IOM Manual

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Product Information

AntrumX®

AntrumX is a patented Air Quality Monitoring System (AQMS) that provides your Building Management System (BMS) or Laboratory Airflow Control System (LACS) with the data needed to validate the safety of the lab while optimizing ventilation for increased energy savings. Antrum's scalable sensing platform continuously monitors a multitude of parameters as specified in the submittal.

AntrumEYE®

AntrumEYE is a software platform designed to highlight the benefits of demand-controlled ventilation, with a particular focus on laboratory environments. While adaptable for various applications, AntrumEYE was developed specifically with laboratory end-users in mind. The platform provides insights into ventilation demand using data shared over the BMS and from the AntrumX centralized sensing system. Additionally, it displays key safety and energy-saving metrics, including air change rate (based on the positions of the supply and GEX valves), kWh savings, sash position, air quality trends, and more.

AntrumEYE is available for the entire lifespan of each calibrated sensor pack. It runs locally on the AntrumX Gateway and is also available online at antrumeye.com if equipped with an ethernet connection. The online service benefits the end-user providing advanced troubleshooting, regular updates, and a reduced cost compared to just the local installation.

System Installation

Preparing for Installation

The AntrumX centralized sensing system is simple to install and operate. To ensure a smooth and successful installation, the location, placement and installation method of the key system components should be considered.

Air Accelerators, Duct Couplers and 2" Hose

The air accelerators provide the negative pressure necessary to make the AntrumX system function and are connected to existing ductwork using the 2" hose and duct couplers. The differential static pressure in the duct at the location where the duct couplers are to be installed must be at least 0.5" WC (inches of water column). In installations where the fan has a setback mode, this requirement applies to both the normal operating speed and the setback speed. If you are unsure of the exact static pressure at the chosen installation point, it is advisable to test the pressure first.

To test the static pressure in a duct, the installer will need a pressure gauge and an access port into the duct. The connection between the pressure gauge and the access port must be fully sealed to ensure an accurate reading. Antrum can assist in the sourcing of materials necessary to complete pressure testing should the installer not have the equipment available.

Additionally, air flow conditions within the duct where the duct couplers are installed should be as stable as possible. The following locations are not suitable for installation:

- Within 5' of an elbow in the duct.
- Within 5' of a change in the duct cross sectional area.
- Downstream of any valves, filters or other equipment which is in the air stream (filters housed within air handler itself are exempt from this requirement).

AntrumX Panel, Gateway and Sensor Pack

The install location of the AntrumX panel must take the pressure source supplying the air accelerators as well as the individual zone pickup locations into consideration to ensure optimal performance. The ideal location will minimize the length of the individual ¼" tubing runs while ensuring that the length of the ½" and 2" hose remains within the requirements below. Maximum lengths of the ¼" tubing, ½" hose and 2" hose are below:

- The length of ½" hose connecting the air accelerators to the AntrumX panel shall not be greater than 100'.
- The length of 2" hose connecting the inlet side of the air accelerator to the supply duct coupler shall not be greater than 25'. Similarly, the 2" hose connecting the outlet side of the air accelerator to the exhaust duct coupler shall not be greater than 25' if installed.
- The ¼" tube runs should be kept as short and as straight as possible. Excessive bends, coils and kinks must be avoided. The actual length of each ¼" tube run should be documented during installation.

It is better to shorten the lengths of the ¼" tubing and length the ½" and/or 2" when attempting to find a suitable location for the AntrumX panel.

¼" Tubing

The most time-consuming aspect of the installation is pulling and securing the ¼" tubing. Furthermore, the proper and careful installation of the ¼" tubing is critical to the performance of the AntrumX system. Extreme care should be taken when pulling tubing to ensure there are no kinds, cuts or knicks. One of

the easiest ways to minimize this risk is also one of the most efficient methods for pulling tubing and it involves pulling multiple tubes at the same time and bundling them together. 4-6 tubes can be fairly easily pulled simultaneously which is a tremendous time savings during install. Be sure to label both ends of the tubing and the spools prior to pulling which will make subsequent landing of the tubing into the panel very straightforward. Here are a few additional tips:

- Install the air accelerators, duct couplers, ½" and 2" hose first to ensure the location has suitable static pressure.
- Next, pull the longest/furthest ¼" tube runs before the shorter runs.
- After the longest runs have been pulled, stop to check airflow using the startup kit. If there are any airflow issues, it is best to catch them early in the install process. Otherwise there is risk of needing to remove and relocate components of the system which is time consuming.

Questions or concerns regarding the installation location should be discussed with an Antrum representative as early as possible.

Field Connections

Field Provided

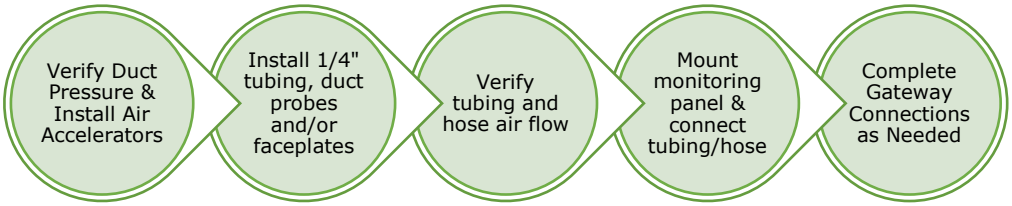
- 1 ¾" hole saw (for installation of duct couplers)
- ¾" hole saw (for installation of 1" duct probe)
- General tools

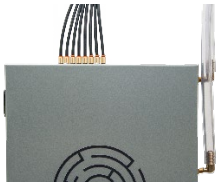
If additional tubing or parts are needed

- Many are pneumatic components and readily available at your local pneumatic controls store
- Tubing, Duct Probes / Faceplates, or other specific AntrumX parts can be ordered from your local Antrum representative

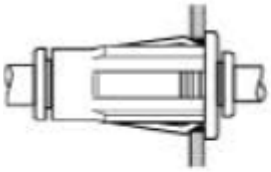
Install Process

Installation of the AntrumX system should be completed in this order.





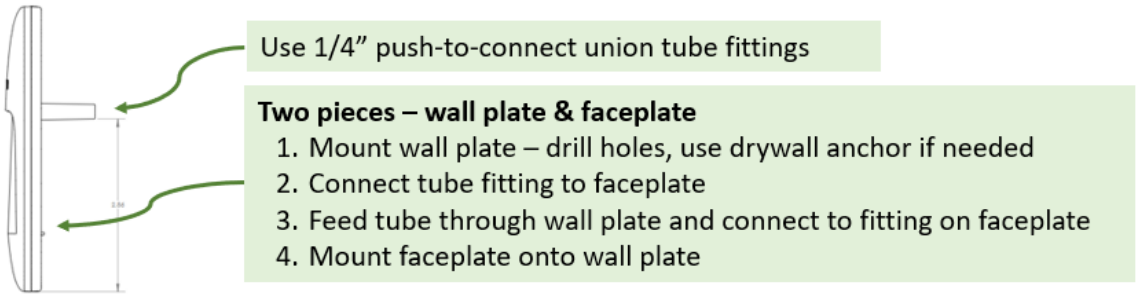
Duct Probe



NOTES:
1. Mark fixing hole
2. Drill 3/4" hole
3. Simply push duct probe into place

- Duct Probe should be mounted:
  - General Exhaust Pickup
    - Downstream of the general exhaust grille, but upstream of the general exhaust control valve. Installation must be for general exhaust only, do not sample exhaust air from fume hood(s).
  - Supply Air Pickup
    - Install in the supply air stream of a 100% OA unit, upstream of the laboratory diffuser. One supply air reference pickup point is needed for an 8 or 16-Zone panel, and two are required for a 32-Zone panel.

Faceplate

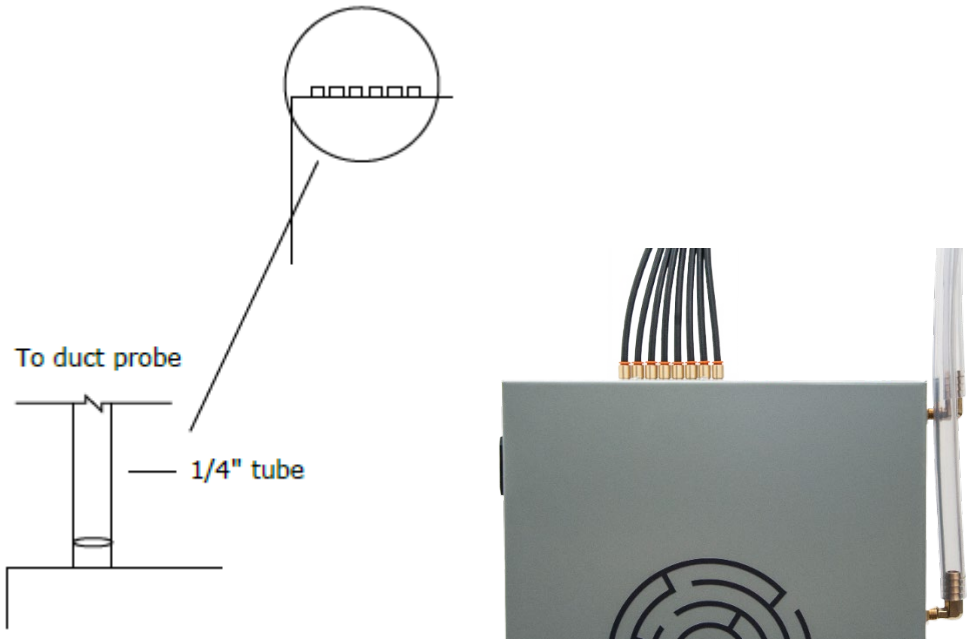


- Faceplate should be mounted:
  - approximately 5 feet from the floor, in the normal breathing zone, on a column or wall
    - use interior support columns to maximize coverage
    - faceplates typically cover a diameter of 80’ or 5,000ft^2
    - additional faceplates required in areas where people work or air is known to be stagnant
  - on the ceiling near the center of the room in applications which utilize an open plenum (e.g. no general exhaust or supply air pickups)

- The Faceplate should NOT be mounted in a corner where ambient temperature is below 0F or greater than 125F (-18C to 52F).

1/4” Tubing

1. Tubing available from Antrum
2. The tubing should be homerun from the AntrumX panel to the Duct Probe or Faceplate. Careful consideration should be taken when installing tubing. Use conduit where necessary. The fewer bends, turns, and fittings the better, and it is critical there are no kinks or breaks in the tubing.
3. The other end of the tubing should be installed into the manifold on the top of the Monitoring Panel on the appropriate channel, as specified.
4. Each tube should be labelled according to the drawings.
5. Under no circumstance should the tubing be coiled at any point along the length of the run or at the ends.



- Minimize fittings and prevent sharp bends, kinks and breaks.
- Do not install within outside walls.
- Label each tube at the Monitoring Panel according to the drawings.

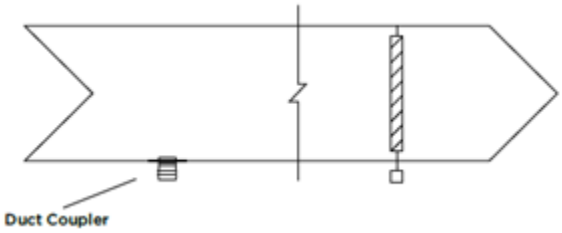
Air Accelerators (AA)

- No moving parts
- Requires minimum ½" of supply duct static pressure at all times
- Optional connection to exhaust duct so samples can be exhausted from building (required for critical applications)

Duct Coupler

1. Drill a 1 ¾" hole in the supply and exhaust ducts, upstream of any dampers
2. Apply the Duct Coupler Gasket to the Duct Coupler.

3. Insert the Duct Coupler into the hole in the ductwork.



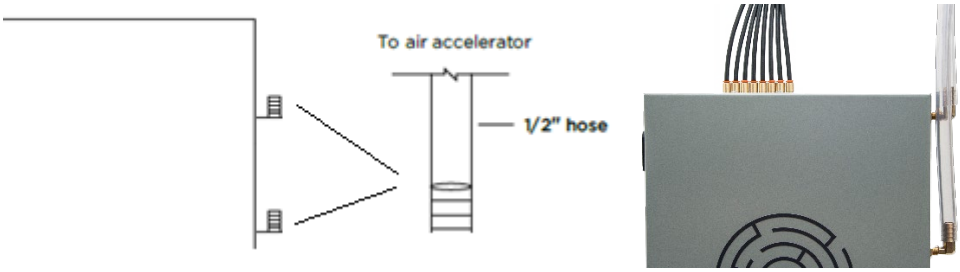
4. Install a minimum of four #12 screws through the holes in the Duct Coupler (avoid over-tightening).

5. Connect the Air Accelerator to the Duct Coupler with 2" hose.

- An AA is used for each Sensor Pack and MUX within a Monitoring Panel. Therefore, 8 and 16-zone panels use two AAs, and 32-zone panels use four AAs.
- The AAs should be installed between the supply and exhaust main on the air handling unit (AHU) that is serving the monitored laboratories. **There are arrows on the AA that show the direction of airflow.**
- AAs can be supported using the mounting holes if necessary.

1/2" Hose

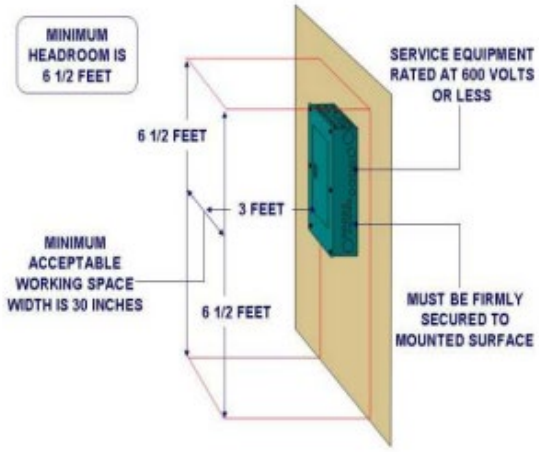
- Securely fasten the ½" hose to the AA
- Remove hose barbs from bag inside panel and screw into fittings on top of panel.
- Run the ½" hose from the ½" barbed fitting on the AA to the ½" barbed fitting on the monitoring panel. Ensure there are no kinks in the hose.

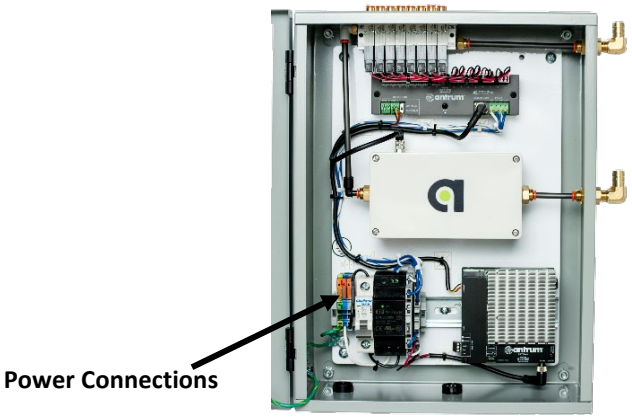


Monitoring Panel

The panel(s) should be installed in a location determined by the Design Engineer/General Contractor as indicated on the drawings in the design documents.

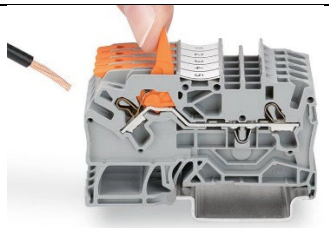
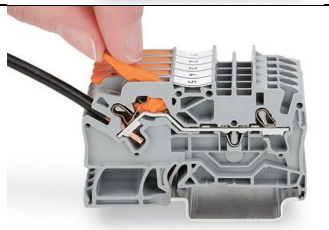
- Before mounting the panel to the wall, ensure there is enough clearance provided to insert power and tubing as required.
- Mounting surface must be capable of handling the weight of the unit as specified in the submittal. Recommend mounting surface ¾" fire retardant rated plywood.
- Securely mount the monitoring panel onto the wall according to local building code requirements for.
- The control panel should be mounted in accordance with the National Electrical Code (NEC). The Occupational Safety and Health Administration (OSHA) and the NEC require that electrical panels have a minimum of 3 feet of clearance and a minimum headroom of 6.5 feet or the height of the equipment whichever is greater. There shall be 15 inches of clear space from the vertical centerline of the panel to the sides, and 36 in of clearance in front of the panel.





Power

1. Open front panel to reveal inside of control panel.
2. If an access hole sized for ½" conduit has been provided it should be utilized if possible. If the provided location is insufficient, punch hole in panel at appropriate point.
3. Install flexible or rigid conduit per NEC. To maintain the environmental rating of the enclosure, install in the openings only Listed or Recognized fittings with the same environmental rating as the enclosure in compliance with the installation instructions of the device.
4. Connect 120-VAC Line to the panel mounted circuit breaker and Neutral and Ground to the terminal blocks.

A. Lift the orange latch into the vertical position. B. Insert the wire fully into the opening below the latch.	
C. Press the latch down firmly until it is in the horizontal (fully closed) position. An audible "click" can be heard when the latch snaps back down. D. Gently pull on the installed wire to ensure a secure fit.	

BMS and Internet

1. If an access hole sized for ½" conduit has been provided it should be utilized if possible. If the provided location is insufficient, punch hole in panel at appropriate point.
2. Insert RJ45 network cable and connect it to the Internet port on the gateway
3. Insert BACnet MS/TP or IP cable and connect it to the BMS terminal block on the Gateway.
4. If two cables are connected to the BMS terminal block, set the Gateway's BMS Terminate/Continue switch to Continue, otherwise set to Terminate.

AntrumX Product Maintenance

Gateway and Sensor Pack Software Updates

The AntrumX Gateway BACnet Device provides access to sensor data and functionality in a network of AntrumX panels through BACnet objects and services. Supporting both MS/TP and IP, it is designed for seamless integration with your Building Management System.

The Gateway includes AntrumEYE, Antrum's ventilation and energy savings dashboard. AntrumEYE enables end-users to quickly monitor and analyze ventilation system performance, identify energy-saving opportunities, and streamline the collection, visualization, and interpretation of data.

Should your Gateway be connected to the internet, updates will be available over-the-air (OTA). In the absence of an internet connection, software updates are not available.

Sensor Maintenance

Sensors require periodic maintenance and calibration to ensure their long-term accuracy and reliable performance. AntrumX centralizes sensors in a patented microenvironment, which enables the calibration processes to be convenient and non-disruptive.

- **Calibration**: To ensure accurate data, sensor calibration is required at a frequency that is specific to your sensor pack, see sensor pack cutsheet for more information. This on-site service can be performed by facility management, your local Antrum representative, or any service provider. The calibration procedure consists of replacing the Sensor Pack.

Calibration Procedure
The Sensor Pack calibration procedure is a replacement procedure. See "Antrum Sensor Pack Installation & Removal Instructions."

Additional Parts

If additional parts are needed, they can be obtained through various channels. Please contact your local Antrum representative for more information. If you need help finding your local representative, contact Antrum at 616-214-3155, or sales@antrum.com.

Part	Manufacturer	Manufacturer Part Number
1/4” Push-to-Connect union	Parker Hannifin	32PLP-4
1/4” Tubing	Antrum	CFEP
2" Hose (Tigerflex)	Kuriyama	GT200X50
1/2" Hose (Kuri Tec)	Kuriyama	K050-0812X100
1” Duct Probe	Parker Legris	3156 56 00
8” Duct Probe	Antrum	20007
Duct Couplers	Antrum	10267
Faceplate	Antrum	10268
Wallplate	Antrum	10279
Startup Kit	Antrum	AXSTARTUP

Warranty Content

Antrum expressly warrants that its products (except the Sensor Pack) are free from defects in material and workmanship for a period of sixty (60) months from the date of shipment by Antrum. The Sensor Pack requires calibration between 6-months and 5-years based on application and configuration of sensor pack and therefore comes with a warranty equal to the frequency of calibration as specified in the submittal.

THE WARRANTY DESCRIBED HEREIN SHALL BE IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR COMPLIANCE WITH ANY LAWS, ALL OF WHICH ARE SPECIFICALLY DISCLAIMED. THE WARRANTY AND REMEDIES SET FORTH HEREIN ARE THE SOLE AND EXCLUSIVE RECOURSE AGAINST ANTRUM.

In the event a breach of the foregoing is noticed and reported to Antrum within the above warranty period, Antrum will, at its option, repair or replace any such product that, in Antrum's reasonable opinion, has failed due to a defect in material or workmanship resulting from normal use. Repair or replacement, F.O.B. point of shipment, shall be exclusive remedy with respect to any such product, provided that if the product is not repaired or replaced as set forth herein, customer may have the option to return any such product for a refund. No other remedy, including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, labor, shipping, handling, freight, transportation, or other charges or damages shall be available. The foregoing warranty does not extend to: improper installation, operation, or maintenance; other misuse; abuse; neglect; damage; accident, sabotage or acts of God; or products which have been altered or repaired by anyone other than Antrum or its authorized representatives.