

# Single Point Calibration

## Fisher™ FIELDVUE™ DVC2000 Digital Valve Controller

The Single Point Calibration procedure allows you to replace an existing positioner with a DVC2000, on sliding-stem applications, without performing a travel calibration. This procedure should only be used in emergency situations where a positioner must be completely replaced and is part of a valve assembly that does not have a process bypass or the process cannot be shut down. For other procedures, refer to the DVC2000 Quick Start Guide and the DVC2000 Instruction Manual.

### Related Documents

- Fisher FIELDVUE DVC2000 Digital Valve Controller Quick Start Guide ([D103203X012](#))
- Fisher FIELDVUE DVC2000 Digital Valve Controller Instruction Manual ([D103176X012](#))

These documents are available from your [Emerson sales office](#) or at Fisher.com.

#### **⚠ WARNING**

**Personal injury or property damage, caused by unexpected valve movement and an uncontrolled process, could result if this procedure is attempted when the valve is not locked at its present position. If you cannot safely lock the valve in position until this procedure is complete, do not proceed with this procedure.**

#### **Notes**

This procedure should only be used in emergency situations where a positioner must be completely replaced and is part of a valve assembly that does not have a process bypass or the process cannot be shut down. Do not proceed if the valve has a bypass or the process can be shut down.

The valve will need to be locked at its present position. This can be accomplished by using a handwheel or other mechanism. If the valve assembly or valve application will not allow you to safely lock the valve in position until this procedure is complete, do not proceed with this procedure.

This procedure can be used to replace a positioner with a DVC2000. The DVC2000 used to replace the existing positioner must have firmware 3, 4, or 5 and HC, AD, or PD diagnostic tiering. Do not proceed with this procedure if the digital valve controller does not meet the tiering and firmware requirements mentioned above.

This procedure can only be performed on sliding-stem valve assemblies and only supports feedback connections using the linear sliding-stem arrays. This procedure cannot be performed with a long stroke roller array. Do not proceed if you have something other than a sliding-stem valve assembly with a linear sliding-stem array.

This procedure requires the use of ValveLink™ software 13.5 or newer.

## Installation

### **⚠ WARNING**

Avoid personal injury or property damage from sudden release of process pressure or bursting of parts. Before proceeding with any procedures:

- Always wear protective clothing, gloves, and eyewear to prevent personal injury or property damage.
- Do not remove or uncouple the actuator from the valve while the actuator is still pressurized.
- The valve will need to be locked at its present position. If you cannot safely lock the valve in position until this procedure is complete, do not proceed with this procedure.
- After the valve has been safely locked in position, disconnect any operating lines providing air pressure, electric power, or a control signal to the actuator. Be sure the actuator cannot suddenly open or close the valve.
- Use lock-out procedures to be sure that the above measures stay in effect while you work on the equipment.
- Check with your process or safety engineer for any additional measures that must be taken to protect against process media.

## 1. Lock Valve in Place

- 1.1 Ensure the mounting kit for the replacement DVC2000 is compatible with the valve assembly. Do not proceed with this procedure until you have obtained a mounting kit compatible with the replacement DVC2000 and the control valve assembly.
- 1.2 Block the valve into position either with a handwheel or other mechanism. If you cannot safely lock the valve in position until this procedure is complete, do not proceed with this procedure.
- 1.3 Disconnect the operating lines that provide air pressure to the actuator. Bleed any extra air that may be built up in the instrument. Please note which air connections go to the actuator and which come from supply for future reassembly.
- 1.4 Determine and record the following parameters:
  - Feedback Connection: The magnetic array type that will be used with the replacement digital valve controller.

### **Note**

This procedure only supports feedback connections using linear sliding-stem arrays. Do not proceed if you are not using a linear sliding-stem array.

- Travel Sensor Motion: States whether increasing drive signal causes the magnetic assembly to move toward the top of the instrument or away from the top of the instrument.
- Air (Closes/Opens): States whether adding air opens or closes the valve.
- Actual Travel: The measured distance from the closed position to the fully open position of the valve.

## 2. Configure Replacement Digital Valve Controller Prior to Installation

- 2.1 Open ValveLink software and connect to the replacement digital valve controller.

2.2 Open the tag for your replacement digital valve controller and run Setup Wizard.

2.2a Initiate the Setup Wizard from either the Instrument Setup menu or Setup Wizard Icon on the toolbar.



2.2b Set the desired Pressure Units and the Max Supply Pressure for the application.

2.2c Select the required Actuator Information including: Actuator Make, Actuator Model, Actuator Size, and designate if a Volume Booster or Quick Release Valve is present.

2.2d If prompted, fill out any additional screens (eg: Zero Power Condition, Actuator Style, and Tuning Information).

2.2e Select Yes when prompted to Use Factory Default Settings.

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#### Note

It is not necessary to run an Auto Travel Calibration since the digital valve controller will be calibrated with the Single Point Calibration feature in future steps and is not currently mounted to a valve assembly.

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2.2f When prompted to run an Auto Travel Calibration select No.

2.3 Place the instrument In Service and close the tag. Then disconnect the digital valve controller.

## 3. Manually Replace Positioner

### **⚠ WARNING**

Refer to the Installation Warning on page 2.

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3.1 Disconnect any operating lines that provide air pressure, electric power, or a control signal to the actuator. Be sure the actuator cannot suddenly open or close the valve. Remember to note where each line goes for reassembly.

3.2 Confirm the valve assembly is safely locked in position. Do not proceed if the valve assembly has not been safely locked in position.

3.3 Carefully remove the existing positioner without disturbing the mechanism locking the valve in position.

3.4 Mount the replacement digital valve controller by following the mounting instructions for sliding-stem valve assemblies in the DVC2000 Quick Start Guide ([D103566X012](#)).

### **CAUTION**

**Valve movement may occur if air is supplied to the digital valve controller during calibration. The Single Point Calibration process cannot be started if air is supplied to the instrument.**

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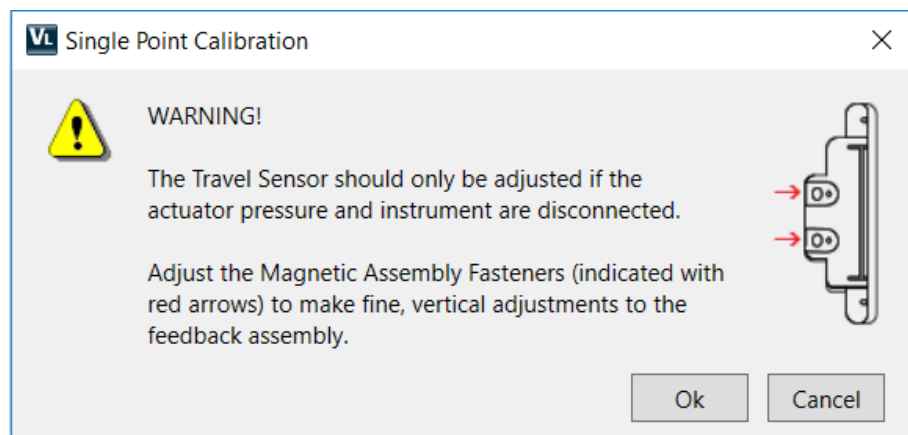
3.5 Reattach pneumatic and electrical operating lines to the replacement digital valve controller but Do Not Turn On Air Supply.

- Measure and record the valve assembly's Observed Travel (%). Observed Travel is the current position of the valve as a percentage of the actual travel.

## 4. Run Single Point Calibration

- 4.1 In ValveLink software, connect to the replacement digital valve controller. Open the tag for your replacement digital valve controller.
- 4.2 Initiate **Single Point** from the **Calibration** menu. Set the device Out of Service if prompted.
- 4.3 Read the **Start Screen** and confirm you have completed the required initial steps for Single Point Calibration. Click **Next** if you have completed the required steps listed.
- 4.4 Review the travel configuration information pre-populated by Setup Wizard and/or enter the correct values in the blanks on the **Configuration Screen**. Click **Next** when all the values are entered correctly.
- 4.5 Review the tuning information pre-populated by Setup Wizard and/or enter the correct values in the blanks on the **Tuning Screen**. Click **Next** when all the values are entered correctly.
- 4.6 Read the **Warning Screen** (figure 1) that describes how to adjust the travel sensor. Click **OK** when finished reading the screen.

Figure 1. Warning Screen



- 4.7 On the **Travel Screen**, enter the Actual Travel (in) and Observed Travel (%). Then click **Next**.
  - 4.7a Read the alignment recommendations in the bottom left hand corner of the screen. Follow the alignment recommendations, to move the feedback assembly up or down, until the alignment is indicated with the good status symbol (Figure 2). Then click **Next** to put your digital valve controller back In Service.

Figure 2. Good Status Symbol



- 4.8 Review the travel setpoint and measured travel on the **Control Signal Screen**. Adjust the travel setpoint to match travel. This will minimize valve movement when air is resupplied. Once the travel setpoint matches travel, click **Next**.
- 4.9 Reintroduce instrument air pressure to the digital valve controller. The air pressure supplied will be shown on the dial graphic on the **Air Screen**. Once you've confirmed instrument air has been supplied, click **Next**.

**⚠ WARNING**

**Refer to the Installation Warning on page 2.**

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- 4.10 On the resulting Finish Screen adjust the Travel Setpoint to remove force on the valve locking mechanism. Then carefully remove the valve locking mechanism.

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**Note**

The lack of a full travel calibration can impact the accuracy of the position feedback. While this does not impact the instrument's ability to control the process, it can influence the results of diagnostic tests.

This calibration is approximate and accuracy is limited. To ensure optimal accuracy and operation, perform an auto travel calibration on the digital valve controller as soon as conditions allow.

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