

## Product overview

- ◎ Rated voltage: AC230V 【AC95-265V】 ,AC/DC24V,DC24V
- ◎ Rated torque: 15Nm[18N.m@Max] (02DH-DC24V: 20Nm)[24N.m@Max]
- ◎ Running time: about 6s (02DH-DC24V: 1s)
- ◎ Install valves: 2-way,3-way ball valve and butterfly valve
- ◎ Timer mode: pulse mode , time mode
- ◎ Loop mode : loop by days , loop by weeks
- ◎ 02D-KT: With the power off,the actuator will automatically perform the OFF/ON valve control command
- ◎ Adopted high-performance brushless motor,Overload protection of internal motor
- ◎ It can be used 20,000 times.\*1
- ◎ Two or more actuators can be used in parallel



## Product features

- △ 1.3" OLED screen,no visual dead angle,highly bright,energy saving and eco-friendly,real time to show valve opening angle and external control command.Enter sleeping state automatically after about 5 minutes,while it could prompt location state and its control command at sleeping time.
- △ Original valve adjustment mode-free cover-opening and interactive:
  - step1:saving "anticlockwise full open position " by using the button to control valve;
  - step2:saving "clockwise full close position " by using the button to control valve;it makes valve adjustment easier.
 Thoroughly eliminate the complex and inconvenience caused by mechanical positioning.
- △ Adopt 16 High-performance microcontrollers,12 high-precision AD conversion,built-in unique algorithm,thoroughly eliminate valve on/off inaccuracy caused by mechanical hysteresis,espacially suitable for 3-way valve adjustment.
- △ Adopt non contact positioning,control unit modularize design and potting processing,greatly improve product service life;Interface uses standard connectors,convenient for installment,adjustment and replacement.
- △ Menu can report real time failure,including stuck or other reasons which lead actuator fail to realize valve on/off integrally,and output failure warning signal.
- △ Menu can realize valve control command exchange.
- △ Menu can switch freely between remote control and local setting,and adopt button to realize valve on/off locally.
- △ Menu can set valve close position deviation to on or off direction,thoroughly eliminate the complex and inconvenience bring by "Normal On/Off mechanical positioning" to local valve adjustment.
- △ Menu can real-time adjust valve running speed of the actuator.
- △ Menu can restore factory default setting.

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

## Technical data

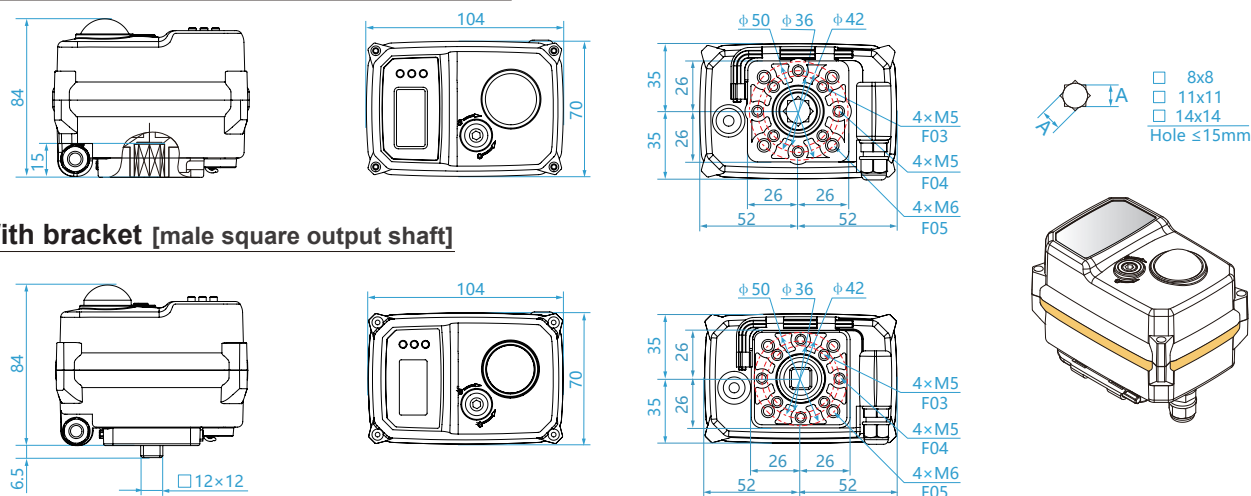
|                     |                           |                                                                                                           |                                        |                                       |  |
|---------------------|---------------------------|-----------------------------------------------------------------------------------------------------------|----------------------------------------|---------------------------------------|--|
| Electrical data     | Rated voltage             | AC230V(50/60HZ)                                                                                           | AC/DC24V                               | DC24V                                 |  |
|                     | Rated voltage range       | AC95–265V/DC100–300V                                                                                      | AC18–26V/DC22–28V                      | DC22–28V                              |  |
|                     | Power consumption         | 25W @ max10W @ running 1.2W @ holding                                                                     | 25W @ max9.6W @ running 0.6W @ holding | 85W @ max12W @ running 0.6W @ holding |  |
|                     | Peak current              | 0.11A @ 5ms @ AC230V                                                                                      | 1.0A @ 5ms @ DC24V                     | 3.5A @ 5ms @ DC24V                    |  |
|                     |                           |                                                                                                           |                                        |                                       |  |
|                     | Fuse                      | 1A                                                                                                        | 2A                                     | 8A                                    |  |
|                     | Connecting cable          | 7*0.2mm² cable, voltage withstand AC300V(Length 800mm)                                                    |                                        |                                       |  |
| Functional data     | Rated torque              | 15Nm@rated voltage    20Nm@DC24V                                                                          |                                        |                                       |  |
|                     | Angle of rotation         | 90±2°                                                                                                     |                                        |                                       |  |
|                     | Max angle of rotation     | 330±5°                                                                                                    |                                        |                                       |  |
|                     | Manual operation          | ※ Matching hexagon wrench, using at no power                                                              |                                        |                                       |  |
|                     | Running time              | About 6s (per 90°)    1s@DC24V                                                                            |                                        |                                       |  |
|                     | Operating mode            | S3-85%    loading ≤85% rated torque refer to IEC60034-1-2017*2                                            |                                        |                                       |  |
|                     | Sound power level         | 65dB(A)                                                                                                   |                                        |                                       |  |
|                     | Position indicator        | Mechanical and    screen                                                                                  |                                        |                                       |  |
|                     | Working conditions        | Electricity safety level                                                                                  | I Type (ground protection )            | III Type (ground protection )         |  |
|                     |                           | Inflaming retarding level                                                                                 | V0 UL94 test method                    |                                       |  |
|                     | Enclosure                 | IP67 As Per En60529/GB4208-2008 (all directions)                                                          |                                        |                                       |  |
|                     |                           | F type can add dehumidifying heater                                                                       |                                        |                                       |  |
|                     | Insulation resistance     | 100MΩ /1500VDC                                                                                            |                                        | 100MΩ /500VDC                         |  |
|                     | Withstand voltage         | 1500VAC @1Min                                                                                             |                                        | 500VAC @1Min                          |  |
|                     | Medium temperature        | ≤80°can install with actuator directly                                                                    |                                        |                                       |  |
|                     |                           | ※ >80° need to install bracket or 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 in flammable and explosive environment.                        |                                        |                                       |  |
|                     | Ambient temp              | -15℃ ~+45℃ （ABS） ; -15℃ ~+60℃ (Aluminum)                                                                  |                                        |                                       |  |
|                     | Non-operation temp        | ≤-40℃ or ≥80℃                                                                                             |                                        |                                       |  |
|                     | Humidity                  | 5-95%RH non-condensing                                                                                    |                                        |                                       |  |
|                     | Vibration Shock           | ≤5g                                                                                                       |                                        |                                       |  |
|                     | Vibration amplitude       | ※ 10 to 55 Hz, 1.5 mm double amplitude                                                                    |                                        |                                       |  |
|                     | Installation notes        | 360°any angle, The need for manual operation or the wiring space                                          |                                        |                                       |  |
|                     | Maintenance               | Free maintenance                                                                                          |                                        |                                       |  |
|                     | Certification             | CE                                                                                                        |                                        |                                       |  |
| Dimensions / weight | Dimensions (LXWXH)        | See “Dimensions”                                                                                          |                                        |                                       |  |
|                     | Connection standard       | ISO5211 F03、F04、F05                                                                                       |                                        |                                       |  |
|                     | Output axis specification | Female octagonal / male square                                                                            |                                        |                                       |  |
|                     | Hole deepness             | ≤15mm(Female octagonal)/6.5mm(Male square)                                                                |                                        |                                       |  |
|                     | Weight                    | ABS material 0.62kg,Casting aluminum 0.82kg                                                               |                                        |                                       |  |

\*2 Operating mode: The testing environment temperature is 25℃ inside the factory. The testing standard as per IEC 60034-1-2017. The operation mode will be S3-90% if the loading less than 60% rated torque..

**Dimension** 【TCN-01X/02X-ABS- I (Cable from buttom)】

unit: mm

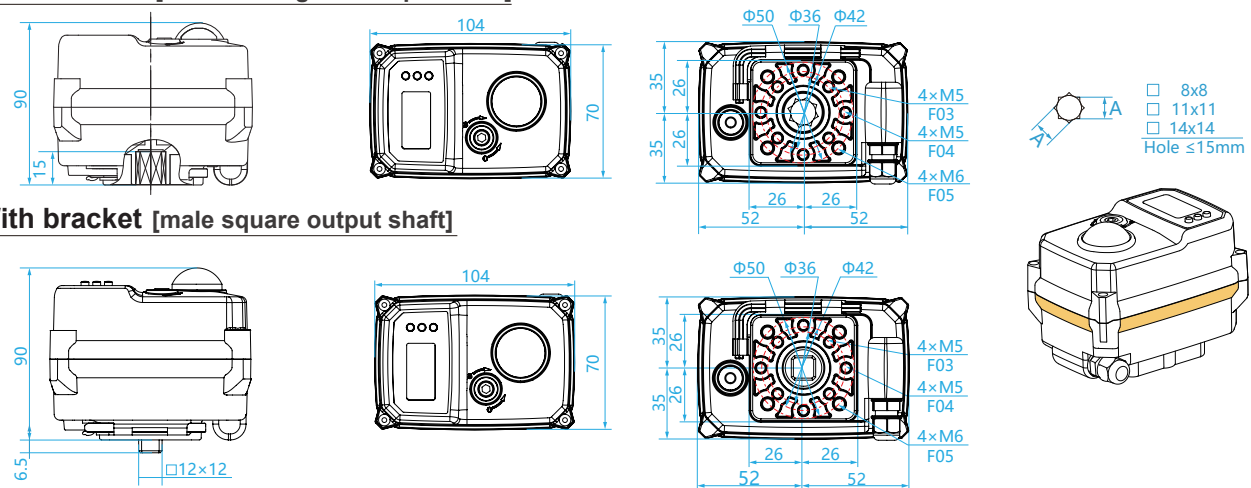
**Direct mount [female octagonal output shaft]**



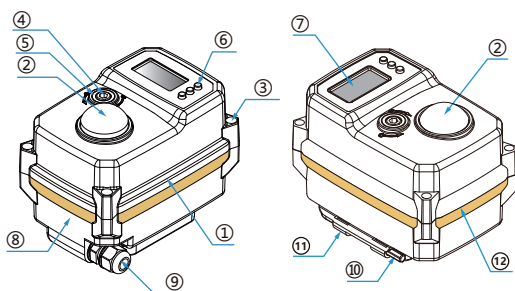
**Dimension** 【TCN-01X/02X- ABS-Ⅱ -Die-casting Aluminium】

unit: mm

**Direct mount [female octagonal output shaft]**



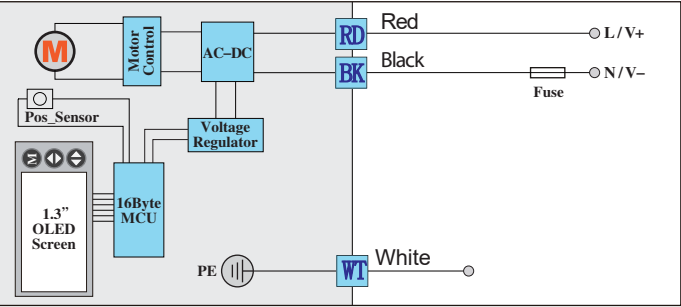
## Main parts



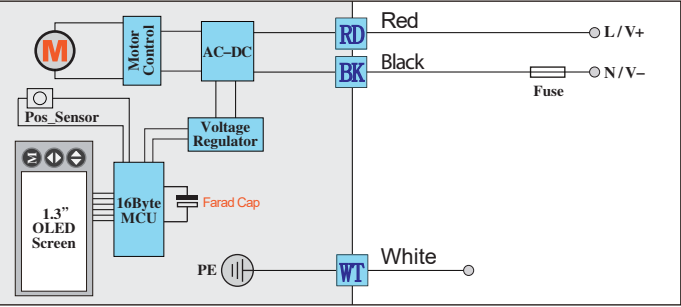
|   | Parts        | Material                             |    | Parts                      | Material      |
|---|--------------|--------------------------------------|----|----------------------------|---------------|
| 1 | Actuator     | Heatproof ABS<br>or Casting aluminum | 7  | 1.3" LCD Screen            | OLED          |
| 2 | Indicator    | Transparent AS                       | 8  | Label                      | PVC           |
| 3 | Screw X 4    | 304                                  | 9  | Wrench fixed               | Heatproof_ABS |
| 4 | Manual shaft | 304                                  | 10 | Hexagon wrench             | Tool steel    |
| 5 | Oil seal     | NBR                                  | 11 | Waterproof cable connector | NiLon         |
| 6 | KEY          | Rubber                               | 12 | Lid seal                   | NBR           |

Wiring Diagrams

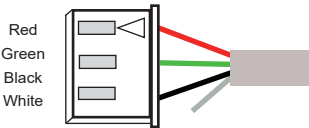
TCN-02D



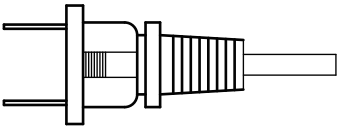
TCN-02D-KT



Notice: With the power off,the actuator will automatically perform the OFF/ON valve control command )



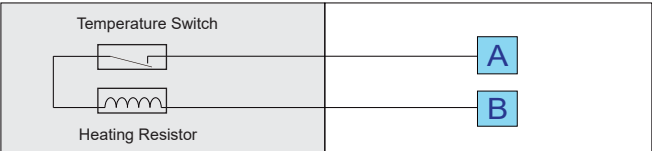
( TCN-01/02 series 4-core wiring diagram )



( TCN-01/02 series ANSI plug diagram )

※ Notice: AC110/230V products could use ANSI plug.

Anti-condensation heater 【Accessory】



※ Notice 1: The range of power is 2W-3W;

※ Notice 2:The range of constant temperature heating is 25℃ ± 20%.

Mounting instructions

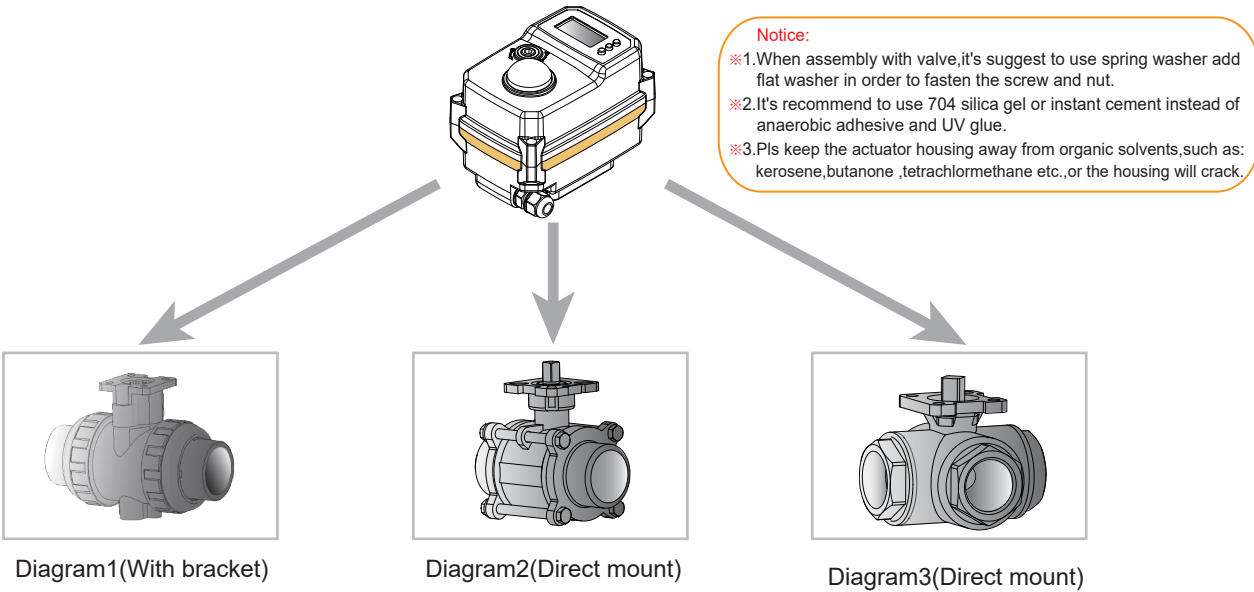


Diagram1 UPVC plastic ball valve+bracket assembly  
Diagram2 3piece stainless steel ball valve assembly  
Diagram3 3piece stainless steel 3way ball valve assembly

Installed valve technical requirements

| Valve type             | Recommend install condition                           |
|------------------------|-------------------------------------------------------|
| wafer butterfly valve  | actuator rate torque $\geq$ 2times valve max torque   |
| flange butterfly valve | actuator rate torque $\geq$ 1.7times valve max torque |
| metal ball valve       | actuator rate torque $\geq$ 1.7times valve max torque |
| plastic ball valve     | actuator rate torque $\geq$ 1.5times valve max torque |

- 1. 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.
- 2. When installing direct mount model valve, the hole deep  $\leq$  15mm. It requires cutting if the output shaft is longer than 17mm.
- 3. 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  $\leq$  0.2mm in the process of on or off.
  - ※ The parallelism of bracket  $\leq$  0.5mm.
  - ※ 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°, otherwise it will cause the actuator unable to work.
- 4. Screw should be installed spring washer、flat washer, and we suggest you daub some glue cement around the screw in case of screw loosening.
- 5. 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.

## 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 overload protection of motor after 3s                                      | 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 actuator is cut off the power                                              | Connect power and signal will be normal                                                                  |
| □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 return difference increases due to abrasion between actuator and valve rod | 1 Adjust valve-off position to realize deviation by the menu<br>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 cover/head 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.