

Installation, Operation, and Maintenance Manual

VELTRON DPT 2500

Ultra-Low Range Differential
Pressure & Flow Transmitter

Installation, Operation & Maintenance

Air Monitor Corporation provides complete
technical support between the hours of
7 a.m. and 5 p.m. PST, M-F

Contact our Service Department
Toll Free: 1-800-AIRFLOW

or fax us at 1-707-526-2825



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INSTRUMENT WARRANTY

Air Monitor Corporation (hereinafter referred to as "Seller") warrants that at the time of shipment, products sold pursuant to this contract will be free from defects in materials and workmanship, and will conform to the specifications furnished or approved in writing by Seller. No warranty is given that delivered products will conform to catalog sheets, data sheets, and the like, which are subject to change without notice.

product which has been repaired or altered by persons not expressly approved by Seller. Nor does Seller warrant equipment against normal deterioration due to environment; nor items such as lamps, glass, and similar items subject to wear or burnout through usage. Adjustments for items or equipment not manufactured by Seller shall be made to the extent of any warranty of the manufacturer or supplier thereof.

Seller will repair or replace, at its option, any products listed under this warranty which is returned freight prepaid to Seller within the earlier of three (3) years after start-up or thirty-nine (39) months after shipment that, upon test and examination, proves defective within the terms of this warranty. The warranty period for any item repaired or replaced shall be for the time remaining on the warranty period of the original components. Purchaser shall notify Seller in writing of such defect within sixty (60) days of discovery of the defect.

Seller shall not be liable for any special or consequential damages or for loss of damage, directly or indirectly arising from the use of the products. Seller's warranty shall be limited to replacement of defective equipment and shall not include field removal and installation expenses.

This warranty does not extend to any product sold by Seller which has been the subject of misuse, neglect, accident, damage or malfunction caused by interconnection with equipment manufactured by others, improper installation or storage, or used in violation of instructions furnished by Seller, nor does it extend to any

The warranty set forth above is in lieu of all other warranties either express or implied and constitutes the full extent of Air Monitor Corporation's liability to the customer, or any other party for breach of warranty.

THERE ARE NO EXPRESS WARRANTIES EXCEPT AS SET FORTH HEREIN AND THERE ARE NO IMPLIED WARRANTIES OF MERCHANTABILITY OF FITNESS FOR ANY PARTICULAR PURPOSE, WHICH ARE PARTICULARLY DISCLAIMED.

NOTICE OF PROPRIETARY RIGHTS

This document contains confidential technical data, including trade secrets and proprietary information which are the sole property of Air Monitor Corporation. The use of said data is solely limited to use as specified herein. Any other use is strictly prohibited without the prior written consent of Air Monitor Corporation.

1 – GENERAL INFORMATION

1.1 – DESCRIPTION

The VELTRON DPT 2500 is an electronic differential pressure transmitter designed to receive low magnitude pressure signals of space or duct pressurization and reference pressures from static pressure sensors, or signals of total and static pressure from an airflow measuring station, and convert the sensed differential pressure into a 4 to 20mADC output signal proportional and linear to static or velocity pressure. An optional integral LCD digital display provides local indication of the measured process in appropriate engineering units (in w.c., CFM, FPM, %, etc.). The VELTRON DPT 2500 is available in a NEMA 1 brushed aluminum enclosure with external wiring connections (Standard version) or a NEMA 12 painted steel enclosure with internal wiring connections (Industrial version). All VELTRON DPT 2500's contain an integral 3-way zeroing valve to aid in calibration.

2 – PERFORMANCE SPECIFICATIONS

2.1 – TRANSMITTER

Pressure Spans	Velocity Spans
0 to 0.10" w.c.	0 to 1266 fpm
0 to 0.25" w.c.	0 to 2003 fpm
0 to 0.50" w.c.	0 to 2832 fpm
0 to 1.00" w.c.	0 to 4005 fpm
0 to 2.00" w.c.	0 to 5664 fpm
0 to 5.00" w.c.	N/A
0 to 10.00" w.c.	N/A

Spans are Factory set.

Calibrated (Reference) Accuracy.

±0.50% of Natural Full Span, including non-linearity, hysteresis, and non-repeatability.

Stability.

±0.5% of Natural Full Span for six months.

Temperature Effects.

Zero & Span – 0.015% of Natural Full Span/°F

Mounting Position Effect.

Zero shift only; corrected through manual zeroing.

Integral Zeroing Means.

3-way, zeroing valve with manual switch.

Overpressure and Static Pressure Limit.

25 psig.

Temperature Limits.

-20 to 180°F Storage; +32 to 140°F Operating.

2.2 – OUTPUTS

Output Signal.

4.0 to 20.0 mADC (2 wire). Proportional and linear to differential pressure or velocity

2.3 – POWER

Power Supply.

14 to 40 VDC unregulated. Power input is reverse polarity protected.

Power Consumption.

0.5VA @ 24VDC

2.4 – MATERIALS OF CONSTRUCTION

Standard Version.

NEMA 1 aluminum enclosure with external power/signal connections.

Industrial Version.

NEMA 12, drawn 16 gauge steel enclosure with hinged cover, quick-release latch and bulkhead signal and conduit connections.

3– INSTALLATION

3.1 – RECEIVING AND INSPECTION

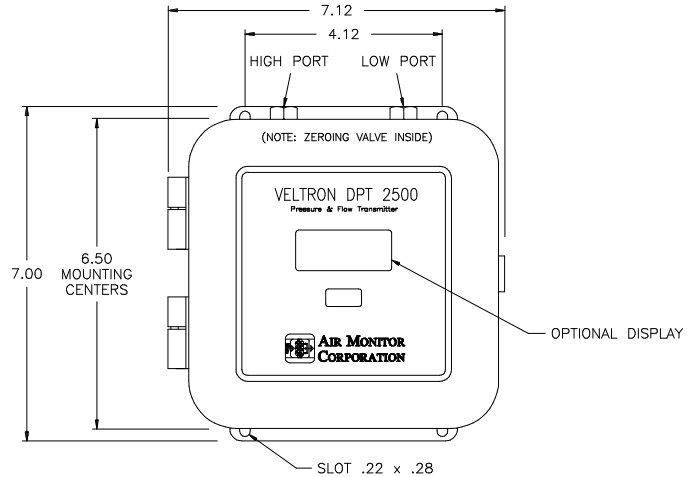
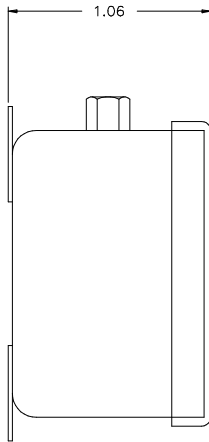
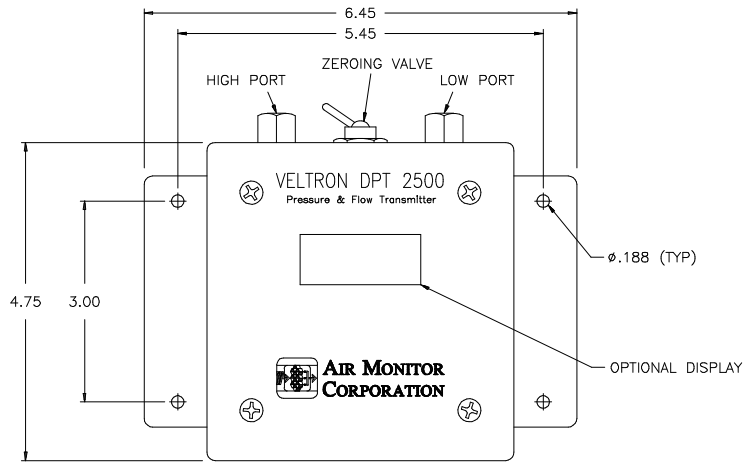
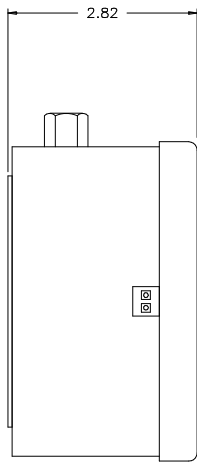
- Carefully remove the VELTRON DPT 2500 from the shipping container taking ESD (electrostatic discharge) precautions.
- Inspect unit for any damage. If damaged, contact freight company.
- Verify that the information recorded on the label on the bottom side of the unit is correct for your application. If not, contact Air Monitor's Service Department at 1-800-AIRFLOW for further guidance.

3.2 – LOCATION

- The standard version of the VELTRON DPT 2500 is a NEMA 1 enclosure suitable for most clean indoor locations. If additional protection is required, mount unit in an enclosure with adequate NEMA rating.
- The industrial version of the VELTRON DPT 2500 is housed in a NEMA 12 enclosure (see NEMA ratings for degree of protection).
- The ambient temperature of the selected mounting location must be between +40 to 120°F. Consideration should be given to units exposed to direct sunlight.
- The selected mounting location should be rigid and free of vibration.

3.3 – MOUNTING

- Tools Required: Electric drill; #25 (0.1495”) bit; screwdriver or nutdriver; and four #8-32 self-tapping machine screws.
- The VELTRON DPT 2500 can be mounted in any position provided it is secured using all four mounting holes.
- Reasonable consideration should be given to clearances for pressure and electrical connections.
- Once a suitable location is found, use the unit as a template to mark the centers of the four mounting holes.
- Drill four pilot holes at the marked locations. With the unit in position, install the four #8-32 screws.



3.4 – PROCESS CONNECTIONS

The VELTRON DPT 2500 comes standard with brass 1/4" tube compression fittings (or special fittings if ordered). To these fittings connect the appropriate rigid or flexible tubing. Although any size tubing can be used, the response time of the VELTRON DPT 2500 to process change can increase if there is an increase in tubing size or an increase in tube length. The following table lists recommended tube size versus length.

Signal Line Length	Recommended Tube Size
Up to 50'	1/4"
50' to 200'	3/8"
Over 200'	1/2"

When connecting the VELTRON DPT 2500 to an airflow measuring device, connections must be completed as follows:

- High port on the DPT 2500 connects to Total Pressure from the airflow measuring device.
- Low port on the DPT 2500 connects to Static Pressure from the airflow measuring device.

When connecting the VELTRON DPT 2500 for positive room pressurization, connections must be completed as follows:

- High port on the DPT 2500 connects to sensor from monitored room.
- Low port on the DPT 2500 connects to reference sensor.

When connecting the VELTRON DPT 2500 for negative room pressurization, connections must be completed as follows:

- High port on the DPT 2500 connects to reference sensor.
- Low port on the DPT 2500 connects to sensor from monitored room.

CAUTION

It is extremely important that no pressure be present in signal tubing at the time of installation, and the orientation of High and Low pressure signal lines is maintained between the source and the VELTRON DPT 2500.

When making any tubing connections or changing fittings, use a 9/16" wrench to prevent the 1/8" FPT bulkhead fitting from turning.

3.5 – POWER/SIGNAL CONNECTIONS

All wiring is done at the terminal strip of the VELTRON DPT 2500. The cover needs to be opened or removed to gain access to the terminal strip. On the industrial version, the signal/power wires need to be routed through the conduit connection on the bottom side of the enclosure. It is recommended that wiring be between 14 awg and 22 awg, and no more than two wires should be connected to any one terminal. Follow Figure 2 below to connect the Power/Signal wires.

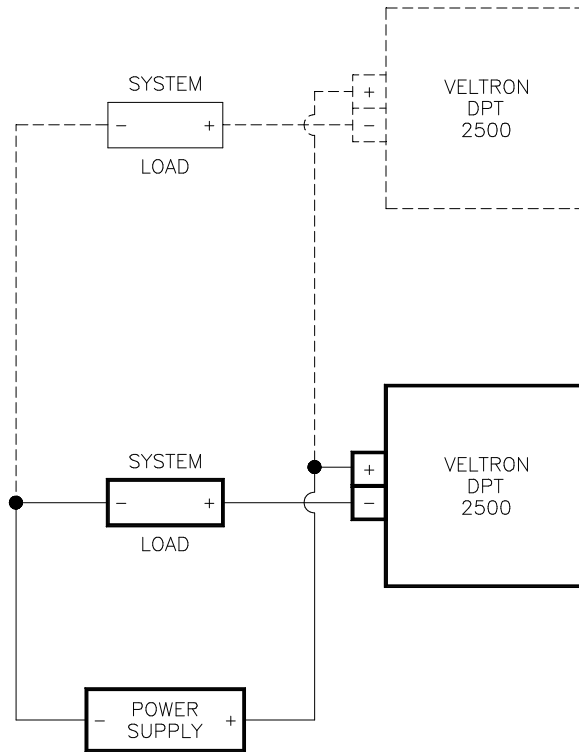


Figure 2

The maximum load resistance that can be driven will depend on the power supply voltage (see Figure 3 below).

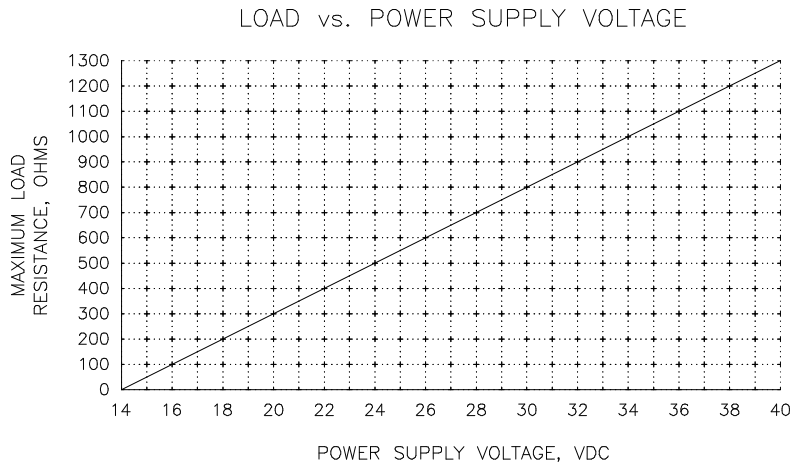


Figure 3

4 – OPERATION

4.1 – LOW PASS FILTER

If the VELTRON DPT 2500's output and display (if provided) are continuously fluctuating due to pulsating (noisy) process signal, the user can slow the unit's response to these fluctuations by increasing the signal noise filter.

1. Open or remove the cover on the VELTRON DPT 2500 and locate the jumper strip-J6 (see Figure 4) on the main board.
2. The factory setting for the filter is 0.50 seconds (jumper position 2). To slow the unit's response time, remove the jumper and install on the pair of pins labeled 1.0 seconds (jumper position 3). The indicated value of time refers to the length of time required for the output and display to fully respond to a 98% (of full span) step change.
3. Operate the unit and observe the output and display. Continue to increase or decrease the time value of the filter until the desired results are obtained.

Note: Any time the filter value is changed (new jumper position), zero calibration must be performed on unit. This is accomplished by performing Steps 1 through 5 for unipolar or 1 through 6 for bipolar as outlined in the following Section – "CALIBRATION".

5 – CALIBRATION

Calibration should be done when the unit is suspect or on an annual basis as a minimum.

Calibration consists of applying minimum and maximum input pressure and verifying and adjusting (if necessary) the VELTRON DPT 2500 output and optional display.

The VELTRON DPT 2500 can be calibrated mounted in its operating location or at a test bench in a calibration lab. If calibrated at a test bench, position the unit in the same attitude as in its operating location.

5.1 – REQUIRED EQUIPMENT

- Digital Multi-meter (DMM)
- Manometer capable of measuring to the nearest 0.001” w.c.
- Adjustable low pressure regulator, such as AMC “Low Pressure Air Source” or equal.
- Source of clean dry air.

5.2 – PREPARATION

1. Open or remove cover.
2. Place zeroing valve (see Figure 1 for location) in the Zero position.
3. Remove High and Low pressure signal lines at the unit.

5.3 – TRANSMITTER INPUT CALIBRATION

5.3.1 For Units With Positive or Negative Differential Pressure Spans

4. Connect DMM, set to read to the nearest 0.001 VDC, across test points **TP0 COM** (black) and **TP1 XMIT 1** (brown) on the main circuit board. See Figure 4.
5. With zero input pressure to the VELTRON DPT 2500, verify the DMM reads 0.000 ± 0.001 VDC. If adjustment is required, adjust **XMIT ZERO** (R37 on main circuit board) as needed.
6. Verify the LCD display (if so equipped) reads 000 ± 001 . Adjust as necessary using **ZERO** (R9 on display board). See Figure 5.
7. Connect DMM, set to read to the nearest 0.01 mADC, across **TP2 OUT+** (red) and **TP3 OUT-** (orange) on the main board. DMM should read 4.00 ± 0.01 mADC. Adjust as necessary using **OUTPUT ZERO** (R13 on main board).
8. Place zeroing valve to the Normal position and apply input pressure (as read on manometer) to the High port of the VELTRON DPT 2500. Adjust pressure according to the following:
 - For positive differential pressure spans, use the span value as indicated on the label under “SPAN”.
 - For negative differential pressure spans, use the positive equivalent of the span value as indicated on the label under “SPAN”.

Caution: Adjust low pressure signal air to zero before connecting to the VELTRON DPT 2500. This will prevent over-pressurizing and damaging the unit.

9. Verify DMM reads 20.00 ± 0.01 mADC. Adjust as necessary using **XMIT SPAN** (R38 on main board).
10. Verify the LCD display (if so equipped) reads the desired full scale value ± 001 . Adjust as necessary using **SPAN** (R1 on display board).
11. Repeat steps 4 through 10 as necessary until no further adjustments are required to either zero or span.
12. Disconnect all test equipment, re-install High and Low pressure signal lines and close or reattach cover.

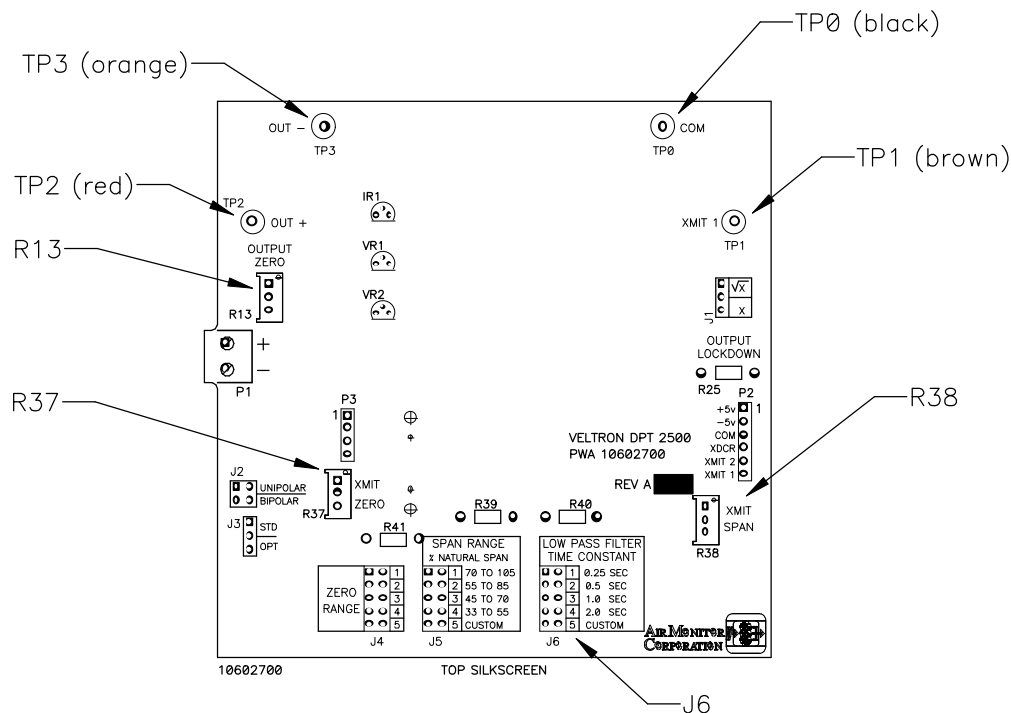


Figure 4

5.3 – TRANSMITTER INPUT CALIBRATION

5.3.2 For Units With Bi-Polar Spans

4. Connect DMM, set to read to the nearest 0.001 VDC, across test points **TP0 COM** (black) and **TP1 XMIT 1** (brown) on the main circuit board. See Figure 4.
5. Place zeroing valve to the Normal position and apply input pressure (as read on manometer) to the Low port of the VELTRON DPT 2500. Adjust pressure to the positive equivalent of the minimum (negative) span value as indicated on the label under “SPAN”.

Caution: Adjust low pressure signal air to zero before connecting to the VELTRON DPT 2500. This will prevent over-pressurizing and damaging the unit.

6. Verify the DMM reads 0.000 ± 0.001 VDC. If adjustment is required, adjust **XMIT ZERO** (R37 on main circuit board) as needed.
7. Verify the LCD display (if so equipped) reads the desired minimum process value ± 001 . Adjust as necessary using **ZERO** (R9 on display board). See Figure 5.
8. Connect DMM, set to read to the nearest 0.01 mADC, across **TP2 OUT+** (red) and **TP3 OUT-** (orange) on the main board. DMM should read 4.00 ± 0.01 mADC. Adjust as necessary using **OUTPUT ZERO** (R13 on main board).
9. Disconnect pressure input from Low port and connect to High port.
10. Adjust input pressure to the maximum (positive) span value as indicated on the label under “SPAN”.
11. Verify DMM reads 20.00 ± 0.01 mADC. Adjust as necessary using **XMIT SPAN** (R38 on main board).
12. Verify the LCD display (if so equipped) reads the desired full scale value ± 001 . Adjust as necessary using **SPAN** (R1 on display board).
13. Repeat steps 4 through 12 as necessary until no further adjustments are required to either zero or span.
14. Disconnect all test equipment, re-install High and Low pressure signal lines and close or reattach cover.

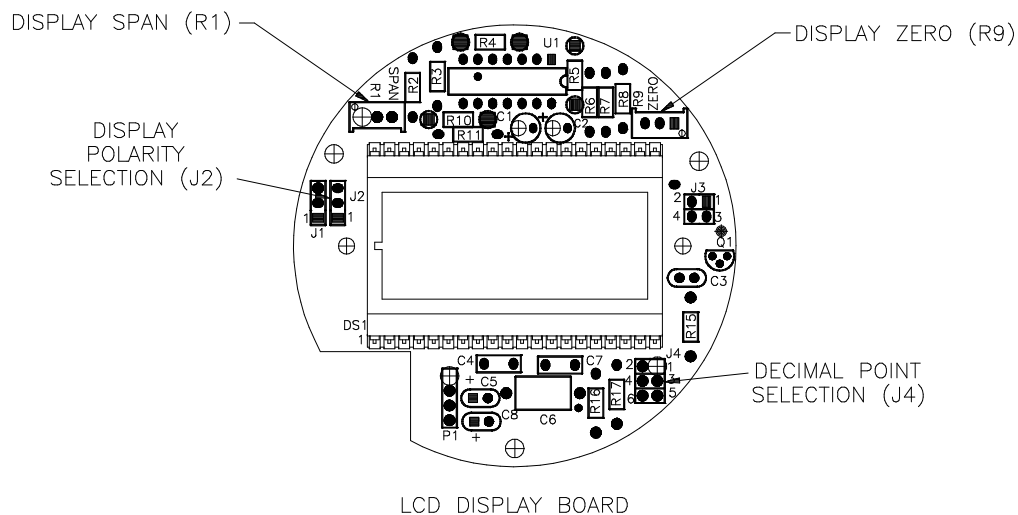


Figure 5

6 – MAINTENANCE

The VELTRON DPT 2500 is a solid state device having few mechanical parts requiring special periodic maintenance. The following maintenance steps are not requirements, but guidelines for establishing a maintenance program for your specific installation.

Operating experience should be used to set frequency of specific types of maintenance.

6.1 – CLEANLINESS

– Verify condensation (or other sources of liquids) are not present inside the VELTRON DPT 2500.

6.2 – MECHANICAL

- Verify pressure signal connections are secure.
- Inspect pressure signal lines for any cracks or leaks.
- Verify mounting hardware is secure.

6.3 – ELECTRICAL

– Periodically inspect all wiring to the VELTRON DPT 2500 for good connections and absence of corrosion.

6.4 – CALIBRATION

– VELTRON DPT 2500 should have calibration verified annually as a minimum.

7 – CUSTOMER SERVICE

7.1 – CUSTOMER SERVICE/TECHNICAL SUPPORT

Air Monitor Corporation provides in-house technical support for our products:

Monday through Friday
7 am to 5 pm (pst)
Phone: 707-544-2706 or 1-800-AIRFLOW
Fax: 707-526-2825

Additionally, on-site technical assistance is available. Before contacting the Customer Service Department, please ensure any applicable troubleshooting steps outlined in Section 8 have been performed.

7.2 – REPAIRS/RETURNS

If after contacting the Customer Service Department it is determined that equipment will require return to Air Monitor Corporation for further repair, a Return Authorization number will be issued by the Customer Service Department. A Confirmation of Return Authorization with shipping instructions will be sent via facsimile.

Equipment to be returned to Air Monitor should be returned in its original shipping container if possible. If this is not possible, ensure equipment is packaged sufficiently to protect it during shipment.

CAUTION
All damage occurring during transit is the Customer's responsibility.

List the Return Authorization (R/A) number on the packing list and clearly mark this number on the outside of each shipping container.

Costs associated with return of equipment to Air Monitor are the customer's responsibility regardless whether the repair/return is under warranty.

7.3 – WARRANTY REPAIRS/RETURNS

Once the Customer Service Department determines that the equipment repair is under warranty, the item will be repaired and returned to the customer at no charge.

7.4 – NON-WARRANTY REPAIRS/RETURNS

Customer will be invoiced for all parts and labor required for the repair of equipment. Return shipping charges will also be added to invoice.

7.5 – FIELD SERVICE

Requests for field service should be made to the Customer Service Department, who will coordinate sending a technician to customer's site.

Phone: 707-544-2706 or 1-800-AIRFLOW
Fax: 707-526-2825

Upon completion of work, technician completes a Field Service Report and gives a copy to the customer. Field service is charged on a daily basis and all travel expenses are also added to customer's invoice.

APPENDIX A

FACTORY SET-UP SHEETS

(PROVIDED SEPARATELY WITH THE UNIT(S))