

# Fisher™ FIELDVUE™ DPC2K Digital Process Controller

The Fisher FIELDVUE DPC2K digital process controller (figure 1) is an electro-pneumatic PID controller that can replace pneumatic controllers to meet your single continuous PID loop needs. The DPC2K has been designed to provide application flexibility, through simple configuration and high speed network communications, for your next expansion or modernization project.



## Control at the Valve

The DPC2K may be connected directly to the process and has an integral travel sensor that provides actual feedback when mounted on a control valve. It uses proven linkageless non-contacting technology that supports both globe and linear valve applications. Pipe stand mounting with remote position feedback is available when valve mounting is not feasible.

## Features

### Application Flexibility

- **Control at the Valve**— The DPC2K has an option for pressure control utilizing an integral pressure sensor. A 4-20 mA transmitter may also be used for other process operations such as temperature, level, and more. Remote setpoints can be entered digitally or with an analog input.
- **PID Control**— With both pneumatic and analog control outputs, the DPC2K is ideal for use in expansion or modernization projects, including for air/gas operated actuators or analog control for electric actuators, variable frequency drives, and pumps.

- **Intuitive and Simple Configuration**— Traditional controllers typically require skilled programming and can be difficult to support and maintain. The configuration software is easy to understand and navigate, using guided instructions to take the guesswork out of troubleshooting.

### Safety and Reliability

- **Tested in Use**— The low-bleed pneumatic design has been field proven. It provides reliable control in harsh environments. Non-contact readback of the valve position ensures proper operation of the PID control algorithm.
- **At a Glance Displays**—User-friendly displays, both at the local user interface and the Control Dashboard of LoopConnect™ Software when network is connected, providing easy access to the information needed to keep your process running smoothly.

Figure 1. Fisher DPC2K Digital Process Controller



**BASE UNIT WITH  
PNEUMATIC OUTPUT OPTION**



**BASE UNIT WITH ANALOG OUTPUT**

## Efficient Operation

- **Fast Commissioning**— When compared to a programmed solutions, a configured instrument reduces the time and labor needed to bring the process loop into operation.
- **Network Reliability**— Ethernet communications allows you to quickly integrate into SCADA or control systems. Remote monitoring is supported via Modbus TCP or Modbus RTU serial data paths.
- **Easy to Use**— The six button interface supports local operation even in harsh environments or where gloves are required.

## Process Data

Stranded process data becomes a thing of the past when using the DPC2K as an upgrade for standalone pneumatic controllers.

The DPC2K digital process controller provides local control for continuous, single PID loops. Installation, configuration, and monitoring are fast and easy with network connected Ethernet communication. Any unused inputs can be used for monitoring of additional variables.

Data can be used for near real time data driven decisions which can save money by averting downtime and by improved performance of your process systems.

Networked communication and simplified monitoring allow your support infrastructure to troubleshoot process issues and prepare mitigation, therefore minimizing downtime to diagnose a potential problem.

With multiple simultaneous sessions supported, the right resources can collaborate to optimize performance of the process loop and take the guesswork out of tuning and operating. This also improves employee safety by eliminating unnecessary travel, reduced on-site risk, and minimized process upsets.

Designed to be integrated within your company's network security, the DPC2K has flexible methods to secure communications by protocol and port. A physical switch can also be used to lock configurations and prevent unwarranted changes. The firmware also utilizes priority for the control algorithm to ensure operation in case of cyber attacks against the network infrastructure.

## Value

- **Cost Effective**— The integrated design of the DPC2K significantly reduces the cost of installation compared to other electro-pneumatic solutions.  
Once installed, the self-contained package ensures the lowest cost of implementation. Low power electronics and optional integrated pressure sensor and pneumatic output, shown in figure 2, minimize the need for extra wiring, conduit, and enclosures.
- **Flexibility of Application**— The DPC2K supports a variety of measurement types and provides control signals for either pneumatic or analog controls. Almost anywhere a single PID control loop is required, the DPC2K can be counted on to provide a consistent user experience.
- **Operational Efficiency**— The intuitive LoopConnect Configuration and Monitoring software interface is simple to learn and groups task-based actions, allowing you to save time by simplifying configuration. The software uses drag and drop, guided tasks, color changes, and simple data entry to create a consistent user experience for the wide range of applications and process loop performance requirements.  
Monitoring of Alerts, Alarms and Process Status is available on network connected controllers.
- **Lower Support Costs**— The consistent user experience provided by LoopConnect software helps reduce troubleshooting and product support needs.

- **Remote Data Availability**— Digital communication enables easy access to the condition of the process loop. Ethernet communication supports multiple simultaneous sessions which may be monitored by operations, maintenance, and engineering. These connections ensure all groups can make real time process control and maintenance decisions.

## Performance

- **Easy Adjustment and Tuning** —The electro-pneumatic DPC2K improves the ability to correctly tune your process versus pneumatic only controllers by making the data available for real time trending, setting PID parameters digitally, and by remote monitoring of the loop performance.

Loop response and disturbance rejection are easily setup through the local interface or remotely. This flexibility in responsiveness ensures your operation maintains productivity throughout the lifecycle. With legacy pneumatic instruments small dial changes or movements could result in tuning changes. With a digital instrument, tuning parameters are entered directly and the PID control algorithm responds appropriately.

- **High Sample Rate and Configurable Deadbands** allow you to balance performance with valve longevity.

Figure 2. Fisher DPC2K Digital Process Controller



# LoopConnect Configuration and Monitoring Software

The DPC2K is a configured controller. LoopConnect provides a consistent user experience for implementing continuous PID control loops at the valve. Through the use of color and user guidance the instrument firmware and the software make setting up your control loop simple, flexible, and timely.

Two versions of LoopConnect are available. The full version of LoopConnect presents you with a realtime view from the network connected DPC2K instruments. This map, shown in figure 3, provides operating data and status information without any programming.

The Technician Tool version is strictly a peer-to-peer connection for a single DPC2K. You can simply open any of the cards to configure, monitor, or troubleshoot a remote device.

When the card opens you will see the operating loop and be able to navigate the software to perform the required tasks (see figure 4).

Figure 3. Device Map

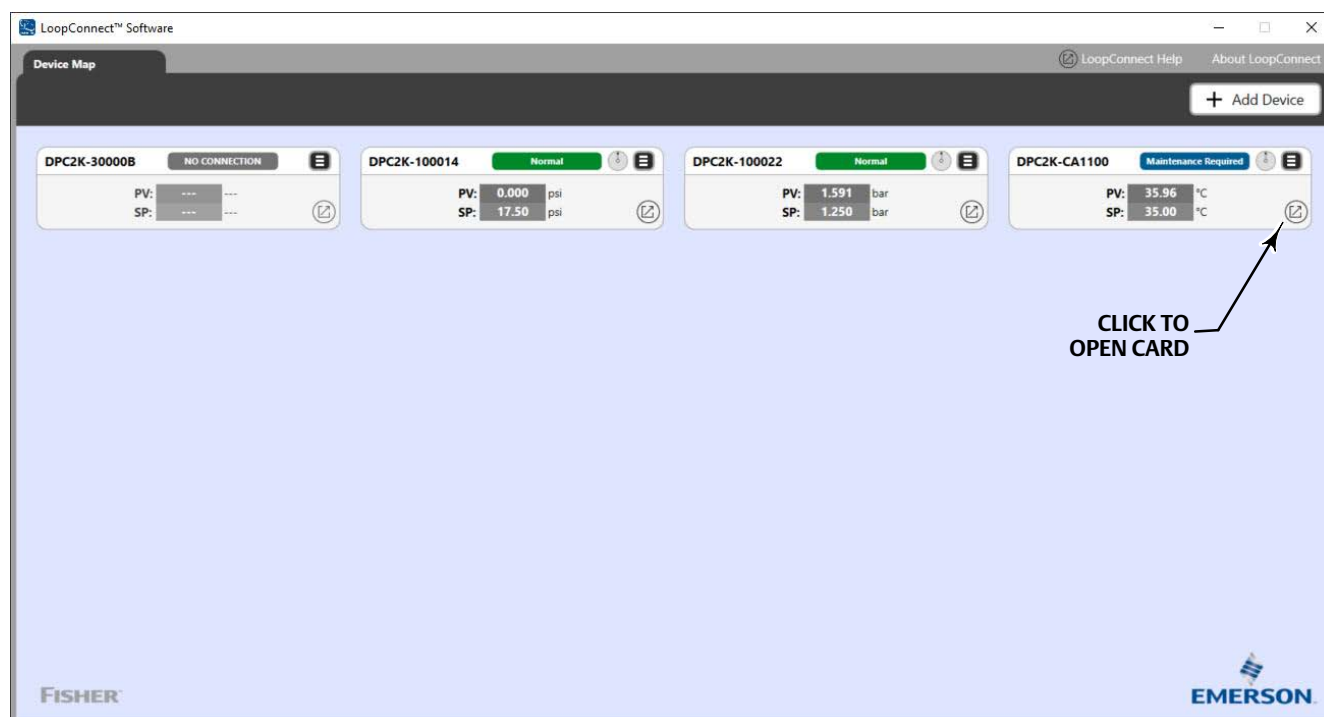
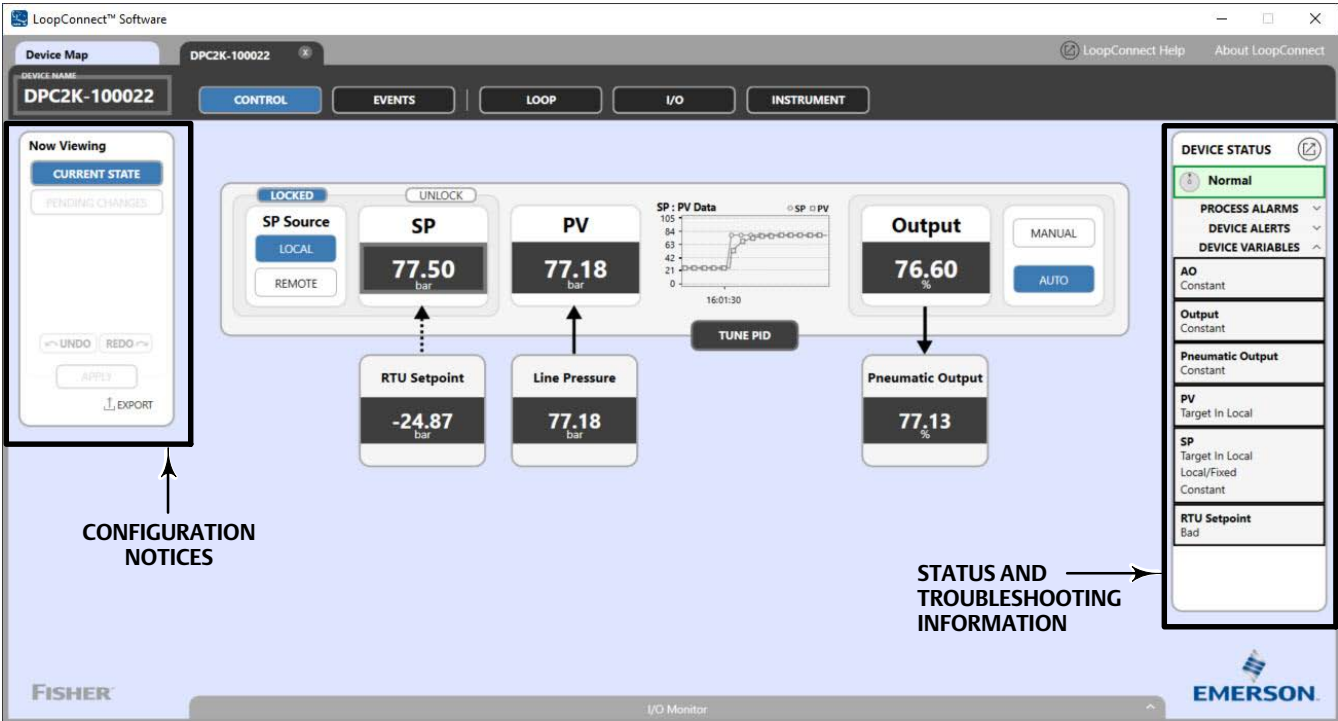


Figure 4. LoopConnect CONTROL Dashboard



## Specifications

### Base Unit (Analog Output)

These specifications also apply to the Pneumatic Output Option

The Base Unit may also include the Process Pressure Sensor Option

#### Available Mounting

- Integral mounting to Fisher 657/667 actuators
- Integral mounting to Fisher rotary actuators
- Sliding-stem linear applications

#### 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)<sup>(1)</sup>

Rotary actuators with rated travel between 45 degrees and 180 degrees

#### Instrument Power

9 to 28 VDC at 1 Watt nominal

#### Maximum Voltage

28 VDC, Reverse Polarity protected

#### Operating Ambient Temperature Limits<sup>(2)(3)</sup>

-40 to 80°C (-40 to 176°F)

#### Inputs

Analog Input 1: 4-20 mA, 250 ohm internal resistance

Accuracy:  $\pm 0.25\%$

Reverse polarity protected up to 30 VDC

Analog Input 2: 4-20 mA with internal 28 VDC Source, 250 ohm internal resistance

Accuracy:  $\pm 0.25\%$

Overcurrent protection

Reverse polarity protected up to 30 VDC

#### Output

Analog Output: 4-20 mA with internal 28 VDC Source,

1 K ohm maximum

Accuracy:  $\pm 0.25\%$

Reverse polarity protected

Linearity:

Typical Value:  $\pm 0.50\%$  of output span

#### Communication Protocol

- Serial: Modbus RTU, Supports function codes
- Baud: Configured 9600 to 256,000 baud  
Default 115,200
- Ethernet: Modbus TCP, HART-IP (Common commands and Universal commands)

#### Electromagnetic Compatibility

Meets EN 61326-1:2013

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

#### Humidity Testing Method

Tested per IEC 61514-2

#### Hazardous Area Approvals (PENDING)

cCSAus (Canada & United States)

Class I Div 1 - Explosion-proof

Class I Div 2 - Non-incendive

Class I Zone 1 Ex db ia IIB T5 Gb

Class I Zone 2 Ex ec ic IIB T5 Gc

ATEX & IECEx:

Flameproof - Ex db ia IIB T5 Gb

Increased Safety - Ex ec ic IIB T5 Gc

#### Electrical Housing

cCSAus— Type 4X, IP66

ATEX & IECEx— IP66

#### Weight

Electric Only:

*Without process pressure sensor:* 3.3 kg (7.4 lbs)

*With process pressure sensor:* 3.7 kg (8.1 lbs)

**With Pneumatic Output Option:**

*Without process pressure sensor:* 5.5 kg (12.2 lbs)

*With process pressure sensor:* 5.9 kg (12.9 lbs)

#### Construction Materials

Housing, module base and terminal box:

A03600 low copper aluminum alloy

#### Dimensions

See figure 5

-continued-

## Specifications (continued)

**Pneumatic Output Option**

The Base Unit specifications also apply to the Pneumatic Output Option

The Pneumatic Output Option may also include the Process Pressure Sensor Option

**Supply Pressure**

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

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. 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

*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

**Connections**

Supply Pressure: 1/4 NPT internal

Output Pressure: 1/4 NPT internal

Tubing: 3/8-inch recommended

Vent: 3/8 NPT internal

Electrical: 1/2 NPT internal, two conduit entries

**Output Signal**

Pneumatic signal, up to full supply pressure

Minimum Span: 0.4 bar (6 psig)

Maximum Span: 9.5 bar (140 psig)

Action: Single Direct

**Low Bleed Steady-State Air Consumption<sup>(4)(5)(6)</sup>**

At 1.4 bar (20 psig) supply pressure  
0.056 normal m<sup>3</sup>/hr (2.1 scfh), average

At 5.5 bar (80 psig) supply pressure  
0.184 normal m<sup>3</sup>/hr (6.9 scfh), average

**Maximum Output Capacity<sup>(4)(5)</sup>**

At 1.4 bar (20 psig) supply pressure:  
10.0 normal m<sup>3</sup>/hr (375 scfh)

At 5.5 bar (80 psig) supply pressure:  
29.5 normal m<sup>3</sup>/hr (1100 scfh)

**Process Pressure Sensor Option**

The Process Pressure Sensor option can be used with either the Base Unit (Analog Output) or the Pneumatic Output Option

**Pressure Ranges**

Sealed Gauge: 2.1, 6.9, 20.7, 41.4, 103 bar (30, 100, 300, 600, 1500 psi) ranges available

**Compensated Temperature range<sup>(2)</sup>**

-20 to 80°C (-4 to 176°F)

**Total Accuracy**

Reference accuracy: ± 0.25%

Temperature Sensitivity: < 0.3% per 50°C

**Construction**

316 stainless steel wetted parts

**Pressure Port**

1/4 NPT

**Canadian Registration (CRN)**

Pending

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

1. NAMUR mounting is not supported on quarter-turn rotary actuators.

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

3. Temperature limits vary based on hazardous area approval.

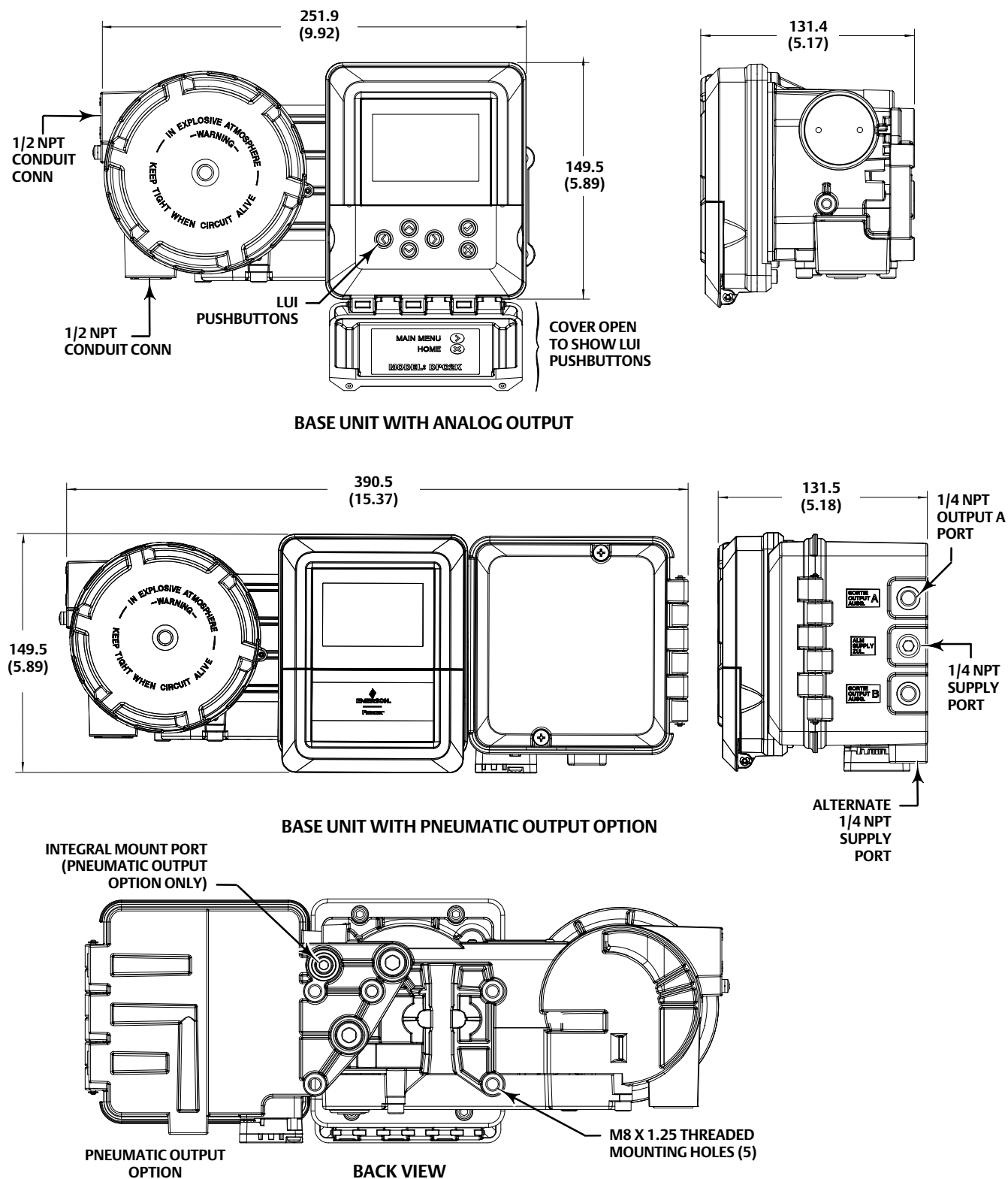
4. Normal m<sup>3</sup>/hour - Normal cubic meters per hour at 0°C and 1.01325 bar, absolute. Scfh - Standard cubic feet per hour at 60°F and 14.7 psia.

5. Values at 1.4 bar (20 psig) based on a single-acting direct relay.

6. The Quad O steady-state consumption requirement of 6 scfh can be met by a DPC2K. The 6 scfh requirement can be met by low bleed relay C when used with up to 5.2 bar (75 psi) supply of Natural Gas at 16°C (60°F).



**Figure 5. Dimensions**



## Product Bulletin

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## DPC2K Digital Process Controller

D104561X012

### Product Selection

#### DPC2KX1-A B C D

Assembly	Item	Option	Descriptive Element	Description
Base Unit	A	1	Base Unit Analog Output with Travel	Single PID Loop Controller for continuous control and use with analog actuators (4 - 20 mA) Aluminum construction Operating temperature from -40°C to 80°C
		2	Base Unit Pneumatic Output with Travel	Single PID Loop Controller for continuous control at the valve with air operated actuators Aluminum construction
Pneumatic Assembly (when specified)	B	1	Low Bleed Single-Acting Direct	Less than 3.0 scfh @ 20 psi, meets Quad O requirements Operating temperature from -40°C to 80°C Pneumatic assembly is comprised of I/P and relay
Pressure Sensor (sealed gage)	C	0	None	None
		1	2.1 Bar	2.1 Bar (0-30 Psi)
		2	6.9 Bar	6.9 Bar (100 Psi)
		3	20.1 Bar	20.1 Bar (300 Psi)
		4	41.4 Ba	41.4 Bar (600 Psi)
		5	103.4 Bar	103.4 Bar (1500 Psi)
Nameplate	D	0	None	Non-approved
		1	cCSAus	CSA Class 1 Div 1 Explosion-proof Canada & United States
		2	ATEX	ATEX Zone 1 Explosion-proof
		3	IECEX	IECEX Zone 1 Explosion-proof

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