

Fisher™ FIELDVUE™ DVC6200 SIS Digital Valve Controller for Safety Instrumented Systems (SIS)

The FIELDVUE DVC6200 SIS digital valve controller is a HART® communicating instrument for use in valve applications such as Emergency Shutdown, Emergency Blow Down, Emergency Venting, and Emergency Isolation. The DVC6200 SIS is capable of monitoring the health of and controlling the safety shutdown function of a valve and can easily be installed on most Fisher and non-Fisher pneumatic actuators.



X0079

Features

Reliability

- **Linkage-less Position Feedback**—The high performance, linkage-less feedback system eliminates physical contact between the valve stem and the DVC6200 SIS. This minimizes the affects of pipeline vibration and environmental corrosion.
- **Built to Survive**—The field proven DVC6200 SIS 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.

Safety

- **Partial Stroke Testing (PST)**—An on-line diagnostic to detect valve failure modes such as stuck valve by performing a user-defined ramp test, without disrupting the process. Testing can be automated or initiated manually.
- **Full Stroke Testing (FST)**—An off-line diagnostic test to reveal additional valve failures undetected by the PST by performing a ramp over the entire valve travel range. FST is typically performed during a shut down.

Ease of Use

- **Remote Access**—Valve diagnostic information can be accessed anywhere along the loop, reducing personnel exposure to hazardous environments or difficult to reach locations.
- **Faster Commissioning**—HART communication allows you to quickly commission loops with a variety of tools, either locally at the valve assembly or remotely.
- **Easy Maintenance**—The DVC6200 SIS digital valve controller is modular in design. Critical working components can be replaced without removing field wiring or pneumatic tubing.
- **Hassle-free diagnostics**—Partial stroke and full stroke tests result in an easy to understand Pass/Abnormal criteria including reason for any Abnormal result.

Value

- **Spurious Trip Protection**—An outgoing pressure threshold will abort the partial stroke test if exceeded. This prevents a sticking valve and actuator from overtraveling and potentially causing a spurious trip.
- **Increased Uptime**—The self-diagnostic capability of the DVC6200 SIS provides valve availability and health evaluation without shutting down the process or pulling the valve assembly from the line.
- **Audit Documentation**—Using ValveLink™ software, a time and date stamp on all tests and reports provides compliance with requirements of statutory authorities.
- **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. In addition, an integrated 4-20 mA position transmitter or limit switch option is available.
- **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 diagnostic information through ValveLink software, DD's, or DTM's.

Packaged Solutions

LCP100/LCP200—A local control panel can be connected directly to the DVC6200 SIS to provide manual control of the SIS valve, including manual reset. A partial stroke test can also be initiated with the local control panel (see figure 1).

Figure 1. Fisher LCP200 Local Control Panel



X1543

Figure 2. exida Certificates



Safety Certification

The functional safety assessment was performed to the requirements of IEC 61508: ed2, 2010, SIL3.

The DVC6200 SIS digital valve controller, in the de-energize to trip (DETT) or energize to trip (ETT) configuration, meets the systematic integrity requirements of SIL 3.

The DVC6200 SIS position monitor, in the position transmitter or limit switch configuration, meets the systematic integrity requirements of SIL 2.

Valve Diagnostics

The DVC6200 SIS digital valve controller provides a broad and deep portfolio of valve diagnostic capabilities. Whether an Emerson 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 SIS delivers prompt notification of current or potential equipment issues and supports NAMUR NE107 alert categorization.

Valve diagnostic tests enable condition and performance monitoring of the entire valve assembly - not just the digital valve controller. Results are displayed graphically, with severity indicated by a red/yellow/green icon. A detailed description of the identified issue as well as suggestions for recommended actions are provided.

In the event that the DVC6200 SIS is commanded to trip, diagnostic data can be gathered automatically to be used for troubleshooting.

Examples of identifiable issues are:

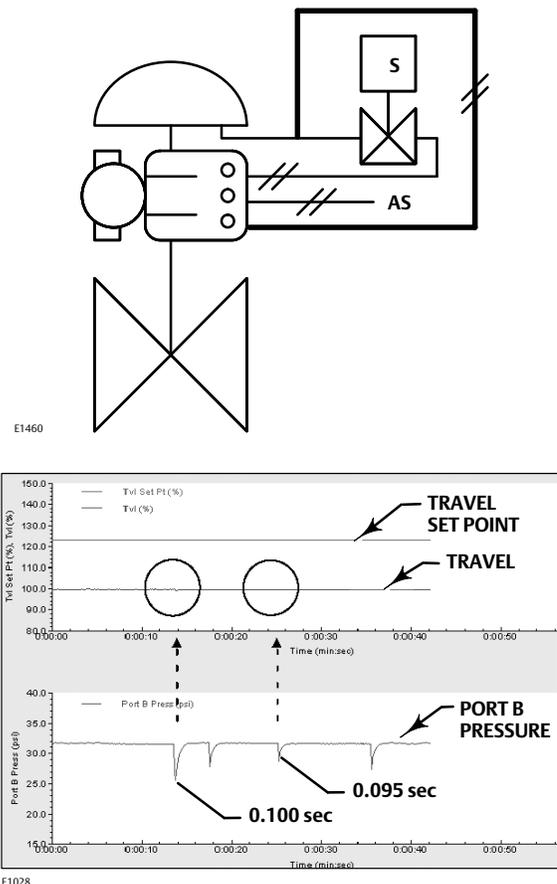
- Valve Stuck
- Solenoid Stuck
- Low or high air supply or pressure droop
- Dirty air supply
- External air leak (actuator diaphragm or tubing)
- Piston actuator O-ring failure
- Excessive or insufficient valve assembly friction
- Broken actuator spring
- Broken valve/actuator shaft

For additional information on FIELDVUE diagnostics and ValveLink software refer to Fisher Bulletin 62.1:ValveLink Software ([D10227X012](#)).

Solenoid Valve Health Monitoring

If a solenoid valve is installed between the DVC6200 SIS pressure output and the actuator, as shown in figure 3, the operation of the solenoid valve can be verified by configuring the DVC6200 SIS. In single-acting actuator applications, the “unused” output port of the DVC6200 SIS can be piped such that the pressure downstream of the solenoid valve is measured. When the solenoid valve is pulsed, either by the DVC6200 SIS or externally, the DVC6200 SIS can sense the momentary pressure drop across the solenoid valve. The solenoid should be pulsed long enough to detect a pressure drop across the solenoid valve, but not so long that it affects the travel of the final control element. This not only increases the availability of the solenoid valve during a safety demand, but also enhances the reliability of the SIF (Safety Instrumented Function) loop.

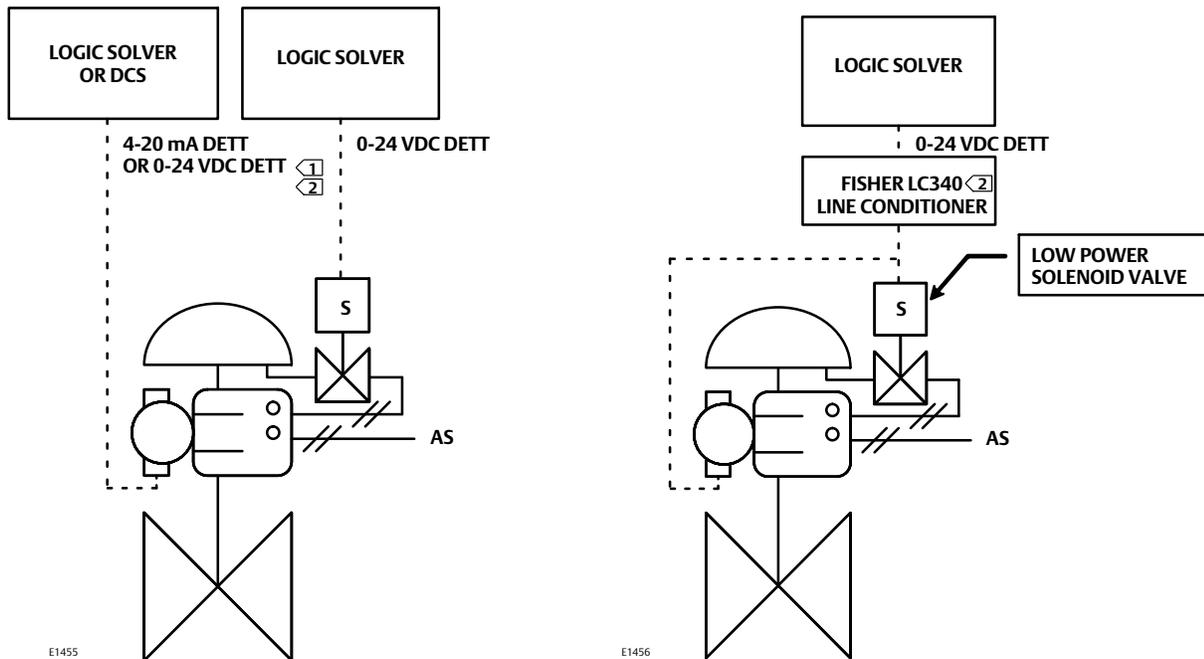
Figure 3. Solenoid Valve Testing



ValveLink Software Screen Image Showing Pressure Drop Across the Solenoid Valve

Application Examples

Figure 4. De-Energize to Trip (DETT) FIELDVUE DVC6200 SIS and DETT Solenoid Valve



Options Available

- LCP100/LCP200 Local Control Panel or external pushbutton
- Integral 4-20 mA position transmitter or discrete switch

Benefits

- DVC6200 SIS provides diagnostic coverage with PST
- DVC6200 SIS used with solenoid can provide redundant safety function
- DVC6200 SIS can provide additional diagnostic coverage when optional solenoid pulse recording is utilized
- When powered by 4-20 mA, the DVC6200 SIS is capable of recording the demand and reset stroke

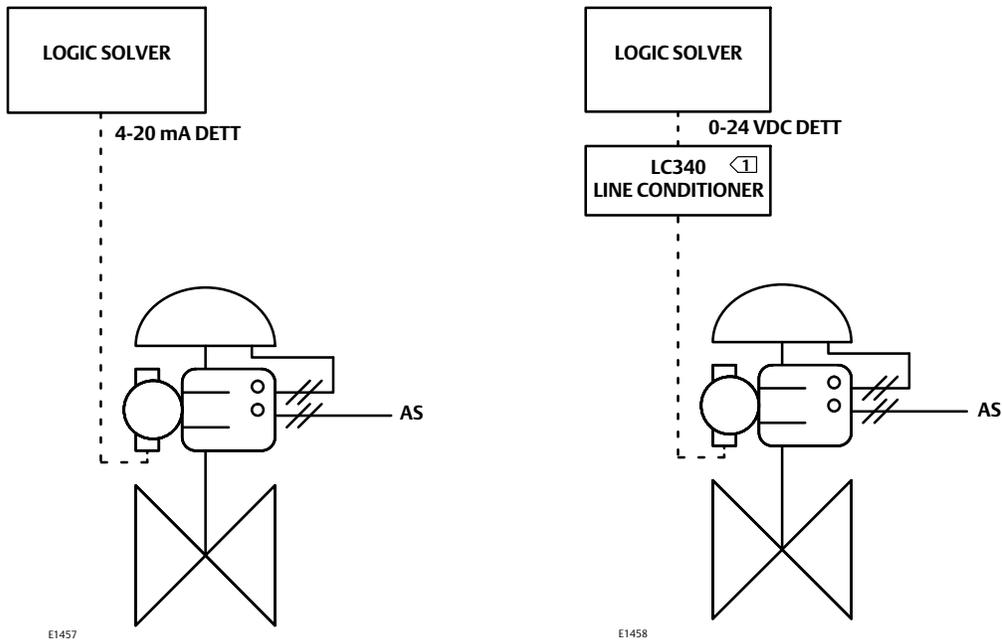
Operation

- DVC6200 SIS will move to the safety demand state upon signal de-energization, loss of power, or loss of pneumatic supply

① LC340 line conditioner is required for 0-24 VDC DETT

② LC340 mounting requires standard 35 mm DIN rail; install in marshalling or I/O cabinet, or junction box. For additional information refer to the LC340 instruction manual (D102797X012), available at www.Fisher.com or from your [Emerson sales office](#).

Figure 5. De-Energize to Trip (DETT) FIELDVUE DVC6200 SIS; No Solenoid Valve



Options Available

- LCP100/LCP200 Local Control Panel or external pushbutton
- Integral 4-20 mA position transmitter or discrete switch

Benefits

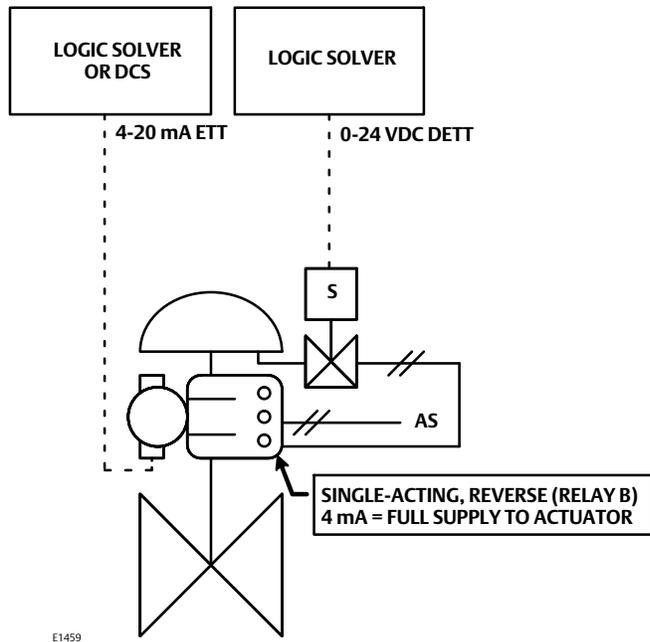
- DVC6200 SIS provides diagnostic coverage with PST
- Eliminates solenoid valve
- When powered by 4-20 mA, the DVC6200 SIS is capable of recording the demand and reset stroke

Operation

- DVC6200 SIS will move to the safety demand state upon signal de-energization, loss of power, or loss of pneumatic supply

1 > LC340 mounting requires standard 35 mm DIN rail; install in marshalling or I/O cabinet, or junction box. For additional information refer to the LC340 instruction manual (D102797X012), available at www.Fisher.com or from your [Emerson sales office](#).

Figure 6. FIELDVUE DVC6200 SIS for PST only and DETT Solenoid Valve



Options Available

- LCP100/LCP200 Local Control Panel or external pushbutton
- Integral 4-20 mA position transmitter or discrete switch

Benefits

- The energize to trip option provides maximum actuator pressure at minimum control signal (4 mA). Therefore, loss of the control signal will not cause the valve to trip.
- Prevents spurious trip on loss of electrical power to DVC6200 SIS
- DVC6200 SIS can provide additional diagnostics coverage when performing PST
- DVC6200 SIS can provide additional diagnostic coverage when optional solenoid pulse recording is utilized

Operation

- DVC6200 SIS will move to the safety demand state upon signal energization or loss of pneumatic supply
- The solenoid valve will move to the safety demand state upon signal de-energization

Specifications

Available Mounting

- Sliding-stem linear applications
- Quarter-turn rotary applications
- Integral mounting to Fisher rotary actuators
- Integral mounting to Fisher 657/667 or GX actuators

DVC6200 SIS 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

Input Signal

Point-to-Point

Analog Input Signal: 4-20 mA DC, nominal

Minimum Voltage Available at Instrument Terminals must be 9.5 VDC for analog control, 10 VDC for HART communication

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⁽¹⁾

Minimum Recommended

DVC6200 SIS w/Low Bleed Relay:

0.3 bar (5 psig) higher than maximum actuator requirements

DVC6200 SIS High Cv (HCv1, HCv2, HCv3)⁽²⁾:

2.8 bar (40 psig) required

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

Medium: Air or Natural Gas

Supply medium must be clean, dry and noncorrosive

Per ISA Standard 7.0.01

A maximum 40 micrometer particle size in the air system is acceptable, however, the DVC6200 SIS High Cv requires a maximum 5 micrometer particle size. Further filtration down to 5 micrometer particle size for other applications is recommended as well. Lubricant content is not to exceed 1 ppm weight (w/w) or volume (v/v) basis. Condensation in the air supply should be minimized

Pressure dew point: At least 10°C less than the lowest ambient temperature expected

Per ISO 8573-1

Maximum particle density size: Class 7

Oil content: Class 3

Pressure dew point: Class 3

Output Signal

Pneumatic Output: up to full supply pressure

Maximum Span: 9.5 bar (140 psig)

Action: Double, Single Direct, or Single Reverse

Note: HCv3 is only available for Single Direct action

Electronic Output⁽³⁾

■ **Integral 4-20 mA Position Transmitter⁽⁴⁾:**

4-20 mA output, isolated

Supply Voltage: 8-30 VDC

Reference Accuracy: 1% of travel span

Safety Accuracy: 5% of travel span

■ **Integral Limit Switch:** 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

Supply Voltage: 30 VDC maximum

Reference Accuracy: 2% of travel span

Safety Accuracy: 5% of travel span

Steady State Air Consumption⁽⁵⁾⁽⁶⁾

DVC6200 SIS w/Low Bleed Relay⁽⁷⁾:

At 1.4 bar (20 psig) supply pressure:

0.056 normal m³/hr (2.1 scfh), average

At 5.5 bar (80 psig) supply pressure:

0.184 normal m³/hr (6.9 scfh), average

DVC6200 SIS High Cv

At 3.4 bar (50 psig) supply pressure

HCv1

Pressurized: 0.033 normal m³/hr (1.25 scfh)

Vented: 0.129 normal m³/hr (4.82 scfh)

HCv2

Pressurized: 0.039 normal m³/hr (1.49 scfh)

Vented: 0.173 m³/hr normal (6.48 scfh)

HCv3

Pressurized: 0.144 normal m³/hr (5.38 scfh)

Vented: 0.179 normal m³/hr (6.70 scfh)

-continued-

Specifications (continued)

Maximum Output Capacity⁽⁵⁾

DVC6200 SIS w/Low Bleed Relay⁽⁶⁾:

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)

DVC6200 SIS High Cv:

HCv1: 1.2 Cv

HCv2: 3.2 Cv

HCv3: 6.2 Cv exhaust, 3.2 Cv fill

Operating Ambient Temperature Limits⁽¹⁾⁽⁸⁾

-52 to 85°C (-62 to 185°F)

Independent Linearity⁽⁹⁾

Typical Value: +/-0.50% of output span

Electromagnetic Compatibility

Meets EN 61326-1:2021

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 Load Impedance

An equivalent impedance of 500 ohms may be used.
This value corresponds to 10V @ 20 mA.

Humidity Testing Method

Tested per IEC 61514-2

Hazardous Area Approvals

CSA— Intrinsicly Safe, Explosion-proof, Division 2,
Dust Ignition-proof (Canada)

FM— Intrinsicly Safe, Explosion-proof, Dust
Ignition-proof, Non-Incendive (United States)

ATEX— Intrinsicly Safe, Flameproof, Type n,
Dust by intrinsic safety

IECEX— Intrinsicly Safe, Flameproof, Type n,
Dust by intrinsic safety or by enclosure

Marine Approvals— Lloyds, DNV, ABS, Bureau Veritas

CML— Certification Management Limited (Japan)

CUTR— Customs Union Technical Regulations

ESMA— Emirates Authority for Standardization and
Metrology - ECAS-Ex (UAE)

INMETRO— National Institute of Metrology, Quality,
and Technology (Brazil)

KOSHA— Korean Occupational Safety & Health
Agency (South Korea)

KTL— Korea Testing Laboratory (South Korea)

CCC— China Compulsory Certification

NEPSI— National Supervision and Inspection Centre
for Explosion Protection and Safety of
Instrumentation (China)

PESO CCOE— Petroleum and Explosives Safety
Organisation - Chief Controller of Explosives (India)

SANS— South Africa National Standards

UKEx— Intrinsicly Safe & Dust, Flameproof, Dust by
Enclosure, Type n (United Kingdom)

Not all certifications apply to all constructions.

Contact your [Emerson sales office](#) or refer to the
DVC6200 SIS product page at Fisher.com for approval
specific information

Electrical Housing

CSA— Type 4X, IP66

FM— Type 4X, IP66

ATEX— IP66

IECEX— IP66

Electrical Classification

Auxiliary Terminal Contact: Nominal Electrical Rating
5 V, <1 mA

IEC 61010 Compliance Requirements

Power Source: The loop current must be derived from
a separated extra-low voltage (SELV) power source

Environmental Conditions: Installation Category I

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Specifications (continued)

Connections

DVC6200 SIS w/Low Bleed Relay:

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

Output Pressure: 1/4 NPT internal

Tubing: 3/8-inch recommended

Vent: 3/8 NPT internal

Electrical: 1/2 NPT internal or M20

DVC6200 SIS High Cv:

Supply Port	Output Port	Vent
HCv1: 3/8 NPT	HCv1: 3/8 NPT	HCv1: 3/8 NPT
HCv2: 1/2 NPT	HCv2: 1/2 NPT	HCv2: 1/2 NPT
HCv3: 1/2 NPT	HCv3: 1 NPT	HCv3: 1 NPT

Recommended tubing size at least equal to port connection size

Minimum inside diameter required

HCv1: 7.11 mm (0.28 inch)

HCv2: 11.7 mm (0.46 inch)

HCv3: 16.5 mm (0.65 inch)

Electrical: 1/2 NPT internal or M20

Actuator Compatibility

Stem Travel (Sliding-Stem Linear)

Linear actuators with rated travel between 6.35 mm (0.25 inch) and 606 mm (23.375 inches)

Shaft Rotation (Quarter-Turn Rotary)

Rotary actuators with rated travel between 45 degrees and 180 degrees⁽¹⁰⁾

Weight

Aluminum

DVC6200 SIS w/low bleed relay: 3.5 kg (7.7 lbs)

DVC6200 SIS High Cv: 6.5 kg (14.3 lbs)

Stainless Steel

DVC6200 SIS w/low bleed relay: 8.6 kg (19 lbs)

Construction Materials

Housing, module base, and terminal box:
A03600 low copper aluminum alloy (standard)

Stainless steel (optional)

Cover: Thermoplastic polyester

Elastomers: Fluorosilicone

Options

- Supply and output pressure gauges or tire valves
- Integral mounted filter regulator⁽¹¹⁾
- Energize to trip
- Standard bleed relay
- Remote mount⁽¹²⁾⁽¹³⁾
- LCP100 local control panel
- LCP200 local control panel
- LC340 line conditioner
- Stainless steel
- DVC6200 SIS High Cv

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

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

2. HCv1: 1.2 Cv spool valve, needs a minimum 8 inch diameter cylinder/diaphragm.

HCv2: 3.2 Cv spool valve, needs a minimum 12 inch diameter cylinder or 220 inch² diaphragm area.

HCv3: 6.2 Cv spool valve, needs a minimum 12 inch diameter cylinder or 220 inch² diaphragm area.

3. The electronic output is available with either the position transmitter or the switch.

4. Position transmitter meets the requirements of NAMUR NE43; selectable to show failure low (< 3.6 mA) or failure high (> 22.5 mA). Fail high available only when the positioner is powered.

5. 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.

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

7. The Quad O steady-state consumption requirement of 6 scfh can be met by a DVC6200 SIS with low bleed relay A option, when used with up to 4.8 bar (70 psi) supply of Natural Gas at 16°C (60°F). The 6 scfh requirement can be met by low bleed relay B and C when used with up to 5.2 bar (75 psi) supply of Natural Gas at 16°C (60°F).

8. Temperature limits vary based on hazardous area approval. Lower temperature limit for CUTR Ex d approval with fluorosilicone elastomers is -53°C (-63.4°F).

9. 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 over 4-inch.

10. Rotary actuators with 180 degree rated travel require a special mounting kit; contact your Emerson sales office for kit availability.

11. An integral mounted filter regulator is not available with the DVC6200 SIS High Cv.

12. 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.

13. The position monitor (transmitter or switch) with the remote mount construction is not safety certified.

Product Bulletin

62.1:DVC6200 SIS
March 2023

DVC6200 SIS Digital Valve Controller
D103555X012

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