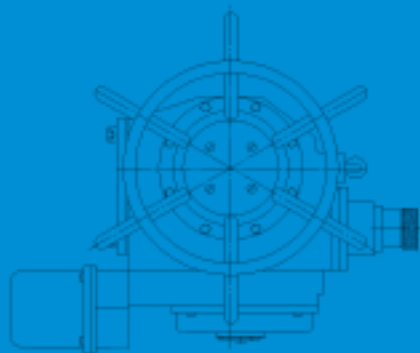
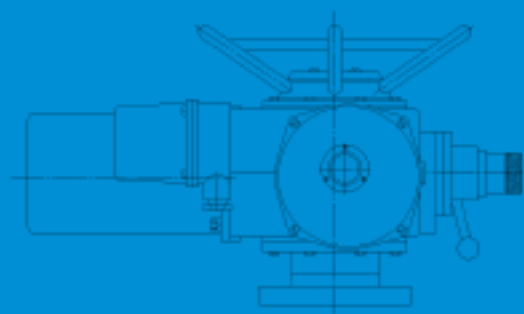


M—TYPE

Valve electric actuator
User's Guide

BERRE Yangzhou Bell Valve Control Co.,Ltd



I . Summary

The multi-turn valve electric actuator, generally known as M-type, can be utilized on linear-action valve such as gate valve, diaphragm valve, check valve and water valve. Used to open, close or modulate valves. The actuator is indispensable for the remote control, centralized control or self-control of the valves. This versatile device features small size, light weight, reliable performance, advanced control system and ease of maintenance; which allows for a wide range of use in many industries like petroleum and chemical industries, power stations, water treatment and paper-making industries. In terms of working environment, the equipment can be classified into four types: MS(The outdoor type); ME(The explosion-proof type); MW(The integral type); MA(The integrated-regulating type).

The performance of this product conforms to the stipulation of JB/T8528-1997"General valve Electric Actuator Technical conditions". Its explosion-proof performance conforms to the stipulations of GB3836.1-2000 "Electrical Apparatus for Explosive Gas Atmospheres Part 1: General Requirements", GB3836.2-2000 "Electrical Apparatus for Explosive Gas Atmosphere's Part 2: Flameproof Enclosed" and JB/T8529-1997"Explosion-proof valve Electric Actuator Technical Conditions".

II . Working Conditions and Technical Data

1.Conventional Features

1.1.Power Source: The is three-phase AC380V (special orders 220V or 660V), 50HZ (special orders 60HZ); The control line is 220v, 50HZ (Special orders 60HZ); Remote control is 24V DC.

1.2.Ambient Temperature: $-20^{\circ}\text{C} \sim +60^{\circ}\text{C}$ (special orders $-40^{\circ}\text{C} \sim +80^{\circ}\text{C}$).

1.3.Relative Humidity: $\leq 95\%$ (when 25°C).

1.4.Surrounding Mediums: The outdoor type is used for environment free of combustible, explosive and corrosive mediums; The explosion-proof products include d I and d II BT4; d I is suitable for the working face of the coal mine where no excavating undertaken; and d II BT4 can be applied in the factories, where the explosive gases mixture meets the requirements for the Environment (II A, II B T1-T4).

1.5.Protection Class: IP55 - IP67 for the outdoor type and explosion-proof type.

1.6.Operation Rule: Only 10 minutes at a stretch (special orders 30 minutes)

2.Intelligent module Features

NI3 intelligent electric actuator control module, the use of advanced micro-computer, surface mount (SMT), electromagnetic compatibility (EMC) technology, large-scale use of ASIC modules.

NI3 intelligent electric actuator control module via remote control, field control, centralized control bus (optional) and control of the valve to achieve open, close and adjust.

Having control principle advanced, full-featured, long-term stable and reliable, high integration, heat a small, easy handling, maintenance and simple, and can be through non-invasive infrared remote control Quick Setup.Using wide viewing angle LCD Segment LCD display, there are two kinds of Chinese and English menu display interface optional operating parameters of the valve, working status can be clear and intuitive on-site monitoring.And remote centralized monitoring (optional) The RS485 or signal output cables and the control room.

- 2.1. The original adoption of the European advanced products as a central microprocessor, combined with modern advanced electronic technology, integrated SMT placement process, wide module supply voltage range, anti-jamming, online programming, meet valve harsh working environment, sustained and stable operation , precise control requirements.
- 2.2. Non-intrusive design, commissioning simple and intuitive; wide viewing angle LCD menu display screen: There are two kinds of English language options;EEPROM power comes from the central microprocessor and memory function, the valve set parameters and display real-time operational data storage;Various malfunction, valve head opening, timely load current, input current signal value, the valve head working conditions, control mode, select the bus function, stroke setting and other parameters and status of all valve head can be carried out on the LCD monitor display, Settings.
- 2.3. Module output displacement precise positioning, the overall proportion of regulated amplifier modules, analog to digital conversion, position transmitter function integrated, real mechatronics, control integration, modulating module receives a 4 to 20mA output 4 a 20mA current signal .Switching module receives the potentiometer resistance signal, the switch valve head by controlled Gui control.
- 2.4. In order to overcome the inertia of the valve head run-down, precise positioning, adjust type modules with reverse braking.
- 2.5.Four non-through type magnet control electrical shell Hall element operation.
- 2.6. Electronic brake and non-sparking commutation technology, thyristor control output, to ensure the normal output by two interlocking software and hardware.At the same time using a load off, no sparks commutation technology.
- 2.7. Electrical output can be any configuration to meet the needs of different conditions.
- 2.8.Complete Multiple protection features:
 - A: input and output signal optical isolation, with 2.5KV rms high voltage protection;
 - B: two-way over-travel protection function: When the actuator output exceeds the effective travel itinerary, the function is activated, LCD monitor display on or off overload overload newspaper glance, while a passive switching point and closes the alarm signal, suggesting that site operators;
 - C: automatic phase commutation function: real-time detection phase sequence, when there is wrong with the motor running in the wrong direction cause, the module automatically closes the valve head commutation;
 - D: phase detection: module with input power phase detection and motor output phase loss

- detection, phase failure, the module automatically closes the valve head, fault signal closes;
- E: motor overheating, instantaneous reversal, power, overload integrated fault alarm;
- F: off signal protection: When the signal is interrupted unexpectedly actuator stops in the current working location will not cause fully open, fully closed phenomenon, to ensure stability, security, fault alarm signal point of the whole system is closed;
- G: state control password lock function;
- H: Sensor fault protection: After the position sensor or actuator failure itself 5S not run continuously collected signal changes, or the open valve, close the valve signal, etc. Instead, the module automatically closes the valve head on the LCD screen "full," "full off" "Meanwhile flashing fault report glanced signal closes.
- 2.9. Use a single-turn potentiometer or multi-turn potentiometer two kinds of angle detection mode.
- 2.10. Automatic switching function: Series modules allow "remote automatic / remote manual / scene" three working state switching; Remote Open, Close signal can be received DC24V, AC220V two kinds of signals; infrared remote control operation, and field operations set the same way.
- 2.11. Fieldbus function (optional): optional RS485 industrial bus communication interface, optional Modbus RTU communication protocol and PROFIBUS can also be designed other communication interfaces and protocols as required.
- 2.12. ESD emergency function selection: emergency action in place, fully open, fully closed, usually set to retain the factory-situ manner.
- 2.13. It has a positive reaction to select functions to meet the needs of actual control.
- 2.14. Full stroke setting, input and output calibration function.

3. Technical Date of M-type series

Table1

Model Number	Rated Torque (kgf • m)	Max Stem (mm)	Max Turn (R)	Manual Ratio	Output Torque (r/min)	Motor Power (KW)	Power current (A)	Weight (Kg)
5	50	28	60	1:1	12	0.13	0.58	27
11	110	28			18	0.26	1.04	44
16	160				18	0.38	1.39	48
21	210	40			18	0.38	1.39	49
31	310				18	0.56	2.22	52
47	470	48	24		1.11	4.03	103	
62	620		24		1.51	4.14	105	
93	930	60	24		2.22	5.27	130	
123	1230		24		3.2	8	135	
184	1840	70	150	22.5:1	18	4.03	8.88	230
254	2540				18	5.5	12.05	240
355	3550	80	150	20:1	18	7.5	15.6	320
505	5050				18	10	20.5	340
806	8060	80	120	90:1	12	13	23.4	680
1006	10060	100			12	15	26.6	710

Note:we provide the electric actuators of other rotational speeds according to the use's requirements.

III. Model Order code

M —
1 2 3 4 5 6 7

1. Product Type: M Series
2. Feature selection: S represents the ordinary type, E represents proof type, W represents the overall type, A represents regulated, I represents intelligent non-invasive type, B represents bus, D represents special.
3. Rated output torque: Binning Table 1 below. Unit N.M (kgf • m)
4. Connection: F indicates flange No., T represents a thrust type, L represents a linear stroke, D represents special.
5. speed: Output shaft speed is 12r / min (r / min), 18r / min, 24r / min, 36r / min, 48r / min, 72r/min.
6. Functionality: S represents the conventional type, F represents the signal feedback 4~20mA, R represents the remote control, K represents the ordinary type with push-button, D represents special.
7. voltage: 2 represents the AC220, 3 represents AC380, 4 represents AC415, D represents special.

***Demonstration as follows:**

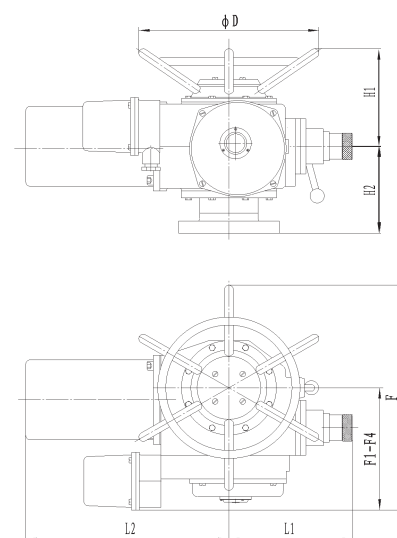
Model MS11F21-18S3 explanation: M series, Conventional ordinary products, the output force of 110 kgf • m, connected to the valve flange number of F2I, speed of 18 rev / min, conventional-type voltage 380V.

IV. Outline and Connection Dimension

1. Dimensions

Table2

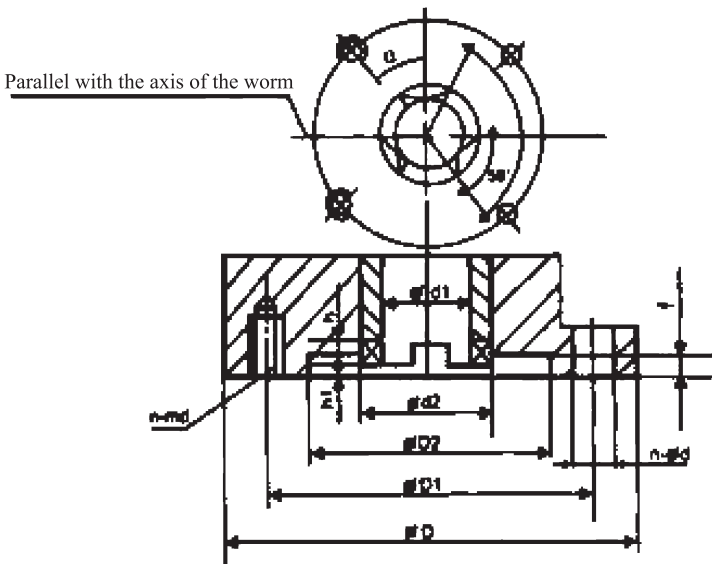
Torque Binning	H1	H2	L1	L2	F	F1	F2	F3	F4	φ D
5	230	96	135	245	140	195		280		175
11~31	315	135	205	295	185	240	320	300	320	315
47-62	435	195	280	405	240	250	405	315	405	475
93~123	440	200	300	480	250	305	435	360	435	490
184-254	625	280	330	510	310	340	495	410	495	315
355-505	625	280	330	540	310	340	495	410	495	315



Note: F1 are the outdoor type, F2 are the explosion – proof type, F3 are the integral type.

Picture 1 Outline drawing.

2.Torque type connection dimensions shown in Piture 2 and Table 3

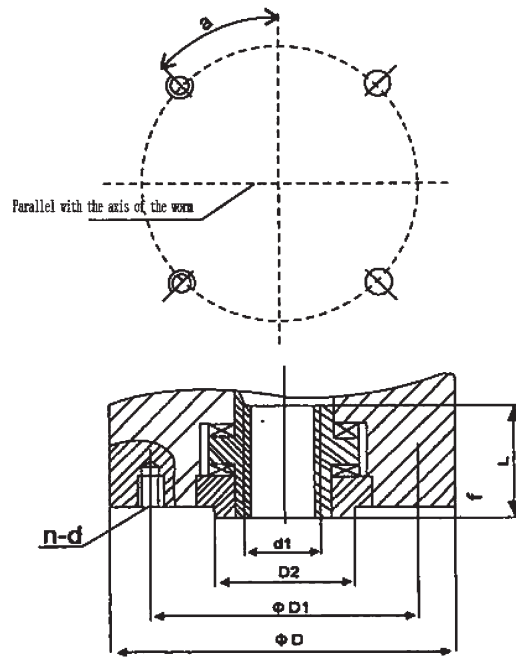


Picture 2: Connection dimension drawing

Table3

Model Number	Torque Type JB2920											
	Flanged Number	D	D1	D2 (H9)	h1	f	h	dl	d2	d	n	a
5-16	2	145	120	90	2	4	8	30	45	M10	4	45°
	2I	115	95	75			6	26	39	M8		
21-31	3	185	160	125			10	42	58	M12		
	3I	145	120	90			8	30	45	M10		
47-62	4	225	195	150			12	50	72	φ 18		
93-123	5	275	235	180		5	14	62	82	φ 22		
	5I	230	195	150			12	50	72	φ 18		
184-254	7	330	285	220		3	6	16	72	98		
355-505	8	380	340	280	20			83	118	φ 22		
806	9	430	380	300	8		25	85	128	φ 26		
1007	10	510	450	360			30	105	158	φ 33		

3. Thrust connection dimensions shown in Picture 3 and Table 4



Picture 3: Thrust dimension drawing

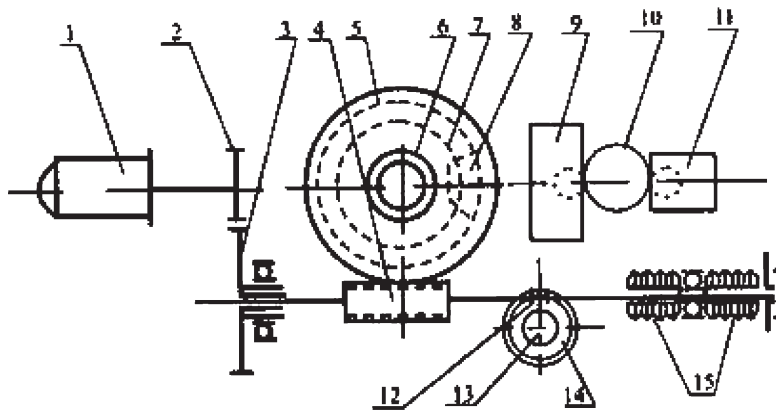
Table4

Model Number	Thrust Type GB12222									
	Flanged Number	D	D1	D2 (f8)	f	d1 max	d	L	n	a
5-16	F10	125	102	70	3	T28	M10	40	4	45°
21-31	F14	175	140	100	4	T36	M16	55		
47-62	F16	210	165	130	5	T44	M20	70		
93-123	F25	300	254	200		T60	M16	90	8	22.5°
184-254	F30	350	298	230		T70	M20	110		
355-505	F35	415	356	260		T80	M30	150		

V. Components.

M-type electric actuator consists of motor , speed reducer , moment of force control apparatus, traveling control apparatus , opening indicator , manual-electrical changing mechanism ,hand wheel and electrical part . The outdoor type utilizes the incorporate round rim and O-ring to seal; while the seal design of the explosion –proof type is the same as that of the outdoor type but an explosion-proof face is added to the explosion-proof type in addition to the same seal design . The explosion-proof junction box and three –phase motor which specially designed to the

outdoor type , corrosion and explosion-proof the electrical valve of series YBDF. See picture 4 about its transmission principle:



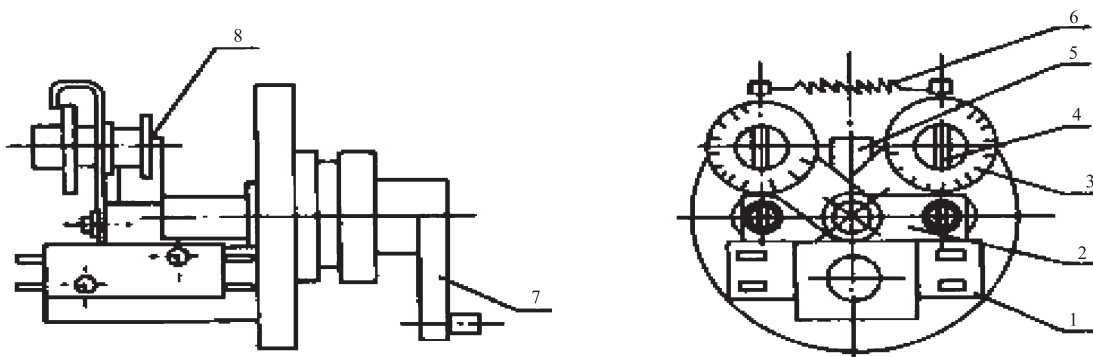
Picture 4

1. Motor 2.3 . Spur Gear. 4. Worm 5 .Worm gear. 6. Output Shaft. 7. 8 Bevel Gear 9. Travelling Control Apparatus. 10 .Middle Gear 11. Opening Indicator 12. Worm Round Grave 13. Crank 14. Torque Control Apparatus. 15 .Butterfly Spring .

5.1 Motor : The outdoor type utilizes the YDF-type motor and the explosion-proof type adopts the YBDF-type three-phase asynchronous motor which specially designed for the valve.

5.2 Speed reducer : Speed reducer is composed of a pair of spur gears and worm gear pairs .The motive force of the motor transfers from speed reducer to the output shaft.

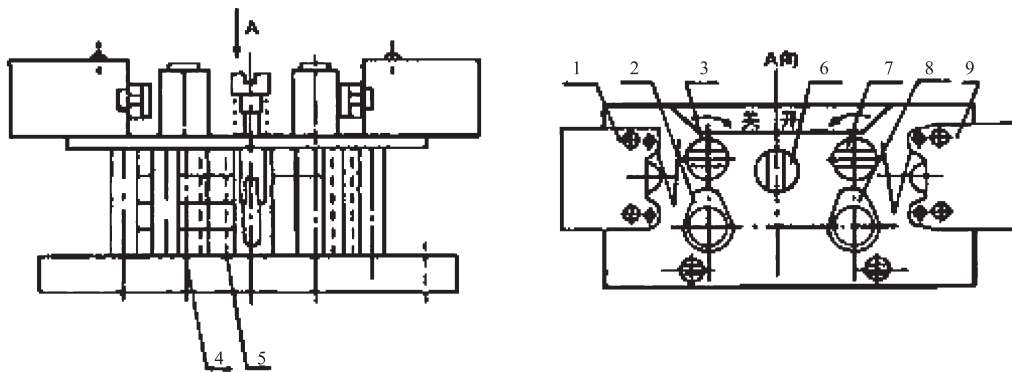
5.3 Torque control apparatus : Torque control apparatus is a commonly used part for the M-series , its components see Picture 5. When a certain amount of torque is applied to the output shaft , the worm will rotate and move to drive the crank which in turn causes the block collision to press the cam and raise the support will lift until the microswitch disconnects the power source and stops the motor so as to control the output and protect the valve .



1. Microswitch 2. Support 3. Calibrated Dial 4. Adjustment Shaft 5. Block Collision 6.Extension Spring 7. Crank 8.Cam

Picture 5: Torque control apparatus

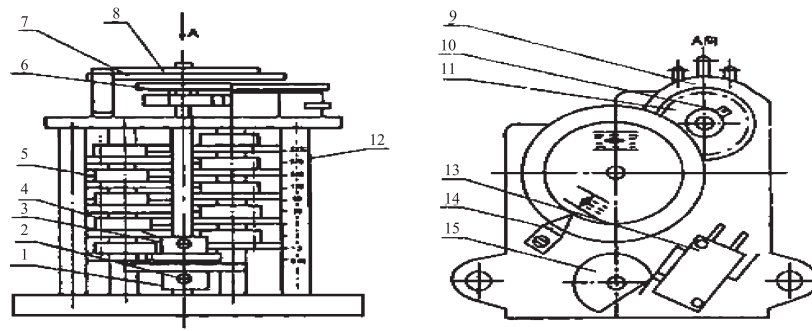
5.4 travelling control apparatus: traveling control apparatus utilizes the same principle as the decimal counter with a high precision. It is also the commonly used part for the m-series (see picture 6). Its working principle is as follows :A pair of big and small bevel gears in the speed reducer box drive the active small gear ($z=8$), and drive the counter to work. If the counter has been adjusted according to the closed /opening position of the valve, then when the counter reaches the preset point , the cam will turn 1/4-turn and force the microswitch to cut off the power source and stop the at this time, thereby controlling the revolutions number



1.Close Microswitch 2.Close Cam 3.Closed Adjustment Shaft 4.Idle Wheel 5.Counting Gear
6.Roof Bar 7.Opening Adjustment Shaft 8.Opening Cam 9.Knife Microswitch

Picture 6: Travelling Control Apparatus

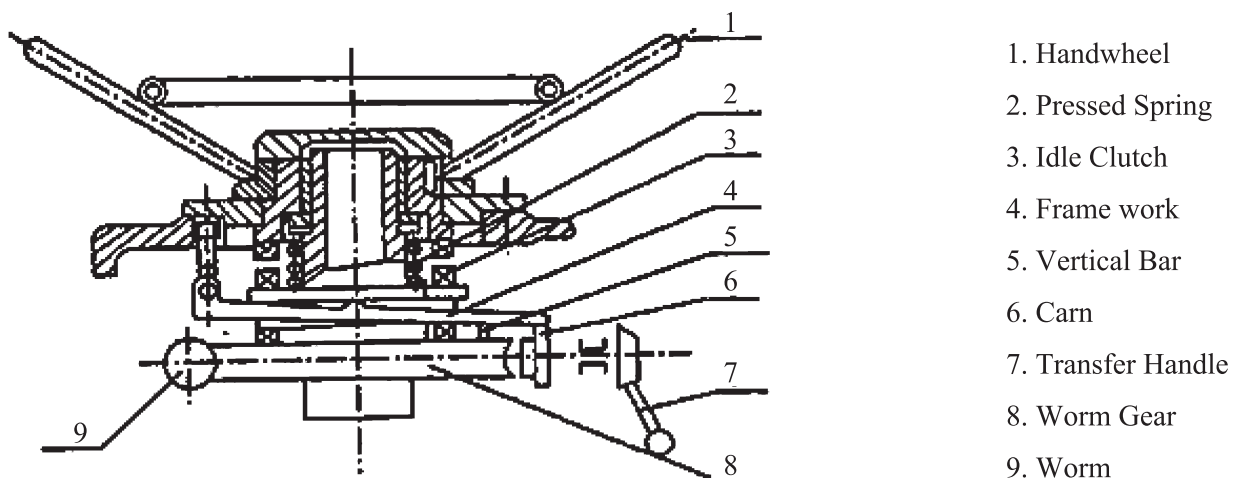
5.5.Opening indicator: opening indicator is also a commonly used part for z-series. see picture 7.started by the unit gear of the counter , input gear slow down and turn the indictor dial to indicate the close/opening of the valve. The potentiometer rotor turns as the indicator dial rotates ,which enables the opening indication of remote transmission , the opening indicator is equipped with a microswitch and cam, the rotational cam periodically causes the microswitch to act during the operation of the actuator , its frequency being one 1 tow actions for one turn of the output shaft, which provides the flash signal .



- 1.Input Gear 2. Fixing Screw 3. Fixing Screw 4. Revolutions Adjustment Gear 5. Step Gear
6. Opening Gear 7. Closed Indicator Dial 8. Opening Indicator Dial 9. Potentiometer 10. Fixing Screw
11. Potentiometer Gear 12. Revolutions Signal 13. Flash Switch 14. Pointer 15. Flash Cam

Picture 7: Machinery-type Opening Indicator

5.6 manual – electrical changing mechanism : manual – electrical changing mechanism is a semi-automatic system , which consists of handle ,cam, frame work ,vertical bar, middle clutch, pressed spring and so on, see picture8,when the hand wheel is used for operation, first push the transfer handle in the manual direction and cause the cam to turn with the handle shaft, lift the framework the idle clutch and in turn so to press the pressed spring. The idle clutch disengages from the worm gear and meshes with the hand wheel when the handle is pushed to a certain position, then the acting force of the hand wheel transfers to the output shaft to reach the manual state. when the frame work rises to a certain height, the vertical bar will erect on the surface of worm gear by the torsion spring force, which supports the framework so as to keep the idle clutch from falling down, release the handle when it is pushed to the manual position and the use the hand wheel to operate. The vertical bar falls down as the motor drives the rotation of the worm gear, the idle clutch moves to the worm gear by the pressed spring force and meshes with the worm gear, there by reaching the electrical state



Picture 8: Manual-electrical Changing Mechanism

VI. Electrical part of the structure of intelligent switching and modulating

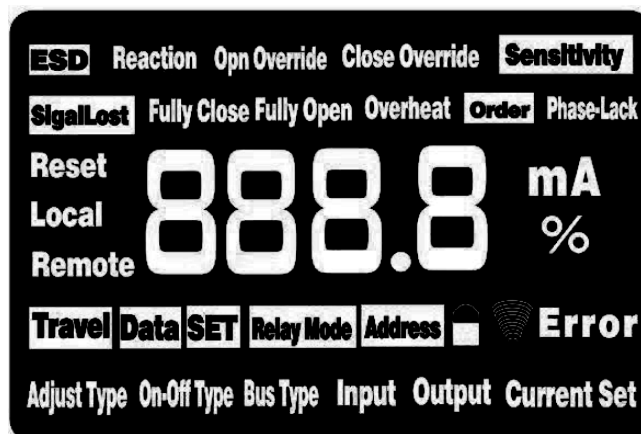
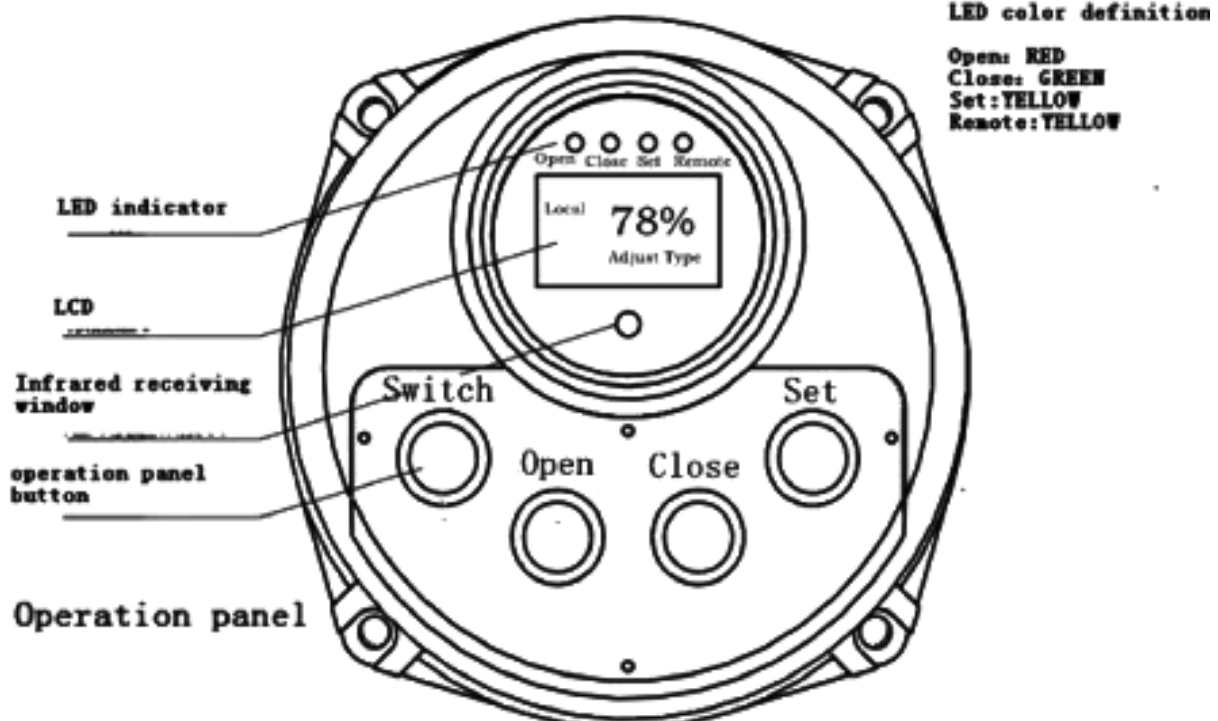
follows

i IR Remote Control

1. The remote control Power supply with 3v, has been installed at the factory.
2. There are "OPEN" "CLOSE", "SET", "SWITCH", "ADD", "REDUCE" six buttons on the remote control.
3. When the remote distance is short , replace the battery.



ii Operation panel & LCD display



iii Setting&Debugging

1. Without opening the actuator cover, you can use the control panel buttons and IR remote control are two ways to set the parameters of the actuator or debugging. (Infrared remote control operation is more suitable for the explosion hazardous areas.)
2. Electric valves run and debug data are stored in the control module memory, users can view all function parameters in the LCD window.
3. When setting parameters, to ensure the actuator is shutdown

4. System Set

Figure 1 local keyboard locked, while holding down the button “Open ” and “Close ” for 3s or press the IR remote control button, the system unlock, enter figure 2 . By pressing the “Set” button to switch between "remote" and "local", (at the same times clearing the Error information). Switch system to "local", and then press “Set” for 3s entering figure 3, travel / data set.

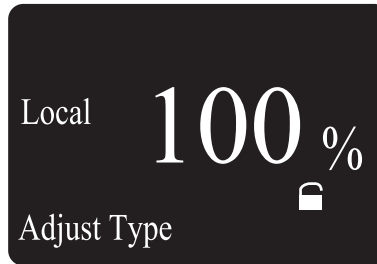


Figure 1

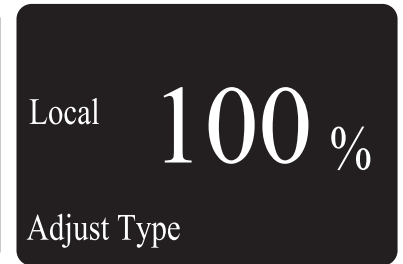


Figure 2

4.1 Travel / Data Set

Figure 3, you can press the “add” or “reduce” to select the menu that you want to entry. When “travel set” is elected, "travel" constantly flashing. At this point, if you press the “Set” entering figure 4, Fully Close travel setting. If the selected Data set, the "Data" is flashing, press the Set button, the system enters the Data setting.

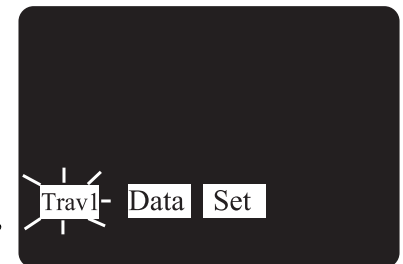


Figure 3

4.2 Fully Close travel Set

"Fully Close " flashing, manual or electric make the valve moves to the fully closed position, then press the “Set”to confirm, the system automatically enters the figure 5 *Fully Open Travel Set* .

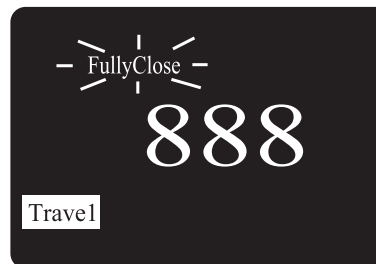


Figure 4

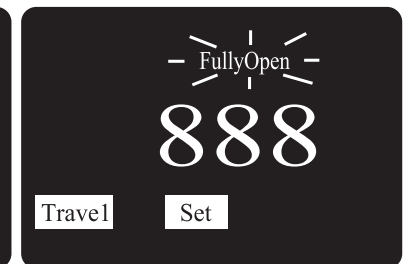


Figure 5

4.3 Fully Open travel Set

"Fully Open " flashing, manual or electric make the valve moves to the fully open position. If at this time press the system will save setting data and exit the system settings back to the working state.

4.4. Password Input

At figure 4 ,If the selected Data set, the "Data" is flashing, press the Set button, the system enters the figure 6. Input command password “211” , press “add” or “reduce” to adjust present number and press “set ” to confirm and move to the next number ,Only input the right password you can enter the data set ,otherwise system will exist set mode automatically . If the remote control mode is the

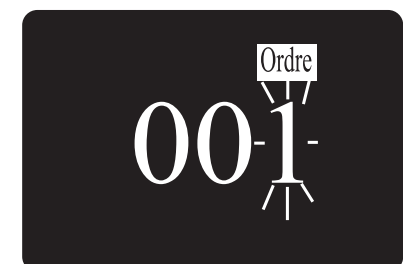


Figure 6

On-Off-bus type or Adjust-bus type, the system automatically enters the figure 18, On-Off type or Adjust type, the system automatically enters the figure 7.

4.5 Address Set (Bus type)

After entering this figure , the default display is the current address by pressing “add” or “reduce” buttons can be re-set the address, press the Set button to confirm, the system automatically enters the figure 7 relay mode set..



Figure 18

4.6 The Passive feedback Relay Mode Set

There are 4 relays,you can redefine .Pressing “add” or”reduce” button to choose relay functions, and confirm it with “set” button. four relay functions: local /remote, error alarm , open overload ,close overload ,fully closed, fully open.the number on the on the screen represents the corresponding K1 - K4 relay driver board, the words indicates the function corresponding to the relay , press the "set" key to confirm, the system enters the "figure 8 ESD input control mode selection ".(Default set :1-local ,2-Error,3-open overload,4-close overload.)

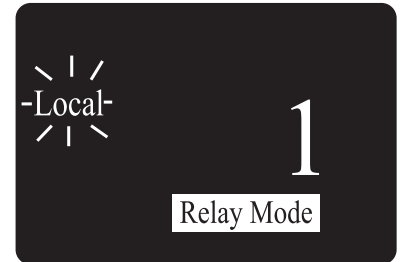


Figure 7

4.7 ESD action

Press the "add", "reduce" button to choose the ESD action. The value of LCD refer actuator movement times, the actual action is10 times as display value . Press "set" button, the system automatically enters the figure 9.The default set is Reset .



Figure 8

4.8 Signal lost action (on-off type without this option)

Press the "add", "reduce" to select the data , Press "set" button, the system automatically enters the figure 10. The default data is Reset .



Figure 9

4.9 Reaction mode selection

By “add”or “reduce”button to set the input signal Reaction. Press "set" key to confirm, if you press the "switch ” button at the figure of 8 , the system will entered figure 19 , otherwise the system entered figure 11 The default input signal is positive.

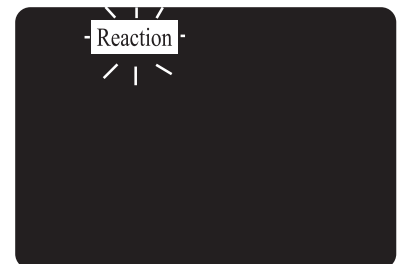


Figure 10

4.10 Input 4mA Current Calibration (Adjust type)

you should input 20mA current signal , then press "set" system save the data and enters the figure 20.

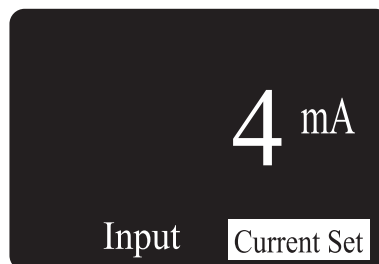


Figure 19

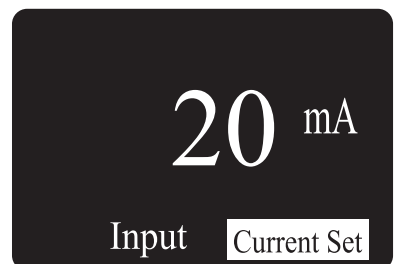


Figure 20

4.11 Input 20mA Current Calibration (Adjust type)

Before Calibrating ,you should input 4mA current signal , then press "set" system save the data and enters the figure 11.

4.12 Output 4mA Current Calibration

When calibrated output 4mA current, connect ammeter to monitor the output current. By pressing “add” “reduce” button to adjust the output current. When the output current is just 4mA, press the Set button to

confirm. The system enters the figure12.

4.13 Output 20mA Current Calibration

Press the "add", "reduce" button to change the output current, when adjust the current stability to 20mA, press the "set" to confirm. Adjust type enters the figure 13, On-Off type enters the figure 16.

4.14 Sensitivity set

Press "add""reduce" button can adjust the sensitivity of the system, the default value is 10. Press the "Set" to save the parameters, the system enters the figure 14.

4.15 Motor inertia volume Set

Press "add" or "reduce" button to adjust the amount of inertia of the motor, the default value is 5. Suitable inertial system settings can improve control accuracy. Press the Set button to save the parameters, the system enters the figure 15. Motor inertia volume value should be less than the sensitivity value. The default value is 0.5%.

4.16 Remote control signal selection

Press the "add" or "reduce" button to select remote control mode, can be set as follows: F0 -Inching, F1 - Maintain, F2 -Open with Signal On/Close with Signal Off. F3 -Close with Signal On/Open with Signal Off. Press the Set button to save the system enters the figure 15. The default set is F1-Maintain .

4.17 Scale display mode

Press the "add", "reduce" button to choose and to press "Set "to confirm, then it exits set mode automatically and it starts to work. Then it exits set mode automatically and it starts to work.

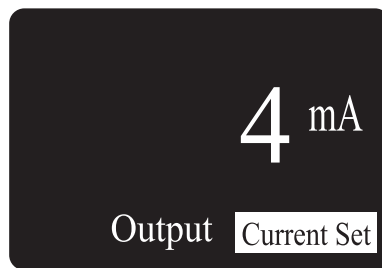


Figure 11

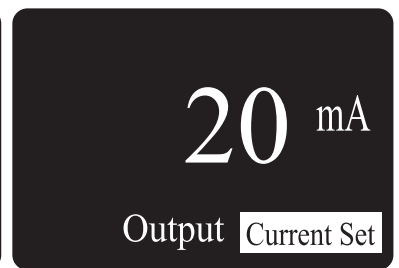


Figure 12

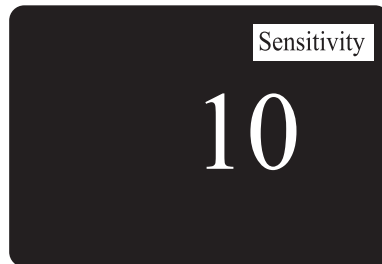


Figure 13



Figure 14



Figure 16

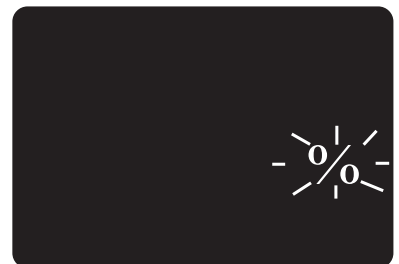


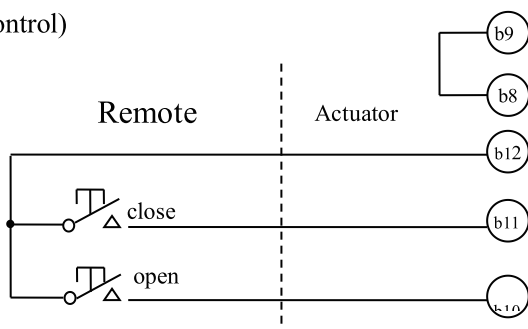
Figure 15

iv Remote Control

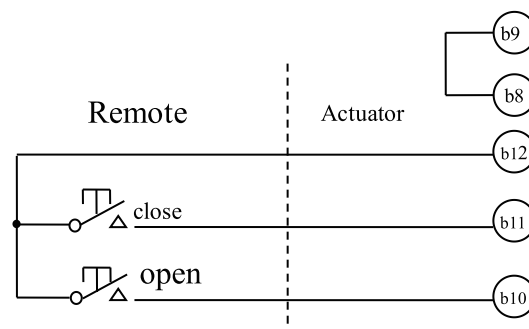
1.On-Off control (On-Off type)

a.Remote control signal selection is F0 or F1 (figure 16).

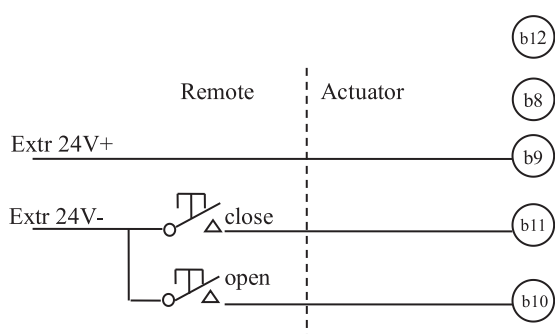
(In the process of opening or closing the valve, if the closed Stop-Signal, stop valves, may optionally be opened or closed off signal to achieve the stop valve control wiring can achieve the following 4 Maintain control)



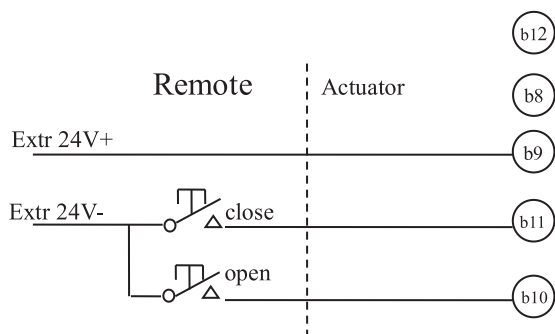
Remote control wiring diagram 1



Remote control wiring diagram 2



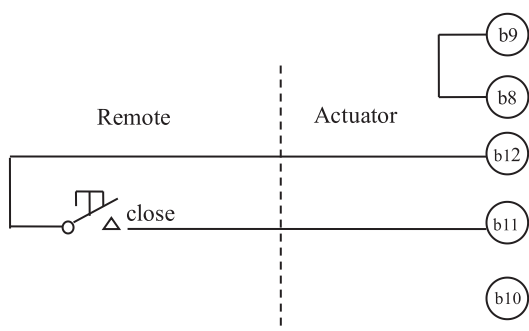
Remote control wiring diagram 3



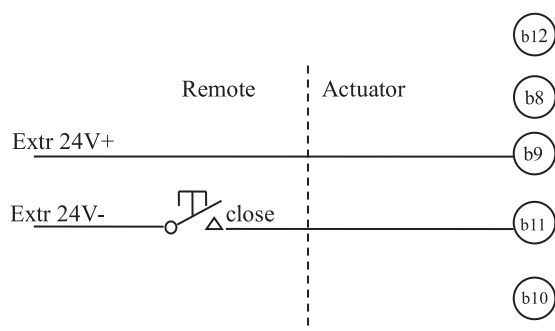
Remote control wiring diagram 4

b. Remote control signal selection is F2 or F3 (figure 16).

If the remote control mode is set to “F2”: Open with Signal On/Close with Signal Off, then you can achieve the two-wire control: When receiving the remote signal, did not close the valve opens. If the control mode selected settings “F3”: Close with Signal On/Open with Signal Off. to (when a signal is received, the valve is closed, there is no signal to open the valve)

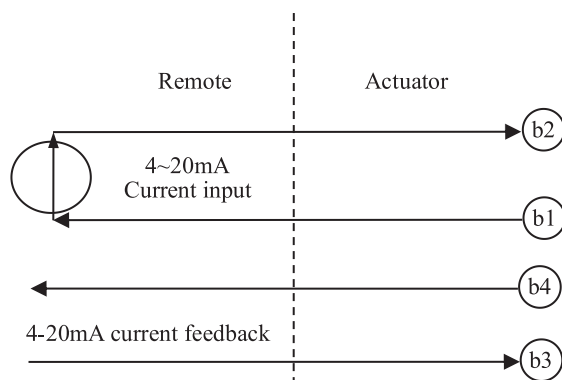


Remote control wiring diagram 5

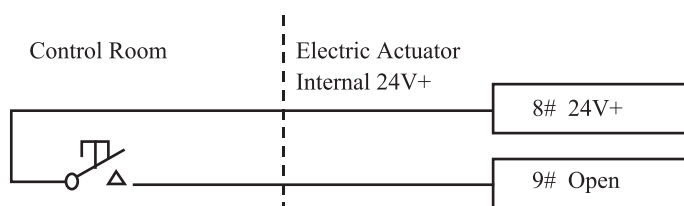


Remote control wiring diagram 6

2. Analog signal control(Adjust type)



Remote control wiring diagram 7



Remote control wiring diagram 8

v Errors & Solution

No.	Error	Cause	Solution
1	Nothing on display or led indicator off	No power supply or power cord off	Check the power supply
		Fuse on wiring board broken	Replace fuse as the same time
		Socket component of display off	Check wiring of socket component
		Circuit element of display broken	Contact for repair or change display
		Contact element of main board broken	Contact for repair or change main board
2	Button no response	Socket component of display off	Check wiring of socket component
		Circuit element of main board broken	Contact for repair or change main board
		Button on actuator installed wrongly	Contact for repair of change button
		Button on display broken	Contact for repair or change display
3	remote control no response	Battery runs out	Replace battery
		Remote operate distance shorten	Replace battery
		Circuit board of remote broken	Contact for repair or change remote
4	phase-lack on display	Power supply cord off	Check the power supply
		Power supply for main board unstable	Check the supply of main board
		Contact wiring off broken	Checking wiring of Contact or change Contact
		Circuit element of main board broken	Contact for repair or change main board
5	Overheat on display	Motor in high temp when over-work	Cool motor and use it after solving problem
		connector cable loose	Check the connection cables
		Motor temp sensor broken	Contact for repair or change
		Circuit element of main board broken	
6	Open overload or close overload	Overload when valve open /close or in fully open/close position	Certain substance stuck in the pipe or valve and clean it
		Short of start Overload value	Change actuator with larger torque
		Torque controller broken	Contact for repair or change torque controller
		Circuit element of main board broken	Contact for repair or change main board
7	Display scale unchanged	Disengaged position sensor connector loose	Check the line
		Position sensor is damaged	Replacement of the same type of position sensor

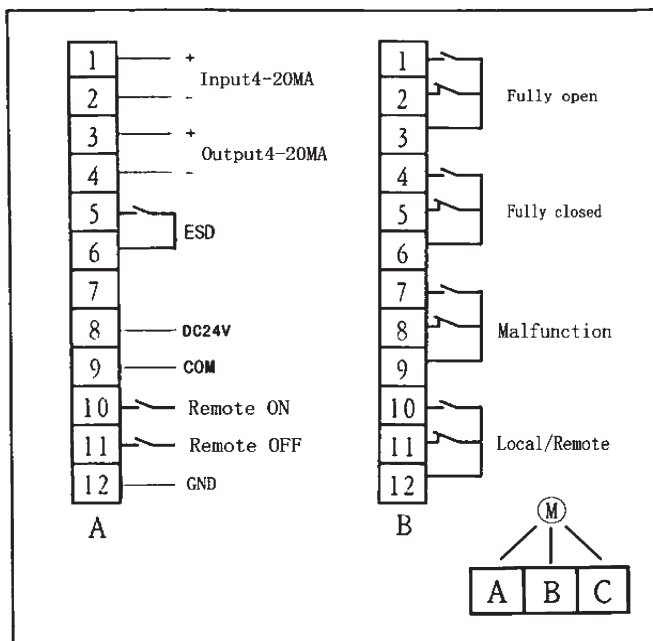
		Driver board circuit components related damage	Contact repair or replacement driver board
		Display panel component damage	
8	Motor doesn't stop when valve in right position	Valve travel set wrongly or unset	Check travel and reset travel
		Sensor error	Check or change sensor
		Certain element main board broken	Contact for repair of change main board
9	ESD on display	Remote wiring off	Check remote wiring
		Remote signal error of ESD error	Check ESD signal
		Circuit element of main board broken	Contact for repair of change main board
10	Signal lost on display	Remote wiring off	Check remote wiring
		Remote 4-20mA signal error	Check remote 4-20mA signal
		Socket component of main board off	Check socket component wiring
		Circuit element of main board broken	Contact for repair or change main board
11	No feedback signal	Terminal signal wiring wrongly	Check wiring
		Remote wiring off	Check remote wiring
		Socket component of main board off	Check socket component wiring
		Circuit element of main board broken	Contact for repair or change actuator

7.1 Conventional outdoor switching wiring diagram (see Picture 9)

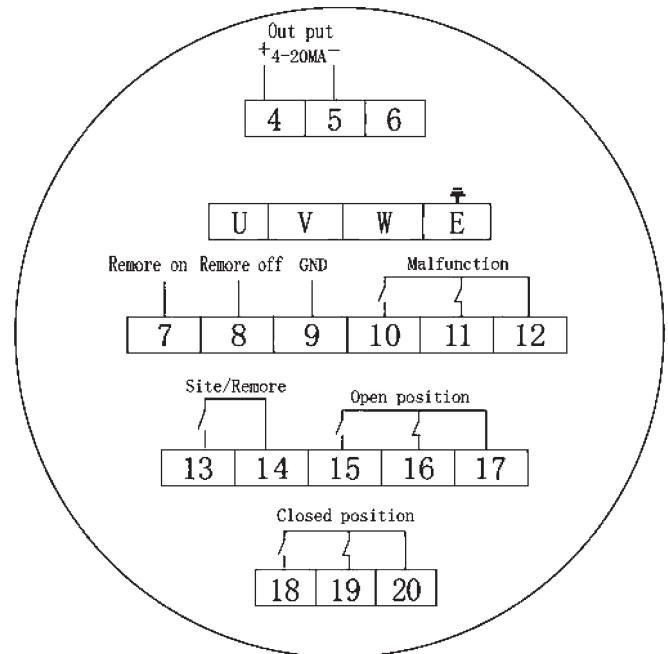
7.2 Conventional outdoor switching and explosion-proof electric apparatus terminal diagrams (see Picture 10.11)

P17

7.3 Intelligent switching terminal diagrams (see Picture 12.13)

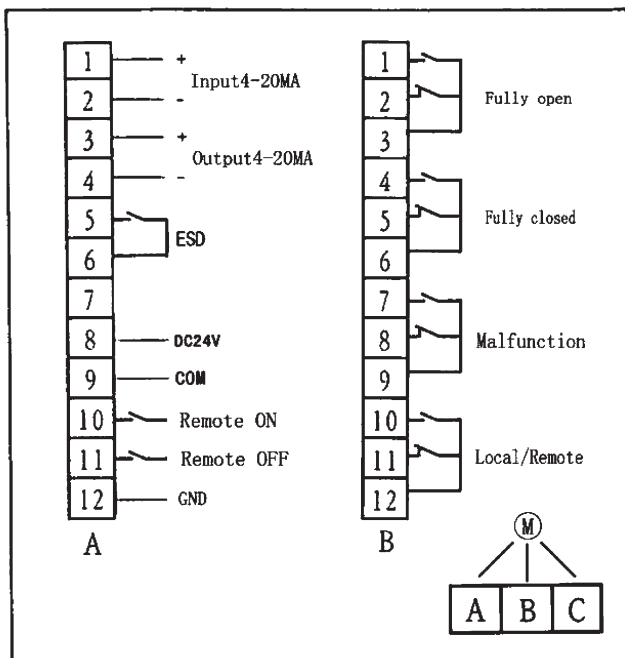


Picture12.Intelligent switching

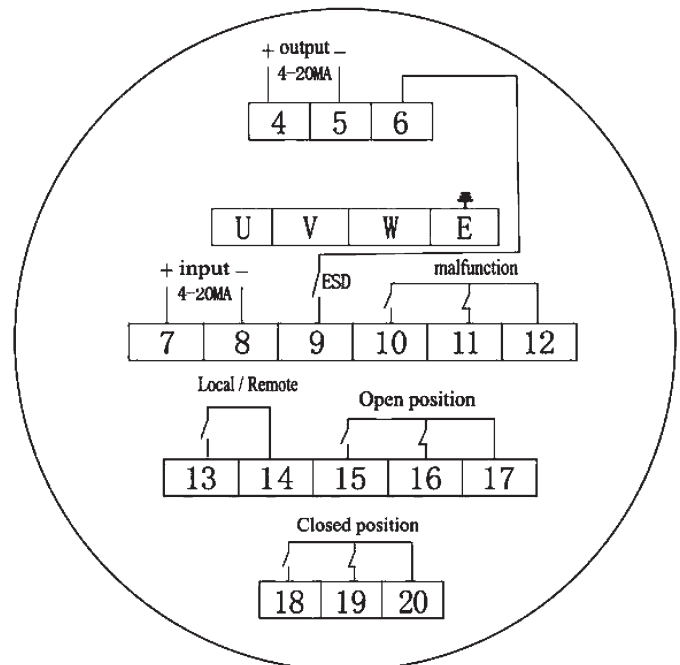


Picture13.Explosion intelligent switching

7.4 Intelligent modulating terminal diagrams (see Picture 14.15)



Picture14.Intelligent modulating



Picture15.Explosion intelligent modulating

Table 5 cable diameter

Concentric ring groove hole diameter (mm)	$\phi 15$	$\phi 19$	$\phi 23$
Allow the introduction of cable nominal diameter (mm)	$\phi 15 \pm 1$	$\phi 19 \pm 1$	$\phi 23 \pm 1$

Note: flameproof power cable must have ground should clip pliers and wire clamp in the wiring head, threading seal damage and aging should be replaced.

Table 6 Electrical Components Table

Symbol	Name	Model Specifications	Symbol	Name	Model Specifications
K0、KC	AC contactor	CJX8-9 或 CJ10	B	Transformer	220V/9V/6V
FR	Thermal relay	JR16B	YD、RD、GD	Lights	ND3 或 NDL3
LSF	Flash switch	V-157	V	Zener diode	2CP10
LSO、LSC	Limit switch	MK2-1	M	Motor	YDF/YBDF
TSO、TSC	Torque switch	WK1-1 或 WK3-1	W1, W2	Potentiometer	WX10-1K
SA	Toggle Switch	KN1-203	RH	Heating resistors	RX20-25
SBO、SBC	Push button	MK1-1	RPC	Precision potentiometers	WX701-5.1KQ
QC	Site / remote control switch	MK1-1	TMK	Automatic adjustment module	Made pieces
RJ	Thermal switch	T11	MK1	Phase sequence recognition and protection	Made pieces
FU	Fuses	BLX-1	DC	DC power supply	DC24V
CB	Opening of the table	0~10mA-4~20mA	MK2	Remote Control Module	Made pieces
C	Electrolytic capacitors	220UF, 10V	HS	Interlock protection	Made pieces

VIII. Problems and Solutions

Items	Problems	Reason	Solutions
1	Can't be started	<ul style="list-style-type: none"> ① The power cords disconnect ; ② Control lines disengage ; ③ Travelling or the moment of ; force apparatus fail ; 	<ul style="list-style-type: none"> ① Check the power cords ; ② Fix the lines ; ③ Remove the problem of; the traveling and the moment of force apparatus ;
2	The rotational direction of the output haft doesn't conform to the stipulation	The phase sequence of power source is connected improperly	Exchange two random power cords
3	The motor overheat	<ul style="list-style-type: none"> ① The running time is too long ; ② Motor cannot match with the electric actuator; ③ One phase disengages ; 	<ul style="list-style-type: none"> ① Stop operating and cool the electromotor ; ② Check the necessary condition ; ③ Check the power cords ;
4	Motor stops during the operation	<ul style="list-style-type: none"> ① The actuator is over loaded and the moment of force acts; ② The valve has a breakdown ; 	<ul style="list-style-type: none"> ① Increase the setting moment of force ; ② Inspect the valve ;
5	The motor still rotates or the light is not bright though the valve is in the right position	<ul style="list-style-type: none"> ① The travelling or the moment of force apparatus has a break down ; ② Travelling controller may not be adjusted properly ; 	<ul style="list-style-type: none"> ① Inspect the setting moment of force apparatus ; ② Readjust the traveling control apparatus ;
6	No position signal available	<ul style="list-style-type: none"> ① Remote transmission potentiometer has breakdown ; ② The fixing screw of the potentiometer gear gets loosen ; 	<ul style="list-style-type: none"> ① Inspect or change the potentiome ; ② Tighten up the fixing screw of the potentiometer gear ;

IX. Notice for Orders

1. Please specify the model number and the necessary torque of the close / opening direction .

We will provide you with the actuators according to the specifications of ours unless you specify ;

2. You must state clearly if the actuator must be used under the explosive environment which must conform to the stipulations of the explosion-proof standard in this user's guide ;

3. Please specify the standard of connection dimension , the diameter and extension length of the stem . If they don't conform to this guide , please consult us for possible solutions ;

4. A clockwise rotation of the handwheel is assumed to closed valve , please specify if your practice is just the opposite ;

We provide the electric actuators of other rotational speed according to the customer's requirements .



Mseries



Lseries



Hseries



MAEseries



Mseries



PEseries



CTseries



Pseries

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Special tips:

The company of any change of product structure and this specification without prior notice.