

VELTRON DPT-plus

Microprocessor Based Ultra-Low Range Pressure & Flow Transmitter



Proven solutions for the power industry

Air Monitor
Precision Airflow Measurement
An ONICON Brand

VELTRON DPT-plus

with Automatic Zeroing Circuit

The VELTRON DPT-plus transmitter is furnished with an automatic zeroing circuit capable of electronically adjusting the transmitter zero at predetermined time intervals while simultaneously holding the transmitter output signal. The automatic zeroing circuit eliminates all output signal drift due to thermal, electronic or mechanical effects, as well as the need for initial or periodic transmitter zeroing. For transmitters operating in a moderately steady temperature location (thus no thermally induced span drift), this automatic

zeroing function essentially produces a "self-calibrating" transmitter. The automatic zeroing circuit will re-zero the transmitter to within 0.1% of its operating span; for a transmitter with a 0.02 IN w.c. operating span, this represents a zeroing capability within 0.00002 IN w.c.

To permit manual calibration of the VELTRON DPT-plus, an electronic switch is provided to permit manual positioning of the zeroing valve.

Transmitter

Accuracy. 0.1% of Natural Span, including hysteresis, deadband, non-linearity, and non-repeatability.

Type. Differential pressure, flow, and mass flow.

Ranges. *Natural Spans* *Bi-Polar Natural Spans*

0 to 25.00 IN w.c.	
0 to 10.00 IN w.c.	-10.00 to 10.00 IN w.c.
0 to 5.00 IN w.c.	-5.00 to 5.00 IN w.c.
0 to 2.00 IN w.c.	-2.00 to 2.00 IN w.c.
0 to 1.00 IN w.c.	-1.00 to 1.00 IN w.c.
0 to 0.50 IN w.c.	-0.50 to 0.50 IN w.c.
0 to 0.25 IN w.c.	-0.25 to 0.25 IN w.c.
0 to 0.10 IN w.c.	-0.10 to 0.10 IN w.c.
0 to 0.05 IN w.c.	-0.05 to 0.05 IN w.c.

Span Rangeability. The calibrated span can be down ranged to 40% of the Natural Span.

Stability. $\pm 0.5\%$ of Natural Span for six months.

Temperature Effect. Zero. None; corrected by AUTOzero. Span. 0.015% of Natural Span/ $^{\circ}\text{F}$.

Mounting Position Effect. None; corrected through transmitter automatic zeroing.

Span and Zero Adjustment. Digital, via internally located push buttons.

Low Pass Filtration. Response time to reach 98% of a step change is adjustable from 2.0 to 250.0 seconds.

Overpressure and Static Pressure Limit. 25 psig.

Automatic Zeroing.

Accuracy. Within 0.1% of calibrated span.

Frequency. Every 1 to 24 hours on 1 hour intervals.

Temperature Limits.

-20 to 180 $^{\circ}\text{F}$ Storage; +32 to 140 $^{\circ}\text{F}$ Operating.

Humidity Limits. 0-95% RH, non-condensing.

Indication

Display. A backlit, graphical LCD providing three lines of data display. Also used for programming.

Inputs/Outputs

Analog Inputs. Differential pressure (high and low), and 4-20mA, 2-wire, internally or externally loop powered temperature signal.

Analog Outputs. Dual 4-20mA outputs, individually configurable as internally powered/non-isolated, or externally powered/isolated.

Digital Outputs. Dual Form A dry contacts rated for 3 amps at 24VAC/VDC for optional HI/LO alarm.

Temperature Compensation Selection. Push button selection of linearized or non-linear temperature transmitter input for the following temperature sensing types:

Type E	E -50 to 1750 $^{\circ}\text{F}$	-50 to 950 $^{\circ}\text{C}$
Type T	-50 to 750 $^{\circ}\text{F}$	-50 to 400 $^{\circ}\text{C}$
Type J	-50 to 2000 $^{\circ}\text{F}$	-50 to 1090 $^{\circ}\text{C}$
Type K	-50 to 2000 $^{\circ}\text{F}$	-50 to 1090 $^{\circ}\text{C}$
RTD	-50 to 1500 $^{\circ}\text{F}$	-50 to 815 $^{\circ}\text{C}$

Power

Power Supply.

Standard 24VAC (20-28VAC) or 24VDC (20-40VDC).

Optional 120VAC (100-132VAC), via external transformer.

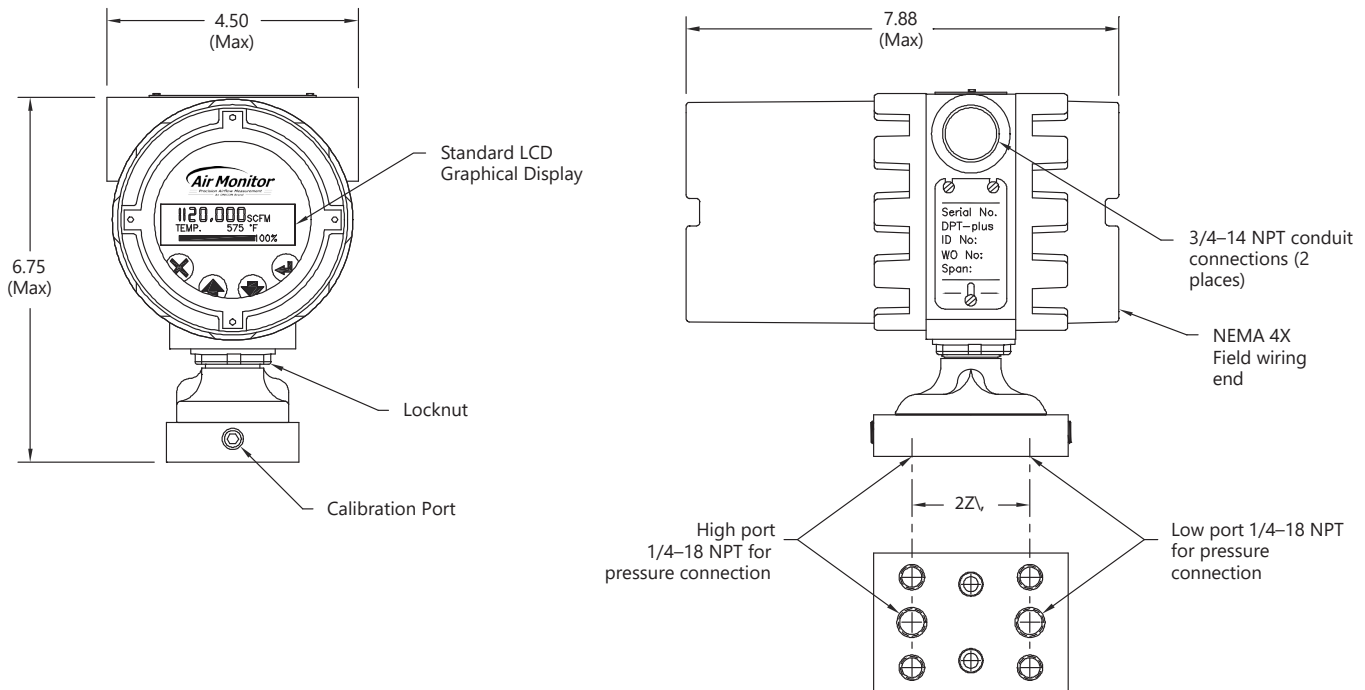
Power Consumption.

Standard: 18VA at 24VAC; 13VA at 24VDC; 36VA at 120VAC. With AUTO-purge Management: 54VA at 24VAC; 48VA at 24VDC; 108VA at 120VAC.

Circuit Protection. Power input is fused and reverse polarity protected.

Ultra-Low Differential Pressure & Flow Transmitter

Construction Features



Features

Accuracy. The VELTRON DPT-plus is designed to maintain an accuracy of 0.1% of Natural Span. For a span of 0 to 0.05 IN w.c., this accuracy is equivalent to an output accuracy of ± 0.00005 IN w.c. differential pressure or ± 0.90 FPM velocity.

Microprocessor Based Functionality. The VELTRON DPT-plus on-board microprocessor performs the functions of operating parameter selection, transmitter configuration, input/output and display signal scaling, and transducer calibration. Imbedded software performs span, flow, and 3-point "K" factor calculations. Input to the microprocessor is via push buttons.

Electronic Respanning. The VELTRON DPT-plus operating span can be electronically selected anywhere between the Natural Span and 40% of Natural Span, without having to perform recalibration involving an external pressure source.

Air Density Correction. The VELTRON DPT-plus is capable of accepting a process temperature input to perform density correction to volumetric or mass flow. Temperature input is a 4-20mA signal from a remote temperature transmitter; nonlinear temperature inputs can be linearized by the microprocessor. Temperature sensor type is software selectable from the following choices: Thermocouple types E, T, J, and K; or Platinum RTD.

High Turndown Ratio Operation. The VELTRON DPT-plus, with its high level of accuracy and automatic zeroing circuitry, can maintain linear output signals on applications requiring velocity turndown of 10 to 1 (equal to a velocity pressure turndown of 100 to 1).

Features

Continuous Display of Process. The VELTRON DPT-plus comes equipped with a multi-line, backlit, graphical LCD for use during transmitter configuration and calibration, and to display multiple measured processes in engineering units. The LCD provides one line having 8 digits with double wide and double high characters, two 20 digit lines having standard size characters, and various descriptors for transmitter operating status.

Primary Signal Noise Filter. To eliminate background noise and pulsations from the flow signal, the VELTRON DPT-plus has a user selectable low pass digital filter.

AUTO-purge Management (optional). For "dirty air" applications, AUTO-purge Management is achieved via an external smart relay option.

Hazardous Locations. The VELTRON DPT-plus is Factory Mutual approved for the following:

- Explosion Proof: Class 1, Division 1, Groups B, C, D.
- Dust Ignition Proof: Class II, III, Division 1, Groups E, F, G.
- Suitable for indoor and outdoor NEMA Type 4X hazardous locations.

Enclosure. The VELTRON DPT-plus is packaged in a NEMA 4X enclosure with standard industrial process connections.

VELTRON DPT-plus

Physical Specifications

Process Connections. Industry standard 1/4"-NPT ports on 2-1/8" centers on flanges. 1/2"-NPT ports on bottom of base.

Electrical Connections. Dual 3/4" conduit connections. Terminal strip for field wiring and test points. External terminal strip with plug-in connectors.

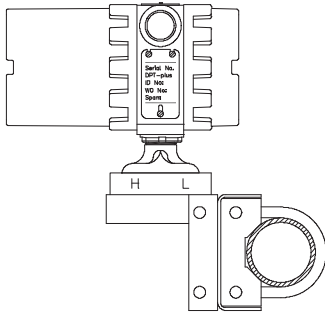
O-Rings. BUNA N.

Electrical Enclosure. NEMA 4X aluminum body with Neoprene gaskets.

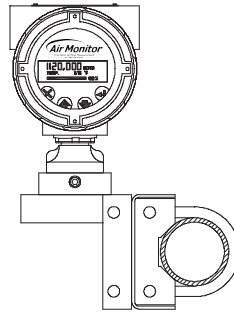
Paint. Polyurethane with epoxy primer.

Mounting. Flat and angle mounting brackets for 2" pipe.

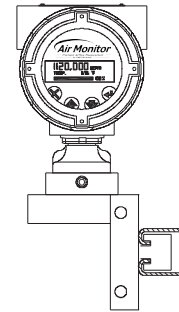
Weight. 10.5 lbs.



Angle Mount to Horizontal Pipe

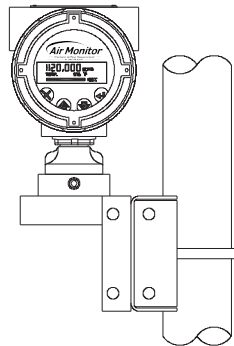


Vertical Mount to Horizontal Pipe

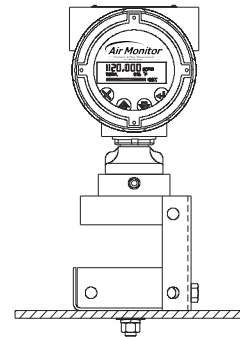


Mount to Horizontal Channel

Note: Mounting bracket kit includes 3/8-16 U-bolt, nuts, and washers for 2" Schedule 40 pipe, plus 4 bolts and washers to attach the transmitter to the mounting bracket.



Vertical Mount to Vertical Pipe



Mount to Flat Surface

Suggested Specification

The mass flow transmitter shall be capable of receiving flow signals (total and static pressure) from an airflow station or probe array equipped with a temperature sensing means, internally perform density correction for the process temperature, and produce individual outputs linear and scaled for standard air volume or mass flow, and temperature.

The mass flow transmitter shall contain an integral graphic LCD for use during the configuration and calibration process, and be capable of indicating multiple process parameters (temperature, flow, dp, etc.) during normal operating mode. All transmitter parameter setting, zero and span calibration, and display scaling will be performed digitally in the on-board microprocessor via input push buttons.

The mass flow transmitter will be available in multiple natural spans covering the range of 0.05 IN w.c. to 10.0 IN w.c. with an accuracy of 0.1% of natural span. The transmitter shall be

furnished with a transducer automatic zeroing circuit and be capable of maintaining linear output signals on applications requiring 10 to 1 velocity (100 to 1 pressure) turndown. The transmitter shall be capable of having its operating span electronically selected without having to perform recalibration involving an external pressure source.

(Optional) The transmitter will provide the means of managing a system for automatic high pressure purge of the airflow station or probe array, with user selectable purge frequency and duration, while maintaining the last transmitter output during the purge cycle.

The mass flow transmitter shall be the VELTRON DPT-plus as manufactured by Air Monitor Corporation, Santa Rosa, California.

Air Monitor Power's Product Families of Air Flow Measurement Systems



IBAM™ – Individual Burner Airflow Measurement

The IBAM™ – Individual Burner Airflow Measurement probe is ideally suited for new or retrofit applications where a reduction in plant emissions and improvement in efficiency can be obtained through accurate measurement of burner secondary airflow. The IBAM™ probe has been designed to accurately measure in the particulate laden, high operating temperature conditions found in burner air passages.



VOLU-probe/SS™ Stainless Steel Airflow Traverse Probes.

Multi-point, self-averaging, Pitot-Fechheimer airflow traverse probes with integral airflow direction correcting design. Constructed of Type 316 stainless steel and available in externally and internally mounted versions for harsh, corrosive or high temperature applications such as fume hood, laboratory exhaust, pharmaceutical, and clean room production and dirty industrial process applications.



CA™ – Combustion Airflow Measuring Station & VOLU-probe/SS™ Traverse Probes.

Air Monitor Power's duct mounted airflow measurement devices have been designed to accurately and repeatedly measure air mass flow in power plants. The Combustion Air (CA) Station™ includes honeycomb air straightener to accurately measure in shorter straight duct runs than any other flow measurement device. The VOLU-probe/SS™ delivers accurate airflow measurement performance in the form of an insertion probe. Both devices feature Type 316 stainless steel flow sensing arrays.



CAMST™ – Combustion Airflow Management Systems.

The CAMST™ – Combustion Airflow Management System has been designed to reliably and accurately measure airflow in combustion airflow applications. The CAMST™ contains the microprocessor based instrumentation to measure the airflow and manage the AUTO-purge. The AUTO-purge is a high pressure air blowback system that protects the duct mounted flow measurement device from any degradation in performance due to the presence of airborne particulate (flyash).



CEMST™ – Continuous Emissions Monitoring System

Air Monitor Power's CEMST™ – Continuous Emissions Monitoring Systems assist in complying with the Clean Air Act's stringent emission measurement standards and the requirements of 40 CFR 75. Air Monitor has assembled a cost effective integrated system consisting of in-stack flow measurement equipment and companion instrumentation to provide continuous, accurate, and reliable volumetric airflow monitoring of stacks and ducts of any size and configuration.

Engineering & Testing Services. Air Monitor Power offers complete engineering and testing to analyze air and coal delivery systems. Air Monitor Power's field testing services use 3D airflow traversing and flow measurement systems for the highest possible accuracy. To ensure cost effective and accurate solutions, Air Monitor Power has full scale model fabrication and certified wind tunnel testing is used to develop application specific products that will measure accurately where no standard flow measurement can.