• VOLU-flo / OAM II •
Outdoor Airflow Measurement System

DESCRIPTION

The OAM II airflow measuring system provides accurate flow measurement in challenging outdoor air applications, as well as other airflow applications with limited straight ducts. The system consists of a dedicated multifunction transmitter with precision ultra-low differential pressure transducers and our proprietary uni-sensor airflow sensor.

Three analog outputs and native BACnet® or MODBUS® are included standard. Displayed data includes flow, temperature, velocity, dP and operating status. This data is also provided to the network.

IDEAL FOR OUTDOOR AIR

The OAM II has been specifically engineered to overcome the challenges associated with other methods of measuring outdoor air:

- The measurements across a fixed inlet minimizes the effects of limited straight duct runs typical of outdoor air applications.
- The uni-sensor significantly reduces the effects of airborne particulates and condensing moisture as well as varying directional wind loads and gusts. Particulate and moisture contamination will dramatically impair the functionality and accuracy of other technologies.

OUTDOOR AIR APPLICATIONS

The OAM II System is factory configurable for a variety of common applications, including:

Minimum Airflow Measurement – The low flow mode of operation provides airflow measurement from 100 to 600 FPM, making it ideal for this application.

Full Range Airflow Measurement – The extended mode configuration provides outdoor airflow measurement from 100 to 2400 FPM - Excellent solution for accurate flow measurement from minimum outdoor air through economizer operation.

Split Minimum & Economizer Airflow Measurement – The min/max (split) mode provides combined airflow measurement for separate minimum and economizer inlets – Effective tool for measuring this commonly used inlet configuration.

Dual Inlet Airflow Measurement – The dual operation mode provides two separate airflow measurements in one transmitter - Great for built up systems that provide outdoor air to multiple locations.

FEATURES

Extended Flow Range Capability

The extended airflow mode of the OAM II provides a 24:1 range of measurement - Well suited for variable flow inlets.

Multiple BAS Interface Options

The OAM II includes three field configurable analog outputs and one RS485 interface for native BACnet MS/TP or MODBUS RTU.

Color Graphic Display with Interface

The backlit flow display can also provide temperature, velocity or dP data. The user interface has easy to use menu pages that eliminate the need for special tools.

Air Density Correction

The OAM II is provided with a temperature sensor for air density correction - Enabling the OAM II to perform active density compensation and output actual or standard volumetric flow.

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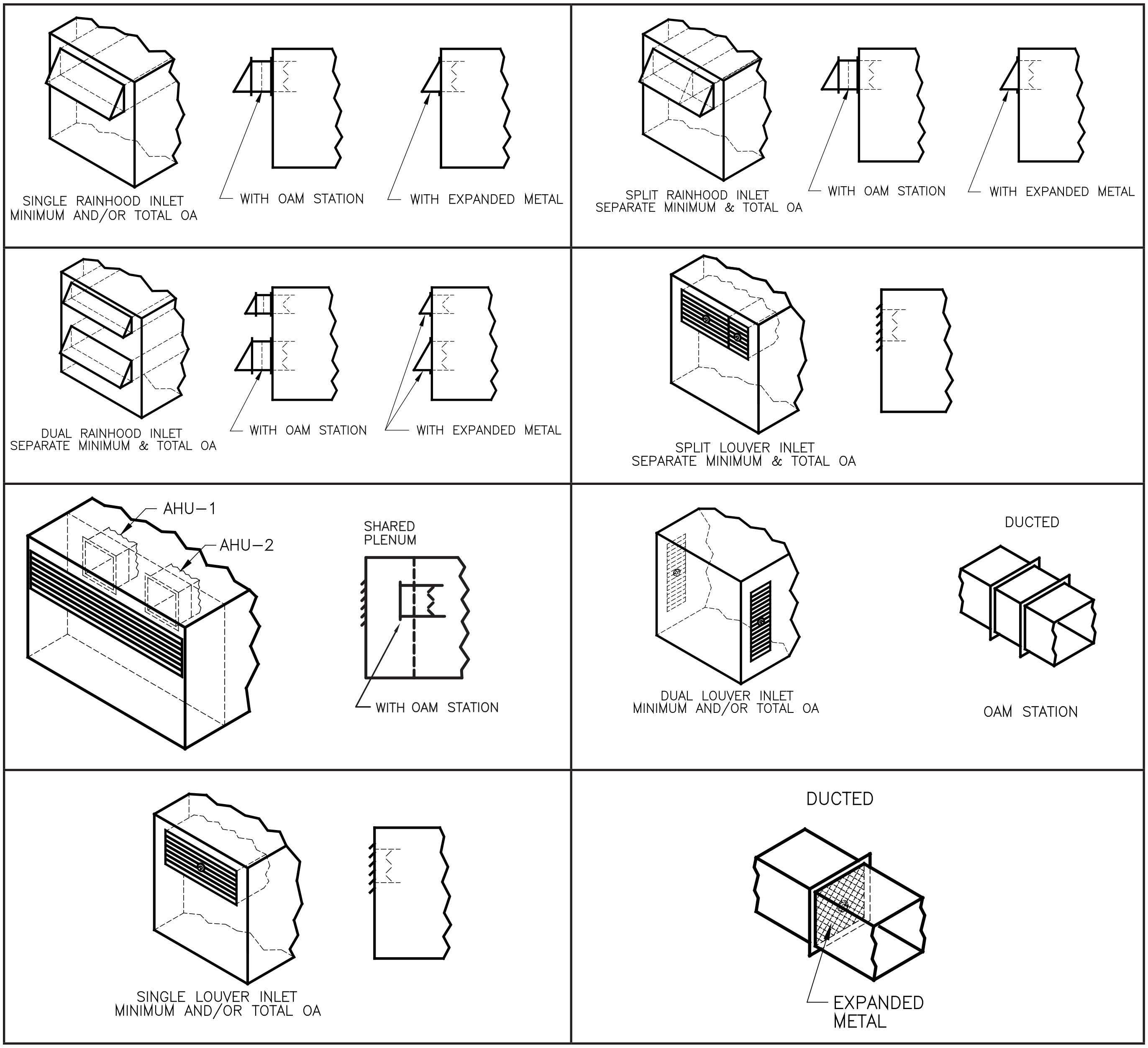
TYPICAL APPLICATION GUIDE

The OAM II System can be used with most single, dual, and split inlets found on air handlers and built-up systems. Depicted below are the most commonly encountered inlet configurations. Contact the Factory with any unique configuration or those that do not meet the stated Minimum Installation Requirements.



MINIMUM INSTALLATION REQUIREMENTS

The OAM II is suitable for use on most packaged air handlers and built-up systems where the outdoor air intake is outfitted with an OAM II Station, inlet louver or any fixed inlet with an airflow resistence that produces at least 0.06” w.c. pressure drop at 600 FPM face velocity.

- The uni-sensor should be mounted in the center of the louver or fixed resistance inlet.
- The OAM II Station must be positioned upstream of the outside air intake control damper.

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Uni-sensor

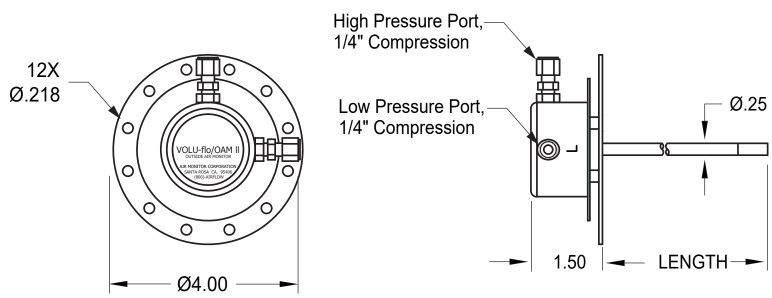
Uni-sensor – Combination Reference and Inlet Airflow Static Pressure Sensor

The proprietary design of the uni-sensor system is unaffected by gusting wind; this allows for an accurate measurement of the differential pressure created by the airflow entering and moving through the inlet. The uni-sensor also simplifies installation on both new and retro-fit applications.

The OAM II does not use thermal airflow sensors or typical Pitot type sensing ports that face into the air-stream. The uni-sensor eliminates measurement instability caused by the presence of moisture, and accuracy degradation due to the build up of deposits that can affect other sensing systems.

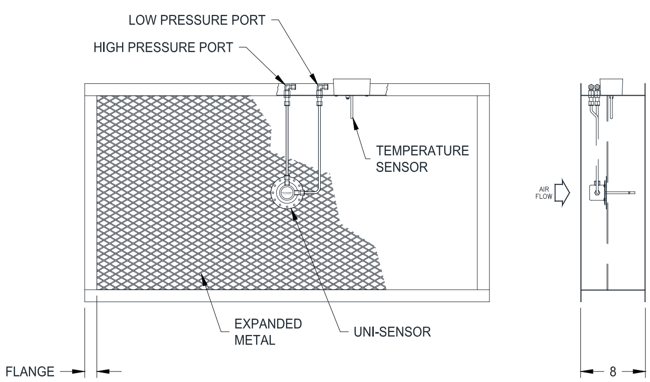
The uni-sensor is constructed of Type 316 stainless steel and is resistant to corrosion caused by salt and most other airborne corrosives. It combines an outside reference (high pressure) sensor and an inlet airflow (low pressure) sensor into one assembly. They are provided with probe lengths that match the clearance requirements of the inlet where they will be installed.

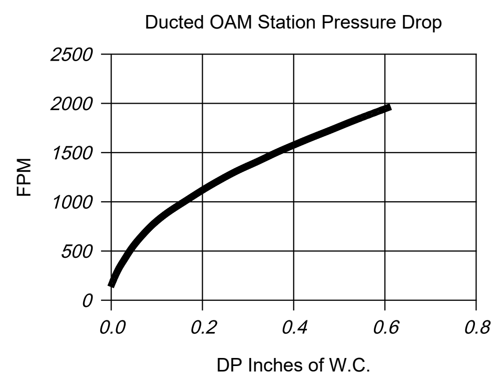
DIMENSIONAL SPECIFICATIONS - UNI-SENSOR



OAM II Airflow Station

The OAM II Station has been designed to simplify installation and commissioning. The station consists of factory mounted sensors on a layer of expanded metal of known fixed resistance that is welded into a galvanized sheet metal casing. In most applications, the known fixed resistance of the OAM II Station combined with the factory mounting of sensors allows the overall system to be pre-calibrated at the factory, eliminating the need for field characterization. OAM II stations are built to order from dimensional data provided for the project.





PERFORMANCE SPECIFICATIONS

SENSING METHOD
Differential pressure is measured across a fixed inlet resistance along with temperature. Sensor readings are used to calculate and report velocity, volumetric flow and temperature data. The fixed inlet resistance must produce at least 0.06” w.c. pressure drop at 600 FPM face velocity.

MEASUREMENT MODES
Low Flow Mode: provides a single differential pressure signal connection
Extended Mode: provides a single differential pressure signal connection operating over an extended flow range
Split Min/Max Mode: provides two differential pressure signal connections, one for the minimum OA inlet, and the other for the maximum OA inlet.
Dual Mode: provides separate air flow measurement channels for OA feeding two separate air handlers.

ACCURACY
±5% of actual airflow over the specified operating range above 150 FPM. Requires an optional enclosure heater to maintain accuracy when operating at ambient temperatures below 32° F.

OVERALL FLOW RANGE (≥ 100 FPM)
Low flow operating mode: 6:1 turndown
Extended operating mode: up to 24:1 turndown
Split Min/Max operating mode: 6:1 turndown for each channel
Dual operating mode: 6:1 turndown for each channel

AVAILABLE SENSOR TYPES
Uni-sensor
316 stainless steel combination reference and inlet airflow pressure sensors. It is provided with ⅛” FTP fittings.

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PERFORMANCE SPECIFICATION (CONTINUED)

OAM II Station
Pre-fabricated station using expanded metal with factory mounted uni-sensors.

Temperature
316 stainless steel, 3-wire 100 Ohm Platinum RTD with ¼" NPT mounting hardware

ENCLOSURE
Standard: NEMA 1 (8¼ x 10¼") aluminum with hinged cover
Optional: NEMA 4 (8¼ x 10¼") with display window

AIRFLOW SENSOR CONNECTIONS
316 stainless steel ⅛" FPT fittings

TEMPERATURE LIMITS
Standard operating range: +32 to 120º F
Extended operating range: -40 to 120º F (requires optional NEMA4 enclosure with heater)
Storage temperature range: 0 to 180º F

POWER SUPPLY REQUIREMENTS
24VAC (20-32VAC RMS) or 24VDC (20-40VDC).
Power Consumption.
Standard: 18VA @ 24VAC; 13W @ 24VDC
With heater: 40VA @ 24VAC; 35W @ 24VDC

DISPLAY
3.5" diagonal color graphic LCD with field programmable menu driven user interface accessed via four button membrane keypad.

PROGRAMMING
Factory programmed for specific application. Field programming available through the user interface/display.

MEMORY
Nonvolatile FLASH memory retains all program parameters in the event of power loss.

ANALOG OUTPUTS
Three analog outputs are provided: available - Capable of reporting flow, temperature and/or differential pressure.

Field configurable via user interface/display as: 4-20mA, 0-10 VDC or 0-5VDC

COMMUNICATION PROTOCOLS (Field configurable via user interface/display)
BACnet MS/TP (Default)
MODBUS RTU

NETWORK CONFIGURATION & ADDRESSING
RS485 unit load: ⅓
Recommended maximum number of devices per segment: 32
Baud Rates: 9600, 19200, 38400, 57600, 76800, or 115200 (Default: 38400)
Device Address Range: 1 – 255 (1 - 247 MODBUS) (Default: 1)
BACnet Device Instance Range: 1 – 4,194,303 (Default 1)
BACnet Max Master Range: 1 – 127 (Default 127)
Modbus Parity: None, Even, Odd (Default: Even)

APPROVALS
FCC Part 15 Subpart B, Class A Device

Model Selection Guide

Model Number Coding = OAM II-ABCD-EEFGH

A = Model Configuration
1 = Low Flow Range
(1 Transducer, Single Flow Range)
2 = Extended Flow Range
(2 Transducers)
3 = Min/Max (Split) Flow Ranges
(2 Transducers)
4 = Dual Flow Ranges
(2 Transducers)

B = Enclosure
1 = NEMA 1
2 = NEMA 4 with window
3 = NEMA 4 with window & heater
5 = NEMA 4 Blind

C = Power & Signal Configuration
1 = 24V AC/DC with 3-Analog outputs & RS485

D = Process Connections (2 or 4 connections)
1 = 1/8" FPT
2 = 1/8" NPT with 1/4" Compression fittings

EE = Qty. of Sensors
M = Station Mounted
1 = 01
2 = 02
3 = 03
n = n (Any quanity up to 10)

F = Sensor Design
3 = 3" uni-sensor
4 = 4" uni-sensor
5 = 5" uni-sensor
6 = 6" uni-sensor
7 = 7" uni-sensor
8 = 8" uni-sensor
M = Station mounted
N = Custom

G = Transducer 1
A = 0.1" w.c.
B = 0.25" w.c.
C = 0.5" w.c.
E = 1" w.c.
G = 2" w.c.
J = 5" w.c.
K = 10" w.c.

H = Transducer 2
Z = None
A = 0.1" w.c.
B = 0.25" w.c.
C = 0.5" w.c.
E = 1" w.c.
G = 2" w.c.
J = 5" w.c.
K = 10" w.c.

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