet the using requirements: the bracket twisting extent $\leq 0.2\text{mm}$ in the process of on or off.
 - ※ The parallelism of bracket $\leq 0.5\text{mm}$.
 - ※ When processing the shaft hole at both end of the coupling, it is necessary to ensure the accuracy and concentricity. The purpose is to make sure the mechanical hysteresis $\leq 10^\circ$, otherwise it will cause the actuator unable to work.
- 5. Screw should be installed spring washer, flat washer, and we suggest you daub some glue cement around the screw in case of screw loosening.
- 6. After installation, user should switch the valve on and off one time with handle device first. Modifying the valve after make sure it works well.

Adjusting valve location instructions

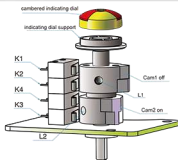


Diagram 1

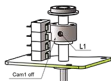


Diagram 3

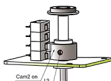


Diagram 4

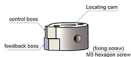


Diagram 2

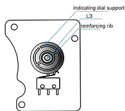


Diagram 5

Diagram 1 locating mechanism structural schematic diagram

Diagram 3 close adjustment schematic diagram

Diagram 5 Indicating dial adjustment schematic diagram

Diagram 2 locating cams structural schematic diagram

Diagram 4 open adjustment schematic diagram

Valve positon adjustment

※ Notice 1: The default is that rotating in clockwise direction means closing, and rotating in anticlockwise direction means opening.

※ Notice 2: B3P does not have K2, K4 micro switch.

Micro-adjustment of electrical limit:

□1 Adjusting full close:

△ Rotate the valve to full close position with handle.

※ Since the valve has gone through "factory default setting", this step can be omitted if the adjustment is slight.

△ Detach cambered indicating dial, loosen fixing screw L3 of indicating dial support, turn reinforcing rib as shown in diagram 5, perpendicular to the flow direction of valve, then screw up L3 and buckle up cambered indicating dial.

※ Caution: When screwing up L3, the torque is 0.5 Nm, otherwise it will damage locating driving gear.

△ Loosen fixing screw L1 of cam 1, drive cam 1 to rotate clockwise and trigger micro switches K2, K1 to move in turn and make sound. When K1 moves and makes sound, stop adjustment. Then screw up fixing screw L1.

□2 Adjusting full open:

△ Rotate the valve to full open position with handle;

△ Loosen fixing screw L2 of cam2, drive cam 2 to rotate anticlockwise and trigger micro switches K4, K3 to move in turn and make sound. When K3 moves and makes sound, stop adjustment. Then screw up fixing screw L2.

□3 Wiring:

After modifying, connect the circuit according to the wiring label on the box cover. After confirmation, you can do power test.

□4 Power test:

△ mainly check the consistence of on and off between the actuator and the valve body. At the same time, please check whether the valve is full close or not. Special testing device is recommended.

※ In the process of adjustment, do not over tighten screws, otherwise it will damage screw threads or other parts.

Common failures and processing methods

| | Fault phenomenon | Fault cause | Processing methods |
|----|---------------------------------|--|---|
| □1 | Actuator no action | △1 power not connected | Connect power |
| | | △2 voltage below level or incorrect | Check whether voltage is within the normal range |
| | | △3 overtemperature protection of motor | Check whether valve gets stuck or torque value is too big |
| | | △4 terminal loose or poor contact | Check and correctly connect terminal |
| | | △5 starting capacitance poor run | Contact the manufacturer to get repair |
| □2 | No feedback signal | △1 line barrier of user acquisition signal | Connect user acquisition signal |
| | | △2 microswitch damage | Change microswitch |
| □3 | Actuator not fully closed | △1 use feedback signal to control actuator | Receive feedback signal doesn't mean actuator is fully closed, so don't cut power off |
| | | △2 technical hysteresis increases due to abrasion between actuator and valve rod | 1 Roadjust valve-off position 2 Contact the manufacturer to get repair |
| □4 | Actuator interior water ingress | △1 OD of incoming line cable non-standard | Contact the manufacturer to get repair |
| | | △2 waterproof treatment of incoming line incomplete | |
| | | △3 actuator lens wearout | |
| | | △4 screws on connection overhead cover / slide cover loose | |

Working environment

- ☐ Indoor and outdoor are both optional.
- ☐ Not explosion proof products, ⚠ do not use them in flammable and explosive environment.
- ☐ You need to install protective device for the actuator if it is exposed to the rain or sunshine.
- ☐ Please pay attention to the ambient temp.
- ☐ When installing, you need to consider the reserved space for wiring and repairing.
- ☐ When power on, ⚠ it is not allowed to dismantle actuator and valve.
- ☐ When power on, ⚠ it is not allowed to do wiring.
- ☐ ⚡ Absolutely no falling down the ground, which will hit the device and lead to improper operation.
- ☐ ⚡ Absolutely no standing on the device, which will cause device malfunction or personal accident.
- ☐ ⚡ It is forbidden to do wiring project in rainy day or when there is water splash.

Safety notice

- ☐ In order to use the device safely for a long term, please pre-read the manual carefully to ensure correct use.
- ☐ Notice item: Please understand the product specification and using method clearly to prevent personal safety danger or device damage.
- ☐ In order to indicate damage and danger, here we classify them as "warning ⚠" and "notice ⚡".
- ☐ Both of contents are very important, which should be obeyed strictly.
- ☐ "Warning ⚠": It will cause death or serious injury if not obeyed.
- ☐ "Notice ⚡": It will cause slight injury or device damage if not obeyed.
- ☐ Subject to technical changes.