

**AVAR**

**AVARM**

**Intelligent Electric Actuator**

**AVAR/AVARM SERIES**

**MANUAL**

Edition: V2.0  
Date : Sept. 2017

Reading carefully before commissioning and using the actuators

# 1. Brief Introduction

This manual is for the user to be competent for the installation, operation, commissioning and inspection of AVAR series actuator. The electrical installation, maintenance and use of these actuators shall be carried out in accordance with the laws and regulations of the relevant safety of the country to adapt to the site installation.

If ex-proof mark shows on the nameplate, the actuator may be applied to explosive gas of Zone 1 and 2 and with the ignition point higher than 135° C.

No change is allowed in any case because it will make the achieved approval invalid.

Maintain should be adopted in safe area with the actuator being removed.

Only trained personnel can install, maintain and repair these actuators under the instruction of this manual.

AVAR Series actuator can be configured through local 4 buttons without removing the covers, which insure a safe and time-saving setting-up of the Torque value, Position Limit and other controlling and indicating functions, even in hazard circumstances. Set-up data will be saved in the memory even in case of power break. No battery is needed as back-up power for this range.

AVAR Series is Quarter-turn. Mechanical adjustable range is  $90^{\circ} \pm 5^{\circ}$ .

Motor of AVAR on-off actuator is short-time working duty, S2-15min, and S4-50% for modulating ones. Standard working temperature is -20°C to 70°C and the enclosure protection grade is IP67.

Warning:

Motor temperature

Extreme surface temperature of AVAR motor can reach 132° C (270° F).

The motor temperature protection bypass

If the actuator is set to the motor temperature protection bypass, when ESD function is used, the achieved hazardous area approval will be invalid.

Cover material: Aluminum alloy. Fastener material: Stainless Steel. Base material: Cast iron.

Worm:albronze. Worm shaft: Alloy steel.

Please ensure a good application environment. Please protect actuator from danger.

If the actuator will not be installed immediately, store it in a dry place.

If the actuator has been installed without cabling, it is recommended that the plastic transit cable entry plugs are replaced with metal plugs which are sealed with PTFE tape.

Cable connection:

Please ensure a powered-off state when removing the cover.

Ensure a safe earthing cable connection.

Please check the voltage and end position before operating the actuator.

## 2. AVAR/AVARM Actuator installation

### 2.1 Actuator installation with drive coupling



FIG. 2.1

AVAR actuator is quarter-turn, mostly used to butterfly valves, ball valves, dampers. Popular coupling will be Non-thrust drive coupling as key and square shaft.

Driving base is machined according to ISO Standard, that is F05, F07, F10, F12, F14, and so on. We can make as per your drawings. Please inquire for extra charge.

Actuators are connected to driving base which enable an immediate installation to valves when ex

works unless more machining is needed to the driving bush.

When installing actuators to valves, please fit the actuator drive bush into valve shaft and tighten mounting bolts.

## 2.2 Cable wiring and wiring diagram

Check that the supply voltage agrees with that stamped on actuator nameplates.

A circuit breaker and fuse must agree with motor rating current. The bag inside cable box has cabling screws, gasket, O ring seal and manual.

There are two 1" NPT cable entries. Tie-in of the cable should fit the outside diameter. Ensure cable glands are tight and fully waterproof. Seal unused cable entries with a steel or brass threaded plug.

### 3 AVAR/AVARM Actuator Operation

#### 3.1 names of spare parts



Fig. 3. 1

Left of the Local operation panel, you will find Remote/Local/Menu button. Press the button to change the status of Remote/Local/Menu.

Right top is Open button, also up and increase button during Menu setting-up

Right middle is Close button, also down button and decrease during Menu setting-up

Right bottom is Stop button, also Enter button during Menu setting-up

## 3.2 Actuator windows

The display window of the actuator consists of the indicator light and the LCD screen

### 1. Indicator light

There are three position indicators on top of the actuator screen, which are green, yellow and red. Used to indicate valve position in full open, middle and full close position. In the default state, the green light indicates the full close position, the yellow light indicates the middle position, and the red light indicates the full open position. The color of full open indicator light and full close indicator light can be changed through the menu (refer to 7.3.2.6.1). There are 3 status indicator lights below the actuator screen, indicating that the actuator is currently at remote, local and menu three states, the green light indicates the remote state, and the yellow light indicates the state of the menu. The red light indicates the local state and can be switched by the state button on the left side of the panel. (FIG 3-2)

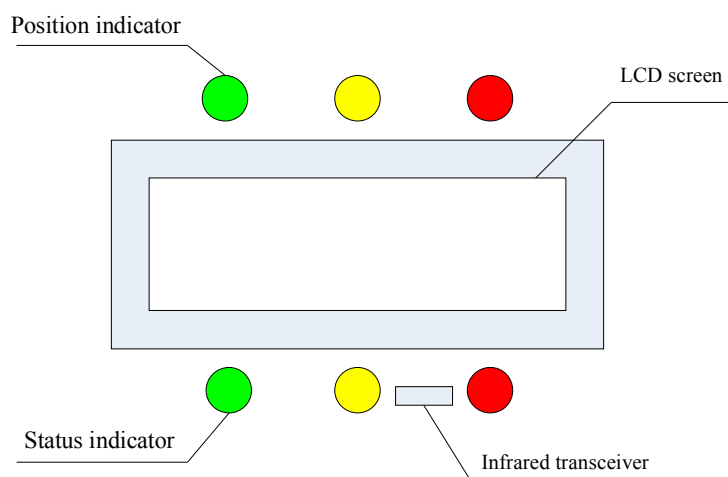


FIG 3-2

### 2. Main screen

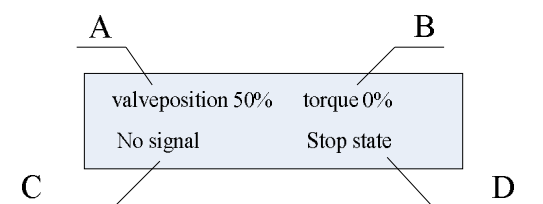


FIG 3-3 (FIG 3-3 is LCD screen)

- (A) Valve position indication: when actuator fully close, it shows“工”, when actuator fully open, it shows “三”, when actuator between fully close and fully open, it shows numbers in percentage.
- (B) Torque position indication: use the status bar and percentage to indicate the torque generated by the current actuator.
- (C) Command indication: indicates the instructions currently being executed by the actuator.

- (D) Status indication: indicates the status or alarm that the actuator is currently executing.

## **4 Actuator control method**

Actuator can be operated electrically and manually, in which electric operation includes local control, remote switching value control, remote analog control, and field bus control. This manual focuses on local control, remote switching value control and remote analog control, and field bus control will be described in detail in specialized documents.

### **4.1 Local control**

When the state button on the actuator control panel selects the actuator state to the LOCAL state, the red status indicator light is on. Press the open valve button on the panel, the actuator will perform the open valve operation; Also press the close valve button on the bottom panel, and the actuator will perform the close valve operation.

Local self-sustain control: Default set as self-sustain control, it means when press open/close button, actuator will open/close valve, even when users release these buttons, actuator will still moving until fully open/close position. When need stop, press STOP.

### **4.2 Remote on/off control**

When the state button on the actuator control panel selects the actuator state to the REMOTE state, the green status indicator light is on. Then actuator can be control by connect with terminal compartment. Please refer to appendix FIG 1 actuator circuit diagram, it marked signal input terminals corresponding to remote open, close, stop and ESD. Please find below detailed instruction of remote control signal terminal circuit and remote control wiring method.

#### **4.2.1 Remote control signal terminal circuit**

FIG 4-1 is signal input terminal circuit structure, take terminal No. 22 for example:

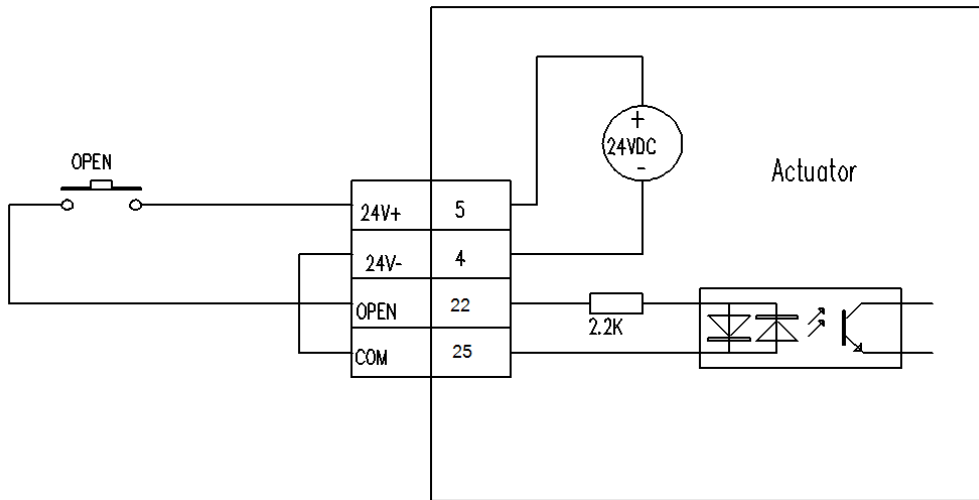


FIG. 4-1

Terminal No.5 and Terminal No.4 are actuator internal 24v control voltage. Terminal No. 22 is valve open signal input terminal, terminal No. 25 is control signal common terminal, generally connect with negative pole of 24v control voltage. OPEN is push button on actuator panel. When users push OPEN button, current will go through 24v voltage positive pole and OPEN button, flow to terminal No. 22, make photocoupler work, generate open valve signal. As actuator adopt photocoupler, terminal No. 22 can accept both 24v ac signal and 24vdc signal. Besides controlled by internal control voltage, actuator can controlled by external control voltage, the wiring method refer to FIG 4-2.

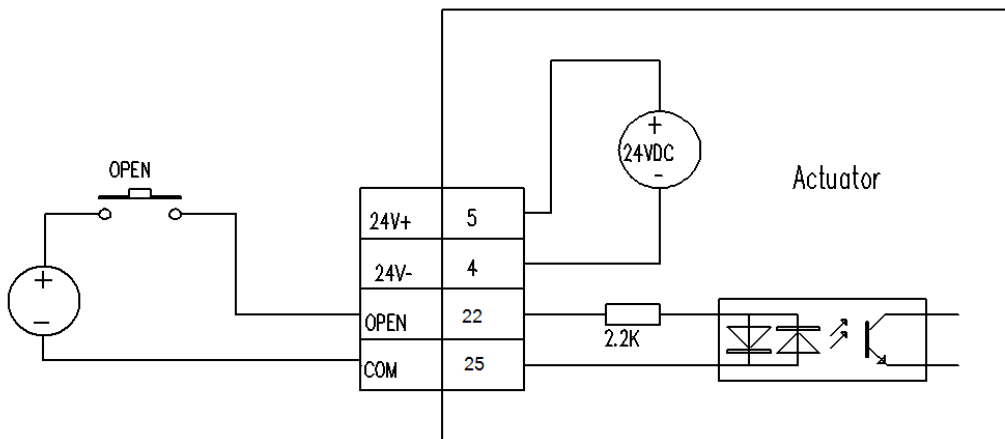


FIG 4-2

#### 4.2.2 Remote control wiring method

##### 4.2.2.1 open valve, close valve, stop self-sustain control ( refer to FIG. 4-3)



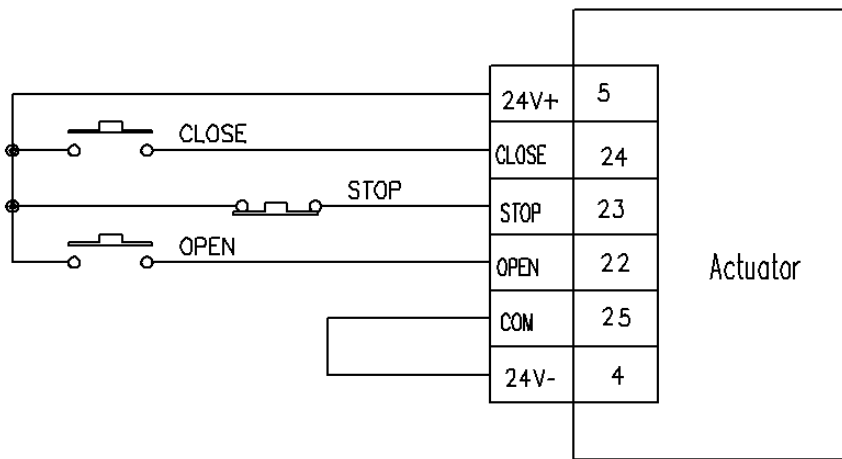


FIG. 4-3

**Instruction:**

1. Press OPEN button, actuator will execute open command, when release, actuator will continue moving to open direction.
2. Press CLOSE button, actuator will execute close command, when release, actuator will continue moving to close direction.
3. Press STOP, actuator will stop.

4.2.2.2 Open valve, close valve self sustain control (FIG. 4-4)

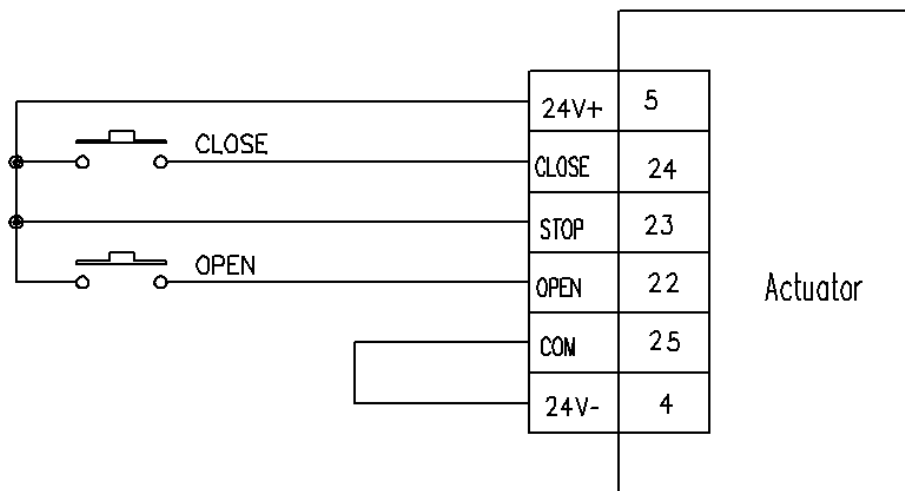


FIG. 4-4

**Instruction:**

1. Press OPEN button, actuator will execute open command, when release, actuator will continue moving to open direction.
2. Press CLOSE button, actuator will execute close command, when release, actuator will continue moving to close direction.

4.2.2.3 Open and close valve inching control (FIG. 4-5)

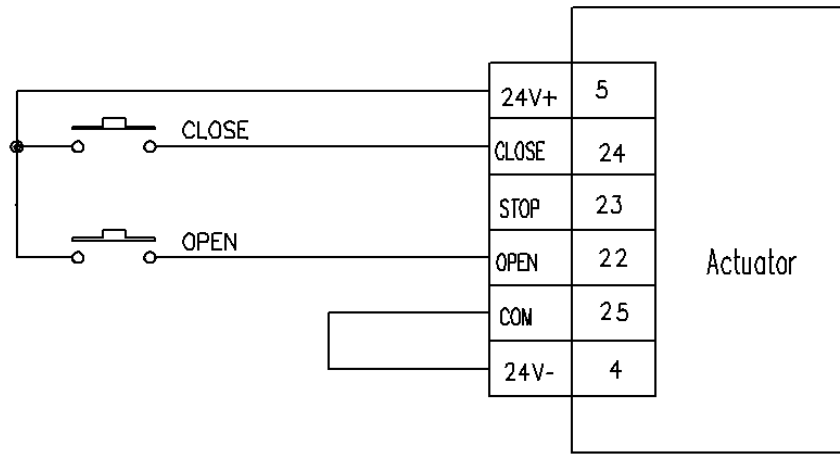


FIG. 4-5

Instruction:

1. Press OPEN button, actuator will execute open command, when release, actuator will stop.
2. Press CLOSE button, actuator will execute close command, when release, actuator will stop.

4.2.2.4 Two wire control (Open valve priority) FIG. 4-6

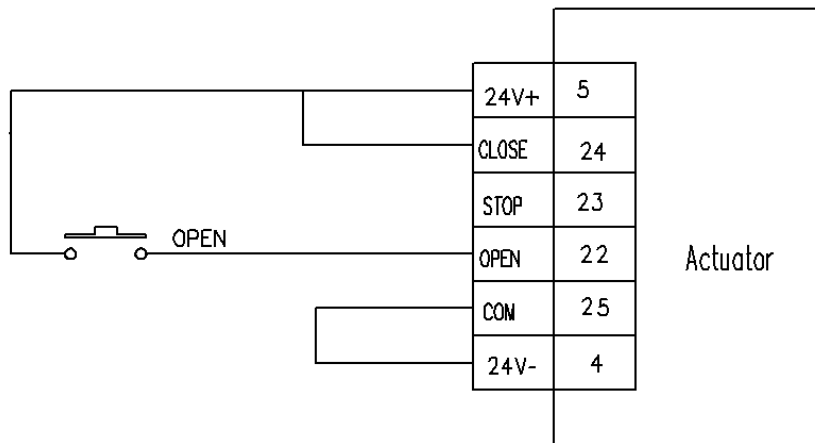


FIG. 4-6

Instruction:

1. Set “Two wire control” menu (Refer to 7.3.2.3.9) to “Open”
2. Press OPEN button, actuator will execute open command, when release, actuator will execute close valve command.

4.2.2.5 Two wire control (Close valve priority) FIG. 4-7

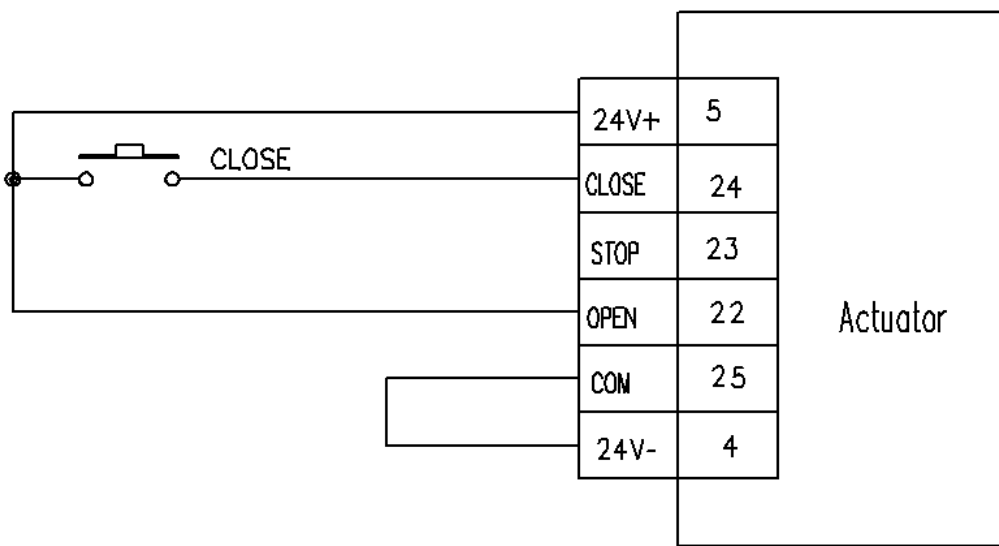


FIG. 4-7

- Instruction: 1. Set “Two wire control” menu (refer to 7.3.2.3.9) to “Close”  
 2. Press CLOSE button, actuator will execute close command, when release, actuator will execute open valve command.

4.2.2.6 ESD Control (Fig. 4-8)

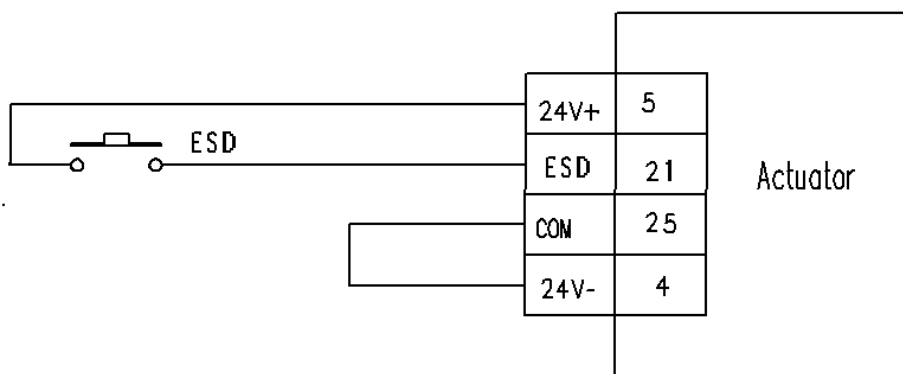


FIG. 4-8

- Instruction:  
 1. For detailed ESD function, please refer to 7.3.2.3.

**4.3 Modulating control (optional)(FIG. 4-9)**

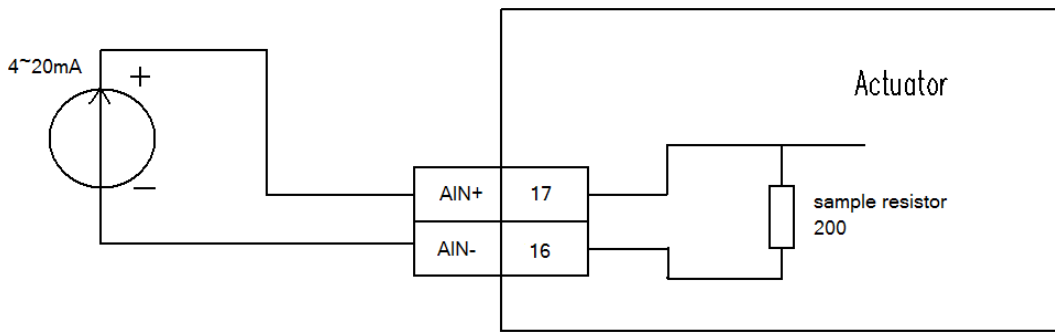


FIG.4-9

**Instruction:**

1. When actuator installed modulating module, and set “modulating” menu to be “Enabled”, the function will be valid.
2. Modulating control shall be at REMOTE status. To set “modulating” menu to be “Enabled”, on-off signal is invalid; when set “modulating” menu to be “disabled”, on-off signal is valid.
3. Terminal No.17 and terminal No.16 connect with positive pole and negative pole of control signal separately.
4. Input impedance of analog signal input terminal is 200 Ω .
5. Detailed instruction of analog control please refer to.7.3.2.5.

## 5. Signal feedback

### 5.1 On/off signal feedback

5.1.1 Actuator has 4 indication contacts (optional to 8 contacts) for indicate actuator working status. Parameter of these 4 contacts are as following:

Rated voltage	Rated current
250VAC	5A
30VDC	5A

4 feedback contacts can be set to different function and normal open/close method according to user's requirement through menu (Detailed instruction, please refer to 7.3.2.2 ).

### 5.2 Analog feedback (optional)

Actuator can optionally choose one active/passive 4-20mA current valve position transmitter to feedback valve signal. The parameters are as following:

Acceptable max.output resistance	650 Ω
Current feedback accuracy	± 2%

Current linearity	$\pm 1\%$
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Analog feedback can be changed to voltage valve position transmitter optionally as required. For details of voltage valve position transmitter, please contact with us.

If valve position transmitter is installed, users need set “valve position transmitter” to be valid in the menu. Users can set 4mA to be fully close or open by menu (refer to 7.3.2.4).

## 6.Alarm

### 6.1 Phase lost alarm (only for 3 phase power supply)

When one of 3 phases power supply lost, actuator will show “PhaseLst” , and stop.

### 6.2 Motor over temperature

There is temperature sensor in motor, when motor temperature is higher than 135℃, actuator will show “TempErr” alarm and stop.

### 6.3 Torque alarm

Actuator has torque sensor, when open/close torque is higher than set torque value (the value can be set by users, please refer to 7.3.1.2), actuator main screen will show “TorqTrip” and stop. Users can learn torque value when torque alarm displays through screen(refer to 7.4.5.5). Operate actuator at opposite direction, the torque alarm will disappear.

### 6.4 Stall alarm

When actuator actual rotated speed is lower than 70% of rated speed, actuator will show “Stall” and stop. Operate actuator at opposite direction, the alarm will disappear.

### 6.5 Locked rotor alarm

When locked rotor for 5 seconds, actuator will show “LockRotor” alarm and stop. Operate actuator at opposite direction, the alarm will disappear.

### 6.6 CPU over temperature

When actuator internal temperature exceed 80℃ , actuator main screen will show “CPUTemp” and stop. Alarm will disappear, only when CPU temperature lower than 80℃.

### 6.7 Pressure sensor error

When actuator torque sensor error, actuator main screen will show “ SensorErr ” . It's hardware error, and can be solved by changing hardware.

### 6.8 Valve position error

When actuator fails to communicate with its position encoder, actuator will show flashing “PosErr” , alarm will disappear when actuator reconnect the position encoder cable or change the position encoder.

### 6.9 Crystal vibration failure

When actuator main board crystals can't afford to vibration or malfunction, actuators status bar will show flashing of "failure" , alarm will disappear when actuator power-on again or change the main board.

## 7. Menu Function

Actuator menu structure as following:

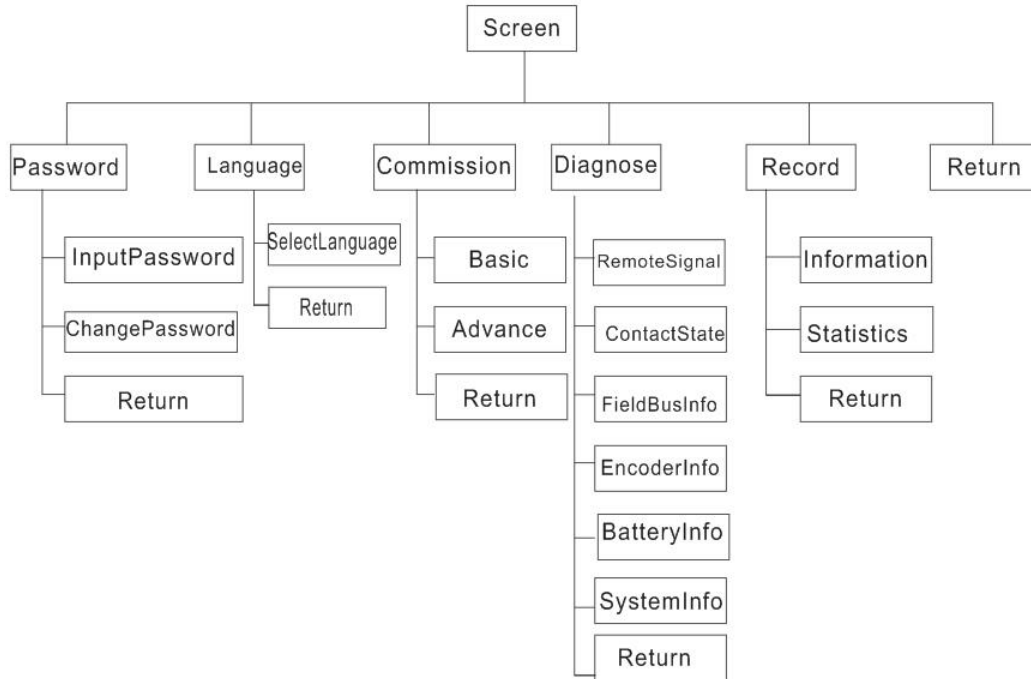


FIG. 7-1

Users can press the status button to switch the menu. Menu includes upper menu and submenu, every stage has RETURN to back to upper menu. User can turn status switch to back to main screen.

### (7.1) Password

#### (7.1.1) Input password

Position: Main screen → password →  
└ input password

Note: Actuator parameters are protected by password, users can only change parameters when input right 4 numbers password. If password is right, the yellow status light will off, if not, the password is wrong. If the password is wrong, users can only observe parameters but can't set.

Default factory password: 0000

#### (7.1.2) Change Password

Position: Main screen → password →  
└ input password → Chang password

Note: Users can change password only when input right password, or this menu will be shielded.

## (7.2) Language

### (7.2.1) Select language

Position: Main screen→password→language→  
└ SelectLanguage

Note: Users can choose “Chinese” or “English”, has set accordingly when at factory.

## (7.3) Commission

### (7.3.1) Basic menu

#### (7.3.1.1) Valve menu

##### (7.3.1.1.1) Close Direction

Position: Main screen→password→language→commission→  
└ Basic→  
└ Valve→  
└ Closedirection

Parameter: Clockwise, Anti-Clockwise

Note: Close direction is used to set actuator close at clockwise or anti-clockwise direction.

Default: Clockwise.

##### (7.3.1.1.2) Close Action (actuator close method)

Position: Main screen→password→language→commission→  
└ Basic→  
└ Valve→  
└ Closedirection→...→CloseAction

Parameter: PositionLimit, TorqueTrip

Note: “CloseAction” means how actuator reaches fully close position. “PositionLimit” means actuator will limit stop at fully close position(refer to 7.3.1.3.1), namely actuator will stop at set limit position. “TorqueTrip” means torque stop at fully close position, namely actuator will judge the position which exceed set torque value as the fully close position and stop.

##### (7.3.1.1.3) Open Action (actuator open method)

Position: Main screen→password→language→commission→  
└ Basic→  
└ Valve→  
└ Closedirection→...→OpenAction

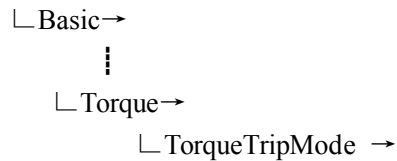
Parameter: PositionLimit, TorqueTrip

Note: “OpenAction” means how actuator reaches fully open position. “PositionLimit” means actuator will limit stop at fully open position(refer to 7.3.1.3.2), namely actuator will stop at set limit position. “TorqueTrip” means torque stop at fully open position, namely actuator will judge the position which exceed set torque value as the fully open position and stop.

### (7.3.1.2) Torque set

#### (7.3.1.2.1) TorqueTripMode

Position: Main screen → password → language → commission →



Parameter: Normal, Intelligent

Note: "TorqueTripMode" is used to set open/close valve torque protection. "Normal" means when operating, and output torque exceed the set torque protection value, actuator will stop and alarm. "Intelligent" means when operating, and output torque exceed the set torque protection value, actuator will not stop immediately, but backward for certain distance (available to set by user, refer to 7.3.1.2.4), then keep moving forward, and try certain times (available to set by user, refer to 7.3.1.2.5). If still over torque, actuator will alarm and stop. Please refer to example below:

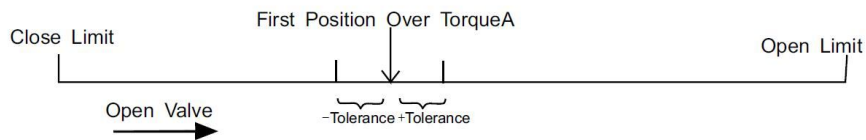


FIG. 7-2

As FIG.7-2 shows, given actuator is under intelligent protection mode, "backward" menu (refer to 7.3.1.2.4) is set 5%, "backwardTimes" menu is set 2 (refer to 7.3.1.2.5), "position tolerance" is set 1% (refer to 7.3.1.2.6, when actuator over torque at A position in open direction, actuator will record this position, backward 5% then keep opening, when over torque within  $\pm 1\%$  of A position again, actuator will backward 5% and opening again. When still over torque within  $\pm 1\%$  of A position, but the backward times is up, actuator will stop and alarm. Position tolerance is used to judge whether over torque position changed, if it's out of position tolerance scope, actuator will re-calculate the backward times.

#### (7.3.1.2.2) CloseTorque

Position: Main screen → password → language → commission →



Note: Close torque is used to set torque protection value when close valve. If actuator close torque exceeds that value, actuator will alarm (refer to normal, intelligent mode, 7.3.1.2.1).

#### (7.3.1.2.3) OpenTorque

Position: Main screen → password → language → commission →



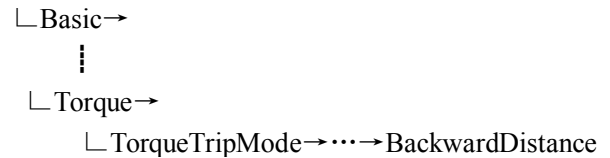


Parameter: 40%~100%

Note: Open torque is used to set torque protection value when open valve. If actuator opening output torque exceeds that value, actuator will alarm (refer to normal, intelligent mode, 7.3.1.2.1).

#### (7.3.1.2.4) Backward Distance (Only for Intelligent Mode)

Position: Main screen→password→language→commission→

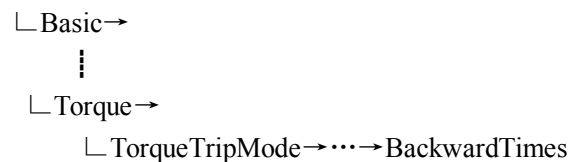


Parameter: 1%~10%

Note: Backward distance Menu is used to set actuator distance of backward when actuator is over torque. When actuator is back to the set position, it will stop backing, but move forward again.

#### (7.3.1.2.5) Backward Times (Only for Intelligent Mode)

Position: Main screen→password→language→commission→

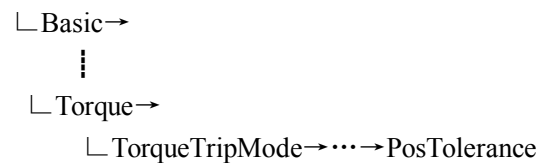


Parameter: 1~10

Note: Backward times Menu is used to set the actuator times of backward when actuator is over torque. When reach set backward times, actuator will stop and display alarm.

#### (7.3.1.2.6) Position tolerance (Only for Intelligent Mode)

Position: Main screen→password→language→commission→



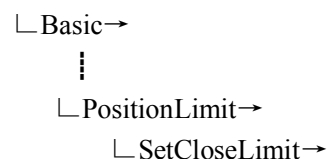
Parameter: 1%~5%

Note: Under the intelligent mode, PosTolerance menu is used to set the deviation value of present over torque position. After actuator recognized the position over torque first time, as long as the actuator is over torque within  $\pm$  PosTolerance range of first time over torque position, actuator regarded as over torque at that position.

### (7.3.1.3) Position Limit

#### (7.3.1.3.1) Close Limit

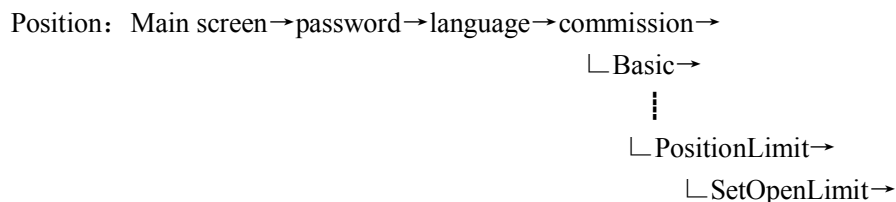
Position: Main screen→password→language→commission→



Parameter: Set,Cancel

Note: Menu “SetCloseLimit” is used to set actuator current position as fully close position. Parameter “set” is used to confirm fully close position. Parameter “Cancel” is used to cancel the current operation.

(7.3.1.3.2) Open Limit

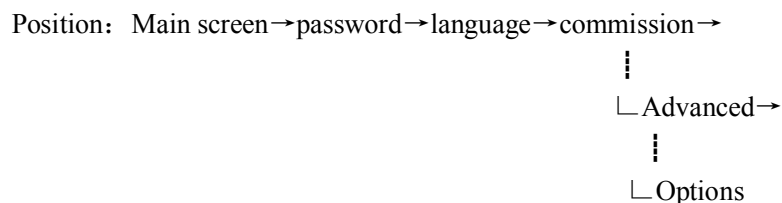


Parameter: Set,Cancel

Note: Menu “SetOpenLimit” is used to set actuator current position as fully open position. Parameter “set” is to confirm fully open position. Parameter “Cancel” is used to cancel the current operation.

**(7.3.2) Advanced**

**(7.3.2.1) Options**

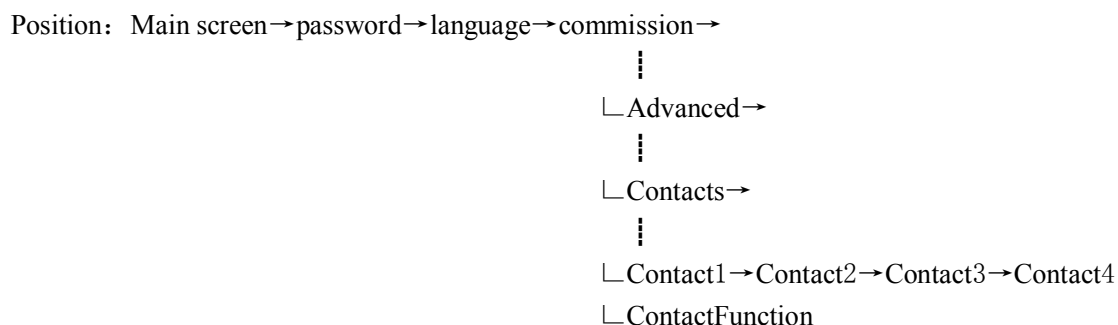


Note: Menu Options is used to set actuator optional functions. Many of its submenus are used to set actuator special functions. When these functions are set as enabled, the corresponding functions of advanced menu will display. If they are set as “disabled”, these functions will be shielded automatically.

**(7.3.2.2) Contacts**

(7.3.2.2.1) Contact 1

(7.3.2.2.1.1) Contact function



Parameter: Close Limit, Open Limit, Middle Position, Torque Trip Close, TorqueTripOpen, TorqueTrip, TorqueTripMid, Opening, Closing, Running, Stall, Hand Wheel, Running Blink, Stop State, ESD Signal, Phase Lost,Local State,Remote State, MotorRunning, MotorTempError, SensorError,CPUTempError,IntegratedError.

Note: Menu “contactfunction” is used to set the contacts action condition of on/off signal value feedback. Take Contact 1 as the example. Set method of other contacts are as same as contact 1.

CloseLimit: When actuator reach fully close position, contact action.

OpenLimit: When actuator reach fully open position, contact action.

MiddlePosition: When actuator is in the scope of set middle position, contact action. When select this parameter, the shield menu " low position " and " high position " will display after " ContactFunction " . Those two menu are used to limit the scope of middle position (refer to 7.3.2.2.1.3&7.3.2.2.1.4).

TorqueTripClose(Torque trip when closing): Actuator displays "TorqTrip" alarm when valve closing, contact action (refer to 7.3.1.2.2).

TorqueTripOpen(Torque trip when opening): Actuator displays "TorqTrip" alarm when valve opening, contact action (refer to 7.3.1.2.3).

TorqueTrip(Torque trip at any position): Actuator displays "TorqTrip" alarm at any position, contact action.

TorqueTripMid(Torque trip at middle travel): Actuator displays "TorqTrip" alarm at middle travel, contact action.

Opening: When actuator is running in the direction of open, contact action.

Closing: When actuator is running in the direction of close, contact action.

Rotating the valve: When is actuator is rotating, contact action.

Stall: When actuator displays " Stall " alarm, contact action.

HandWheel(Manual operation): When actuator is manual operating, contact action.

RunningBlink: When actuator is running, contact will alternately connect and disconnect with an interval of 0.5 second.

StopState: When actuator knob is switched to STOP, or Menu "PanelIr-Set" is set Stop, contact action (refer to 11.3.2.3.15).

ESDSignal: When actuator receive ESD signal, contact action (refer to 11.3.2.3).

PhaseLost: When actuator displays " PhaseLst " alarm, contact action.

LocalState: When actuator knob is switched to LOCAL or Menu "PanelIr-Set" is set Local, contact action.

RemoteState: When actuator knob is switched to REMOTE or Menu "PanelIr-Set" is set Remote, contact action.

MotorRunning: When actuator motor is connecting with power (Regardless motor is running or not), contact action.

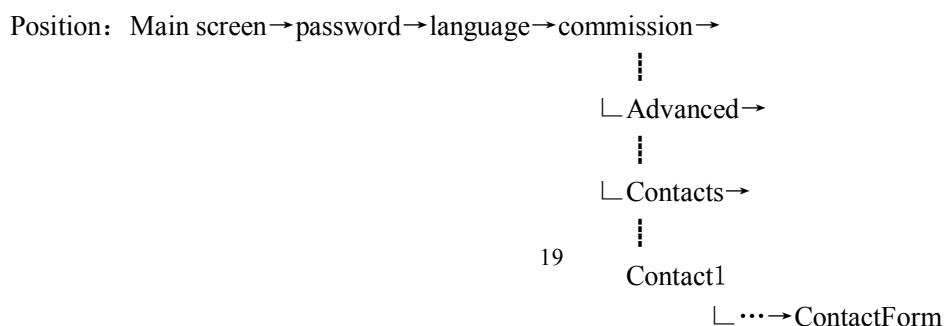
MotorTempError(Motor over temperature) : When actuator displays "TempErr" alarm, contact action.

SensorError (Pressure sensor error) : When actuator displays "SensorErr" alarm, contact action.

CPUTempError(CPU over temperature): When actuator displays "CPUTemp" alarm, contact action.

IntegratedError: When actuator displays any alarm which can result in actuator stop running, contact action.

(7.3.2.2.1.2) ContactForm

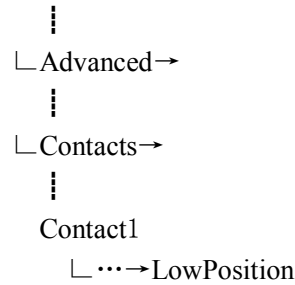


Parameter: NormallyOpen,NormallyClose

Note: When parameter is set NormallyOpen, contact action means contact connect; When parameter is NormallyClose, contact action means contact disconnect.

(7.3.2.2.1.3) Low position (Display when menu “ContactFunction” is set “Middle Position”)

Position: Main screen→password→language→commission→

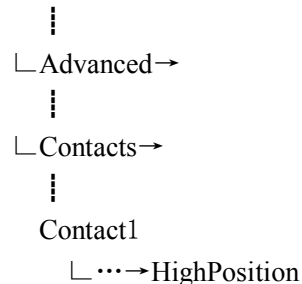


Parameter: Fully close, 0%~99%, fully open

Note: When Actuator indication contact act in the scope of middle position, low position value of middle position scope should lower than high position value.

(7.3.2.2.1.4) High position (Display when menu “ContactFunction” is set “Middle Position”)

Position: Main screen→password→language→commission→



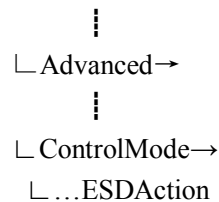
Parameter: Fully close, 0%~99%, fully open

Note: When Actuator indication contact act in the scope of middle position, high position value of middle position scope should higher than low position value.

### (7.3.2.3) Control Mode

(7.3.2.3.1) ESDAction

Position: Main screen→password→language→commission→

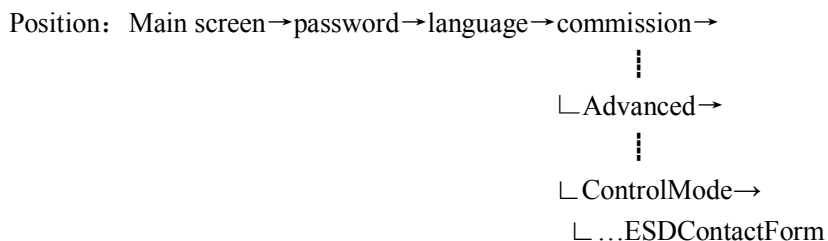


Parameter: StayPut,Close,Open

When it is set as “StayPut”, and connects with ESD signal, actuator stop at the last position. Other

signals such as open, close valve can not control actuator. When it is set as “Close”, and connects with ESD signal, actuator run in close valve direction. Other signals such as open, stop can not control actuator. When it is set as “Open”, and connects with ESD signal, actuator run in open valve direction, Other signals such as close, stop can not control actuator.

#### (7.3.2.3.2) ESDDisplayForm

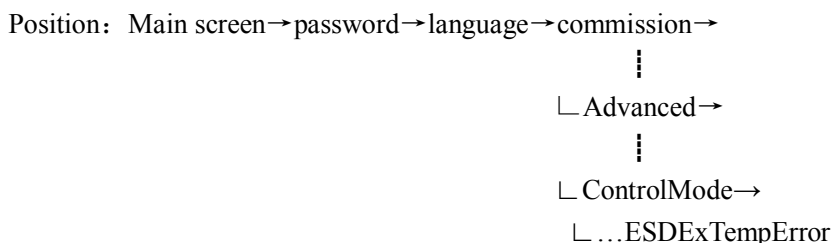


Parameter: NormallyOpen,NormallyClose

Note: “NormallyOpen” means when ESD control terminal (terminal no. 21) connects with voltage signal, executes ESD function; When disconnect, don't executes ESD function.

“NormallyClose” means when ESD control terminal (terminal no. 21) connect with voltage signal, don't executes ESD function; when disconnect, executes ESD function.

#### (7.3.2.3.3) ESDExTempError

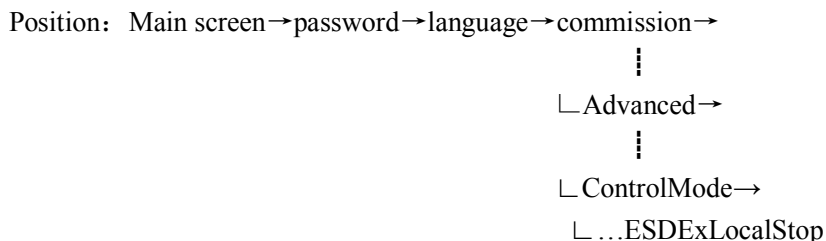


Parameter: Enabled,Disabled

Note: When set “Enabled”, ESD function exceed motor over temperature(TempErr). If ESD action is set “Valve open” or “Valve close”, press ESD button, even though motor over temperature, actuator still running in valve open or close direction.

When set “Disabled”, ESD function can't exceed motor over temperature(TempErr). If ESD action is set “Valve open” or “Valve close”, and motor is over temperature, press ESD button, actuator still keep stop state.

#### (7.3.2.3.4) ESDExLocalStop

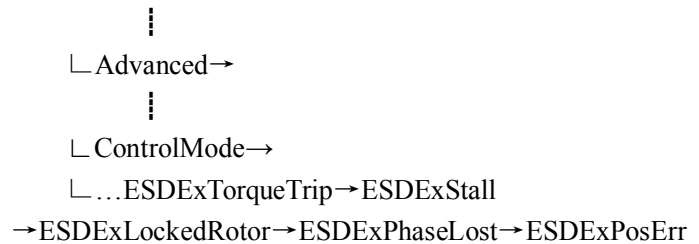


Parameter: Enabled,Disabled

Note: When set “Enabled”, actuator knob is switched to STOP, ESD function still can exceed Stop state and control actuator.

(7.3.2.3.5) ESDExTorqueTrip,ESDExStall,ESDExLockedRotor,ESDExPhaseLost,ESDExPosErr

Position: Main screen→password→language→commission→

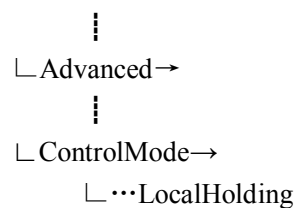


Parameter: Enabled, disabled

Note: When set “Enabled”, ESD still can control actuator, even if these protection alarms display.

(7.3.2.3.6) LocalHolding

Position: Main screen→password→language→commission→



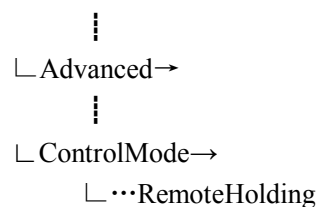
Parameter: Enabled,Disabled

Note: When set “Enabled”, local control is Local holding (Keep running when release button).

When set “Disabled”, local control is inching control (Stop when release button).

(7.3.2.3.7) RemoteHolding

Position: Main screen→password→language→commission→



Parameter: Enabled,Disabled

Note: When set “Enabled”, stop signal is high level, stop command (compatible with Sipos or Auma) is valid;

When set “disabled”, stop signal is low level (or hang), stop command( compatible with ROTORK) is valid.

When terminal no.34 is not connected, set RemoteHolding to disabled, remote open/close signal control will be self holding.

When set Enabled, actuator will be remote inch control.

When terminal no.34 is connected with high level, set RemoteHolding to disabled, actuator will be remote inch control.

When set Enabled, remote open/close signal control will be self holding.

#### (7.3.2.3.9) 2-WirePriority

Position: Main screen→password→language→commission→  
┆  
┆┆Advanced→  
┆  
┆┆ControlMode→  
┆┆┆2-WirePriority

Parameter: Open,Close

Note: Open: Actuator executes valve open command when 2-wirePriority control.

Close:Actuator executes valve close command when 2-wirePriority control.

#### (7.3.2.3.10) TorqueTripDelay

Position: Main screen→password→language→commission→  
┆  
┆┆Advanced→  
┆  
┆┆ControlMode→  
┆┆┆TorqueTripDelay

Parameter: 0~100 (Unit: 0.1 second)

Note: When set 5, torque protection is valid 0.5 second after actuator start. This option is used to ensure actuator open non-moving valve with high start torque.

### (7.3.2.4) PosFeedBack (Option)

#### (7.3.2.4.1) FullyCloseSignal

Position: Main screen→password→language→commission→  
┆  
┆┆Advanced→  
┆  
┆┆PosFeedBack→  
┆┆┆FullyCloseSignal

Parameter:4mA,20mA

Note: When set “4mA”, 4-20 mA Position Feedback is 4mA to fully close, 20mA to fully open.

When set “20mA”, 4-20 mA Position Feedback is 20mA to fully close, 4mA to fully open.

### (7.3.2.5) Modulate (Option)

#### (7.3.2.5.1) ModulatingMode

Position: Main screen→password→language→commission→  
┆  
┆┆Advanced→  
┆  
┆┆Modulate→  
┆┆┆ModulatingMode



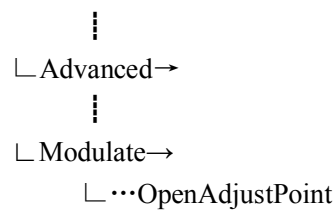


Parameter: 0~4095

Note: When menu “SignalScope” is set “Userdefine”, this menu is used to set the low value of user defined current signal. Set method is the same as “HighSignalValue” .

#### (7.3.2.5.6) OpenAdjustPoint

Position: Main screen→password→language→commission→



Parameter: 0~20

Note:

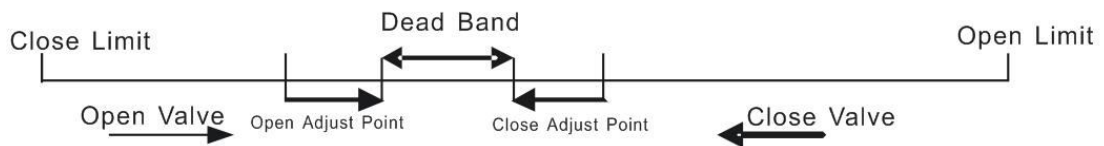
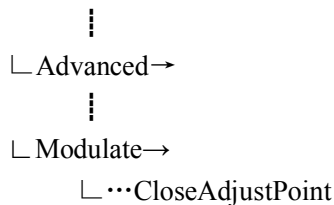


FIG. 7-3

When reach open adjust band, adjust pulse(unit:pulse). For example: When set OpenAdjustPoint as 5, actuator will inching control when reach dead band 5 Adjust Point away, running in open direction into the scope of dead band, inching pulse width can be adjusted from 0-1S.

#### (7.3.2.5.7) CloseAdjustPoint

Position: Main screen→password→language→commission→



Parameter: 0~20

Note: When reach close adjust band, adjust pulse(unit:pulse). For example: When set CloseAdjustPoint as 5, actuator will inching control when reach dead band 5 Adjust Point away, running in close direction into the scope of dead band, inching pulse width can be adjusted from 0-1S.

#### (7.3.2.5.8) AdjustPulseWidth

Position: Main screen→password→language→commission→  
 ↓  
 └Advanced→  
 ↓  
 └Modulate→  
 └···AdjustPulseWidth

Parameter: 0~10

Note: When reach Adjust Band, adjust impulse, set Adjust Pulse Width(unit: 0.1S).

(7.3.2.5.9) DeadBand

Position: Main screen→password→language→commission→  
 ↓  
 └Advanced→  
 ↓  
 └Modulate→  
 └···DeadBand

Parameter: 1%~50%

Note: Only modulating actuator has dead band. Dead band can be adjusted from 1%~50%.

If actuator vibrates or responses to unnecessary signal changes, then increase control signal dead band. If it needs more accurate control, then decreases dead band. Adjust precision of dead band will increase when full travel time increase.

(7.3.2.5.10) InhibitTime

Position: Main screen→password→language→commission→  
 ↓  
 └Advanced→  
 ↓  
 └Modulate→  
 └···InhibitTime

Parameter: 0-50

Note: In order to prevent from working frequently within rapidly fluctuating point signal, actuator will delay to prevent unnecessary movement. When the system becomes stable, actuator will response steadily according to required point signal. Actuator will response the signal changes after inhibit time. (Unit: 0.1 second), default value is 1 second.

(7.3.2.5.11) SignalLostAction

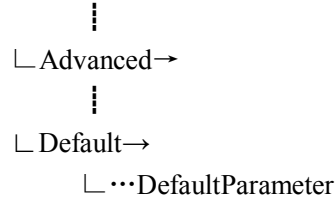
Position: Main screen→password→language→commission→  
 ↓  
 └Advanced→  
 ↓  
 └Modulate→  
 └···SignalLostAction



### (7.3.2.7) Default setting

#### (7.3.2.7.1) DefaultParameter

Position: Main screen → password → language → commission →

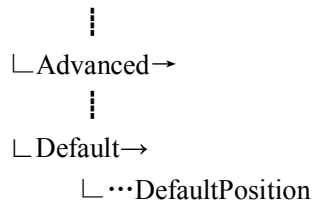


Parameter: Set, Cancel

Note: Set means that actuator will set as factory default value. Cancel means that parameter change canceled.

#### (7.3.2.7.2) DefaultPosition

Position: Main screen → password → language → commission →



Parameter: Set, Cancel

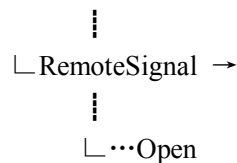
Note: Set means that actuator valve position will set 50% as default. Cancel means that parameter change canceled.

## (7.4) Diagnose

### (7.4.1) RemoteSignal

#### (7.4.1.1) Remote Open

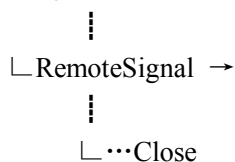
Position: Main screen → password → language → Diagnose →



Note: Enabled means remote open valve signal valid. Disabled means remote open valve signal invalid.

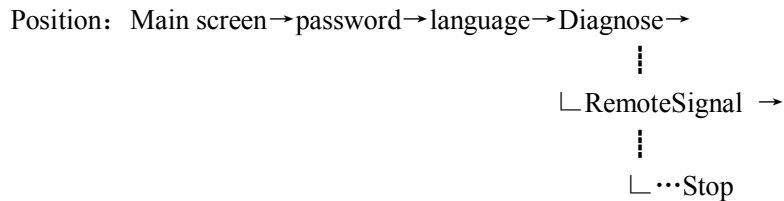
#### (7.4.1.2) Remote Close

Position: Main screen → password → language → Diagnose →



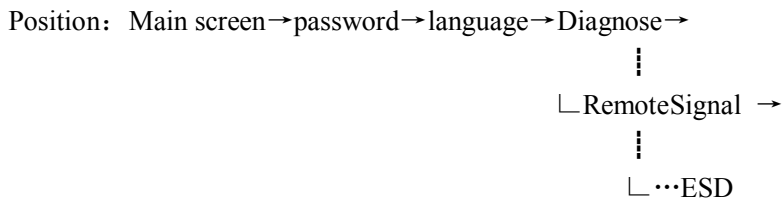
Note: Enabled means remote close valve signal valid. Disabled means remote close valve signal invalid.

#### (7.4.1.3) Remote Stop



Note: Enabled means remote stop valve signal valid. Disabled means remote stop valve signal invalid.

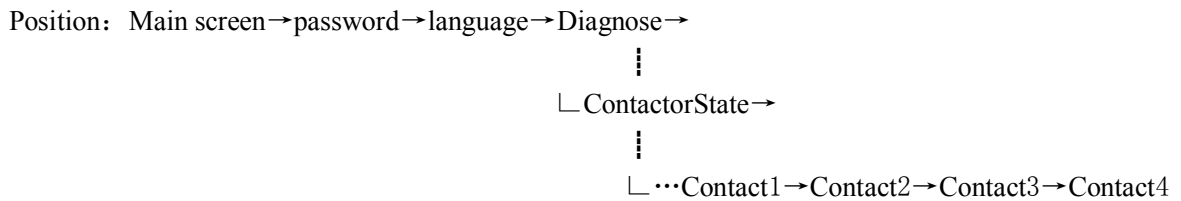
#### (7.4.1.4) Remote ESD



Note: Enabled means actuator ignore local or remote control when ESD signal valid. Disabled means ESD signal invalid.

### (7.4.2) ContactorState

#### (7.4.2.1) Contact 1

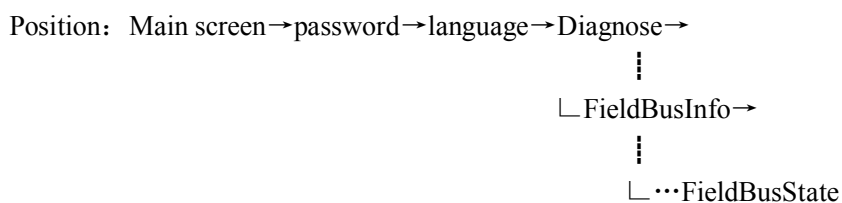


Note: “Contact” menu is used to set on-off signal feedback contacts operating conditions.

Take contact 1 for example, other contacts set as same as contact 1. OFF means contact 1 break, ON means contact 1 make.

### (7.4.3) FieldBusInfo (retain)

#### (7.4.3.1) FieldBusState



Note: Enabled means actuator can connect with bus control system. Disabled mean actuator





Note: Phase time of actuator sampling, when the power is 50Hz, the value is 133 or 66. When the power is 60Hz, the value is 111 or 56.

## (7.5) Record

### (7.5.1) Information

#### (7.5.1.1) ProductionDate

Position: Main screen → password → language → Diagnose →  
┆  
┆ Information →  
┆  
┆ …ProductionDate

Note: Actuator production date.

#### (7.5.1.2) SerialNumber

Position: Main screen → password → language → Diagnose →  
┆  
┆ Information →  
┆  
┆ …SerialNumber

Note: Actuator production code.

#### (7.5.1.3) SoftWare

Position: Main screen → password → language → Diagnose →  
┆  
┆ Information →  
┆  
┆ …SoftWare

Note: Actuator software version.

### (7.5.2) Statistics

#### (7.5.2.1) Contactor1 Works

Position: Main screen → password → language → Diagnose →  
┆  
┆ Statistics →  
┆  
┆ …Contactor1 Works

Note: Control the contactor operating times at anticlockwise direction.

#### (7.5.2.2) Contactor2 Works

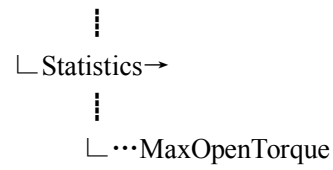
Position: Main screen → password → language → Diagnose →  
┆  
┆ Statistics →  
┆  
┆ …Contactor2 Works



Note: Control the contactor operating times at clockwise direction.

(7.5.2.3) MaxOpenTorque

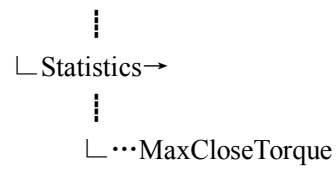
Position: Main screen → password → language → Diagnose →



Note: Max output opening torque percentage when actuator operating.

(7.5.2.4) MaxCloseTorque

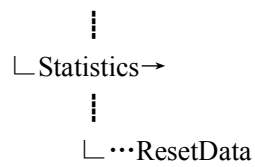
Position: Main screen → password → language → Diagnose →



Note: Max output closing torque percentage when actuator operating.

(7.5.2.5) ResetData

Position: Main screen → password → language → Diagnose →



Note: Reset above data to zero.

## 8. Weights and Lubrication

Mechanical gear chamber is filled with 0 # semi liquid lubricating grease to ensure that it is unnecessary to exchange for normal use except that there is a special demand to be used in a extreme weather . Its suitable temperature are from -20° C to 70° C.

Weight

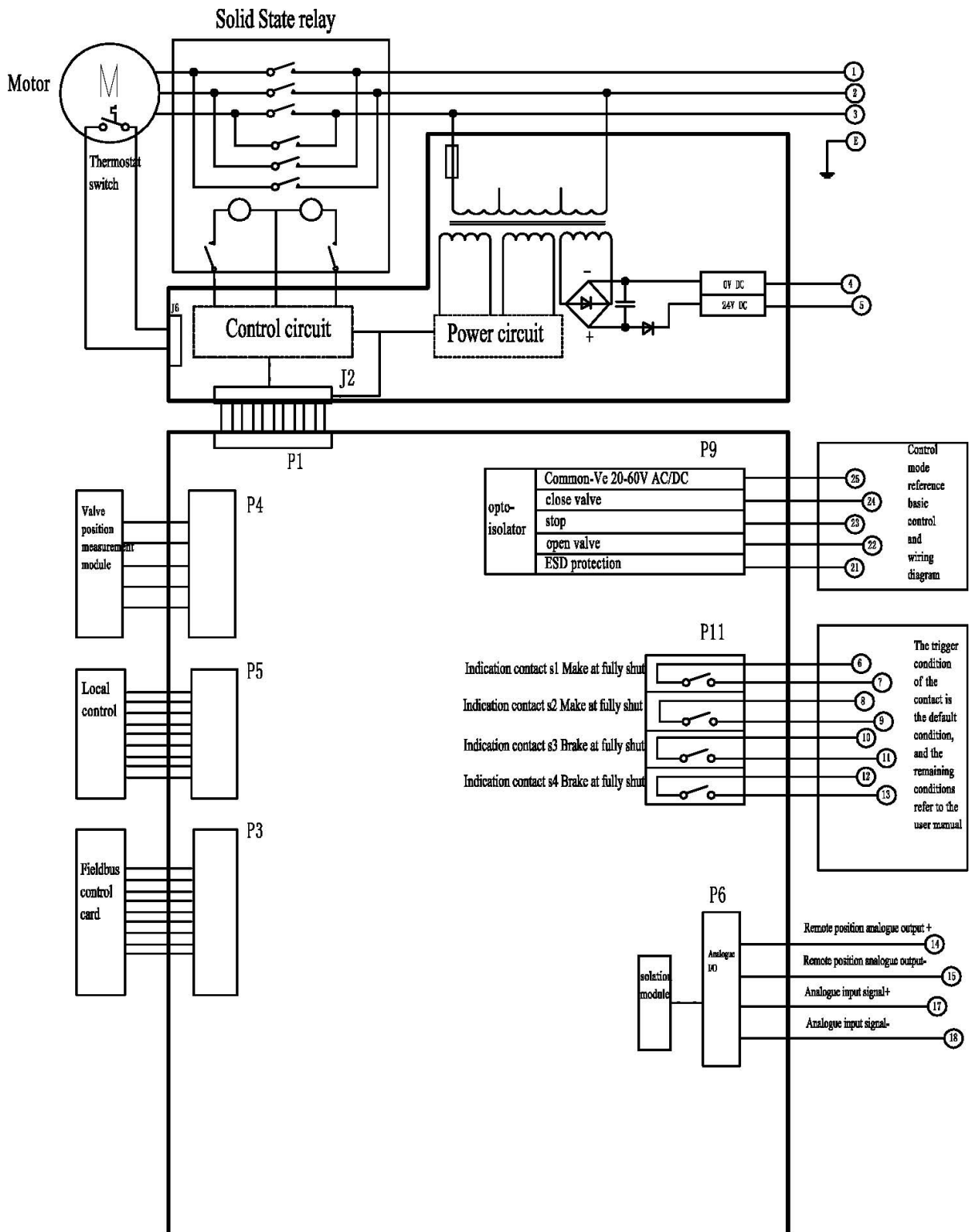
Model	net weight
AVAR-500	17KG
AVAR-200	13.5KG

The process of producing AVAR actuators is composed by scientific design, advanced machining and correct packing, which can ensure several years operation without any faults.

If you need any technology support or spare parts , please contact local agents or contact us directly, meanwhile, please provide models and series numbers。 AVAR promises to serve you best wherever you are in the world.

As we are continually developing our products, please forgive us that the design of Greatork Actuators is subject to change without notice. The latest products and information are available at our website: [www.greatork.com](http://www.greatork.com), for more information, please email us at [Greatork@greatork.com](mailto:Greatork@greatork.com).

# Appendix 1 AVAR BASIC DIAGRAM



## Special setting of actuators