

EP Series

Differential Pressure/Air Velocity Transducer



Product Description

The EP transducer can measure either air pressure or velocity with the flip of a switch. The EP is available in three installation configurations: duct, panel or universal. Duct and panel models have two pressure and velocity options: 0-1" WC / 0-3,000 ft/min or 1-10" WC / 3,000-6,000 ft/min with four field-selectable sub-ranges. The universal model comes in one pressure/velocity range: 0-10" WC / 0-7,000 ft/min with seven field-selectable sub-ranges for pressure and eight for velocity. All variants are available with and without display. The EP has an IP65/NEMA 4 environmental rating and a 5-year limited warranty.

Available Products

Enclosure	Range	Local Display
EP		
D = Duct P = Panel	301 = Pressure: 0 to 1 in. WC 0 to 250 Pa Velocity: 0 to 3000 ft/min 0 to 15 m/s 302 = Pressure: 1 to 10 in. WC 0.25 kPa to 2500 Pa Velocity: 0 to 6000 ft/min 0 to 30 m/s	Blank = No Display LCD = LCD Display
U = Universal	305 = Pressure: 0 to 10 in. WC 0 to 2500 Pa Velocity: 0 to 7000 ft/min 0 to 35 m/s	Blank = No Display LCD = LCD Display

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Specifications

Media Compatibility	Dry or inert gas
Input Power	Three-wire Volt mode: 24 Vac or 12-30 Vdc*, Two-wire mA mode: 12-30 Vdc*
Output Power	Field-selectable: 2-wire, loop-powered 4-20 mA Minimum input voltage for 4 to 20 mA operation: 250 Ω loop = 12 Vdc; 500 Ω loop = 19 Vdc (DC only, clipped and capped), 24 Vac/dc or 3-wire 0-5V/0-10V Minimum load resistance for Volt operation: 5 kΩ
301 Pressure Range	Pressure mode: Unidirectional: 0.1/0.25/0.5/1.0 in. WC FS, switch selectable Bidirectional: ±0.1/±0.25/±0.5/±1.0 in. WC FS, switch selectable Unidirectional: 25 Pa/50 Pa/100 Pa/250 Pa, FS, switch selectable Bidirectional: ±25 Pa/±50 Pa/±100 Pa/±250 Pa, FS, switch selectable Velocity mode: 500/1,000/2,000/3,000 ft/min, 2.5/5/10/15 m/s
302 Pressure Range	Pressure mode: Unidirectional: 1.0/2.5/5.0/10 in. WC FS, switch selectable Bidirectional: ±1.0/±2.5/±5.0/±10 in. WC FS, switch selectable Unidirectional: 0.250 kPa/0.500 kPa/1.000 kPa/2.500 kPa, FS, switch selectable Bidirectional: ±0.250 kPa/±0.500kPa/±1.000 kPa/±2.500 kPa, FS, switch selectable Velocity mode: 3,000/4,000/5,000/6,000 ft/min, 15/20/25/30 m/s
305 Pressure Range	Pressure mode: Unidirectional: 0.1/0.25/0.5/1.0/2.5/5/10 in. WC FS, switch selectable Bidirectional: ±0.1/0.25/0.5/1.0/2.5/5/10 in. WC FS, switch selectable Unidirectional: 25Pa/50Pa/100Pa/250Pa/0.5kPa/1kPa/2.5kPa FS, switch selectable Bidirectional: ±25Pa/50Pa/100Pa/250Pa/0.5kPa/1kPa/2.5kPa FS, switch selectable Velocity mode: 500/1000/2000/3000/4000/5000/6000/7000 ft/min, 2.5/5/10/15/20/25/30/35 m/s
Response Time	Standard: T95 in 20 sec, Fast: T95 in 2 sec, DIP switch selectable
Mode	Unidirectional or bidirectional, DIP switch selectable
Display (Option)	Pressure mode: Signed 3-1/2 digit LCD, indicates pressure, overrange indicator Velocity mode: Signed 4-1/2 digit LCD, indicates velocity, overrange indicator
Proof Pressure	3 psid (20.6 kPa)
Burst Pressure	5 psid (34.5 kPa)
Pressure Mode Accuracy	±1% FS (combined linearity and hysteresis)
Velocity Mode Accuracy	±90 ft/min (±0.45 m/s) plus 5% of measured value****
Temperature Effect	1" (250 Pa) models: 0.05%/°C; 10" (2.5 kPa) models: 0.01%/°C (Relative to 25 °C) 0 to 50 °C (32 to 122 °F)
Zero Drift (1 year)	1" (250 Pa) models: 2.0% max.; 10" (2.5 kPa) models: 0.5% max.
Zero Adjust	Pushbutton auto-zero and digital input (2-position terminal block)
Operating Environment	0 to 60 °C (32 to 140 °F)
Altitude of Operation	0 to 3000 m
Pollution Degree	2
Humidity Range	100% RH, non-condensing
Mounting Location	For indoor use only.
Fittings	Brass barb; 0.24" (6.1 mm) o.d.
Suggested Cable	Shielded: Belden #9939 (22 AWG) 3-wire multi-conductor (or similar) Belden #9940 (22 AWG) 4-wire multi-conductor (or similar) Belden #9939 (22 AWG) 5-wire multi-conductor (or similar) Unshielded: Belden #8443 (22 AWG) 3-wire multi-conductor (or similar) Belden #8444 (22 AWG) 4-wire multi-conductor (or similar) Belden #8445 (22 AWG) 5-wire multi-conductor (or similar)

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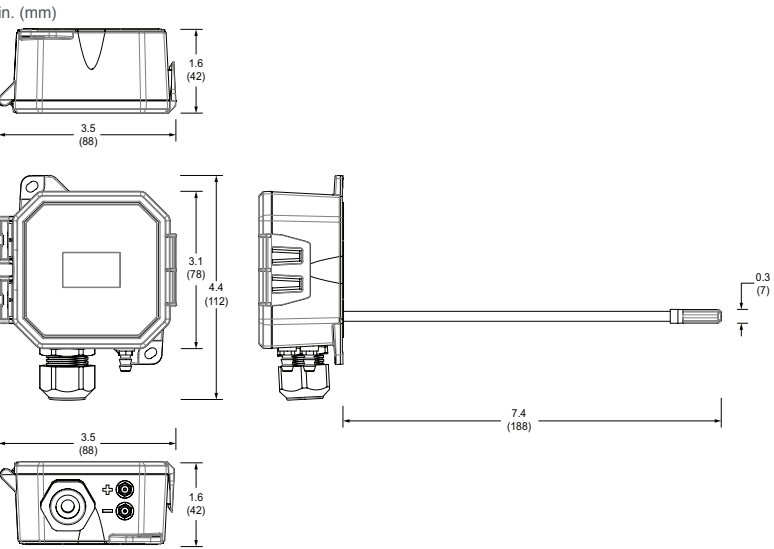
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Specifications (cont.)

Environmental Rating	IP65, NEMA 4
Flammability Rating	UL 94 5VA fire retardant ABS, plenum rated
Limited Warranty	5 years

EMC Conformance: EN 61000-6-3 and A1 Class B, EN 61000-6-1
* Class 2/II power source.
** For measured values between 200 and 7000 ft/min (1 and 35 m/s).

Dimensions



Safety Precautions

NOTICE
- This product is not intended for life or safety applications. - Do not install this product in hazardous or classified locations. - Read and understand the instructions before installing this product. - Turn off all power supplying equipment before working on it. - The installer is responsible for conformance to all applicable codes.

If this product is used in a manner not specified by the manufacturer, the protection provided by the product may be impaired. No responsibility is assumed for the manufacturer for any consequences arising out of the use of this material.

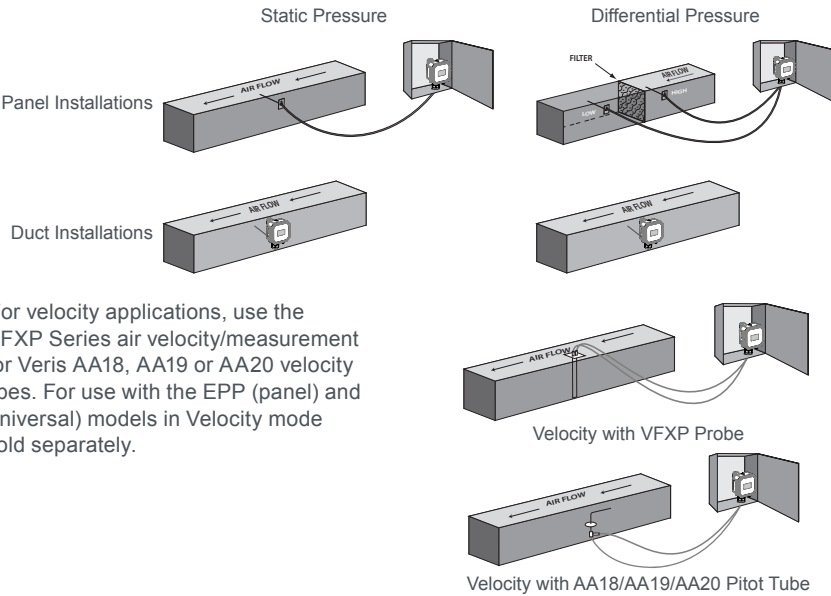
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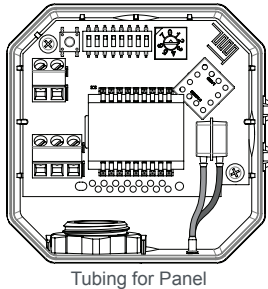
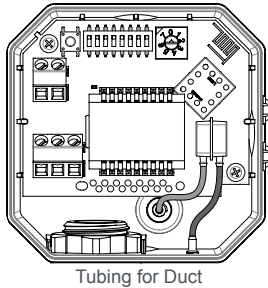
Installation, Wiring & Configuration

- Plan the installation. Panel or duct mount?



- For duct mount applications, thread the probe into the back of the device housing as shown in the dimensional drawing.
- Configure the internal tubing for the selected installation method as described below.

- Duct mount tubing configuration:
- Connect the right-side tube to the rear brass barb marked as “-” on the underside of the device housing.
 - Connect the left-side tube to the probe in the back of the device housing.
- Panel mount tubing configuration:
- Connect the right-side tube to the rear brass barb marked as “-” on the underside of the device housing.
 - Connect the left-side tube to the front brass barb marked as “+” on the underside of the device housing.



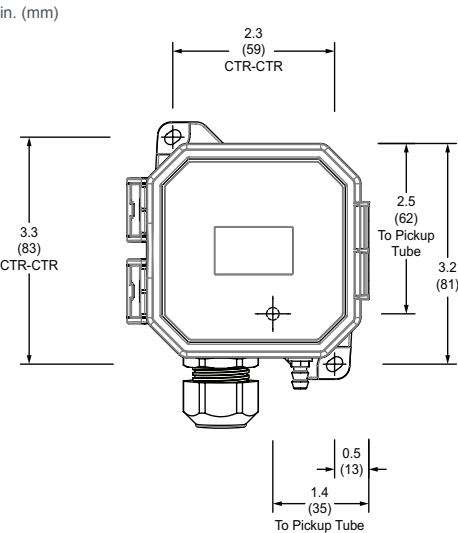
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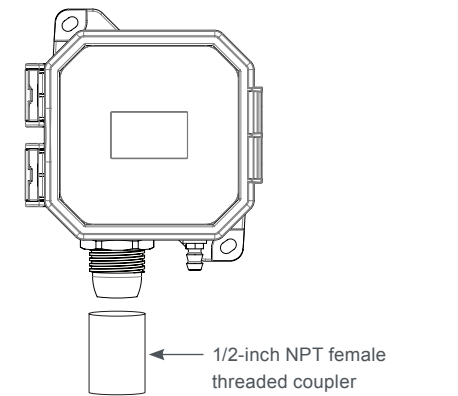
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Installation, Wiring & Configuration (cont.)

4. Mount the transducer (see the screw hole diagram below).



5. For applications using conduit, remove the cable gland nut on the bottom of the unit. Thread a standard 1/2-inch NPT female threaded coupler onto the body of the cable gland. Connect the opposite end of the coupler to the conduit.



6. Set DIP switches to desired settings.

- DIP Switch 1: Scale
ON = Pascal (m/s)
OFF = In. WC (ft/min)
- DIP Switch 2: Mode
ON = Velocity
OFF = Pressure
- DIP Switch 3: Direction*
ON = Unidirectional
OFF = Bidirectional
- DIP Switch 4: Response
ON = Slow
OFF = Fast
- DIP Switch 5: Output
ON = 4-20 mA
OFF = Voltage
- DIP Switch 6: Volt Scale
ON = 0-5 Vdc
OFF = 0-10 Vdc
- DIP Switch 7: Unused
- DIP Switch 8: Unused

*Velocity mode is unidirectional regardless of DIP switch setting.

Installation, Wiring & Configuration (cont.)

DIP Switch Settings

	Scale	Mode	Direction	Response	Output	Volt Scale	Unused	Unused
ON	Pascal / m/s	Velocity	Uni	Slow	mA	5V	Unused	Unused
OFF	In. WC / ft/min	Pressure	Bi	Fast	Volt	10V	Unused	Unused
	1	2	3	4	5	6	7	8

7. Set rotary switch to desired range setting. Align the arrow (not the slot) on the rotary switch to the desired full-scale range. LCD models momentarily indicate the selected range.

Rotary Switch Settings

Range 01 Model, Field Selectable (WC / ft/min or Pa / m/s)

WC / ft/min	Pa / m/s
0 0 to 0.1 in. WC	0 0 to 25 Pa
1 0 to 0.25 in. WC	1 0 to 50 Pa
2 0 to 0.5 in. WC	2 0 to 100 Pa
3 0 to 1 in. WC	3 0 to 250 Pa
4 0 to 500 ft/min	4 0 to 2.5 m/s
5 0 to 1000 ft/min	5 0 to 5 m/s
6 0 to 2000 ft/min	6 0 to 10 m/s
7 0 to 3000 ft/min	7 0 to 15 m/s

Range 05 Model, Field Selectable (P) Pressure or (V) Velocity Mode, Field Selectable (WC / ft/min or Pa / m/s)

Pressure Mode	Velocity Mode
0 0 to 0.1 in. WC	0 0 to 500 ft/min
1 0 to 0.25 in. WC	1 0 to 1000 ft/min
2 0 to 0.5 in. WC	2 0 to 2000 ft/min
3 0 to 1 in. WC	3 0 to 3000 ft/min
4 0 to 2.5 in. WC	4 0 to 4000 ft/min
5 0 to 5 in. WC	5 0 to 5000 ft/min
6 0 to 10 in. WC	6 0 to 6000 ft/min
7 0 to 10 in. WC	7 0 to 7000 ft/min

Range 02 Model, Field Selectable (WC / ft/min or Pa / m/s)

WC / ft/min	Pa / m/s
0 0 to 1 in. WC	0 0 to 250 Pa
1 0 to 2.5 in. WC	1 0 to 500 Pa
2 0 to 5 in. WC	2 0 to 1000 Pa
3 0 to 10 in. WC	3 0 to 2500 Pa
4 0 to 3000 ft/min	4 0 to 15 m/s
5 0 to 4000 ft/min	5 0 to 20 m/s
6 0 to 5000 ft/min	6 0 to 25 m/s
7 0 to 6000 ft/min	7 0 to 30 m/s

Pressure Mode	Velocity Mode
0 0 to 25 Pa	0 0 to 2.5 m/s
1 0 to 50 Pa	1 0 to 5 m/s
2 0 to 100 Pa	2 0 to 10 m/s
3 0 to 250 Pa	3 0 to 15 m/s
4 0 to 500 Pa	4 0 to 20 m/s
5 0 to 1000 Pa	5 0 to 25 m/s
6 0 to 2500 Pa	6 0 to 30 m/s
7 0 to 2500 Pa	7 0 to 35 m/s

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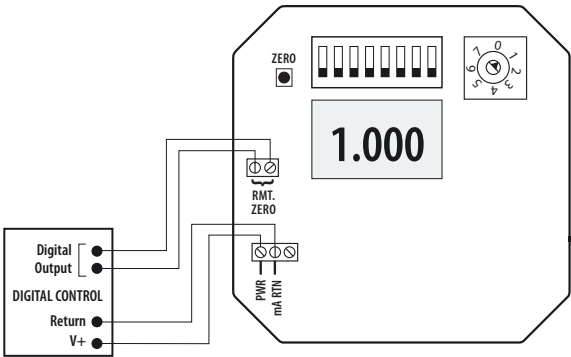
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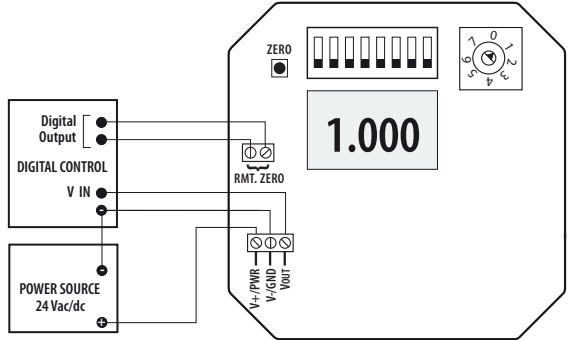
Installation, Wiring & Configuration (cont.)

8. Connect the transmitter to the control system and power supply as indicated below. Optional: Connect the ZERO terminals to the digital output (contact closure) of the control system.

2-wire, 4-20 mA Current Loop Output



3-wire, 0-5 V/0-10 V Voltage Output



9. Wait five seconds, then press and hold the ZERO pushbutton for two seconds or provide contact closure on the AUX ZERO terminal. This will reset the output and display to zero pressure. For best accuracy, press the ZERO button while both ports are open to atmospheric pressure. To protect the unit from accidental zero, this feature is enabled only when the detected pressure is within about 0.1 in. WC (25 Pa) of factory calibration.

10. Connect desired external tubing to the EP.

Operation

EP Series devices employ high performance sensors and sophisticated temperature compensation circuitry. The sensor achieves its best accuracy after an initial warm-up period. During the first few minutes of operation, readings at zero pressure and the lowest pressure ranges appear erroneous. Following this initial warm-up period, the EP device maintains its specified accuracy and stability.

LCD Display: The display momentarily indicates range 'SET' when a selection is made. Pressure is normally indicated on the display. Units are in inches water column (in. WC), Pascals (Pa) or kilopascals (kPa) as indicated on the display. The display shows 'OVER' when the pressure is over range.

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