AIR MONITOR
AIRFLOW MEASUREMENT SOLUTIONS

SPECIFICATIONS

Click on the desired Specification link,
select the text, then copy into your document

INDIVIDUAL SPECIFICATIONS

ELECTRA-flo/FI	STAT-probe
ELECTRA-flo Plus	VEL-trol II
ELECTRA-flo/CM Plus	VELTRON DPT 2500
ELECTRA-flo/M Plus	VELTRON DPT 2500-plus
FAN-E	VELTRON II
HOOD-trol II	VOLU-flo/OAM II
LO-flo	VOLU-flo/OAM II Station
Meters	VOLU-probe
SAP/BPSR	VOLU-probe/FI
SENTRY	VOLU-probe/SS
SOAP	VOLU-probe/VS

DUCTED AIRFLOW MEASUREMENT & CONTROL

Note: For Outside Airflow Measurement, the optimal technology is under the Section "Outside Airflow Measurement & Control" shown below

Minimum Velocity > 400 FPM

A complete Airflow Measuring System consists of a Flow Station and a Transmitter

FLOW STATION

Applications with minimal lengths of straight run:
- FAN-E (Pitot flow station with cell)

Applications with ample lengths of straight run:
- VOLU-probe/VS (flow station)
- VOLU-probe (flow probes only)

TRANSMITTER

Optimum Accuracy (0.1%) with AUTO-zeroing
- VELTRON II

Optimum Accuracy (0.1%) with AUTO-zeroing and control capability
- VEL-trol II

Excellent Accuracy (0.25%) with AUTO-zeroing
- VELTRON DPT 2500-plus

Good Accuracy (0.50%)
- VELTRON DPT 2500

Minimum Velocity < 400 FPM

FLOW STATION

Applications with minimal lengths of straight run:
- ELECTRA-flo/CM (Thermal flow station with cell)

Applications with ample lengths of straight run:
- ELECTRA-flo/M (Thermal flow station)
- ELECTRA-flo Plus (Thermal probes only)

Note

The ELECTRA-flo product line includes a Flow Station and a Transmitter packaged together as an integral system.

FAN INLET AIRFLOW MEASUREMENT & CONTROL

Recommended Technology

A complete Airflow Measuring System consists of a Flow Station and a Transmitter

FLOW STATION

- VOLU-probe/FI (Pitot fan inlet probe)

TRANSMITTER

Optimum Accuracy (0.1%) with AUTO-zeroing
- VELTRON II

Optimum Accuracy (0.1%) with AUTO-zeroing and control capability
- VEL-trol II

Excellent Accuracy (0.25%) with AUTO-zeroing
- VELTRON DPT 2500-plus

Good Accuracy (0.50%)
- VELTRON DPT 2500

Alternate Technology

FLOW STATION

- ELECTRA-flo/FI (Thermal fan inlet probe)

Note

The ELECTRA-flo product line includes a Flow Station and a Transmitter packaged together as an integral system.

OUTSIDE AIRFLOW MEASUREMENT & CONTROL

Outside Air Intakes (Louvers/Rainhoods)

- VOLU-flo/OAM II (standard system)

Ducted/Indoor Applications

- VOLU-flo/OAM with Station (standard system with flow station)

Return to Top

STATIC PRESSURE MEASUREMENT & CONTROL ***A complete system consists of a Pressure Sensor and a Transmitter***	
Ducted Applications **PRESSURE SENSOR** - STAT-probe (Static Pressure Traverse Probe) **TRANSMITTER** Optimum Accuracy (0.1%) with AUTO-zeroing - VELTRON II Optimum Accuracy (0.1%) with AUTO-zeroing and control capability - VEL-trol II Excellent Accuracy (0.25%) with AUTO-zeroing - VELTRON DPT 2500-plus Good Accuracy (0.50%) - VELTRON DPT 2500	**Space, Plenum & Outdoor Applications** **PRESSURE SENSOR** - S.A.P. [/B/P/S/R] (Shielded Static Air Probe) - S.O.A.P. (Shielded Static Outside Air Probe) **TRANSMITTER** Optimum Accuracy (0.1%) with AUTO-zeroing - VELTRON II Optimum Accuracy (0.1%) with AUTO-zeroing and control capability - VEL-trol II Excellent Accuracy (0.25%) with AUTO-zeroing - VELTRON DPT 2500-plus Good Accuracy (0.50%) - VELTRON DPT 2500
Laboratory & Hospital Isolation Room Applications - SENTRY (Room Pressurization Monitor/Controller)	
FUME HOOD FLOW MONITORING & CONTROL	
- HOOD-trol II (Fume Hood Monitor & Controller)	

Return to Top

SAMPLE SPECIFICATIONS

FAN-E, VOLU-probe/FI, VELTRON II, VOLU-flo/OAM
FAN-E, VOLU-probe/FI, VELTRON DPT 2500-plus, VOLU-flo/OAM
FAN-E, VOLU-probe/FI, VELTRON DPT 2500, VOLU-flo/OAM

VOLU-probe/VS, VOLU-probe/FI, VELTRON II, VOLU-flo/OAM
VOLU-probe/VS, VOLU-probe/FI, VELTRON DPT 2500-plus, VOLU-flo/OAM
VOLU-probe/VS, VOLU-probe/FI, VELTRON DPT 2500, VOLU-flo/OAM

VOLU-probe, VOLU-probe/FI, VELTRON II, VOLU-flo/OAM
VOLU-probe, VOLU-probe/FI, VELTRON DPT 2500-plus, VOLU-flo/OAM
VOLU-probe, VOLU-probe/FI, VELTRON DPT 2500, VOLU-flo/OAM

ELECTRA-flo/CM, VOLU-probe/FI, VELTRON II, VOLU-flo/OAM
ELECTRA-flo/CM, VOLU-probe/FI, VELTRON DPT 2500-plus, VOLU-flo/OAM
ELECTRA-flo/CM, VOLU-probe/FI, VELTRON DPT 2500, VOLU-flo/OAM

ELECTRA-flo/M, VOLU-probe/FI, VELTRON II, VOLU-flo/OAM
ELECTRA-flo/M, VOLU-probe/FI, VELTRON DPT 2500-plus, VOLU-flo/OAM
ELECTRA-flo/M, VOLU-probe/FI, VELTRON DPT 2500, VOLU-flo/OAM

ELECTRA-flo Plus, VOLU-probe/FI, VELTRON II, VOLU-flo/OAM
ELECTRA-flo Plus, VOLU-probe/FI, VELTRON DPT 2500-plus, VOLU-flo/OAM
ELECTRA-flo Plus, VOLU-probe/FI, VELTRON DPT 2500, VOLU-flo/OAM

Return to Top

Return to Top

AIRFLOW MEASURING SYSTEM (FAN INLET CONFIGURATION)

(Insert the text below)

A. Provide on the indicated fans, Airflow Measuring System(s) consisting of probe arrays mounted in the fan inlets capable of continuously measuring the air handling capacity (air volume) and airflow temperature of the respective centrifugal [or plug, vane-axial] fan(s).

B. Airflow Measuring System (ELECTRA-flo/FI – Thermal Fan Inlet Airflow Measuring Probe):

1. For a single inlet fan, each probe array shall consist of one pair of single-point measuring probes and a single microprocessor based transmitter. For a double inlet fan, each probe array shall consist of two pairs of single-point measuring probes and a single microprocessor based transmitter. The transmitter shall be supplied by the same manufacturer as the probe array(s).

2. Each probe array shall be assembled using heavy wall anodized aluminum tubing, stainless steel adjustable support struts, stainless steel mounting brackets, and an aerodynamically optimized molded sensing apertures to ensure accurate measurement in angular airflow conditions.

3. Probe arrays shall be connected to the transmitter using cable of up to 100' in length, included with the transmitter.

4. Each stand-alone sensing point shall use an ambient temperature thermistor and an externally heated thermistor to determine the point velocity and temperature. Automatic equal area averaging of the individual point measurements shall be performed in the transmitter.

5. Each airflow sensor shall have an operating range of 0-10,000 FPM, with a NIST traceable accuracy of ±2% of reading for velocity measurement and 0.1ºF for temperature measurement. Individual sensors shall be fully field serviceable without need for field calibration, not requiring that the probe be returned to the Factory for repair and/or calibration.

6. Each transmitter shall be capable of averaging as many as thirty-two (32) sensors.

7. The transmitter will have a high visibility backlit LCD for display of either the averaged or individual sensor airflow and temperature measurements, in user selectable units of measure. The transmitter shall be factory configured to output duct air volume for plug and play operation.

8. All transmitter configuration, scaling, and diagnostic functions shall be performed by means of a password protected, cover mounted membrane keypad.

9. The transmitter outputs shall be dual analog (4-20mA, 0-5VDC or 0-10VDC) for airflow and temperature or optional LonWorks® communication interface.

10. The operating temperature range of the transmitter shall be from -20º to 140ºF. The transmitter shall be located where it will be sheltered from water or weather.

11. Input power to each transmitter shall be 24VAC/24VDC.

12. The transmitter shall be provided with interconnect cable for remote mounting up to 100’ away.

13. When installed per the manufacturer’s minimum installation requirements, the transmitter with probe array shall measure with an accuracy of ±3-10% of actual airflow as installed or within ±2-3% of actual flow with field calibration.

14. The Airflow Measuring System shall be the ELECTRA-flo/FI as manufactured by Air Monitor Corporation, Santa Rosa, California.

Return to Top

AIRFLOW MEASURING SYSTEM (DUCT MOUNTED CONFIGURATION)

(insert the text below)

A. Provide where indicated, airflow/ temperature probe arrays capable of continuously measuring airflow velocity/volume and temperature.

B. Airflow Measuring System (ELECTRA-flo Plus – Thermal Airflow Measuring Probe Array):

1. Each probe array shall consist of one or more multi-point measuring probes and a single microprocessor based transmitter. The transmitter shall be supplied by the same manufacturer as the measuring station or probe array.

2. Each multi-point probe shall be assembled using heavy wall anodized aluminum tubing, aluminum mounting plates, aerodynamically optimized molded sensing apertures to ensure accurate measurement in angular airflow conditions, and neoprene mounting gasket.

3. The probe array shall be connected to the transmitter using a single cable, of up to 100' in length, included with the transmitter.

4. Each stand-alone sensing point shall use an ambient temperature thermistor and an externally heated thermistor to determine the point velocity and temperature. Automatic equal area averaging of the individual point measurements shall be performed in the transmitter.

5. Each airflow sensor shall have an operating range of 5,000 FPM, with a NIST traceable accuracy of ±2% of reading for velocity measurement and 0.1ºF for temperature measurement.

6. The number of sensors for each rectangular probe array shall be:

Station Area	Sensor Density
1 to < 15 Sq. Ft.	1.50 Sq. Ft. Per Sensor
15 to < 30 Sq. Ft.	1.67 Sq. Ft. Per Sensor
30 to < 60 Sq. Ft.	2.10 Sq. Ft. Per Sensor
60 to 100 Sq. Ft.	3.13 Sq. Ft. Per Sensor

7. Individual sensors shall be fully field serviceable without need for field calibration, not requiring that the probe be returned to the Factory for repair and/or calibration.

8. Each transmitter shall be capable of averaging as many as thirty-two (32) sensors,

9. The transmitter will have a high visibility backlit LCD for display of either the averaged or individual sensor airflow and temperature measurements, in user selectable units of measure. The transmitter shall be factory configured to output duct air volume for plug and play operation.

10. All transmitter configuration, scaling, and diagnostic functions shall be performed by means of a password protected, cover mounted membrane keypad.

11. The transmitter outputs shall be dual analog (4-20mA, 0-5VDC or 0-10VDC) for airflow and temperature or optional LonWorks® communication interface.

12. The operating temperature range of the transmitter shall be from -20º to 140ºF. The transmitter shall be located where it will be sheltered from water or weather.

13. Input power to each transmitter shall be 24VAC/24VDC.

14. The transmitter shall be provided with interconnect cable for remote mounting up to 100’ away.

15. When installed per the manufacturer's minimum installation requirements, the transmitter with accompanying station or probe array shall measure with an accuracy of ±2-3% of actual flow.

16. The Airflow Measuring System shall be the ELECTRA-flo Plus as manufactured by Air Monitor Corporation, Santa Rosa, California.

Return to Top

AIRFLOW MEASURING SYSTEM (DUCT MOUNTED CONFIGURATION)

(Insert the text below)

A. Provide where indicated, airflow/temperature station(s) capable of continuously measuring airflow velocity/volume and temperature.

B. Airflow Measuring System (ELECTRA-flo/CM Plus – Thermal Airflow Measuring Station w/Honeycomb Cell:

1. Each station shall consist of one or more multi-point measuring probes and a single microprocessor based transmitter. The transmitter shall be supplied by the same manufacturer as the measuring station or probe array.

2. Each multi-point probe shall be assembled using heavy wall anodized aluminum tubing, aluminum mounting plates, aerodynamically optimized molded sensing apertures to ensure accurate measurement in angular airflow conditions, and neoprene mounting gasket.

3. The station shall be connected to the transmitter using a single cable, of up to 100’ in length, included with the transmitter.

4. Each stand-alone sensing point shall use an ambient temperature thermistor and an externally heated thermistor to determine the point velocity and temperature. Automatic equal area averaging of the individual point measurements shall be performed in the transmitter.

5. Each airflow sensor shall have an operating range of 5,000 FPM, with a NIST traceable accuracy of ±2% of reading for velocity measurement and 0.1ºF for temperature measurement.

6. The number of sensors for each rectangular station shall be:

Station Area	Sensor Density
1 to < 15 Sq. Ft.	1.50 Sq. Ft. Per Sensor
15 to < 30 Sq. Ft.	1.67 Sq. Ft. Per Sensor
30 to < 60 Sq. Ft.	2.10 Sq. Ft. Per Sensor
60 to 100 Sq. Ft.	3.13 Sq. Ft. Per Sensor

7. Individual sensors shall be fully field serviceable without need for field calibration, not requiring that the probe be returned to the Factory for repair and/or calibration.

8. Each transmitter shall be capable of averaging as many as thirty-two (32) sensors,

9. The transmitter will have a high visibility backlit LCD for display of either the averaged or individual sensor airflow and temperature measurements, in user selectable units of measure. The transmitter shall be factory configured to output duct air volume for plug and play operation.

10. All transmitter configuration, scaling, and diagnostic functions shall be performed by means of a password protected, cover mounted membrane keypad.

11. The transmitter outputs shall be dual analog (4-20mA, 0-5VDC or 0-10VDC) for airflow and temperature or optional LonWorks® communication interface.

12. The operating temperature range of the transmitter shall be from -20º to 140ºF. The transmitter shall be located where it will be sheltered from water or weather.

13. Input power to each transmitter shall be 24VAC/24VDC.

14. The stations shall have a 14 ga. [18 ga. for circular units] galvanized steel, 8” deep, welded casing with 90º formed flanges.

15. Each station will have ½" hex, 3" deep aluminum honeycomb air straightener positioned upstream of the measuring probes.

16. The transmitter shall be provided integrally mounted to the station or with interconnect cable for remote mounting up to 100' away.

17. When installed per the manufacturer's minimum installation requirements, the transmitter with accompanying station or probe array shall measure with an accuracy of ±2-3% of actual flow.

18. The Airflow Measuring System shall be the ELECTRA-flo/CM Plus as manufactured by Air Monitor Corporation, Santa Rosa, California.

Return to Top

AIRFLOW MEASURING SYSTEM (DUCT MOUNTED CONFIGURATION)

(Insert the text below)

A. Provide where indicated, airflow/temperature station(s) capable of continuously measuring airflow velocity/volume and temperature.

B. Airflow Measuring System (ELECTRA-flo/M Plus – Thermal Airflow Measuring Station):

1. Each station shall consist of one or more multi-point measuring probes and a single microprocessor based transmitter. The transmitter shall be supplied by the same manufacturer as the measuring station.

2. Each multi-point probe shall be assembled using heavy wall anodized aluminum tubing, aluminum mounting plates, aerodynamically optimized molded sensing apertures to ensure accurate measurement in angular airflow conditions, and neoprene mounting gasket.

3. The station shall be connected to the transmitter using a single cable, of up to 100' in length, included with the transmitter.

4. Each stand-alone sensing point shall use an ambient temperature thermistor and an externally heated thermistor to determine the point velocity and temperature. Automatic equal area averaging of the individual point measurements shall be performed in the transmitter.

5. Each airflow sensor shall have an operating range of 5,000 FPM, with a NIST traceable accuracy of ±2% of reading for velocity measurement and 0.1ºF for temperature measurement.

6. The number of sensors for each rectangular station shall be:

Station Area	Sensor Density
1 to < 15 Sq. Ft.	1.50 Sq. Ft. Per Sensor
15 to < 30 Sq. Ft.	1.67 Sq. Ft. Per Sensor
30 to < 60 Sq. Ft.	2.10 Sq. Ft. Per Sensor
60 to 100 Sq. Ft.	3.13 Sq. Ft. Per Sensor

7. Individual sensors shall be fully field serviceable without need for field calibration, not requiring that the probe be returned to the Factory for repair and/or calibration.

8. Each transmitter shall be capable of averaging as many as thirty-two (32) sensors,

9. The transmitter will have a high visibility backlit LCD for display of either the averaged or individual sensor airflow and temperature measurements, in user selectable units of measure. The transmitter shall be factory configured to output duct air volume for plug and play operation.

10. All transmitter configuration, scaling, and diagnostic functions shall be performed by means of a password protected, cover mounted membrane keypad.

11. The transmitter outputs shall be dual analog (4-20mA, 0-5VDC or 0-10VDC) for airflow and temperature or optional LonWorks® communication interface.

12. The operating temperature range of the transmitter shall be from -20º to 140ºF. The transmitter shall be located where it will be sheltered from water or weather.

13. Input power to each transmitter shall be 24VAC/24VDC.

14. The stations shall have a 14 ga. [18 ga. for circular units] galvanized steel, 8” deep, welded casing with 90º formed flanges. Transmitter shall be provided integrally mounted to the station with interconnect cable for remote mounting up to 100’ away.

15. When installed per the manufacturer’s minimum installation requirements, the transmitter with accompanying station or probe array shall measure with an accuracy of ±2-3% of actual flow.

16. The Airflow Measuring System shall be the ELECTRA-flo/M Plus as manufactured by Air Monitor Corporation, Santa Rosa, California.

Return to Top

AIRFLOW MEASURING SYSTEM (DUCT MOUNTED CONFIGURATION)

(Insert the text below)

A. Provide where indicated, Airflow Measuring System(s) capable of continuously monitoring the fan or duct capacities (air volumes) they serve. Each Airflow Measuring System shall consist of an Airflow Measuring Station and a Transmitter. In order to guarantee the overall accuracy and performance of the Airflow Measuring System, the Airflow Measuring Station and the Transmitter shall be by the same manufacturer.

B. Airflow Measuring Station (FAN-Evaluator – Pitot Traverse Station with Honeycomb Cell):

1. Each airflow measuring station shall contain multiple total and static pressure sensors positioned in a log-Tchebycheff pattern. Rectangular stations having a cross-section greater than 4 square feet will have a minimum of 25 points of measurement. For stations having a dimension less than 18", locate the points of measurement at the center of equal areas not more than 6" apart, and use a minimum of two measurement points per side. For a station having a dimension greater than 56", the maximum distance between measurement points will be 8". For circular ducts having a diameter of 18" or greater, locate measurement points on three systematically disposed diameters. For round stations smaller than 18", locate the measurement points on two perpendicular diameters.

2. The airflow measuring station(s) shall be fabricated of a minimum of 14 ga. galvanized steel, welded casing in 8" depth with 90º connecting flanges in a configuration and size equal to that of the duct it is mounted into. Each station shall be complete with an open parallel cell air straightener–equalizer honeycomb mechanically fastened to the casing, and external signal connection fittings. An identification label shall be placed on each station casing listing model number, size, area, and specified airflow capacity.

3. Stations shall be AMCA certified and be capable of measuring the airflow rates within an accuracy of ±2%. The maximum allowable unrecovered pressure drop caused by the station shall not exceed .085" w.c. at 2000 FPM, or .30" w.c. at 4000 FPM.

4. The Airflow Measuring Station(s) shall be the FAN-Evaluator as manufactured by Air Monitor Corporation, Santa Rosa, California.

C. Transmitter:

(enter desired Transmitter specification here)

Return to Top

FUME HOOD MONITORING AND CONTROL SYSTEMS

(Insert the text below)

A. Provide as indicated a Fume Hood Monitoring/Control System capable of continuous monitoring [and control] of the hood face velocity, and provide flow and alarm outputs for remote monitoring.

B. Fume Hood Monitoring/Control Systems (HOOD-trol II Fume Hood Monitor & Controller):

1. The operator/technician keypad shall contain an integral 2x16 digital display for use during the configuration and calibration process, plus display during normal use both the hood operating mode (normal, setback, emergency flow) and the actual face velocity in FPM. The face of the keypad will also have high visibility room status LED's in green, yellow, and red depicting normal, caution, and alarm conditions.

2. All monitor set-up, calibration, alarm configuration, [control loop tubing,] and password selection will be performed using the membrane pushbuttons with tactile feedback and LCD display to provide input to the on-board microprocessor.

3. The monitor's alarms shall provide the following technician configurable selections: Latching/non-latching, active/inactive, audible/muted, with time delay selectable in one second increments up to 30 seconds, and separate HI/LO alarm points for each room pressurization mode. Remote alarm notification will be via a Form C dry contact.

4. The hood operating mode shall be selectable via local keypad pushbutton, or remotely from the BAS via dry contact.

5. [Optional] The controller function shall perform single loop pressurization control via a three-mode 4-20mA, or tri-state (floating point) output.

6. The Fume Hood Monitoring/Control System shall be the HOOD-trol II as manufactured by Air Monitor Corporation, Santa Rosa, California.

Return to Top

AIRFLOW MEASURING SYSTEM (DUCT MOUNTED CONFIGURATION)

(Insert the text below)

A. Provide where indicated, a Pitot traverse station with integral flow conditioner for continuous measurement of air volume.

B. Aluminum LO-flo Pitot Traverse Station:

1. Each flow traverse station shall contain a flow straightener-equalizer consisting of open cell aluminum honeycomb having a minimum cell size to length ratio of 8 to 1 to minimize the effects of turbulent and rotational flows. The Pitot total pressure sensors shall be positioned at the centers of equal concentric areas on the averaging probe; the static pressure sensor will be a bullet nose type probe.

2. The station's casing shall be of all welded construction using 3000 series aluminum.

3. The traverse station shall be capable of measuring airflow volumes within 2% of actual flow, and shall be the Aluminum LO-flo Pitot Traverse Station as manufactured by Air Monitor Corporation, Santa Rosa, California.

Return to Top

Airflow Meters – Stationary and Panel Mounted

(Insert the text below. Note: One spec is for “Stationary” and the other is for “Meter Panel”)

A. Provide where indicated a stationary meter consisting of a dual-scale, diaphragm-actuated, differential pressure gauge mounted in an anodized aluminum enclosure.

B. Stationary Meter:

1. Gauges to be custom scaled to read in user selected volume, velocity, and/or pressure units of measure.

2. Meter to be complete with internal tubing, [specify type] signal connection fittings, wall mounting brackets, and furnished with a plastic data plate listing the system, the airflow station number, and the maximum scheduled air volume.

3. The meter shall be the Stationary Meter as manufactured by Air Monitor Corporation, Santa Rosa, California.

A. Provide where indicated a meter panel consisting of multiple dual-scale, diaphragm-actuated, differential pressure gauges mounted in a NEMA 1 steel enclosure.

B. Meter Panel:

1. Gauges to be custom scaled to read in user selected volume, velocity, and/or pressure units of measure.

2. Meter to be complete with internal tubing, [specify type] signal connection fittings, wall mounting brackets, and furnished with a plastic data plate listing for each gauge, the system, the airflow station number, and the maximum scheduled air volume.

3. The central panel shall be the Meter Panel as manufactured by Air Monitor Corporation, Santa Rosa, California.

Return to Top

STATIC PRESSURE MEASUREMENT/CONTROL SYSTEM (INDOOR APPLICATIONS)

(Insert the text below)

A. Provide where indicated, a Static Pressure Measurement/Control System(s) capable of continuously monitoring and/or controlling the differential pressure between indoor space(s), plenums and/or ducts. Each Static Pressure Measurement/Control System shall consist of Shielded Static Air Probe(s) [and/or Duct Static Pressure Traverse Probe(s)] and a Transmitter. In order guarantee the overall accuracy and performance of the Static Pressure Measurement/Control System, the Probes and the Transmitter shall be by the same manufacturer.

B. Shielded Room and Space Static Pressure Sensors (S.A.P.):

1. Provide for each room or space, a Shielded Static Pressure Sensor suitable for surface [recessed flush; suspended; junction box; external flush] mounting, complete with multiple sensing ports, pressure impulse suppression chamber, airflow shielding, and 1/8" FPT [1/2" FPT (for S.A.P./P)] takeoff fitting, all contained in an aluminum [316 stainless steel] casing, with brushed finish on exposed surfaces.

2. These probes shall be capable of sensing the static pressure in the proximity of the sensor to within 1% of the actual pressure value while being subjected to a maximum airflow of 1,000 FPM from a 360º radial source.

3. The Shielded Room and Space Static Pressure Sensor(s) shall be the S.A.P. [/B /P /S] shielded static air probe as manufactured by Air Monitor Corporation, Santa Rosa, California.

C. Shielded Plenum Static Pressure Sensor (S.A.P./R):

1. Provide where indicated for each plenum, two Shielded Static Pressure Sensors suitable for mounting externally on the plenum wall in opposing positions. The plenum pressure sensors shall be complete with multiple sensing ports, pressure impulse suppression chamber, airflow shielding, and 1/8" FPT takeoff fitting, all contained in an aluminum [316 stainless steel] casing, with brushed finish on exposed surfaces.

2. These probes shall be capable of sensing the static pressure of the plenum in the proximity of the sensor to within 1% of the actual pressure value.

3. The Shielded Plenum Static Pressure Sensor(s) shall be the S.A.P./R Shielded Static Air Probe as manufactured by Air Monitor Corporation, Santa Rosa, California.

D. Transmitter:

(enter desired Transmitter specification here)

Return to Top

STATIC PRESSURE MEASUREMENT AND CONTROL (LABORATORY AND/OR HOSPITAL ISOLATION ROOM APPLICATIONS)

(Insert the text below)

A. Provide as indicated a Room Pressurization Monitoring/Control System capable of monitoring [and controlling] the differential pressure between a room and reference area, and provide both pressurization and alarm outputs for remote monitoring.

B. Room Pressurization Monitoring/Control Systems (SENTRY Room Pressurization Monitor & Controller:

1. The operator/technician keypad shall contain an integral 2x16 digital display for use during the configuration and calibration process, and display during normal use both the room operating mode (positive, negative, unoccupied, purge) and the actual room condition in Inches w.c. or FPM. The face of the keypad shall also have high visibility room status LED's in green, yellow, and red depicting normal, caution, and alarm conditions.

2. All monitor set-up, calibration, alarm configuration, [control loop tubing,] and password selection will be performed using the membrane pushbuttons with tactile feedback and LCD display to provide input to the on-board microprocessor.

3. The monitor's alarms shall provide the following technician configurable selections: Latching/non-latching, active/inactive, audible/muted, with time delay selectable in one second increments up to 30 seconds, and separate HI/LO alarm points for each room pressurization mode. Remote alarm notification will be via a Form C dry contact.

4. Three different methods for selecting room mode will be provided: Via password protected keypad access, optional three position key switch, or remotely via dry contact from the BAS or nurse's station.

5. [Optional] The controller function shall perform single loop pressurization control via a three-mode 4-20mA, or tri-state (floating point) output.

6. The Room Pressurization Monitoring/Control System shall be the SENTRY as manufactured by Air Monitor Corporation, Santa Rosa, California.

Return to Top

STATIC PRESSURE MEASUREMENT/CONTROL SYSTEM (INDOOR/OUTDOOR APPLICATION)

(Insert the text below)

A. Provide where indicated, a Static Pressure Measurement/Control System(s) capable of continuously monitoring and/or controlling the differential pressure between indoor space(s) and the outdoors. Each Static Pressure Measurement/ Control System shall consist of Shielded Static Air Probes for indoor locations, a Shielded Static Outside Air Probe and a Transmitter. In order guarantee the overall accuracy and performance of the Static Pressure Measurement/Control System, the Shielded Probes and the Transmitter shall be by the same manufacturer.

B. Shielded Static Outside Air Probe (S.O.A.P.):

1. Provide for the Static Pressure Measurement/Control System an outdoor static pressure sensor constructed of 10 ga. Type 316 stainless steel with a 2" diameter FPT connection.

2. The outdoor air probe shall be capable of sensing the outside atmospheric air pressure to within 2% of the actual value when subjected to radial wind velocities up to 40 miles per hour with approach angles up to 30^{o} to the horizontal.

3. The Shielded Static Outside Air Probe shall be the S.O.A.P. as manufactured by Air Monitor Corporation, Santa Rosa, California.

C. Transmitter:

(enter desired Transmitter specification here)

Return to Top

STATIC PRESSURE MEASUREMENT/CONTROL SYSTEM (INDOOR APPLICATIONS)

(Insert the text below)

A. Provide where indicated, a Static Pressure Measurement/Control System(s) capable of continuously monitoring and/or controlling the differential pressure between indoor space(s), plenums and/or ducts. Each Static Pressure Measurement/Control System shall consist of Shielded Static Air Probe(s) [and/or Duct Static Pressure Traverse Probe(s)] and a Transmitter. In order guarantee the overall accuracy and performance of the Static Pressure Measurement/Control System, the Probes and the Transmitter shall be by the same manufacturer.

B. Duct Static Pressure Traverse Probe (STAT-probe):

1. Provide where indicated for each duct, a Duct Static Traverse Probe(s) capable of continuously monitoring the duct or system static pressure it serves.

2. Each Duct Static Traverse Probe(s) shall contain multiple static pressure sensors located along the exterior surface of the cylindrical probe. Said sensors shall not protrude beyond the surface of the probe. The Duct Static Pressure Traverse Probes(s) shall be of extruded aluminum construction and (except for 3/4" dia. probes with lengths of 24” or less) be complete with threaded end support rod, sealing washer and nut, and mounting plate with a gasket and static pressure signal fitting. The Duct Static Traverse Probe(s) shall be capable of producing a steady, non-pulsating signal of standard static pressure, without need for correction factors, with an instrument accuracy of 1%.

3. The Duct Static Pressure Traverse Probe(s) shall be the STAT-probe as manufactured by Air Monitor Corporation, Santa Rosa, California.

C. Transmitter:

(enter desired Transmitter specification here)

Return to Top

Transmitter (VEL-trol II Microprocessor Based Pressure & Flow "Smart" Transmitter-Controller):

(Insert the text below)

C. Transmitter:

1. Transmitter (VEL-trol II Microprocessor Based Pressure & Flow “Smart” Transmitter-Controller).

2. The Transmitter-controller shall be capable of receiving flow signals (total and static pressure) from an airflow station or probe array and produce an output linear and scaled for air volume, velocity, differential pressure, etc. The internal P, I, I/D three-mode controller shall be capable of controlling at a user selectable internal or external setpoint, and output a 0-5VDC, 0-10VDC, or 4-20mADC control signal.

3. The Transmitter-controller shall contain an integral multi-line digital display for use during the configuration and calibration process, and to display one transmitter output plus controller setpoint during normal operating mode. All Transmitter configuration, parameter setting, zero and span calibration, plus display formatting and scaling will be performed digitally in the on-board microprocessor via input pushbuttons.

4. The Transmitter-controller 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 0.10% of natural span. The Transmitter-controller shall be furnished with a transducer automatic zeroing circuit, and be capable of maintaining linear output signals on applications requiring 10 to 1 velocity or pressure turndown.

5. Transmitter-controller shall be capable of having its operating span electronically selected without having to perform recalibration involving an external pressure source.

6. (Optional) The Transmitter-controller 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.

7. (Optional) Using a second Transmitter as an input, the internal microprocessor can perform a summed flow, flow differential, low signal select, high signal select or percent deviation calculation, with the result being displayed and provided as an analog output signal.

8. The Transmitter-controller shall be the VEL-trol II as manufactured by Air Monitor Corporation, Santa Rosa, California.

Return to Top

Transmitter (VELTRON DPT 2500 Ultra-Low Differential Pressure & Flow Transmitter)

(Insert the text below)

C. Transmitter:

1. Transmitter (VELTRON DPT 2500 Ultra-Low Differential Pressure & Flow Transmitter):

2. The Transmitter shall have an accuracy of ±0.5% of Natural Span and be furnished with a built-in 3-way zeroing valve, user selectable square root function, and integral 3-1/2 digit scalable LCD for display of measured process. The Transmitter shall be housed in a NEMA 1 aluminum [NEMA 12 steel] enclosure with universal 1/8" FPT signal connection ports.

3. The Transmitter shall be the VELTRON DPT 2500 [2500I] as manufactured by Air Monitor Corporation, Santa Rosa, California.

Return to Top

Transmitter (VELTRON DPT 2500-plus Ultra-Low Differential Pressure & Flow Transmitter):

(Insert the text below)

C. Transmitter.

1. Transmitter (VELTRON DPT 2500-plus Ultra-Low Differential Pressure & Flow Transmitter).

2. The Transmitter shall be capable of receiving flow signals (total and static pressure) from an airflow station or probe array and produce an output linear and scaled for air volume, velocity, differential pressure, etc.

3. The Transmitter shall contain an integral multi-line digital display for use during the configuration and calibration process, and to display one Transmitter output during normal operating mode. All Transmitter configuration, parameter setting, zero and span calibration, plus display formatting and scaling will be performed digitally in the on-board microprocessor via input pushbuttons.

4. The Transmitter will be available in multiple natural spans covering the range of 0.05 IN w.c. to 25.0 IN w.c. with an accuracy of 0.25% 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 turndown.

5. The Transmitter shall be the VELTRON DPT 2500-plus as manufactured by Air Monitor Corporation, Santa Rosa, California.

Return to Top

Transmitter (VELTRON II Microprocessor Based Pressure & Flow “Smart” Transmitter):

(Insert the text below)

C. Transmitter:

1. Transmitter (VELTRON II Microprocessor Based Pressure & Flow “Smart” Transmitter).

2. The Transmitter shall be capable of receiving flow signals (total and static pressure) from an airflow station or probe array and produce dual outputs linear and scaled for air volume, velocity, differential pressure, etc.

3. The Transmitter shall contain an integral multi-line digital display for use during the configuration and calibration process, and to display one transmitter output during normal operating mode. All Transmitter configuration, parameter setting, zero and span calibration, plus display formatting and scaling will be performed digitally in the on-board microprocessor via input pushbuttons.

4. The 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.

5. Transmitter shall be capable of having its operating span electronically selected without having to perform recalibration involving an external pressure source.

6. (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.

7. (Optional) Using a second Transmitter as an input, the internal microprocessor can perform a summed flow, flow differential, low signal select, high signal select or percent deviation calculation, with the result being displayed and provided as an analog output signal.

8. The Transmitter shall be the VELTRON II as manufactured by Air Monitor Corporation, Santa Rosa, California.

Return to Top

OUTSIDE AIRFLOW MEASUREMENT SYSTEM (LOUVERS/RAINHOODS)

(Insert the text below)

A. Provide as indicated an Outdoor Airflow Measurement System capable of direct measurement of airflow through an outside air inlet and produce dual outputs; one representing the measured airflow, and the other to control the inlet damper

B. VOLU-flo/OAM II (Outside Air Monitor/Transmitter)

1. The Outdoor Airflow Measurement System shall contain an integral color graphic display for use during the configuration and calibration processes, and to display two measured processes (volume, velocity, temperature) during normal operation. Product configuration, output scaling, and field characterization, will be performed through the user interface/display without the need for additional utility software.

2. The Outdoor Airflow Measurement System shall measure inlet airflow with an accuracy of ±5% of reading over a range of 150-600 FPM, 250-1,000 FPM, 150-2,000 FPM, and 500-2,000 FPM and not have its reading affected by the presence of directional or gusting wind. Measured airflow shall be density corrected for ambient temperature variances, and atmospheric pressure due to site altitude.

3. The Outdoor Airflow Measurement System shall interface with existing building automation systems (BAS), accepting inputs for fan system start, economizer mode operation, and an external controller setpoint, and provide flow deviation alarm outputs.

4. The sensors shall be constructed of materials that resist corrosion due to the presence of salt or chemicals in the air; all non-painted surfaces shall be constructed of stainless steel. The electronics enclosure shall be NEMA 1 [NEMA 4; NEMA 4 with enclosure heater and insulation].

5. The Outdoor Airflow Measurement System shall be the VOLU-flo/OAM II as manufactured by Air Monitor Corporation, Santa Rosa, California.

Return to Top

OUTSIDE AIRFLOW MEASUREMENT SYSTEM (DUCTED/INDOOR APPLICATIONS)

(Insert the text below)

A. Provide as indicated an Outside Airflow Measurement System capable of direct measurement of airflow through an outside air inlet and produce dual outputs; one representing the measured airflow, and the other to control the inlet damper

B. VOLU-flo/OAM Station (Outside Air Monitor/Controller with Flow Station)

1. The Outside Airflow Measurement System shall contain an integral multi-line liquid crystal display for use during the configuration and calibration processes, and to display two measured processes (volume, velocity, temperature) during normal operation. All configuration, output scaling, calibration, and controller tuning will be performed digitally in the on-board microprocessor via input pushbuttons

2. The Outside Airflow Measurement System shall measure inlet airflow with an accuracy of ±5% of reading over a range of 150-600 FPM, 250-1,000 FPM, 150-2,000 FPM, and 500-2,000 FPM and not have its reading affected by the presence of directional or gusting wind. Measured airflow shall be density corrected for ambient temperature variances, and atmospheric pressure due to site altitude.

3. The Outside Airflow Measurement System shall interface with existing building automation systems (BAS), accepting inputs for fan system start, economizer mode operation, and an external controller setpoint, and provide flow deviation alarm outputs.

4. The sensors shall be constructed of materials that resist corrosion due to the presence of salt or chemicals in the air; all non-painted surfaces shall be constructed of stainless steel. Sensors shall be factory mounted in an airflow station constructed of 14 ga. [18 ga. for circular units] galvanized steel, 6" deep welding casing with 90º connecting flanges and a galvanized expanded metal sheet. The electronics enclosure shall be NEMA 1 [NEMA 4; NEMA 4 with enclosure heater and insulation].

5. The Outside Airflow Measurement System shall be the VOLU-flo/OAM Station as manufactured by Air Monitor Corporation, Santa Rosa, California.

Return to Top

AIRFLOW MEASURING SYSTEM (DUCT MOUNTED CONFIGURATION)

(Insert the text below)

A. Provide where indicated, Airflow Measuring System(s) capable of continuously monitoring the fan or duct capacities (air volumes) they serve. Each Airflow Measuring System shall consist of an Airflow Measuring Station and a Transmitter. In order guarantee the overall accuracy and performance of the Airflow Measuring System, the Airflow Measuring Station and the Transmitter shall be by the same manufacturer.

B. Airflow Measuring Station (VOLU-probe – Pitot Airflow Traverse Probe):

1. Each airflow traverse probe shall contain multiple total and static pressure sensors located along the exterior surface of the cylindrical probe and internally connected to their respective averaging manifolds. The flow sensors shall not protrude beyond the surface of the probe(s), and shall be the offset (Fechheimer) type for static pressure and the chamfered impact type for total pressure measurement. The airflow sensing probe's measurement accuracy shall not be affected by directional flow having pitch and/or yaw angles up to 30º. Each airflow traverse probe shall be of extruded aluminum construction and furnished with mounting plate(s), gasket, and signal fittings suitable for HVAC duct installation.

2. Total and static pressure sensors shall be located at the centers of equal areas (for rectangular ducts) or at equal concentric area centers (for circular ducts) along the probe length.

3. Probes shall be AMCA certified and be capable of measuring the airflow rates within an accuracy of ±2% without the use of correction factors. The maximum allowable unrecovered pressure drop caused by the probes shall not exceed .025" w.c. at 2000 FPM, or .085" w.c. at 4000 FPM.

4. The Airflow Measuring Stations(s) shall be the VOLU-probe [/1,/2,/3,/4] as manufactured by Air Monitor Corporation, Santa Rosa, California

C. Transmitter:

(enter desired Transmitter specification here)

Return to Top

AIRFLOW MEASURING SYSTEM (FAN INLET CONFIGURATION)

(Insert the text below)

A. Provide on the indicated fans, Airflow Measuring System(s) mounted in the fan inlets capable of continuously measuring the air handling capacity (air volume) of the respective centrifugal [or plug, vane-axial] fan(s). Each Airflow Measuring System shall consist of an Airflow Measuring Station and a Transmitter. In order guarantee the overall accuracy and performance of the Airflow Measuring System, the Airflow Measuring Station and the Transmitter shall be by the same manufacturer.

B. Airflow Measuring Station (VOLU-probe/FI – Fan Inlet Airflow Traverse Probe):

1. The Airflow Measuring Station shall contain multiple total and static pressure sensors placed at concentric area centers along the exterior surface of the cylindrical probes and internally connected to their respective averaging manifolds. Sensors shall not protrude beyond the surface of the probe, nor be adversely affected by particle contamination normally present in building system airflows.

2. The Airflow Measuring Station shall have symmetrical averaging signal takeoffs, and shall be of aluminum construction with hard anodized finish [copper construction] with galvanized steel mounting hardware.

3. The Airflow Measuring Station shall not significantly impact fan performance or contribute to fan generated noise levels. The probes shall be capable of producing steady, non-pulsating signals of standard total and static pressure, without need for flow corrections or factors, with an accuracy of 3% of actual flow over a fan operating range of 6 to 1 capacity turndown.

4. The Airflow Measuring Stations(s) shall be the VOLU-probe/FI as manufactured by Air Monitor Corporation, Santa Rosa, California

C. Transmitter:

(enter desired Transmitter specification here)

Return to Top

AIRFLOW MEASURING SYSTEM (DUCT MOUNTED CONFIGURATION)

(Insert the text below)

A. Provide where indicated, Airflow Measuring System(s) capable of continuously monitoring the fan or duct capacities (air volumes) they serve. Each Airflow Measuring System shall consist of an Airflow Measuring Station and a Transmitter. In order guarantee the overall accuracy and performance of the Airflow Measuring System, the Airflow Measuring Station and the Transmitter shall be by the same manufacturer.

B. Airflow Measuring Station (VOLU-probe/SS – Stainless Steel Pitot Airflow Traverse Probe):

1. Provide where indicated an array of airflow traverse probes capable of continuously monitoring the stack or duct capacities (air volumes) it serves.

2. Each airflow traverse probe shall contain multiple total and static pressure sensors and internally connected to their respective averaging manifolds. The flow sensors shall not protrude beyond the surface of each probe, and shall be the offset (Fechheimer) type for static pressure and the chamfered impact type for total pressure measurement. The airflow sensing probe's measurement accuracy shall not be affected by directional flow having pitch and/or yaw angles up to 30º.

3. Each airflow traverse probe shall be fabricated of type 316 stainless steel, all welded construction, and shall be furnished with the flat or curved plate mounting means. In addition, access ports and accessory hardware shall be provided to facilitate external installation of the probe and end support (if required), yet permitting easy probe removal for inspection, etc.

4. The airflow traverse probe shall not induce a pressure drop in excess of 0.046 IN w.c. at 2000 FPM, nor measurably contribute to sound levels within the duct. Total and static pressure sensors shall be located at the centers of equal areas (for rectangular duct) or at equal concentric area centers (for circular ducts) along the probe length. The airflow traverse probe shall be capable of producing steady, non-pulsating signals of total and static pressure without need for flow corrections or factors, with an accuracy of 2-3% of actual flow, over a velocity range of 400 to 4000 FPM.

5. The Airflow Measuring Stations(s) shall be the VOLU-probe [1SS, 2SS] as manufactured by Air Monitor Corporation, Santa Rosa, California

C. Transmitter:

(enter desired Transmitter specification here)

Return to Top

AIRFLOW MEASURING SYSTEM (DUCT MOUNTED CONFIGURATION)

(Insert the text below)

A. Provide where indicated, Airflow Measuring System(s) capable of continuously monitoring the fan or duct capacities (air volumes) they serve. Each Airflow Measuring System shall consist of an Airflow Measuring Station and a Transmitter. In order guarantee the overall accuracy and performance of the Airflow Measuring System, the Airflow Measuring Station and the Transmitter shall be by the same manufacturer.

B. Airflow Measuring Station (VOLU-probe/VS – Airflow Traverse Station):

1. Each airflow traverse probe mounted within the station shall contain multiple total and static pressure sensors located along its exterior surface, and internally connected to their respective averaging manifolds. The flow sensors shall not protrude beyond the surface of the probe(s), and shall be the offset (Fechheimer) type for static pressure and the chamfered impact type for total pressure measurement. The airflow station's measured accuracy shall not be affected by directional flow having yaw and/or pitch angles up to 30º.

2. The airflow measuring station(s) shall have a 14 ga. [18 ga. for circular units] galvanized steel, 6" deep welding casing with 90º connecting flanges. Total and static pressure sensors shall be located at the centers of equal areas (for rectangular ducts) or at equal concentric area centers (for circular ducts) across the station's face area.

3. Stations shall be AMCA certified and be capable of measuring the airflow rates within an accuracy of ±2% without the use of correction factors. The maximum allowable unrecovered pressure drop caused by the station shall not exceed .025" w.c. at 2000 FPM, or .085" w.c. at 4000 FPM.

4. The Airflow Measuring Stations(s) shall be the VOLU-probe/VS as manufactured by Air Monitor Corporation, Santa Rosa, California.

C. Transmitter:

(enter desired Transmitter specification here)

Provide where indicated, Airflow Measuring System(s) capable of continuously monitoring the fan or duct capacities (air volumes) they serve. Each Airflow Measuring System shall consist of an Airflow Measuring Station and a Transmitter. In order to guarantee the overall accuracy and performance of the Airflow Measuring System, the Airflow Measuring Station and the Transmitter shall be by the same manufacturer.

Duct Mounted Systems:

Flow Station:

Each airflow measuring station shall contain multiple total and static pressure sensors positioned in a log-Tchebycheff pattern. Rectangular stations having a cross-section greater than 4 square feet will have a minimum of 25 points of measurement. For stations having a dimension less than 18", locate the points of measurement at the center of equal areas not more than 6" apart, and use a minimum of two measurement points per side. For a station having a dimension greater than 56", the maximum distance between measurement points will be 8". For circular ducts having a diameter of 18" or greater, locate measurement points on three systematically disposed diameters. For round stations smaller than 18", locate the measurement points on two perpendicular diameters.

The airflow measuring station(s) shall be fabricated of a minimum of 14 ga. galvanized steel, welded casing in 8" depth with 90º connecting flanges in a configuration and size equal to that of the duct it is mounted into. Each station shall be complete with an open parallel cell air straightener–equalizer honeycomb mechanically fastened to the casing, and external signal connection fittings. An identification label shall be placed on each station casing listing model number, size, area, and specified airflow capacity.

Stations shall be AMCA certified and be capable of measuring the airflow rates within an accuracy of ±2%. The maximum allowable unrecovered pressure drop caused by the station shall not exceed .085" w.c. at 2000 FPM, or .30" w.c. at 4000 FPM.

The Airflow Measuring Station(s) shall be the FAN-Evaluator as manufactured by Air Monitor Corporation, Santa Rosa, California.

Fan Inlet Mounted Systems:

Flow Station:

The Airflow Measuring Station shall contain multiple total and static pressure sensors placed at concentric area centers along the exterior surface of the cylindrical probes and internally connected to their respective averaging manifolds. Sensors shall not protrude beyond the surface of the probe, nor be adversely affected by particle contamination normally present in building system airflows.

The Airflow Measuring Station shall have symmetrical averaging signal takeoffs, and shall be of aluminum construction with hard anodized finish [copper construction] with galvanized steel mounting hardware.

The Airflow Measuring Station shall not significantly impact fan performance or contribute to fan generated noise levels. The probes shall be capable of producing steady, non-pulsating signals of standard total and static pressure, without need for flow corrections or factors, with an accuracy of 3% of actual flow over a fan operating range of 6 to 1 capacity turndown.

The Airflow Measuring Station shall be the VOLU-probe/FI as manufactured by Air Monitor Corporation, Santa Rosa, California.

Transmitter (for both Duct and Fan Inlet Flow Stations above):

The Transmitter shall be capable of receiving flow signals (total and static pressure) from an airflow station or probe array and produce dual outputs linear and scaled for air volume, velocity, differential pressure, etc.

The Transmitter shall contain an integral multi-line digital display for use during the configuration and calibration process, and to display one transmitter output during normal operating mode. All Transmitter configuration, parameter

setting, zero and span calibration, plus display formatting and scaling will be performed digitally in the on-board microprocessor via input pushbuttons.
The 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.

(Optional) Using a second Transmitter as an input, the internal microprocessor can perform a summed flow, flow differential, low signal select, high signal select or percent deviation calculation, with the result being displayed and provided as an analog output signal.

The Transmitter shall be the VELTRON II as manufactured by Air Monitor Corporation, Santa Rosa, California.

Outside Airflow Measurement Systems (louvers/rainhoods):

The Outside Airflow Measurement System shall be capable of direct measurement of airflow through an outside air inlet and produce dual outputs; one representing the measured airflow, and the other to control the inlet damper.

The Outside Airflow Measurement System shall contain an integral multi-line liquid crystal display for use during the configuration and calibration processes, and to display two measured processes (volume, velocity, temperature) during normal operation. All configuration, output scaling, calibration, and controller tuning will be performed digitally in the on-board microprocessor via input pushbuttons.

The Outside Airflow Measurement System shall measure inlet airflow with an accuracy of ±5% of reading over a range of 150-600 FPM, 250-1,000 FPM, 150-2,000 FPM, and 500-2,000 FPM and not have its reading affected by the presence of directional or gusting wind. Measured airflow shall be density corrected for ambient temperature variances, and atmospheric pressure due to site altitude.

The Outside Airflow Measurement System shall interface with existing building automation systems (BAS), accepting inputs for fan system start, economizer mode operation, and an external controller setpoint, and provide flow deviation alarm outputs.

The sensors shall be constructed of materials that resist corrosion due to the presence of salt or chemicals in the air; all non-painted surfaces shall be constructed of stainless steel. The electronics enclosure shall be NEMA 1 [NEMA 4; NEMA 4 with enclosure heater and insulation].

The Outside Airflow Measurement System shall be the VOLU-flo/OAM as manufactured by Air Monitor Corporation, Santa Rosa, California

AIRFLOW MEASURING SYSTEM(S)

Provide where indicated, Airflow Measuring System(s) capable of continuously monitoring the fan or duct capacities (air volumes) they serve. Each Airflow Measuring System shall consist of an Airflow Measuring Station and a Transmitter. In order to guarantee the overall accuracy and performance of the Airflow Measuring System, the Airflow Measuring Station and the Transmitter shall be by the same manufacturer.

Duct Mounted Systems:

Flow Station:

Each airflow measuring station shall contain multiple total and static pressure sensors positioned in a log-Tchebycheff pattern. Rectangular stations having a cross-section greater than 4 square feet will have a minimum of 25 points of measurement. For stations having a dimension less than 18", locate the points of measurement at the center of equal areas not more than 6" apart, and use a minimum of two measurement points per side. For a station having a dimension greater than 56", the maximum distance between measurement points will be 8". For circular ducts having a diameter of 18" or greater, locate measurement points on three systematically disposed diameters. For round stations smaller than 18", locate the measurement points on two perpendicular diameters.

The airflow measuring station(s) shall be fabricated of a minimum of 14 ga. galvanized steel, welded casing in 8" depth with 90º connecting flanges in a configuration and size equal to that of the duct it is mounted into. Each station shall be complete with an open parallel cell air straightener–equalizer honeycomb mechanically fastened to the casing, and external signal connection fittings. An identification label shall be placed on each station casing listing model number, size, area, and specified airflow capacity.

Stations shall be AMCA certified and be capable of measuring the airflow rates within an accuracy of ±2%. The maximum allowable unrecovered pressure drop caused by the station shall not exceed .085" w.c. at 2000 FPM, or .30" w.c. at 4000 FPM.

The Airflow Measuring Station(s) shall be the FAN-Evaluator as manufactured by Air Monitor Corporation, Santa Rosa, California.

Fan Inlet Mounted Systems:

Flow Station:

The Airflow Measuring Station shall contain multiple total and static pressure sensors placed at concentric area centers along the exterior surface of the cylindrical probes and internally connected to their respective averaging manifolds. Sensors shall not protrude beyond the surface of the probe, nor be adversely affected by particle contamination normally present in building system airflows.

The Airflow Measuring Station shall have symmetrical averaging signal takeoffs, and shall be of aluminum construction with hard anodized finish [copper construction] with galvanized steel mounting hardware.

The Airflow Measuring Station shall not significantly impact fan performance or contribute to fan generated noise levels. The probes shall be capable of producing steady, non-pulsating signals of standard total and static pressure, without need for flow corrections or factors, with an accuracy of 3% of actual flow over a fan operating range of 6 to 1 capacity turndown.

The Airflow Measuring Station shall be the VOLU-probe/FI as manufactured by Air Monitor Corporation, Santa Rosa, California.

Transmitter (for both Duct and Fan Inlet Flow Stations above):

The Transmitter shall be capable of receiving flow signals (total and static pressure) from an airflow station or probe array and produce an output linear and scaled for air volume, velocity, differential pressure, etc.

The Transmitter shall contain an integral multi-line digital display for use during the configuration and calibration process, and to display one Transmitter output during normal operating mode. All Transmitter configuration, parameter setting, zero and span calibration, plus display formatting and scaling will be performed digitally in the on-board microprocessor via input pushbuttons.

The Transmitter will be available in multiple natural spans covering the range of 0.05 IN w.c. to 25.0 IN w.c. with an accuracy of 0.25% 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 turndown.

The Transmitter shall be the VELTRON DPT 2500-plus as manufactured by Air Monitor Corporation, Santa Rosa, California.

Outside Airflow Measurement Systems (louvers/rainhoods):

The Outside Airflow Measurement System shall be capable of direct measurement of airflow through an outside air inlet and produce dual outputs; one representing the measured airflow, and the other to control the inlet damper.

The Outside Airflow Measurement System shall contain an integral multi-line liquid crystal display for use during the configuration and calibration processes, and to display two measured processes (volume, velocity, temperature) during normal operation. All configuration, output scaling, calibration, and controller tuning will be performed digitally in the on-board microprocessor via input pushbuttons.

The Outside Airflow Measurement System shall measure inlet airflow with an accuracy of ±5% of reading over a range of 150-600 FPM, 250-1,000 FPM, 150-2,000 FPM, and 500-2,000 FPM and not have its reading affected by the presence of directional or gusting wind. Measured airflow shall be density corrected for ambient temperature variances, and atmospheric pressure due to site altitude.

The Outside Airflow Measurement System shall interface with existing building automation systems (BAS), accepting inputs for fan system start, economizer mode operation, and an external controller setpoint, and provide flow deviation alarm outputs.

The sensors shall be constructed of materials that resist corrosion due to the presence of salt or chemicals in the air; all non-painted surfaces shall be constructed of stainless steel. The electronics enclosure shall be NEMA 1 [NEMA 4; NEMA 4 with enclosure heater and insulation].

The Outside Airflow Measurement System shall be the VOLU-flo/OAM as manufactured by Air Monitor Corporation, Santa Rosa, California

AIRFLOW MEASURING SYSTEM(S)

Provide where indicated, Airflow Measuring System(s) capable of continuously monitoring the fan or duct capacities (air volumes) they serve. Each Airflow Measuring System shall consist of an Airflow Measuring Station and a Transmitter. In order to guarantee the overall accuracy and performance of the Airflow Measuring System, the Airflow Measuring Station and the Transmitter shall be by the same manufacturer.

Duct Mounted Systems:

Flow Station:

Each airflow measuring station shall contain multiple total and static pressure sensors positioned in a log-Tchebycheff pattern. Rectangular stations having a cross-section greater than 4 square feet will have a minimum of 25 points of measurement. For stations having a dimension less than 18", locate the points of measurement at the center of equal areas not more than 6" apart, and use a minimum of two measurement points per side. For a station having a dimension greater than 56", the maximum distance between measurement points will be 8". For circular ducts having a diameter of 18" or greater, locate measurement points on three systematically disposed diameters. For round stations smaller than 18", locate the measurement points on two perpendicular diameters.

The airflow measuring station(s) shall be fabricated of a minimum of 14 ga. galvanized steel, welded casing in 8" depth with 90º connecting flanges in a configuration and size equal to that of the duct it is mounted into. Each station shall be complete with an open parallel cell air straightener–equalizer honeycomb mechanically fastened to the casing, and external signal connection fittings. An identification label shall be placed on each station casing listing model number, size, area, and specified airflow capacity.

Stations shall be AMCA certified and be capable of measuring the airflow rates within an accuracy of ±2%. The maximum allowable unrecovered pressure drop caused by the station shall not exceed .085" w.c. at 2000 FPM, or .30" w.c. at 4000 FPM.

The Airflow Measuring Station(s) shall be the FAN-Evaluator as manufactured by Air Monitor Corporation, Santa Rosa, California.

Fan Inlet Mounted Systems:

Flow Station:

The Airflow Measuring Station shall contain multiple total and static pressure sensors placed at concentric area centers along the exterior surface of the cylindrical probes and internally connected to their respective averaging manifolds. Sensors shall not protrude beyond the surface of the probe, nor be adversely affected by particle contamination normally present in building system airflows.

The Airflow Measuring Station shall have symmetrical averaging signal takeoffs, and shall be of aluminum construction with hard anodized finish [copper construction] with galvanized steel mounting hardware.

The Airflow Measuring Station shall not significantly impact fan performance or contribute to fan generated noise levels. The probes shall be capable of producing steady, non-pulsating signals of standard total and static pressure, without need for flow corrections or factors, with an accuracy of 3% of actual flow over a fan operating range of 6 to 1 capacity turndown.

The Airflow Measuring Station shall be the VOLU-probe/FI as manufactured by Air Monitor Corporation, Santa Rosa, California.

Transmitter (for both Duct and Fan Inlet Flow Stations above):

The Transmitter shall have an accuracy of ±0.5% of Natural Span and be furnished with a built-in 3-way zeroing valve, user selectable square root function, and integral 3½ digit scalable LCD for display of measured process. The Transmitter shall be housed in a NEMA 1 aluminum [NEMA 12 steel] enclosure with universal 1/8" FPT signal connection ports.

The Transmitter shall be the VELTRON DPT 2500 [2500I] as manufactured by Air Monitor Corporation, Santa Rosa, California.

Outside Airflow Measurement Systems (louvers/rainhoods):

The Outside Airflow Measurement System shall be capable of direct measurement of airflow through an outside air inlet and produce dual outputs; one representing the measured airflow, and the other to control the inlet damper.

The Outside Airflow Measurement System shall contain an integral multi-line liquid crystal display for use during the configuration and calibration processes, and to display two measured processes (volume, velocity, temperature) during normal operation. All configuration, output scaling, calibration, and controller tuning will be performed digitally in the on-board microprocessor via input pushbuttons.

The Outside Airflow Measurement System shall measure inlet airflow with an accuracy of ±5% of reading over a range of 150-600 FPM, 250-1,000 FPM, 150-2,000 FPM, and 500-2,000 FPM and not have its reading affected by the presence of directional or gusting wind. Measured airflow shall be density corrected for ambient temperature variances, and atmospheric pressure due to site altitude.

The Outside Airflow Measurement System shall interface with existing building automation systems (BAS), accepting inputs for fan system start, economizer mode operation, and an external controller setpoint, and provide flow deviation alarm outputs.

The sensors shall be constructed of materials that resist corrosion due to the presence of salt or chemicals in the air; all non-painted surfaces shall be constructed of stainless steel. The electronics enclosure shall be NEMA 1 [NEMA 4; NEMA 4 with enclosure heater and insulation].

The Outside Airflow Measurement System shall be the VOLU-flo/OAM as manufactured by Air Monitor Corporation, Santa Rosa, California

AIRFLOW MEASURING SYSTEM(S)

Provide where indicated, Airflow Measuring System(s) capable of continuously monitoring the fan or duct capacities (air volumes) they serve. Each Airflow Measuring System shall consist of an Airflow Measuring Station and a Transmitter. In order to guarantee the overall accuracy and performance of the Airflow Measuring System, the Airflow Measuring Station and the Transmitter shall be by the same manufacturer.

Duct Mounted Systems:

Flow Station:

Each airflow traverse probe mounted within the station shall contain multiple total and static pressure sensors located along its exterior surface, and internally connected to their respective averaging manifolds. The flow sensors shall not protrude beyond the surface of the probe(s), and shall be the offset (Fechheimer) type for static pressure and the chamfered impact type for total pressure measurement. The airflow station's measured accuracy shall not be affected by directional flow having yaw and/or pitch angles up to 30º.

The airflow measuring station(s) shall have a 14 ga. [18 ga. for circular units] galvanized steel, 6" deep welding casing with 90º connecting flanges. Total and static pressure sensors shall be located at the centers of equal areas (for rectangular ducts) or at equal concentric area centers (for circular ducts) across the station's face area.

Stations shall be AMCA certified and be capable of measuring the airflow rates within an accuracy of ±2% without the use of correction factors. The maximum allowable unrecovered pressure drop caused by the station shall not exceed .025" w.c. at 2000 FPM, or .085" w.c. at 4000 FPM.

The Airflow Measuring Stations(s) shall be the VOLU-probe/VS as manufactured by Air Monitor Corporation, Santa Rosa, California.

Fan Inlet Mounted Systems:

Flow Station:

The Airflow Measuring Station shall contain multiple total and static pressure sensors placed at concentric area centers along the exterior surface of the cylindrical probes and internally connected to their respective averaging manifolds. Sensors shall not protrude beyond the surface of the probe, nor be adversely affected by particle contamination normally present in building system airflows.

The Airflow Measuring Station shall have symmetrical averaging signal takeoffs, and shall be of aluminum construction with hard anodized finish [copper construction] with galvanized steel mounting hardware.

The Airflow Measuring Station shall not significantly impact fan performance or contribute to fan generated noise levels. The probes shall be capable of producing steady, non-pulsating signals of standard total and static pressure, without need for flow corrections or factors, with an accuracy of 3% of actual flow over a fan operating range of 6 to 1 capacity turndown.

The Airflow Measuring Station shall be the VOLU-probe/FI as manufactured by Air Monitor Corporation, Santa Rosa, California.

Transmitter (for both Duct and Fan Inlet Flow Stations above):

The Transmitter shall be capable of receiving flow signals (total and static pressure) from an airflow station or probe array and produce dual outputs linear and scaled for air volume, velocity, differential pressure, etc.

The Transmitter shall contain an integral multi-line digital display for use during the configuration and calibration process, and to display one transmitter output during normal operating mode. All Transmitter configuration, parameter setting, zero and span calibration, plus display formatting and scaling will be performed digitally in the on-board microprocessor via input pushbuttons.

The 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.

(Optional) Using a second Transmitter as an input, the internal microprocessor can perform a summed flow, flow differential, low signal select, high signal select or percent deviation calculation, with the result being displayed and provided as an analog output signal.

The Transmitter shall be the VELTRON II as manufactured by Air Monitor Corporation, Santa Rosa, California.

Outside Airflow Measurement Systems (louvers/rainhoods):

The Outside Airflow Measurement System shall be capable of direct measurement of airflow through an outside air inlet and produce dual outputs; one representing the measured airflow, and the other to control the inlet damper.

The Outside Airflow Measurement System shall contain an integral multi-line liquid crystal display for use during the configuration and calibration processes, and to display two measured processes (volume, velocity, temperature) during normal operation. All configuration, output scaling, calibration, and controller tuning will be performed digitally in the on-board microprocessor via input pushbuttons.

The Outside Airflow Measurement System shall measure inlet airflow with an accuracy of ±5% of reading over a range of 150-600 FPM, 250-1,000 FPM, 150-2,000 FPM, and 500-2,000 FPM and not have its reading affected by the presence of directional or gusting wind. Measured airflow shall be density corrected for ambient temperature variances, and atmospheric pressure due to site altitude.

The Outside Airflow Measurement System shall interface with existing building automation systems (BAS), accepting inputs for fan system start, economizer mode operation, and an external controller setpoint, and provide flow deviation alarm outputs.

The sensors shall be constructed of materials that resist corrosion due to the presence of salt or chemicals in the air; all non-painted surfaces shall be constructed of stainless steel. The electronics enclosure shall be NEMA 1 [NEMA 4; NEMA 4 with enclosure heater and insulation].

The Outside Airflow Measurement System shall be the VOLU-flo/OAM as manufactured by Air Monitor Corporation, Santa Rosa, California

AIRFLOW MEASURING SYSTEM(S)

Provide where indicated, Airflow Measuring System(s) capable of continuously monitoring the fan or duct capacities (air volumes) they serve. Each Airflow Measuring System shall consist of an Airflow Measuring Station and a Transmitter. In order to guarantee the overall accuracy and performance of the Airflow Measuring System, the Airflow Measuring Station and the Transmitter shall be by the same manufacturer.

Duct Mounted Systems:

Flow Station:

Each airflow traverse probe mounted within the station shall contain multiple total and static pressure sensors located along its exterior surface, and internally connected to their respective averaging manifolds. The flow sensors shall not protrude beyond the surface of the probe(s), and shall be the offset (Fechheimer) type for static pressure and the chamfered impact type for total pressure measurement. The airflow station's measured accuracy shall not be affected by directional flow having yaw and/or pitch angles up to 30º.

The airflow measuring station(s) shall have a 14 ga. [18 ga. for circular units] galvanized steel, 6" deep welding casing with 90º connecting flanges. Total and static pressure sensors shall be located at the centers of equal areas (for rectangular ducts) or at equal concentric area centers (for circular ducts) across the station's face area.

Stations shall be AMCA certified and be capable of measuring the airflow rates within an accuracy of ±2% without the use of correction factors. The maximum allowable unrecovered pressure drop caused by the station shall not exceed .025" w.c. at 2000 FPM, or .085" w.c. at 4000 FPM.

The Airflow Measuring Stations(s) shall be the VOLU-probe/VS as manufactured by Air Monitor Corporation, Santa Rosa, California.

Fan Inlet Mounted Systems:

Flow Station:

The Airflow Measuring Station shall contain multiple total and static pressure sensors placed at concentric area centers along the exterior surface of the cylindrical probes and internally connected to their respective averaging manifolds. Sensors shall not protrude beyond the surface of the probe, nor be adversely affected by particle contamination normally present in building system airflows.

The Airflow Measuring Station shall have symmetrical averaging signal takeoffs, and shall be of aluminum construction with hard anodized finish [copper construction] with galvanized steel mounting hardware.

The Airflow Measuring Station shall not significantly impact fan performance or contribute to fan generated noise levels. The probes shall be capable of producing steady, non-pulsating signals of standard total and static pressure, without need for flow corrections or factors, with an accuracy of 3% of actual flow over a fan operating range of 6 to 1 capacity turndown.

The Airflow Measuring Station shall be the VOLU-probe/FI as manufactured by Air Monitor Corporation, Santa Rosa, California.

Transmitter (for both Duct and Fan Inlet Flow Stations above):

The Transmitter shall be capable of receiving flow signals (total and static pressure) from an airflow station or probe array and produce an output linear and scaled for air volume, velocity, differential pressure, etc.

The Transmitter shall contain an integral multi-line digital display for use during the configuration and calibration process, and to display one Transmitter output during normal operating mode. All Transmitter configuration, parameter setting, zero and span calibration, plus display formatting and scaling will be performed digitally in the on-board microprocessor via input pushbuttons.

The Transmitter will be available in multiple natural spans covering the range of 0.05 IN w.c. to 25.0 IN w.c. with an accuracy of 0.25% 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 turndown.

The Transmitter shall be the VELTRON DPT 2500-plus as manufactured by Air Monitor Corporation, Santa Rosa, California.

Outside Airflow Measurement Systems (louvers/rainhoods):

The Outside Airflow Measurement System shall be capable of direct measurement of airflow through an outside air inlet and produce dual outputs; one representing the measured airflow, and the other to control the inlet damper.

The Outside Airflow Measurement System shall contain an integral multi-line liquid crystal display for use during the configuration and calibration processes, and to display two measured processes (volume, velocity, temperature) during normal operation. All configuration, output scaling, calibration, and controller tuning will be performed digitally in the on-board microprocessor via input pushbuttons.

The Outside Airflow Measurement System shall measure inlet airflow with an accuracy of ±5% of reading over a range of 150-600 FPM, 250-1,000 FPM, 150-2,000 FPM, and 500-2,000 FPM and not have its reading affected by the presence of directional or gusting wind. Measured airflow shall be density corrected for ambient temperature variances, and atmospheric pressure due to site altitude.

The Outside Airflow Measurement System shall interface with existing building automation systems (BAS), accepting inputs for fan system start, economizer mode operation, and an external controller setpoint, and provide flow deviation alarm outputs.

The sensors shall be constructed of materials that resist corrosion due to the presence of salt or chemicals in the air; all non-painted surfaces shall be constructed of stainless steel. The electronics enclosure shall be NEMA 1 [NEMA 4; NEMA 4 with enclosure heater and insulation].

The Outside Airflow Measurement System shall be the VOLU-flo/OAM as manufactured by Air Monitor Corporation, Santa Rosa, California

AIRFLOW MEASURING SYSTEM(S)

Provide where indicated, Airflow Measuring System(s) capable of continuously monitoring the fan or duct capacities (air volumes) they serve. Each Airflow Measuring System shall consist of an Airflow Measuring Station and a Transmitter. In order to guarantee the overall accuracy and performance of the Airflow Measuring System, the Airflow Measuring Station and the Transmitter shall be by the same manufacturer.

Duct Mounted Systems:

Flow Station:

Each airflow traverse probe mounted within the station shall contain multiple total and static pressure sensors located along its exterior surface, and internally connected to their respective averaging manifolds. The flow sensors shall not protrude beyond the surface of the probe(s), and shall be the offset (Fechheimer) type for static pressure and the chamfered impact type for total pressure measurement. The airflow station's measured accuracy shall not be affected by directional flow having yaw and/or pitch angles up to 30º.

The airflow measuring station(s) shall have a 14 ga. [18 ga. for circular units] galvanized steel, 6" deep welding casing with 90º connecting flanges. Total and static pressure sensors shall be located at the centers of equal areas (for rectangular ducts) or at equal concentric area centers (for circular ducts) across the station's face area.

Stations shall be AMCA certified and be capable of measuring the airflow rates within an accuracy of ±2% without the use of correction factors. The maximum allowable unrecovered pressure drop caused by the station shall not exceed .025" w.c. at 2000 FPM, or .085" w.c. at 4000 FPM.

The Airflow Measuring Stations(s) shall be the VOLU-probe/VS as manufactured by Air Monitor Corporation, Santa Rosa, California.

Fan Inlet Mounted Systems:

Flow Station:

The Airflow Measuring Station shall contain multiple total and static pressure sensors placed at concentric area centers along the exterior surface of the cylindrical probes and internally connected to their respective averaging manifolds. Sensors shall not protrude beyond the surface of the probe, nor be adversely affected by particle contamination normally present in building system airflows.

The Airflow Measuring Station shall have symmetrical averaging signal takeoffs, and shall be of aluminum construction with hard anodized finish [copper construction] with galvanized steel mounting hardware.

The Airflow Measuring Station shall not significantly impact fan performance or contribute to fan generated noise levels. The probes shall be capable of producing steady, non-pulsating signals of standard total and static pressure, without need for flow corrections or factors, with an accuracy of 3% of actual flow over a fan operating range of 6 to 1 capacity turndown.

The Airflow Measuring Station shall be the VOLU-probe/FI as manufactured by Air Monitor Corporation, Santa Rosa, California.

Transmitter (for both Duct and Fan Inlet Flow Stations above):

The Transmitter shall have an accuracy of ±0.5% of Natural Span and be furnished with a built-in 3-way zeroing valve, user selectable square root function, and integral 3½ digit scalable LCD for display of measured process. The Transmitter shall be housed in a NEMA 1 aluminum [NEMA 12 steel] enclosure with universal 1/8” FPT signal connection ports.

The Transmitter shall be the VELTRON DPT 2500 [2500I] as manufactured by Air Monitor Corporation, Santa Rosa, California.

Outside Airflow Measurement Systems (louvers/rainhoods):

The Outside Airflow Measurement System shall be capable of direct measurement of airflow through an outside air inlet and produce dual outputs; one representing the measured airflow, and the other to control the inlet damper.

The Outside Airflow Measurement System shall contain an integral multi-line liquid crystal display for use during the configuration and calibration processes, and to display two measured processes (volume, velocity, temperature) during normal operation. All configuration, output scaling, calibration, and controller tuning will be performed digitally in the on-board microprocessor via input pushbuttons.

The Outside Airflow Measurement System shall measure inlet airflow with an accuracy of ±5% of reading over a range of 150-600 FPM, 250-1,000 FPM, 150-2,000 FPM, and 500-2,000 FPM and not have its reading affected by the presence of directional or gusting wind. Measured airflow shall be density corrected for ambient temperature variances, and atmospheric pressure due to site altitude.

The Outside Airflow Measurement System shall interface with existing building automation systems (BAS), accepting inputs for fan system start, economizer mode operation, and an external controller setpoint, and provide flow deviation alarm outputs.

The sensors shall be constructed of materials that resist corrosion due to the presence of salt or chemicals in the air; all non-painted surfaces shall be constructed of stainless steel. The electronics enclosure shall be NEMA 1 [NEMA 4; NEMA 4 with enclosure heater and insulation].

The Outside Airflow Measurement System shall be the VOLU-flo/OAM as manufactured by Air Monitor Corporation, Santa Rosa, California

AIRFLOW MEASURING SYSTEM(S)

Provide where indicated, Airflow Measuring System(s) capable of continuously monitoring the fan or duct capacities (air volumes) they serve. Each Airflow Measuring System shall consist of an Airflow Measuring Station and a Transmitter. In order to guarantee the overall accuracy and performance of the Airflow Measuring System, the Airflow Measuring Station and the Transmitter shall be by the same manufacturer.

Duct Mounted Systems:

Flow Station:

Each airflow traverse probe shall contain multiple total and static pressure sensors located along the exterior surface of the cylindrical probe and internally connected to their respective averaging manifolds. The flow sensors shall not protrude beyond the surface of the probe(s), and shall be the offset (Fechheimer) type for static pressure and the chamfered impact type for total pressure measurement. The airflow sensing probe's measurement accuracy shall not be affected by directional flow having pitch and/or yaw angles up to 30º. Each airflow traverse probe shall be of extruded aluminum construction and furnished with mounting plate(s), gasket, and signal fittings suitable for HVAC duct installation.

Total and static pressure sensors shall be located at the centers of equal areas (for rectangular ducts) or at equal concentric area centers (for circular ducts) along the probe length.

Probes shall be AMCA certified and be capable of measuring the airflow rates within an accuracy of ±2% without the use of correction factors. The maximum allowable unrecovered pressure drop caused by the probes shall not exceed .025" w.c. at 2000 FPM, or .085" w.c. at 4000 FPM.

The Airflow Measuring Station(s) shall be the VOLU-probe[/1,/2,/3,/4] as manufactured by Air Monitor Corporation, Santa Rosa, California

Fan Inlet Mounted Systems:

Flow Station:

The Airflow Measuring Station shall contain multiple total and static pressure sensors placed at concentric area centers along the exterior surface of the cylindrical probes and internally connected to their respective averaging manifolds. Sensors shall not protrude beyond the surface of the probe, nor be adversely affected by particle contamination normally present in building system airflows.

The Airflow Measuring Station shall have symmetrical averaging signal takeoffs, and shall be of aluminum construction with hard anodized finish [copper construction] with galvanized steel mounting hardware.

The Airflow Measuring Station shall not significantly impact fan performance or contribute to fan generated noise levels. The probes shall be capable of producing steady, non-pulsating signals of standard total and static pressure, without need for flow corrections or factors, with an accuracy of 3% of actual flow over a fan operating range of 6 to 1 capacity turndown.

The Airflow Measuring Station shall be the VOLU-probe/FI as manufactured by Air Monitor Corporation, Santa Rosa, California.

Transmitter (for both Duct and Fan Inlet Flow Stations above):

The Transmitter shall be capable of receiving flow signals (total and static pressure) from an airflow station or probe array and produce dual outputs linear and scaled for air volume, velocity, differential pressure, etc.

The Transmitter shall contain an integral multi-line digital display for use during the configuration and calibration process, and to display one transmitter output during normal operating mode. All Transmitter configuration, parameter setting, zero and span calibration, plus display formatting and scaling will be performed digitally in the on-board microprocessor via input pushbuttons.

The 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.

(Optional) Using a second Transmitter as an input, the internal microprocessor can perform a summed flow, flow differential, low signal select, high signal select or percent deviation calculation, with the result being displayed and provided as an analog output signal.

The Transmitter shall be the VELTRON II as manufactured by Air Monitor Corporation, Santa Rosa, California.

Outside Airflow Measurement Systems (louvers/rainhoods):

The Outside Airflow Measurement System shall be capable of direct measurement of airflow through an outside air inlet and produce dual outputs; one representing the measured airflow, and the other to control the inlet damper.

The Outside Airflow Measurement System shall contain an integral multi-line liquid crystal display for use during the configuration and calibration processes, and to display two measured processes (volume, velocity, temperature) during normal operation. All configuration, output scaling, calibration, and controller tuning will be performed digitally in the on-board microprocessor via input pushbuttons.

The Outside Airflow Measurement System shall measure inlet airflow with an accuracy of ±5% of reading over a range of 150-600 FPM, 250-1,000 FPM, 150-2,000 FPM, and 500-2,000 FPM and not have its reading affected by the presence of directional or gusting wind. Measured airflow shall be density corrected for ambient temperature variances, and atmospheric pressure due to site altitude.

The Outside Airflow Measurement System shall interface with existing building automation systems (BAS), accepting inputs for fan system start, economizer mode operation, and an external controller setpoint, and provide flow deviation alarm outputs.

The sensors shall be constructed of materials that resist corrosion due to the presence of salt or chemicals in the air; all non-painted surfaces shall be constructed of stainless steel. The electronics enclosure shall be NEMA 1 [NEMA 4; NEMA 4 with enclosure heater and insulation].

The Outside Airflow Measurement System shall be the VOLU-flo/OAM as manufactured by Air Monitor Corporation, Santa Rosa, California

AIRFLOW MEASURING SYSTEM(S)

Provide where indicated, Airflow Measuring System(s) capable of continuously monitoring the fan or duct capacities (air volumes) they serve. Each Airflow Measuring System shall consist of an Airflow Measuring Station and a Transmitter. In order to guarantee the overall accuracy and performance of the Airflow Measuring System, the Airflow Measuring Station and the Transmitter shall be by the same manufacturer.

Duct Mounted Systems:

Flow Station:

Each airflow traverse probe shall contain multiple total and static pressure sensors located along the exterior surface of the cylindrical probe and internally connected to their respective averaging manifolds. The flow sensors shall not protrude beyond the surface of the probe(s), and shall be the offset (Fechheimer) type for static pressure and the chamfered impact type for total pressure measurement. The airflow sensing probe's measurement accuracy shall not be affected by directional flow having pitch and/or yaw angles up to 30º. Each airflow traverse probe shall be of extruded aluminum construction and furnished with mounting plate(s), gasket, and signal fittings suitable for HVAC duct installation.

Total and static pressure sensors shall be located at the centers of equal areas (for rectangular ducts) or at equal concentric area centers (for circular ducts) along the probe length.

Probes shall be AMCA certified and be capable of measuring the airflow rates within an accuracy of ±2% without the use of correction factors. The maximum allowable unrecovered pressure drop caused by the probes shall not exceed .025" w.c. at 2000 FPM, or .085" w.c. at 4000 FPM.

The Airflow Measuring Station(s) shall be the VOLU-probe[/1,/2,/3,/4] as manufactured by Air Monitor Corporation, Santa Rosa, California

Fan Inlet Mounted Systems:

Flow Station:

The Airflow Measuring Station shall contain multiple total and static pressure sensors placed at concentric area centers along the exterior surface of the cylindrical probes and internally connected to their respective averaging manifolds. Sensors shall not protrude beyond the surface of the probe, nor be adversely affected by particle contamination normally present in building system airflows.

The Airflow Measuring Station shall have symmetrical averaging signal takeoffs, and shall be of aluminum construction with hard anodized finish [copper construction] with galvanized steel mounting hardware.

The Airflow Measuring Station shall not significantly impact fan performance or contribute to fan generated noise levels. The probes shall be capable of producing steady, non-pulsating signals of standard total and static pressure, without need for flow corrections or factors, with an accuracy of 3% of actual flow over a fan operating range of 6 to 1 capacity turndown.

The Airflow Measuring Station shall be the VOLU-probe/FI as manufactured by Air Monitor Corporation, Santa Rosa, California.

Transmitter (for both Duct and Fan Inlet Flow Stations above):

The Transmitter shall be capable of receiving flow signals (total and static pressure) from an airflow station or probe array and produce an output linear and scaled for air volume, velocity, differential pressure, etc.

The Transmitter shall contain an integral multi-line digital display for use during the configuration and calibration process, and to display one Transmitter output during normal operating mode. All Transmitter configuration, parameter setting, zero and span calibration, plus display formatting and scaling will be performed digitally in the on-board microprocessor via input pushbuttons.

The Transmitter will be available in multiple natural spans covering the range of 0.05 IN w.c. to 25.0 IN w.c. with an accuracy of 0.25% 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 turndown.

The Transmitter shall be the VELTRON DPT 2500-plus as manufactured by Air Monitor Corporation, Santa Rosa, California.

Outside Airflow Measurement Systems (louvers/rainhoods):

The Outside Airflow Measurement System shall be capable of direct measurement of airflow through an outside air inlet and produce dual outputs; one representing the measured airflow, and the other to control the inlet damper.

The Outside Airflow Measurement System shall contain an integral multi-line liquid crystal display for use during the configuration and calibration processes, and to display two measured processes (volume, velocity, temperature) during normal operation. All configuration, output scaling, calibration, and controller tuning will be performed digitally in the on-board microprocessor via input pushbuttons.

The Outside Airflow Measurement System shall measure inlet airflow with an accuracy of ±5% of reading over a range of 150-600 FPM, 250-1,000 FPM, 150-2,000 FPM, and 500-2,000 FPM and not have its reading affected by the presence of directional or gusting wind. Measured airflow shall be density corrected for ambient temperature variances, and atmospheric pressure due to site altitude.

The Outside Airflow Measurement System shall interface with existing building automation systems (BAS), accepting inputs for fan system start, economizer mode operation, and an external controller setpoint, and provide flow deviation alarm outputs.

The sensors shall be constructed of materials that resist corrosion due to the presence of salt or chemicals in the air; all non-painted surfaces shall be constructed of stainless steel. The electronics enclosure shall be NEMA 1 [NEMA 4; NEMA 4 with enclosure heater and insulation].

The Outside Airflow Measurement System shall be the VOLU-flo/OAM as manufactured by Air Monitor Corporation, Santa Rosa, California

AIRFLOW MEASURING SYSTEM(S)

Provide where indicated, Airflow Measuring System(s) capable of continuously monitoring the fan or duct capacities (air volumes) they serve. Each Airflow Measuring System shall consist of an Airflow Measuring Station and a Transmitter. In order to guarantee the overall accuracy and performance of the Airflow Measuring System, the Airflow Measuring Station and the Transmitter shall be by the same manufacturer.

Duct Mounted Systems:

Flow Station:

Each airflow traverse probe shall contain multiple total and static pressure sensors located along the exterior surface of the cylindrical probe and internally connected to their respective averaging manifolds. The flow sensors shall not protrude beyond the surface of the probe(s), and shall be the offset (Fechheimer) type for static pressure and the chamfered impact type for total pressure measurement. The airflow sensing probe's measurement accuracy shall not be affected by directional flow having pitch and/or yaw angles up to 30º. Each airflow traverse probe shall be of extruded aluminum construction and furnished with mounting plate(s), gasket, and signal fittings suitable for HVAC duct installation.

Total and static pressure sensors shall be located at the centers of equal areas (for rectangular ducts) or at equal concentric area centers (for circular ducts) along the probe length.

Probes shall be AMCA certified and be capable of measuring the airflow rates within an accuracy of ±2% without the use of correction factors. The maximum allowable unrecovered pressure drop caused by the probes shall not exceed .025" w.c. at 2000 FPM, or .085" w.c. at 4000 FPM.

The Airflow Measuring Station(s) shall be the VOLU-probe[/1,/2,/3,/4] as manufactured by Air Monitor Corporation, Santa Rosa, California

Fan Inlet Mounted Systems:

Flow Station:

The Airflow Measuring Station shall contain multiple total and static pressure sensors placed at concentric area centers along the exterior surface of the cylindrical probes and internally connected to their respective averaging manifolds. Sensors shall not protrude beyond the surface of the probe, nor be adversely affected by particle contamination normally present in building system airflows.

The Airflow Measuring Station shall have symmetrical averaging signal takeoffs, and shall be of aluminum construction with hard anodized finish [copper construction] with galvanized steel mounting hardware.

The Airflow Measuring Station shall not significantly impact fan performance or contribute to fan generated noise levels. The probes shall be capable of producing steady, non-pulsating signals of standard total and static pressure, without need for flow corrections or factors, with an accuracy of 3% of actual flow over a fan operating range of 6 to 1 capacity turndown.

The Airflow Measuring Station shall be the VOLU-probe/FI as manufactured by Air Monitor Corporation, Santa Rosa, California.

Transmitter (for both Duct and Fan Inlet Flow Stations above):

The Transmitter shall have an accuracy of ±0.5% of Natural Span and be furnished with a built-in 3-way zeroing valve, user selectable square root function, and integral 3½ digit scalable LCD for display of measured process. The Transmitter shall be housed in a NEMA 1 aluminum [NEMA 12 steel] enclosure with universal 1/8" FPT signal connection ports.

The Transmitter shall be the VELTRON DPT 2500 [2500I] as manufactured by Air Monitor Corporation, Santa Rosa, California

Outside Airflow Measurement Systems (louvers/rainhoods):

The Outside Airflow Measurement System shall be capable of direct measurement of airflow through an outside air inlet and produce dual outputs; one representing the measured airflow, and the other to control the inlet damper.

The Outside Airflow Measurement System shall contain an integral multi-line liquid crystal display for use during the configuration and calibration processes, and to display two measured processes (volume, velocity, temperature) during normal operation. All configuration, output scaling, calibration, and controller tuning will be performed digitally in the on-board microprocessor via input pushbuttons.

The Outside Airflow Measurement System shall measure inlet airflow with an accuracy of ±5% of reading over a range of 150-600 FPM, 250-1,000 FPM, 150-2,000 FPM, and 500-2,000 FPM and not have its reading affected by the presence of directional or gusting wind. Measured airflow shall be density corrected for ambient temperature variances, and atmospheric pressure due to site altitude.

The Outside Airflow Measurement System shall interface with existing building automation systems (BAS), accepting inputs for fan system start, economizer mode operation, and an external controller setpoint, and provide flow deviation alarm outputs.

The sensors shall be constructed of materials that resist corrosion due to the presence of salt or chemicals in the air; all non-painted surfaces shall be constructed of stainless steel. The electronics enclosure shall be NEMA 1 [NEMA 4; NEMA 4 with enclosure heater and insulation].

The Outside Airflow Measurement System shall be the VOLU-flo/OAM as manufactured by Air Monitor Corporation, Santa Rosa, California

AIRFLOW MEASURING SYSTEM(S)

Provide where indicated, Airflow Measuring System(s) capable of continuously monitoring the fan or duct capacities (air volumes) they serve. Each Airflow Measuring System shall consist of an Airflow Measuring Station and a Transmitter. In order to guarantee the overall accuracy and performance of the Airflow Measuring System, the Airflow Measuring Station and the Transmitter shall be by the same manufacturer.

Duct Mounted Systems:

Flow Station:

Where indicated on the plans, provide airflow/ temperature station(s) capable of continuously measuring airflow velocity/volume and temperature.

Each station shall consist of one or more multi-point measuring probes and a single microprocessor based transmitter. The transmitter shall be supplied by the same manufacturer as the measuring station or probe array.

Each multi-point probe shall be assembled using heavy wall anodized aluminum tubing, aluminum mounting plates, aerodynamically optimized molded sensing apertures to ensure accurate measurement in angular airflow conditions, and neoprene mounting gasket.

Station shall be connected to the transmitter using a single cable, of up to 100' in length, included with the transmitter.

Each stand-alone sensing point shall use an ambient temperature thermistor and an externally heated thermistor to determine the point velocity and temperature. Automatic equal area averaging of the individual point measurements shall be performed in the transmitter.

Each airflow sensor shall have an operating range of 5,000 FPM, with a NIST traceable accuracy of ±2% of reading for velocity measurement and 0.1ºF for temperature measurement.

The number of sensors for each rectangular station shall be:

Station Area	Sensor Density
1 to < 15 Sq. Ft.	1.50 Sq. Ft. Per Sensor
15 to < 30 Sq. Ft.	1.67 Sq. Ft. Per Sensor
30 to < 60 Sq. Ft.	2.10 Sq. Ft. Per Sensor
60 to 100 Sq. Ft.	3.13 Sq. Ft. Per Sensor

Individual sensors shall be fully field serviceable without need for field calibration, not requiring that the probe be returned to the Factory for repair and/or calibration.

Each transmitter shall be capable of averaging as many as thirty-two (32) sensors.

The transmitter will have a high visibility backlit LCD for display of either the averaged or individual sensor airflow and temperature measurements, in user selectable units of measure. The transmitter shall be factory configured to output duct air volume for plug and play operation.

All transmitter configuration, scaling, and diagnostic functions shall be performed by means of a password protected, cover mounted membrane keypad.

Transmitter outputs shall be dual analog (4-20mA, 0-5VDC or 0-10VDC) for airflow and temperature or optional LonWorks® communication interface.

The operating temperature range of the transmitter shall be from -20º to 140ºF. The transmitter shall be located where it will be sheltered from water or weather.

Input power to each transmitter shall be 24VAC/24VDC.

Stations shall have a 14 ga. [18 ga. for circular units] galvanized steel, 8" deep, welded casing with 90º formed flanges. Each station will have 1/2" hex, 3" deep aluminum honeycomb air straightener positioned upstream of the measuring

probes. Transmitter shall be provided integrally mounted to the station or with interconnect cable for remote mounting up to 100' away.

When installed per the manufacturer's minimum installation requirements, the transmitter with accompanying station or probe array shall measure with an accuracy of ±2-3% of actual airflow.

The acceptable manufacturer is Air Monitor Corporation, and the product is the ELECTRA-flo/CM.

Fan Inlet Mounted Systems:

Flow Station:

The Airflow Measuring Station shall contain multiple total and static pressure sensors placed at concentric area centers along the exterior surface of the cylindrical probes and internally connected to their respective averaging manifolds. Sensors shall not protrude beyond the surface of the probe, nor be adversely affected by particle contamination normally present in building system airflows.

The Airflow Measuring Station shall have symmetrical averaging signal takeoffs, and shall be of aluminum construction with hard anodized finish [copper construction] with galvanized steel mounting hardware.

The Airflow Measuring Station shall not significantly impact fan performance or contribute to fan generated noise levels. The probes shall be capable of producing steady, non-pulsating signals of standard total and static pressure, without need for flow corrections or factors, with an accuracy of 3% of actual flow over a fan operating range of 6 to 1 capacity turndown.

The Airflow Measuring Station shall be the VOLU-probe/FI as manufactured by Air Monitor Corporation, Santa Rosa, California.

Transmitter:

The Transmitter shall be capable of receiving flow signals (total and static pressure) from an airflow station or probe array and produce dual outputs linear and scaled for air volume, velocity, differential pressure, etc.

The Transmitter shall contain an integral multi-line digital display for use during the configuration and calibration process, and to display one transmitter output during normal operating mode. All Transmitter configuration, parameter setting, zero and span calibration, plus display formatting and scaling will be performed digitally in the on-board microprocessor via input pushbuttons.

The 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.

(Optional) Using a second Transmitter as an input, the internal microprocessor can perform a summed flow, flow differential, low signal select, high signal select or percent deviation calculation, with the result being displayed and provided as an analog output signal.

The Transmitter shall be the VELTRON II as manufactured by Air Monitor Corporation, Santa Rosa, California.

Outside Airflow Measurement Systems (louvers/rainhoods):

The Outside Airflow Measurement System shall be capable of direct measurement of airflow through an outside air inlet and produce dual outputs; one representing the measured airflow, and the other to control the inlet damper.

The Outside Airflow Measurement System shall contain an integral multi-line liquid crystal display for use during the configuration and calibration processes, and to display two measured processes (volume, velocity, temperature) during normal operation. All configuration, output scaling, calibration, and controller tuning will be performed digitally in the on-board microprocessor via input pushbuttons.

The Outside Airflow Measurement System shall measure inlet airflow with an accuracy of ±5% of reading over a range of 150-600 FPM, 250-1,000 FPM, 150-2,000 FPM, and 500-2,000 FPM and not have its reading affected by the presence of directional or gusting wind. Measured airflow shall be density corrected for ambient temperature variances, and atmospheric pressure due to site altitude.

The Outside Airflow Measurement System shall interface with existing building automation systems (BAS), accepting inputs for fan system start, economizer mode operation, and an external controller setpoint, and provide flow deviation alarm outputs.

The sensors shall be constructed of materials that resist corrosion due to the presence of salt or chemicals in the air; all non-painted surfaces shall be constructed of stainless steel. The electronics enclosure shall be NEMA 1 [NEMA 4; NEMA 4 with enclosure heater and insulation].

The Outside Airflow Measurement System shall be the VOLU-flo/OAM as manufactured by Air Monitor Corporation, Santa Rosa, California

AIRFLOW MEASURING SYSTEM(S)

Provide where indicated, Airflow Measuring System(s) capable of continuously monitoring the fan or duct capacities (air volumes) they serve. Each Airflow Measuring System shall consist of an Airflow Measuring Station and a Transmitter. In order to guarantee the overall accuracy and performance of the Airflow Measuring System, the Airflow Measuring Station and the Transmitter shall be by the same manufacturer.

Duct Mounted Systems:

Flow Station:

Where indicated on the plans, provide airflow/ temperature station(s) capable of continuously measuring airflow velocity/volume and temperature.

Each station shall consist of one or more multi-point measuring probes and a single microprocessor based transmitter. The transmitter shall be supplied by the same manufacturer as the measuring station or probe array.

Each multi-point probe shall be assembled using heavy wall anodized aluminum tubing, aluminum mounting plates, aerodynamically optimized molded sensing apertures to ensure accurate measurement in angular airflow conditions, and neoprene mounting gasket.

Station shall be connected to the transmitter using a single cable, of up to 100' in length, included with the transmitter.

Each stand-alone sensing point shall use an ambient temperature thermistor and an externally heated thermistor to determine the point velocity and temperature. Automatic equal area averaging of the individual point measurements shall be performed in the transmitter.

Each airflow sensor shall have an operating range of 5,000 FPM, with a NIST traceable accuracy of ±2% of reading for velocity measurement and 0.1ºF for temperature measurement.

The number of sensors for each rectangular station shall be:

Station Area	Sensor Density
1 to < 15 Sq. Ft.	1.50 Sq. Ft. Per Sensor
15 to < 30 Sq. Ft.	1.67 Sq. Ft. Per Sensor
30 to < 60 Sq. Ft.	2.10 Sq. Ft. Per Sensor
60 to 100 Sq. Ft.	3.13 Sq. Ft. Per Sensor

Individual sensors shall be fully field serviceable without need for field calibration, not requiring that the probe be returned to the Factory for repair and/or calibration.

Each transmitter shall be capable of averaging as many as thirty-two (32) sensors. The transmitter will have a high visibility backlit LCD for display of either the averaged or individual sensor airflow and temperature measurements, in user selectable units of measure. The transmitter shall be factory configured to output duct air volume for plug and play operation.

All transmitter configuration, scaling, and diagnostic functions shall be performed by means of a password protected, cover mounted membrane keypad.

Transmitter outputs shall be dual analog (4-20mA, 0-5VDC or 0-10VDC) for airflow and temperature or optional LonWorks® communication interface.

The operating temperature range of the transmitter shall be from -20º to 140ºF. The transmitter shall be located where it will be sheltered from water or weather.

Input power to each transmitter shall be 24VAC/24VDC.

Stations shall have a 14 ga. [18 ga. for circular units] galvanized steel, 8" deep, welded casing with 90º formed flanges. Each station will have ½" hex, 3" deep aluminum honeycomb air straightener positioned upstream of the measuring

probes. Transmitter shall be provided integrally mounted to the station or with interconnect cable for remote mounting up to 100' away.

When installed per the manufacturer's minimum installation requirements, the transmitter with accompanying station or probe array shall measure with an accuracy of ±2-3% of actual airflow.

The acceptable manufacturer is Air Monitor Corporation, and the product is the ELECTRA-flo/CM.

Fan Inlet Mounted Systems:

Flow Station:

The Airflow Measuring Station shall contain multiple total and static pressure sensors placed at concentric area centers along the exterior surface of the cylindrical probes and internally connected to their respective averaging manifolds. Sensors shall not protrude beyond the surface of the probe, nor be adversely affected by particle contamination normally present in building system airflows.

The Airflow Measuring Station shall have symmetrical averaging signal takeoffs, and shall be of aluminum construction with hard anodized finish [copper construction] with galvanized steel mounting hardware.

The Airflow Measuring Station shall not significantly impact fan performance or contribute to fan generated noise levels. The probes shall be capable of producing steady, non-pulsating signals of standard total and static pressure, without need for flow corrections or factors, with an accuracy of 3% of actual flow over a fan operating range of 6 to 1 capacity turndown.

The Airflow Measuring Station shall be the VOLU-probe/FI as manufactured by Air Monitor Corporation, Santa Rosa, California.

Transmitter:

The Transmitter shall be capable of receiving flow signals (total and static pressure) from an airflow station or probe array and produce an output linear and scaled for air volume, velocity, differential pressure, etc.

The Transmitter shall contain an integral multi-line digital display for use during the configuration and calibration process, and to display one Transmitter output during normal operating mode. All Transmitter configuration, parameter setting, zero and span calibration, plus display formatting and scaling will be performed digitally in the on-board microprocessor via input pushbuttons.

The Transmitter will be available in multiple natural spans covering the range of 0.05 IN w.c. to 25.0 IN w.c. with an accuracy of 0.25% 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 turndown.

The Transmitter shall be the VELTRON DPT 2500-plus as manufactured by Air Monitor Corporation, Santa Rosa, California.

Outside Airflow Measurement Systems (louvers/rainhoods):

The Outside Airflow Measurement System shall be capable of direct measurement of airflow through an outside air inlet and produce dual outputs; one representing the measured airflow, and the other to control the inlet damper.

The Outside Airflow Measurement System shall contain an integral multi-line liquid crystal display for use during the configuration and calibration processes, and to display two measured processes (volume, velocity, temperature) during normal operation. All configuration, output scaling, calibration, and controller tuning will be performed digitally in the on-board microprocessor via input pushbuttons.

The Outside Airflow Measurement System shall measure inlet airflow with an accuracy of ±5% of reading over a range of 150-600 FPM, 250-1,000 FPM, 150-2,000 FPM, and 500-2,000 FPM and not have its reading affected by the presence of directional or gusting wind. Measured airflow shall be density corrected for ambient temperature variances, and atmospheric pressure due to site altitude.

The Outside Airflow Measurement System shall interface with existing building automation systems (BAS), accepting inputs for fan system start, economizer mode operation, and an external controller setpoint, and provide flow deviation alarm outputs.

The sensors shall be constructed of materials that resist corrosion due to the presence of salt or chemicals in the air; all non-painted surfaces shall be constructed of stainless steel. The electronics enclosure shall be NEMA 1 [NEMA 4; NEMA 4 with enclosure heater and insulation].

The Outside Airflow Measurement System shall be the VOLU-flo/OAM as manufactured by Air Monitor Corporation, Santa Rosa, California

AIRFLOW MEASURING SYSTEM(S)

Provide where indicated, Airflow Measuring System(s) capable of continuously monitoring the fan or duct capacities (air volumes) they serve. Each Airflow Measuring System shall consist of an Airflow Measuring Station and a Transmitter. In order to guarantee the overall accuracy and performance of the Airflow Measuring System, the Airflow Measuring Station and the Transmitter shall be by the same manufacturer.

Duct Mounted Systems:

Flow Station:

Where indicated on the plans, provide airflow/ temperature station(s) capable of continuously measuring airflow velocity/volume and temperature.

Each station shall consist of one or more multi-point measuring probes and a single microprocessor based transmitter. The transmitter shall be supplied by the same manufacturer as the measuring station or probe array.

Each multi-point probe shall be assembled using heavy wall anodized aluminum tubing, aluminum mounting plates, aerodynamically optimized molded sensing apertures to ensure accurate measurement in angular airflow conditions, and neoprene mounting gasket.

Station shall be connected to the transmitter using a single cable, of up to 100' in length, included with the transmitter.

Each stand-alone sensing point shall use an ambient temperature thermistor and an externally heated thermistor to determine the point velocity and temperature. Automatic equal area averaging of the individual point measurements shall be performed in the transmitter.

Each airflow sensor shall have an operating range of 5,000 FPM, with a NIST traceable accuracy of ±2% of reading for velocity measurement and 0.1ºF for temperature measurement.

The number of sensors for each rectangular station shall be:

Station Area	Sensor Density
1 to < 15 Sq. Ft.	1.50 Sq. Ft. Per Sensor
15 to < 30 Sq. Ft.	1.67 Sq. Ft. Per Sensor
30 to < 60 Sq. Ft.	2.10 Sq. Ft. Per Sensor
60 to 100 Sq. Ft.	3.13 Sq. Ft. Per Sensor

Individual sensors shall be fully field serviceable without need for field calibration, not requiring that the probe be returned to the Factory for repair and/or calibration.

Each transmitter shall be capable of averaging as many as thirty-two (32) sensors.

The transmitter will have a high visibility backlit LCD for display of either the averaged or individual sensor airflow and temperature measurements, in user selectable units of measure. The transmitter shall be factory configured to output duct air volume for plug and play operation.

All transmitter configuration, scaling, and diagnostic functions shall be performed by means of a password protected, cover mounted membrane keypad.

Transmitter outputs shall be dual analog (4-20mA, 0-5VDC or 0-10VDC) for airflow and temperature or optional LonWorks® communication interface.

The operating temperature range of the transmitter shall be from -20º to 140ºF. The transmitter shall be located where it will be sheltered from water or weather.

Input power to each transmitter shall be 24VAC/24VDC.

Stations shall have a 14 ga. [18 ga. for circular units] galvanized steel, 8" deep, welded casing with 90º formed flanges. Each station will have ½" hex, 3" deep aluminum honeycomb air straightener positioned upstream of the measuring

probes. Transmitter shall be provided integrally mounted to the station or with interconnect cable for remote mounting up to 100' away.

When installed per the manufacturer's minimum installation requirements, the transmitter with accompanying station or probe array shall measure with an accuracy of ±2-3% of actual airflow.

The acceptable manufacturer is Air Monitor Corporation, and the product is the ELECTRA-flo/CM.

Fan Inlet Mounted Systems:

Flow Station:

The Airflow Measuring Station shall contain multiple total and static pressure sensors placed at concentric area centers along the exterior surface of the cylindrical probes and internally connected to their respective averaging manifolds. Sensors shall not protrude beyond the surface of the probe, nor be adversely affected by particle contamination normally present in building system airflows.

The Airflow Measuring Station shall have symmetrical averaging signal takeoffs, and shall be of aluminum construction with hard anodized finish [copper construction] with galvanized steel mounting hardware.

The Airflow Measuring Station shall not significantly impact fan performance or contribute to fan generated noise levels. The probes shall be capable of producing steady, non-pulsating signals of standard total and static pressure, without need for flow corrections or factors, with an accuracy of 3% of actual flow over a fan operating range of 6 to 1 capacity turndown.

The Airflow Measuring Station shall be the VOLU-probe/FI as manufactured by Air Monitor Corporation, Santa Rosa, California.

Transmitter:

The Transmitter shall have an accuracy of ±0.5% of Natural Span and be furnished with a built-in 3-way zeroing valve, user selectable square root function, and integral 3½ digit scalable LCD for display of measured process. The Transmitter shall be housed in a NEMA 1 aluminum [NEMA 12 steel] enclosure with universal 1/8" FPT signal connection ports.

The Transmitter shall be the VELTRON DPT 2500 [2500I] as manufactured by Air Monitor Corporation, Santa Rosa, California

Outside Airflow Measurement Systems (louvers/rainhoods):

The Outside Airflow Measurement System shall be capable of direct measurement of airflow through an outside air inlet and produce dual outputs; one representing the measured airflow, and the other to control the inlet damper.

The Outside Airflow Measurement System shall contain an integral multi-line liquid crystal display for use during the configuration and calibration processes, and to display two measured processes (volume, velocity, temperature) during normal operation. All configuration, output scaling, calibration, and controller tuning will be performed digitally in the on-board microprocessor via input pushbuttons.

The Outside Airflow Measurement System shall measure inlet airflow with an accuracy of ±5% of reading over a range of 150-600 FPM, 250-1,000 FPM, 150-2,000 FPM, and 500-2,000 FPM and not have its reading affected by the presence of directional or gusting wind. Measured airflow shall be density corrected for ambient temperature variances, and atmospheric pressure due to site altitude.

The Outside Airflow Measurement System shall interface with existing building automation systems (BAS), accepting inputs for fan system start, economizer mode operation, and an external controller setpoint, and provide flow deviation alarm outputs.

The sensors shall be constructed of materials that resist corrosion due to the presence of salt or chemicals in the air; all non-painted surfaces shall be constructed of stainless steel. The electronics enclosure shall be NEMA 1 [NEMA 4; NEMA 4 with enclosure heater and insulation].

The Outside Airflow Measurement System shall be the VOLU-flo/OAM as manufactured by Air Monitor Corporation, Santa Rosa, California.

AIRFLOW MEASURING SYSTEM(S)

Provide where indicated, Airflow Measuring System(s) capable of continuously monitoring the fan or duct capacities (air volumes) they serve. Each Airflow Measuring System shall consist of an Airflow Measuring Station and a Transmitter. In order to guarantee the overall accuracy and performance of the Airflow Measuring System, the Airflow Measuring Station and the Transmitter shall be by the same manufacturer.

Duct Mounted Systems:

Flow Station:

Where indicated on the plans, provide airflow/ temperature station(s) capable of continuously measuring airflow velocity/volume and temperature.

Each station shall consist of one or more multi-point measuring probes and a single microprocessor based transmitter. The transmitter shall be supplied by the same manufacturer as the measuring station.

Each multi-point probe shall be assembled using heavy wall anodized aluminum tubing, aluminum mounting plates, aerodynamically optimized molded sensing apertures to ensure accurate measurement in angular airflow conditions, and neoprene mounting gasket.

Station shall be connected to the transmitter using a single cable, of up to 100' in length, included with the transmitter.

Each stand-alone sensing point shall use an ambient temperature thermistor and an externally heated thermistor to determine the point velocity and temperature. Automatic equal area averaging of the individual point measurements shall be performed in the transmitter.

Each airflow sensor shall have an operating range of 5,000 FPM, with a NIST traceable accuracy of ±2% of reading for velocity measurement and 0.1ºF for temperature measurement.

The number of sensors for each rectangular station shall be:

Station Area	Sensor Density
1 to < 15 Sq. Ft.	1.50 Sq. Ft. Per Sensor
15 to < 30 Sq. Ft.	1.67 Sq. Ft. Per Sensor
30 to < 60 Sq. Ft.	2.10 Sq. Ft. Per Sensor
60 to 100 Sq. Ft.	3.13 Sq. Ft. Per Sensor

Individual sensors shall be fully field serviceable without need for field calibration, not requiring that the probe be returned to the Factory for repair and/or calibration.

Each transmitter shall be capable of averaging as many as thirty-two (32) sensors.

The transmitter will have a high visibility backlit LCD for display of either the averaged or individual sensor airflow and temperature measurements, in user selectable units of measure. The transmitter shall be factory configured to output duct air volume for plug and play operation.

All transmitter configuration, scaling, and diagnostic functions shall be performed by means of a password protected, cover mounted membrane keypad.

Transmitter outputs shall be dual analog (4-20mA, 0-5VDC or 0-10VDC) for airflow and temperature or optional LonWorks® communication interface.

The operating temperature range of the transmitter shall be from -20º to 140ºF. The transmitter shall be located where it will be sheltered from water or weather.

Input power to each transmitter shall be 24VAC/24VDC.

Stations shall have a 14 ga. [18 ga. for circular units] galvanized steel, 8" deep, welded casing with 90º formed flanges. Transmitter shall be provided integrally mounted to the station with interconnect cable for remote mounting up to 100' away.

When installed per the manufacturer's minimum installation requirements, the transmitter with accompanying station or probe array shall measure with an accuracy of ±2-3% of actual airflow.

The acceptable manufacturer is Air Monitor Corporation, and the product is the ELECTRA-flo/M.

Fan Inlet Mounted Systems:

Flow Station:

The Airflow Measuring Station shall contain multiple total and static pressure sensors placed at concentric area centers along the exterior surface of the cylindrical probes and internally connected to their respective averaging manifolds. Sensors shall not protrude beyond the surface of the probe, nor be adversely affected by particle contamination normally present in building system airflows.

The Airflow Measuring Station shall have symmetrical averaging signal takeoffs, and shall be of aluminum construction with hard anodized finish [copper construction] with galvanized steel mounting hardware.

The Airflow Measuring Station shall not significantly impact fan performance or contribute to fan generated noise levels. The probes shall be capable of producing steady, non-pulsating signals of standard total and static pressure, without need for flow corrections or factors, with an accuracy of 3% of actual flow over a fan operating range of 6 to 1 capacity turndown.

The Airflow Measuring Station shall be the VOLU-probe/FI as manufactured by Air Monitor Corporation, Santa Rosa, California.

Transmitter:

The Transmitter shall be capable of receiving flow signals (total and static pressure) from an airflow station or probe array and produce dual outputs linear and scaled for air volume, velocity, differential pressure, etc.

The Transmitter shall contain an integral multi-line digital display for use during the configuration and calibration process, and to display one transmitter output during normal operating mode. All Transmitter configuration, parameter setting, zero and span calibration, plus display formatting and scaling will be performed digitally in the on-board microprocessor via input pushbuttons.

The 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.

(Optional) Using a second Transmitter as an input, the internal microprocessor can perform a summed flow, flow differential, low signal select, high signal select or percent deviation calculation, with the result being displayed and provided as an analog output signal.

The Transmitter shall be the VELTRON II as manufactured by Air Monitor Corporation, Santa Rosa, California.

Outside Airflow Measurement Systems (louvers/rainhoods):

The Outside Airflow Measurement System shall be capable of direct measurement of airflow through an outside air inlet and produce dual outputs; one representing the measured airflow, and the other to control the inlet damper.

The Outside Airflow Measurement System shall contain an integral multi-line liquid crystal display for use during the configuration and calibration processes, and to display two measured processes (volume, velocity, temperature) during normal operation. All configuration, output scaling, calibration, and controller tuning will be performed digitally in the on-board microprocessor via input pushbuttons.

The Outside Airflow Measurement System shall measure inlet airflow with an accuracy of ±5% of reading over a range of 150-600 FPM, 250-1,000 FPM, 150-2,000 FPM, and 500-2,000 FPM and not have its reading affected by the presence of directional or gusting wind. Measured airflow shall be density corrected for ambient temperature variances, and atmospheric pressure due to site altitude.

The Outside Airflow Measurement System shall interface with existing building automation systems (BAS), accepting inputs for fan system start, economizer mode operation, and an external controller setpoint, and provide flow deviation alarm outputs.

The sensors shall be constructed of materials that resist corrosion due to the presence of salt or chemicals in the air; all non-painted surfaces shall be constructed of stainless steel. The electronics enclosure shall be NEMA 1 [NEMA 4; NEMA 4 with enclosure heater and insulation].

The Outside Airflow Measurement System shall be the VOLU-flo/OAM as manufactured by Air Monitor Corporation, Santa Rosa, California

AIRFLOW MEASURING SYSTEM(S)

Provide where indicated, Airflow Measuring System(s) capable of continuously monitoring the fan or duct capacities (air volumes) they serve. Each Airflow Measuring System shall consist of an Airflow Measuring Station and a Transmitter. In order to guarantee the overall accuracy and performance of the Airflow Measuring System, the Airflow Measuring Station and the Transmitter shall be by the same manufacturer.

Duct Mounted Systems:

Flow Station:

Where indicated on the plans, provide airflow/ temperature station(s)capable of continuously measuring airflow velocity/volume and temperature.

Each station shall consist of one or more multi-point measuring probes and a single microprocessor based transmitter. The transmitter shall be supplied by the same manufacturer as the measuring station.

Each multi-point probe shall be assembled using heavy wall anodized aluminum tubing, aluminum mounting plates, aerodynamically optimized molded sensing apertures to ensure accurate measurement in angular airflow conditions, and neoprene mounting gasket.

Station shall be connected to the transmitter using a single cable, of up to 100' in length, included with the transmitter.

Each stand-alone sensing point shall use an ambient temperature thermistor and an externally heated thermistor to determine the point velocity and temperature. Automatic equal area averaging of the individual point measurements shall be performed in the transmitter.

Each airflow sensor shall have an operating range of 5,000 FPM, with a NIST traceable accuracy of ±2% of reading for velocity measurement and 0.1ºF for temperature measurement.
The number of sensors for each rectangular station shall be:

Station Area	Sensor Density
1 to < 15 Sq. Ft.	1.50 Sq. Ft. Per Sensor
15 to < 30 Sq. Ft.	1.67 Sq. Ft. Per Sensor
30 to < 60 Sq. Ft.	2.10 Sq. Ft. Per Sensor
60 to 100 Sq. Ft.	3.13 Sq. Ft. Per Sensor

Individual sensors shall be fully field serviceable without need for field calibration, not requiring that the probe be returned to the Factory for repair and/or calibration.

Each transmitter shall be capable of averaging as many as thirty-two (32) sensors.

The transmitter will have a high visibility backlit LCD for display of either the averaged or individual sensor airflow and temperature measurements, in user selectable units of measure. The transmitter shall be factory configured to output duct air volume for plug and play operation.

All transmitter configuration, scaling, and diagnostic functions shall be performed by means of a password protected, cover mounted membrane keypad.

Transmitter outputs shall be dual analog (4-20mA, 0-5VDC or 0-10VDC) for airflow and temperature or optional LonWorks® communication interface.

The operating temperature range of the transmitter shall be from -20º to 140ºF. The transmitter shall be located where it will be sheltered from water or weather.

Input power to each transmitter shall be 24VAC/24VDC.

Stations shall have a 14 ga. [18 ga. for circular units] galvanized steel, 8" deep, welded casing with 90º formed flanges. Transmitter shall be provided integrally mounted to the station with interconnect cable for remote mounting up to 100' away.

When installed per the manufacturer's minimum installation requirements, the transmitter with accompanying station or probe array shall measure with an accuracy of ±2-3% of actual airflow.

The acceptable manufacturer is Air Monitor Corporation, and the product is the ELECTRA-flo/M.

Fan Inlet Mounted Systems:

Flow Station:

The Airflow Measuring Station shall contain multiple total and static pressure sensors placed at concentric area centers along the exterior surface of the cylindrical probes and internally connected to their respective averaging manifolds. Sensors shall not protrude beyond the surface of the probe, nor be adversely affected by particle contamination normally present in building system airflows.

The Airflow Measuring Station shall have symmetrical averaging signal takeoffs, and shall be of aluminum construction with hard anodized finish [copper construction] with galvanized steel mounting hardware.

The Airflow Measuring Station shall not significantly impact fan performance or contribute to fan generated noise levels. The probes shall be capable of producing steady, non-pulsating signals of standard total and static pressure, without need for flow corrections or factors, with an accuracy of 3% of actual flow over a fan operating range of 6 to 1 capacity turndown.

The Airflow Measuring Station shall be the VOLU-probe/FI as manufactured by Air Monitor Corporation, Santa Rosa, California.

Transmitter:

The Transmitter shall be capable of receiving flow signals (total and static pressure) from an airflow station or probe array and produce an output linear and scaled for air volume, velocity, differential pressure, etc.

The Transmitter shall contain an integral multi-line digital display for use during the configuration and calibration process, and to display one Transmitter output during normal operating mode. All Transmitter configuration, parameter setting, zero and span calibration, plus display formatting and scaling will be performed digitally in the on-board microprocessor via input pushbuttons.

The Transmitter will be available in multiple natural spans covering the range of 0.05 IN w.c. to 25.0 IN w.c. with an accuracy of 0.25% 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 turndown.

The Transmitter shall be the VELTRON DPT 2500-plus as manufactured by Air Monitor Corporation, Santa Rosa, California.

Outside Airflow Measurement Systems (louvers/rainhoods):

The Outside Airflow Measurement System shall be capable of direct measurement of airflow through an outside air inlet and produce dual outputs; one representing the measured airflow, and the other to control the inlet damper.

The Outside Airflow Measurement System shall contain an integral multi-line liquid crystal display for use during the configuration and calibration processes, and to display two measured processes (volume, velocity, temperature) during normal operation. All configuration, output scaling, calibration, and controller tuning will be performed digitally in the on-board microprocessor via input pushbuttons.

The Outside Airflow Measurement System shall measure inlet airflow with an accuracy of ±5% of reading over a range of 150-600 FPM, 250-1,000 FPM, 150-2,000 FPM, and 500-2,000 FPM and not have its reading affected by the presence of directional or gusting wind. Measured airflow shall be density corrected for ambient temperature variances, and atmospheric pressure due to site altitude.

The Outside Airflow Measurement System shall interface with existing building automation systems (BAS), accepting inputs for fan system start, economizer mode operation, and an external controller setpoint, and provide flow deviation alarm outputs.

The sensors shall be constructed of materials that resist corrosion due to the presence of salt or chemicals in the air; all non-painted surfaces shall be constructed of stainless steel. The electronics enclosure shall be NEMA 1 [NEMA 4; NEMA 4 with enclosure heater and insulation].

The Outside Airflow Measurement System shall be the VOLU-flo/OAM as manufactured by Air Monitor Corporation, Santa Rosa, California

AIRFLOW MEASURING SYSTEM(S)

Provide where indicated, Airflow Measuring System(s) capable of continuously monitoring the fan or duct capacities (air volumes) they serve. Each Airflow Measuring System shall consist of an Airflow Measuring Station and a Transmitter. In order to guarantee the overall accuracy and performance of the Airflow Measuring System, the Airflow Measuring Station and the Transmitter shall be by the same manufacturer.

Duct Mounted Systems:

Flow Station:

Where indicated on the plans, provide airflow/ temperature station(s)capable of continuously measuring airflow velocity/volume and temperature.

Each station shall consist of one or more multi-point measuring probes and a single microprocessor based transmitter. The transmitter shall be supplied by the same manufacturer as the measuring station.

Each multi-point probe shall be assembled using heavy wall anodized aluminum tubing, aluminum mounting plates, aerodynamically optimized molded sensing apertures to ensure accurate measurement in angular airflow conditions, and neoprene mounting gasket.

Station shall be connected to the transmitter using a single cable, of up to 100' in length, included with the transmitter.

Each stand-alone sensing point shall use an ambient temperature thermistor and an externally heated thermistor to determine the point velocity and temperature. Automatic equal area averaging of the individual point measurements shall be performed in the transmitter.

Each airflow sensor shall have an operating range of 5,000 FPM, with a NIST traceable accuracy of ±2% of reading for velocity measurement and 0.1ºF for temperature measurement.

The number of sensors for each rectangular station shall be:

Station Area	Sensor Density
1 to < 15 Sq. Ft.	1.50 Sq. Ft. Per Sensor
15 to < 30 Sq. Ft.	1.67 Sq. Ft. Per Sensor
30 to < 60 Sq. Ft.	2.10 Sq. Ft. Per Sensor
60 to 100 Sq. Ft.	3.13 Sq. Ft. Per Sensor

Individual sensors shall be fully field serviceable without need for field calibration, not requiring that the probe be returned to the Factory for repair and/or calibration.

Each transmitter shall be capable of averaging as many as thirty-two (32) sensors.

The transmitter will have a high visibility backlit LCD for display of either the averaged or individual sensor airflow and temperature measurements, in user selectable units of measure. The transmitter shall be factory configured to output duct air volume for plug and play operation.

All transmitter configuration, scaling, and diagnostic functions shall be performed by means of a password protected, cover mounted membrane keypad.

Transmitter outputs shall be dual analog (4-20mA, 0-5VDC or 0-10VDC) for airflow and temperature or optional LonWorks® communication interface.

The operating temperature range of the transmitter shall be from -20º to 140ºF. The transmitter shall be located where it will be sheltered from water or weather.

Input power to each transmitter shall be 24VAC/24VDC.

Stations shall have a 14 ga. [18 ga. for circular units] galvanized steel, 8" deep, welded casing with 90º formed flanges. Transmitter shall be provided integrally mounted to the station with interconnect cable for remote mounting up to 100' away.

When installed per the manufacturer's minimum installation requirements, the transmitter with accompanying station or probe array shall measure with an accuracy of ±2-3% of actual airflow.

The acceptable manufacturer is Air Monitor Corporation, and the product is the ELECTRA-flo/M.

Fan Inlet Mounted Systems:

Flow Station:

The Airflow Measuring Station shall contain multiple total and static pressure sensors placed at concentric area centers along the exterior surface of the cylindrical probes and internally connected to their respective averaging manifolds. Sensors shall not protrude beyond the surface of the probe, nor be adversely affected by particle contamination normally present in building system airflows.

The Airflow Measuring Station shall have symmetrical averaging signal takeoffs, and shall be of aluminum construction with hard anodized finish [copper construction] with galvanized steel mounting hardware.

The Airflow Measuring Station shall not significantly impact fan performance or contribute to fan generated noise levels. The probes shall be capable of producing steady, non-pulsating signals of standard total and static pressure, without need for flow corrections or factors, with an accuracy of 3% of actual flow over a fan operating range of 6 to 1 capacity turndown.

The Airflow Measuring Station shall be the VOLU-probe/FI as manufactured by Air Monitor Corporation, Santa Rosa, California.

Transmitter:

The Transmitter shall have an accuracy of ±0.5% of Natural Span and be furnished with a built-in 3-way zeroing valve, user selectable square root function, and integral 3½ digit scalable LCD for display of measured process. The Transmitter shall be housed in a NEMA 1 aluminum [NEMA 12 steel] enclosure with universal 1/8" FPT signal connection ports.

The Transmitter shall be the VELTRON DPT 2500 [2500I] as manufactured by Air Monitor Corporation, Santa Rosa, California

Outside Airflow Measurement Systems (louvers/rainhoods):

The Outside Airflow Measurement System shall be capable of direct measurement of airflow through an outside air inlet and produce dual outputs; one representing the measured airflow, and the other to control the inlet damper.

The Outside Airflow Measurement System shall contain an integral multi-line liquid crystal display for use during the configuration and calibration processes, and to display two measured processes (volume, velocity, temperature) during normal operation. All configuration, output scaling, calibration, and controller tuning will be performed digitally in the on-board microprocessor via input pushbuttons.

The Outside Airflow Measurement System shall measure inlet airflow with an accuracy of ±5% of reading over a range of 150-600 FPM, 250-1,000 FPM, 150-2,000 FPM, and 500-2,000 FPM and not have its reading affected by the presence of directional or gusting wind. Measured airflow shall be density corrected for ambient temperature variances, and atmospheric pressure due to site altitude.

The Outside Airflow Measurement System shall interface with existing building automation systems (BAS), accepting inputs for fan system start, economizer mode operation, and an external controller setpoint, and provide flow deviation alarm outputs.

The sensors shall be constructed of materials that resist corrosion due to the presence of salt or chemicals in the air; all non-painted surfaces shall be constructed of stainless steel. The electronics enclosure shall be NEMA 1 [NEMA 4; NEMA 4 with enclosure heater and insulation].

The Outside Airflow Measurement System shall be the VOLU-flo/OAM as manufactured by Air Monitor Corporation, Santa Rosa, California

AIRFLOW MEASURING SYSTEM(S)

Provide where indicated, Airflow Measuring System(s) capable of continuously monitoring the fan or duct capacities (air volumes) they serve. Each Airflow Measuring System shall consist of an Airflow Measuring Station and a Transmitter. In order to guarantee the overall accuracy and performance of the Airflow Measuring System, the Airflow Measuring Station and the Transmitter shall be by the same manufacturer.

Duct Mounted Systems:

Flow Station:

Where indicated on the plans, provide airflow/ temperature probe arrays capable of continuously measuring airflow velocity/volume and temperature.

Each probe array shall consist of one or more multi-point measuring probes and a single microprocessor based transmitter. The transmitter shall be supplied by the same manufacturer as the measuring station or probe array.

Each multi-point probe shall be assembled using heavy wall anodized aluminum tubing, aluminum mounting plates, aerodynamically optimized molded sensing apertures to ensure accurate measurement in angular airflow conditions, and neoprene mounting gasket.

Probe array shall be connected to the transmitter using a single cable, of up to 100' in length, included with the transmitter.

Each stand-alone sensing point shall use an ambient temperature thermistor and an externally heated thermistor to determine the point velocity and temperature. Automatic equal area averaging of the individual point measurements shall be performed in the transmitter.

Each airflow sensor shall have an operating range of 5,000 FPM, with a NIST traceable accuracy of ±2% of reading for velocity measurement and 0.1ºF for temperature measurement.

The number of sensors for each rectangular probe array shall be:

Station Area	Sensor Density
1 to < 15 Sq. Ft.	1.50 Sq. Ft. Per Sensor
15 to < 30 Sq. Ft.	1.67 Sq. Ft. Per Sensor
30 to < 60 Sq. Ft.	2.10 Sq. Ft. Per Sensor
60 to 100 Sq. Ft.	3.13 Sq. Ft. Per Sensor

Individual sensors shall be fully field serviceable without need for field calibration, not requiring that the probe be returned to the Factory for repair and/or calibration.

Each transmitter shall be capable of averaging as many as thirty-two (32) sensors.

The transmitter will have a high visibility backlit LCD for display of either the averaged or individual sensor airflow and temperature measurements, in user selectable units of measure. The transmitter shall be factory configured to output duct air volume for plug and play operation.

All transmitter configuration, scaling, and diagnostic functions shall be performed by means of a password protected, cover mounted membrane keypad.

Transmitter outputs shall be dual analog (4-20mA, 0-5VDC or 0-10VDC) for airflow and temperature or optional LonWorks® communication interface.

The operating temperature range of the transmitter shall be from -20º to 140ºF. The transmitter shall be located where it will be sheltered from water or weather.

Input power to each transmitter shall be 24VAC/24VDC.

Transmitter shall be provided with interconnect cable for remote mounting up to 100' away.

When installed per the manufacturer's minimum installation requirements, the transmitter with accompanying station or probe array shall measure with an accuracy of ±2-3% of actual airflow.

The acceptable manufacturer is Air Monitor Corporation, and the product is the ELECTRA-flo Plus.

Fan Inlet Mounted Systems:

Flow Station:

The Airflow Measuring Station shall contain multiple total and static pressure sensors placed at concentric area centers along the exterior surface of the cylindrical probes and internally connected to their respective averaging manifolds. Sensors shall not protrude beyond the surface of the probe, nor be adversely affected by particle contamination normally present in building system airflows.

The Airflow Measuring Station shall have symmetrical averaging signal takeoffs, and shall be of aluminum construction with hard anodized finish [copper construction] with galvanized steel mounting hardware.

The Airflow Measuring Station shall not significantly impact fan performance or contribute to fan generated noise levels. The probes shall be capable of producing steady, non-pulsating signals of standard total and static pressure, without need for flow corrections or factors, with an accuracy of 3% of actual flow over a fan operating range of 6 to 1 capacity turndown.

The Airflow Measuring Station shall be the VOLU-probe/FI as manufactured by Air Monitor Corporation, Santa Rosa, California.

Transmitter:

The Transmitter shall be capable of receiving flow signals (total and static pressure) from an airflow station or probe array and produce dual outputs linear and scaled for air volume, velocity, differential pressure, etc.

The Transmitter shall contain an integral multi-line digital display for use during the configuration and calibration process, and to display one transmitter output during normal operating mode. All Transmitter configuration, parameter setting, zero and span calibration, plus display formatting and scaling will be performed digitally in the on-board microprocessor via input pushbuttons.

The 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.

(Optional) Using a second Transmitter as an input, the internal microprocessor can perform a summed flow, flow differential, low signal select, high signal select or percent deviation calculation, with the result being displayed and provided as an analog output signal.

The Transmitter shall be the VELTRON II as manufactured by Air Monitor Corporation, Santa Rosa, California.

Outside Airflow Measurement Systems (louvers/rainhoods):

The Outside Airflow Measurement System shall be capable of direct measurement of airflow through an outside air inlet and produce dual outputs; one representing the measured airflow, and the other to control the inlet damper.

The Outside Airflow Measurement System shall contain an integral multi-line liquid crystal display for use during the configuration and calibration processes, and to display two measured processes (volume, velocity, temperature) during

normal operation. All configuration, output scaling, calibration, and controller tuning will be performed digitally in the on-board microprocessor via input pushbuttons.

The Outside Airflow Measurement System shall measure inlet airflow with an accuracy of ±5% of reading over a range of 150-600 FPM, 250-1,000 FPM, 150-2,000 FPM, and 500-2,000 FPM and not have its reading affected by the presence of directional or gusting wind. Measured airflow shall be density corrected for ambient temperature variances, and atmospheric pressure due to site altitude.

The Outside Airflow Measurement System shall interface with existing building automation systems (BAS), accepting inputs for fan system start, economizer mode operation, and an external controller setpoint, and provide flow deviation alarm outputs.

The sensors shall be constructed of materials that resist corrosion due to the presence of salt or chemicals in the air; all non-painted surfaces shall be constructed of stainless steel. The electronics enclosure shall be NEMA 1 [NEMA 4; NEMA 4 with enclosure heater and insulation].

The Outside Airflow Measurement System shall be the VOLU-flo/OAM as manufactured by Air Monitor Corporation, Santa Rosa, California

AIRFLOW MEASURING SYSTEM(S)

Provide where indicated, Airflow Measuring System(s) capable of continuously monitoring the fan or duct capacities (air volumes) they serve. Each Airflow Measuring System shall consist of an Airflow Measuring Station and a Transmitter. In order to guarantee the overall accuracy and performance of the Airflow Measuring System, the Airflow Measuring Station and the Transmitter shall be by the same manufacturer.

Duct Mounted Systems:

Flow Station:

Where indicated on the plans, provide airflow/ temperature probe arrays capable of continuously measuring airflow velocity/volume and temperature.

Each probe array shall consist of one or more multi-point measuring probes and a single microprocessor based transmitter. The transmitter shall be supplied by the same manufacturer as the measuring station or probe array.

Each multi-point probe shall be assembled using heavy wall anodized aluminum tubing, aluminum mounting plates, aerodynamically optimized molded sensing apertures to ensure accurate measurement in angular airflow conditions, and neoprene mounting gasket.

Probe array shall be connected to the transmitter using a single cable, of up to 100' in length, included with the transmitter.

Each stand-alone sensing point shall use an ambient temperature thermistor and an externally heated thermistor to determine the point velocity and temperature. Automatic equal area averaging of the individual point measurements shall be performed in the transmitter.

Each airflow sensor shall have an operating range of 5,000 FPM, with a NIST traceable accuracy of ±2% of reading for velocity measurement and 0.1ºF for temperature measurement.
The number of sensors for each rectangular probe array shall be:

Station Area	Sensor Density
1 to < 15 Sq. Ft.	1.50 Sq. Ft. Per Sensor
15 to < 30 Sq. Ft.	1.67 Sq. Ft. Per Sensor
30 to < 60 Sq. Ft.	2.10 Sq. Ft. Per Sensor
60 to 100 Sq. Ft.	3.13 Sq. Ft. Per Sensor

Individual sensors shall be fully field serviceable without need for field calibration, not requiring that the probe be returned to the Factory for repair and/or calibration.

Each transmitter shall be capable of averaging as many as thirty-two (32) sensors.

The transmitter will have a high visibility backlit LCD for display of either the averaged or individual sensor airflow and temperature measurements, in user selectable units of measure. The transmitter shall be factory configured to output duct air volume for plug and play operation.

All transmitter configuration, scaling, and diagnostic functions shall be performed by means of a password protected, cover mounted membrane keypad.

Transmitter outputs shall be dual analog (4-20mA, 0-5VDC or 0-10VDC) for airflow and temperature or optional LonWorks® communication interface.

The operating temperature range of the transmitter shall be from -20º to 140ºF. The transmitter shall be located where it will be sheltered from water or weather.

Input power to each transmitter shall be 24VAC/24VDC.

Transmitter shall be provided with interconnect cable for remote mounting up to 100' away.

When installed per the manufacturer's minimum installation requirements, the transmitter with accompanying station or probe array shall measure with an accuracy of ±2-3% of actual airflow.

The acceptable manufacturer is Air Monitor Corporation, and the product is the ELECTRA-flo Plus.

Fan Inlet Mounted Systems:

Flow Station:

The Airflow Measuring Station shall contain multiple total and static pressure sensors placed at concentric area centers along the exterior surface of the cylindrical probes and internally connected to their respective averaging manifolds. Sensors shall not protrude beyond the surface of the probe, nor be adversely affected by particle contamination normally present in building system airflows.

The Airflow Measuring Station shall have symmetrical averaging signal takeoffs, and shall be of aluminum construction with hard anodized finish [copper construction] with galvanized steel mounting hardware.

The Airflow Measuring Station shall not significantly impact fan performance or contribute to fan generated noise levels. The probes shall be capable of producing steady, non-pulsating signals of standard total and static pressure, without need for flow corrections or factors, with an accuracy of 3% of actual flow over a fan operating range of 6 to 1 capacity turndown.

The Airflow Measuring Station shall be the VOLU-probe/FI as manufactured by Air Monitor Corporation, Santa Rosa, California.

Transmitter:

The Transmitter shall be capable of receiving flow signals (total and static pressure) from an airflow station or probe array and produce an output linear and scaled for air volume, velocity, differential pressure, etc.

The Transmitter shall contain an integral multi-line digital display for use during the configuration and calibration process, and to display one Transmitter output during normal operating mode. All Transmitter configuration, parameter setting, zero and span calibration, plus display formatting and scaling will be performed digitally in the on-board microprocessor via input pushbuttons.

The Transmitter will be available in multiple natural spans covering the range of 0.05 IN w.c. to 25.0 IN w.c. with an accuracy of 0.25% 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 turndown.

The Transmitter shall be the VELTRON DPT 2500-plus as manufactured by Air Monitor Corporation, Santa Rosa, California.

Outside Airflow Measurement Systems (louvers/rainhoods):

The Outside Airflow Measurement System shall be capable of direct measurement of airflow through an outside air inlet and produce dual outputs; one representing the measured airflow, and the other to control the inlet damper.

The Outside Airflow Measurement System shall contain an integral multi-line liquid crystal display for use during the configuration and calibration processes, and to display two measured processes (volume, velocity, temperature) during normal operation. All configuration, output scaling, calibration, and controller tuning will be performed digitally in the on-board microprocessor via input pushbuttons.

The Outside Airflow Measurement System shall measure inlet airflow with an accuracy of ±5% of reading over a range of 150-600 FPM, 250-1,000 FPM, 150-2,000 FPM, and 500-2,000 FPM and not have its reading affected by the presence of directional or gusting wind. Measured airflow shall be density corrected for ambient temperature variances, and atmospheric pressure due to site altitude.

The Outside Airflow Measurement System shall interface with existing building automation systems (BAS), accepting inputs for fan system start, economizer mode operation, and an external controller setpoint, and provide flow deviation alarm outputs.

The sensors shall be constructed of materials that resist corrosion due to the presence of salt or chemicals in the air; all non-painted surfaces shall be constructed of stainless steel. The electronics enclosure shall be NEMA 1 [NEMA 4; NEMA 4 with enclosure heater and insulation].

The Outside Airflow Measurement System shall be the VOLU-flo/OAM as manufactured by Air Monitor Corporation, Santa Rosa, California

AIRFLOW MEASURING SYSTEM(S)

Provide where indicated, Airflow Measuring System(s) capable of continuously monitoring the fan or duct capacities (air volumes) they serve. Each Airflow Measuring System shall consist of an Airflow Measuring Station and a Transmitter. In order to guarantee the overall accuracy and performance of the Airflow Measuring System, the Airflow Measuring Station and the Transmitter shall be by the same manufacturer.

Duct Mounted Systems:

Flow Station:

Where indicated on the plans, provide airflow/ temperature probe arrays capable of continuously measuring airflow velocity/volume and temperature.

Each probe array shall consist of one or more multi-point measuring probes and a single microprocessor based transmitter. The transmitter shall be supplied by the same manufacturer as the measuring station or probe array.

Each multi-point probe shall be assembled using heavy wall anodized aluminum tubing, aluminum mounting plates, aerodynamically optimized molded sensing apertures to ensure accurate measurement in angular airflow conditions, and neoprene mounting gasket.

Probe array shall be connected to the transmitter using a single cable, of up to 100' in length, included with the transmitter.

Each stand-alone sensing point shall use an ambient temperature thermistor and an externally heated thermistor to determine the point velocity and temperature. Automatic equal area averaging of the individual point measurements shall be performed in the transmitter.

Each airflow sensor shall have an operating range of 5,000 FPM, with a NIST traceable accuracy of ±2% of reading for velocity measurement and 0.1ºF for temperature measurement.

The number of sensors for each rectangular probe array shall be:

Station Area	Sensor Density
1 to < 15 Sq. Ft.	1.50 Sq. Ft. Per Sensor
15 to < 30 Sq. Ft.	1.67 Sq. Ft. Per Sensor
30 to < 60 Sq. Ft.	2.10 Sq. Ft. Per Sensor
60 to 100 Sq. Ft.	3.13 Sq. Ft. Per Sensor

Individual sensors shall be fully field serviceable without need for field calibration, not requiring that the probe be returned to the Factory for repair and/or calibration.

Each transmitter shall be capable of averaging as many as thirty-two (32) sensors.

The transmitter will have a high visibility backlit LCD for display of either the averaged or individual sensor airflow and temperature measurements, in user selectable units of measure. The transmitter shall be factory configured to output duct air volume for plug and play operation.

All transmitter configuration, scaling, and diagnostic functions shall be performed by means of a password protected, cover mounted membrane keypad.

Transmitter outputs shall be dual analog (4-20mA, 0-5VDC or 0-10VDC) for airflow and temperature or optional LonWorks® communication interface.

The operating temperature range of the transmitter shall be from -20º to 140ºF. The transmitter shall be located where it will be sheltered from water or weather.

Input power to each transmitter shall be 24VAC/24VDC.

Transmitter shall be provided with interconnect cable for remote mounting up to 100' away.

When installed per the manufacturer's minimum installation requirements, the transmitter with accompanying station or probe array shall measure with an accuracy of ±2-3% of actual airflow.

The acceptable manufacturer is Air Monitor Corporation, and the product is the ELECTRA-flo/Plus.

Fan Inlet Mounted Systems:

Flow Station:

The Airflow Measuring Station shall contain multiple total and static pressure sensors placed at concentric area centers along the exterior surface of the cylindrical probes and internally connected to their respective averaging manifolds. Sensors shall not protrude beyond the surface of the probe, nor be adversely affected by particle contamination normally present in building system airflows.

The Airflow Measuring Station shall have symmetrical averaging signal takeoffs, and shall be of aluminum construction with hard anodized finish [copper construction] with galvanized steel mounting hardware.

The Airflow Measuring Station shall not significantly impact fan performance or contribute to fan generated noise levels. The probes shall be capable of producing steady, non-pulsating signals of standard total and static pressure, without need for flow corrections or factors, with an accuracy of 3% of actual flow over a fan operating range of 6 to 1 capacity turndown.

The Airflow Measuring Station shall be the VOLU-probe/FI as manufactured by Air Monitor Corporation, Santa Rosa, California.

Transmitter:

The Transmitter shall have an accuracy of ±0.5% of Natural Span and be furnished with a built-in 3-way zeroing valve, user selectable square root function, and integral 3½ digit scalable LCD for display of measured process. The Transmitter shall be housed in a NEMA 1 aluminum [NEMA 12 steel] enclosure with universal 1/8" FPT signal connection ports.

The Transmitter shall be the VELTRON DPT 2500 [2500I] as manufactured by Air Monitor Corporation, Santa Rosa, California

Outside Airflow Measurement Systems (louvers/rainhoods):

The Outside Airflow Measurement System shall be capable of direct measurement of airflow through an outside air inlet and produce dual outputs; one representing the measured airflow, and the other to control the inlet damper.

The Outside Airflow Measurement System shall contain an integral multi-line liquid crystal display for use during the configuration and calibration processes, and to display two measured processes (volume, velocity, temperature) during normal operation. All configuration, output scaling, calibration, and controller tuning will be performed digitally in the on-board microprocessor via input pushbuttons.

The Outside Airflow Measurement System shall measure inlet airflow with an accuracy of ±5% of reading over a range of 150-600 FPM, 250-1,000 FPM, 150-2,000 FPM, and 500-2,000 FPM and not have its reading affected by the presence of directional or gusting wind. Measured airflow shall be density corrected for ambient temperature variances, and atmospheric pressure due to site altitude.

The Outside Airflow Measurement System shall interface with existing building automation systems (BAS), accepting inputs for fan system start, economizer mode operation, and an external controller setpoint, and provide flow deviation alarm outputs.

The sensors shall be constructed of materials that resist corrosion due to the presence of salt or chemicals in the air; all non-painted surfaces shall be constructed of stainless steel. The electronics enclosure shall be NEMA 1 [NEMA 4; NEMA 4 with enclosure heater and insulation].

The Outside Airflow Measurement System shall be the VOLU-flo/OAM as manufactured by Air Monitor Corporation, Santa Rosa, California.