

Installation Instructions

V-Traq™ Field Installed Kit

Precedent™ Packaged Rooftop HVAC Units

Model**BAYTRAQ001*****BAYTRAQ002***

Used with:

Precedent BF Cabinet

Precedent CDE Cabinet

 **SAFETY WARNING**

Only qualified personnel should install and service the equipment. The installation, starting up, and servicing of heating, ventilating, and air-conditioning equipment can be hazardous and requires specific knowledge and training. Improperly installed, adjusted or altered equipment by an unqualified person could result in death or serious injury. When working on the equipment, observe all precautions in the literature and on the tags, stickers, and labels that are attached to the equipment.

Introduction

Read this manual thoroughly before operating or servicing this unit.

Warnings, Cautions, and Notices

Safety advisories appear throughout this manual as required. Your personal safety and the proper operation of this machine depend upon the strict observance of these precautions.

The three types of advisories are defined as follows:

⚠ WARNING Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It could also be used to alert against unsafe practices.

NOTICE Indicates a situation that could result in equipment or property-damage only accidents.

Important Environmental Concerns

Scientific research has shown that certain man-made chemicals can affect the earth's naturally occurring stratospheric ozone layer when released to the atmosphere. In particular, several of the identified chemicals that may affect the ozone layer are refrigerants that contain Chlorine, Fluorine and Carbon (CFCs) and those containing Hydrogen, Chlorine, Fluorine and Carbon (HCFCs). Not all refrigerants containing these compounds have the same potential impact to the environment. Trane advocates the responsible handling of all refrigerants-including industry replacements for CFCs and HCFCs such as saturated or unsaturated HFCs and HCFCs.

Important Responsible Refrigerant Practices

Trane believes that responsible refrigerant practices are important to the environment, our customers, and the air conditioning industry. All technicians who handle refrigerants must be certified according to local rules. For the USA, the Federal Clean Air Act (Section 608) sets forth the requirements for handling, reclaiming, recovering and recycling of certain refrigerants and the equipment that is used in these service procedures. In addition, some states or municipalities may have additional requirements that must also be adhered to for responsible management of refrigerants. Know the applicable laws and follow them.

⚠ WARNING

Proper Field Wiring and Grounding Required!

Failure to follow code could result in death or serious injury. All field wiring **MUST** be performed by qualified personnel. Improperly installed and grounded field wiring poses **FIRE** and **ELECTROCUTION** hazards. To avoid these hazards, you **MUST** follow requirements for field wiring installation and grounding as described in **NEC** and your local/state/national electrical codes.

⚠ WARNING

Personal Protective Equipment (PPE) Required!

Failure to wear proper PPE for the job being undertaken could result in death or serious injury. Technicians, in order to protect themselves from potential electrical, mechanical, and chemical hazards, **MUST** follow precautions in this manual and on the tags, stickers, and labels, as well as the instructions below:

- Before installing/servicing this unit, technicians **MUST** put on all PPE required for the work being undertaken (Examples; cut resistant gloves/sleeves, butyl gloves, safety glasses, hard hat/bump cap, fall protection, electrical PPE and arc flash clothing). **ALWAYS** refer to appropriate Safety Data Sheets (SDS) and OSHA guidelines for proper PPE.
- When working with or around hazardous chemicals, **ALWAYS** refer to the appropriate SDS and OSHA/ GHS (Global Harmonized System of Classification and Labeling of Chemicals) guidelines for information on allowable personal exposure levels, proper respiratory protection and handling instructions.
- If there is a risk of energized electrical contact, arc, or flash, technicians **MUST** put on all PPE in accordance with OSHA, NFPA 70E, or other country-specific requirements for arc flash protection, **PRIOR** to servicing the unit. **NEVER PERFORM ANY SWITCHING, DISCONNECTING, OR VOLTAGE TESTING WITHOUT PROPER ELECTRICAL PPE AND ARC FLASH CLOTHING. ENSURE ELECTRICAL METERS AND EQUIPMENT ARE PROPERLY RATED FOR INTENDED VOLTAGE.**

⚠ WARNING**Follow EHS Policies!**

Failure to follow instructions below could result in death or serious injury.

- All Trane personnel must follow the company's Environmental, Health and Safety (EHS) policies when performing work such as hot work, electrical, fall protection, lockout/tagout, refrigerant handling, etc. Where local regulations are more stringent than these policies, those regulations supersede these policies.
- Non-Trane personnel should always follow local regulations.

⚠ WARNING**Hazardous Service Procedures!**

Failure to follow all precautions in this manual and on the tags, stickers, and labels could result in death or serious injury.

Technicians, in order to protect themselves from potential electrical, mechanical, and chemical hazards, **MUST** follow precautions in this manual and on the tags, stickers, and labels, as well as the following instructions: Unless specified otherwise, disconnect all electrical power including remote disconnect and discharge all energy storing devices such as capacitors before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. When necessary to work with live electrical components, have a qualified licensed electrician or other individual who has been trained in handling live electrical components perform these tasks.

⚠ WARNING**Hazardous Voltage!**

Failure to disconnect power before servicing could result in death or serious injury.

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Verify that no power is present with a voltmeter.

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General Information

This document gives detailed instructions for installing a Traq Outdoor Air Monitoring assembly and controls in Precedent units equipped with the factory Low Leak Damper Economizer option. For startup notes, see [“Verify System Operation,”](#) p. 10.

The Traq field installation instructions are categorized by Precedent cabinet size. See [“Installation,”](#) p. 6 to identify which instructions pertain to this kit. Note that these instructions assume the Low-Leak Economizer section has already been installed. If the low leak section has not been installed, do so before starting this process.

The parts listed below are common to all Traq kits:

Parts List

- 5x Assorted wiring harnesses
- 1x Traq Assembly
- 1x Bullet sensor
- 1x Control relay
- 1x Relay base
- 1x DIN rail
- 1x UC400 controller
- 1x Field install wiring diagram
- 2x Special unit label stickers
- 1x Sticker field install wiring diagram
- 1x 24VAC control transformer
- 12x sheet metal screws

Receipt of Kit

Inspect the kit components for damage. Check internal components for damage. If inspection reveals damage or material shortages, file a claim with the shipper immediately. Specify the type and extent of the shipping damage on the “bill of lading” before signing. It is the responsibility of the purchasing contractor to file the freight claim; failure to do so makes the purchaser financially responsible for shipping damage.

Do not install a damaged unit without approval from the appropriate Trane sales representative.

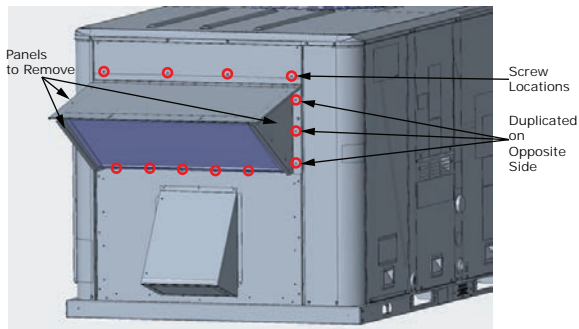
Installation

Precedent Cabinet with Low Leak Economizer (BAYTRAQ001A)

The Traq airflow measurement system should be installed according to the following steps:

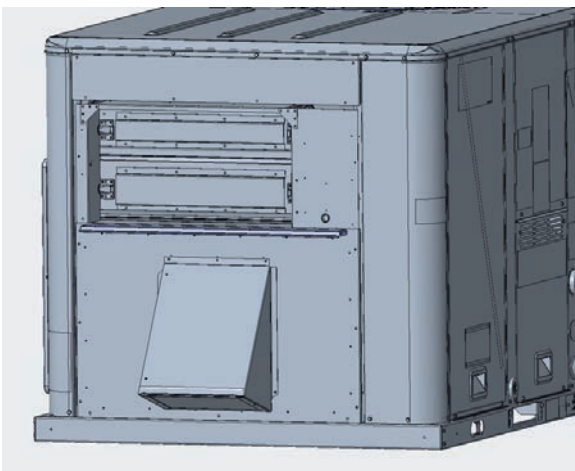
1. Remove the outdoor air hood of the unit to gain access to the section behind, once the panels are removed, the low leak economizer dampers should be visible. [Figure 1](#) below highlights the screws to be removed, and the panels that need to be removed.

Figure 1. OA panel at end of unit



2. Once the Outdoor Air panel has been removed from the end of the unit, the low leak damper section should be visible, like shown in [Figure 2](#). Keep the screws from the removed panel, along with the removed panels, they will be replaced later during install.

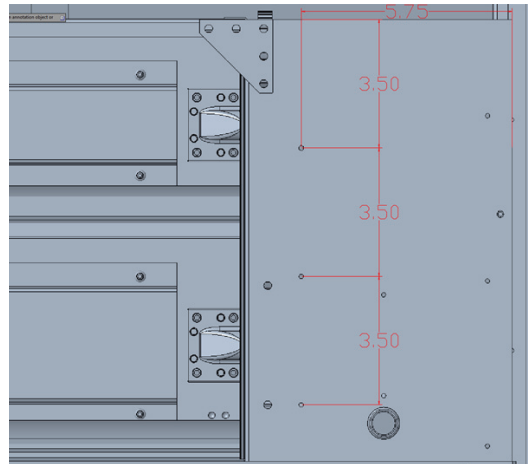
Figure 2. End of unit with OA hood removed



3. With the outdoor air panels removed, mark and drill the following holes using a 0.125-inch drill bit, using the top and right edges as reference points, as shown in [Figure 3](#). The top right hole is to be 5.75-inch left from the right edge of the panel, and down 3.50-inch

from the top edge of the panel. Each hole from the top will be spread 3.50-inch between each other.

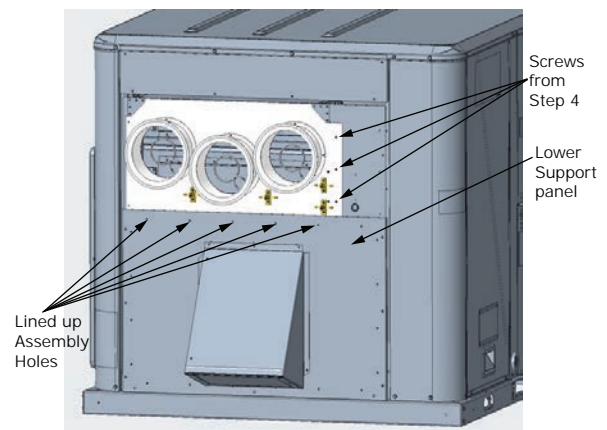
Figure 3. Dimensions of hole locations



4. Once the holes have been drilled shown in [Figure 3](#), have one technician hold the Traq assembly in place, while the other technician screws the assembly in place using the (3) screw holes from [Figure 3](#) and the provided sheet metal screws.

Ensure the Traq assembly is installed behind the lower support panel as shown in [Figure 4](#). An indication that the panel is installed correctly is that the screw holes at the bottom of the assembly line up with the holes of the lower support panel.

Figure 4. Traq assembly in place before being secured

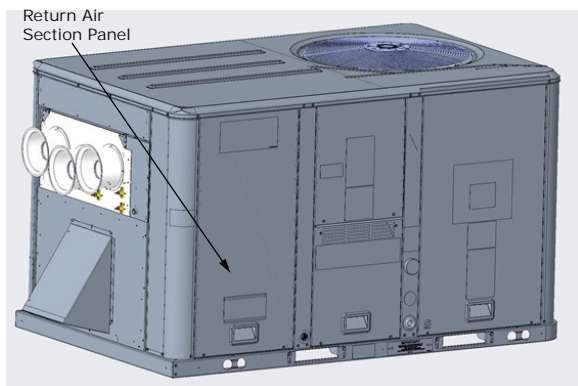


5. With one technician holding the assembly, have the other technician secure the fixture in place by replacing the bottom (5) screws using the holes that were lined up in [Figure 4](#).

Note: The pneumatic tubing is not shown.

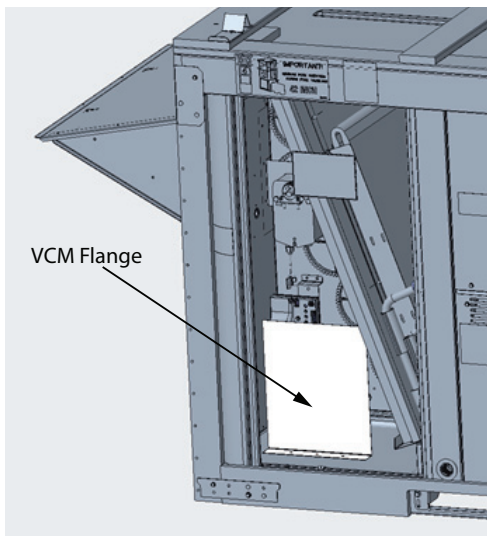
6. By this point, the assembly should be structurally sound enough to no longer require support from the second technician.
7. Install the UC400 assembly, which has been pre-mounted on DIN rail in the main control panel. Also mount the provided control transformer, CST-T1.
8. Remove the panel on the right side that exposes the return air section, the panel is shown in [Figure 5](#).
9. Mount the VCM Flange in the bottom of the return air section using the pre-drilled screw holes and the provided drill screws. The VCM flange should be oriented as shown in [Figure 6](#).

Figure 5. Panel to remove



10. Once the VCM flange is mounted, mount the VCM using the provided sheet metal screws.

Figure 6. VCM flange

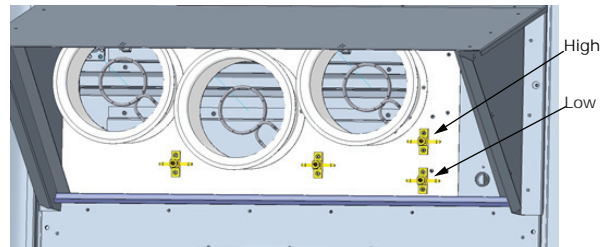


11. Use the provided wire whips to wire the RTEM, transformer, and UC400 control module according to the provided wiring diagram. Follow the same wire routing as the factory wiring. [Figure 6](#) shows the open RA section.

12. Connect the provided air tubing between the Traq assembly and the VCM control module. Be sure to match the high and low connections on the Traq assembly with the high and low connections on the VCM, the high and low connections are shown in [Figure 7](#).

Note: The pneumatic tubing is not shown.

Figure 7. High and low pneumatic tubing port locations



13. Once the RTEM and VCM have been wired, replace the panel that was removed in [Step 8](#).
14. Reinstall the OA panel that was removed in [Step 1](#), replacing all factory screws.
15. The screw holes should line up on the left side of the OA hood such that when the (3) screws are replaced, they will go through both the Traq assembly, and the original backside panel.

The completed unit should appear as shown in [Figure 1](#).

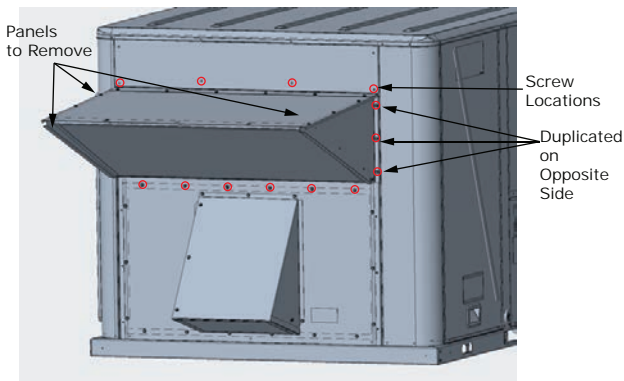
Installation

Precedent Cabinet with Low Leak Economizer (BAYTRAQ002A)

The Traq airflow measurement system should be installed according to the following steps:

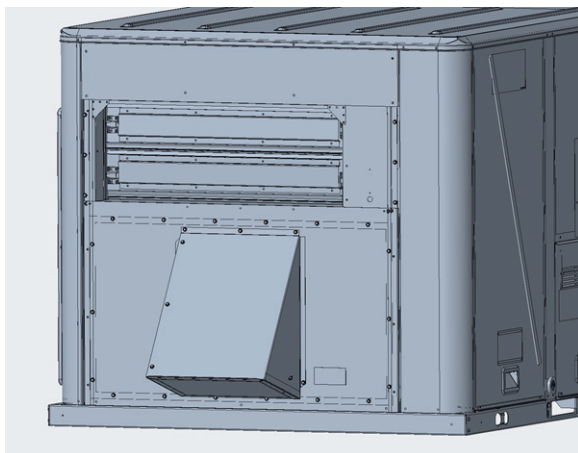
1. Remove the outdoor air hood of the unit to gain access to the section behind, once the panels are removed, the low leak economizer dampers should be visible. [Figure 8](#) highlights the screws to be removed, and the panels that need to be removed.

Figure 8. OA panel at end of unit



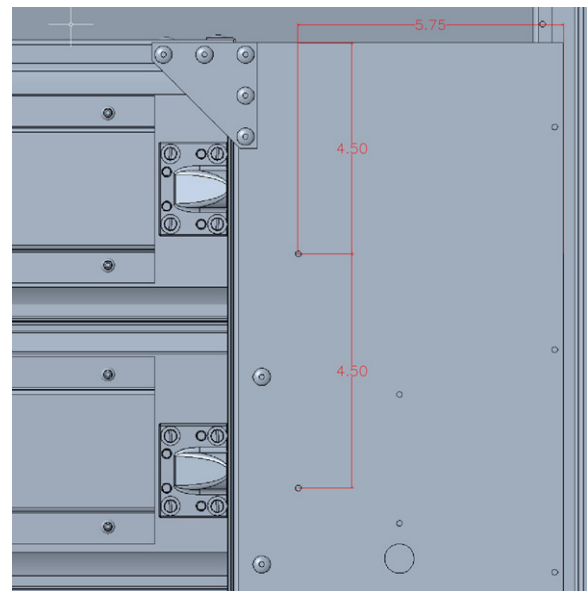
2. Once the OA panel has been removed from the end of the unit, the low leak damper section should be visible, like in [Figure 9](#). Keep the screws from the removed panel, along with the removed panels, they will be replaced later during install.

Figure 9. End of unit with OA hood removed



3. With the outdoor air panels removed, mark and drill the following holes using a 0.125-inch drill bit, using the top and right edges as reference points, as shown in [Figure 10](#). The top right hole is to be 5.75 inches left from the right edge of the panel, and down 4.5 inches from the top edge of the panel. Each hole from the top will be spread 4.5 inches between each other.

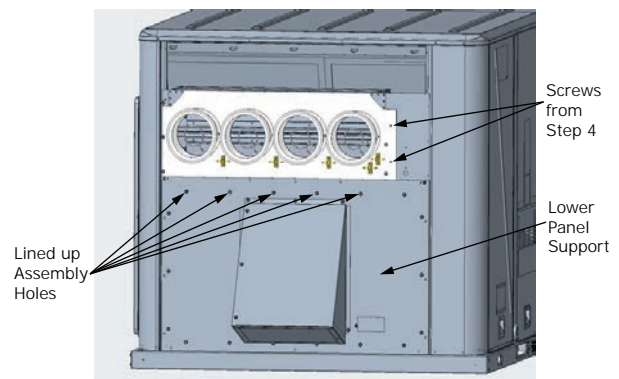
Figure 10. Dimensions of hole locations



4. Once the holes have been drilled like in [Figure 10](#), have one technician hold the Traq assembly in place, while the other technician screws the assembly in place using the (2) screw holes from [Figure 10](#) and the provided sheet metal screws.

Ensure the Traq assembly is installed behind the lower support panel as shown in [Figure 11](#). An indication that the panel is installed correctly is that the screw holes at the bottom of the assembly line up with the holes of the lower support panel.

Figure 11. Traq assembly in place before being secured

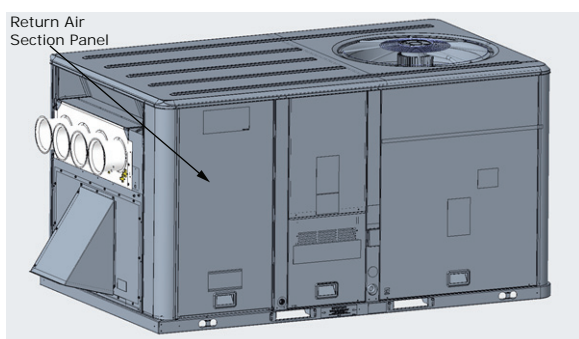


5. With one technician holding the assembly, have the other technician secure the fixture in place by replacing the bottom (5) screws using the holes that were lined up in [Figure 11](#).

Note: The pneumatic tubing is not shown.

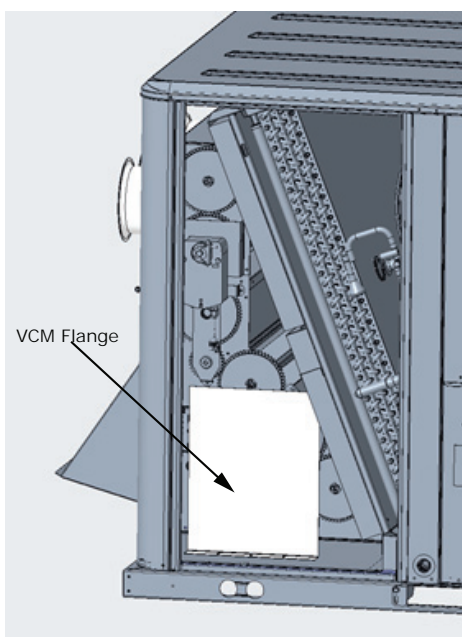
6. By this point, the assembly should be structurally sound enough to no longer require support from the second technician.
7. Install the UC400 assembly, which has been pre-mounted on DIN rail in the main control panel. Mount the provided control transformer, CST-T1.
8. Remove the panel on the right side that exposes the return air section, the panel is shown in [Figure 12](#).
9. Mount the VCM Flange in the bottom of the return air section using the pre-drilled screw holes and the provided drill screws. The VCM flange should be oriented as in [Figure 13](#).

Figure 12. Panel to remove



10. Once the VCM flange is mounted, mount the VCM using the provided sheet metal screws.

Figure 13. VCM flange



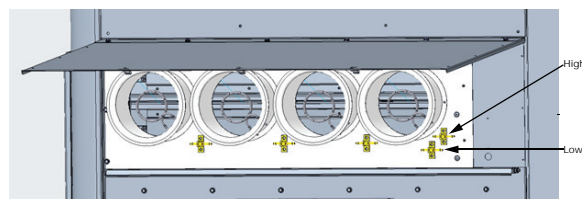
11. Use the provided wire whips to wire the RTEM, transformer, and UC400 control module according to the provided wiring diagram. Follow the same wire

routing as the factory wiring. [Figure 13](#) shows the open RA section.

12. Connect the provided air tubing between the Traq assembly and the VCM control module. Be sure to match the high and low connections on the Traq assembly with the high and low connections on the VCM, the high and low connections are shown in [Figure 14](#).

Note: The pneumatic tubing is not shown.

Figure 14. High and low pneumatic tubing port locations



13. Once the RTEM and VCM have been wired, replace the panel that was removed in [Step 8](#).
14. Reinstall the OA panel that was removed in [Step 1](#), replacing all factory screws.
15. The screw holes should line up on the left side of the OA hood such that when the (3) screws are replaced, (2) of the screws will go through both the Traq assembly, and the original backside panel, with the top screw will not go through the Traq assembly.

The completed unit should look as it did in [Figure 8](#).

Verify System Operation

UC400 Application Notes

- This unit is factory equipped with the Traq outside air monitoring system. This system is capable of metering the flow of outside air through the economizer.
- The economizer dampers are modulated to maintain a minimum outside airflow into the building for ventilation purposes. This set point may be adjusted using the Tracer TU Software or communicated via BACnet. The default set point is 0 CFM. Without changing this set point, the economizer will only open based on the standard Reliatel cooling and ventilation algorithms.
- The Traq system will modulate the outside air damper to maintain minimum outside airflow any time the supply fan is proven ON.
- If the unit cooling or CO₂ purge algorithm requests an economizer position greater than that which is required for ventilation, Traq will increase the damper position to satisfy zone requirements.

Note: *This unit has a Trane programmable microcontroller. The controller contains setpoints and PID loops that could require adjusting/tuning during startup.*

System Tuning Notes (if necessary)

In order to properly tune this system, adjust Analog Values 7 and/or 8, "Airflow Correction Factor" and "Min CFM Calc P-Gain" by connecting to the UC400 through Tracer TU.

- Increasing the P-Gain value will increase the response time of the calculation for the damper position (this helps if damper is not responding to airflow changes quickly enough).
- Decreasing the P-Gain slows down the response time of the calculation for the damper position (this helps if the damper is fluctuating too quickly and over shooting the setpoint).
- The Airflow Correction factor can be adjusted if the airflow calculation (Analog Value 3) seems to be off from the measuring value. Adjust the value higher than 1 if the measured airflow is consistently higher than what is being calculated. Adjust the value lower than 1 if the measured airflow is consistently lower than what is being calculated.

Field Operational Check

1. Verify that in no-power state, the outside air dampers are held closed and the return air damper is held open by the actuator spring return.
2. Cycle the unit into economizer test mode. Note that certain outside air conditions may prevent the Reliatel

cooling algorithm from opening the economizer dampers. A 10 VDC signal may be applied to the damper actuator to verify proper direction of operation.

3. Verify that outside air dampers open and return damper closes in response to the Reliatel cooling request.
4. Tracer TU may be used to read "measured cfm" value on the UC400 controller to verify that the correct CFM is being read.

BACnet Notes

The following network variables are used to communicate with the Traq system via BACnet:

Table 1. Network variables

Function	Value Name
Active Damper Position	Damper Position
Measured Outside Air CFM	OA CFM - Measured
Outside Air Set Point	Minimum OA CFM Setpoint

Note: *In some cases the Traq air monitoring system will override the Reliatel damper position to maintain minimum ventilation set point. If damper position is to be read over a BACnet network, actual damper position should be read from analog value Min OA CFM Position.*

Object Data Points List (UC400)

Table 2. Object data points

Instance	Object Name	Point Reference	Read/Write	Description
Analog Inputs				
1	Outdoor Air Velocity	UI1.analogValue	Read	
2	Reliatel Economizer Signal	UI2.analogValue	Read	
Analog Outputs				
1	Outdoor Air Damper	AO1.analogValue	Read	2-10 VDC Output
Analog Values				
1	Minimum Outdoor Air CFM Setpoint		Read/Write	Default Setpoint: 0 cfm, Range: 0-20,000 cfm
2	Outdoor Air Damper Position		Read	
3	Outdoor Air CFM Measured		Read	
4	Minimum Outdoor Air CFM Position		Read	
5	Damper Diameter		Read	Default: 13
6	Damper Count		Read	Default: 3
7	Airflow Correction Factor		Read/Write	Default: 1, Range: 0-10000
8	Min CFM Calc P-Gain		Read/Write	Default: 1, Range: 0-1000
Binary Inputs				
1	Supply Fan Status	BI1.binaryValue	Read	
Multistate Values				
1	Emergency Override Command	bacnet.1.point.mo.2.value	Read	1: Normal
				2: Pressurize
				3: Depressurize
				4: Purge
				5: Shutdown
				6: Fire

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