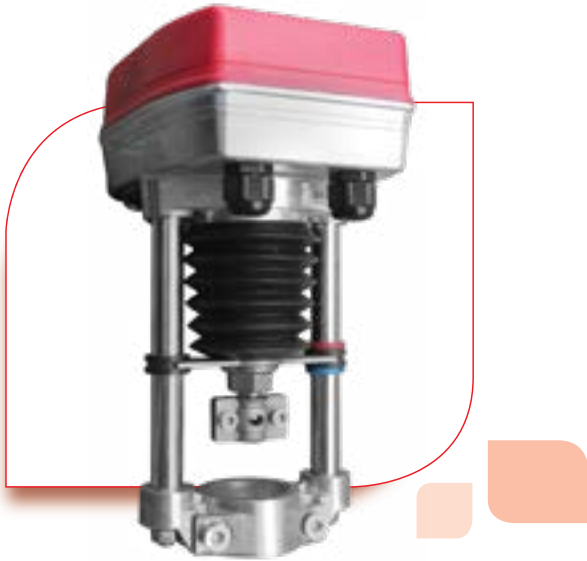




TW

Globe Valve Actuator



TW500 / MTW1000...suitable for valve stroke ≤ 20 mm, nominal output force 500N / 1000N

TW1000 / MTW3000...suitable for valve stroke ≤ 40 mm, nominal output force 1000N/ 3000N

TW5000...suitable for valve stroke ≤ 60 mm, nominal output force 5000N

Features



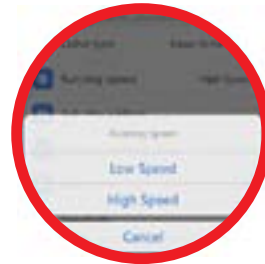
RS485 Remote Control
The actuator is equipped with RS485 communication interface. The valve can be remotely controlled by ModBus protocol.



NFC (Near Field Communication)
The actuator has NFC function which can not only control opening and closing of valve by mobile NFC client, but also set a number of parameters. NFC function can still read actuator parameter even if the actuator is powered off on site.



Self Stroking Function
The actuator has the self-stroking function. It can automatically measure the valve stroke.



Speed Adjustability
The high/low speed can be switched through Dip switch. High speed 2s/mm, low speed 4s/mm.



Manual Function
The actuator has the mechanical manual function and manual priority function, that is, when insert the wrench, the actuator will be automatically powered off which is safe and convenient.



Seamless Connection
It adopts the seamless connection structure. It can ensure there is no gap during the movement which can ensure the actuator to get a higher control precision of 0.2% when it is controlled by RS485.



Local Mode (Electric manual function)
The actuator has local control function which can control the opening and closing of valve by the button on the plate.



LED Indicating Light
There are LED indicating lights on the actuator cover which is convenient to observe the actuator running status.

Type Summary

500N actuator



Type	Type Description	Rating Force	Stroke	Operating Voltage	Control Signal	Feedback Signal	Running Time (50Hz)
TW500-XD24-S.12	Proportional	500N	30mm	24VAC 24VDC	0(2)~10VDC 0(4)~20mA	0(2)~10VDC 0(4)~20mA	high speed: 2s/mm low speed: 4s/mm
TW500-XD24-S.12	3-position	500N	30mm	24VAC 24VDC	3-position	-	high speed: 2s/mm low speed: 4s/mm
TW500-XD24-SF2.12	3-position with 2 SPDT feedback	500N	30mm	24VAC 24VDC	3-position	2 SPDT feedback	high speed: 2s/mm low speed: 4s/mm
TW500-XD24-S485.12	RS485	500N	30mm	24VAC 24VDC	RS485 NFC	RS485 NFC	high speed: 2s/mm ow speed: 4s/mm

1000N actuator



Type	Type Description	Rating Force	Stroke	Operating Voltage	Control Signal	Feedback Signal	Running Time (50Hz)
TW1000-XD24-S.12	Proportional	1000N	30mm	24VAC 24VDC	0(2)~10VDC 0(4)~20mA	0(2)~10VDC 0(4)~20mA	high speed: 2s/mm low speed: 4s/mm
TW1000-XD24-S.12	3-position	1000N	30mm	24VAC 24VDC	3-position	-	high speed: 2s/mm low speed: 4s/mm
TW1000-XD24-SF2.12	3-position with 2 SPDT feedback	1000N	30mm	24VAC 24VDC	3-position	2 SPDT feedback	high speed: 2s/mm low speed: 4s/mm
TW1000-XD24-S485.12	RS485	1000N	30mm	24VAC 24VDC	RS485 NFC	RS485 NFC	high speed: 2s/mm low speed: 4s/mm

1000N actuator



Type	Type Description	Rating Force	Stroke	Operating Voltage	Control Signal	Feedback Signal	Running Time (50Hz)
TW1001-XD24-S.14	Proportional	1000N	50mm	24VAC 24VDC	0(2)~10VDC 0(4)~20mA	0(2)~10VDC 0(4)~20mA	high speed: 2s/mm low speed: 4s/mm
TW1001-XD24-S.14	3-position	1000N	50mm	24VAC 24VDC	3-position	-	high speed: 2s/mm low speed: 4s/mm
TW1001-XD24-SF2.14	3-position with 2 SPDT feedback	1000N	50mm	24VAC 24VDC	3-position	2 SPDT feedback	high speed: 2s/mm low speed: 4s/mm
TW1001-XD24-S485.14	RS485	1000N	50mm	24VAC 24VDC	RS485 NFC	RS485 NFC	high speed: 2s/mm low speed: 4s/mm

3000N actuator



Type	Type Description	Rating Force	Stroke	Operating Voltage	Control Signal	Feedback Signal	Running Time (50Hz)
TW3000-XD24-S.14	Proportional	3000N	50mm	24VAC 24VDC	0(2)~10VDC 0(4)~20mA	0(2)~10VDC 0(4)~20mA	high speed: 2s/mm low speed: 4s/mm
TW3000-XD24-S.14	3-position	3000N	50mm	24VAC 24VDC	3-position	-	high speed: 2s/mm low speed: 4s/mm
TW3000-XD24-SF2.14	3-position with 2 SPDT feedback	3000N	50mm	24VAC 24VDC	3-position	2 SPDT feedback	high speed: 2s/mm low speed: 4s/mm
TW3000-XD24-S485.14	RS485	3000N	50mm	24VAC 24VDC	RS485 NFC	RS485	high speed: 2s/mm low speed: 4s/mm

5000N actuator



Type	Type Description	Rating Force	Stroke	Operating Voltage	Control Signal	Feedback Signal	Running Time (50Hz)
TW5000-XD24-S.14	Proportional	5000N	70mm	24VAC 24VDC	0(2)~10VDC 0(4)~20mA	0(2)~10VDC 0(4)~20mA	4s/mm
TW5000-XD24-S.14	3-position	5000N	70mm	24VAC 24VDC	3-position	-	4s/mm
TW5000-XD24-SF2.14	3-position with 2 SPDT feedback	5000N	70mm	24VAC 24VDC	3-position	2 SPDT feedback	4s/mm
TW5000-XD24-S485.14	RS485	5000N	70mm	24VAC 24VDC	RS485 NFC	RS485	4s/mm



TW

Globe Valve Actuator



Type Summary

500N actuator



Type	Type Description	Rating Force	Stroke	Operating Voltage	Control Signal	Feedback Signal	Running Time (50Hz)
TW500-XD220-S.12	Proportional	500N	30mm	110~230VAC	0(2)~10VDC 0(4)~20mA	0(2)~10VDC 0(4)~20mA	high speed: 2s/mm low speed: 4s/mm
TW500-XD220-S.12	3-position	500N	30mm	110~230VAC	3-position	-	high speed: 2s/mm low speed: 4s/mm
TW500-XD220-SF2.12	3-position with 2 SPDT feedback	500N	30mm	110~230VAC	3-position	2 SPDT feedback	high speed: 2s/mm low speed: 4s/mm
TW500-XD220-S485.12	RS485	500N	30mm	110~230VAC	RS485 NFC	RS485 NFC	high speed: 2s/mm ow speed: 4s/mm

1000N actuator



Type	Type Description	Rating Force	Stroke	Operating Voltage	Control Signal	Feedback Signal	Running Time (50Hz)
TW1000-XD220-S.12	Proportional	1000N	30mm	110~230VAC	0(2)~10VDC 0(4)~20mA	0(2)~10VDC 0(4)~20mA	high speed: 2s/mm low speed: 4s/mm
TW1000-XD220-S.12	3-position	1000N	30mm	110~230VAC	3-position	-	high speed: 2s/mm low speed: 4s/mm
TW1000-XD220-SF2.12	3-position with 2 SPDT feedback	1000N	30mm	110~230VAC	3-position	2 SPDT feedback	high speed: 2s/mm low speed: 4s/mm
TW1000-XD220-S485.12	RS485	1000N	30mm	110~230VAC	RS485 NFC	RS485 NFC	high speed: 2s/mm ow speed: 4s/mm

1000N actuator



Type	Type Description	Rating Force	Stroke	Operating Voltage	Control Signal	Feedback Signal	Running Time (50Hz)
TW1001-XD220-S.14	Proportional	1000N	50mm	110~230VAC	0(2)~10VDC 0(4)~20mA	0(2)~10VDC 0(4)~20mA	high speed: 2s/mm low speed: 4s/mm
TW1001-XD220-S.14	3-position	1000N	50mm	110~230VAC	3-position	-	high speed: 2s/mm low speed: 4s/mm
TW1001-XD220-SF2.14	3-position with 2 SPDT feedback	1000N	50mm	110~230VAC	3-position	2 SPDT feedback	high speed: 2s/mm low speed: 4s/mm
TW1001-XD220-S485.14	RS485	1000N	50mm	110~230VAC	RS485 NFC	RS485 NFC	high speed: 2s/mm ow speed: 4s/mm

3000N actuator



Type	Type Description	Rating Force	Stroke	Operating Voltage	Control Signal	Feedback Signal	Running Time (50Hz)
TW3000-XD220-S.14	Proportional	3000N	50mm	110~230VAC	0(2)~10VDC 0(4)~20mA	0(2)~10VDC 0(4)~20mA	high speed: 2s/mm low speed: 4s/mm
TW3000-XD220-S.14	3-position	3000N	50mm	110~230VAC	3-position	-	high speed: 2s/mm low speed: 4s/mm
TW3000-XD220-SF2.14	3-position with 2 SPDT feedback	3000N	50mm	110~230VAC	3-position	2 SPDT feedback	high speed: 2s/mm low speed: 4s/mm
TW3000-XD220-S485.14	RS485	3000N	50mm	110~230VAC	RS485 NFC	RS485	high speed: 2s/mm ow speed: 4s/mm

5000N actuator



Type	Type Description	Rating Force	Stroke	Operating Voltage	Control Signal	Feedback Signal	Running Time (50Hz)
TW5000-XD220-S.14	Proportional	5000N	70mm	110~230VAC	0(2)~10VDC 0(4)~20mA	0(2)~10VDC 0(4)~20mA	4s/mm
TW5000-XD220-S.14	3-position	5000N	70mm	110~230VAC	3-position	-	4s/mm
TW5000-XD220-SF2.14	3-position with 2 SPDT feedback	5000N	70mm	110~230VAC	3-position	2 SPDT feedback	4s/mm
TW5000-XD220-S485.14	RS485	5000N	70mm	110~230VAC	RS485 NFC	RS485	4s/mm

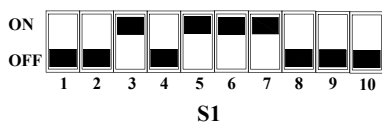
DIP Switch Instruction

Switch	Function	Description
S1-1	Starting of control / feedback signal	ON 20%:the starting of control/feedback signal is 20%(namely 4~20mA or 0~10VDC)
		OFF 0:the starting of control/feedback signal is 0(namely 0~20mA or 0~10VDC)
S1-2	Type of control signal	ON I:current signal
		OFF U:voltage signal
S1-3	Impedence match of control signal	ON U:voltage signal
		OFF I:current signal
S1-4	Type of feedback signal	ON IO:current signal
		OFF UO:voltage signal
S1-5	Operating mode	ON DA:When the control signal increase, actuator shaft extends;When the control signal decrease, actuator shaft retracts.
		OFF RA:When the control signal increase, actuator shaft retracts;When the control signal decrease, actuator shaft extends.
S1-6	Losing control signal mode	ON DW:When lose control signal (voltage type or current type), actuator will provide a min. control signal internally.
		OFF UP: 1)When lose control signal (voltage type),actuator will provide a max. control signal internally. 2)When lose control signal (current type),actuator will provide a min. control signal internally.
S1-7	Self-stroking mode	ON DF:Power on each time, self-stroking starts automatically.
		OFF RF:Self-stroking starts only when press the red self-stroking button manually.
S1-8	Control mode (when S1-9 is OFF)	ON 3-position type
		OFF Proportional type
S1-9	Control type	ON RS485 interface control(Modbus protocol)
		OFF Proportional type and 3-position type
S1-10	Sensitivity	ON High Sensitivity: 0.5%
		OFF Low Sensitivity: 1.0%

DIP Switch Instruction

Proportional Type

Control signal/feedback signal: 0~10VDC

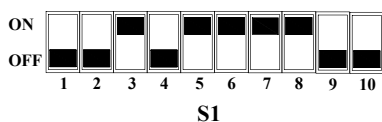


Proportional Type (Equiped with Dynamic balancing vlave)

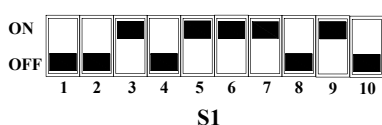
Control signal/feedback signal 0~10VDC



3-position Type
(the terminal O,E,Y doesn't work)



RS485 Bus Communication



When TW...is **proportional type**, terminal B,O is power input, actuator can be controlled by connecting terminal O,E

As shown in the left, when equipped with our TL.../TF.../TF...series **Globe Valve**, DIP Switch S1-5 is DA mode:

- Control signal at terminal O,E increasing: actuator shaft extends, valve stem retracts, valve tends to open.
- Control signal at terminal O,E decreasing: actuator shaft retracts, valve stem extends, valve tends to close.
- Control signal at terminal O,E has no changing, actuator shaft and valve stem stay in present position.
- When voltage (or current) signal is disconnected, this is equivalent to input a min. control signal, actuator shaft retracts, valve closed.

As shown in the left, when equipped with TPL.../TPF...series **Pressure Independent Control Valve**, DIP Switch S1-5 is DA mode:

- Control signal at terminal O,E increasing: actuator shaft retracts, valve stem extends, valve tends to open.
- Control signal at terminal O,E decreasing, actuator shaft extends, valve stem retracts, valve tends to close.
- Control signal at terminal O,E has no changing, actuator shaft and valve stem stay in present position.
- When voltage (or current) signal is disconnected, this is equivalent to input a min. control signal, actuator shaft extends, valve closed.

When TW...is **3-position type**, terminal B,O is power input, control the actuator by the switch O,UP,DOWN:

O, UP connected : actuator shaft extends, and valve stem retracts

O, DOWN connected : actuator shaft retracts, and valve stem extends

Notes:Terminal E,Y doesn't work by this time!

When TW...is **RS485 bus communication**, terminal B,O is power input, remote control by terminal 8,9: Actuator can be controled remotely by RS485 bus communication, actuator supports ModBus protocol.

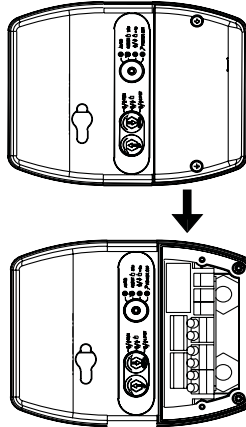
Notes : Terminal O,E,Y,UP,DOWN doesn't work by this time!



DIP Switch Instruction

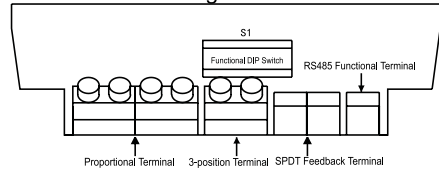
1. Open the cover when wiring, prohibit to disassemble other spare parts!
2. Carefully check the power voltage when wiring, wire according to the product parameter, if not, it may cause fire and endanger personal safety in severe case!
3. Please cut off power supply during wiring in order to ensure personal safety!
4. After wiring, please install the cover to the original position, avoid electric shock for the terminal!

1. Open the cover and prepare to wire.

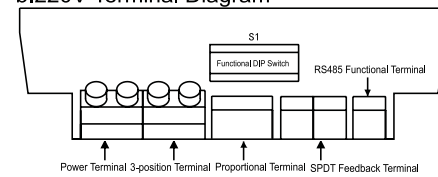


2. Wire correctly according to the wiring diagram.

a. 24V Terminal Diagram

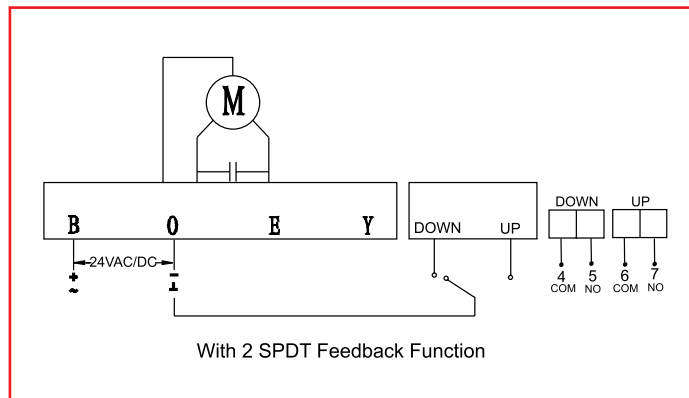
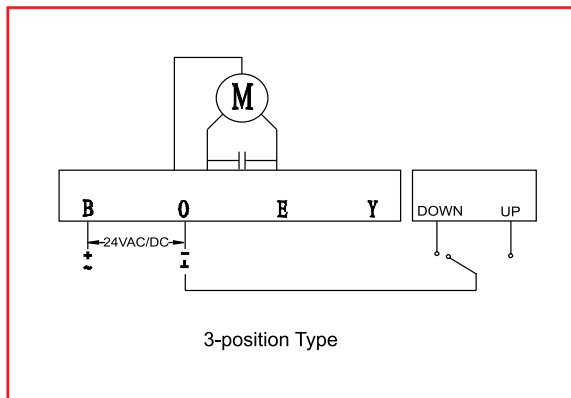
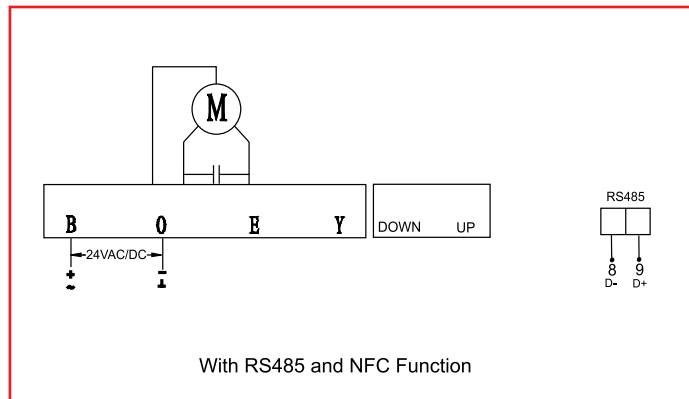
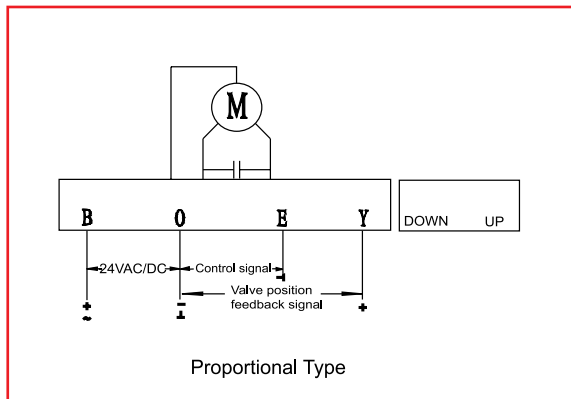


b. 220V Terminal Diagram

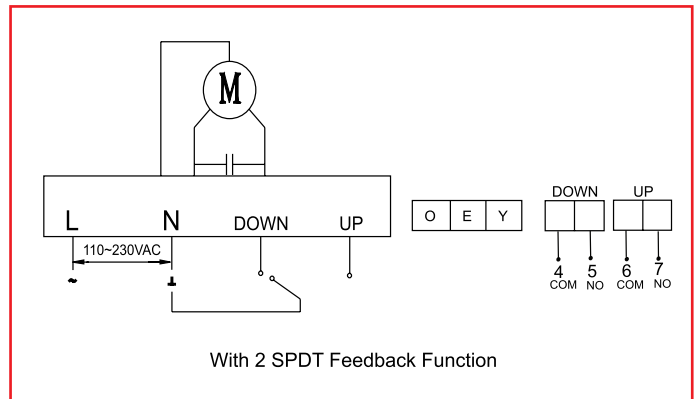
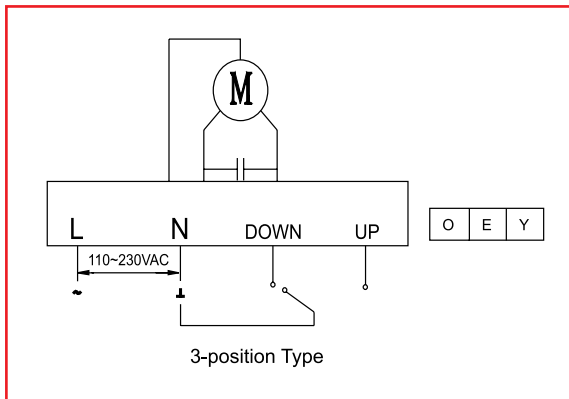
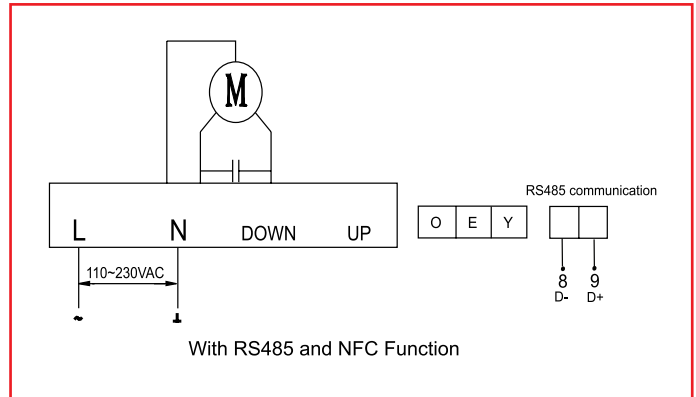
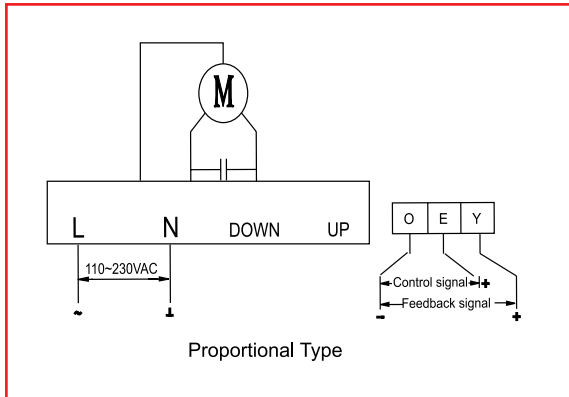


DIP Switch Instruction

TW...-XD24...Wiring Diagram



TW...-XD220...Wiring Diagram



Indicating Light



Reset Light	Reset	Status	Description
	Green	Always	Normal mode
	Red	Always	Local mode
	Yellow	Flickering (1Hz)	Self-stroking

Retractive Light-UP	UP	Status	Description
	Green	Always	Normal mode
	Yellow	Always	Reach upper limit position
	Red	Flickering (1Hz)	Alarming
	Red	Always	Local mode

Extended light-DOWN	DOWN	Status	Description
	Green	Always	Normal mode
	Red	Always	Reach down limit position
	Red	Flickering (1Hz)	Alarming
	Red	Always	Local mode



TW

Globe Valve Actuator



Debugging Instruction

- A. Connect actuator and valve body.
- B. Wiring power and control signal wires.
- C. Set DIP Switch to needed position. After the setting, turn on power of actuator, pre-setting function will come into effect. (DIP Switch can be set with power)
- D. Turn on the actuator power, actuator will run according to the given control signal.
- E. Actuator Self-stroking: this step is for matching stroke of actuator and valve.

- 1) Actuator shaft extends to down limited position firstly and the Reset yellow indicating light will keep flickering (frequency is 1Hz). And then, it retracts to upper limited position and the Reset yellow indicating light will keep flickering (frequency is 1Hz). (Actuator will not be controlled by signal now)
- 2) Indicating light stops flickering after about 3 minutes and the Reset indicating light turn green and keep on. Self-stroking stops and the matching modulating of the valve and actuator is finished. By then, actuator running direction can be controlled by control signal.

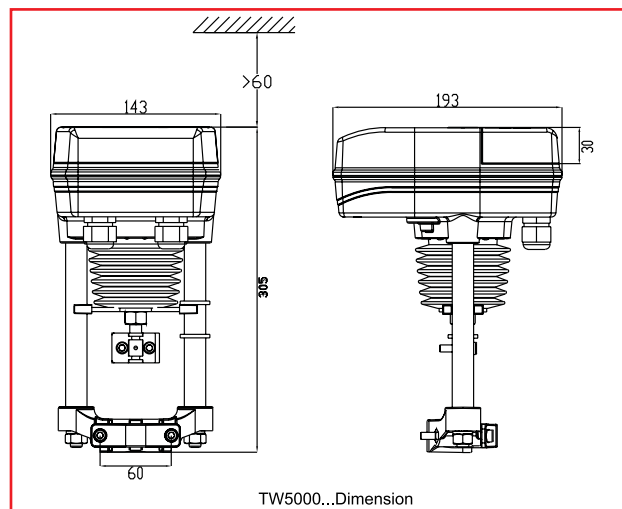
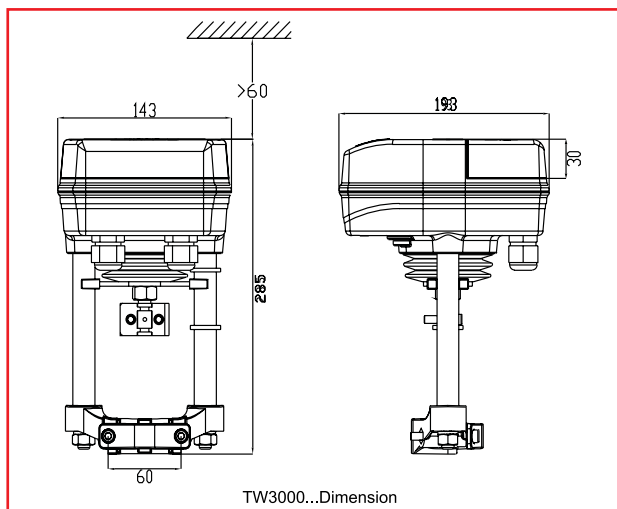
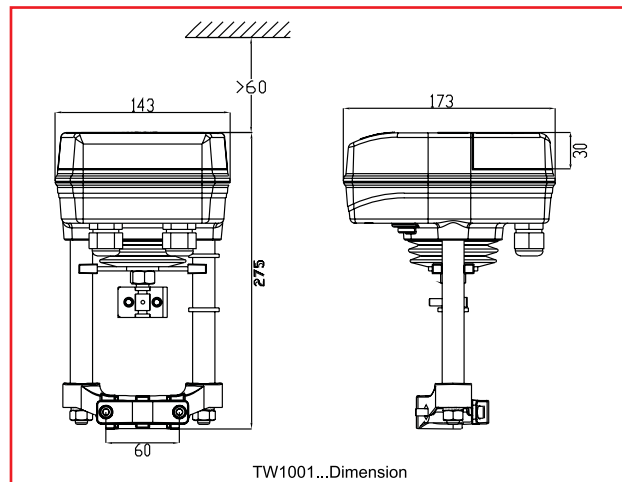
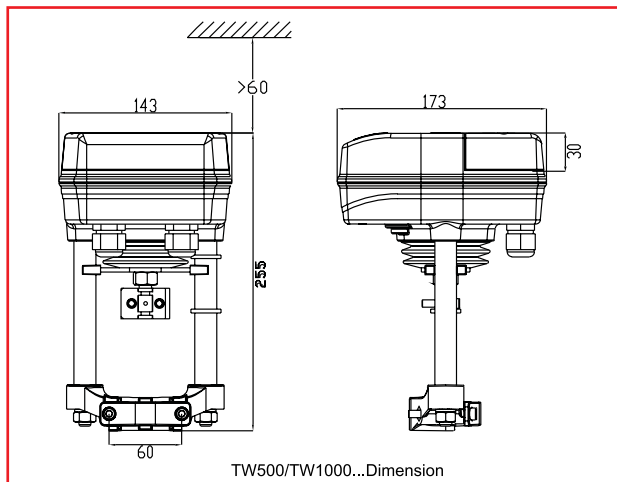
Remarks: If self-stroking is needed in a power-on state, press down the Reset button on PCB over 5 seconds, and then the actuator start self-stroking. Self-stroking phenomenon are the same as step (1), (2) above.

- F. Local mode:press the button UP and DOWN at the same time over 5s, loosen the buttons and actuator enter into local mode, at that time the UP, DOWN and Reset light will always be on red. If you need actuator run to "0", long press UP,the UP light will always be on green; if you need actuator run to "1",long press DOWN, the DOWN light will always be on green.After reach to the expected position,repress UP and DOWN at the same time over 5s, then loosen the buttons, it will exit the local mode.

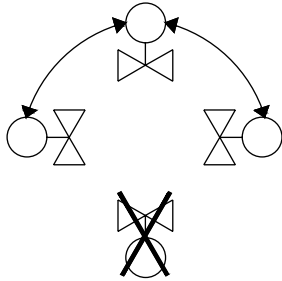
Note :

1. The factory default setting is automatic self-stroking, it means that actuator will repeat automatic self-stroking when power on each time.
2. If you don't need automatic self-stroking function, you can set the 7th switch to OFF. It will change into manual self-stroking (Phenomenon as same with (1), (2)).

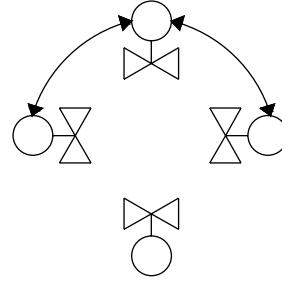
Debugging Instruction



Installation Orientation



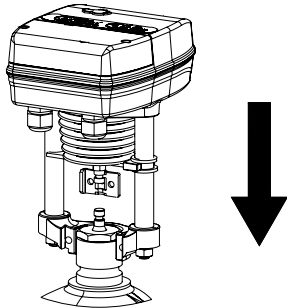
Medium is chilled/hot water
Downward installation is forbidden



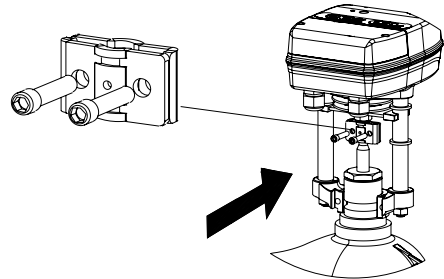
Medium is steam water
Any installation position is OK

Installation Orientation

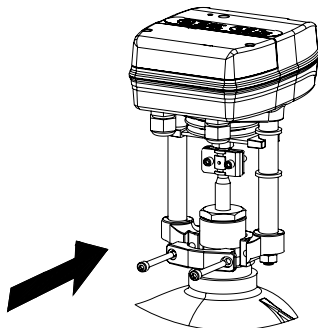
1. Prepare for assembling actuator, take down the fixed fitting, and disengage the clip.



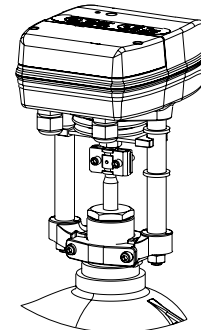
2. Made the actuator's stem is concentric with the valve's stem which can be observed from the hole, and make these two connecting faces keep coinciding. Then clock the two screws on the clip.



3. Pulling the fixed fitting to the groove and locking by two screws.



4. The status after assembled, face and back.





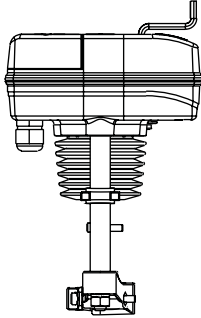
TW

Globe Valve Actuator

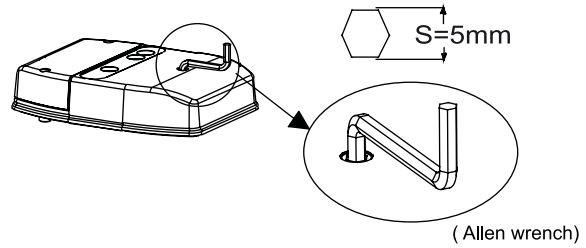


Manual Device Operation

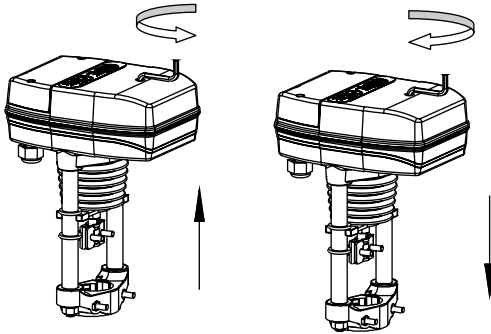
1. Shut off and prepare for manual operation.



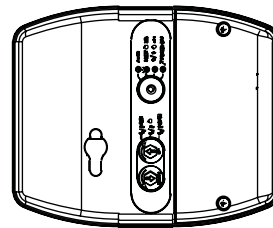
2. Insert the Allen wrench into the manual hole on the top of the cover.



3. Turn the Allen wrench anticlockwise, the actuator shaft retracts; Turn it clockwise, the actuator shaft extends.



4. Manual operation is done, take out the wrench and cover tightly the red plug.



Operating Parameters	
Electric Motor	DC Brushless Motor
Operating Voltage TW...XD24... TW...XD220...	24VAC±15%, C24VDC+15% 110~230VAC
Frequency	50Hz / 60Hz
Power consumption TW500/1000/1001-XD24... TW3000-XD24... TW5000-XD24...	Run: F14VA; Max.: 25 VA Run: F23VA; Max.: 35 VA Run: F27VA; Max.: 41 VA
Running speed	High speed: F2s/mm; Low speed: F4s/mm
Impedance(only for proportional type) voltage input impedance current input impedance	> 100K < 0.125K
Load requirements(only for proportional type) voltage output load requirement current output load requirement	> 1K < 0.5K
Control signal TW...XD... TW...XD...-S485...	0(2)~10VDC, 0(4) ~ 20mA RS485
Feedback signal TW...XD... TW...XD...-F2... TW...XD...-RS485...	0(2)~10VDC, 0(4) ~ 20mA 2 SPDT feedback RS485



TW

Globe Valve Actuator



Spare Parts Material	
Cover	PC
Bracket	Stainless steel
Base	Aluminum die casting
Environment Parameter	
Protection Level	IP54
*Permissible medium temperature	
Water valve	-25~+150°C
Steam valve	2~+180°C
High temperature steam valve	2~+220°C
Running	
Ambient temperature:	-10~+55°C
Ambient humidity:	≤ 95% RH
Transportation	
Ambient temperature:	-30~+65°C
Ambient humidity:	≤ 95% RH
Storage	
Ambient temperature:	-15~+50°C
Ambient humidity:	≤ 95% RH
*Remark: when medium temperature in valve is below 0°C, such as:refrigerant(R12,R22,R134a,R202) glycol and so on, valve stem should be protected by stem heater(Type:THOT...) to avoid the connection parts of valve body and valve stem frosting and icing.	
Weight	
TW500/1000/1001...	3.0 kg
TW3000/5000...	3.8 kg



RS485 Communication Function (Optional)



RS485 Communication: there is RS485 communication interface on the PCB

RS485 Communication can set the control mode of actuator:Remote(Modbus)Control, Local control.

- It can control the actuator opening remotely.
- It can ready the valve position feedback value remotely.
- It can ready the actuator operating status remotely.
- It can set the actuator operating speed, sensitivity, dead zone and so on remotely.

RS485 Communication Function (Optional)



NFC supports the actuator's parameter reading and setting without the electricity supply. Open the mobile NFC client and close to the actuator NFC scanning area. After connected, it can set the actuator parameters.

As shown on the left, the NFC client mainly contains the Actuator basic parameters, Actuator configuration parameters and Advanced functions, the function of each part is shown as below:

- Actuator basic parameters: the actuator feedback,running cycle,current time and valve stroke can be read.
- Actuator configuration parameters: the actuator curve type,running speed,actuator address, opening range, dead zone,sensitivity can be set.
- Advanced functions: it contains signal division and conversion function, winter and summer mode conversion function and so on.

Notes:

1. Current type actuator can't set signal division,please use the function after setting voltage type.
2. The factory default of winter and summer mode conversion function is close state, when using the function, actuator must in a power on state.
3. The default address is 1.

