Product overview

◎ Rated voltage: AC/DC95-265V , AC/DC24V
◎ Rated torque: 50Nm
◎ Install valves: 2way,3way ball valve and butterfly valve
※ Note: Please reserve torque safety factor when selecting
◎ Wiring and feedback model: BD3S,B3S,B3C,BD3C,B3R,B3P
◎ High performance brushless motor,Overload protection of internal motor
◎ It can be used 20,000 times.*1
◎ Two and more actutors can be used in parallel

Technical Data

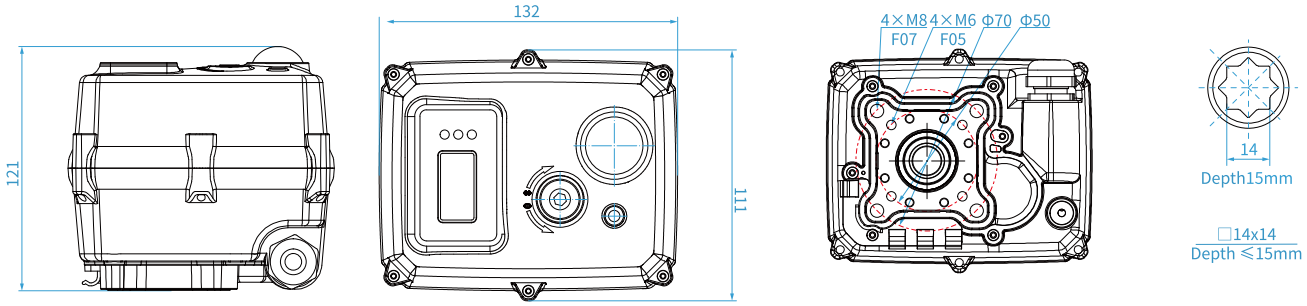
Electrical data	Rated voltage	AC/DC95-265V	AC/DC24V
	Rated voltage range	AC95-265V/DC100-300V	AC20-26V/DC22-30V
	Power consumption	25W@max; 9.6W@running; 2.5W@holding	25W@max; 9.6W@running; 2.5W@holding
	Peak current	0.11A@5ms @AC230V	1.0A@5ms @DC24V
	Fuse	1A	2A
Functional data	Rated torque	50Nm	
	Connecting cable	7*0.5mm² cable, voltage withstand AC300V (Length 800mm)	
	Angle of rotation	90±2°	
	Max angle of rotation	360°	
	Manual operation	※Matching hexagon wrench, using at no power	
	Running time	about 12s	
	Operating mode	S3-75%(AC),S3-85%(DC)(loading ≤85% rated torque refer to IEC60034-1)*2	
	Sound power level	65dB(A)	
	Position indicator	Mechanical	
Working conditions	Electricity safety level	I Type(ground protection)	III(safety low voltage)
	Inflaming retarding level	HB/ UL94 test method	
	Enclosure	IP67 As Per En60529/GB4208-2008 (all directions)	
		F type can add bracket or dehumidifying heater	
	Insulation resistance	100MΩ/500VDC	100MΩ/500VDC
	Withstand voltage	1500VAC@1Min	500VAC@1Min
	Medium temperature	≤80°can install to actuator directly	
		※＞80° 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*3	-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, need manual operation	
		or allow for wiring space	
	Maintenance	Free maintenance	
	Certification	CE	
Dimensions / weight	Dimensions (LXWXH)	See “Dimensions”	
	Connection standard	ISO5211 F05,F07	
	Output axis specification	Female octagonal	

*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.
*2 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.
*3.(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.

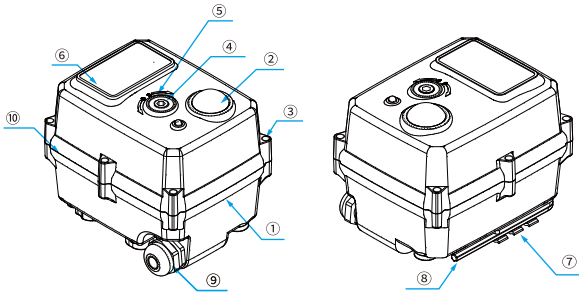
Hole deepness	15mm(Female octagonal)
Weight	ABS material 1.8kg / Casting aluminum 2.2kg

Dimension 【TCN-05X- ABS / Die-casting Alumimum】

unit:mm



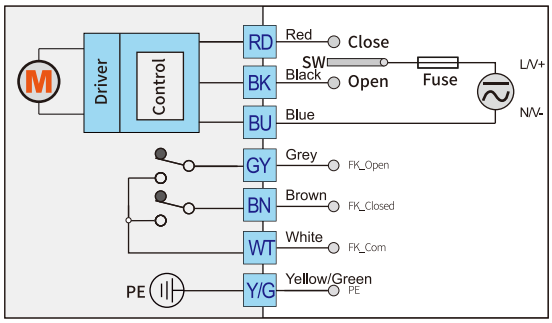
Main parts



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

Wiring diagrams

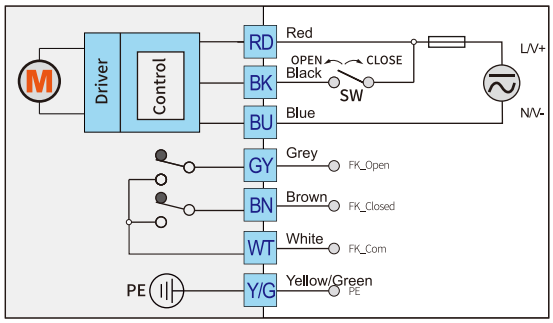
B3S



Control instructions:

- ☐ SW is connected with RD ,the actuator will rotate clockwise . When the valve is closed, WT is connect with BN ,giving signal of closing.
- ☐ SW is connected with BK ,the actuator will rotate anticlockwise . When the valve is open, WT is connect with GY ,giving signal of opening.
- ※ Notice 1: WT is non-connected with GY and BN , 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.

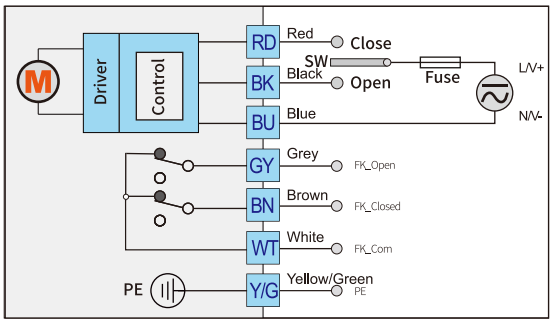
BD3S/KT32S



Control instructions:

- ☐ If SW is disconnected;the actuator will drive valve close clockwise .When the valve is closed completely, WT is connected with BN ,giving signal of closing.
- ☐ If SW is connected,the actuator will drive valve open anticlockwise .When the valve is open completely, WT is connected with GY ,giving ignal of opening .
- ※ Notice 1: WT is non-connected with GY BN,when the actuator is running.
- ※ 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.

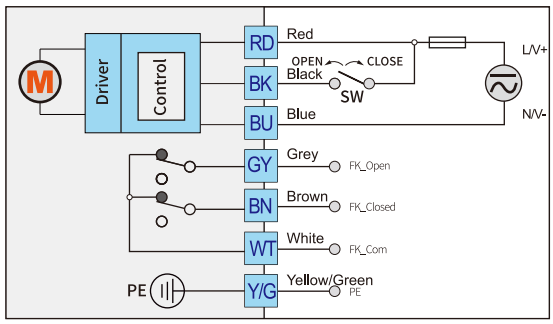
B3C



Control instructions:

- ☐ SW is connected with RD ,the actuator will rotate clockwise . When the valve is closed, WT is non-connect with BN ,giving signal of closing.
- ☐ SW is connected with BK ,the actuator will rotate anticlockwise . When the valve is open, WT is non-connect with GY ,giving signal of opening.
- ※ Notice 1: WT is connected with GY and BN , 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.

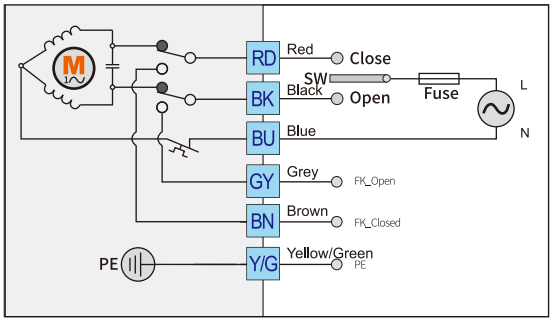
BD3C



Control instructions:

- ☐ If SW is disconnected;the actuator will drive valve close clockwise .When the valve is closed completely, WT is non-connected with BN ,giving signal of closing.
- ☐ If SW is connected,the actuator will drive valve open anticlockwise .When the valve is open completely, WT is non-connected with GY ,giving ignal of opening .
- ※ Notice 1: WT is connected with GY BN ,when the actuator is running.
- ※ 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.

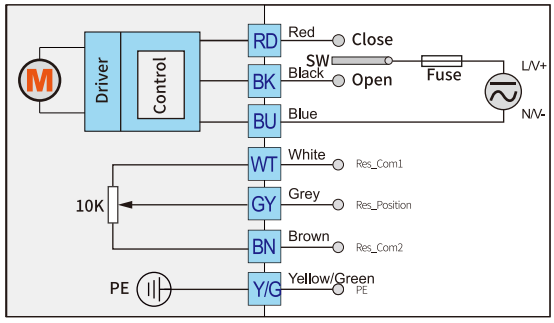
B3P



Control instructions:

- ☐ SW is connected with RD ,the actuator will rotate clockwise .When the valve is closed, RD is connect with BN ,giving signal of closing.
- ☐ SW is connected with BK ,the actuator will rotate anticlockwise .When the valve is open, BK is connect with GY ,giving signal of opening.
- ※ Notice 1: RD is not connected with BN , BK is not connected with GY when the actuator is rotating.
- ※ Notice 2: The feedback signal is synchronous with valve positon.

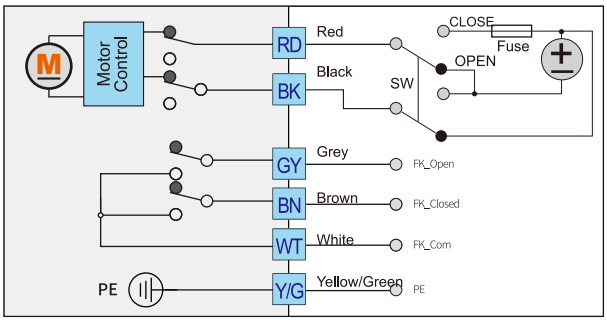
B3R



Control instructions:

- ☐ SW is connected with RD ,the actuator will rotate clockwise .The resistance value between WT and GY will decrease,the actuator will stop when the valve is closed.
- ☐ SW is connected with BK ,the actuator will rotate anticlockwise .The resistance value between WT and GY will increase,the actuator will stop when the valve is open.

B2S-DC24V/DC12V

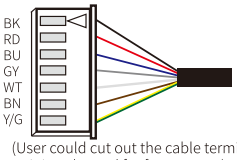


Control instructions:

- ☐ If SW is connected with CLOSE;the actuator will drive valve close clockwise .When the valve is closed completely, WT is connected with BN ,giving signal of closing.
- ☐ If SW is connected with OPEN,the actuator will drive valve open anticlockwise .When the valve is open completely, WT is connected with GY ,giving ignal of opening .
- ※ Notice 1: WT is not connected with BN GY ,when the actuator is running.
- ※ 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.

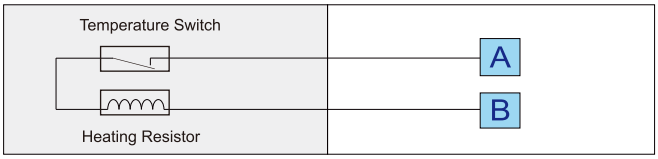
Test terminal for the cable end_wiring instruction

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)

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

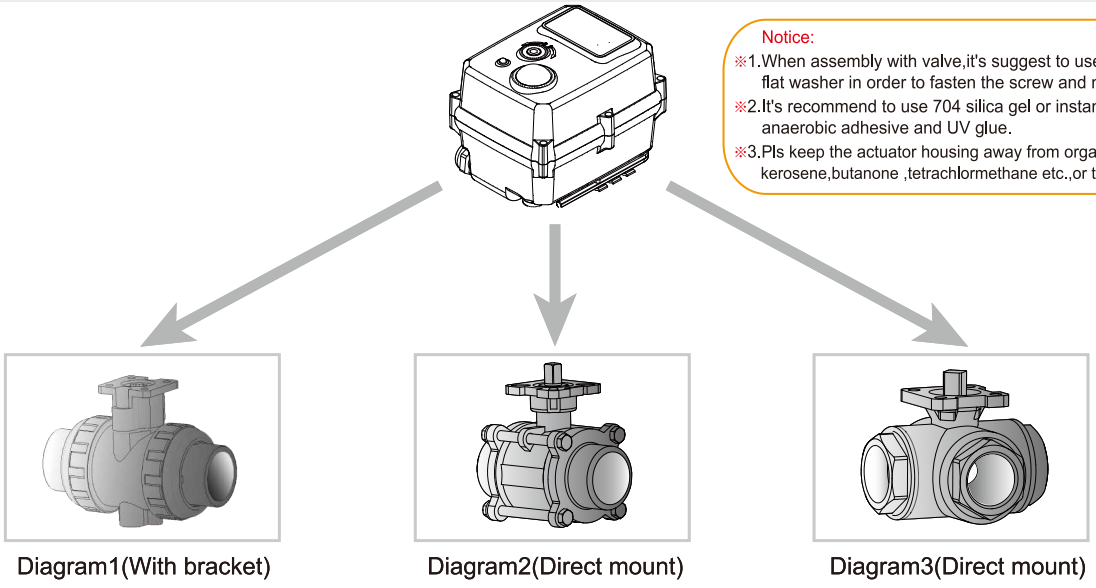


Diagram1(With bracket) Diagram2(Direct mount) Diagram3(Direct mount)

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
clip-on 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.

Adjusting valve location instructions

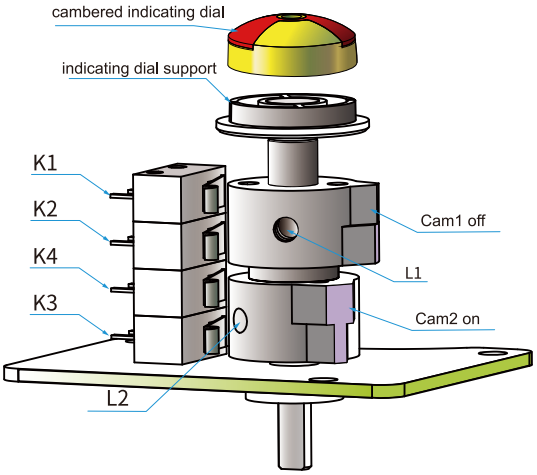


Diagram 1

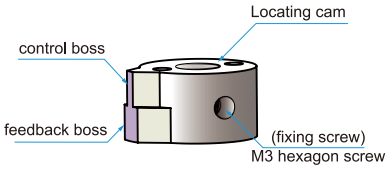


Diagram 2

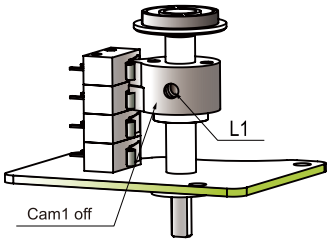


Diagram 3

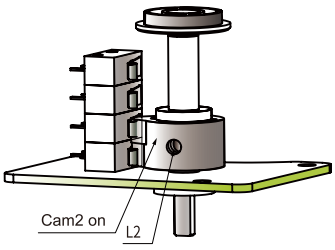


Diagram 4

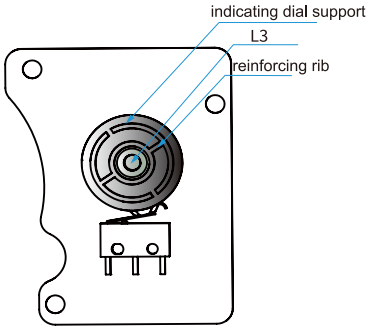


Diagram 5

Diagram 1 locating mechanism structural schematic diagram
Diagram 2 locating cams structural schematic diagram
Diagram 3 close adjustment 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 omited if it 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≤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 Readjust 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 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 expossed 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.