

Product overview

- Rated voltage: AC/DC95-265V , AC/DC24V
- Rated torque: 20Nm
- Control feedback model: RS485(Modbus).
- Install valves: 2-way, 3-way ball valve and butterfly valve.
- ※ **Note: Please reserve torque safety factor when selecting**
- High performance brushless motor, Overload protection of internal motor.
- It can be used 20,000 times. *1
- 2 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.
- △ 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.Thoroughly eliminate the complex and inconvenience caused by mechanical positioning, then complete modifying the valve easily.
- △ Adopt 32 digit high performances CPU, 12 digit high-precision AD converting, built-in unique algorithm, thoroughly eliminate mechanical hysteresis, greatly reduce valve position control error.
- △ Motor frequency speed control can realize accurate positioning.
- △ Adopt non contact positioning, control unit module design and potting processing, guarantee components reliability and greatly improve product service life; Interface uses standard connectors, convenient for installment, adjustment and replacement.
- △ Menu can realize valve control command exchange.
- △ Menu can switch freely between remote control and local setting, by pressing button to realize valve on/off locally.
- △ Menu can set valve close position deviation to on or off direction, enormously reduce the complex and inconvenience of local valve adjustment.
- △ Menu button 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	AC/DC95-265V	AC/DC24V
	Rated voltage range	AC95-265V/DC100-300V	AC20-26V/DC22-30V
	Power consumption	15W@max 10W@running 2W@holding	15W@max 9.6w@running 2W@holding
	Peak current	0.08A@5ms@AC230V	0.75A@5ms@DC24V
	Fuse	1A	2A
	Connecting cable	7*0.3mm ² cable, voltage withstand AC300V(Length 800mm)	
Functional data	Rated torque	20Nm@rated voltage	
	Angle of rotation	90±2°	
	Max angle of rotation	330±5°	
	Manual operation	※ Matching hexagon wrench, using at no power	
	Running time	About 10s (per 90°)	
	Operating mode	S3-75%(AC), S3-85%(DC)(loading ≤85% rated torque refer to IEC60034-1)*1	
	Sound power level	65dB(A)	
Working conditions	Position indicator	Mechanical and screen	
	Electricity safety level	I Type (ground protection)	III Type (safety low voltage)
	Inflaming retarding level	HB/ UL94 test method	
	Enclosure	IP67 As Per En60529/GB4208-2008 (all directions)	
		F type can add dehumidifying heater	
	Insulation resistance	100MΩ/500VDC	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*2	-15℃~+45℃ (ABS) ; -15℃~+60℃ (Aluminum)	
	Non-operation temp	≤-40℃ or ≥80℃	
	Ambient humidity	5-95%RH non-condensing	
	Vibration Shock	≤2g	
	Vibration amplitude	※ 10 to 55 Hz, 1.5 mm double amplitude	
Dimensions / weight	Installation notes	360°any angle, need manual operation	
		or allow for wiring space	
	Maintenance	Free maintenance	
	Certification	CE	
	Dimensions (LXWXH)	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 0.62kg,Casting aluminum 0.82kg	

*1 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..

*2.(1) It is customized item when used and stored under special ambient temperature of -20℃~+40℃, and special instructions are required.

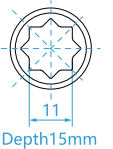
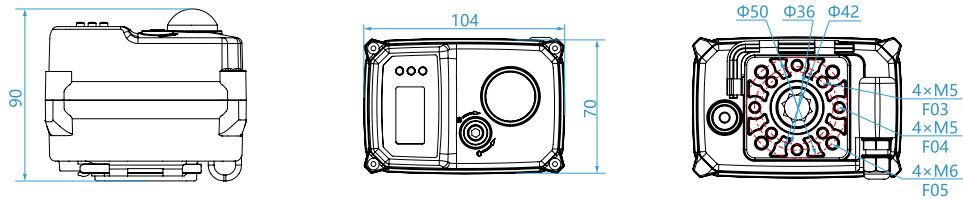
(2) At the ambient temperature of -40℃, power on is required for more than 15 minutes (30 minutes is recommended) before use. The higher the ambient temperature is, the shorter the power on time can be.

(3) If user use the product at the ambient temperature of -40℃ for long time, it needs to be insulated. For example, add heating cable around the actuator. If the ambient temperature is over -20℃, then the heating cable can be canceled.

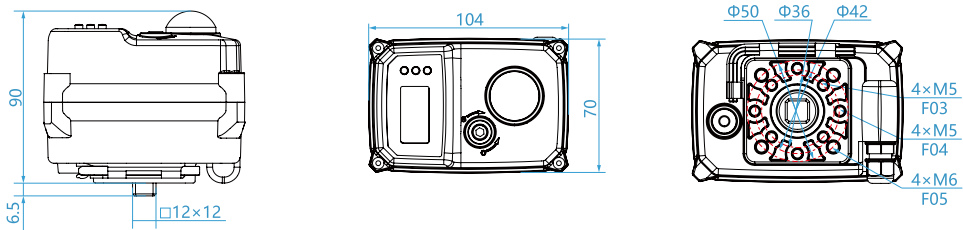
Dimension 【TCN-02X- ABS-II / Die-casting Aluminum】

unit: mm

Direct mount [female octagonal output shaft]

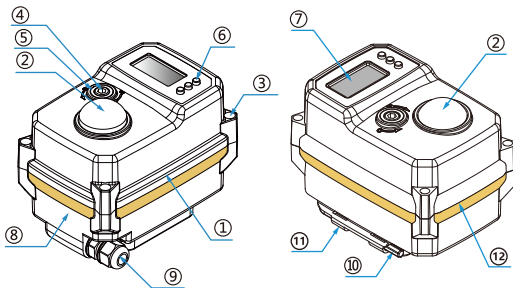


With bracket [male square output shaft]



□ 8x8
□ 11x11
□ 14x14
Depth ≤15mm

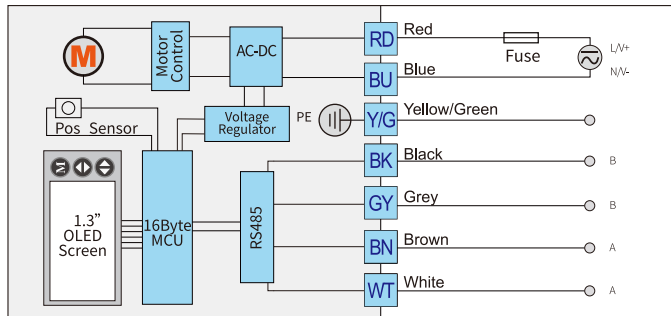
Main parts



Parts	Material	Parts	Material
1 Actuator	Heatproof ABS or Casting aluminum	7 1.3 inch LCD Screen	OLED
2 Indicator	PC	8 Label	PVC
3 Screw X 4	304	9 Wrench fixed	Heatproof_ABS
4 Manual shaft	304	10 Hexagon wrench	CR-V
5 Oil seal	NBR	11 Waterproof cable connector	NiLon
6 KEY	Rubber	12 Lid seal	Silica gel

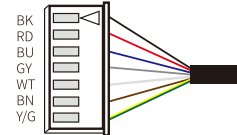
Wiring Diagrams

RS485



Test terminal for the cable end_wiring instruction

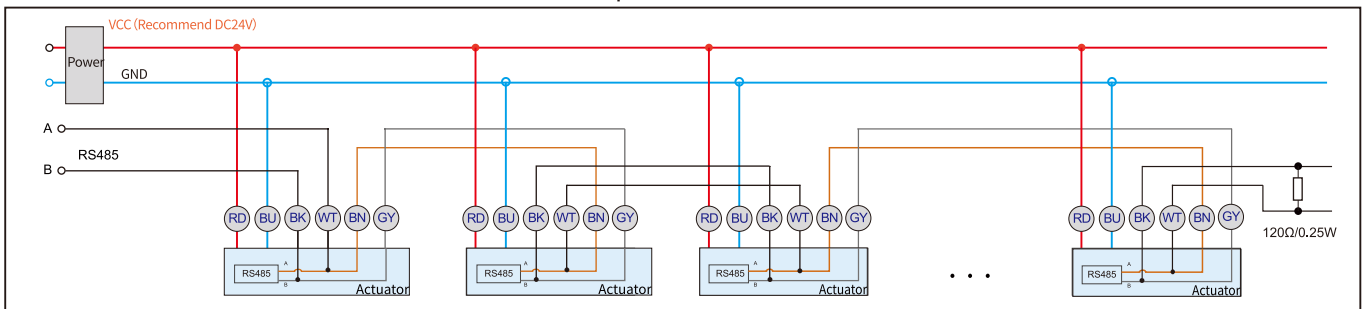
- 1.Fuse:please refer to manual for more parameters.
- 2.SW switching capability:please refer to manual for more parameters.
- 3.Feedback signal contact load capacity:0.1A/250VAC 0.5A/30VDC.
- 4.Please make sure actuator connect ground reliably
5. Some products adopt wiring box ,user could wiring according to the order of number.



(User could cut out the cable terminal as it is only used for factory test.)

Cable terminal for test(7pin)

Recommended circuit of several actuators communicate in parallel



Mounting instructions

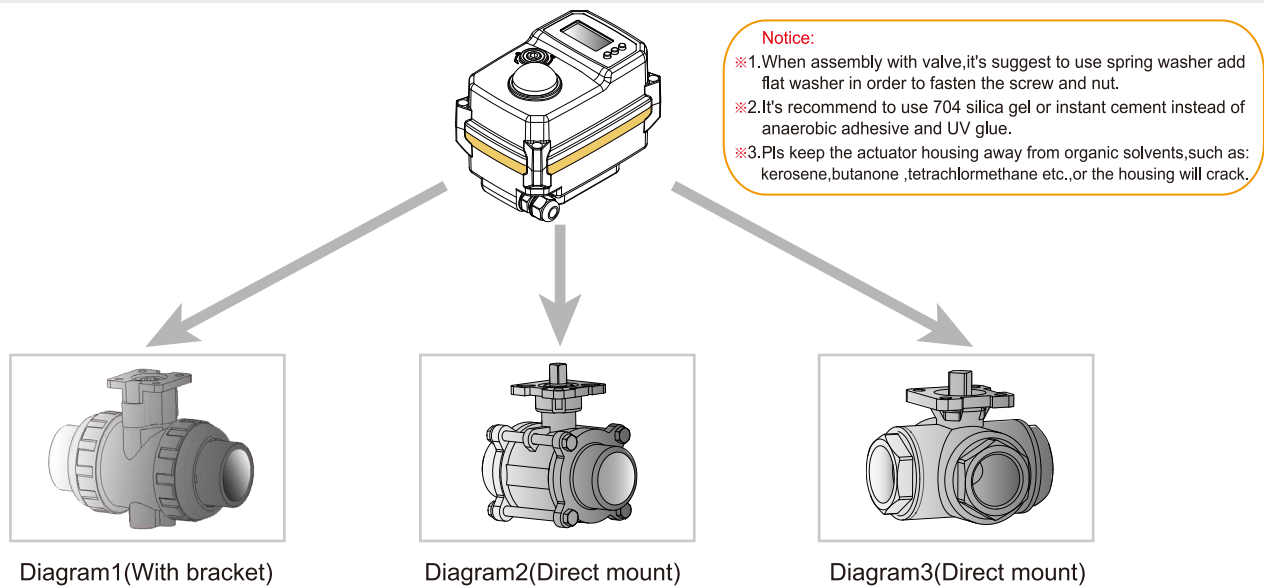


Diagram1 UPVC plastic ball valve+bracket assembly
Diagram2 3piece stainless steel ball valve assembly
Diagram3 3piece stainless steel 3way ball valve assembly

Installed valve technical requirements

Valve type	Recommend install condition
wafer butterfly valve	actuator rate torque ≥ 2times valve max torque
flange butterfly valve	actuator rate torque ≥ 1.7times valve max torque
metal ball valve	actuator rate torque ≥ 1.7times valve max torque
plastic ball valve	actuator rate torque ≥ 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 ≤ 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 ≤ 0.2mm in the process of on or off.
 - ※ The parallelism of bracket ≤ 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 ≤ 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 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	

Special Version

- Valve is suggested to use DC24V central power supply for valve, every valve power is consider to be 15W, for example if there are 10 valves to be supported, the switch power should be 150W at least. DC voltage range is DC22V-30V, if hop-up DC30V, valve will be damage. For the practical power of the electrical valve, user could refer to the data shown on the nameplate.
- When AC supply, transformer power should also take 15W into consideration, if 10 valves to be supported, the switch power should be 150W at least. AC voltage range is AC20-AC26V, if hop-up AC26V, valve will be damage. In addition, AC220V voltage fluctuant range is AC180-AC265V, so we design transformers on the basis of input voltage AC265V and floating voltage less than AC265V. We recommend 24VDC NOT 220VAC for the BUS series.
- 485bus the max numbers of terminal connects are less than 32, please illustrate in particular when order if more are needed.
- 485bus communication rate range is 1200-19200, factory default is 9600, it can be designated when ordered.
- 485bus adopts hand connect schema instead of star schema, or length of every terminal will less than 5m.
- 485communication line should be shielded line more than 0.2mm², it will reduce the transfer distance to terminals if line is thin excessively.
- **485communication line is more than 5m, you should parallel a 120ohm /0.25 resistance at the end part**
- If it is necessary to increase the communication distance, it is recommended to add a 485 relay or hub.

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.