

Fisher™ FIELDVUE™ DVC6005 Series Remote Mount Digital Valve Controllers

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This quick start guide provides installation and initial setup information for DVC6005 HW2 and DVC6005f remote mount base units and DVC6015, DVC6025, and DVC6035 remote feedback units





Before You Begin



Do not install, operate, or maintain a DVC6005 Series base unit and a DVC6015, DVC6025 or DVC6035 remote feedback unit without being fully trained and qualified in valve, actuator, and accessory installation, operation, and maintenance. To avoid personal injury or property damage, it is important to carefully read, understand, and follow all the contents of this quick start guide, including all safety cautions and warnings. Refer to the appropriate instruction manual supplement listed below for hazardous area approvals and special instructions for “safe use” and installations in hazardous locations. If you have any questions about these instructions, contact your [Emerson sales office](#) before proceeding.

- CSA Hazardous Area Approvals DVC6005 Series Remote Mount Digital Valve Controllers ([D104209X012](#))
- FM Hazardous Area Approvals DVC6005 Series Remote Mount Digital Valve Controllers ([D104210X012](#))
- ATEX Hazardous Area Approvals DVC6005 Series Remote Mount Digital Valve Controllers ([D104211X012](#))
- IECEx Hazardous Area Approvals DVC6005 Series Remote Mount Digital Valve Controllers ([D104212X012](#))

All documents are available from your Emerson sales office or at www.Fisher.com. Contact your Emerson sales office for all other approval/certification information.

⚠ WARNING

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

- Always wear protective clothing, gloves, and eyewear to prevent personal injury or property damage.
- Do not remove the actuator from the valve while the valve is still pressurized.
- 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 bypass valves or completely shut off the process to isolate the valve from process pressure. Relieve process pressure from both sides of 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.
- Vent the pneumatic actuator loading pressure and relieve any actuator spring precompression so the actuator is not applying force to the valve stem; this will allow for the safe removal of the stem connector.

⚠ WARNING

To avoid static discharge from the plastic cover when flammable gases or dust are present, do not rub or clean the cover with solvents. To do so could result in a spark that may cause the flammable gases or dust to explode, resulting in personal injury or property damage. Clean with a mild detergent and water only.

NOTICE

Do not use sealing tape on pneumatic connections. This instrument contains small passages that may become obstructed by detached sealing tape. Thread sealant paste should be used to seal and lubricate pneumatic threaded connections.



Related Documents

The following documents include product specifications, reference materials, custom setup information, maintenance procedures, and replacement part details.

If a copy of any of these documents is needed contact your [Emerson sales office](#) or visit www.Fisher.com.

- FIELDVUE DVC6000 HW2 Digital Valve Controller Instruction Manual ([D103785X012](#))
- HART Field Device Specification - FIELDVUE DVC6000 HW2 Digital Valve Controller ([D103782X012](#))
- FIELDVUE DVC6000f Digital Valve Controllers Instruction Manual ([D103189X012](#))

Step 1—Install the Remote Mount Base Unit and Feedback Unit

Notes

The DVC6005 base unit ships separately from the control valve and does not include tubing, fittings or wiring.

Mounting the instrument vertically, with the vent at the bottom of the assembly, or horizontally, with the vent pointing down, is recommended to allow drainage of moisture that may be introduced via the instrument air supply.

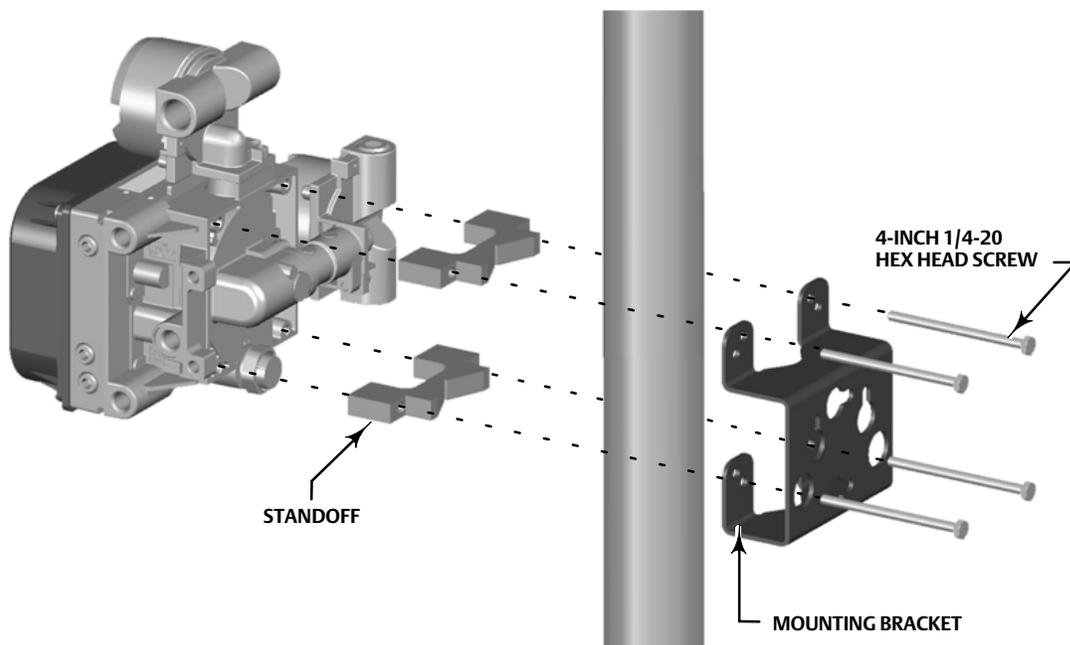
For pipestand mounting proceed to page 4

For wall mounting proceed to page 5

Pipestand Mounting

1. Position a standoff on the back of the DVC6005 base unit.
2. Using two 101.6 mm (4-inch) 1/4-20 hex head screws loosely attach the base unit to the pipestand with the mounting bracket.
3. Position the second standoff, then, using the remaining 101.6 mm (4-inch) hex head screws, securely fasten the base unit to the pipe stand.
4. Tighten all screws.
5. Proceed to the appropriate remote feedback unit mounting procedure.

Figure 1. FIELDVUE DVC6005 Pipestand Mounting



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For DVC6015 remote feedback unit on sliding-stem linear actuators up to 102 mm (4 inches) travel proceed to page 6

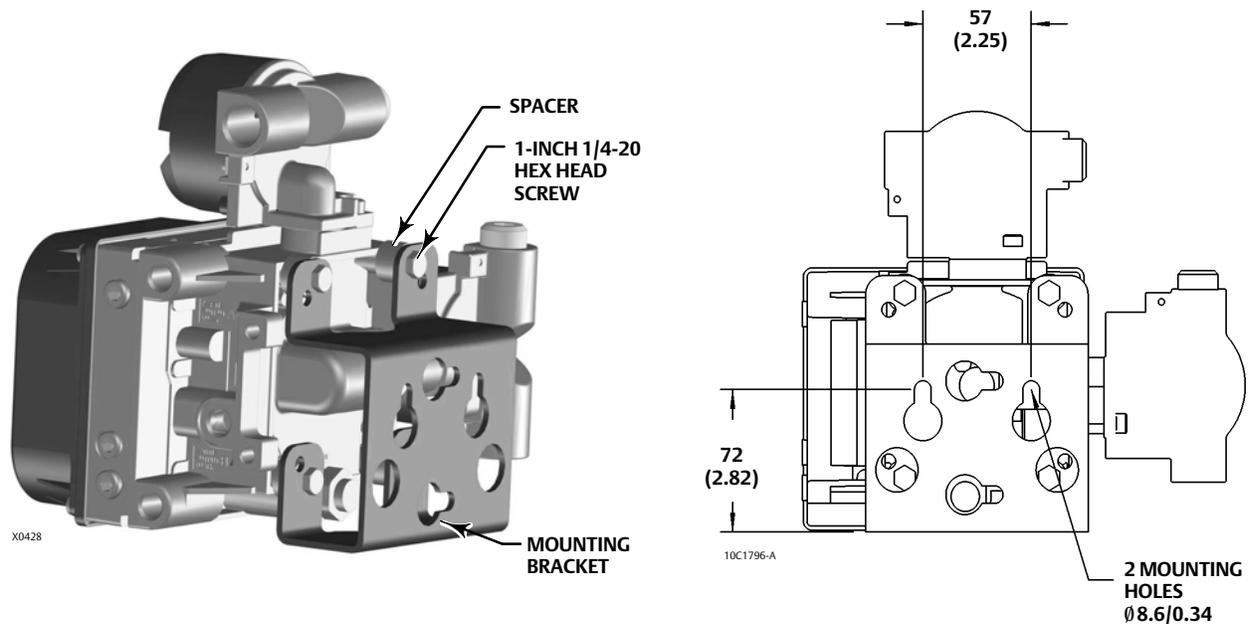
For DVC6025 remote feedback unit on long-stroke [102-610 mm (4-24 inch)] travel sliding-stem actuators and rotary actuators proceed to page 9

For DVC6035 remote feedback unit on quarter-turn rotary actuators proceed to page 12

Wall Mounting

1. Install the wall mounting screws by using the mounting bracket as a template.
2. Install the mounting bracket to the back of the base unit using the spacers and screws provided in the mounting kit.
3. Slide the assembly on the wall mounting screws and tighten.
4. Proceed to the appropriate remote feedback unit mounting procedure.

Figure 2. FIELDVUE DVC6005 Wall Mounting



For DVC6015 remote feedback unit on sliding-stem linear actuators up to 102 mm (4 inches) travel proceed to page 6

For DVC6025 remote feedback unit on long-stroke [102-610 mm (4-24 inch)] travel sliding-stem actuators and rotary actuators proceed to page 9

For DVC6035 remote feedback unit on quarter-turn rotary actuators proceed to page 12

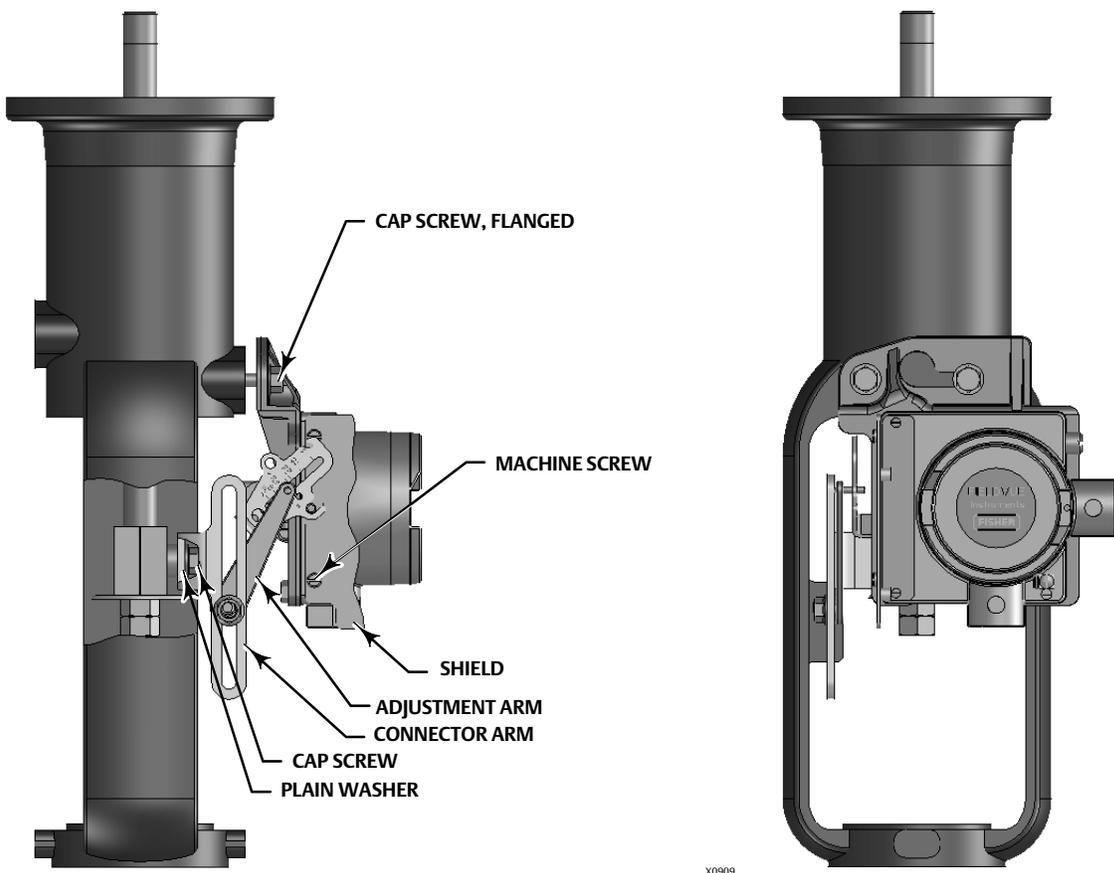
DVC6015 Remote Mount Feedback Unit on Sliding-Stem Linear Actuators up to 102 mm (4 inches) Travel

Note

If ordered as part of a control valve assembly, the factory mounts the DVC6015 remote feedback unit on the actuator. If you purchased the remote feedback unit separately, you will need a mounting kit to mount the remote feedback unit on the actuator. See the instructions that come with the mounting kit for detailed information on mounting the remote feedback unit to a specific actuator model.

The DVC6015 remote feedback unit mounts on sliding-stem actuators with up to 102 mm (4 inch) travel. Figure 3 shows a typical mounting on an actuator with up to 51 mm (2 inch) travel. Figure 4 shows a typical mounting on actuators with 51 to 102 mm (2 to 4 inch) travel. For actuators with greater than 102 mm (4 inch) travel, see the guidelines for mounting a DVC6025 remote feedback unit.

Figure 3. FIELDVUE DVC6015 Remote Feedback Unit Mounted on Sliding-Stem Actuators with up to 2 Inches Travel

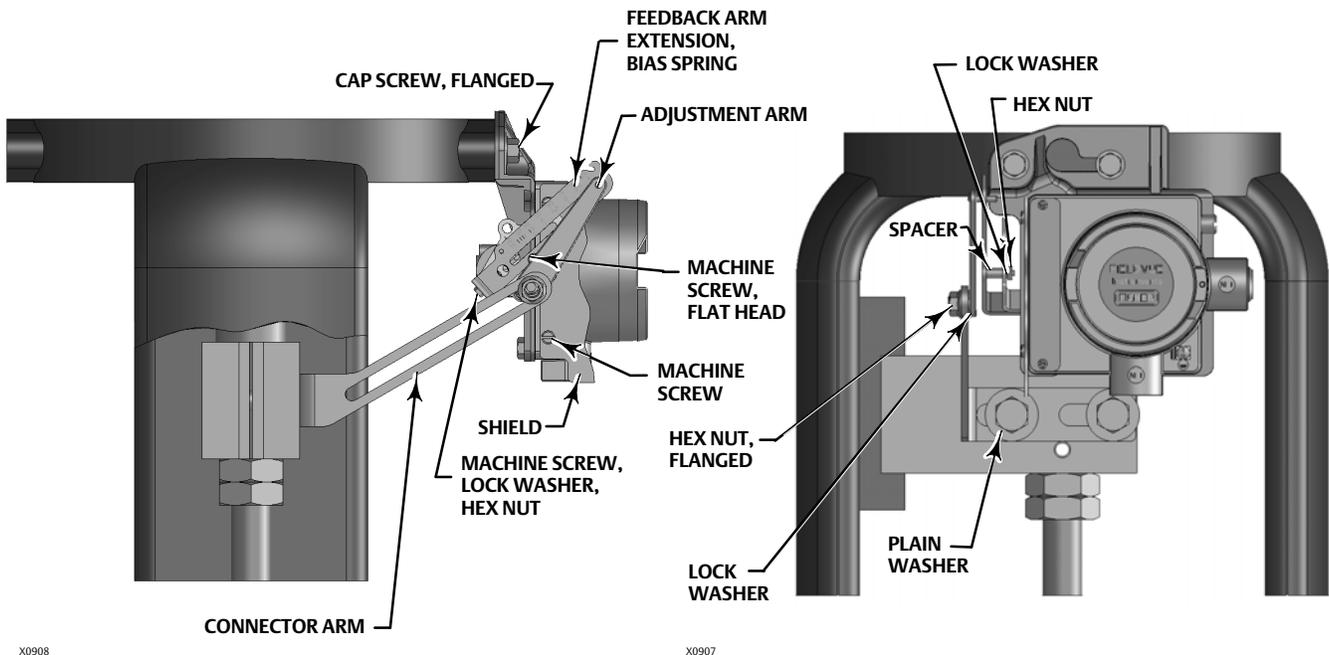


Refer to the following guidelines when mounting on sliding-stem actuators with up to 4 inches of travel.

1. Isolate the control valve from the process line pressure and release pressure from both sides of the valve body. Shut off all pressure lines to the actuator, releasing all pressure from the actuator. Use lock-out procedures to be sure that the above measures stay in effect while you work on the equipment.

2. Attach the connector arm to the valve stem connector.
3. Attach the mounting bracket to the digital valve controller housing.
4. If valve travel exceeds 2 inches, a feedback arm extension is attached to the existing 2-inch feedback arm. Remove the existing bias spring from the 2-inch feedback arm. Attach the feedback arm extension to the feedback arm (key 79) as shown in figure 4.
5. Mount the remote feedback unit on the actuator as described in the mounting kit instructions.

Figure 4. FIELDVUE DVC6015 Remote Feedback Unit Mounted on Sliding-Stem Actuators with 2 to 4 Inches Travel



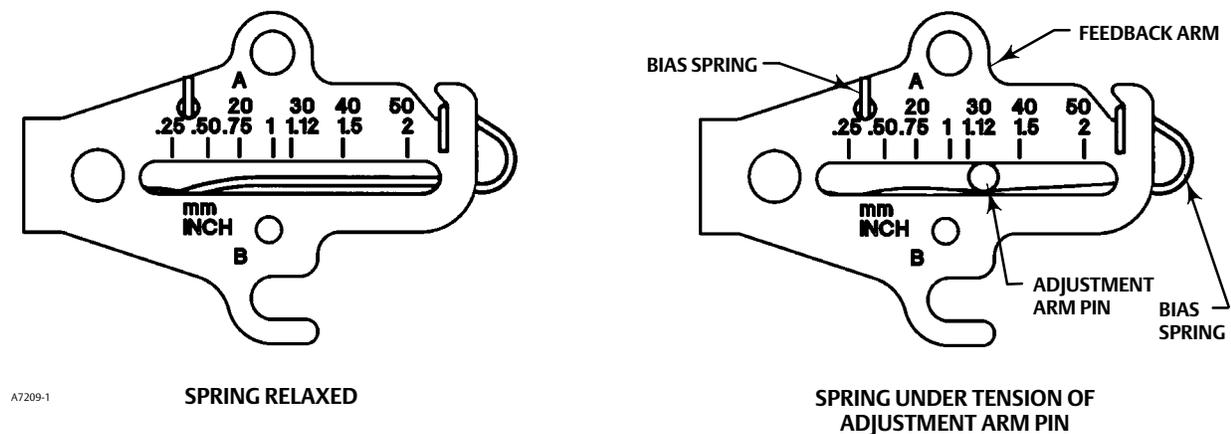
6. Set the position of the feedback arm (key 79) on the remote feedback unit to the no air position by inserting the alignment pin (key 46) through the hole on the feedback arm as follows:
 - For air-to-open actuators (i.e., the actuator stem retracts into the actuator casing or cylinder as air pressure to the casing or lower cylinder increases), insert the alignment pin into the hole marked “A”. For this style actuator, the feedback arm rotates counterclockwise, from A to B, as air pressure to the casing or lower cylinder increases.
 - For air-to-close actuators (i.e., the actuator stem extends from the actuator casing or cylinder as air pressure to the casing or upper cylinder increases), insert the alignment pin into the hole marked “B”. For this style actuator, the feedback arm rotates clockwise, from B to A, as air pressure to the casing or upper cylinder increases.

Note

When performing the following steps, ensure there is enough clearance between the adjustment arm and the feedback arm to prevent interference with the bias spring.

7. Apply lubricant to the pin of the adjustment arm. As shown in figure 5, place the pin into the slot of the feedback arm or feedback arm extension so that the bias spring loads the pin against the side of the arm with the valve travel markings.

Figure 5. Locating Adjustment Arm Pin in Feedback Arm



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8. Install the external lock washer on the adjustment arm. Position the adjustment arm in the slot of the connector arm and loosely install the flanged hex nut.
9. Slide the adjustment arm pin in the slot of the connector arm until the pin is in line with the desired valve travel marking. Tighten the flanged hex nut.
10. Remove the alignment pin (key 46) and store it in the module base next to the I/P assembly.
11. After calibrating the instrument, attach the shield with two machine screws.
12. Proceed to Step 2—Connect the Pneumatic Tubing on page 15.

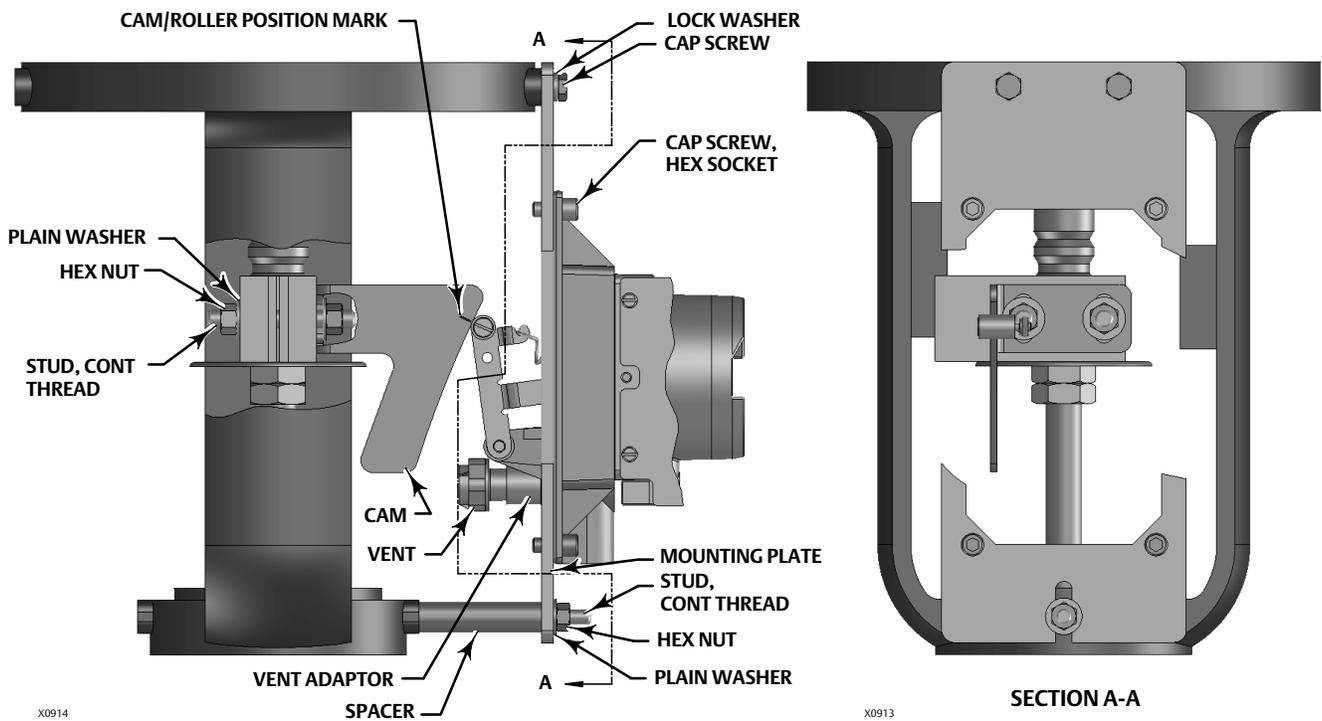
DVC6025 Remote Feedback Unit on Long-Stroke [102-610 mm (4-24 inch) Travel] Sliding-Stem Actuators and Rotary Actuators

Note

If ordered as part of a control valve assembly, the factory mounts the DVC6025 remote feedback unit on the actuator. If you purchased the remote feedback unit separately, you will need a mounting kit to mount the remote feedback unit on the actuator. See the instructions that come with the mounting kit for detailed information on mounting the remote feedback unit to a specific actuator model.

DVC6025 remote feedback units use a cam and roller as the feedback mechanism. Figure 6 shows an example of mounting on sliding-stem actuators with travels from 4 inches to 24 inches. Some long-stroke applications will require an actuator with a tapped lower yoke boss. Figures 7 and 8 show examples of mounting on rotary actuators.

Figure 6. FIELDVUE DVC6025 Remote Feedback Unit Mounted on Long-Stroke Sliding-Stem Actuator



As shown in figure 7, two feedback arms are available for the remote feedback unit. Most long-stroke sliding-stem and rotary actuator installations use the long feedback arm [62 mm (2.45 inches) from roller to pivot point]. Installations on 1051 size 33 and 1052 size 20 and 33 actuators use the short feedback arm [54 mm (2.13 inches) from roller to pivot point]. Make sure the correct feedback arm is installed on the remote feedback unit before beginning the mounting procedure.

Refer to figures 6, 7, and 8 for parts locations. Refer to the following guidelines when mounting on sliding-stem actuators with 4 to 24 inches of travel or on rotary actuators:

1. Isolate the control valve from the process line pressure and release pressure from both sides of the valve body. Shut off all pressure lines to the pneumatic actuator, releasing all pressure from the actuator. Use lock-out procedures to be sure that the above measures stay in effect while working on the equipment.
2. If a cam is not already installed on the actuator, install the cam as described in the instructions included with the mounting kit. For sliding-stem actuators, the cam is installed on the stem connector.

Figure 7. FIELDVUE DVC6025 Remote Feedback Unit Mounted on Rotary Actuators

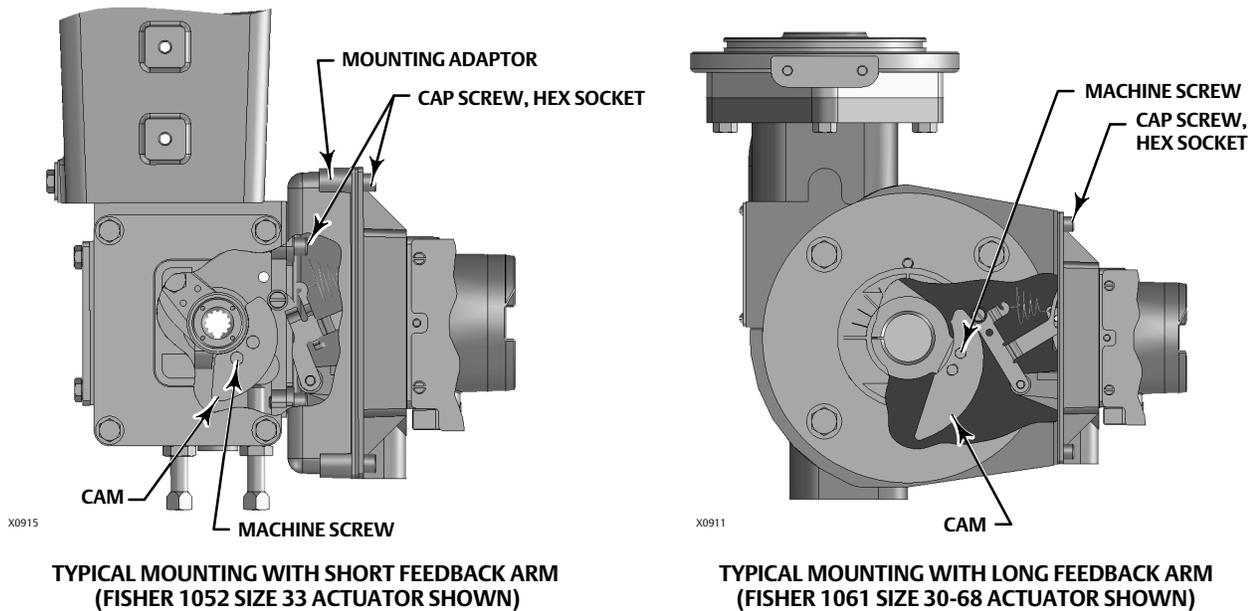
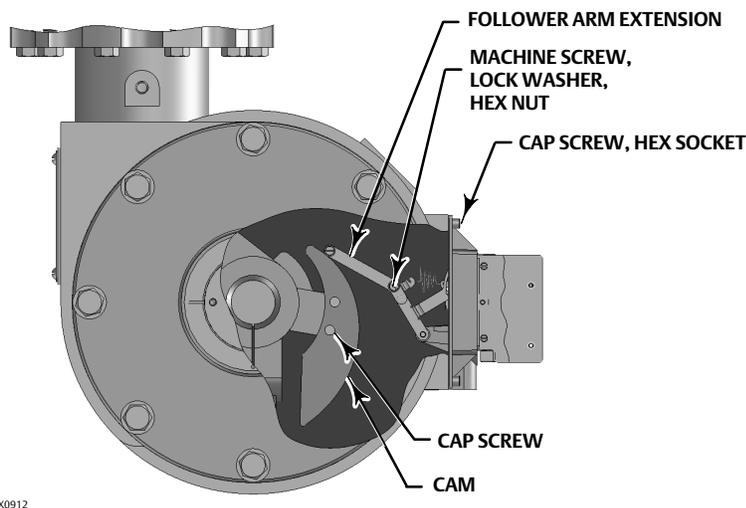
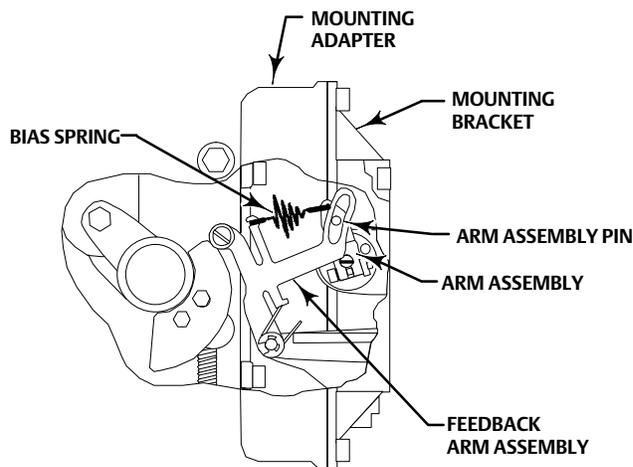


Figure 8. FIELDVUE DVC6025 Remote Feedback Unit with Long Feedback Arm and Follower Arm Extension Mounted on a Rotary Actuator



3. If a mounting plate is required, fasten the mounting plate to the actuator.
4. For applications that require remote venting, a pipe-away bracket kit is available. Follow the instructions included with the kit to replace the existing mounting bracket on the digital valve controller with the pipe-away bracket and to transfer the feedback parts from the existing mounting bracket to the pipe-away bracket.
5. Larger size actuators may require a follower arm extension, as shown in figure 8. If required, the follower arm extension is included in the mounting kit. Follow the instructions included with the mounting kit to install the follower arm extension.
6. Apply anti-seize to the arm assembly pin as shown in figure 9.

Figure 9. Locating Adjustment Arm Pin in Feedback Arm of a DVC6025 Remote Feedback Unit



7. Mount the DVC6025 on the actuator as follows:
 - If required, a mounting adaptor is included in the mounting kit. Attach the adaptor to the actuator as shown in figure 7. Then attach the remote feedback unit assembly to the adaptor. The roller on the digital valve controller feedback arm will contact the actuator cam as it is being attached.
 - If no mounting adaptor is required, attach the remote feedback unit assembly to the actuator or mounting plate. The roller on the remote feedback unit feedback arm will contact the actuator cam as it is being attached.
8. For long-stroke sliding-stem actuators, after the mounting is complete, check to be sure the roller aligns with the position mark on the cam (see figure 6). If necessary, reposition the cam to attain alignment.
9. Proceed to Step 2—Connect the Pneumatic Tubing on page 15.

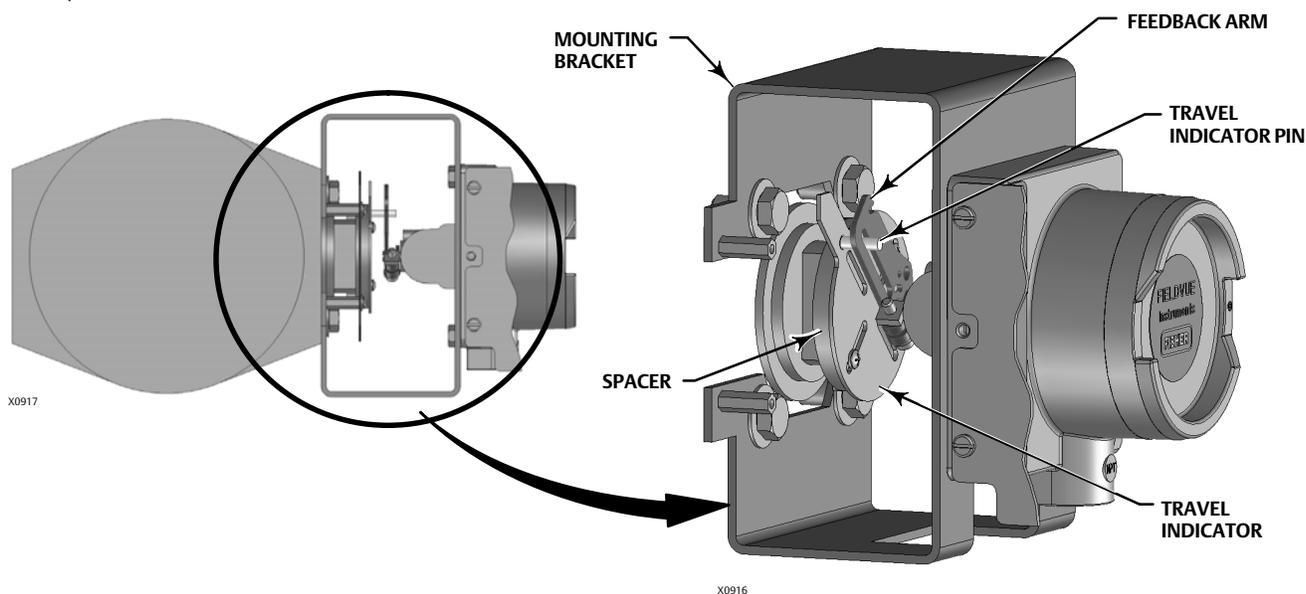
DVC6035 Remote Feedback Unit on Quarter-Turn Rotary Actuators

Note

If ordered as part of a control valve assembly, the factory mounts the DVC6035 remote feedback unit on the actuator. If you purchased the remote feedback unit separately, you will need a mounting kit to mount the remote feedback unit on the actuator. See the instructions that come with the mounting kit for detailed information on mounting the remote feedback unit to a specific actuator model.

Figure 10 shows an example of mounting on a quarter-turn actuator. Refer to figure 10 for parts locations. Refer to the following guidelines when mounting on quarter-turn actuators:

Figure 10. Mounting a FIELDVUE DVC6030 Remote Feedback Unit on a Rotary Actuator (Fisher 1032 Size 425A Shown)

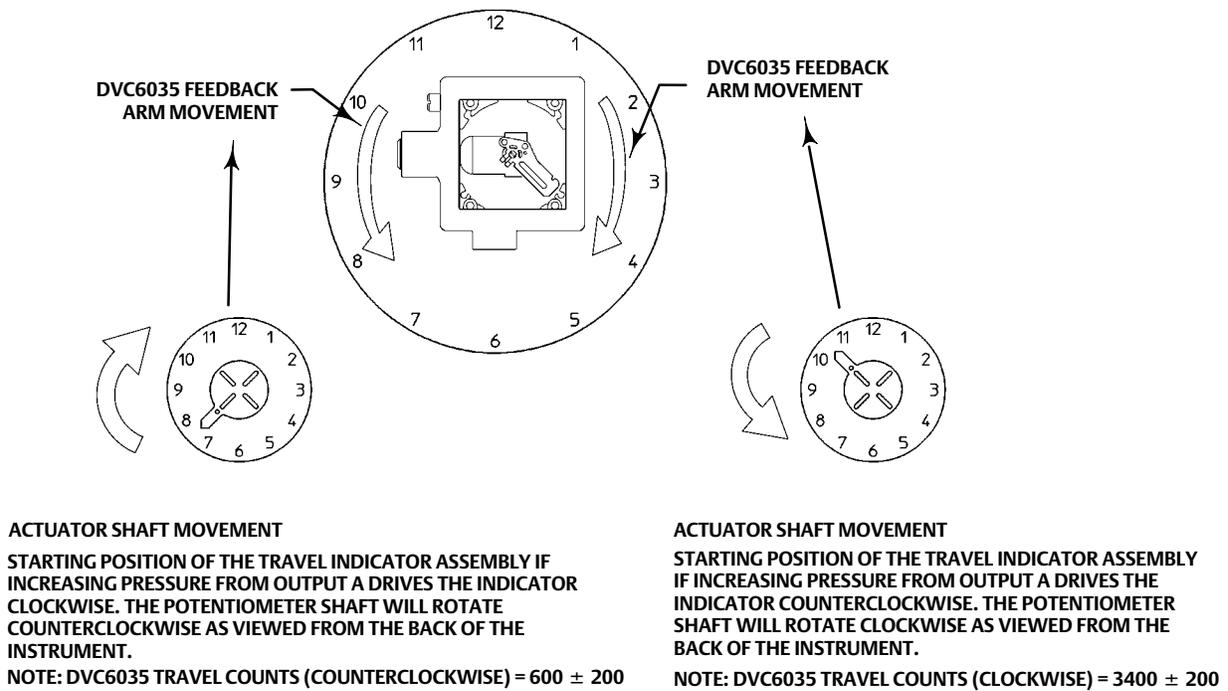


1. Isolate the control valve from the process line pressure and release pressure from both sides of the valve body. Shut off all pressure lines to the pneumatic actuator, releasing all pressure from the actuator. Use lock-out procedures to be sure that the above measures stay in effect while working on the equipment.
2. If necessary, remove the existing hub from the actuator shaft.
3. If a positioner plate is required, attach the positioner plate to the actuator as described in the mounting kit instructions.
4. If required, attach the spacer to the actuator shaft.

Refer to figure 11. The travel indicator assembly can have a starting position of 7:30 or 10:30. Determine the desired starting position then proceed with the next step. Considering the top of the remote travel sensor as the 12 o'clock position, in the next step attach the travel indicator, so that the pin is positioned as follows:

- If increasing pressure from the digital valve controller output A rotates the digital valve controllers potentiometer shaft clockwise (as viewed from the back of the instrument), mount the travel indicator assembly such that the arrow is in the 10:30 position, as shown in figure 11.
- If increasing pressure from the digital valve controller output A rotates the digital valve controllers potentiometer shaft counterclockwise (as viewed from the back of the instrument), mount the travel indicator assembly such that the arrow is in the 7:30 position, as shown in figure 11.

Figure 11. FIELDVUE DVC6035 Travel Indicator Installation



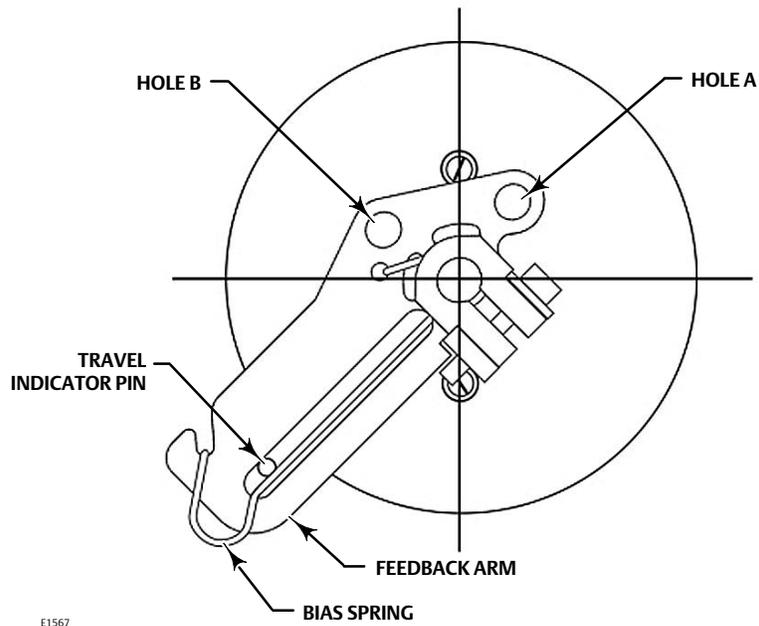
Note

ValveLink software and Emerson handheld communicators use the convention of clockwise and counterclockwise when viewing the potentiometer shaft from the back of the FIELDVUE instrument (figure 11).

5. Attach the travel indicator, to the shaft connector or spacer as described in the mounting kit instructions.

6. Attach the mounting bracket to the digital valve controller.
7. Position the digital valve controller so that the pin on the travel indicator, engages the slot in the feedback arm and that the bias spring loads the pin as shown in figure 12. Attach the digital valve controller to the actuator or positioner plate.

Figure 12. Positioning Travel Indicator Pin in the Feedback Arm (Viewed as if Looking from the FIELDVUE DVC6030 toward the Actuator)

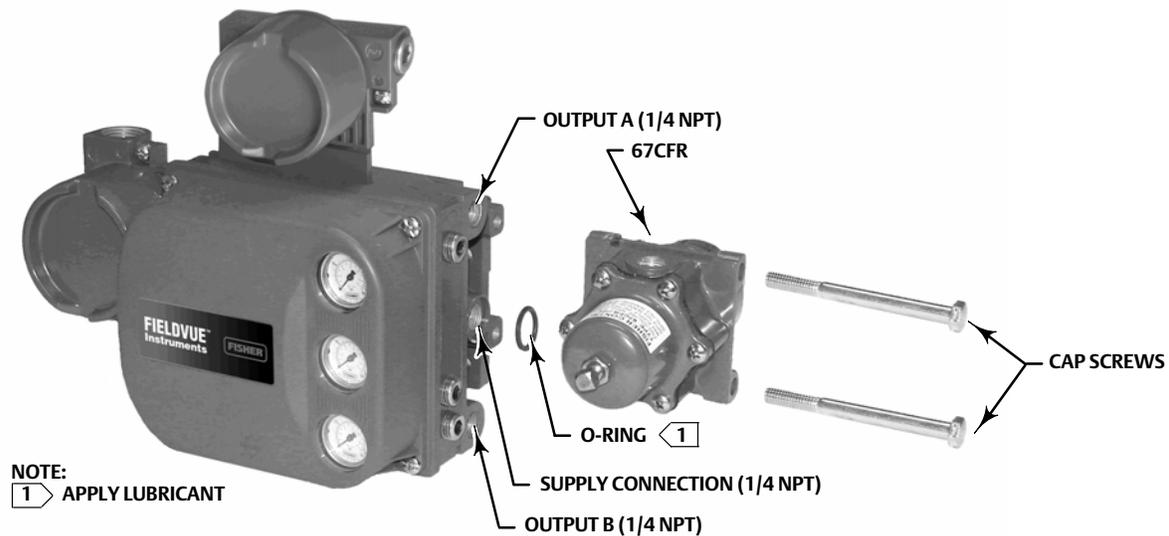


8. If a travel indicator scale is included in the mounting kit, attach the scale as described in the mounting kit instructions.
9. Proceed to Step 2—Connect the Pneumatic Tubing on page 15.



Step 2—Connect the Pneumatic Tubing

Figure 13. Integral Mounting of a Fisher 67CFR Regulator on a DVC6005 Remote Feedback Unit



NOTICE

Do not use sealing tape on pneumatic connections. This instrument contains small passages that may become obstructed by detached sealing tape. Thread sealant paste should be used to seal and lubricate pneumatic threaded connections.

1. Connect the DVC6005 pneumatic output to the actuator input using at least 10 mm (3/8-inch) diameter tubing.
 - When using a single-acting direct digital valve controller (relay A or C) on a single-acting actuator, connect OUTPUT A to the actuator pneumatic input.
 - When using a single-acting reverse digital valve controller (relay B) on a single-acting actuator, connect OUTPUT B to the actuator diaphragm casing.
 - When using a double-acting digital valve controller (relay A) on a double-acting actuator, connect OUTPUT A and OUTPUT B to the appropriate actuator pneumatic input. With no input current to the DVC6005, OUTPUT A is at zero pressure and OUTPUT B is at full supply pressure when the relay is properly adjusted.

Note

To have the actuator stem extend from the cylinder with increasing input signal, connect OUTPUT A to the actuator cylinder connection farthest from the actuator stem. Connect OUTPUT B to the cylinder connection closest to the actuator stem. To have the actuator stem retract into the cylinder with increasing input signal, connect OUTPUT A to the actuator cylinder connection closest to the actuator stem. Connect OUTPUT B to the cylinder connection farthest from the actuator stem.

Note

Solenoid valves placed between the output of a DVC6005 digital valve controller and the input to an actuator require a minimum Cv of 0.49. Greater restrictions can affect the response of the assembly.

⚠ WARNING

Supply medium must be clean, dry, oil-free, and noncorrosive and meet the requirements of ISA Standard 7.0.01 or ISO 8573-1.

Severe personal injury or property damage may occur from an uncontrolled process if the instrument supply medium is not clean, dry, oil-free, and noncorrosive. While use and regular maintenance of a filter that removes particles larger than 40 micrometers in diameter will suffice in most applications, further filtration down to 5 micrometer particle size is recommended. Lubricant content is not to exceed 1 ppm weight (w/w) or volume (v/v) basis. Condensation in the air supply should be minimized.

Check with an Emerson field office and industry instrument air quality standards for use with corrosive air or if you are unsure about the amount of air filtration or filter maintenance.

When using natural gas as the supply medium, or for explosion proof applications, the following warnings also apply:

- **Remove electrical power before removing the housing cap. Personal injury or property damage from fire or explosion may result if power is not disconnected before removing the cap.**
 - **Remove electrical power before disconnecting any of the pneumatic connections.**
 - **When disconnecting any of the pneumatic connections or any pressure retaining part, natural gas will seep from the unit and any connected equipment into the surrounding atmosphere. Personal injury or property damage may result from fire or explosion if natural gas is used as the supply medium and appropriate preventive measures are not taken. Preventive measures may include, but are not limited to, one or more of the following: ensuring adequate ventilation and the removal of any ignition sources.**
 - **Ensure that all caps and covers are correctly installed before putting this unit back into service. Failure to do so could result in personal injury or property damage from fire or explosion.**
-

2. Connect a filter or filter regulator to the DVC6005 supply input using at least 10 mm (3/8-inch) diameter tubing.
 - When using an integral mounted 67CFR filter regulator, lubricate an O-ring and insert it in the recess around the SUPPLY connection on the digital valve controller. Attach the filter regulator to the side of the digital valve controller. Thread a 1/4-inch socket-head pipe plug into the unused outlet on the filter regulator. This is the standard method of mounting the filter regulator. No tubing is required.
 - When using a yoke mounted 67CFR filter regulator, mount the filter regulator with two cap screws to the pre-drilled and tapped holes in the actuator yoke. Thread a 1/4-inch socket-head pipe plug into the unused outlet on the filter regulator. No O-ring is required.
 - When using a casing mounted filter regulator, use a separate casing mounting bracket (typically provided with the filter regulator). Attach the mounting bracket to the filter regulator and then attach this assembly to the actuator casing. Thread a 1/4-inch socket-head pipe plug into the unused outlet on the filter regulator. No O-ring is required.
 - If the supply pressure is less than the maximum actuator and instrument pressure rating, a regulator is not required. However, a filter is always required. Attach the filter securely to the actuator or instrument.

⚠ WARNING

Personal injury or property damage can occur from cover failure due to overpressure. Ensure that the housing vent opening is open and free of debris to prevent pressure buildup under the cover.

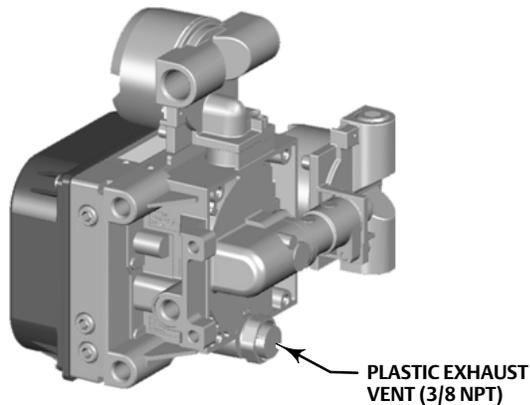
This unit vents the supply medium into the surrounding atmosphere. When installing this unit in a non-hazardous (non-classified) location in a confined area, with natural gas as the supply medium, you must remotely vent this unit to a safe location. Failure to do so could result in personal injury or property damage from fire or explosion, and area re-classification.

When installing this unit in a hazardous (classified) location remote venting of the unit may be required, depending upon the area classification, and as specified by the requirements of local, regional, and national codes, rules and regulations. Failure to do so when necessary could result in personal injury or property damage from fire or explosion, and area re-classification.

In addition to remote venting of the unit, ensure that all caps and covers are correctly installed. Failure to do so could result in personal injury or property damage from fire or explosion, and area re-classification.

3. If necessary, remove the plastic vent on the DVC6005 and install a pipe-away vent line using at least 12.7 mm (1/2-inch) diameter tubing. The vent line must be as short as possible with a minimum number of bends and elbows to prevent back pressure build-up.

Figure 14. Vent Connection



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⚠ WARNING

To avoid personal injury or property damage resulting from bursting or parts, do not exceed maximum supply pressure.

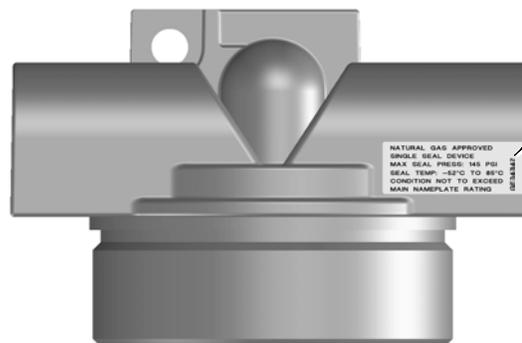
Personal injury or property damage may result from fire or explosion if natural gas is used as the supply medium and appropriate preventive measures are not taken. Preventive measures may include, but are not limited to, one or more of the following: Remote venting of the unit, re-evaluating the hazardous area classification, ensuring adequate ventilation, and the removal of any ignition sources.

Note

The Gas Certified device option simplifies process sealing requirements when using natural gas as the supply medium. Instruments with the label shown in figure 15 include a “Single Process Seal” and meet ISA 12.27.01 Single Sealed and IEC 60079-40 Process Sealed requirements. If natural gas is detected in the terminal box or connected conduit when using a Gas Certified DVC6005, through use of a gas leak detector or other method, the entire terminal box assembly must be replaced. Read and follow all local, regional, and federal wiring requirements for natural gas installations. Contact your [Emerson sales office](#) for information on obtaining a Gas Certified DVC6005 digital valve controller.

Figure 15. Label for Natural Gas Certified Terminal Box

NATURAL GAS APPROVED SINGLE SEAL DEVICE MAX SEAL PRESS: 145 PSI SEAL TEMP: -52°C TO 85°C CONDITION NOT TO EXCEED MAIN NAMEPLATE RATING	GE34342
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LABEL LOCATED
ON TOP OF
TERMINAL BOX

X0748

4. Connect the pneumatic supply line to the 1/4 NPT IN connection on the filter regulator.

Note

If using a solenoid valve in addition to the digital valve controller, install the solenoid valve in the pneumatic path between the digital valve controller output and the actuator input.

5. Proceed to Step 3—Connect the Electrical Wires on page 19.



Step 3—Connect the Electrical Wires

⚠ WARNING

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.

To avoid personal injury resulting from electrical shock, do not exceed maximum input voltage specified on the product nameplate. If the input voltage specified differs, do not exceed the lowest specified maximum input voltage.

Personal injury or property damage caused by fire or explosion may occur if this connection is attempted in a potentially explosive atmosphere or in an area that has been classified as hazardous. Confirm that area classification and atmosphere conditions permit the safe removal of the terminal box cover before proceeding.

The valve may move in an unexpected direction when power is applied to the digital valve controller. To avoid personal injury and property damage caused by moving parts, keep hands, tools, and other objects away from the valve/actuator assembly when applying power to the instrument.

For HART® devices proceed to page 20

For FOUNDATION fieldbus™ devices proceed to page 25



HART Devices

Refer to the DVC6000 HW2 Instruction Manual ([D103785X012](#)), available at www.Fisher.com or from your [Emerson sales office](#), for additional information.

The remote mount base unit is normally powered by a control system output channel. Shielded cable will ensure proper operation in electrically noisy environments.

Wire the remote mount base unit as follows, refer to figure 16:

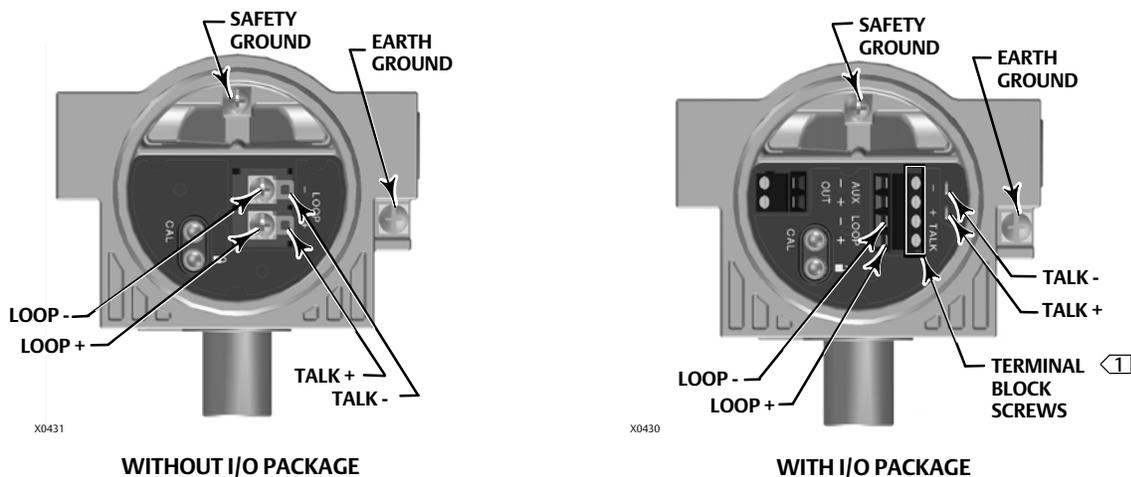
1. Remove the wiring terminal box cap.
2. Bring the field wiring into the terminal box. When applicable, install conduit using local and national electrical codes which apply to the application.
3. Connect the control system output channel positive wire to the LOOP + screw terminal in the terminal box. Connect the control system output channel negative (or return) wire to the LOOP - screw terminal in the terminal box.

⚠ WARNING

Personal injury or property damage, caused by fire or explosion, can result from the discharge of static electricity. Connect a 14 AWG (2.08 mm²) ground strap between the digital valve controller and earth ground when flammable or hazardous gases are present. Refer to national and local codes and standards for grounding requirements.

4. As shown in figure 16, two ground terminals are available for connecting a safety ground, earth ground, or drain wire. The safety ground is electrically identical to the earth ground. Make connections to these terminals following national and local codes and plant standards.

Figure 16. Loop and Talk Connections



NOTE:

① FOR DVC6005 HW 2 WITH I/O OPTION TIGHTEN TERMINAL BLOCK SCREWS TO A MAXIMUM TORQUE OF 0.79 N•m (7 lbf•in).

Note

Depending on the control system you are using, an HF340 HART filter may be needed to allow HART communication. The HART filter is a passive device that is inserted in field wiring from the HART loop. The filter is normally installed near the field wiring terminals of the control system I/O. Its purpose is to effectively isolate the control system output from modulated HART communication signals and raise the impedance of the control system to allow HART communication. For more information on the description and use of the HART filter, refer to the HF340 HART filter instruction manual ([D102796X012](#)). To determine if your system requires a HART filter refer to the DVC6000 HW2 Instruction Manual ([D103785X012](#)) or contact your [Emerson sales office](#).

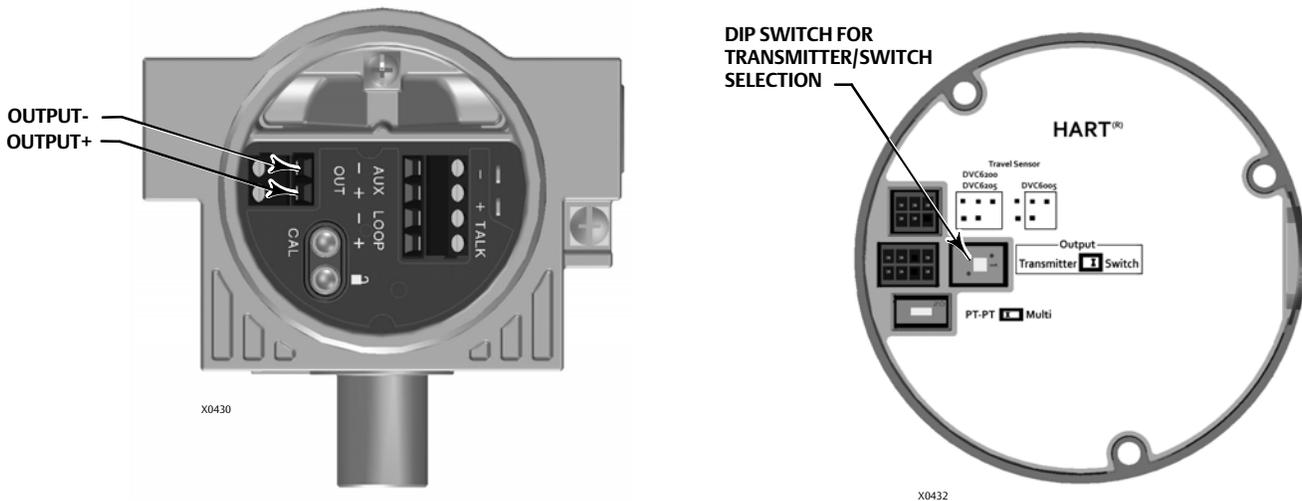
5. Screw the cap onto the terminal box until no gap remains.
6. Install the set screw (key 58) into the cap. Secure the cap by engaging the screw.
7. For applications that require a Position Transmitter or Discrete Switch (page 22) and/or a THUM Adapter (page 24), proceed to the appropriate page. Otherwise proceed to page 27 for remote mount feedback unit wiring.



Position Transmitter or Discrete Switch

The DVC6005 HW2 HART communicating device has an optional output circuit that can be configured as a 4-20 mA position transmitter or a discrete switch. Configuration of the output circuit requires the proper DIP switch electrical setting on the main electronics board (figure 17) and also must be enabled with a user interface tool. The DIP switch electrical setting is preconfigured at the factory when ordered properly.

Figure 17. OUTPUT Connections and Transmitter / Switch Settings



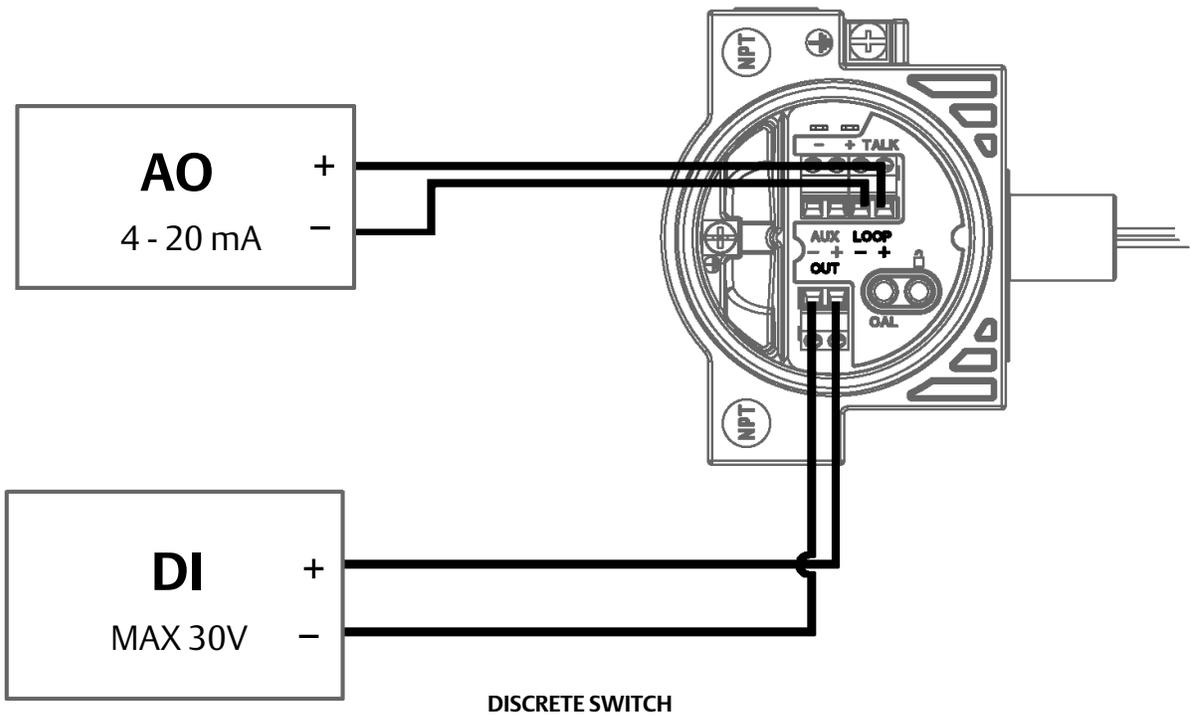
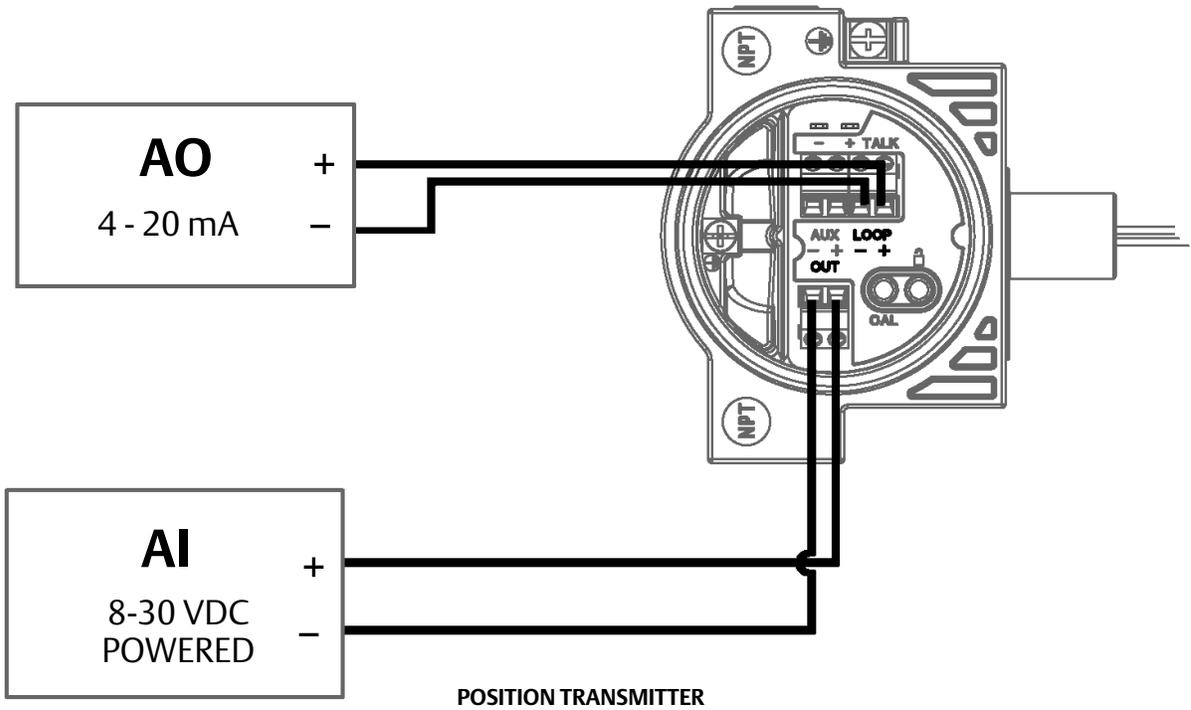
The position transmitter circuit derives its operating power from the control system input channel in the same manner as a 2-wire transmitter.

The discrete switch is a solid state circuit (1-amp maximum) which opens and closes based on a user configurable trip point. The trip point can be based on valve travel anywhere within the calibrated travel range, or based on a device alert. In order for the switch output to function, the digital valve controller must be powered. If power is lost, the switch will always go to the open state. The output circuit, whether operating as a transmitter or switch, is galvanically isolated from the position control loop circuit such that different ground references between the 2 circuits are allowed.

Wire the OUTPUT terminals as follows (refer to figure 18):

1. Route the field wiring into the terminal box through the conduit connection.
2. When applicable, install conduit using any local and national electrical codes that apply to the connection.
3. Connect the control system input channel positive wire to the OUT (+) terminal. Connect the control system input channel negative wire to the OUT (-) terminal.
4. Replace and hand tighten the cover on the terminal box.
5. For applications that require a THUM Adapter, proceed to page 24. Otherwise proceed to page 27 for remote mount feedback unit wiring.

Figure 18. FIELDVUE DVC6005 HW2 with Position Transmitter or Discrete Switch, Field Wiring Schematic





Smart Wireless THUM Adapter

Refer to the Smart Wireless THUM Adapter quick installation guide ([00825-0100-4075](https://www.fieldvue.com/00825-0100-4075)) for additional information.

Note

The recommended mounting orientation for the THUM Adapter is vertically up, for optimal wireless communication range. However, when mounting on the DVC6005 HW2, it may be mounted horizontally, as shown in figure 19. Note that mounting horizontally may result in a decreased communication range.

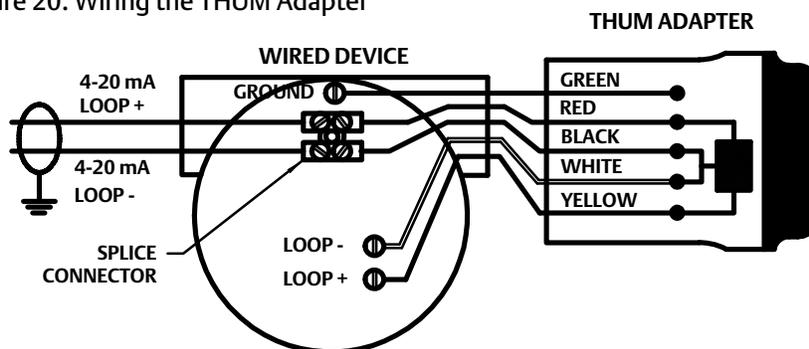
Figure 19. THUM Adapter Installed On DVC6005 HW2 Digital Valve Controller



X0796-1

1. Remove the DVC6005 terminal box plug from the top conduit entrance.
2. Thread the THUM Adapter into the top conduit entrance.
3. Using the wire splice included with the THUM Adapter (or other suitable wire splice), connect the wires as shown in figure 20 below.

Figure 20. Wiring the THUM Adapter



GG18677

4. Carefully coil the wires inside the terminal box.
5. Replace and hand tighten the cover on the terminal box.
6. Proceed to page 27 for remote mount feedback unit wiring.

FOUNDATION fieldbus Devices



Refer to the DVC6000f Instruction Manual ([D103189X012](#)), available at www.Fisher.com or from your [Emerson sales office](#), for additional information.

The remote mount base unit is normally powered over the bus from a power supply. Refer to the FOUNDATION fieldbus site planning guide, available from your Emerson sales office, for proper wire types, termination, length, grounding practices, etc.

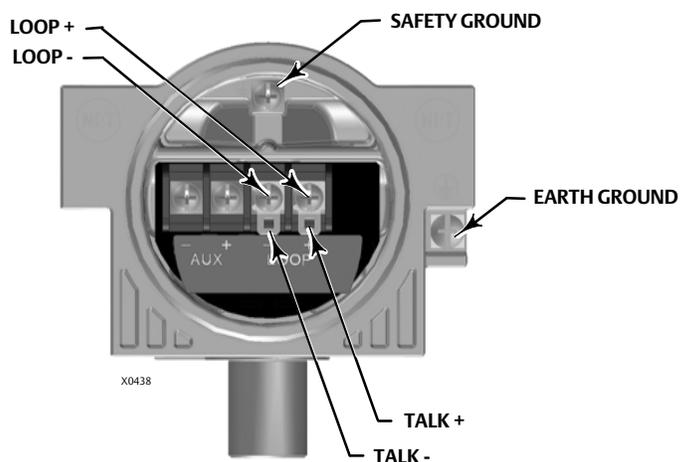
Note

To avoid the valve going to an unknown position when power is applied, the digital valve controller is shipped from the factory with the transducer block mode Out of Service.

Wire the remote mount base unit as follows, refer to figure 21.

1. Remove the wiring terminal box cap.
2. Bring the field wiring into the terminal box. When applicable, install conduit using local and national electrical codes which apply to the application.
3. The instrument is not polarity sensitive. Connect one wire from the controller output to one of the LOOP screw terminals in the terminal box shown in figure 21. Connect the other wire from the controller output to the other LOOP screw terminal in the terminal box.

Figure 21. Loop Connections Terminal Box

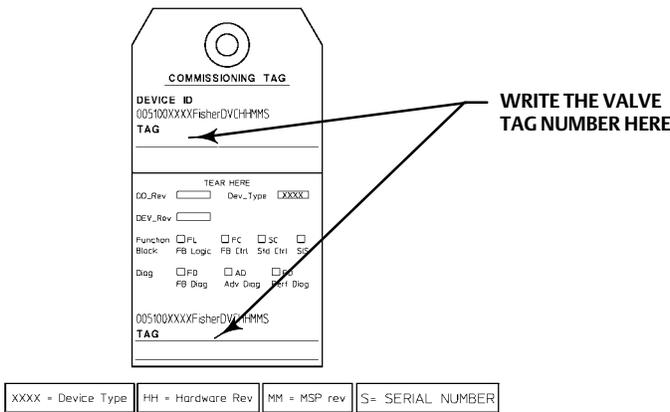


⚠ WARNING

Personal injury or property damage, caused by fire or explosion, can result from the discharge of static electricity. Connect a 14 AWG (2.08 mm²) ground strap between the digital valve controller and earth ground when flammable or hazardous gases are present. Refer to national and local codes and standards for grounding requirements.

4. Make connections to the ground terminal(s) following national and local codes and plant standards. As shown in figure 21, two ground terminals are available for connecting a safety ground, earth ground, or drain wire. The safety ground terminal is electrically identical to the earth ground.
5. Screw the cap onto the terminal box until no gap remains.
6. Install the set screw (key 58) into the cap. Secure the cap by engaging the screw.
7. Write the valve tag number on the top and bottom of the paper commissioning tag, as shown in figure 22.

Figure 22. Paper Commissioning Tag



XXXX = Device Type FH = Hardware Rev MM = MSP rev S= SERIAL NUMBER

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8. Remove the lower half of the paper commissioning tag and deliver it to the control system configurator. With the piece of paper, the control system configurator will be able to easily change the Device ID placeholder to the actual valve tag number.

Note

Alternatively, the valve tag number can be entered at the factory when specified at the time of order entry. When the valve tag number is electronically stored in the DVC6005f, the control system will display the valve tag number instead of the Device ID. As a result, step 7 and 8 will not be required.

9. Proceed to page 27 for remote mount feedback unit wiring.



Remote Mount Feedback Unit

The DVC6005 base unit is designed to receive travel information via a DVC6015, DVC6025 or DVC6035 feedback unit.

⚠ WARNING

Personal injury or property damage, caused by wiring failure, can result if the feedback wiring connecting the base unit with the remote feedback unit shares a conduit with any other power or signal wiring.

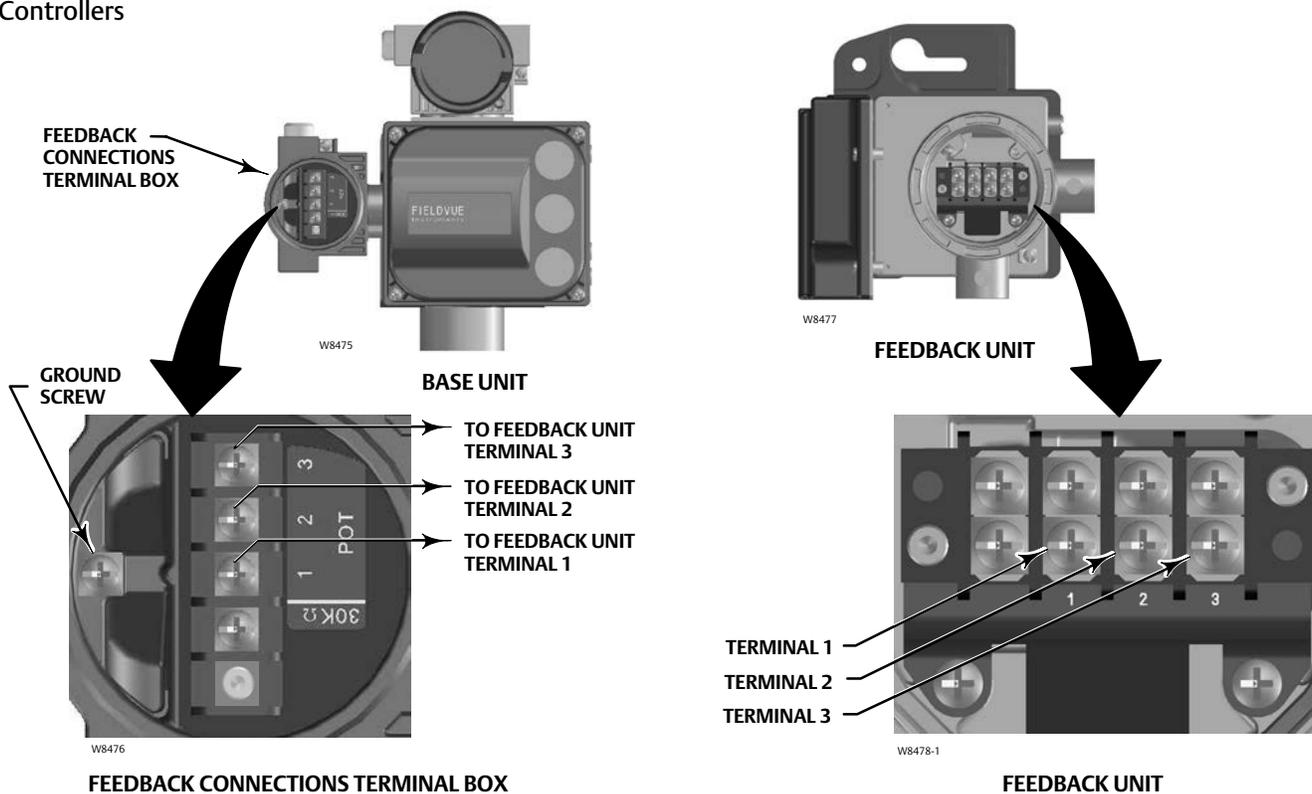
Do not place feedback wiring in the same conduit as other power or signal wiring.

Note

3-conductor shielded cable, 22 AWG minimum wire size, is required for connection between base unit and feedback unit. Pneumatic tubing between base unit output connection and actuator has been tested to 91 meters (300 feet) with minimal pneumatic lag. At 30 meters (100 feet) there was no performance degradation.

1. Remove the termination caps from both the feedback unit and the DVC6005 base unit.
2. Install conduit between the feedback unit and the base unit following applicable local and national electrical codes. Route the 3-conductor shielded cable between the two units (refer to figure 23).

Figure 23. Terminal Details for Connecting Base Unit and Feedback Units of Remote-Mounted Digital Valve Controllers



3. Connect one wire of the 3-conductor shielded cable between terminal 1 on the feedback unit and terminal 1 on the base unit.
4. Connect the second wire of the 3-conductor shielded cable between terminal 2 on the feedback unit and terminal 2 on the base unit.
5. Connect the third wire of the 3-conductor shielded cable between terminal 3 on the feedback unit and terminal 3 on the base unit.
6. Connect the cable shield or drain wire to the ground screw in the feedback connections terminal box of the base unit.

Note

Do not connect the shield or drain wire to any terminal on the feedback unit, to the earth ground, or any other alternative ground.

7. Replace and hand-tighten all covers.
8. Proceed to Step 4—Configure the Digital Valve Controller on page 29.



Step 4—Configure the Digital Valve Controller

⚠ WARNING

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.

To avoid personal injury resulting from electrical shock, do not exceed maximum input voltage specified on the product nameplate. If the input voltage specified differs, do not exceed the lowest specified maximum input voltage.

Personal injury or property damage caused by fire or explosion may occur if this connection is attempted in a potentially explosive atmosphere or in an area that has been classified as hazardous. Confirm that area classification and atmosphere conditions permit the safe removal of the terminal box cover before proceeding.

The valve may move in an unexpected direction when power is applied to the digital valve controller. To avoid personal injury and property damage caused by moving parts, keep hands, tools, and other objects away from the valve/actuator assembly when applying power to the instrument.

While configuring the digital valve controller the valve may move, causing process fluid or pressure to be released. To avoid personal injury and property damage caused by the release of process fluid or pressure, isolate the valve from the process and equalize pressure on both sides of the valve or bleed off the process fluid.

Changes to the instrument setup may cause changes in the output pressure or valve travel. Depending on the application, these changes may upset process control, which may result in personal injury or property damage.

Note

Before proceeding, check that all pressure connections, fasteners, and plugs are installed and tightened.

Ensure that the base unit is wired to the feedback unit before providing electrical power. Failure to do so may cause the DVC6005 to go into “Pressure Control” mode if Pressure Fallback is configured. The unit can be returned to “Travel Control” mode using Detailed Configuration.

1. Install the latest version of the communication software on the user interface tool. This may include Device Descriptions (DD, EDD), ValveLink™ software, or Device Type Manager (DTM). Refer to table 1 below.

Contact your [Emerson sales office](#) to ensure that you have the latest software version or for information on locating the necessary files.

Table 1. User Interface Tools and Software Available for Instrument Configuration and Calibration

	DVC6005 HART	DVC6005f FOUNDATION fieldbus
Handheld Communicator (DD)	☑	☑
AMS Device Manager (DD)	☑	☑
ValveLink Software	☑	☑
ValveLink Mobile Software	☑	☑
Field Device Type Frame (DTM)	☑	☑

2. Apply pneumatic supply pressure to the digital valve controller and adjust the supply pressure regulator according to the actuator requirements and limitations.
3. Apply electrical power to the digital valve controller.
4. Establish communication with the digital valve controller and commission the instrument as described in the host system documentation.

Note

If the TALK terminals on the digital valve controller are to be used for communication, remove the terminal box cap to access the terminals.

5. Launch the user interface tool.
6. Perform Device Setup to configure and calibrate the instrument on the control valve assembly.
7. Enter any additional custom configuration items (optional).

Note

On HART devices with I/O package, you must enable and configure the output terminals. The configuration is disabled by default from the factory.

8. To enable the digital valve controller to follow set point, place the instrument In Service (HART devices) or place the transducer block in Auto (fieldbus devices).

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