

Product overview

- ⊙ Rated voltage: AC/DC95-265V,AC/DC24V
- ⊙ Rated torque: **20Nm@KT**
- ⊙ Running time: **about 10s**
- ⊙ Charging time: **120s(at least 100s)**
- ⊙ Install valves: 2way,3way ball valve and butterfly valve
 - ※ **Note: Please reserve torque safety factor when selecting**
- ⊙ Wiring and feedback model: B3J, BD3J, BD3JA, B3JA, B43JA, B33JA, B44
- ⊙ Alarm output: A(Relay contact feedback)
- ⊙ Direction of rotation and angle of rotation: 2-way double acting 90°
3-way 2 positions 180°, 3-way 3 positions 2-way 4 positions
- ⊙ 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 paralle
- ※ Attention: Don't use in paralle with Normal on/off actuator under control of the same contactor.



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 32 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°C 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	36W@max;10W@running 1.6W@holding	36W@max;9.6W@running ;1.6W@holding
	Peak current	0.16A@5ms@AC230V	1.5A@5ms@DC24V
	Fuse	1A	4A
	Connecting cable	9*0.2mm ² cable, voltage withstand AC300V(Length 800mm) 7*0.3mm ² cable, voltage withstand AC300V(Length 800mm)	
Functional data	Rated torque	20Nm@KT	
	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)	
	Position indicator	Mechanical and screen	
Working conditions	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°C~+45°C (ABS) ; -15°C~+60°C(Aluminum)	
	Non-operation temp	≤-40°C or ≥80°C	
	Ambient humidity	5-95%RH non-condensing	
	Vibration Shock	≤2g	
	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	

*1 Operating mode: The testing environment temperature is 25 °C 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°C~40°C, and special instructions are required.

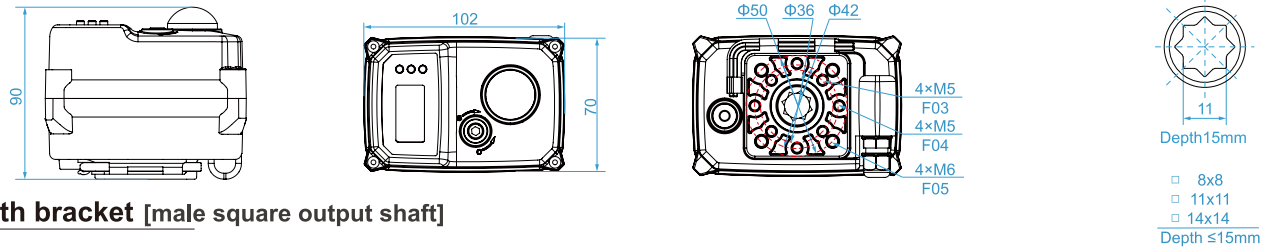
(2) At the ambient temperature of -40 °C, power on is required for more than 15 minutes (30 minutes is recommended) before use. The higher the ambient temperature is, the shorter the power on time can be.

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

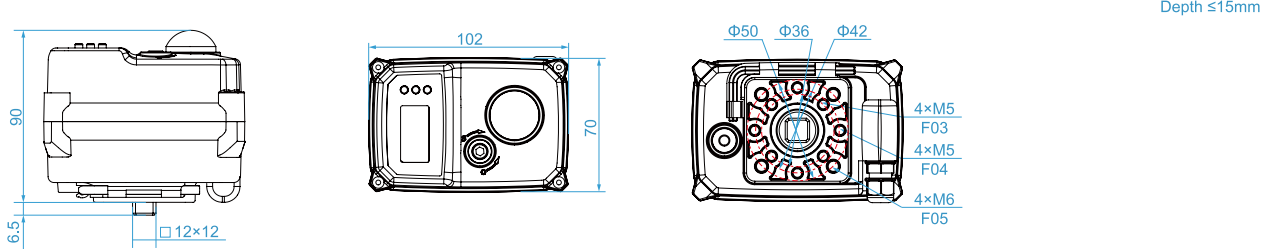
Dimension [TCN-02X- ABS- II -Die-casting Aluminium]

unit:mm

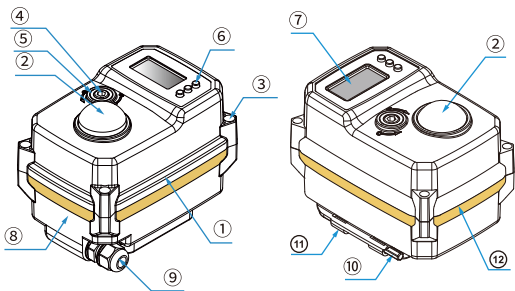
Direct mount [female octagonal output shaft]



With bracket [male square output shaft]



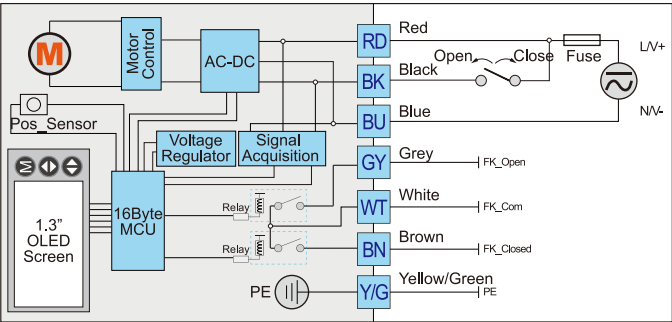
Main parts



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

Intelligent on/off model-wiring diagram

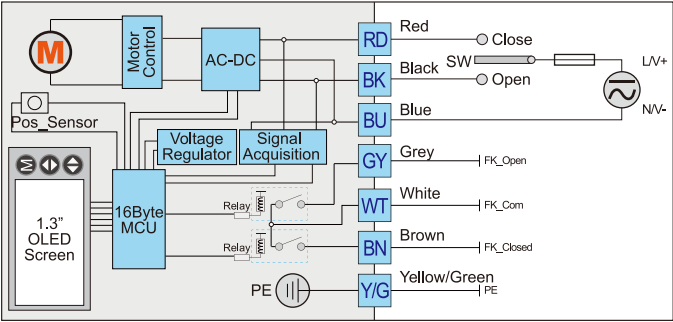
BD3J



Control instructions:[7-core]

- If SW is disconnected,the actuator will drive valve close clockwise ↻.When the valve is closed completely, [WT] is connected with [BN],send signal of full close.
- If SW is connected,the actuator will drive valve open anticlockwise ↻.When the valve is open completely, [WT] is connected with [GY],send signal of full open.
- ※ Note 1: [WT] is not connected with [GY] [BN],when the actuator is operating.
- ※ Note 2:After power cut,the feedback and fault signal will disappear, [WT] is not connected with [GY] and [BN].

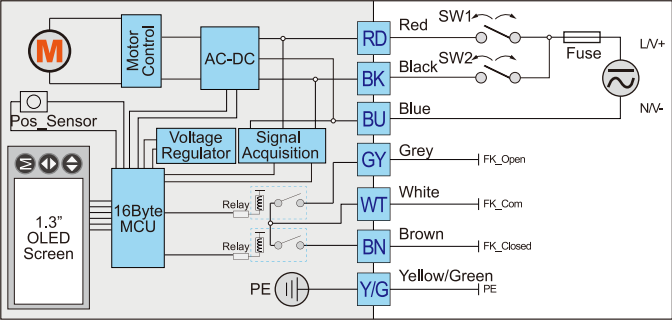
B3J



Control instructions:[7-core]

- SW is connected with [RD],the actuator will rotate clockwise ↻. When the valve is closed, [WT] is connect with [BN],send signal of full close.
- SW is connected with [BK],the actuator will rotate anticlockwise ↻. When the valve is open, [WT] is connect with [GY],send signal of full open.
- ※ Note 1: [WT] is not connected with [GY] and [BN],when the actuator is operating.
- ※ Note 2:After power cut,the feedback and fault signal will disappear, [WT] is not connected with [GY] and [BN].

B33J



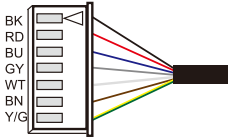
Control instructions:[7-core]

SW1	SW2	Flow direction	Feedback signal
connect ↻	disconnect ↻	0°	[WT] connect with [BN]
disconnect ↻	connect ↻	90°	[WT] connect with [GY]
connect ↻	connect ↻	user-defined	[WT] connect with [GY] [BN]

- ※ Note 1: [WT] is not connected with [GY] and [BN],when the actuator is operating.
- ※ Note 2:After power cut,the feedback and fault signal will disappear, [WT] is not connected with [GY] and [BN].
- ※ Note 3:User-defined position can be set by menu.

Test terminal for the cable end_wiring instruction

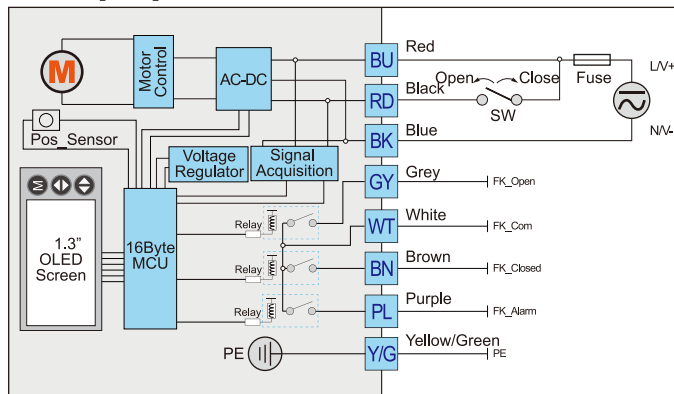
- 1.Fuse:please refer to manual for more parameters.
- 2.SW switching capability:please refer to manual for more parameters.
- 3.Feedback signal contact load capacity:0.1A/250VAC 0.5A/30VDC.
- 4.Please make sure actuator connect ground reliably
5. Some products adopt wiring box ,user could wiring according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

BD3JA【Alarm】



- ☐ If SW is disconnected, the actuator will drive valve close clockwise . When the valve is closed completely, **WT** is connected with **BN**, send signal of full close.
- ☐ If SW is connected, the actuator will drive valve open anticlockwise . When the valve is open completely, **WT** is connected with **GY**, send signal of full open.

※ Note 1: **WT** is not connected with **BN**/**GY** when the actuator is operating.

※ Note 2: When actuator is stuck or switch fails to arrive by other faults, **WT** connect with **PL**, send alarm signal.

※ Note 3: After power cut, the feedback and fault signal will disappear, **WT** is not connected with **GY**/**BN**/**PL**.

[illegible]

- ※ Note 1: **[WT]** is not connected with **[GY BN PL]**, when the actuator is running.
- ※ Note 2: When actuator was stuck or it has other faults, which lead valve unable to full-open or full-close, then **[WT]** connect with **[PL]**, send warning signal.
- ※ Note 3: After power cut, the feedback and fault signal will disappear, **[WT]** is not connected with **[GY BN PL]**.
- ※ Note 4: User-defined position can be set by menu.

SW1	SW2	Flow direction
connect ↗	disconnect ↖	0°
disconnect ↖	connect ↗	90°
connect ↗	connect ↗	user-defined
disconnect ↖	disconnect ↖	user-defined

- ☐ If SW is disconnected, the actuator will drive valve close clockwise . When the valve is closed completely, **[Wt]** is connected with **[BN]**, send signal of full close.
- ☐ If SW is connected, the actuator will drive valve open anticlockwise . When the valve is open completely, **[Wt]** is connected with **[GY]**, send signal of full open.

※ Note 1: **[Wt]** is not connected with **[GY]** **[BN]**, when the actuator is operating.

※ Note 2: When actuator is stuck or switch fails to arrive by other faults, **[Wt]** connect with **[PL]**, send alarm signal.

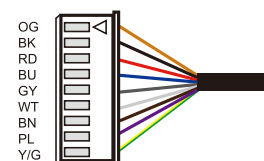
※ Note 3: After power cut, the feedback and fault signal will disappear, **[Wt]** is not connected with **[GY]** **[BN]** **[PL]**.

SW1	SW2	Flow direction	Feedback signal
connect ↶	disconnect ↷	0°	WT connect with BN
disconnect ↷	connect ↶	90°	WT connect with GY
connect ↶	connect ↶	user-defined	WT connect with GY BN

SW1	SW2	Flow direction	Feedback signal
connect ↶	disconnect ↷	0°	WT connect with BN
disconnect ↷	connect ↶	90°	WT connect with GY
connect ↶	connect ↶	user-defined	WT connect with GY BN

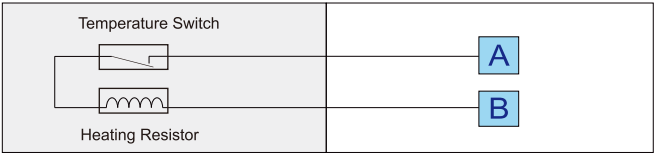
- ※ Note 1: **WT** is not connected with **BN** and **GY**, when the actuator is operating.
- ※ Note 2: After power cut, the feedback and fault signal will disappear, **WT** is not connected with **BN** and **GY**.
- ※ Note 3: When actuator was stuck or it has other faults, which lead valve unable to full-open or full-close, then **WT** connect with **PL**, send warning signal.
- ※ Note 4: User-defined positions can be set by menu.

- 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)

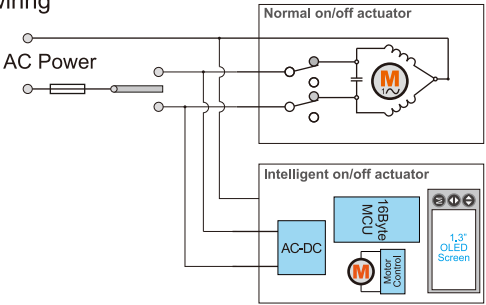
Cable terminal for test (9 pin)



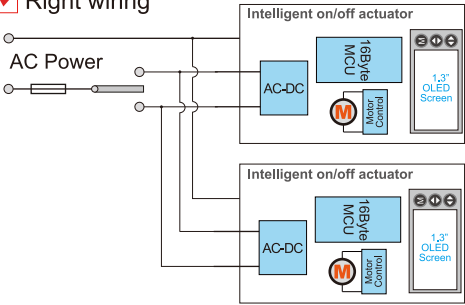
- ※ Notice 1: The range of power is 2W-3W;
- ※ Notice 2:The range of constant temperature heating is 25°C±20%.

Wire notice

✗ Error wiring



✓ Right wiring



※Note:Don't use in parallel with Normal on/off actuator under control of the same contactor.

Mounting instructions

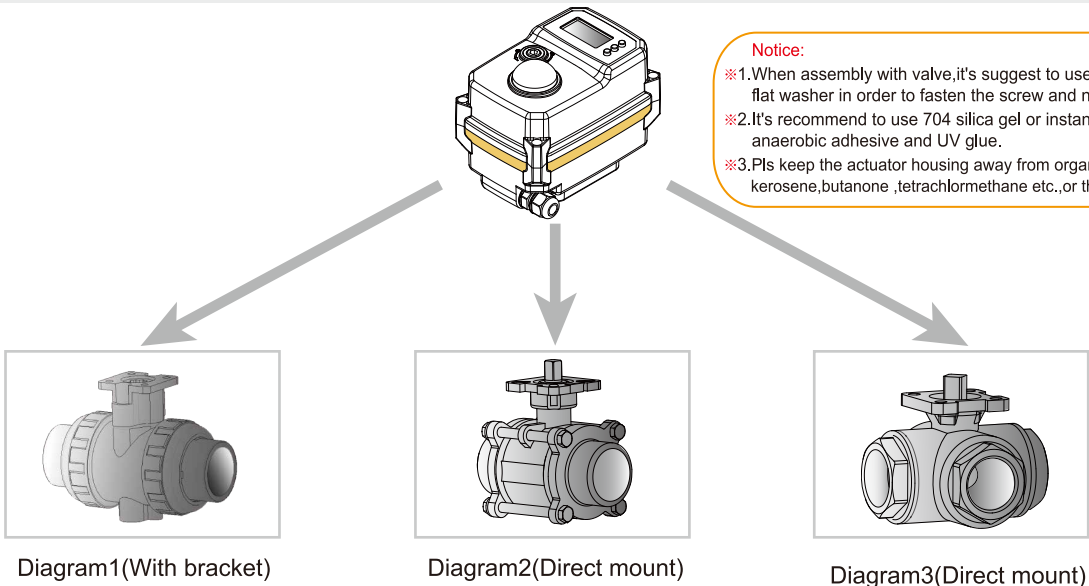


Diagram1 UPVC plastic ball valve+bracket assembly;Diagram2 3piece stainless steel ball valve assembly
Diagram3 3piece stainless steel 3way ball valve assembly

Notice:

- ※1.When assembly with valve,it's suggest to use spring washer add flat washer in order to fasten the screw and nut.
- ※2.It's recommend to use 704 silica gel or instant cement instead of anaerobic adhesive and UV glue.
- ※3.Pls keep the actuator housing away from organic solvents,such as: kerosene,butanone ,tetrachlormethane etc.,or the housing will crack.

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 15mm.
- 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	

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.