

Fisher® FIELDVUE™ DVC6200 Digital Valve Controller

The FIELDVUE DVC6200 digital valve controller is a HART® communicating instrument that converts a two-wire 4-20 mA control signal into a pneumatic output to an actuator. It can easily be retrofitted in place of existing analog positioners on most Fisher and non-Fisher pneumatic actuators.

Features

Reliability

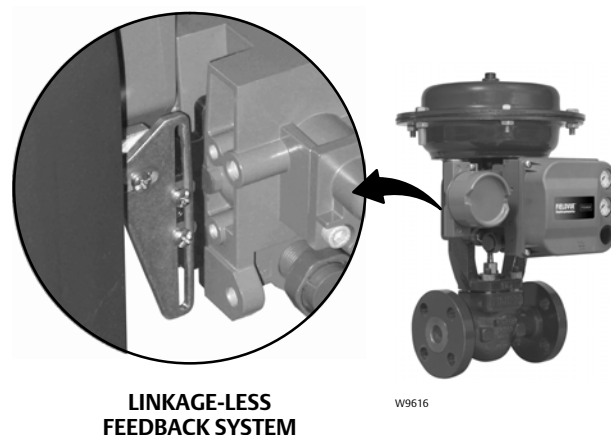
- **Linkage-Less Non-Contact Position Feedback**— The high performance, linkage-less feedback system eliminates physical contact between the valve stem and the DVC6200. There are no wearing parts so cycle life is maximized.
- **Built to Survive**—The field proven DVC6200 instrument has fully encapsulated electronics that resist the effects of vibration, temperature, and corrosive atmospheres. A weather-tight wiring terminal box isolates field wiring connections from other areas of the instrument.

Performance

- **Accurate and Responsive**— The two-stage positioner design provides quick response to large step changes and precise control for small setpoint changes.
- **Travel Control/Pressure Fallback**— Valve position feedback is critical to the operation of a digital valve controller. The DVC6200 can detect position feedback problems and automatically revert to I/P transducer mode to keep the valve operational.

Ease of Use

- **Enhanced Safety**— The DVC6200 is a HART communicating device, so information can be accessed anywhere along the loop. This flexibility can reduce exposure to hazardous environments and make it easier to evaluate valves in hard to reach locations.



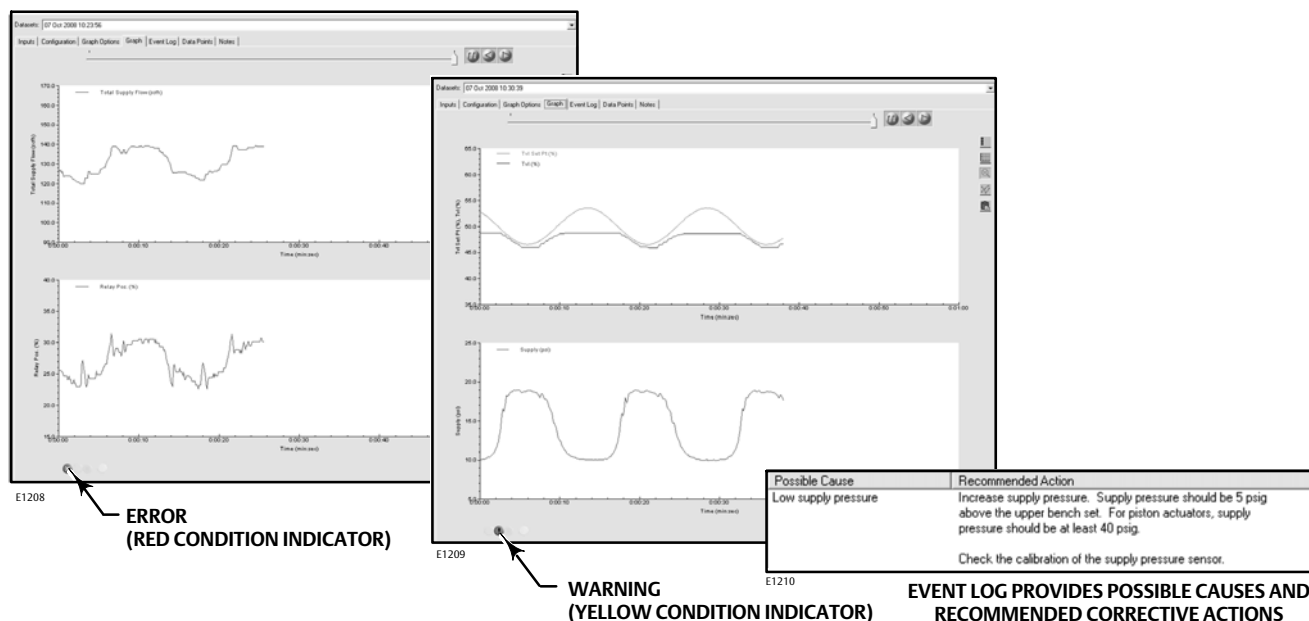
- **Faster Commissioning**— HART communications allows you to quickly commission loops with a variety of tools, either locally at the valve assembly or remotely.
- **Easy Maintenance**— The DVC6200 digital valve controller is modular in design. Critical working components can be replaced without removing field wiring or pneumatic tubing.

Value

- **Hardware Savings**— When installed in an integrated control system, significant hardware and installation cost savings can be achieved. Valve accessories such as limit switches and position transmitters can be eliminated because this information is available via the HART communication protocol.
- **Increased Uptime**— The self-diagnostic capability of the DVC6200 digital valve controller provides valve performance and health evaluation without shutting down the process or pulling the valve assembly from the line.
- **Improved Maintenance Decisions**— Digital communication provides easy access to the condition of the valve. Sound process and asset management decisions can be made by analysis of valve information through Fisher ValveLink™ software.



Figure 1. Condition Indicators



Valve Diagnostics

The DVC6200 digital valve controller provides a broad and deep portfolio of valve diagnostic capabilities. Whether the 475 Field Communicator is used to check for valve alerts and operational status, or ValveLink software is used for comprehensive diagnostic test and analysis, the tools are easy to use. When installed as part of a HART communicating system, the DVC6200 delivers prompt notification of current or potential equipment issues.

Performance Diagnostics enable condition and performance monitoring of the entire valve assembly (not just the digital valve controller) while the valve is actively controlling the process. When conducting Performance Diagnostics tests, the valve does NOT move beyond the normal setpoint changes driven by the process controller. The DVC6200 uses statistical algorithms to determine condition and performance related issues based on live readings from the many on-board sensors. Results are then displayed graphically, with severity indicated by a red/yellow/green indicator (figure 1). A detailed description of the identified issue as well as suggestions for recommended actions are provided.

Examples of identifiable issues are:

- Low air supply or pressure droop
- Incorrect regulator setting
- Dirty air supply
- External air leak (actuator diaphragm or tubing)
- Calibration shift
- Valve stuck
- Piston actuator O-ring failure
- Excessive valve assembly friction
- Excessive valve assembly deadband
- Elastomer failure in the DVC6200
- Broken actuator spring

Performance Diagnostics also provide access to full-stroke dynamic testing of the valve assembly including; valve signature, dynamic error band, step response, and stroke check. These tests change the instrument setpoint at a controlled rate and are performed while the valve assembly is isolated from the process.

For additional information on FIELDVUE diagnostics and ValveLink software refer to Fisher bulletin 62.1:ValveLink (D102227X012).

Specifications

Available Mounting

- Integral mounting to the Fisher GX Control Valve and Actuator System
- Integral mounting to Fisher rotary actuators
- Sliding-stem linear applications
- Quarter-turn rotary applications

DVC6200 digital valve controllers can also be mounted on other actuators that comply with IEC 60534-6-1, IEC 60534-6-2, VDI/VDE 3845 and NAMUR mounting standards.

Communication Protocol

- HART 5 or ■ HART 7⁽¹⁾

Input Signal

Point-to-Point

Analog Input Signal: 4-20 mA DC, nominal; split ranging available

Minimum Voltage Available at Instrument Terminals must be 10.5 VDC for analog control, 11 VDC for HART communication⁽²⁾

Minimum Control Current: 4.0 mA

Minimum Current w/o Microprocessor Restart: 3.5 mA

Maximum Voltage: 30 VDC

Overcurrent protected

Reverse Polarity protected

Multi-drop

Instrument Power: 11 to 30 VDC at 10 mA

Reverse Polarity protected

Supply Pressure⁽³⁾

Minimum Recommended: 0.3 bar (5 psig) higher than maximum actuator requirements

Maximum: 10.0 bar (145 psig) or maximum pressure rating of the actuator, whichever is lower

Supply Medium

Air or Natural Gas

Air: Supply pressure must be clean, dry air that meets the requirements of ISA Standard 7.0.01. A maximum 40 micrometer particle size in the air system is acceptable. Further filtration down to 5 micrometer particle size is recommended.

Natural Gas: Natural gas must be clean, dry, oil-free, and noncorrosive. H₂S content should not exceed 20 ppm.

Output Signal

Pneumatic signal, up to 95% of supply pressure

Minimum Span: 0.4 bar (6 psig)

Maximum Span: 9.5 bar (140 psig)

Action: ■ Double, ■ Single Direct or ■ Reverse

Steady-State Air Consumption⁽⁴⁾⁽⁵⁾

At 1.4 bar (20 psig) supply pressure: Less than 0.38 normal m³/hr (14 scfh)

At 5.5 bar (80 psig) supply pressure: Less than 1.3 normal m³/hr (49 scfh)

Maximum Output Capacity⁽⁴⁾⁽⁵⁾

At 1.4 bar (20 psig) supply pressure: 10.0 normal m³/hr (375 scfh)

At 5.5 bar (80 psig) supply pressure: 29.5 normal m³/hr (1100 scfh)

Operating Ambient Temperature Limits⁽³⁾⁽⁶⁾

-40 to 85°C (-40 to 185°F)

-52 to 85°C (-62 to 185°F) for instruments utilizing the Extreme Temperature option (fluorosilicone elastomers)

Independent Linearity⁽⁷⁾

Typical Value: ±0.50% of output span

Electromagnetic Compatibility

Meets EN 61326-1 (First Edition)

Immunity—Industrial locations per Table 2 of the EN 61326-1 standard.

Emissions—Class A

ISM equipment rating: Group 1, Class A

Vibration Testing Method

Tested per ANSI/ISA-S75.13.01 Section 5.3.5.

Input Impedance

An equivalent impedance of 550 ohms may be used. This value corresponds to 11V @ 20 mA.

Humidity Testing Method

Tested per IEC 61514-2

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Product Bulletin

62.1:DVC6200
November 2011

DVC6200 Digital Valve Controller
D103415X012

Specifications (continued)

Electrical Classification

Hazardous Area Approvals

CSA— Intrinsically Safe, Explosion-proof, Division 2, Dust Ignition-proof

FM— Intrinsically Safe, Explosion-proof, Non-Incendive, Dust Ignition-proof

ATEX— Intrinsically Safe and Dust, Flameproof and Dust, Type n and Dust

IECEX— Intrinsically Safe, Flameproof, Type n

NEPSI— Intrinsically Safe, Flameproof

INMETRO— Intrinsically Safe, Flameproof, Type n

Not all approvals apply to all constructions. Contact your Emerson Process Management sales office for availability.

Electrical Housing

CSA— Type 4X, IP66

IECEX— IP66

FM— NEMA 4X

NEPSI— IP66

ATEX— IP66

INMETRO— IP66W

The Gas Certified DVC6200 is CSA, FM, ATEX, IECEX, and INMETRO approved for use with natural gas as the supply medium

Other Classifications/Certifications

KGS— Korea

TIIS— Japan

Contact your Emerson Process Management sales office for classification/certification specific information

Connections

Supply Pressure: 1/4 NPT internal and integral pad for mounting 67CFR regulator

Output Pressure: 1/4 NPT internal

Tubing: 3/8-inch recommended

Vent: 3/8 NPT internal

Electrical: 1/2 NPT internal, M20 adapter optional

Actuator Compatibility

Stem Travel (Sliding-Stem Linear)

Minimum: 11 mm (0.45 inch)⁽⁸⁾

Maximum: 606 mm (23-7/8 inches)

Shaft Rotation (Quarter-Turn Rotary)

Minimum: 45°

Maximum: 90°

Weight

3.5 kg (7.7 lbs)

Construction Materials

Housing, module base and terminal box: ASTM B85 A03600 low copper aluminum alloy

Cover: Thermoplastic polyester

Elastomers: Nitrile (standard)

Options

- Supply and output pressure gauges or ■ Tire valves
- Integral mounted filter regulator ■ Low-Bleed Relay
- Extreme Temperature ■ Natural Gas Certified
- Remote Mount⁽⁹⁾ ■ Integral 4-20mA Position Transmitter⁽¹⁾⁽¹⁰⁾ ■ Integral Limit Switch⁽¹⁾⁽¹¹⁾

Additional Information

For additional information go to www.FIELDVUE.com or contact your Emerson Process Management sales office.

NOTE: Specialized instrument terms are defined in ANSI/ISA Standard 51.1 - Process Instrument Terminology.

1. Only available with DVC6200 HW2.

2. Values listed are applicable for DVC6200 HW 1. For HW 2: Minimum Voltage Available at Instrument Terminals must be 9.5 VDC for analog control, 10 VDC for HART communication.

3. The pressure/temperature limits in this document and any other applicable code or standard should not be exceeded.

4. Normal m³/hour - Normal cubic meters per hour at 0°C and 1.01325 bar, absolute. Scfh - Standard cubic feet per hour at 60°F and 14.7 psia.

5. Values at 1.4 bar (20 psig) based on a single-acting direct relay; values at 5.5 bar (80 psig) based on double-acting relay.

6. Temperature limits vary based on hazardous area approval.

7. Not applicable for travels less than 19 mm (0.75 inch) or for shaft rotation less than 60 degrees. Also not applicable for digital valve controllers in long-stroke applications.

8. For travel less than 11 mm (0.45 inch) contact your Emerson Process Management sales office.

9. 4-conductor shielded cable, 18 to 22 AWG minimum wire size, in rigid or flexible metal conduit, is required for connection between base unit and feedback unit.

10. 4-20 mA output, isolated; Supply Voltage: 8-30 VDC; Fault Indication: offrange high or low; Reference Accuracy: 1% of travel span.

11. One isolated switch, configurable throughout the calibrated travel range or actuated from a device alert; Off State: 0 mA (nominal); On State: up to 1 A; Reference Accuracy: 2% of travel span.

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