

# easy-Drive™ Factory Preferred Installation Practices

## ⚠ WARNING

Always wear protective gloves, clothing, and eyewear when performing any installation operations to avoid personal injury.

To avoid personal injury or property damage caused by bursting of pressure-retaining parts or by uncontrolled process fluid, be certain the service conditions do not exceed the limits shown on the valve nameplate. Use pressure-relieving devices required by government or accepted industry codes and good engineering practices.

Check with your process or safety engineer for any additional measures that must be taken to protect against process media.

## ⚠ WARNING

For explosion-proof applications, ensure the actuator cover is properly bolted before applying power to the actuator. Personal injury or property damage may result from fire or explosion if power is applied to the actuator with the cover removed in a hazardous area.

For explosion-proof applications, install rigid metal conduit and a conduit seal no more than 457 mm (18 inches) from the actuator. Personal injury or property damage may result from explosion if the seal is not installed.

Select wiring and/or cable glands that are rated for the environment of use (such as hazardous area, ingress protection, and temperature). Failure to use properly rated wiring and/or cable glands can result in personal injury or property damage from fire or explosion.

Wiring connections must be in accordance with local, regional, and national codes for any given hazardous area approval. Failure to follow the local, regional, and national codes could result in personal injury or property damage from fire or explosion.

## CAUTION

When ordered, the valve configuration and construction materials were selected by you to meet particular pressure, temperature, pressure drop, and controlled fluid conditions. Responsibility for the safety of process media and compatibility of valve materials with process media rests solely with the purchaser and end-user. Since some body/trim material combinations are limited in their pressure drop and temperature ranges, do not apply any other conditions to the valve without first contacting your Emerson Process Management sales office.

To avoid product damage, inspect the valve before installation for any damage or any foreign material that may have collected in the valve body. Also remove any pipe scale, welding slag, or other foreign material from the pipeline.



**⚠ WARNING**

Avoid personal injury or property damage caused by possible actuator failure. The use of a rigidly-mounted support on the actuator casing may cause additional stress on the actuator leading to premature wear and/or failure of the actuator components.

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**CAUTION**

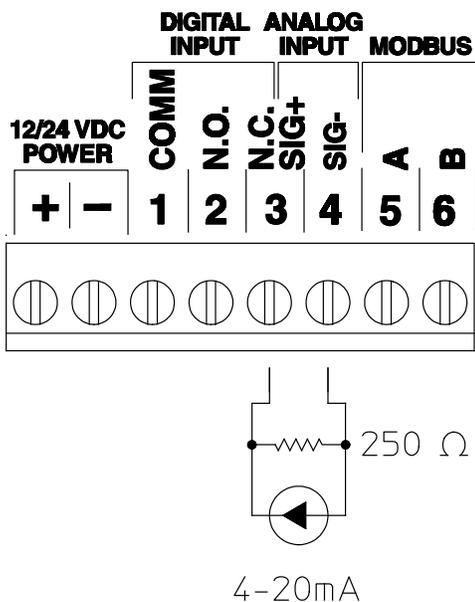
To avoid product damage, inspect the valve before installation for any damage or any foreign material that may have collected in the valve body. Also remove any pipe scale, welding slag, or other foreign material from the pipeline.

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## Standard Wiring Practices

- Use a minimum 22 AWG wire.
- Use a maximum 12 AWG wire.
- Shields always grounded at one end only in a star pattern.
- Tighten all terminal screws firmly to ensure solid mechanical connection.
- Do not ground actuator casing to shields or other grounds. Actuator is grounded through piping.
- Follow NEC and applicable local wiring practices. Ensure power is turned off before connecting the wires.

# Initial Valve Configuration



NOTES:  
 TERMINAL 2 MAY BE LABELLED N.O. OR OPEN.  
 TERMINAL 3 MAY BE LABELLED N.C. OR CLOSE.  
 ALL INSTRUCTIONS USE THE N.O./N.C. TERMINOLOGY BUT THEY APPLY EQUALLY TO OPEN/CLOSE LABELLED UNITS.

## 4-20mA Control Practices / Set-Up Procedure

- Install 250 Ω resistor across the analog input.
- Connect valve to power, either 24 V or 12 V.
- Start-up Fisher® easy-Drive configurator and connect to valve.
- Progress to Initial Valve Set-Up Calibration.

## Troubleshooting – using easy-Drive configuration software

- Valve plug does not move after replacing controller board.
  - When connected to easy-Drive configuration software, board communicates and issues a stall warning when movement is attempted.
    - Confirm wire colors between controller board and motor match. (Red-to-Red, Black-to-Black, Blue-to-Blue).
    - Ensure power supply can provide at least 4 A minimum.
  - When connected to easy-Drive configuration software, board communicates and no stall warning is issued but valve plug does not move.
    - Ensure proper mode is selected and “Update” button has been pressed under “Valve Information and Settings” (On/Off or Modulating and Local/Modbus).
    - If 4-20 mA mode, does Analog I/P value in “Status” box match signal value?
      - If 0.0 mA is shown and greater than 4 mA signal has been verified, verify analog with the “Analog I/P shows 0...” procedure shown at the bottom of this page.
- Valve does not communicate over Modbus connection.
  - Verify 12/24 VDC power is present on power terminals in correct polarity.
  - Verify voltage differential is modulating across Modbus terminals (0-5 VDC).
  - Verify T+ (or A) is on A terminal and T- (or B) is on B terminal.
  - Under “Serial Port Settings”, ensure the Modbus communicating device being used is shown in the “Serial Port” drop down menu window.
    - If Modbus communicating device (USB-RS485) is not visible, check Device Manager on the computer and ensure that the correct drivers have been installed.
  - Valve does not connect to easy-Drive configuration software and does not respond to control signals.
    - Ensure the easy-Drive Selection settings, Serial Port Settings, and Communication settings all match. The default settings are Address 1, 96000 Baud, and Even Parity. The valve can be reset by changing the easy-Drive Selection and Serial Port Settings and then cycling the power.
    - Contact your Emerson Process Management sales office or Local Business Partner.
- Analog I/P shows 0 when analog signal is non-zero, assuming 1-5 V or 4-20 mA control is activated.
  - Leave power to actuator on.
  - Set control to 4-20 mA and click update.
  - Remove 250  $\Omega$  resistor if installed.
  - Apply 20 mA signal then click “Analog Cal at 100%”.
  - If valve doesn't move to 100% open, contact your Emerson Process Management sales office or Local Business Partner.

## Well Site Grounding

- Make sure all control wiring employs shielded cabling.
- All shielded wiring need to be grounded at ONE location, preferably RTU (star configuration).
- Ensure that no wiring coming from the RTU is grounded to the valve.

## Power Source Arrangement

- Place a 5 amp fuse between power supply and valve.
- Connect valve power directly to the battery bank or connect to RTU power.
- Ensure the power source is grounded to the same ground as the RTU.
- Ensure power supply is capable of delivering at least 4 A.

## Initial Valve Set-Up Calibration

### **⚠ WARNING**

To avoid personal injury or property damage, be aware that the valve will open fully and then close fully during the calibration cycle.

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## Modulating Action

- Install easy-Drive Configurator V1.06 (under USER TOOLS in URL).  
<http://www2.emersonprocess.com/en-us/brands/fisher/actuators/electric/easydrive/pages/easy-drive.aspx>
- Read easy-Drive Instruction manual installation procedures.
- Connect to easy-Drive using correct serial port setting. See the Serial Port Settings drop menu.
- Go to easy-Drive Selection and search for Address 1 (Default is address 1, 9600 baud rate, even parity).
- Once connected, the shaded boxes should populate.
- Select Modbus as the control source then click Update.
- Move the Position Demand to 100%, allow it to reach full open. Confirm Position by comparing it to Actual Position in the Status Box. This will be a metal-to-metal connection.
- Move the Position Demand to 0%, allow it to fully close. Confirm Position by comparing it to Actual Position in the Status Box.

- Once confirmed, change Control Source to Local and select the 4-20 mA Analog Scaling. Click Update.
- Now provide a local 20 mA signal to the board from a voltmeter. Wait 5 seconds, then click the “Analog Cal at 100%” button in the Calibration Box.
- Now provide a local 4 mA signal to the board from a voltmeter. Wait 5 seconds, then click the “Analog Cal at 0%” button in the Calibration Box.
- Disconnect the 4-20 mA signal cables and install a 250  $\Omega$  resistor across the analog terminals.
- Once connected, update the Analog Scaling to 1-5 V, then click Update.
- Reconnect the 4-20 mA signal cables and provide a 20 mA signal. This should open the valve.
- Once the 20 mA signal is applied, click the Analog Cal at 100%. If the valve was not completely open it should now be open. Make sure Analog I/P is near 5 V.
- Once the valve has stopped moving and remains open, apply a 4 mA signal to the valve.
- Once the 4 mA signal is applied, click the Analog Cal at 0%. If the valve was not completely closed it should now be closed. Make sure Analog I/P is near 1 V.
- Place a 12 mA signal to the valve and see if the travel moves to 50% open. Check this against the Actual Position in the Status box.
- Once the input value and the Actual Position are close enough then the valve has been calibrated and is ready to use.
- If there is a large deviation between the input and the actual position repeat the above steps to achieve a closer calibration.

## On/Off Action

- Install easy-Drive Configurator V1.06 ( under USER TOOLS in URL).  
<http://www2.emersonprocess.com/en-us/brands/fisher/actuators/electric/easydrive/pages/easy-drive.aspx>
- Read easy-Drive Instruction manual installation procedures.
- Connect to easy-Drive using correct serial port setting.
- Go to easy-Drive Selection and search for Address 1 (default is address 1, 9600 baud rate, even parity).
- Once connected, the shaded boxes should populate.
- Select Modbus as the control source then click Update.
- Move the Position Demand to 100%, allow it to reach full open. Confirm Position by comparing it to Actual Position in the Status box.
- Move the Position Demand to 0%, allow it to fully close. Confirm Position by comparing it to Actual Position in the Status box.
- Once confirmed, go to Valve Information. Make sure On/Off Mode is selected. Click Update and select Settings tab.
- Within Setting make sure that the Local Control Source and L2e (Dual Contact) are selected. Once selected click Update.

- The valve should be closed at this time. Use a voltmeter to confirm that 5 V exists between the Common (COMM) and Normally Open (N.O.) terminals. If there is not 5 V across the terminals, repeat steps for supplying power outlined in the easy-Drive instruction manual. (If problem persists contact factory).
- Repeat above step with COMM and Normally Closed (N.C./CLOSE) terminals.
- Use a piece of wire to connect the COMM and N.O. (OPEN) Terminals. Once connected valve should open.
- Wait for actuator to stop. Once stopped check Actual Position in the Status box for 100%.
- Remove the wire between COMM and N.O. (OPEN) terminals. Valve should remain open to 100%.
- Connect the wire between the COMM and the N.C. (CLOSE) terminal.
- Once connected the valve should close. Once actuator has stopped check Actual Position in the Status box for 0%.
- If valve deviates from 0% or 100% when intended, recalibrate the valve using Modbus as described above.

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