I. Machining of the Drive Bush

1.1 Thrust Base Type (diagram1-1 ,1-2)

1) Turn actuator onto its side, remove the two cap-headed screws holding base plate onto thrust base, pull out the drive bush complete with its bearing assembly. Remove the thrust bearing of the drive bush’ s double end (The two thrust bearing stop ring near the mid bulgy – shoulder of the drive bush may not be removed.)

2) According to the thread dimension of the valve stem, machine the internal screw thread of the drive bush.

3) Clean all the drive bush and others that removed, ensuring that they are in good condition, clean and greased. According to the above steps, with adverse steps we can refit the drive bush and base assembly on the actuator, ensuring

that the slots in the drive bush are located into the drive dogs of the hollow output shaft. (The bearing modules must be topped up lubricating oil).

1.2 Non-Thrust Base Type (diagram 1-3)

1) Turn actuator onto its side, remove the base, the retaining clip on top of the drive bush can be seen now.

2) Turn the retaining clip slots until reach the drive dogs of the output shaft, or with the screwdriver seek out the retaining clip, we can remove the drive bush.

According to the connection mode of the configured value, we can machine the hole of the drive bush shaft, key seat or combination claw, and refit them assembly on the actuator. Then fit on the retaining clip and base. Before fitting on the base, must daub between base and drive bush with any lubricating oil.

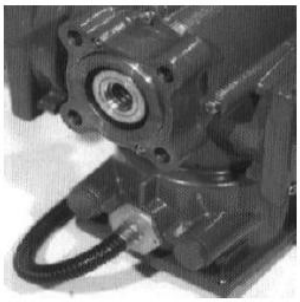


diagram 1-1

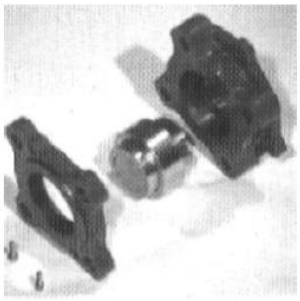


diagram 1-2

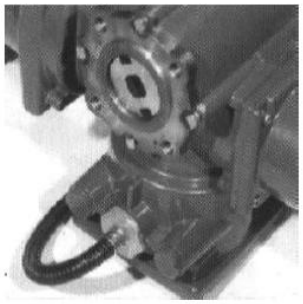


diagram 1-3

II. Installation of the actuator

2.1 Installation with the Visible Stem Valves

2.1.1 Install the Thrust Base Type

1. Before delivery, according to the requests of the clients the screw thread inside the drive bush has been machined well. As a combination of actuator and drive bush, it is assembled with valve.

Firstly manual operation mode is available, then place the actuator onto valve, put the screw thread of the actuator and the valve stem in order, turn the handwheel in the opening direction to engage the drive bush onto the stem.

Continue turning until the actuator is firmly down on the valve flange. Another two further turns, fit securing bolts and tighten fully.

2. If the clients machine the internal screws of the drive bush, according to above 1.1, machine and fit in the drive bush. According to the above “a”, fit them assembly.

2.1.2 Installing the Non – thrust Base Type

Ensuring that the drive bushes of the non- thrust type have been machined, then fit the actuator and valve as a combined unit.

Firstly manual operation mode is available, then place the actuator onto the valve, let the valve stem into the hole of the drive bush, or the combination claw of the drive bush is secured to the combination claw of the valve, turn the handwheel in opening direction until the actuator is firmly down on the valve flange. Another two further turns, fit securing bolts and tighten fully.

2.2 Installation with the Valve with Gearbox

Firstly checking that the drive bush, input shaft, key and key seat are all appropriate or not, fit the base and drive bush assembly on the actuator firstly, then place the actuator onto the flange of the gearbox correctly, let the input shaft of the gearbox into the hole of the drive bush shaft, turn the handwheel, ensuring that the key is located into the key‐seat of the drive bush, then fit securing bolts and tighten fully.

2.3 Installation with the Hidden – Stem Valve

Based on 2.1.2, do the assembly in the same way. But if the actuator will support thrust, we should use the thrust‐type connection with thrust bearing.

2.4 Handwheel Sealing

Ensuring that sealing plug in center of handwheel is sealed with PTFE tape and fully tightened. Make sure that moisture does not pass down the output shaft of the actuator.

2.5 Connecting to Terminals and Cable Entry

a. Connect the power wires and signal wires according to control requirements. The actuator has expert earth terminals, in order to ensure the safety of installation personnel and equipment’s, the actuator should be earthed credibly.

b. Only appropriate certified explosion‐proof entry reducers, glands or conduit may be used in hazardous locations. Ensure using threaded adaptors, sealed cable entries with a steel or brass threaded plug. In hazardous areas an appropriately certified threaded blanking plug must be used.

c. Three threaded hole size: one of NPT1 1/2 and two of NPT1.For waterproof type, threaded pipe with one M40X1.5 threaded hole and two of M25X1.5 threaded hole is required before delivery. Recommended cable diameter is two of ø10 and one of ø14 ）

III. Operating of Actuator

3.1 Manual Operation

The actuator provides operating handwheel and switching lever. In case that main power failed, or the control circuit failed and so on, we can operate the actuator by hand. Before operating the handwheel, firstly let the mode selection switch be in the “stop” or “local” position. To engage handwheel drive depress the switching lever into “Manual” position and turn the handwheel slowly to engage the clutch. When the actuator has been in the “Manual” mode, the lever can now be released and return to the free position by its clockwork spring. But the internal clutch has been latched up in the “Manual” position. Now turn the handwheel and the output shaft will be driven, then manual operation is completed.

The clutch is ably designed to be electric operation naturally. When the motor turns, the clutch will switch to the electric operating position automatically.

The switching lever may be latched up in the electric operating position or the manual operating position by the padlock. Please notice that if the lever is latched up in the manual operating position by the padlock, the turning of the motor can not make the clutch switch to the electric operating position automatically.

3.2 Local Operation

If local operation is needed, switch (red switch) the selection knob to the local position and control the actuator by the operation switch (black switch). There are two kinds of work mode for the local operation, namely, inching and maintained. This is set by the setting tool. We will explain the two work mode based on closing operation.

Inching: Switch the operation knob (black switch) to the closing position, the actuator will move towards the closing direction. If release the operation switch, the operation switch will return to the original position, the action towards the closing direction will be stopped. Switch the operation knob to the opening position, the actuator will act towards the opening direction. Releasing the operation switch, it will return to the original position and the actuator will stop running immediately.

Maintained: Switch the operation knob (black switch) to the closing position, even if release the switch and return it to the original position, the actuator will keep acting towards the closing direction. This is the so-called “maintained type closing”. As for opening operation, Switch the operation knob to the opening position, even if you release it and let it return to the original position, the actuator will maintain acting towards the opening direction. This is the so-called “maintained type opening”.

3.3 Remote control operation

“Switching value” control and “analog quantity” control is the two kinds of remote operation. “Switching value” control refers to input DC or AC voltage signal to terminal No. 33 or 35(pay attention to the difference of public terminal between high voltage and low voltage) and “analog quantity” control is to control by inputting 4-20mA current signal to terminal No.26 and 27. Wiring refers to “Electrical control and wiring” and “control type” in our manual.

IV. Working Parameters Setting of Actuator

4.1 Key definition

4.1.1 The key meaning on the hand-held setting tool:

“Up”= Up Key; **“Down”=Down Key;** **“Stop” = Stop/Return Key;**

“Enter”=Confirm/Save Key; **“Open”= Add/Open Key;** **“Close”= Minus /Close Key.**

4.1.2 The key meaning of the mode knob:

Confirm Key: The mode knob move from the "Stop" position to "Local" position, hereinafter referred to as the press the confirm key;

Return Key: The mode key move from the "Stop" position to "Remote" position, hereinafter referred to as the press the return key.

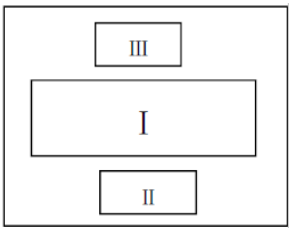
4.1.3 The key meaning of the operation knob

Move down Key: the operation knob move to "**Close**" position, hereinafter

referred to as press the down key;

Add Key: the operation move to "**Open**" position, hereinafter referred to as

press the add move key.



4.2 Liquid crystal display (LCD)

The actuator with a bitmap line LCD display. Its layout region area Ⅰ, area Ⅱ and area Ⅲ.

The area Ⅰ for valve position display, to valve position opening in the form of percentage of real-time display the current valve position value; The area Ⅱ for control mode display; The area Ⅲ for running status and alarm information display (see the " The alarm information" in the subsequent).

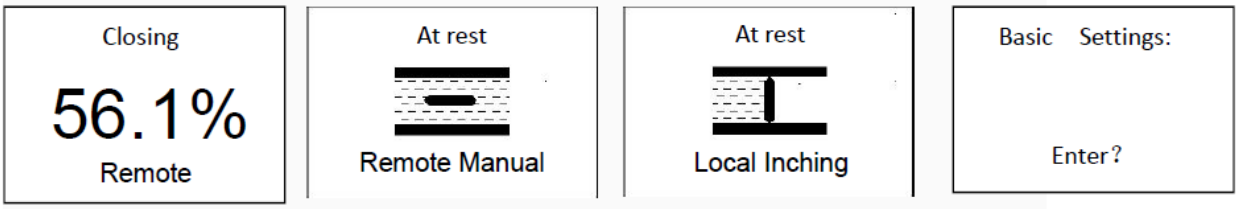
In the working parameters set menu, liquid crystal display (LCD) will be unified use area, area Ⅱ and area Ⅲ.

4.3 Power on or reset

4.3.1 System self on power

After powering up and initialization The instructions ROM area RAM area and A/D function of the control system are checked on. The valve position is displayed in the LCD screen if the checking result is right. Or the alarm information is displayed in the LCD screen if one checking result is not right.

After actuator electrical initialized, the entire LCD screen with large font displays the percentage of valve opening. In the limit position, based on the simulation butterfly valve graphics mode display (see chart).



Displaying valve position | Displaying limit opened | Displaying limit closed | Displaying parameter set

4.4 Customizing the Actuator

Notice: 1. When carrying out menu operation, if user is no key operation for 1 minute long, the LCD will return normal shows. Besides, after carrying out menu operation, you should use the "Return" key until you make the LCD display normal show.

2.The value showed firstly is the last time setting on the LCD. Users can take advantage of this feature to view the previous setting.

4.4.1 To enter the Menu

The LCD can display the parameter setting menu if the red knob is made go to **"LOCAL"** position and press any key in the Up/Down/Return/Enter keys on the setting tool ; Or place the red knob to **"STOP"** position and the black knob is made go to "OPEN" position and is held for 10 seconds long.

Use the **UP** and **Down** keys to select an items, use the **Confirm** key to may enter the next level menu or save parameter.

The LCD display firstly the NO.1 menu. There are four items in the menu, namely **Basic Settings, Feedback Set, Advanced Settings and Signal Inquires.** If the basic password value is 0, the LCD display directly to the next menu level, otherwise enter the basic password to display the next level menu.

4.4.2 Basic Settings

4.4.2.1 Accept Valve Close Limit

In this items, the LCD will display the absolute encoder output encoding value（0～65535）. **Make the valve move to the limit closed by electromotion**(**Pla**ce the red knob to "**LOCAL**" position, press "Open/Close" key or by operating button to run the actuator to the close limit). Press **Confirm** key to accept the limit closed, and the red lamp will twinkle two times. If you press the **Confirm** key before press the **Return** key, the limit closed position is not set, and return to the previous menu.

4.4.2.2 Accept Valve open Limit

In this items, the LCD will display the absolute encoder output encoding value（0～65535）.

Press “Open/Close” key or by operating button to run the actuator to the open limit). Press **Confirm** key to accept the limit opened, and the green lamp will twinkle two times. If you press the **Confirm** key before press the **Return** key, the limit opened position is not set, and return to the previous menu.

Note 1: 65535 and 0 are respectively maximum value and minimum value of the BM18 encode, the two is a coincidence. Setting the limit position process of the whole trip can pass this coincidence point, but should the whole trip is not beyond the scope of the absolute encoder values.

Note 2: If the package is BM12, minimum code encoder value is 0 and the maximum code value is 1000.

Note 3: If supporting is the potentiometer, the minimum code is 0 and the maximum value of 1000 encoder, the actual use of the need to ensure a potentiometer Dead is not within range of travel.

4.4.2.3 Deadband Adjustment

The significance of the dead: This function is effective in remote automatic control mode.

In this control mode, valve position value desired by the user is calculated according to the control current, and then compare that value with the current position value, if the absolute value of the difference is greater than the deadband value, actuators began action, so that the current valve position close to the target valve position. If the valve position of the absolute value of the difference between the current position valve and the user desires within the deadband range, the actuator stop action. Set the appropriate deadband is possible to prevent oscillation in the vicinity of a given position of valve.

In the items, the LCD displayed first on the last time settings（percentage of the valve’s journey. The value can be changed in **“0.3%～9.9**%” bound by Add key or Minus key, using Confirm key to accept.

4.4.2.4 Action on Signal Loss

If actuator works in the remote 4~20mA auto control Mode, Lost Signal occurs when the current control signal is lower than half the 4mA.

If lost signal occurred, the actuator should be configured to one of the follows: “Remain In Situ” （no action）or “Close” or “Open”. In the items, the LCD displayed first on the last time settings (“Remain In Situ” （no action）or “Close” or “Open”) ,Using **Add** key or **Minus** key to select an items, using **Confirm** key to accept.

4.4.2.5 Close Torque Value

(with torque switch products, without this option)

In the items, the LCD displayed first on the last time settings（percentage of the rating torque）.The value can be changed in “**30%～100%**” bound by **Add** key or **Minus** key, using **Confirm** key to accept.

4.4.2.6 Open Torque Value

(with torque switch products, without this option)

In the items， the LCD displayed first on the last time settings（percentage of the rating torque）.The value can be changed in "**30%～100%**" bound by **Add** key or **Minus** key， using **Confirm** key to accept.

4.4.2.7 LCD Display

In the items， the LCD displayed first on the last time settings（**Positive** or **Invert**）. Using**Add** key or **Minus** key to select an items, using **Confirm** key to accept.

4.4.2.8 Local Control Mode

In the items， the LCD displayed first on the last time settings（**Inching** or **Maintain**）. Using **Add** key or **Minus** key to select an item, using **Confirm** key to accept.

4.4.2.9 Basic Password Change

In the items， the LCD displayed first on the last time settings. The value can be changed within the range of from **0** to **255** by **Add** key or **Minus** key， using **Confirm** key to accept.

4.4.2.10 Resume Default

If the parameters were set to confusion during the menu settings, you can use this items to recover **factory settings** except for "**Limit opened**" and "**Limit closed**" and "**Close direction**" parameters.

4.4.3 Feedback Set

In the NO.1 menu, you can select "**Feedback Set**" items and press "**Confirm**" key, then into NO.3 menu if the feedback password is set to 0 (that is, no password). If the password is not 0, you need to enter a feedback password and enter NO.3 menu.

The NO.3 menu has 5 sub-items, namely **Adjust 4mA For CPF, Adjust 20mA For CPF, Status Contact Output, Extended Contact Output and Feedback Password Change**.

Use the **UP** and **Down** keys to select an item, and use the **Return** key to return to the previous menu.

4.4.3.1 Adjust 4mA For CPF.

This items means that for the 4mA current signal sent by the actuator to be calibrated.

In the items， the actuator force output the 4mA current signal for user’s checking. The value of the 4mA can be changed by **Add** key or **Minus** key， using **Confirm** key to accept.

4.4.3.2 Adjust 20mA For CPF.

This items means that for the 20mA current signal sent by the actuator to be calibrated. In the items ， the actuator force output the 20mA current signal for user’s checking. The value of the 4mA can be changed by Add key or Minus key， using Confirm key to accept.

4.4.3.3 Status Contact Output

Output1 ~ Output6 is a group of non-hold type relay (The switching status may change after power off) is used to indicate the state of the valve.

It can be selected in the one of following status items that the relay is closed or disconnected. These States are**: Fully Closed / Fully Open / Over Torque Close / Over Torque Open / Over Torque / Closing / Opening / Running / Middle Position / Remote Mode / Local Mode** Use "Add " key or "Minus" key to select "**Output1~ Output6** " and press "Confirm" key the screen displays the contents of NO.4 menu.

In the NO.4 menu, by "Up " or " Down " key you can select the items you want, and use "Add" and "Minus" keys to select the relay contact is closing (namely **Closure**) or disconnected (namely **Open**), after requirements are met to use "Confirm" key saves the selected contents.

【4】
Relay Output X Trigger by: (Fully Closed / Fully Open / Over Torque Close / Over Torque Open / Over Torque / Closing / Opening / Running / Middle Position / Remote Mode / Local Mode) Result: (Closure / Open)

If you choose the "**Middle Position**" items, and the screen display contents of NO.5 menu after you press the "**Confirm**" key.

The user needs to set a specific intermediate position which the valve is going to run, and also needs to set the contact are closed or disconnected.

Using "Up " or " Down " key to select the items**,** and using "Add" and "Minus" keys to select a specific intermediate position or the relay contact is closing or disconnected, after requirements are met to use "Confirm" key saves the selected contents.

【5】
Relay Output X Middle Position ≥ XX.X % Result: (Closure / Open))

In the NO.4 menu, if **Output6** items is selected, and press the Enter key, the screen display NO.17 menu. This items is used to set the alarm content of the **Output6** relay contained.

The NO.17 menu has 2 sub-items, namely **Alarm Contains Over Torque** and **Alarm Contains Not At Remote.**

【17】
Alarm Contains Over Torque: (No / Yes)
Alarm Contains Not At Remote:
(No / Yes)

The **Alarm Contains Over Torque** means when the actual torque exceeds the set torque value, whether the Output6 relay alarm.

The **Alarm Contains Not at Remote** means when the actual torque exceeds the set torque value, whether the **Output6** relay alarm.

By "Up " or " Down " key you can select the items, and use "Add" and "Minus" keys to select the **Output6** relay contact is Yes or No, after requirements are met to use "Confirm" key saves the selected contents.

4.4.3.4 Extended Contact Output

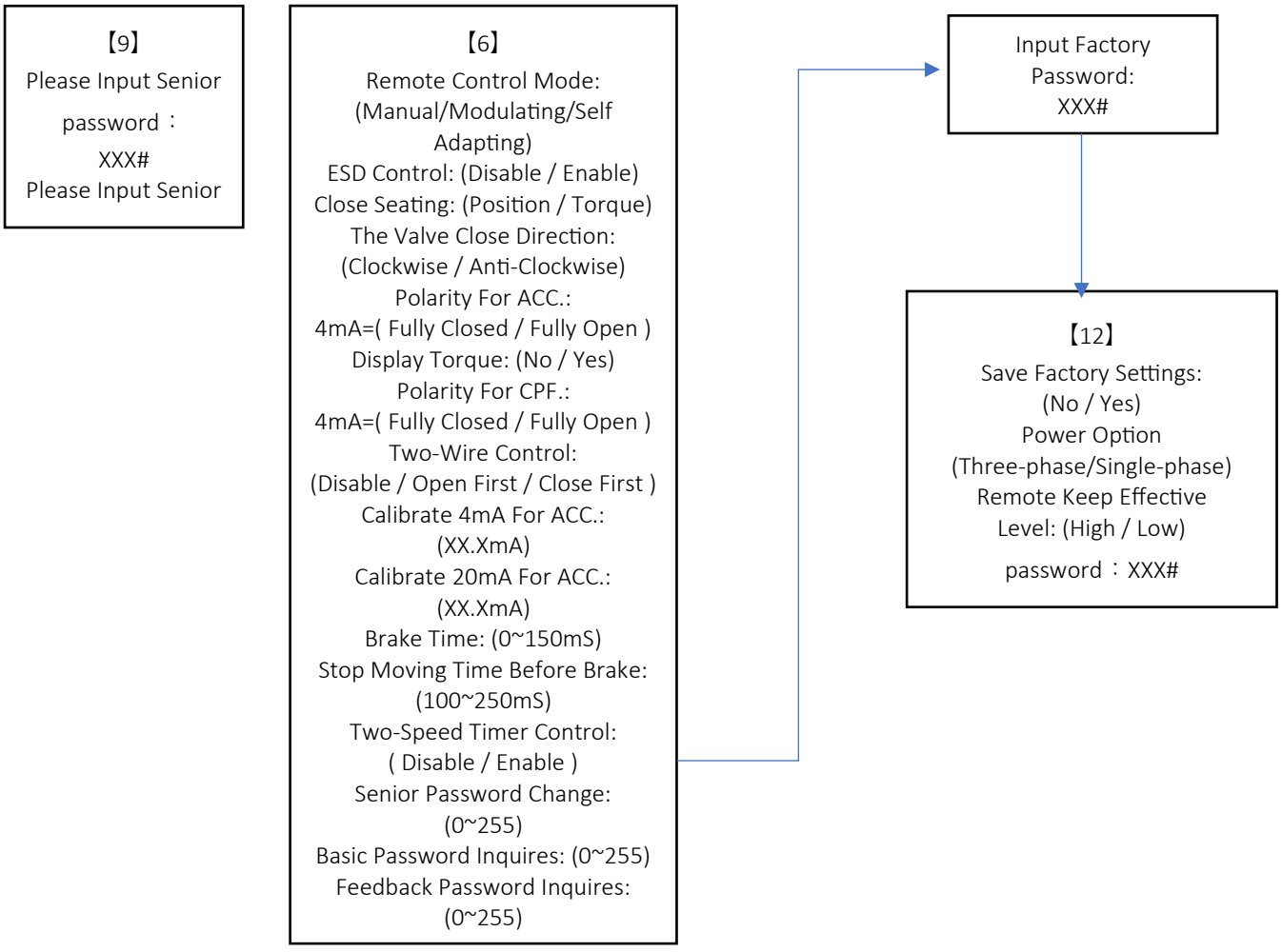
Output7 ~ Output10 is a group of hold-type relay (The switching status does not change after power off) is used to indicate the state of the valve. Its mode of operation and the contents are same with the **" Status Contact Output".** These States are**: Fully Closed / Fully Open / Over Torque Close / Over Torque Open / Over Torque / Closing / Opening / Running / Middle Position / Remote Mode / Local Mode.**

4.4.3.5 Feedback Password Change

In the items, the LCD displayed first on the last time settings. The value can be changed within the range of from **0** to **255** by Add key or Minus key, using Confirm key to accept.

4.4.4 Advanced Settings

In the NO.1 menu, you can select " **Advanced Settings** " items and press "Confirm" key, then into NO.6 menu If the senior password is set to 0 (that is, no password). If the password is not 0, you need to enter a senior password and enter NO.6 menu. Use the **UP** and **Down** keys to select an items, and use the **Return** key to return to the previous menu.



4.4.4.1 Remote Control Mode

When the actuator using analog control, you need to enter the pre-set, In this item, the previous set value (“Manual” 、” Modulating” or ” Self Adapting") will be displayed in the bottom of the LCD. ” Manual” refers to remote switching signals control, ” Modulating” refers to remote analog signals control. ” Self Adapting" refers to remote priority control, and analog signals have priority over switching signals. Using "**Add**" and "**Minus**" keys to select the desired value, using "**Confirm**" key to save the selected changes, and using the **Return** key to return to the previous menu.

4.4.4.2 ESD Control

In this items, the previous set value ("**Enable**" or "**Disable**") will be displayed in the bottom

of the LCD.

By "**Add**" and "**Minus**" keys to select the desired value, using "**Confirm**" key to save the selected changes. When you select "**Enable**" and press "**Confirm**" key the screen appear contents of NO.14 menu.

The NO.14 menu has 6 sub-items, namely **ESD Motion Position**, **ESD Signal Effective Level**, **ESD Beyond On Thermal**, **ESD Beyond On The Stop**, **ESD Beyond On Two-Speed and ESD Beyond On Torque.**

Using the **UP** and **Down** keys to select an items, using "**Add**" and "**Minus**" keys to select the desired value, using "**Confirm**" key to save the selected changes. and using the **Return** key to return to the previous menu.

4.4.4.1.1 ESD Motion Position

This function is used to stipulate the actuator's action on the Emergency circumstances （when the actuator senses ESD effectual signal at the ESD control terminal）.

In this items, the previous set value ("**Remain In Situ** " or "**Open**" or "**Close**") will be displayed in the bottom of the LCD.

【14】
ESD Motion Position:
(Remain In Situ / Open/ Close)
ESD Signal Effective Level:
(High / Low)
ESD Beyond On Thermal:
(No / Yes)
ESD Beyond On The Stop:
(No / Yes)
ESD Beyond On Two-Speed:
(No / Yes)
ESD Beyond On Torque:
(No / Yes)

4.4.4.1.2 ESD Signal Effective Level

There are maybe two effectual voltage values at the ESD control terminal ： Zero voltage signal means low leve（l **Low**）， nonzero voltage signal means high level（**High**）.

In this items, the previous set value ("**High** " or " **Low** ") will be displayed in the bottom of the LCD.

4.4.4.1.3 ESD Beyond On Thermal

This items mean is that if there is a motor overheating alarm is also the implementation of ESD control action?

In this items, the previous set value ("**Yes** " or " **No** ") will be displayed in the bottom of the LCD.

4.4.4.1.4 ESD Beyond On the Stop

This items mean is that if the button is in the "stop" position is also to perform ESD control?

In this items, the previous set value ("**Yes** " or " **No** ") will be displayed in the bottom of the LCD.

4.4.4.1.5 ESD Beyond On Two-Speed

This items mean is that when the actuator is in the " **Two-Speed** " mode if you want to perform ESD control?

In this items, the previous set value ("**Yes** " or " **No** ") will be displayed in the bottom of the LCD.

4.4.4.1.6 ESD Beyond On Torque

This items mean is that when the actuator is in exceeds the set torque if you want to perform ESD control?

In this items, the previous set value ("**Yes** " or " **No** ") will be displayed in the bottom of the LCD.

4.4.4.2 BUS Control (Only for Modbus, Profibus)

When actuator using fieldbus control, you need to enter the pre-set. If the dual channel redundancy configuration, you may need to set the address of channel 1 and channel 2, otherwise just 1 set address. Channel address refers to the actuator can be the identity of the main control system identification code.

Note: after the machine address reset, the actuator shall be cut off, re-power on the rear can guarantee the normal work of the Profibus bus control.

In the menu [6], "**up** " key or "**down**" key to select "**BUS Control**" item and press "**confirm** " key then the screen display the contents of the menu [16].

4.4.4.2.1 Address of Channel 1(Only for Modbus, Profibus)

In menu【16】, using "**up** " key or "**down**" key to select "**Address of Channel 1**" item, the LCD display the last time settings. The value can be changed in "1～126" bound (for**Profibus**) in "1～247" bound (for **Modbus**) by "**Add**" and "**Minus**" keys, using "**Confirm**" key to accept.

4.4.4.2.2 Address of Channel 2(Only for Modbus, Profibus)

In menu【16】, using "**up** " key or "**down**" key to select "**Address of Channel 2**" item, the LCD display the last time settings. The value can be changed in "1～126" bound (for **Profibus**) in "1～247" bound (for **Modbus**) by "**Add**" and "**Minus**" keys, using "**Confirm**" key to accept.

4.4.4.2.3 Baud Rate (Only for Modbus)

Baud Rate means the data bits are transmitted at the loop in network control system, the units is KB/S. The **Baud rate** setting include 8 choices, that are 300bps, 600 bps,1200 bps,2400 bps,4800 bps,9600 bps,19200 bps,38400 bps.

In menu【16】, using "**up** " key or "**down**" key to select "**Baud rate**" item, the LCD display the last time baud rate settings. The value can be changed in "0.3～38.4" bound by "**Add**" and "**Minus**" keys, using "**Confirm**" key to accept.

4.4.4.2.4 Parity (Only for Modbus)

This item sets the parity bit that the data bits are transmitted at the loop in network control system.

In menu 【16】, using "**up** " key or "**down**" key to select "**Parity**" item, the LCD display the last ime parity settings "**Odd**" or "**Even**" or "**None**". Using "**Add**" and "**Minus**" keys to select the requiring item, using "**Confirm**" key to accept.

4.4.4.2.5 Bus ESD Action (Only for Modbus)

This function is used to stipulate the actuator's action on the Emergency circumstances (when the actuator receives the bus ESD signal). There are two sub-item , "Disable" means without this function , the "Enable" refers to the actuator operation according to menu [14] "ESD Motion Position" settings.

In menu 【16】, using "**up** " key or "**down**" key to select "**Bus ESD Action**" item, the LCD display the last time settings "**Disable**" or "**Enable**". Using "**Add**" and "**Minus**" keys to select the requiring item, using "**Confirm**" key to accept.

4.4.4.2.6 Signal Loss Time (Only for Modbus)

This item stipulates the time for the bus signal loss. The bus signal loss is affirmed if the actuator takes not in the bus signal in the time, and the Actuator will operate, according to the menu [2] in the "**Action On Signal Loss**" item settings.

In menu 【16】, using "**up** " key or "**down**" key to select "**Signal Loss Time**" item, the LCD display the last time settings. The value can be changed in "1～255s" bound by "**Add**" and "**Minus**" keys, using "**Confirm**" key to accept.

4.4.4.2.7 AUX. Remote Action (Only for Modbus)

The terminal 22 to terminal 24 in wiring box are regarded as the signal input ports from the other device if "**Disable**" is selected. The digital 1 is sent to the Host when the 24Vdc or 220Vac input to the terminals, and the digital 0 is sent to the Host when the 0V input to the terminals.

The terminals 22 to 24 in wiring box are regarded as the **AUX. Remote Action** input ports

if "**Enable**" is selected. The actuator will carry out correlative action, see 6.1.

In menu 【16】, using "**up** " key or "**down**" key to select "**AUX. Remote Action**" item, the LCD display the last time settings "**Disable**" or "**Enable**". Using "**Add**" and "**Minus**" keys to select the requiring item, using "**Confirm**" key to accept.

4.4.4.2.8 AUX. ESD Action (Only for Modbus)

The terminal 12 in wiring box are regarded as the signal input ports from the other device if "**Disable** " is selected. The digital 1 is sent to the Host when the 24Vdc or 220Vac input to the terminal, and the digital 0 is sent to the Host when the 0V input to the terminal.

The terminal 12 in wiring box are regarded as the **AUX. ESD Action** input ports if "**Enable**" is selected. The actuator will carry out correlative action, see 6.2.

In menu 【16】, using "**up** " key or "**down**" key to select "**AUX. ESD Action**" item, the LCD display the last time settings "**Disable**" or "**Enable**". Using "**Add**" and "**Minus**" keys to select the requiring item, using "**Confirm**" key to accept.

4.4.4.3 Close Seating

In this items, the LCD display firstly the last setting "**Position**" or "**Torque**". Using "**Add**" and "**Minus**" keys to select the desired value, using "**Confirm**" key to save the selected changes, and using the **Return** key to return to the previous menu.

4.4.4.4 The Valve Close Direction

In the items, the LCD display firstly the last setting "**Clockwise** " or " **Anti-Clockwise** ". Using "**Add**" and "**Minus**" keys to select the desired value, using "**Confirm**" key to save the selected changes, and using the **Return** key to return to the previous menu.**(Note: You must re-set after a stroke after "closing direction" Change)**

4.4.4.5 Polarity For ACC.

In remote automatic control mode, if the user issued 4mA current signals, this items is used to determine the position of the valve operation.

In the items, the LCD display firstly the last setting "**4mA = Fully Closed**" or "**4mA =Fully Open**". Using "**Add**" and "**Minus**" keys to select the desired value, using "**Confirm**" key to save the selected changes, and using the **Return** key to return to the previous menu.

4.4.4.6 Display Torque（with torque switch products, without this option）

In the items, the LCD display firstly the last setting "**Yes**" or "**No**". Using "**Add**" and "**Minus**" keys to select the desired value, using "**Confirm**" key to save the selected changes, and using the **Return** key to return to the previous menu.

4.4.4.7 Polarity for CPF.

If the actuator emitted 4mA current signal, this items is used to determine thecorresponding position of the valve.

In the items, the LCD display firstly the last setting "**4mA = Fully Closed**" or "**4mA =Fully Open**". Using "**Add**" and "**Minus**" keys to select the desired value, using "**Confirm**" key to save the selected changes, and using the **Return** key to return to the previous menu.

4.4.4.8 Two-Wire Control

In the items, the LCD display firstly the last setting " **Disable** " or " **Open First** " or " **Close First** ". Using "**Add**" and "**Minus**" keys to select the desired value, using "**Confirm**" key to save the selected changes, and using the **Return** key to return to the previous menu.

The "**Disable**" means that this function is not available.

The "**Open First**" means that actuator to open action when there is voltage signal on the connections of control room and actuator. Otherwise the actuator will close operation.

The "**Close First**" means that actuator to close action when there is voltage signal on the connections of control room and actuator. Otherwise the actuator will open operation.

4.4.4.9 Calibrate 4mA For ACC. /Calibrate 20mA For ACC.

In order to increase the control precision, user should re-calibrate the 4-20mA OF ACC (analog control current) signal, the signal come from the default which it may be different from user's standard scale.

In this **Calibrate 4mA For ACC.**, user need to sent 4 mA current to the actuator, and the LCD will display the value (mA) of the ACC to be collect by the actuator. To wait until after the current stable press "**Confirm**" key to save the current value of the acquisition.

In this **Calibrate 20mA For ACC.**, user need to sent 20 mA current to the actuator, and the LCD will display the value (mA) of the ACC to be collect by the actuator. To wait until after the current stable press "**Confirm**" key to save the current value of the acquisition.

4.4.4.10 Forbid Action Time (Only Q series three-phase)

Forbid action time is the stopping time interval between double action actuator (1-10S), in order to achieve the purpose of adjusting the frequency of the control.

In the【6】menu, Using the UP and Down keys to select "Forbid Action Time", the LCDdisplay the last time settings. Using "**Add**" and "**Minus**" keys to select the desired value, using "**Confirm**" key to save the selected changes, and using the **Return** key to return to

the previous menu.

4.4.4.11 Brake Time（Q series three-phase without this option.）

This function is used to give an reverse energy to the motor and make the motor stop quickly so that we can obtain an accurate valve position control. The motor reverse-rotation time can be adjusted within 0～150mS.

The three-phase motor for 2 ~ 50mS, single-phase motors 5 ~ 150mS. Using "**Add**" and "**Minus**" keys to select the desired value, using "**Confirm**" key to save the selected changes, and using the **Return** key to return to the previous menu.

4.4.4.12 Stop Moving Time Before Brake （Q series three-phase without this option.）

The items means that actuator must be suspended for some time before brake. The three-phase motor for 100~ 150mS, single-phase motors 15 0~ 350mS.

Using "**Add**" and "**Minus**" keys to select the desired value, using "**Confirm**" key to save the selected changes, and using the **Return** key to return to the previous menu.

4.4.4.12.1 Two-Speed Timer Control

The **Two-Speed Timer Control** Refers to the actuators of the running process is not continuous, but stop and go. The two-speed timer extends the operating time of the actuator in the closing or the

opening direction, by pulsating the motor up or off. The Pulsation may be applied to full valve travel or only a part of it. The pulsating length and motor off times are adjustable.

In the NO.6 menu, if you select "**Two-Speed Timer Control**" items, the "**Disable**" or "**Enable**" appear in the bottom of the screen. If you select "**Enable**" items and press "**Confirm**" key, then into menu E. The menu E has 8 sub-items, namely **Open Direction Start, Open Direction End Position, Open Direction Pulsate Journey, Open**

Direction Stoppage Time, Close Direction Start Position, Close Direction End

Position, Close Direction Pulsate Journey and Close Direction Stoppage Time.

Using the **UP** and **Down** keys to select an items, using "**Add**" and "**Minus**" keys to select the desired value, using "**Confirm**" key to save the selected changes. And using the **Return** key to return to the previous menu.

4.4.4.12.2 Open Direction Start Position

The items means in this mode, the start position in the actuator opening direction. This value can be changed within the range of from 0% to 100%.

4.4.4.12.3 Open Direction End Position

The items means in this mode, the end position in the actuator opening direction. This value can be changed within the range of from 1% to 100%. (**Note: The end position must be greater than the start position.)**

4.4.4.12.4 Open Direction Pulsate Journey/ Close Direction

Pulsate Journey

This items sets the required pulsating length which the actuator run in opening **/** closing direction. This value can be changed within the range of from 2% to 100%.

4.4.4.12.5 Open Direction Stoppage Time/Close Direction

Stoppage Time

This item sets the required pulsation off time in opening **/** closing direction. This value can be changed within the range of from 1s to 100s.

4.4.4.12.6 Close Direction Start Position

The items means in this mode, the start position in the actuator closing direction. This value can be changed within the range of from 0% to 100%.

4.4.4.12.7 Close Direction End Position

The items means in this mode, the end position in the actuator closing direction. This value can be changed within the range of from 1% to 100%. **(Note: The end position must be less than the start position.)**

4.4.4.13 Senior Password Change

In the items, the LCD displayed first on the last settings. The value can be changed within the range of from **0** to **255** by **Add** key or **Minus** key, using **Confirm** key to accept.

4.4.4.14 Basic Password Inquires

In the items, the LCD displayed first on the last setting basic password .

4.4.4.15 Feedback Password Inquires

In the item, the LCD displayed first on the last setting feedback password.

4.4.4.16 Signal Inquires

In the NO.1 menu, you can select "**Signal Inquires**" items and press "**Confirm**" key, then into NO.9 menu.

The NO.9 menu has 8 sub-items, namely **Position Of The Selector Knob, Position Of The Operator Knob, Remote Open Signal Appear, Remote Close Signal Appear, Remote keep Signal Appear, Remote Auto Signal Appear, Remote ESD Signal Appear and Position Control Current.**

Using the **UP** and **Down** keys to select an items and using the **Return** key to return to the previous menu.

4.4.5.1 Position Of The Selector Knob

In the items, the LCD displays the position which the red knob locate at.

When the red knob is placed at the "**STOP**" position, the LCD display "**STOP**", otherwise making a mistake.

When the red knob is placed at the "**LOCAL**" position, the LCD display "**LOCAL**", otherwise making a mistake.

When the red knob is placed at the "**REMOTE**" position, the LCD display "**REMOTE**", otherwise making a mistake. **Note: In this item, the implementation of the "Return"**

does not work by red knob.

4.4.5.2 Position Of The Operator Knob

In the items, the LCD display the position which the black knob locate at.

When the red knob is placed at the "**Open**" position, the LCD display "**Open**", otherwise making a mistake.

When the red knob is placed at the "**Close**" position, the LCD display "**Close**", otherwise making a mistake.

When the red knob is placed at the "**None**" position, the LCD display "**None**", otherwise making a mistake.

4.4.5.3 Remote Open Signal Appear

In the items, the LCD will display "**Yes**" (if the signal is existent) or "**No**" (if the signal is nonexistent).

4.4.5.4 Remote Close Signal Appear

In the items, the LCD will display "**Yes**" (if the signal is existent) or "**No**" (if the signal is nonexistent).

4.4.5.5 Remote keep Signal Appear

In the items, the LCD will display "**Yes**" (if the signal is existent) or "**No**" (if the signal is nonexistent).

4.4.5.6 Remote ESD Signal Appear

In the items, the LCD will display "**Yes**" (if the signal is existent) or "**No**" (if the signal is nonexistent).

4.4.5.7 Position Control Current

In the items, the LCD will display the value (mA) of the ACC to be collect by the actuator.

4.4.5.8 Fieldbus signal (Only bus products)

In the【10】menu, to select "Fieldbus signal", Below the line will be displayed if the actuator bus signals received. Users can be seen that the signal is normal.

V. The factory default settings (the setting of the user don't have special instructions)

Adjusting dead zone:1.5 %
ESD Setting:prohibit

Lose signal action:
Display orientation:
Local control:
OUT 1 close to position
OUT 2 open to position
OUT 3 close over-torque
OUT 4 open over-torque

OUT 5 remote close
OUT 6 error alarming(including over-torque,remote is not included)
keep Close valve mode:limit
positive display Close direction:clockwise
Jog Low-end feedback:full closed
Low signal valve position:full close
Flow curve:linear
Brake:0mS
Stop and start time:150mS

VI.Display of the Alarm Signal

1.Alarm shows "**instruction error**"indicating the internal command of control actuator is error, and make "MONI-NC" end of alarm relay and "MONI-COM" end closed,It can be solved by reset or power-on after a power failure, If still can not solve, you need to replace the main circuit board;
2. Alarm shows " **procedure error**"indicating the internal program area of control actuator is error, and make "MONI-NC" end of alarm relay and "MONI-COM" end closed,It can be solved by reset or power-on after a power failure, If still can not solve, you need to replace the main circuit board;

3. Alarm display "**data error**"indicating the internal **DATA** of control actuator is error, and make alarm relay "integrated fault relay port 1" end and "integrated fault relay port 2" end closed. It can be solved by reset or power-on after a power failure. If still can not solve, you need to replace the main circuit board;
4. Alarm display "**A / D Error**" indicating the internal **A / D** of control actuator is error, and make alarm relay "integrated fault relay port 1" end and "integrated fault relay port 2" end closed. It can be solved by reset or power-on after a power failure. If still can not solve, you need to replace the main circuit board;
5. Alarm display "**Over Closing Torque**" indicating when the actuator is closing, if **the torque exceeds the configured value**, the actuator will stop, and a flag prohibiting direction CLOSE operation. A short distance in the opening direction of movement or power-on can clear off Over Closing Torque flag;
6.Alarm display "**Over Opening Torque**" indicating when the actuator is opening, if the **torque exceeds the configured value**, the actuator will stop, and a flag prohibiting direction OPEN operation. A short distance in the closing direction of movement or power-on can clear off Over opening Torque flag;
7.Alarm shows **"Lose Phase"** indicating that the actuator detects **Lose Phase**, then the actuator will stop the rotation of the motor, and make alarm "integrated fault relay port 1" end and "integrated fault relay port 2" end closed;
8.Alarm display "**loss of signal**" indicating that the 4mA ~ 20mA current signal is lost, the actuator will operate according to "**lose signal action"** set value in item 12 of "working parameter",and make alarm "integrated fault relay port 1" end and "integrated fault relay port 2" end closed;
9.Alarm display "**far on far off**"indicating that the actuators simultaneously receive far distant open and close the two signals, the actuator will stop the rotation of the motor, and and make monitoring relay "integrated fault relay port 1" end and "integrated fault relay port 2" end closed;
10.Alarm display "**turns wrong direction**"indicating that the actuator detects a change in the **valve position is incorrect** during the rotation(may be rotated in the wrong direction, or a problem with the valve position encoder), the actuator will stop the rotation of the motor;
11.Alarm shows "**Over Temperature**"indicating that when the motor is over temperature, the actuator will stop.Attempts to execute the other electrically operated, whether remote or local operation are Invalid and make monitoring relay "integrated fault relay port 1" end and "integrated fault relay port 2" end closed;
12.Alarm shows "**motor stalling**", when the actuator is in the fully closed position to act in the open direction, alarm this information when a change in the valve position can't be detected within 9-12 seconds, and the actuator will stop the motor rotation. This alarm indicates that the valve may have jamming or actuator output torque does not comply with the valve.
Note:when there is no alarm, "integrated fault relay port 1" end and "integrated fault relay port 2" end disconnected.

VII.Lubrication and Maintenance

1.ON-OFF type actuator must use the lubricating agent in the table to make sure the dependability of the actuator. The temperature range of the environment is -22F/-30℃ ~ -160F/+70℃. In the extreme climate there’ s special rule.Movement Viscosity of lubrication is 100℃, flash point is 150℃ at least, solidifying point is not higher than -45℃.
2.Machine Maintenance:
If your actuator has run for six months, you must tighten the installation bolts.

Every actuator has been fully tested before leaving the factory to give years of trouble-free operation, providing it is correctly commissioned, installed and sealed.
If your actuator can not be installed immediately, store it in a dry place until you are ready to connect incoming cables.
Don't pull out the transit cable entry plugs until you are ready to connect incoming cables.

VIII.Troubleshooting

8.1 Lose Phase

Reason1 ： phase off in a three-phase power supply of Sunflower external wiring plate.
Solution 1 ： measure external Three-phase power supply with a multimeter if is normal.
Reason 2:Internal fuse of sunflower plate (for wiring diagram No. Type EIO) damage.
Solution 2:Replace the same type fuse.
Reason 3:Driving motor component damage (AC contactor or solid state relays).
Solution 3:Replace the same type of part.
Reason 4:Circuit related to the power phase or Mainboard damage.
Solution 4:Change the same Mainboard or power board.
Reason 5:Current transformer damage.
Solution 5:Change,Under normal circumstances, 1 and 2, 3 and 4, 5 and 6 each resistor plugged into the motherboard core wire 7 is about 50ohm,
Reason 6:the motor windings disconnect.
Solution 6:Measuring three-phase motor winding resistance,the resistance is very large after damage.
Reason 7:The temperature switch String into the AC contactor 220VAC circuit is damaged.
Solution 7:Disconnect the external power supply,measuring the two-pin green socket of power supply board,one of the temperature switch connected to this, if normal the path is access, the resistance is very small.
Reason 8:trifurcating wire loose of control motor.
Solution 8:One side,check the part (AC contactor or solid state relays),on the other side check the three-core control wire of power board.
Reason 9:Output voltage of The transformer has problem.
Solution 9:Measuring if the transformer output voltage is normal, or try to change a transformer.
Reason 10:The connector of Sunflower disk loose.
Solve 10:Disconnect the three-phase power, then measure the Connection disk 1,2,3 of sunflower external to the electric motor device of cover internal.

8.2 Motor stall

Reason 1:Manual / electric shift handle is locked, the motor turn,but the valve cant move.
Solution 1:Turn the handwheel.
Reason 2:The handle is damaged, it can not switch from manual mode to electric mode.
Solution 2:Replace the handle.
Reason 3:Valve position detect that the circuit is damaged.
Solution 3:Replace the valve plate.
Reason 4:bevel gear is damaged.
Solution 4:Replace the bevel gear.
Reason 5: Three-phase motor or AC contactors or solid state relay is damaged.

Solution 5:Giving the Operation instruction to the actuator, measuring whether there is the three-phase voltage, if so, and the motor cant move,that is to say,the motor is damaged,if not,the part of drive motor(AC contactor or solid state relay)is damaged.It does not move, the motor is damaged.
Reason 6: if it’ s the single-phase actuator, could be the primary or secondary winding is not connected to the power, also may be one of the primary or secondary winding is damage.
Solution 6: Disconnect the implementation of external power supply line, primary or secondary winding resistance measured with a multimeter ohm file, normal, primary / secondary winding should have a certain amount of resistance. But note: Due to the secondary winding and start capacitor in series, so when measuring the resistance value of the secondary winding, should identify the location, do not start capacitor also included in the measure, otherwise it will come to the error concluded that secondary winding resistance is infinite .erroneously determined that the secondary winding is damaged.
Reason 7: Because the pipeline pressure is too large, the selected actuator model is too small.
Solution 7-1: The electrical cover open, unplug the white four-pin connector (AMP connector) from the power board above, then shorted here 3 and 4 feet (ie, temperature switch) socket, not magnetic communication number (ie 1 and 2 feet) input power supply board, and then to execute on / off instruction, if this time the motor stall alarm still occurs, then the pipeline is too much pressure, the selected actuator is small. You must select a larger model of the actuator. If customers are not familiar with our circuit, better inform our professional judgment.
Solution 7-2: The electrical cover open, remove the three-core wire on the motherboard, and then the three-stranded three pins all shorted, plug it back in three core wire, and then to the actuator on / off instruction, if at this motor stallnalarm still occurs, then the pipeline is too much pressure, the selected actuator is small. You must select a larger model of the actuator. Note: to ensure the implementation of Type Select the correct premise, the motor may stall may be a mechanical problem may be electrically. If you turn the handwheel, the valve can be moved, but the large digital LCD display on the valve position does not change, it is the electrical problems. If the handwheel large digits on the LCD monitor valve position change, but the valve does not move, or the motor can be rotated, but the valve is not moving, then there is a problem on the machine.

8.3 motor overheating

Reason 1: The temperature is indeed too high, the temperature switch disconnect in order to protect the motor
Solution 1: measuring the temperature, if indeed too high, you should move to ban the dead time and dead zone increasing, do not let the executing agency action too often.
Reason 2: The temperature switch is damaged.
Solution 2: The power plate above the temperature switch signal input socket shorted. (power panel on white four needle socket pin 3 and 4). Four white needle socket, the farthest from the fuse is pin 1 foot.
Reason 3: the main board or power board circuit about judge motor overheating is damaged.
Solution 3: Replace.
Reason 4: The motor damage, while the damage to the temperature switch.
Solution 4: replace the same model motor.

8.4 close valve over torque

Reason 1: The closing direction pressure is relatively large, and the torque protection value set is too small.

Solution 1: torque protection value setter gatekeeper direction increase, and then full stroke again, until there have been no warning of over torque.
Reason 2: pipes foreign body stuck in the valve, resulting in over-torque protection
Solution 2: open the valve and check valve stuck if there is a foreign body.
Reason 3: the power board or main board circuit about judge motor overheating is damaged.
Solution 3: Replace the power board or main board

8.5 open valve over torque

The reasons and Solution methods similar with valves closed above.

8.6 wrong direction

Reason 1: The main control board to the power board 6-cell control line 1 or 2 feet loose or disconnected.
Solution 1: 6-cell lines should be replaced. (EQS series of alarms to "addend error" or "subtraction error").
Reason 2: The power supply board above phase sequence detection circuit damage.
Solution 2: Replace the power supply board (EQS series of alarms to "addend error" or "subtraction error")
Reason 3: The valve position detection module 3 or 4 feet off or virtual weld, or one way damaged.
Solution 3: At this point, no matter how the exchange 6-core control line 5,6 feet, or how exchange for the motor, will appear wrong direction. Switch to manual mode, when the wheel is rotated by hand, valve position always there hopping back and forth. Replace the valve plate. (EQSM series of alarms to "addend error" or "subtraction error").

8.7 Remote switch out of control

Reason 1: No remote panel or remote plate damage
Reason 2: The remote control signal to control the actuator to provide internal 24V, this circuit voltage have a problem.
Solution 2:Measuring 4 and 5 foot voltage of the Sunflower plate
Reason 3: The mode button is not in the "remote" position.
Solution 3:The red mode button marked with pointed projections at the "remote" word alignment mode button next to the electrical cover.
Reason 4: Knob board damaged.
Solution 4: Replace the knob plate.
Reason 5: Remote control signal using pulse control ,the pulse width is not enough.
Solution 5: Increase the pulse width.
Reason 6: Red mode button damage.
Solution 6: Replace the red mode button.
Reason 7: User remote signal has a problem, or remote control cable is not strong.
Solution 7: Sunflower plate connected to wiring terminals 33,34,35,36 about remote control reconnected securely. Disconnect the remote control line. Then 4 and 36 terminals shorted, then a wire connected to 5, with the other end of this wire to touch 33 or 35, if the executing agency to be able to action, then the user control loop has a problem.
Reason 8: The channel about remote control on the main board damaged
Solution 8: Replace the main board.
Reason 9: Knob plate and wire 5 connected to the board is damaged or not
plugged in securely.

Solution 9: Replace or plug firmly.

8.8 remote analog uncontrolled

Reason 1: The mode button is not in the "remote" position.

Solution 1: The red mode button marked with pointed projections at the "remote" word alignment mode button next to the electrical cover.

Reason 2: Analog board or main board is damaged

Solution 2: Replace analog board or control board.

Reason 3: With analog control about No. 22,23,26,27 external wiring terminals not connected securely.

Solution 3: The line connected securely.

Reason 4: Analog input from 26, 27, not as good as calibration.

Solution 4: In accordance with the relevant external regulation of the front set itinerary steps in the method, the analog input to calibrate.

Reason 5: 39,41 manual / automatic selection terminal is not connected securely.

Solution 5: Check the 4&41, 5 &39 terminals and two short wiring is connected securely.

8.9 Display is not normal after power

Reason 1: There is no reliable micro controller reset.

Solution 1: Reset by setter.

Solution 2: Break the actuator power, remove the backup battery, spent more than ten minutes later, back to electricity, if not, try again repeated several times, put the battery back after normal. If not a few tries, it is possible that display board or damage of main control board.

8.10 Run the instant air switch trip

Reason 1: A user configurable air switch capacity is too small or damaged.

Solution 1: User-replaceable larger capacity air switch.

Reason 2: The driving motor component damage (such as AC contactor or solid state relays).

Solution 2: Replace.

Reason 3: Motor damage

Solution 3: Contact the company to replace the motor.

Reason 4: Sunflower plate external power supply wiring error

Solution 4: After inspection, disconnect the power, re-wiring.

Reason 5: Actuator power transformer damage.

8.11 Monitoring relay is not working properly

Reason 1: The supply phase lack.

Reason 2: Knob board without the remote signal.

Reason 3: Motor overheating.

Reason 4: Damage in itself.

Reason 5: Sunflower plate have wrong wiring or poor contact with the monitoring relays.

Reason 6: User 4 ~ 20mA input current is missing or less than 2mA.

8.12 Oil plug oil leakage

Reason 1: The oil plug screw loose.

Solution 1: Wrapping in some of the raw material with the screw, and then re-tighten.

IX. The actuator function connection diagram

9.1 electric actuators can be used for switching, but also can be used as regulated use, different diagram represents different functions.

Terminal No.	Wiring terminal Name	Wiring terminal Meaning	Terminal No.	Wiring terminal Name	Wiring terminal Meaning
⏚	Grounding mark	Pick up the earth	23	Valve position feedback (-)*	Valve position current feedback (-) terminal
1	380VAC1**	380V AC power input port	25	ESD	Emergency operation signal input terminal
2	380VAC2**	380V AC power input port	26	Valve Control current (+) *	Valve position control current input (+)
3	380VAC3**	380V AC power input port	27	Valve Control/bus current （-） *	Valve position control current input (-)
4	Remote high Voltage control terminal	Remote high voltage control terminal	33	Remote close	Remote closing signal input terminal
5	Manual/auto low voltage common terminal	Manual/auto low voltage common terminal	34	Inching / Hold **	Inching/ hold signal input terminal
6	C1 relay port 1	Open end position relay port 1	35	Remote open**	Remote
7	C1 relay port 2	Open end position relay port 2	39	Remote low voltage control terminal	Internal 24V control common terminal
8	C2 relay port 1	Close end position relay port 1	41	Faulty relay port1	Monitoring relay contact normally closed terminal
9	C2 relay port 2	Close end position relay port 2	42	Faulty relay port2	Monitoring relay contact common termina
10	O1 relay port 1	Open over torque relay port 1	43	Faulty relay port3	Monitoring relay contact normally open terminal
11	O1 relay port 2	Open over torque relay port 2	28	Bus control(+)*	Hart communication control input(+)

Terminal No.	Wiring terminal Name	Wiring terminal Meaning	Terminal No.	Wiring terminal Name	Wiring terminal Meaning
12	O2 relay port 1	Close over torque relay port 1			
13	O2 relay port 2	Close over torque relay port 2			
14	Remote relay port 1*	Local/remote relay output terminal			
15	Remote relay port 2*				
22	Valve position feedback (+) *	Valve position current feedback (+) terminal			

1. Items with "* *" is for single-phase motor terminals 1 and 2 to 220 VAC, terminal 3 is free.Items with "*" are only for extension or enhanced types.
2. For Hart communication units,item 27 is for Hart- terminal and item 28 is for Hart+ terminal.

9.2 Wiring diagram

Remote On/off auto control wiring diagram with internal 24V supply.

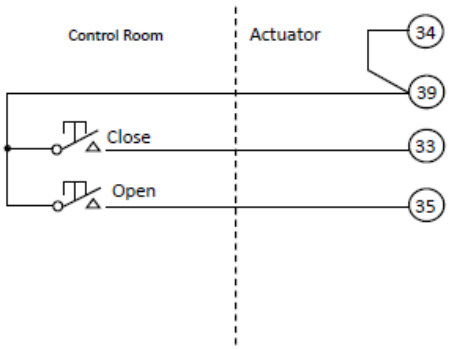


Fig 1-2 Holding type on / off control, reversible stroke, but can not stop in the middle position

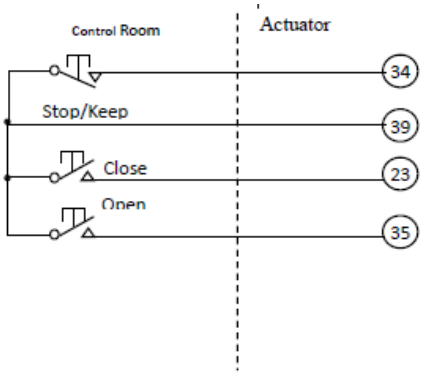


Fig1-3 Inching open, close, stop in the middle

Remote modulating auto control wiring diagram