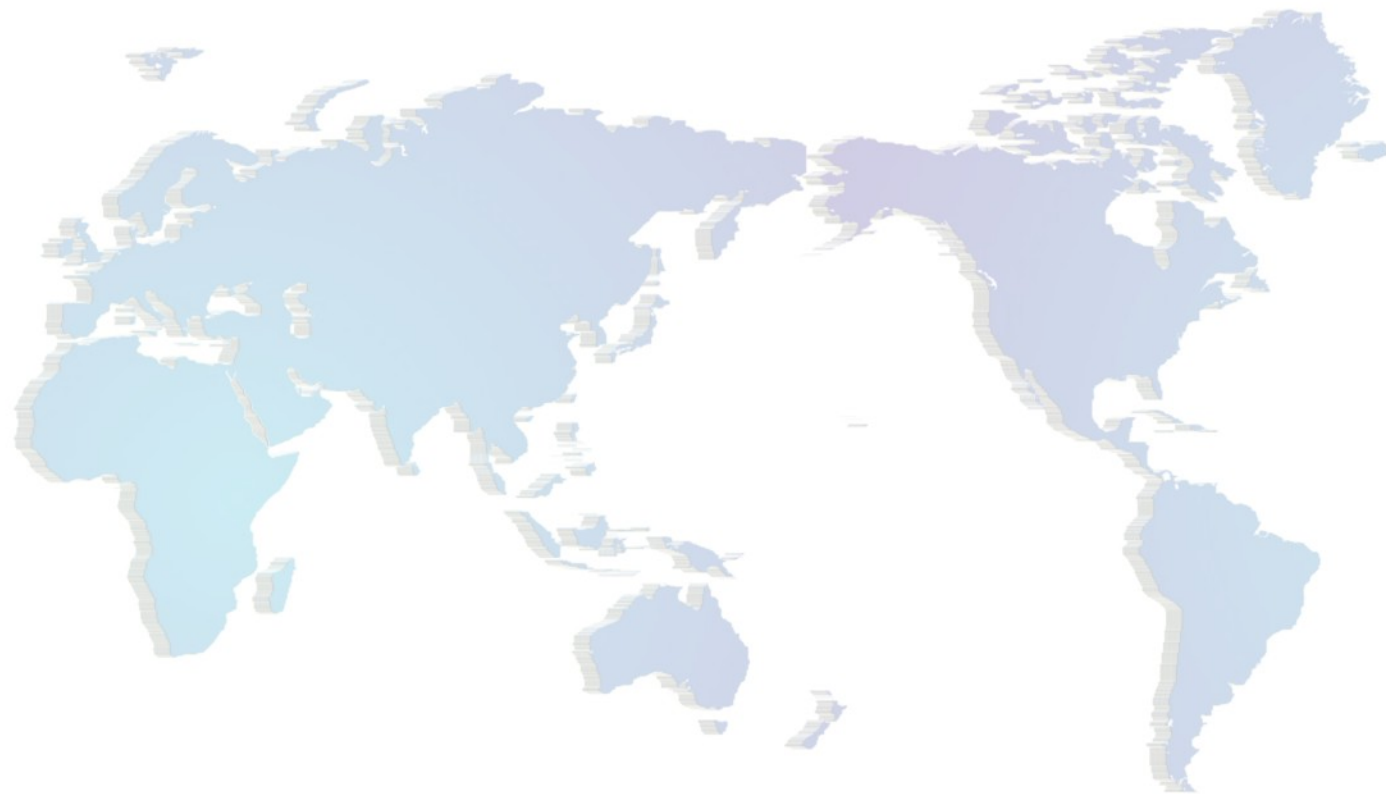


CONSIDER PEOPLE AS A BOAT,  
CONSIDER SERIOUSNESS AS HER HELM,  
CONSIDER WISDOM AS HER SAIL.



**Zhejiang Theoborn Auto-Control Valves Co.,Ltd**

ADD : No.119,4th Road,3rd Avenue,Binhai Industrial Zone,  
Economic & Technical,Wenzhou,China.

TEL : +86-577-86378000 86830000

FAX : +86-577-86887882

E-mail : info@theoborn.com

Website : <http://www.theoborn.com>

P.C : 325025



**Zhejiang Theoborn Auto-control Valves Co.,Ltd**



# COMPANY PROFILE

Zhejiang Theoborn Auto-Control Valves Co., Ltd. is dedicated to manufacture pneumatic actuators, electric actuators. Our products fundamentally transform the complex traditional usage of valves, incorporating high technology with the control process of valves, greatly improving the efficient usage of valves, largely diminishing the controlling cost, and obtaining considerable profits for enterprises.

THEOBORN company is located in Wenzhou City which possesses a long history of manufacturing valves and pumps. Inspired by our experience of manufacturing valves and pumps, supported by exquisite manufacturing technique, and enveloped with the special innovative consciousness and serious spirit. Theoborn endeavors to culminate the wisdom, aspires to make the best products, and desires to benefit human beings.

Theoborn people believe that we should consider people as boat, consider wisdom as helm and consider seriousness as sail. Theoborn believes that professional technology, along with the sincere service, will obtain customers' hearts, win customers' credits, and move customers.

PROFESSIONAL QUALITY  
THE PURSUIT OF EXCELLENCE



## Enterprise Culture

**Corporate philosophy:** Consider people as boat, consider wisdom as  
helm and consider seriousness as sail.

**Quality policy:** People-oriented Technology innovation Continuous  
improvement Create world brand

**Quality target:** (1)100% factory products qualified rate.  
(2)Total customer satisfaction rate averaged 98% in two years.

**Environment policy:** law-abiding pollution prevention saving energy  
reducing consumption cleaner production

**Safety policy:** law-abiding safety prevention health care







With advanced equipment, excellent technology and perfect quality management system, THEOBORN gathered team of professional and technical elite are making full use of new technologies, new processes and new materials to ensure the stability and reliability of the product. Product quality originates in advanced manufacturing;the consciousness of competitive products comes by constant innovation.



# ENTERPRISE EQUIPMENT

Perfect quality is  
originated from advanced  
manufacturing means





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## 1. BN electric actuator instructions

Please read the instructions before using

Before installation and usage, pls confirm as bellow:

- Packing and documents ①product list ②test report ③wiring diagram
- Inspection report; Nameplate; Electrical wiring diagram is consistent with purchasing order
- Before the end of setting Limit switch. Do not make the actuator be in full- open or full-closed
- After Completing of electrical wiring, to deal with cable interface in seal method.

## 2. The name of the product structure and some parts

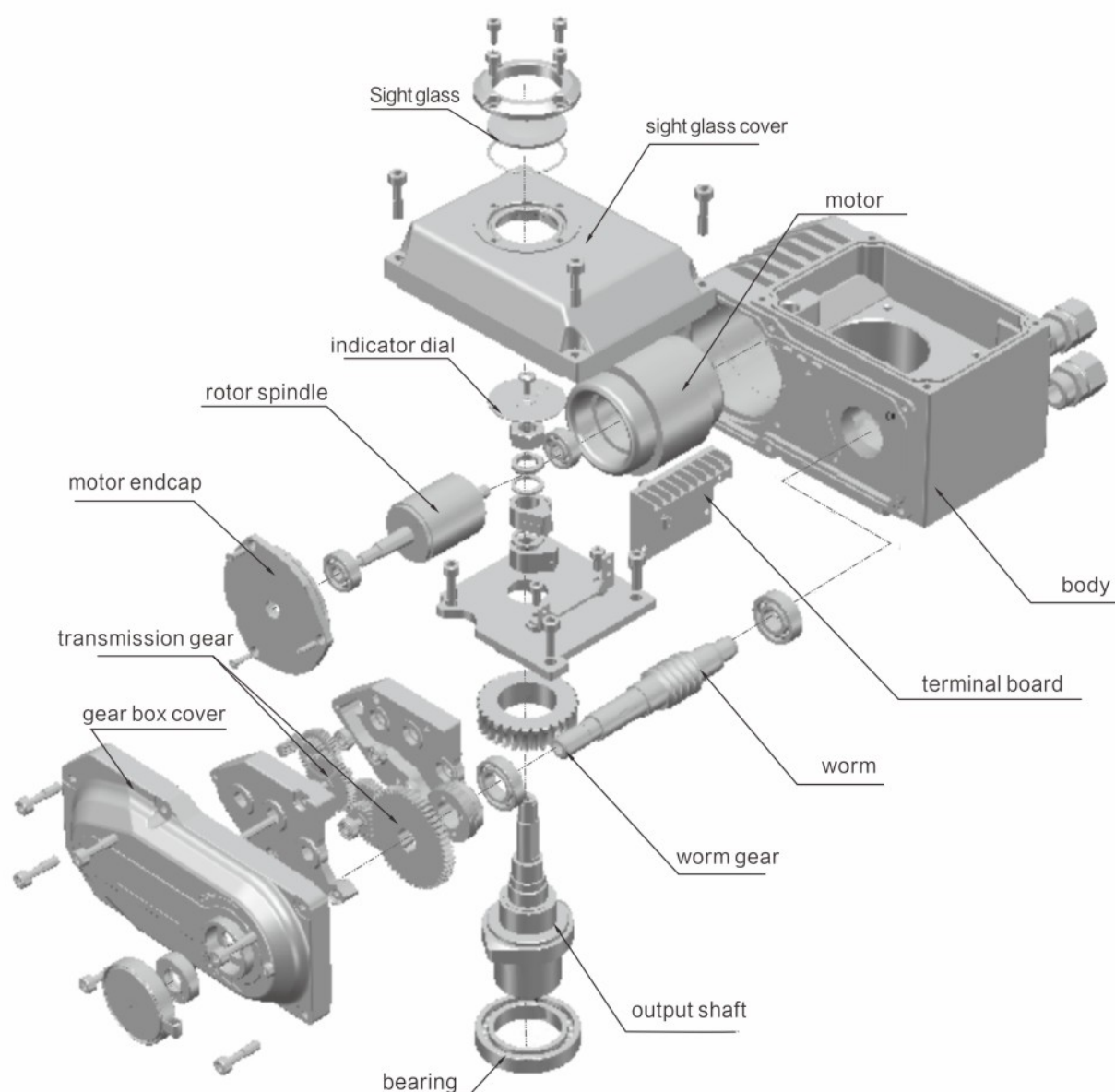


Fig1

## 3. Product overview

BN series electric actuator used to control 0 ~ 270 ° rotary valve, such as butterfly valve, ball valve, throttle, baffle valves, plug valves, etc. Widely used in petroleum, chemical industry, water treatment, ship, paper, power stations, heating supply, building automation, light industry etc. 380 v / 220 v / 110 v AC power supply for driving power supply, 4-20 ma current signal, or 0 -10 VDC voltage signal to be control signal, can make the valve movement to the required position, realize automation control. Maximum output torque is 1500 N. M

## 4. Performance feature

### 4.1 Housing

Aluminum alloy housing, anodic oxidation process and, polyester powder coated, strong corrosion resistance, protection class is IP67.

### 4.2 Motor

Squirrel-cage motor, small size, large torque, low inertia, insulation class is F, built-in overheat protection switch, can prevent the motor from overheating.

### 4.3 Manual operation

Safe and reliable handle design is very easy for manual operate. But make sure the power is "OFF" before manual operation. When the handle is free, put it in the socket beside the body for keeping.

### 4.4 Indicator

Indicator is installed on the central axis, showing valve position. The convex lens design make it more easier to observation and no waterlogging.

### 4.5 Dryer

Dryer is used to control the temperature and avoid actuator internal moisture condensation caused by temperature or weather changes. To keep the electric elements dry.

### 4.6 Seal

Good seals. Standard product protection grade is IP67, and optional IP68.

### 4.7 Limit switch

Mechanical and electronic double position limit. Mechanical limit screw is adjustable, safe and reliable; Electronic limit switch controlled by cam mechanism, easy adjusting the cam can set position accurately and conveniently, and is not affected by excess hand operation.

### 4.8 Self-locking

The high precision worm and gear mechanism has high effectively transfer and output large torque. And it's self-locking function, prevent reverse. transmission part is stable and reliable, no need more grease.

### 4.9 Anti-off bolt

When remove the cover, the bolt attached to the shell, will not fall off.

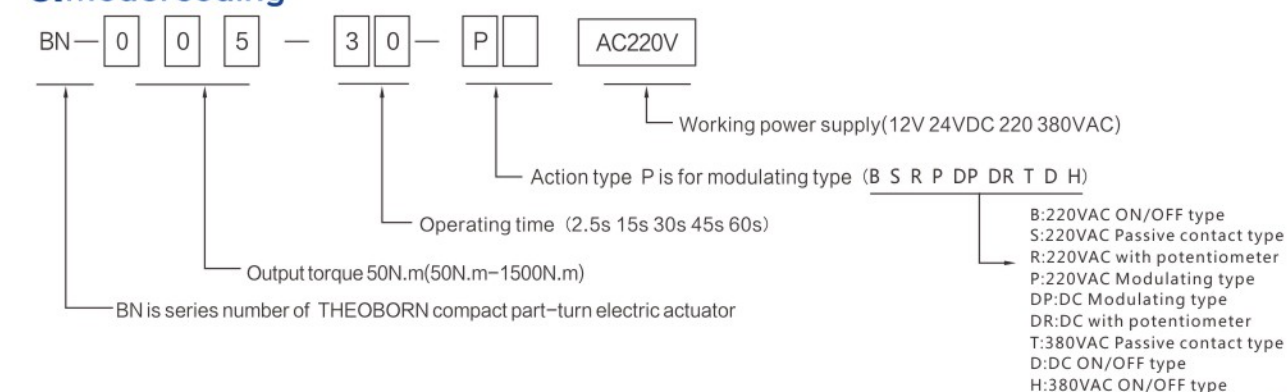
### 4.10 Installation

The bottom connection is according to ISO5211 / DIN3337. Can be installed in both vertical and horizontal installation.

### 4.11 Circuit

Control circuit conforms to single or three-phase power supply standard, circuit layout is reasonable, compact. terminals can effectively satisfy a variety of additional functional requirements.

## 5. Model coding





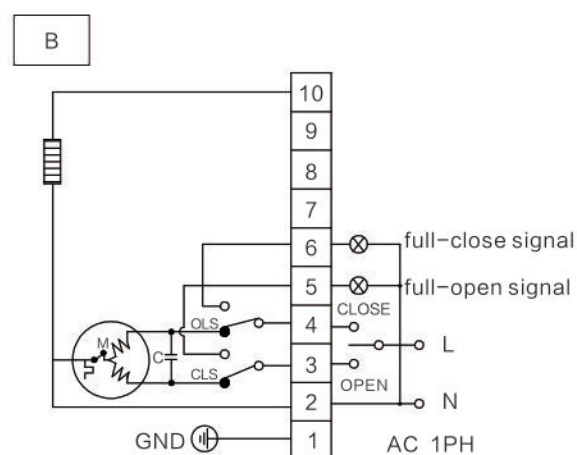
## 6. Electric actuators main technical parameters

BN series electric actuator output torque ranges from 50 N. m to 1500 N. m, fit a variety of rotary valve, (ball valve, utterfly valve, etc.) and damper baffle, etc.

| Model                 | BN005                                                                  | BN008   | BN010       | BN020       | BN040       | BN060     | BN100       | BN150     |
|-----------------------|------------------------------------------------------------------------|---------|-------------|-------------|-------------|-----------|-------------|-----------|
| Performance           |                                                                        |         |             |             |             |           |             |           |
| Output Torque         | 50N.m                                                                  | 80N.m   | 100N.m      | 200N.m      | 400N.m      | 600N.m    | 1000N.m     | 1500N.m   |
| operating time        | 30s                                                                    | 30s/40s | 20s/30s/60s | 15s/30s/60s | 15s/30s/60s | 30s/60s   | 30s/45s/60s | 45s/60s   |
| Rotary Angle          | 0-270 °for option                                                      |         |             |             |             |           |             |           |
| Motor power           | 20W                                                                    | 20W     | 25W         | 40W         | 90W         | 120W      | 120W        | 140W      |
| Standard fit valve    | ball valve                                                             | DN15-40 | DN15-50     | DN50-65     | DN65-80     | DN80-100  | DN125-150   | DN200     |
|                       | butterfly valve                                                        | DN40-65 | DN40-80     | DN65-125    | DN150-200   | DN200-250 | DN200-300   | DN200-350 |
| Power Supply          | DC24V/AC24V AC110V/AC220V/AC380V                                       |         |             |             |             |           |             |           |
| Insulation Resistance | DC24V/AC24V 100MΩ/250VDC AC110V/AC220V/AC380V 100MΩ/500VAC             |         |             |             |             |           |             |           |
| Withstand Voltage     | DC24V/AC24V 500VDC 60S AC110V/AC220V/AC380V 1500VDC 60S                |         |             |             |             |           |             |           |
| Protection Class      | IP67                                                                   |         |             |             |             |           |             |           |
| Counduit Entry        | 2xM18x1.5CABLE GLAND                                                   |         |             |             |             |           |             |           |
| Protective Device     | (automatic recover type)thermal protector                              |         |             |             |             |           |             |           |
| Limit Switch          | electric work:close/open limit switch<br>manual work: mechanical limit |         |             |             |             |           |             |           |
| Installation Location | at any angle                                                           |         |             |             |             |           |             |           |
| Ambient Temperature   | -20°C~60°C                                                             |         |             |             |             |           |             |           |

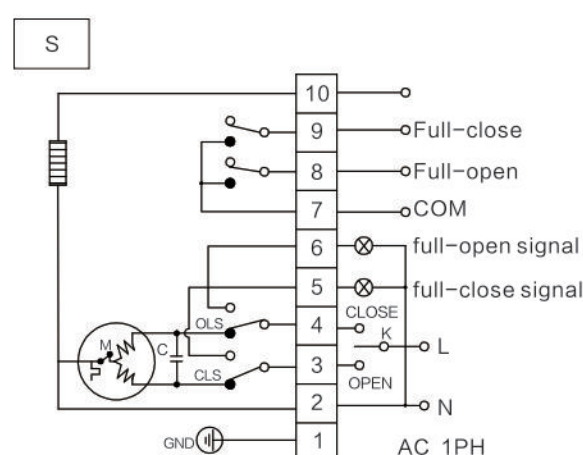
Note: The above valve-actuator sizing table is only for reference.some special requirements such as travel time and the turning Angle can be customized according to customer's requirements.

## 7. Circuit diagram



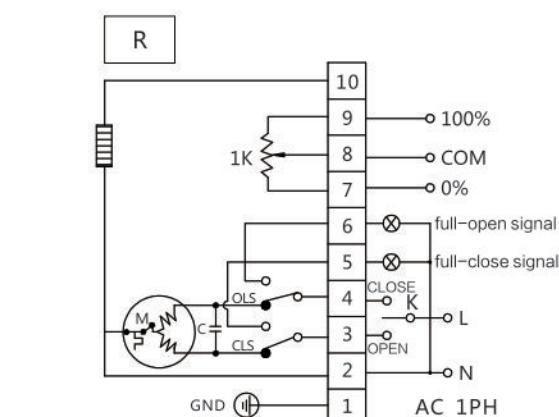
220VAC Standard ON/FF type circuit diagram  
Alternating Current realize startup, shut down action,  
and output a set of instructions "full-close signal"  
"full-open signal" active position signal.

Fig2



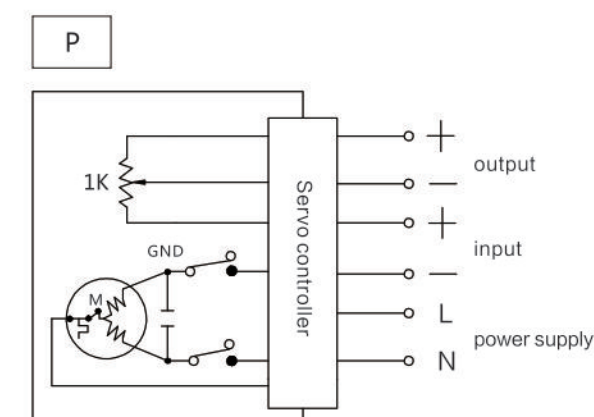
220VAC output Passive contact signal circuit diagram

Fig3



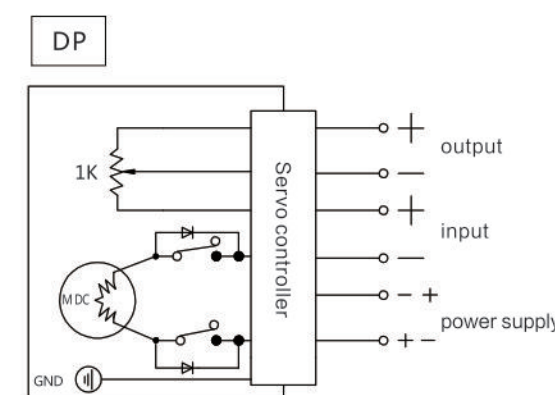
220VAC ON/OFF type (with potentiometer)  
Through the switch circuit to control valve opening angle with corresponding  
potentiometer resistance value, and at the same time realizing mid-position  
function.(with 1KΩ and mid-position switch)

Fig4



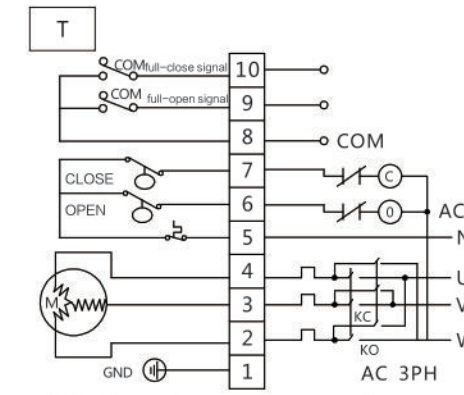
220VAC modulating type circuit diagram  
Through external industrial instrument output standard signal,  
adjust and control actuators open-close Angle, and output 4-20 mA  
feedback signal of valve position.

Fig5



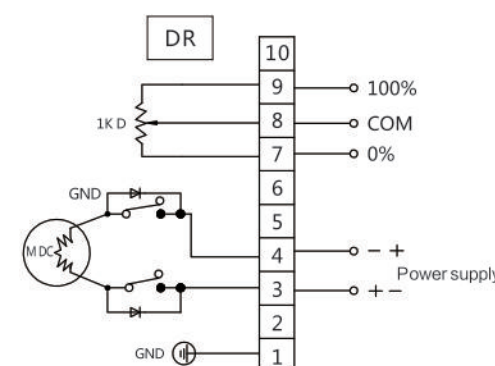
DC modulating type circuit diagram

Fig6



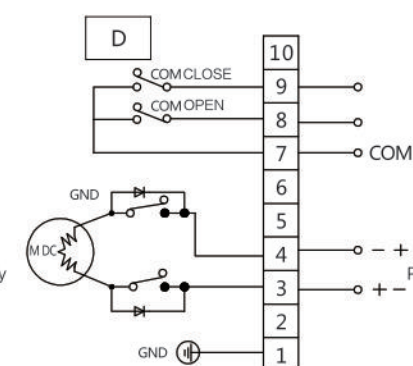
380VAC standard type output passive contact  
signal circuit diagram

Fig7



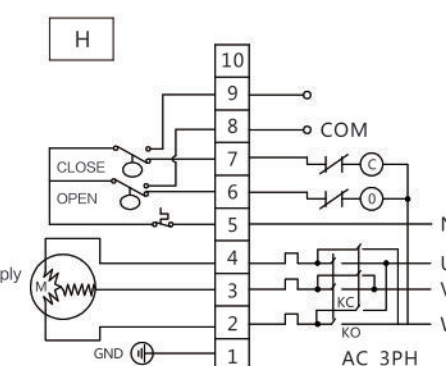
DC Circuit diagram (with potentiometer)

Fig8



DC ON/OFF TYPE Circuit diagram

Fig9



380VAC ON/OFF type circuit diagram

Fig10



## 8. BN005 Overall dimensions and performance parameters

|                       |                                                                        |              |                      |                      |         |        |
|-----------------------|------------------------------------------------------------------------|--------------|----------------------|----------------------|---------|--------|
| Model                 | BN005                                                                  |              |                      |                      |         |        |
| Power supply          | DC12V                                                                  | DC24V        | AC24V                | AC110V               | AC220V  | AC380V |
| Motor power           | 20W                                                                    |              | 23W                  |                      |         |        |
| Rated current         | 2A                                                                     | 1.2A         | 0.8A                 | 0.7A                 | 0.35A   | 0.2A   |
| Output torque         | 30N.m/50N.m                                                            |              | 15N.m/30N.m/50N.m    |                      |         |        |
| Operating time        | 20S/30S/40S/60Sfor option                                              |              |                      |                      |         |        |
| Action type           | B S R P DP DR T D H                                                    |              |                      |                      |         |        |
| Rotary Angle          | 0-270°for option                                                       |              |                      |                      |         |        |
| Withstand voltage     | DC24V/AC24V                                                            | 500VDC       | 60S                  | AC110V/AC220V/AC380V | 1500VDC | 60S    |
| Insulation resistance | DC24V/AC24V                                                            | 100MΩ/250VDC | AC110V/AC220V/AC380V | 100MΩ/500VAC         |         |        |
| Protection class      | IP67                                                                   |              |                      |                      |         |        |
| Counduit entry        | 2xM18x1.5CABLE GLAND                                                   |              |                      |                      |         |        |
| Protective device     | ( automatic recover type) thermal protector                            |              |                      |                      |         |        |
| Limit switch          | Electric work:close/open limit switch<br>Manual work: mechanical limit |              |                      |                      |         |        |
| Installation location | At any angle                                                           |              |                      |                      |         |        |
| Working temperature   | -20℃~60℃                                                               |              |                      |                      |         |        |
| Material of body      | Aluminium alloy                                                        |              |                      |                      |         |        |

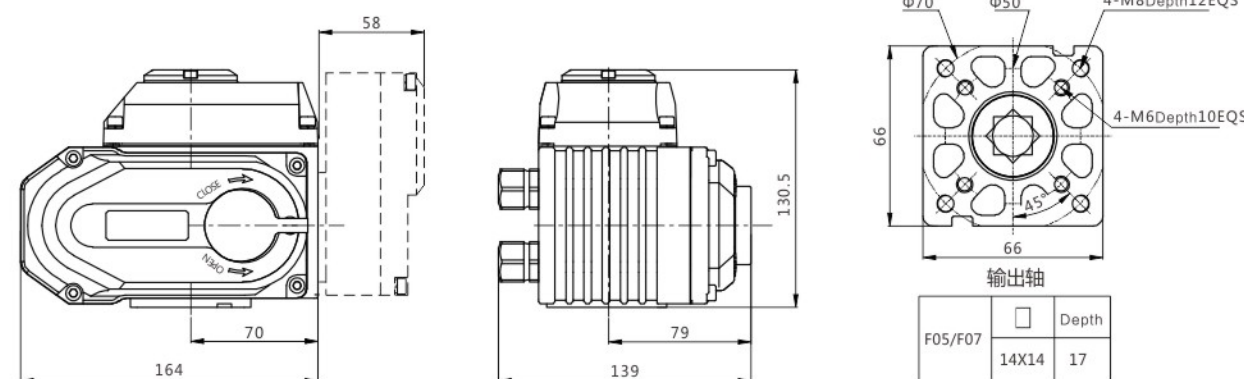


Fig11

| Model | Output torque | 90° operating time of | Power supply                    | Soft seal butterfly valve | Ball valve | Aeration butterfly valve |
|-------|---------------|-----------------------|---------------------------------|---------------------------|------------|--------------------------|
| BN005 | 50N.m         | 30S                   | AC110V, AC220V<br>AC380V, DC24V | ≤PN1.6MP                  | ≤DN32      | ≤0.1MP                   |
|       |               |                       |                                 | ≤DN80                     | ≤DN32      | ≤DN80                    |

## 9. BN010 Overall dimensions and performance parameters

|                       |                                                                        |              |                      |                      |         |        |
|-----------------------|------------------------------------------------------------------------|--------------|----------------------|----------------------|---------|--------|
| Model                 | BN010                                                                  |              |                      |                      |         |        |
| Power supply          | DC12V                                                                  | DC24V        | AC24V                | AC110V               | AC220V  | AC380V |
| Motor power           | 40W                                                                    |              | 25W                  |                      |         |        |
| Rated current         | 2.4A                                                                   | 1.5A         | 0.8A                 | 0.75A                | 0.45A   | 0.25A  |
| Output torque         | 50N.m/100N.m                                                           |              | 50N.m/80N.m/100N.m   |                      |         |        |
| Operating time        | 15S/20S/30S/40Sfor option                                              |              |                      |                      |         |        |
| Action type           | B S R P DP DR T D H                                                    |              |                      |                      |         |        |
| Rotary Angle          | 0-270°for option                                                       |              |                      |                      |         |        |
| Withstand voltage     | DC24V/AC24V                                                            | 500VDC       | 60S                  | AC110V/AC220V/AC380V | 1500VDC | 60S    |
| Insulation resistance | DC24V/AC24V                                                            | 100MΩ/250VDC | AC110V/AC220V/AC380V | 100MΩ/500VAC         |         |        |
| Protection class      | IP67                                                                   |              |                      |                      |         |        |
| Couduit entry         | 2xM18x1.5CABLE GLAND                                                   |              |                      |                      |         |        |
| Protective device     | ( automatic recover type) thermal protector                            |              |                      |                      |         |        |
| Limit switch          | Electric work:close/open limit switch<br>Manual work: mechanical limit |              |                      |                      |         |        |
| Installation location | At any angle                                                           |              |                      |                      |         |        |
| Working temperature   | -20°C~60°C                                                             |              |                      |                      |         |        |
| Material of body      | Aluminium alloy                                                        |              |                      |                      |         |        |

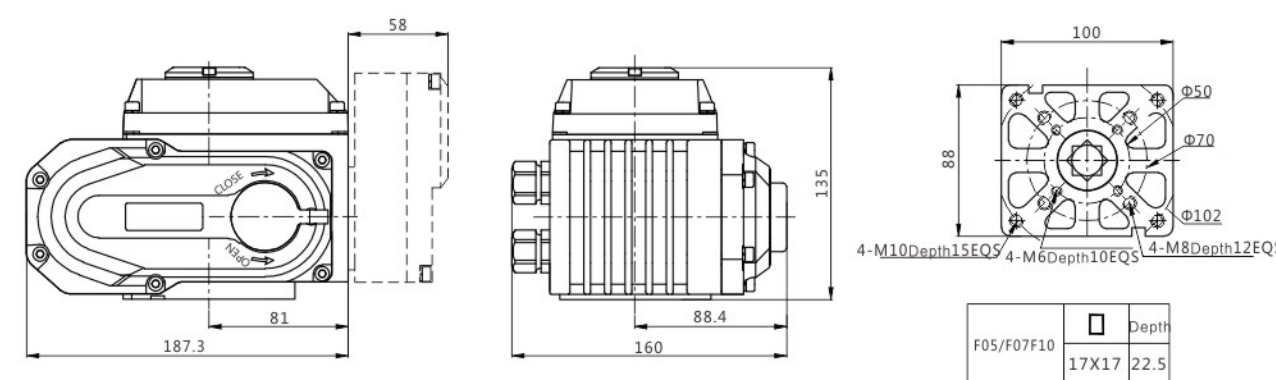


Fig12

| Model  | Output torque | Operating Time of 90° | Power supply                    | butterfly valve | butterfly valve | Ball valve | butterfly valve |
|--------|---------------|-----------------------|---------------------------------|-----------------|-----------------|------------|-----------------|
| BN-010 | 50N.m         | 15S                   | AC110V, AC220V<br>AC380V, DC24V | ≤PN1.6MP        |                 |            | ≤0.1MP          |
|        |               |                       |                                 | ≤DN80           | ≤DN32           | ≤DN80      | ≤DN80           |
|        | 100N.m        | 30S                   |                                 | DN32~DN65       | DN80~DN125      | DN40~DN65  | DN100~DN200     |



## 10. BN020 040 060 Overall dimensions and performance parameters

| Model                 | BN020                                                                     |        |              |        | BN040                                  |        |        |        | BN060        |        |        |        |
|-----------------------|---------------------------------------------------------------------------|--------|--------------|--------|----------------------------------------|--------|--------|--------|--------------|--------|--------|--------|
| Power supply          | DC24V                                                                     | AC110V | AC380V       | AC220V | DC24V                                  | AC110V | AC380V | AC220V | DC24V        | AC110V | AC380V | AC220V |
| Motor power           | 35W                                                                       | 40W    | 30W          | 40W    | 60W                                    | 90W    | 40W    | 40W    | 60W          | 90W    | 40W    | 90W    |
| Rated current         | 3.5A                                                                      | 0.65A  | 0.15A        | 0.35A  | 5.2A                                   | 1.2A   | 0.3A   | 0.58A  | 6.2A         | 1.2A   | 0.3A   | 0.6A   |
| Output torque         | 200N.m                                                                    |        |              |        | 400N.m                                 |        |        |        | 600N.m       |        |        |        |
| Operating time        | 15S    30S    45S for option                                              |        |              |        |                                        |        |        |        |              |        |        |        |
| Action type           | B S R P DP DR T D H                                                       |        |              |        |                                        |        |        |        |              |        |        |        |
| Rotary Angle          | 0-270°for option                                                          |        |              |        |                                        |        |        |        |              |        |        |        |
| Withstand voltage     | DC24V/AC24V    500VDC    60S                                              |        |              |        | AC110V/AC220V/AC380V    1500VDC    60S |        |        |        |              |        |        |        |
| Insulation resistance | DC24V/AC24V                                                               |        | 100MΩ/250VDC |        | AC110V/AC220V/AC380V                   |        |        |        | 100MΩ/500VAC |        |        |        |
| Protection class      | IP67                                                                      |        |              |        |                                        |        |        |        |              |        |        |        |
| Couduit entry         | 2xM18x1.5CABLE GLAND                                                      |        |              |        |                                        |        |        |        |              |        |        |        |
| Protective device     | ( automatic recover type) thermal protector                               |        |              |        |                                        |        |        |        |              |        |        |        |
| Limit switch          | Electric work:close/open    limit switch<br>Manual work: mechanical limit |        |              |        |                                        |        |        |        |              |        |        |        |
| Installation location | At any angle                                                              |        |              |        |                                        |        |        |        |              |        |        |        |
| Working temperature   | - 20℃~60℃                                                                 |        |              |        |                                        |        |        |        |              |        |        |        |
| Material of body      | Aluminium alloy                                                           |        |              |        |                                        |        |        |        |              |        |        |        |

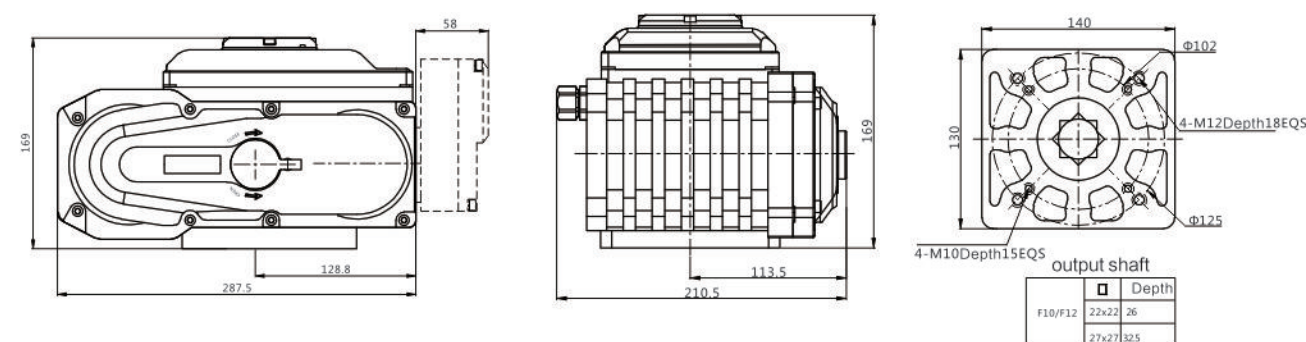


Fig13

| Model         | Output torque  | operating time of 90° | Power supply                    | butterfly valve  | butterfly valve   | Ball valve     | Aeration butterfly valve |
|---------------|----------------|-----------------------|---------------------------------|------------------|-------------------|----------------|--------------------------|
| BN020/040/060 | 200/400/600N.m | 15S.30S.45S           | AC110V, AC220V<br>AC380V, DC24V | ≤PN1.6MP         |                   |                | ≤0.1MP                   |
|               |                |                       |                                 | DN80/DN125/DN200 | DN150/DN200/DN250 | DN65/DN80/D125 | DN250/DN350/DN400        |

## 11. BN100 150 Overall dimensions and performance parameters

| Model                 | BN100                                                                  |        |        | BN150   |        |        |
|-----------------------|------------------------------------------------------------------------|--------|--------|---------|--------|--------|
| Power supply          | AC110V                                                                 | AC380V | AC220V | AC110V  | AC380V | AC220V |
| Motor power           | 120W                                                                   | 90W    | 120W   | 140W    | 100W   | 140W   |
| Rated current         | 1.95A                                                                  | 0.5A   | 0.95A  | 1.75A   | 0.46A  | 0.98A  |
| Output torque         | 1000N.m                                                                |        |        | 1500N.m |        |        |
| Operating time        | 45S      60S      for option                                           |        |        |         |        |        |
| Action type           | B S R P DP DR T D H                                                    |        |        |         |        |        |
| Rotary Angle          | 0-270°for option                                                       |        |        |         |        |        |
| Withstand voltage     | AC110V/AC220V/AC380V 1500VDC 60S                                       |        |        |         |        |        |
| Insulation resistance | AC110V/AC220V/AC380V 100MΩ/500VAC                                      |        |        |         |        |        |
| Protection class      | IP67                                                                   |        |        |         |        |        |
| Couduit entry         | 2xM18x1.5CABLE GLAND                                                   |        |        |         |        |        |
| Protective device     | ( automatic recover type) thermal protector                            |        |        |         |        |        |
| Limit switch          | Electric work:close/open limit switch<br>Manual work: mechanical limit |        |        |         |        |        |
| Installation location | At any angle                                                           |        |        |         |        |        |
| Working temperature   | -20℃~60℃                                                               |        |        |         |        |        |
| Material of body      | Aluminium alloy                                                        |        |        |         |        |        |

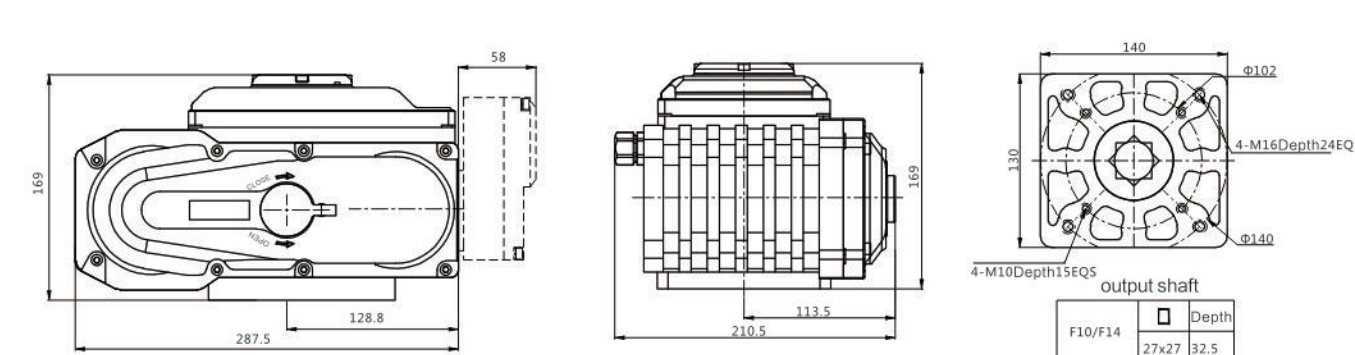


Fig14

| Model     | Output torque | operating time of 90° | Power supply                    | butterfly valve | butterfly valve | Ball valve  | Aeration butterfly valve |
|-----------|---------------|-----------------------|---------------------------------|-----------------|-----------------|-------------|--------------------------|
| BN100/150 | 1000/1500N.m  | 45S.60S               | AC110V, AC220V<br>AC380V, DC24V | ≤PN1.6MP        |                 |             | ≤0.1MP                   |
|           |               |                       |                                 | DN200/DN250     | DN250/DN350     | DN150/DN250 | DN350/DN500              |



## 12.Installation and adjusting

### 1-INSTALLATION

- 1) This product is not explosion-proof. Do not use it in the environment with flammable gas or corrosive gas.
- 2) Installed in a water flooded and outdoor please explain in advance;
- 3) Please reserve wiring, maintenance space such as for manual operation.
- 4) In order to avoid the rain, direct sunlight, need to install the protection cover, or chooses IP68 protection level.
- 5) Basic installation direction to keep the window to the top, the vertical pipeline actuators installation, cable interface to the ground.

### 2-AMBIENT TEMPERATURE, MEDIUM TEMPERATURE

Working temperature:  $-30^{\circ}\text{C} \sim +60^{\circ}\text{C}$

When the environment temperature is below freezing, add desiccant heater inside the actuator.

When fluid temperature is below zero, the bracket connected with the valve shall special process.

Standard bracket: When fluid temperature is below  $+65^{\circ}\text{C}$ , use standard bracket or without bracket.

Middle temp bracket: When fluid temperature is above  $+65^{\circ}\text{C}$ , use middle temp bracket.

High temp bracket: When fluid temperature is above  $+180^{\circ}\text{C}$ , use high temp bracket.

### 3-ASSEMBLY WITH VALVE

Assembly procedure

1. Be sure that power is off before making manual operation.
2. Confirm that a valve is smoothly turnable by hands without eccentricity, then position it at full close.
- Note: There are some valves designed in reverse direction of open/close.
3. Bolt a bracket on the valve.
4. Tentatively mount an actuator on the bracket with loose bolts.
5. Position the actuator at 0 (close), joint the output shaft and the valve stem with couplings.
6. Screw up the bolts.
7. Check with the attached crank handle if the valve is turnable smoothly without eccentricity.

Actuator is in accordance with ISO5211 standard, if the valve is also conform to the standard, it is convenient to be connected; if not, we need to assembly bracket

### 4-ADJUSTMENT

#### 1) Adjustment of Stroke limit (Figure 15,17)

Turn around handwheel to make sure the valve be in the full - closed position. To loosen nuts on cam and rotate cam to adjust the limit Switch (CLS) position and then screw limit cam nut. It is the way to set the full-closed stroke limit position of a. Full-open position is set as the same way.

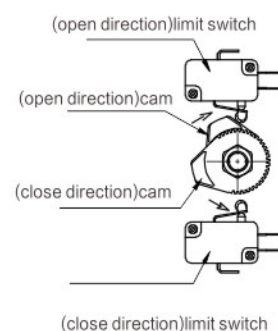


Fig15

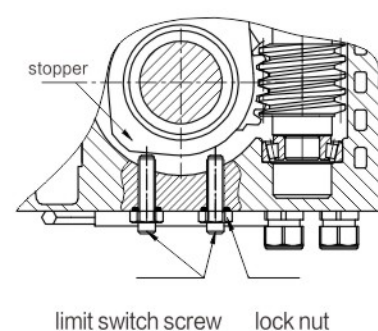


Fig16

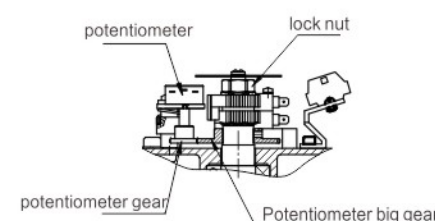


Fig17

#### 2) Adjustment of mechanical limit

Loosen nut mechanical limit and then make sure the actuator move to the full-closed position. Rotating limiting nuts, then stop rotate when it comes across the fan-shaped gear inside and then screw out two circles and screw the nuts at last. It is the way to set the full-closed mechanical position. Full-open position is set as the same way. Shown in Figure 16

#### 3) Adjustment of potentiometer

Potentiometer is used for feedback signal in the actuators with three terminals. ② side connecting with slide arm of potentiometer. ① side connecting with terminal which resistance between slide arms constantly decrease, when the actuator is open. ③ side connecting with terminal which resistance between slide arms constantly increase, when the actuator is closed (Note: The resistance should not over-zero, jumping phenomenon). Rotating valve to the full open position as per open to limit switch action, measured with a multimeter, to adjust the resistance to  $35\ \Omega - 60\ \Omega$ . If it is not correct by rotating potentiometer gear to adjust (Figure 17)

### 5-TEST OPERATION

#### 1) Manual Operation

Cut power off before making manual operation. Insert the manual handle into the hexagonal hole underneath the rubber cap.

Note: Opening to Full-open and full-closed position, after the limit Switch turns half circle, it will come across mechanical block. If rotate excessively, it would result the damage of other parts, So it should be avoided excessive force.

#### 2) Power operation

Before making power operation:

- \* Confirm that the indication on the position meter and the valve opening are matching each other.
- \* Confirm that the circuits are properly wired, also that the unit operates in correct direction with external switches.

- 1) Check the wiring diagram, power supply, input/output signal correctly.
- 2) Don't change the internal wiring
- 3) Please check the rotating direction if the power supply is three-phase
- 4) Make sure the actuator be in the on/off position, turn on the power and input the open signal
- 5) If the actuator runs to the open direction, it means the wiring is correct.
- 6) If not, it must be changed 2 wiring lines of the 3 wiring line.

### 6-MAINTENANCE & LUBRICATION

As the major parts of the products are lubricated with long life by Molybdenum base grease before shipment.

Lubrication is in principle not required.

When re-starting operation after a long period of rest, make the following confirmation.

- \* Cut power off, confirm by manual operation that valve moves smoothly without eccentricity.
- \* Open body cover and check if there is no condensation inside the unit, also no problem on wiring.

Note: After checking, secure the cover to prevent water ingress.

Please refer to the specification of Actuator module parts for modulating instructions.



## 13.CONFIGURATION AND FUNCTION High-performance intelligent module

High-performance intelligent module  
The intelligent control signal acquisition module adopts single-chip microcomputer as the core,with signal acquisition, processing, feedback and control into an organic whole.Which has advanced hybrid integrated circuit, good stability and control precision up to 1/1000. Small volume, convenient installation, simple operation.

### Manual operation

Each BN series actuators will be equipped with a handle.When site control is power failure,user can use the handle to drive valve.

### Electrical and mechanical limit function

Electrical limit function: when actuator reaches full open and close limit position, built-in electrical limit switch will cut off the circuit and protect the actuator.

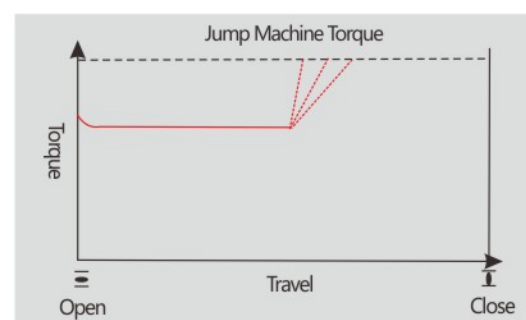
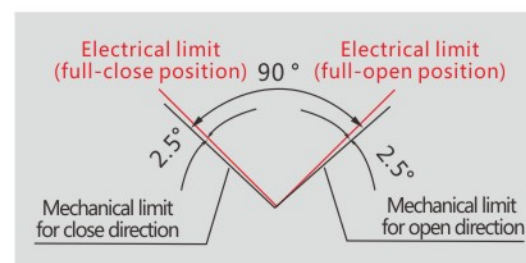
Output shaft mechanical limit function: when the electric limit function fails, the actuator output shaft will be locked by mechanical limit switch, so as to protect the valve from damage.picture shows the position relation of the electrical limit and the mechanical limit.

### Over load torque protection function (optional)

When the valve is running (middle position) and be stuck because of the impurity in the pipeline or for other reasons,the output torque of actuators will increase rapidly.When torque reach a value (jumping machine torque), torque switch will cut off the circuit, so as to protect the valve and actuator from damage.

### Heat dehumidification function (optional)

BN series actuators electric chamber can be configured PTC electronic heating element, for the damp place which has big temperature difference between day and night.The heater will prevent the electrical components from the damage caused by condensation.Heater is with continuous duty, so it is always at charged state, even if the actuators is stopped.



### ON/OFF type actuator A,B, F, G, H control circuit

ON/OFF type actuator has only full open and full close limit position.Actuator drive valve to full open and full close when it receives the instruction.

S2 short work, continuous operation time shall be not more than 15 minutes.

### Feedback type actuator C, D type control circuit

When actuators in the process of driving the valve,it send feedback signal of valves to the central control system at the same time. C type feedback resistance signal of valve, D type feedback analog valve position signal.

S2 short work, continuous operation time shall be not more than 15 minutes.

### Intelligent modulating type actuator E type control circuit

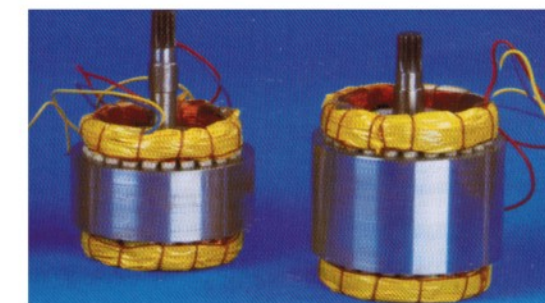
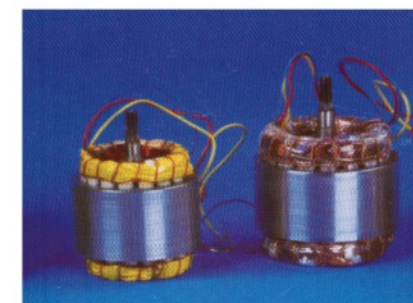
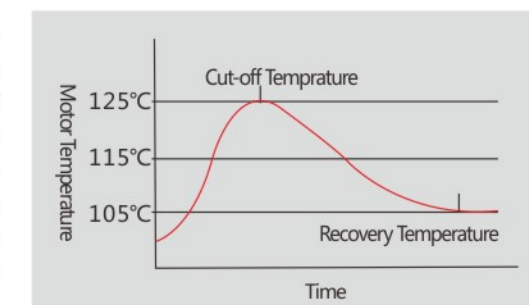
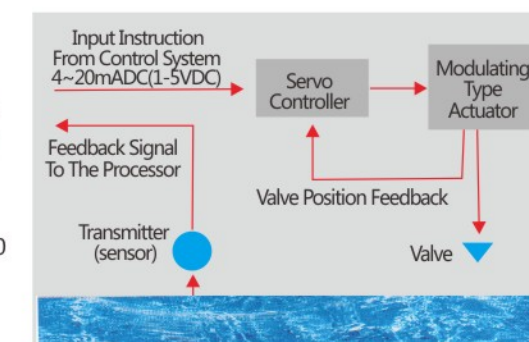
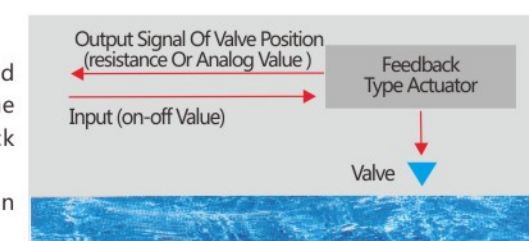
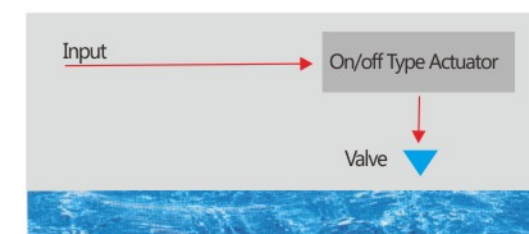
Intelligent module which built-in the actuators, according to the central pipe controlled variables (flow, pressure, temperature, liquid level) and accept the instruction of the control system to drive the valve to the right opening position.

Adopt S4 intermittent type work, working frequency of up to 1200 times per hour.

### The motor

The working characteristics of the valve request the actuator have full launch ability all every position,both the valve open ,valve close and middle position. Which requires the actuator motor has high start torque.At the same time with the need of flow rate (opening), require motor must also have smaller moment of inertia.BN series electric actuators adopts special design to meet these requirements.

When the actuator is blocked, the motor temperature will rise quickly.When the motor temperature rise up to 125 °C,The overheat protector PTC(built-in motor winding) will cut off the circuit, thus protecting motor and control system.When the motor temperature dropped to 90~105 °C, the circuit will be restored.





# PRODUCT SHOW

