AVAR

AVARM

Intelligent Electric Actuator

AVAR/AVARM SERIES

MANUAL

Edition: V2.0

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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 ℃.

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 ± 5 ˚.

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

Warning:

Motor temperature

Extreme surface temperature of AVAR motor can reach 132 ℃ (270 ℉).

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 Ope ration

3.1 names of spare parts

1. LCD Display
2. Main board
3. Travel Controller
4. Local Operation Button
5. Motor

Menu Button
Open Button
Close Button
Stop/Enter Button

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)
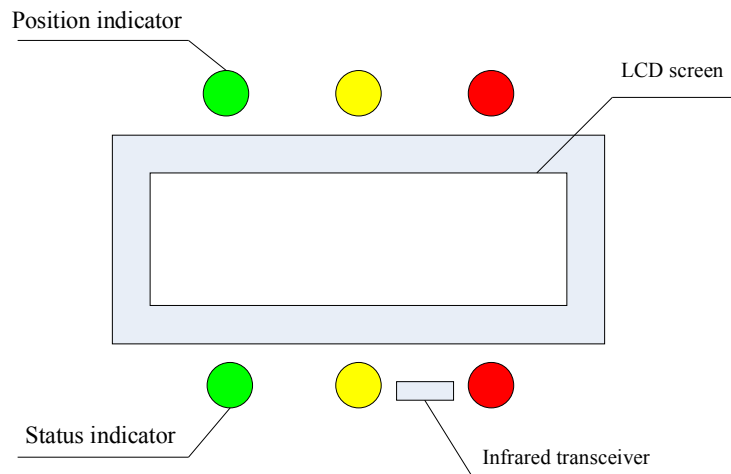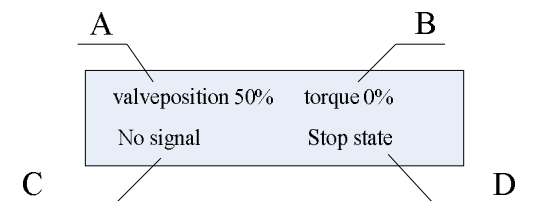

FIG 3-2

2. Main screen

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

A   Valve position indication: when actuator fully close, it shows   , when actuator fully open, it shows "   ", 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.

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.

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:
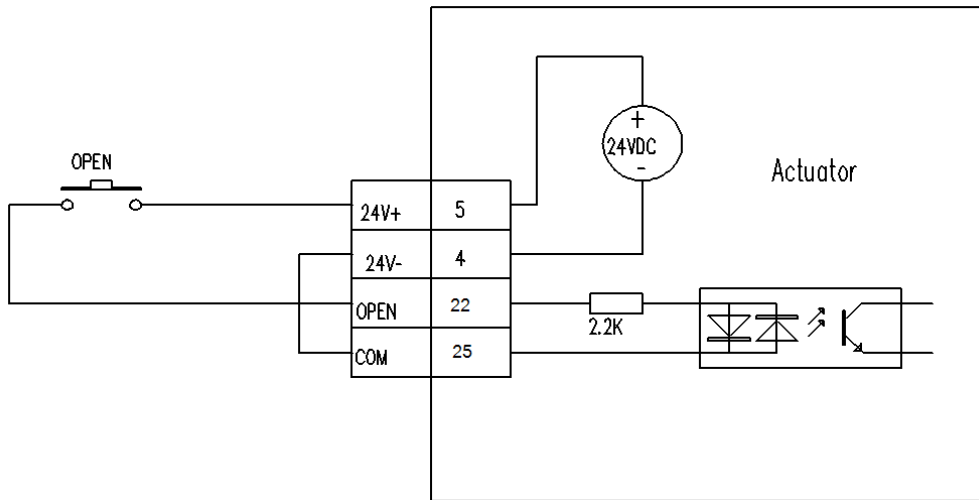
FIG. 4-1

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 vlave 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.
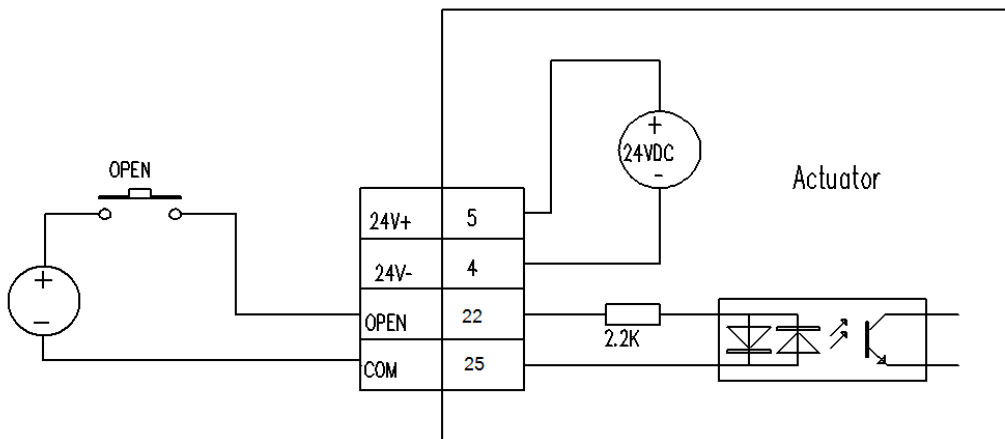

FIG 4-2

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)
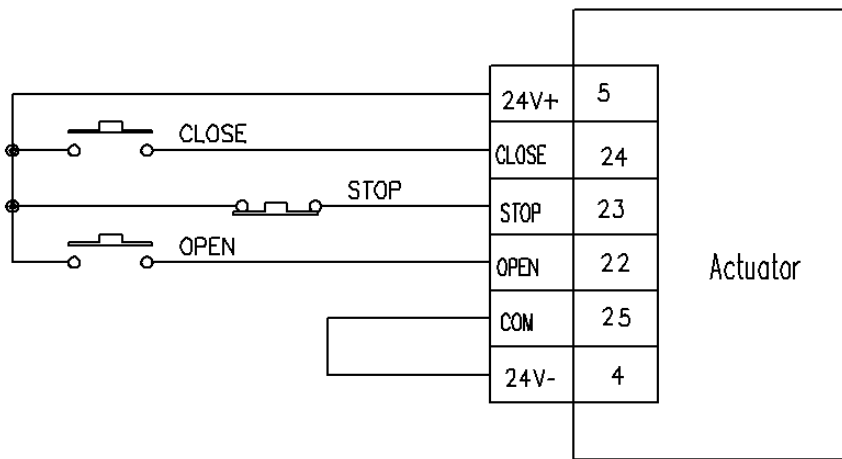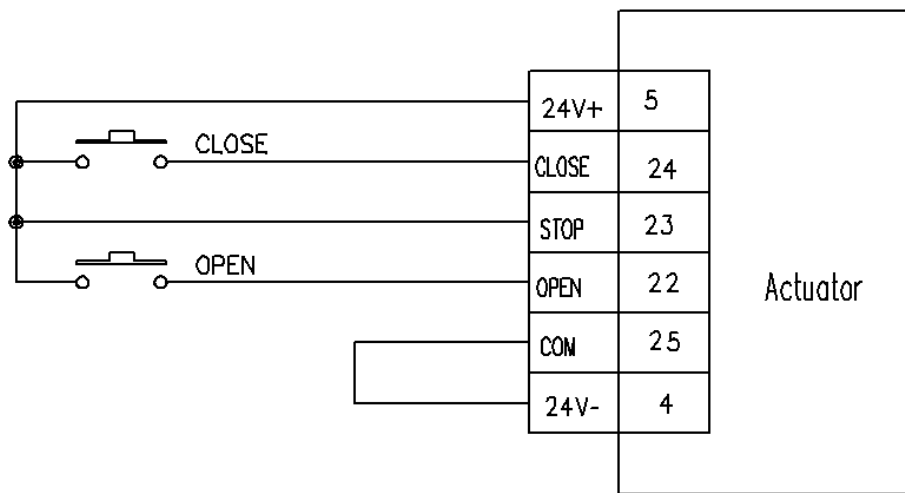

FIG. 4-4

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)
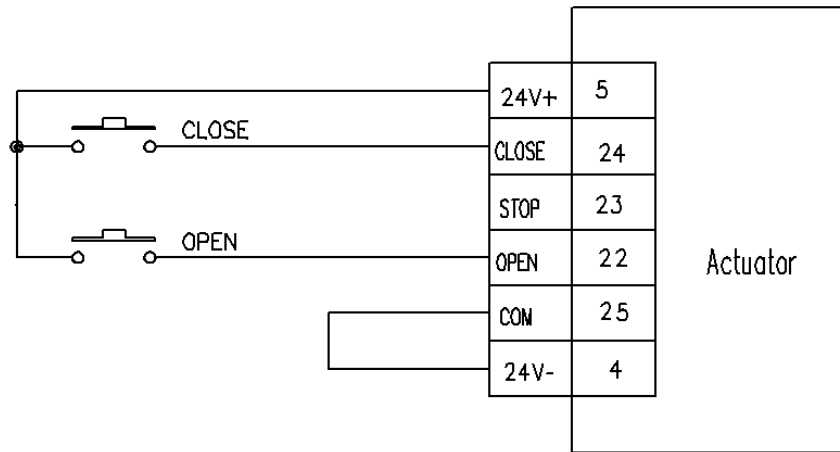
FIG. 4-5

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.
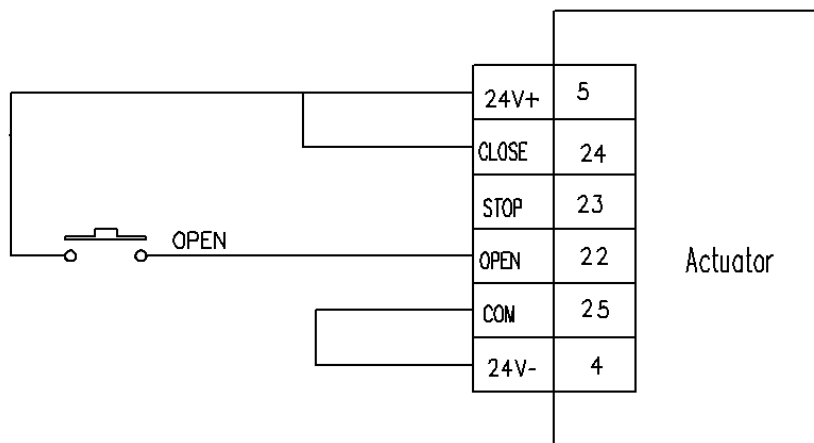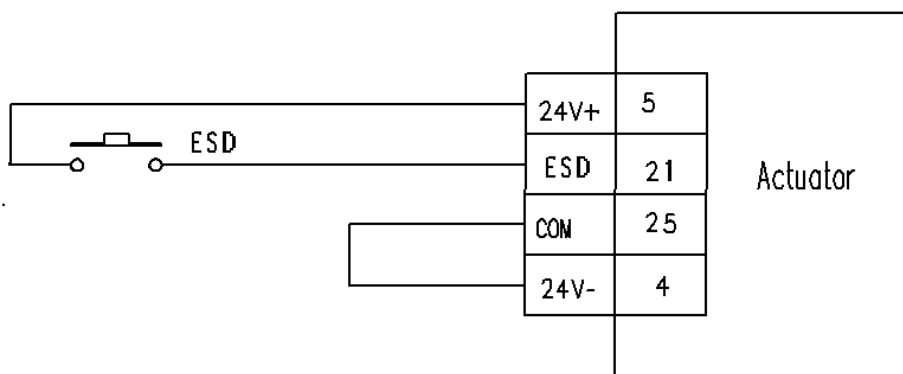
4.2.2.6 ESD Control Fig. 4-8

FIG. 4-8

Instruction

1. For detailed ESD function, please refer to 7.3.2.3.

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　.

　　5. Detailed instruction of analog control please refer to.7.3.2.5

5.

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).

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
Current feedback accuracy	2

Current linearity	1

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 an 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.

（　　）

7.3.1　Basic 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.

（　　　）

7.3.1.2.1　TorqueTripMode

Position　Main screen　password　language　commission

Basic

Torque

TorqueTripMode

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:
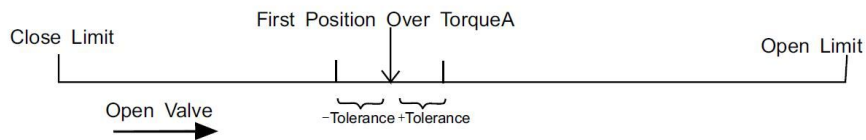
FIG. 7-2

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 　1% of A position again, actuator will backward 5% and opening again. When still over torque within 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

Basic

Torque

TorqueTripMode　CloseTorque

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

Basic

Torque

TorqueTripMode　OpenTorque

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

Basic

Torque

TorqueTripMode   BackwardDistance

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

Basic

Torque

TorqueTripMode   BackwardTimes

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

Basic

Torque

TorqueTripMode   PosTolerance

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   PosTolerance range of first time over torque position, actuator regarded as over torque at that position.

(   )

7.3.1.3.1   Close Limit

Position   Main screen   password   language   commission

Basic

PositionLimit

SetCloseLimit

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

　Position　Main screen　password　language　commission
<div align="center">Basic</div>

<div align="center">PositionLimit</div>
<div align="center">SetOpenLimit</div>

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
（　　）

　Position　Main screen　password　language　commission

<div align="center">Advanced</div>

<div align="center">Options</div>

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.

（　　）

　7.3.2.2.1　Contact 1
　7.3.2.2.1.1　Contact function

　Position　Main screen　password　language　commission

<div align="center">Advanced</div>

<div align="center">Contacts</div>

<div align="center">Contact　Contact　Contact　Contact
ContactFunction</div>

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

Position   Main screen   password   language   commission

Advanced

Contacts

19

Contact

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

Advanced

Contacts

Contact
LowPosition

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

Advanced

Contacts

Contact
HighPosition

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.

(   )

7.3.2.3.1   ESDAction

Position   Main screen   password   language   commission

Advanced

∟ControlMode→
∟…ESDAction

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 ESDContactForm

Position　Main screen　password　language　commission

Advanced

∟ControlMode→
　∟…ESDContactForm

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

Position　Main screen　password　language　commission

Advanced

∟ControlMode→
　∟…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

Position　Main screen　password　language　commission

Advanced

∟ControlMode→
　∟…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

Advanced

└ ControlMode→
…ESDExTorqueTrip ESDExStall
ESDExLockedRotor ESDExPhaseLost ESDExPosErr

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

Advanced

└ ControlMode→
LocalHolding

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

Advanced

└ ControlMode→
RemoteHolding

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.

Parameter: PositionControl,ThresholdControl

Note: When set "PositionControl", adopt 4~20mA current signal to adjust actuator valve position. When set "Thresholdcontrol", adopt 4~20mA current signal to control actuator Open, Close, Stop .

7.3.2.5.2 HighSignalEqual

Parameter: OpenLimit,CloseLimit

Note: When set "OpenLimit",

contri

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

Advanced

└ Modulate→

OpenAdjustPoint

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
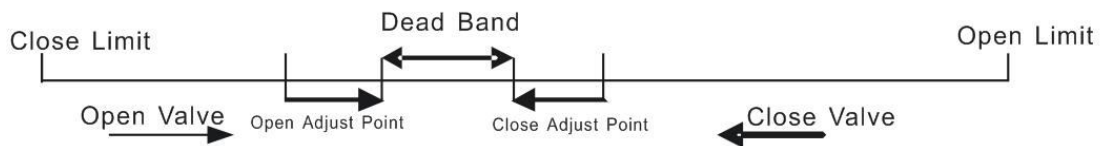
Advanced

└ Modulate→

CloseAdjustPoint

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

Parameter　StayPut, High-Position, Low-Position

Note　StayPut: When signal lost, the actuator stops.

High signal position: When signal lost, actuator runs to the corresponding position of the high signal. Low signal position: When signal lost, actuator runs to the corresponding position of the low signal.

7.3.2.5.12　SignalLostScope

Position　Main screen　password　language　commission

Advanced

∟Modulate→

SignalLostScope

Parameter　0　~200

Note: When the signal is lower than value which equal to　low signal -(High signal-Low signal)　Signal lost scope), actuator judges loss of signal. Default value is 100　.

7.3.2.5.13　SignalEndsScope

Position　Main screen　password　language　commission

Advanced

∟Modulate→

SignalEndsScope

Parameter　0　~100

Note:When the signal is in the range (Low signal, low signal+ (high signal-low signal) SignalEndsScope), actuator is low signal;

When the signal is in the range (High signal-(high signal-low signal)　SignalEndsScope, high signal), the actuator is with high signal.

The default value 20　.

（　　　）

7.3.2.6.1　CloseLampColor

Position　Main screen　password　language　commission

Advanced

∟IndicatorLamp→

CloseLampColor

Parameter　Green(default), Red

Note: Green means fully close with green lamp on. Red means fully close with red lamp on.

（   ）

7.3.2.7.1   DefaultParameter

Position   Main screen   password   language   commission

Advanced

∟ Default→
DefaultParameter

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

Advanced

∟ Default→
DefaultPosition

Parameter   Set   Cancel

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

（   ）

（7.4.1）RemoteSignal

7.4.1.1   Remote Open

Position   Main screen   password   language   Diagnose

RemoteSignal

Open

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

RemoteSignal

Close

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

7.4.1.3   Remote Stop

Position   Main screen   password   language   Diagnose

RemoteSignal

Stop

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

7.4.1.4   Remote ESD

Position   Main screen   password   language   Diagnose

RemoteSignal

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

Position   Main screen   password   language   Diagnose

ContactorState

Contact   Contact   Contact   Contact

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

Position   Main screen   password   language   Diagnose

FieldBusInfo

FieldBusState

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

can't connect with bus control system.

7.4.3.1 FieldBusCommand

Position   Main screen   password   language   Diagnose

FieldBusInfo

FieldBusCommand

Note: Enabled means bus control system command valid. Disable means bus control system command invalid

（**7.4.4**）**EncoderInfo**

7.4.4.1 EncoderDiagnose

Position   Main screen   password   language   Diagnose

EncoderInfo

EncoderDiagnose

Note: Ok means encoder all right. Error means encoder has problem.

7.4.4.2 EncoderValue

Position   Main screen   password   language   Diagnose

EncoderInfo

EncoderValue

Note: It will show current encoder value, when valve opening, encoder value generally increase; When valve closing, encoder value generally decrease.

7.4.4.3 EncoderOrder

Position   Main screen   password   language   Diagnose

EncoderInfo

Note: Number 0~3 is used to judge hall sensor is ok or error. (00,11,01,11 stand for the encoder value, user can judge which encoder is broken; if all is broken that means all is high level EncoderOrder
or low level.)

（**7.4.5**）**SystemInfo**

7.4.5.1 PowerFrequency

Position   Main screen   password   language   Diagnose

SystemInfo

PowerFrequency

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.

（   ）

（7.5.1）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

Statistics

MaxOpenTorque

Note: Max output opening torque percentage when actuator operating.

7.5.2.4   MaxCloseTorque

Position   Main screen   password   language   Diagnose

Statistics

MaxCloseTorque

Note: Max output closing torque percentage when actuator operating.

7.5.2.5   ResetData

Position   Main screen   password   language   Diagnose

Statistics

ResetData

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, for more information, please email us at Greatork@greatork.com.

Appendix 1

Solid State relay

Motor — Thermostat switch

Control circuit — J6 — J2

Power circuit

0V DC — ④
24V DC — ⑤

①
②
③
Ⓔ

P1

P9

opto-isolator	Common-Ve 20-60V AC/DC	㉕
	close valve	㉔
	stop	㉓
	open valve	㉒
	ESD protection	㉑

Control mode reference basic control and wiring diagram

P4 — Valve position measurement module

P11

Indication contact s1 Make at fully shut
Indication contact s2 Make at fully shut
Indication contact s3 Brake at fully shut
Indication contact s4 Brake at fully shut

The trigger condition

of the contact is the default condition, and the remaining conditions refer to the user manual.

⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬

Local control

P3

Fieldbus control card

P6

isolation module — Analogue I/O

Remote position analogue output+ — ⑭
Remote position analogue output- — ⑮
Analogue input signal+ — ⑰
Analogue input signal- — ⑱

Special setting of actuators