Low Differential Pressure Transducer DP140 Series Product Bulletin

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Introduction

The Johnson Controls® Low Differential Pressure Transducer DP140 Series offers an excellent price-to-performance ratio and meets the requirements in all typical HVAC applications. The DP140 is a low differential pressure transducer that uses a dead-ended capacitive sensing element and requires minimal amplification. The DP140 delivers ±1% full-scale (FS) accuracy with ±0.25% and ±0.5% accuracy options with pressure ranges from 0.1 in. W.C. up to ±25 in. W.C. The DP140 has a small footprint and an AC power option.

Figure 1: DP140 Series Transducer



Applications

Use the Low Differential Pressure Transducer DP140 Series in the following applications:

- HVAC systems
- Air flow stations
- Variable Air Volume (VAV) or fan control
- Filter status
- Static duct and cleanroom pressures

Features and benefits

The Low Differential Pressure Transducer DP140 delivers excellent accuracy and longterm stability. Features include:

- Excellent price-to-performance ratio
- Reduced installation costs
- ±0.25%, ±0.5%, ±1% FS accuracy options
- VDC or VAC excitation
- Voltage or milli-amp analog outputs

- Reverse wiring protection
- Internal regulation
- Fire retardant case, UL 94 V-0 approved
- CE and RoHS compliant

High performance

The DP140 is a high-value solution with exceptional features, quality, and performance.

Cost-saving installation

The design of the DP140 reduces installation costs and increases overall operating efficiency. Installation is easy with integral mounting tabs, pressure connections located on the face of the unit, and a screw terminal strip for electrical termination.

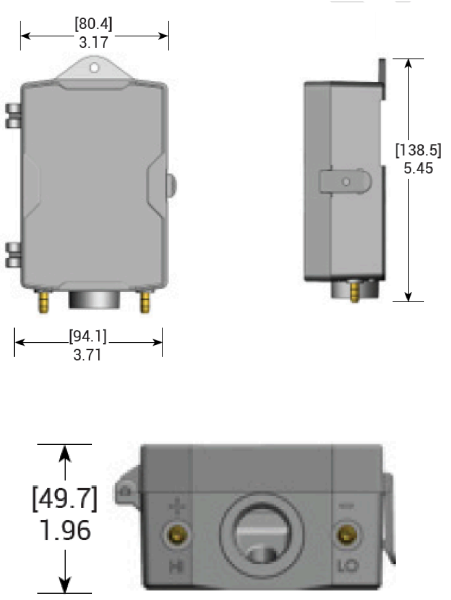
IP67-rated housing

The DP140 housing is a robust IP67-rated design, sealed with a gasket to make it wash-down capable for difficult applications. The DP140 includes a conduit fitting for easy installation and wiring.

Dimensions

The dimensions of the DP140 Transducer are shown in the following figures.

Figure 2: Dimensions of the DP140 Transducer, in. (mm)



Ordering information

See the following table for ordering options for the DP140 Low Differential Pressure Transducers. All units have a 1/2 in. conduit electrical fitting. For example, DP140X25B21F is model DP140, ± 0.25 in. W.C., bidirectional range, 4 mA to 20 mA, 1/2 in. conduit fitting, ±0.25% accuracy.

Table 1: Product codes

Product code	Range, in in. W.C.	Direction	Output	Accuracy
DP140005U21C	0 to 5	Unidirectional	4 mA to 20 mA	±1% FS
DP1402X5U21C	0 to 2.5	Unidirectional	4 mA to 20 mA	±1% FS
DP1402X5U11C	0 to 2.5	Unidirectional	0 VDC to 5 VDC	±1% FS
DP140X25B21C	±0.25	Bidirectional	4 mA to 20 mA	±1% FS
DP140005U21D	0 to 5	Unidirectional	4 mA to 20 mA	±0.5% FS
DP1402X5U21D	0 to 2.5	Unidirectional	4 mA to 20 mA	±0.5% FS
DP140005U11C	0 to 5	Unidirectional	0 VDC to 5 VDC	±1% FS
DP140005U21F	0 to 5	Unidirectional	4 mA to 20 mA	±0.25% FS
DP140025U21D	0 to 25	Unidirectional	4 mA to 20 mA	±0.5% FS
DP140010U21C	0 to 10	Unidirectional	4 mA to 20 mA	±1% FS
DP1400X1B11F	±0.1	Bidirectional	0 VDC to 5 VDC	±0.25% FS
DP140010U21D	0 to 10	Unidirectional	4 mA to 20 mA	±0.5% FS
DP1402X5U21F	0 to 2.5	Unidirectional	4 mA to 20 mA	±0.25% FS
DP140X25B21F	±0.25	Bidirectional	4 mA to 20 mA	±0.25% FS
DP140X25B11C	±0.25	Bidirectional	0 VDC to 5 VDC	±1% FS
DP140001U21F	0 to 1	Unidirectional	4 mA to 20 mA	±0.25% FS
DP140X25U21C	0 to 0.25	Unidirectional	4 mA to 20 mA	±1% FS
DP140010U11D	0 to 10	Unidirectional	0 VDC to 5 VDC	±0.5% FS
DP140001U11F	0 to 1	Unidirectional	0 VDC to 5 VDC	±0.25% FS
DP140001U21C	0 to 1	Unidirectional	4 mA to 20 mA	±1% FS
DP140X25B11F	±0.25	Bidirectional	0 VDC to 5 VDC	±0.25% FS
DP140X25U21D	0 to 0.25	Unidirectional	4 mA to 20 mA	±0.5% FS
DP140001U21D	0 to 1	Unidirectional	4 mA to 20 mA	±0.5% FS
DP1400X5U21C	0 to 0.5	Unidirectional	4 mA to 20 mA	±1% FS
DP140025U11D	0 to 25	Unidirectional	0 VDC to 5 VDC	±0.5% FS
DP1400X5B21C	±0.5	Bidirectional	4 mA to 20 mA	±1% FS
DP1400X5B21D	±0.5	Bidirectional	4 mA to 20 mA	±0.5% FS
DP1400X1B21F	±0.1	Bidirectional	4 mA to 20 mA	±0.25% FS
DP140001U11D	0 to 1	Unidirectional	0 VDC to 5 VDC	±0.5% FS
DP140010U21F	0 to 10	Unidirectional	4 mA to 20 mA	±0.25% FS
DP1400X5B21F	±0.5	Bidirectional	4 mA to 20 mA	±0.25% FS
DP1402X5B21C	±2.5	Bidirectional	4 mA to 20 mA	±1% FS
DP140005B21C	±5	Bidirectional	4 mA to 20 mA	±1% FS
DP140050U21D	0 to 50	Unidirectional	4 mA to 20 mA	±0.5% FS
DP140X25B11D	±0.25	Bidirectional	0 VDC to 5 VDC	±0.5% FS
DP140010U11C	0 to 10	Unidirectional	0 VDC to 5 VDC	±1% FS
DP1400X5U21D	0 to 0.5	Unidirectional	4 mA to 20 mA	±0.5% FS
DP140005U11D	0 to 5	Unidirectional	0 VDC to 5 VDC	±0.5% FS
DP1400X1B11D	±0.1	Bidirectional	0 VDC to 5 VDC	±0.5% FS
DP140025U21F	0 to 25	Unidirectional	4 mA to 20 mA	±0.25% FS
DP1402X5U11F	0 to 2.5	Unidirectional	0 VDC to 5 VDC	±0.25% FS
DP140X25U21F	0 to 0.25	Unidirectional	4 mA to 20 mA	±0.25% FS
DP1400X1B21D	±0.1	Bidirectional	4 mA to 20 mA	±0.5% FS
DP140001U11C	0 to 1	Unidirectional	0 VDC to 5 VDC	±1% FS
DP1400X5B11D	±0.5	Bidirectional	0 VDC to 5 VDC	±0.5% FS
DP1400X1B11C	±0.1	Bidirectional	0 VDC to 5 VDC	±1% FS
DP140X25U11D	0 to 0.25	Unidirectional	0 VDC to 5 VDC	±0.5% FS

Table 1: Product codes

Product code	Range, in in. W.C.	Direction	Output	Accuracy
DP1400X5U21F	0 to 0.5	Unidirectional	4 mA to 20 mA	±0.25% FS
DP140X25U11C	0 to 0.25	Unidirectional	0 VDC to 5 VDC	±1% FS
DP1400X5U11D	0 to 0.5	Unidirectional	0 VDC to 5 VDC	±0.5% FS
DP1402X5B21F	±2.5	Bidirectional	4 mA to 20 mA	±0.25% FS
DP1400X5B11F	±0.5	Bidirectional	0 VDC to 5 VDC	±0.25% FS
DP1402X5B21D	±2.5	Bidirectional	4 mA to 20 mA	±0.5% FS
DP1400X5U11C	0 to 0.5	Unidirectional	0 VDC to 5 VDC	±1% FS
DP140005U11F	0 to 5	Unidirectional	0 VDC to 5 VDC	±0.25% FS
DP140001B21F	±1	Bidirectional	4 mA to 20 mA	±0.25% FS
DP1402X5U11D	0 to 2.5	Unidirectional	0 VDC to 5 VDC	±0.5% FS
DP140001B21D	±1	Bidirectional	4 mA to 20 mA	±0.5% FS
DP140010U11F	0 to 10	Unidirectional	0 VDC to 5 VDC	±0.25% FS
DP1400X5B11C	±0.5	Bidirectional	0 VDC to 5 VDC	±1% FS
DP1400X1U21C	0 to 0.1	Unidirectional	4 mA to 20 mA	±1% FS
DP140001B11D	±1	Bidirectional	0 VDC to 5 VDC	±0.5% FS
DP140X25B21D	±0.25	Bidirectional	4 mA to 20 mA	±0.5% FS
DP140001B21C	±1	Bidirectional	4 mA to 20 mA	±1% FS
DP1400X1U21D	0 to 0.1	Unidirectional	4 mA to 20 mA	±0.5% FS
DP140005B21D	±5	Bidirectional	4 mA to 20 mA	±0.5% FS
DP140005B21F	±5	Bidirectional	4 mA to 20 mA	±0.25% FS
DP140100U11D	0 to 100	Unidirectional	0 VDC to 5 VDC	±0.5% FS
DP140050U11C	0 to 50	Unidirectional	0 VDC to 5 VDC	±1% FS
DP1400X1U11D	0 to 0.1	Unidirectional	0 VDC to 5 VDC	±0.5% FS
DP140001B11C	±1	Bidirectional	0 VDC to 5 VDC	±1% FS
DP1402X5B11F	±2.5	Bidirectional	0 VDC to 5 VDC	±0.25% FS
DP140025U11F	0 to 25	Unidirectional	0 VDC to 5 VDC	±0.25% FS
DP1400X1U21F	0 to 0.1	Unidirectional	4 mA to 20 mA	±0.25% FS
DP1400X1U11C	0 to 0.1	Unidirectional	0 VDC to 5 VDC	±1% FS
DP1400X5U11F	0 to 0.5	Unidirectional	0 VDC to 5 VDC	±0.25% FS
DP140005B11D	±5	Bidirectional	0 VDC to 5 VDC	±0.5% FS
DP140005B11C	±5	Bidirectional	0 VDC to 5 VDC	±1% FS
DP140050U11D	0 to 50	Unidirectional	0 VDC to 5 VDC	±0.5% FS
DP1402X5B11D	±2.5	Bidirectional	0 VDC to 5 VDC	±0.5% FS
DP140X25U11F	0 to 0.25	Unidirectional	0 VDC to 5 VDC	±0.25% FS
DP140001B11F	±1	Bidirectional	0 VDC to 5 VDC	±0.25% FS
DP1400X1U11F	0 to 0.1	Unidirectional	0 VDC to 5 VDC	±0.25% FS
DP140005B11F	±5	Bidirectional	0 VDC to 5 VDC	±0.25% FS
DP140025U21C	0 to 25	Unidirectional	4 mA to 20 mA	±1% FS
DP140050U11F	0 to 50	Unidirectional	0 VDC to 5 VDC	±0.25% FS
DP140025U11C	0 to 25	Unidirectional	0 VDC to 5 VDC	±1% FS
DP140005U31C	0 to 5	Unidirectional	0 VDC to 10 VDC	±1% FS
DP140001U31C	0 to 1	Unidirectional	0 VDC to 10 VDC	±1% FS
DP1402X5U31C	0 to 2.5	Unidirectional	0 VDC to 10 VDC	±1% FS
DP1400X5U31C	0 to 0.5	Unidirectional	0 VDC to 10 VDC	±1% FS
DP140X25U31C	0 to 0.25	Unidirectional	0 VDC to 10 VDC	±1% FS
DP140010U31C	0 to 10	Unidirectional	0 VDC to 10 VDC	±1% FS
DP140X25B31C	±0.25	Bidirectional	0 VDC to 10 VDC	±1% FS
DP1400X5B31C	±0.5	Bidirectional	0 VDC to 10 VDC	±1% FS
DP1400X1B31C	±0.1	Bidirectional	0 VDC to 10 VDC	±1% FS
DP140005B31C	±5	Bidirectional	0 VDC to 10 VDC	±1% FS
DP140001B31C	±1	Bidirectional	0 VDC to 10 VDC	±1% FS
DP1402X5B31C	±2.5	Bidirectional	0 VDC to 10 VDC	±1% FS

Table 1: Product codes

Product code	Range, in in. W.C.	Direction	Output	Accuracy
DP1401X5U21E	0 to 1.5	Unidirectional	4 mA to 20 mA	±0.4% FS
DP1402X5U21FC, NIST	0 to 2.5	Unidirectional	4 mA to 20 mA	±0.25% FS

Technical specifications

Table 2: Differential Pressure Transducer DP140 technical specifications

Description		Specification
Performance data	Accuracy RSS1, at constant temperature	±1.0% FS, standard ±0.5% FS, ±0.25% FS, optional
	Non-linearity, BFSL	±0.98% FS, standard ±0.38% FS, ±0.22% FS, optional
	Hysteresis	0.10% FS
	Non-repeatibility	0.05% FS
Thermal effects ⓘ **Note:** Units calibrated at nominal 70˚F. Maximum thermal error calculated from this data.	Compensated range	0°F to 150°F (-18°C to 65°C)
	Zero shift % FS at 100°F (% FS at 50°C)	±0.033 (±0.06)
	Span shift % FS at 100°F (% FS at 50°C)	±0.033 (±0.06)
	Maximum line pressure	10 psi, 277 in. W.C.
	Overpressure	Up to 10 psi (277 in. W.C.) range dependent
	Long term stability	0.5% FS per year
	Warm-up shift	0.1% FS total
Environmental data	Operating temperature ⓘ **Note:** Operating temperature limits of the electronics only. Pressure media temperatures may be considerably higher.	0°F to 150°F (-18°C to 65°C)
	Storage temperature	-40°F to 185°F (-40°C to 85°C)
Pressure media	Clean air or similar nonconducting gases	
Physical specifications	Pressure fittings	1/4 in. push-on tube fitting
	Case	Fire retardant glass-filled polyester, UL 94-V approved
	Weight	3 oz
	Electrical connections	Removable terminal block
Position effect	Range	Zero offset (%FS/G)
	0 to 0.5 in. W.C.	0.60
	0 to 1.0 in. W.C.	0.50
	0 to 2.5 in. W.C.	0.22
	0 to 5.0 in. W.C.	0.14

Table 2: Differential Pressure Transducer DP140 technical specifications

Description		Specification
Electrical data, voltage	Circuit	3-wire: Exc, Out, Com
	Excitation for output ⓘ **Note:** Calibrated into a 50 K ohm load, operable into a 5 K ohm load or greater	13 VDC to 30 VDC for 0 VDC to 5 VDC 18 VAC to 24 VAC for 0 VDC to 5 VDC 13 VDC to 30 VDC for 0 VDC to 10 VDC 18 VAC to 24 VAC for 0 VDC to 10 VDC
	Output impedance	<100 ohm
	Bidirectional output at zero pressure	2.5 V in case of 0 V to 5 V output 5 V in case of 0 V to 10 V output
Electrical data, current	Circuit	2-wire
	Output ⓘ **Note:** Calibrated at factory with a 24 VDC loop supply voltage and a 250 ohm load.	4 mA to 20 mA ⓘ **Note:** Zero and Span FS output factory set to within ±0.16 mA, ±0.08 mA for optional accuracies.
	External load	0 ohm to 800 ohm
	Minimum supply voltage, VDC	13 + 0.02 x (resistance of receiver plus line)
	Maximum supply voltage, VDC	30 + 0.004 x (resistance of receiver plus line
	Bidirectional output at zero pressure	12 mA
Compliance CE	CE Mark - Johnson Controls declares that this product is in Compliance with the essential requirements and other relevant provisions of the EMC and RoHS Directives.	

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls shall not be liable for damages resulting from misapplication or misuse of its products.

Product warranty

This product is covered by a limited warranty, details of which can be found at www.johnsoncontrols.com/buildingswarranty.

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