Installation Instructions

CO_2 Sensing Kit
Voyager Light Commercial
12½ - 25 Ton Packaged Units

Model Numbers:	Used With:	
BAYCO2K002*	T/YS*150-300	T/YH*150-300
ASYSTAT713*	WS*150-240	T/YZ*150-210
BAYCO2K004*	T/YS*150-300	T/YH*150-300
ASYSTAT715*	WS*150-240	T/YZ*150-210

ACCSVN16EEN0

⚠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.

July 2014

ACC-SVN16E-EN

Ingersoll Rand

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 such as HCFCs and HFCs.

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. 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 electrical codes.

⚠WARNING

Personal Protective Equipment (PPE) Required!

Installing/servicing this unit could result in exposure to electrical, mechanical and chemical hazards.

- **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 Material Safety Data Sheets (MSDS)/Safety Data Sheets (SDS) and OSHA guidelines for proper PPE.**
- **When working with or around hazardous chemicals, ALWAYS refer to the appropriate MSDS/SDS and OSHA/GHS (Global Harmonized System of Classification and Labelling 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.**

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

Table of Contents

General Information 4

Inspection 4

Parts List 4

CO_2 Sensor Installation 5

Unit Close up 6

CO_2 Sensor Connections for ReliaTel Units With Economizer 6

Demand Control Ventilation (DCV) for Units with a Honeywell Economizer Module . . . 6

DCV Minimum and Maximum Position Setpoint Adjustment Procedure 7

Constant Volume and Variable Air Volume Units 7

Demand Control Ventilation (DCV) for Units with the ReliaTel Economizer Module . . . 7

Single Zone Variable Air Volume Units . . 10

Demand Control Ventilation (DCV) for Single Zone VAV Units 10

RTVM Module Installation 11

Installing the RTVM Module in Horizontal Supply Configured Units 11

Installing the RTVM Module in Downflow Supply Configured Units 13

Minimum Position Setpoint Adjustment Procedure 14

General Information

An economizer must be installed and functional before attempting to install a CO_2 Sensing Kit.

These sensors detect and control the carbon dioxide level in the conditioned space by measuring CO_2 concentration, comparing it with a user-adjustable set point and sending a corresponding control signal to the economizer module. This causes the economizer damper to be positioned so that sufficient fresh air is introduced into the conditioned space to reduce and maintain the CO_2 concentration to a minimum level as selected by the user.

Inspection

Unpack all components of the CO_2 Sensing kit.

Check carefully for any shipping damage. If any damage is found it must be reported immediately and a claim made against the transportation company.

Parts List

CO_2 Sensors as follow:

BAYCO2K002*/ASYSTAT713*:

- 1 CO_2 Demand-Controlled Ventilation Wall-Sensor (4190-4100) with instructions and mounting hardware.
- 1 Wire Harness with Low Voltage Terminal Board for CO_2 & Ventilation Override
- 2 #8-32 Screws for mounting LTB
- 1 "CO_2 Kit Has Been Installed" Label
- 1 Enhanced Econ Logic Module (RTEM)
- 1 Econ Logic Mounting Screw, # 6-19 x 0.625
- 1 Conversion plug 5P6

BAYCO2K004*/ASYSTAT715*:

- 1 CO_2 Demand-Controlled Ventilation Duct -Sensor (4190-4101) with instructions and mounting hardware.
- 1 Wire Harness with Low Voltage Terminal Board for CO_2 & Ventilation Override
- 2 #8-32 Screws for mounting LTB
- 1 "CO_2 Kit Has Been Installed" Label
- 1 Enhanced Econ Logic Module (RTEM)
- 1 Econ Logic Mounting Screw, # 6-19 x 0.625
- 1 Conversion plug 5P6

CO_2 Sensor Installation

⚠WARNING

Proper Field Wiring and Grounding Required!

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 electrical codes. Failure to follow code could result in death or serious injury.

⚠WARNING

Hazardous Voltage w/Capacitors!

Disconnect all electric power, including remote disconnects and discharge all motor start/run capacitors before servicing. Follow proper lockout/ tagout procedures to ensure the power cannot be inadvertently energized. Verify with an appropriate voltmeter that all capacitors have discharged. Failure to disconnect power and discharge capacitors before servicing could result in death or serious injury.

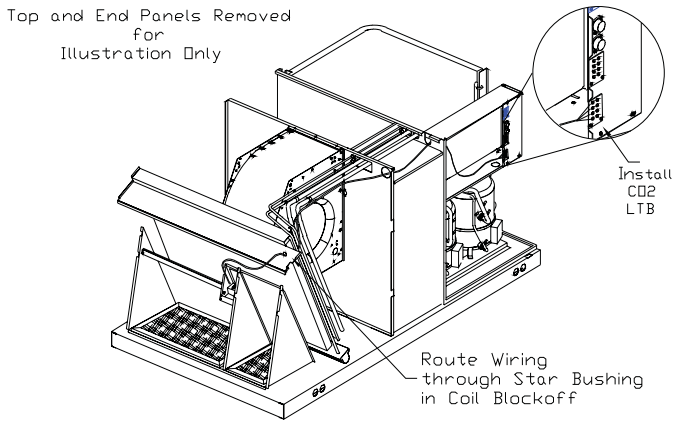
Note: *If the unit has factory installed CO_2 sensor wiring, it will already have the wire harness with low voltage terminal board for CO_2 & ventilation override; skip to Step 6.*

1. Remove Compressor/Control box access panel, Return air/Filter access panel and Fan access panel. See Figure 1.

Note: *BAYCO2K002*, BAYCO2K004*, and BAYVNOR002* contain identical harnesses. If at least one of these accessories has previously been installed, skip to Step 3.*

Note: *If installing the CO_2 sensor kit in a SZ VAV application, refer to the section later in this document for installation of the BAYRTVM001AA as there is additional wire routing involved that could be accomplished simultaneously.*

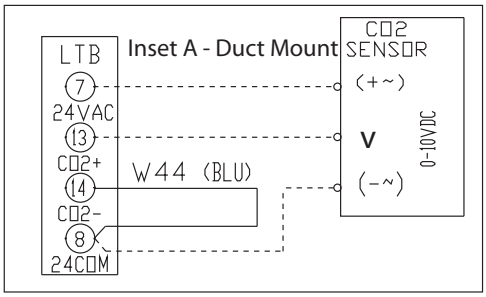
Figure 1. Panel removal

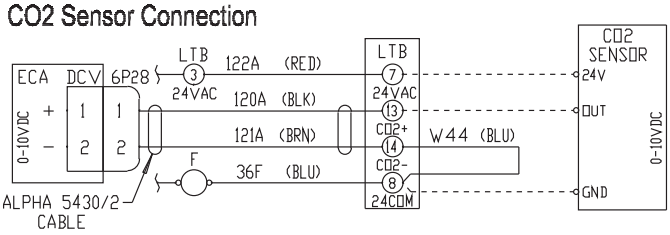


2. Place the harness provided with the kit into the unit control box and install the Low Voltage Terminal Board (LTB) attached to the kit. Place the LTB in the lower right hand corner of the unit control box and secure with the 2 # 8 screws provided using the two existing 0.136" diameter holes in the control box. See Figure 1.
3. Route the remainder of the wires in the kit harness through the control box, pull them through the large hole in the far left side of the control box and then through the hole in the divider panel.

Note: *The wire harness used with this accessory also contains wires used for ventilation override accessory, BAYVNOR002*.*

Figure 2. Connections



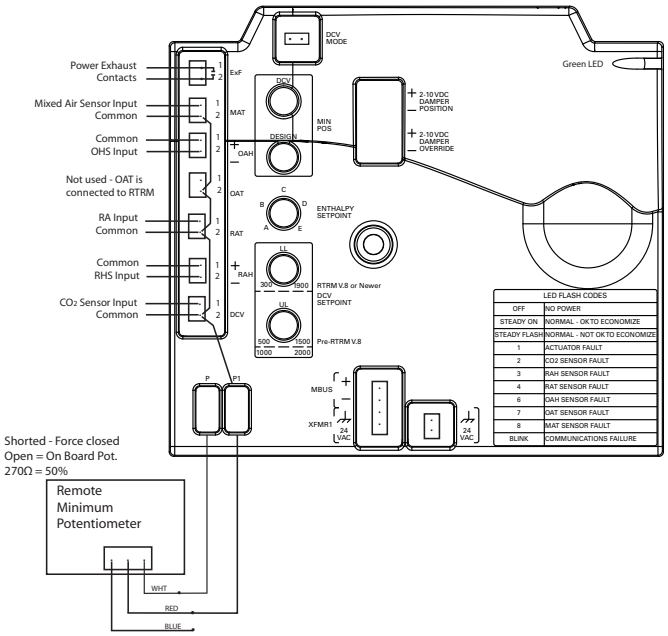


4. Route 6P28 plug and wires 120A (BLK) and 121A (BRN) along the bottom of the raceway in the supply fan section and then through a hole with a star bushing in the top coil blockoff. Pull the 6P28 plug and wires 120A (BLK) and 121A (BRN) into the filter section. See Figure 1.

Note: *Inspect existing economizer actuator for necessary logic module (RTEM) connections. If connections are not present, remove one mounting screw from the top of the existing logic module. Remove existing logic module. Install the new logic module included in the kit. Secure the new logic module with the existing mounting screw or mounting screw provided in the kit.*

5. Connect 6P28 plug to the jack marked "DCV" on the economizer module per Figure 3, p. 6.

Figure 3. Economizer logic module (RTEM) terminal identifications



6. Apply "BAYCO2 Kit Has Been Installed" label next to the main unit wiring diagram label.
7. Install CO_2 sensor in conditioned space or return air duct according to instructions packed with the sensor.
8. Make field wiring connections to LTB installed above per CO_2 diagram. See Figure 2.
9. Route low voltage external field wiring along with and secure to existing low voltage zone sensor or thermostat wiring.

Unit Close up

1. Replace Filter/Coil access panel.
2. Replace Supply fan access panel.
3. Replace Compressor/Control box access panel.

CO_2 Sensor Connections for ReliaTel Units With Economizer

Demand Control Ventilation (DCV) for Units with a Honeywell Economizer Module

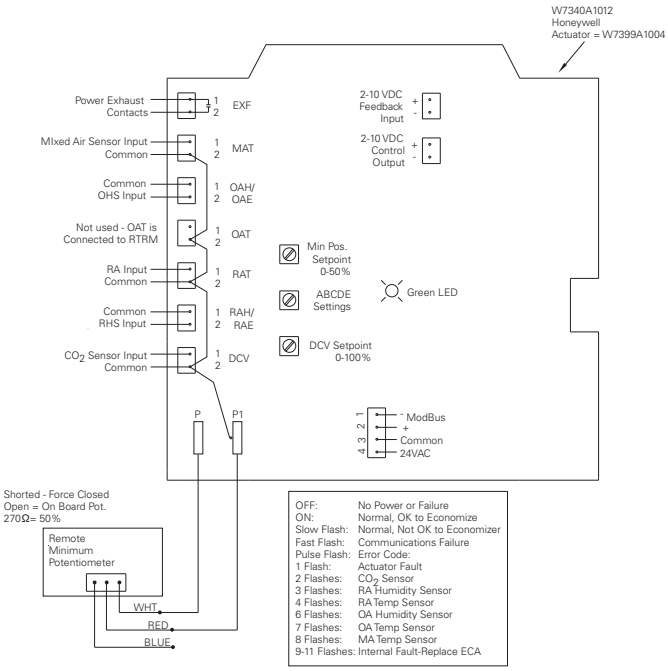
DCV eliminates over-ventilating the space by allowing the fresh air damper to close further than non-$C0_2$ sensing systems, which reduces power consumption. DCV adjusts the fresh air damper between a DCV Minimum Position and DCV Maximum Position. DCV Maximum Position equals non-$C0_2$ sensing systems minimum damper position.

When the CO_2 level is greater than or equal to the CO_2 setpoint the fresh air damper modulates between the DCV Minimum Position Setpoint and the DCV Maximum Position Setpoint, increasing the amount of outdoor air flow and reducing the CO_2 level in the space. The damper will only increase up to the DCV Maximum Position Setpoint. If the CO_2 level drops below the CO_2 setpoint the fresh air damper will drive to the DCV Minimum Position Setpoint.

At first power-up Default DCV Minimum Position Setpoint is 50% of DCV Maximum Position Setpoint. It will remain at this value unless the Setpoint Adjustment Procedure is performed. Once the Adjustment Procedure is performed the two setpoints are independent of each other.

- CO_2 setpoint adjustment
- DCV setpoint potentiometer on economizer module can be adjusted for CO_2 concentrations as follows:
  - 0% - 500ppm
  - 50% - 1000 ppm
  - 100% - 1500ppm

Figure 4. ReliaTel Economizer Module Layout (Honeywell)



DCV Minimum and Maximum Position Setpoint Adjustment Procedure

1. Remove Return Air Temperature (RAT) sensor connector from RAT terminal.
2. Connect CO_2 sensor to LTB terminals. See Figure 2, p. 5.

   To adjust the DCV Minimum and Maximum Position power must be connected to the economizer module. Close the units disconnect and place the zone sensor fan selector in the fan "ON" position and the heat/cool selector in the "OFF" position. This will place the damper in the minimum ventilation position.
3. Apply power to economizer module.
4. Place a jumper between the RAT terminal pins.
5. Disconnect CO_2 sensor from LTB terminals. See Figure 2, p. 5.
6. Economizer module LED will flash 2 times. If LED does not flash, remove power from the module and repeat steps 1-5.

   To adjust the position setting for the required ventilation air, turn the potentiometer clockwise to "open" (increase the amount of ventilation), or counterclockwise to "close" (decrease the amount of ventilation).
7. Set DCV Minimum Position to meet regulatory requirements using MIN POS / DCV MAX potentiometer.

   When adjusting position, the damper may move to the new setting in several small steps. Once the damper has remained in position for 10 – 15 seconds without movement, it can be assumed it is at the new position.
8. Carefully remove the jumper from RAT terminal pins.
9. DCV minimum position is now saved to memory, the economizer module LED flashes 5 times.
10. Remove power from the economizer module.
11. Connect RAT sensor connector to RAT terminal.
12. Connect $C0_2$ sensor to LTB terminals.
13. Apply power to the economizer module.

    To adjust the position setting for the required ventilation air, turn the potentiometer clockwise to "open" (increase the amount of ventilation), or counterclockwise to "close" (decrease the amount of ventilation).
14. Set DCV Maximum Position to meet code requirements using MIN POS / DCV MAX potentiometer.

    When adjusting position, the damper may move to the new setting in several small steps. Once the damper has remained in position for 10 – 15 seconds without movement, it can be assumed it is at the new position.
15. DCV Maximum Position is now set.

Constant Volume and Variable Air Volume Units

Demand Control Ventilation (DCV) for Units with the ReliaTel Economizer Module

Units equipped with an RTEM economizer logic module will perform Demand Controlled Ventilation differently based on the RTRM version also installed in the unit. Similarly to as described above, the unit control will modify the active OA Damper position between a minimum and maximum value based on a minimum and maximum Space CO_2 setpoint. See below for information concerning the different configurations of RTEM and RTRM versions.

RTEM w/ RTRM v8.0 and Later

For units equipped with an RTRM v8.0 or later and also an RTEM, the control will utilize two separate Space CO_2 Setpoints and two separate Damper Minimum Position Setpoints as described below:

CO_2 Setpoints

The CO_2 Setpoints will be obtained through two potentiometers on the RTEM:

- Building Design CO_2 Setpoint (Upper Limit) - Range: 500-2000 ppm

- DCV Minimum CO_2 Setpoint (Lower Limit) - Range: 300-1900 ppm

A 100 ppm differential will be enforced between the Upper Limit CO_2 Setpoint and Lower Limit CO_2 Setpoint.

OA Damper Min Position Setpoints

The OA Damper Min Position setpoints will be obtained by the position of two onboard potentiometers located on the RTEM:

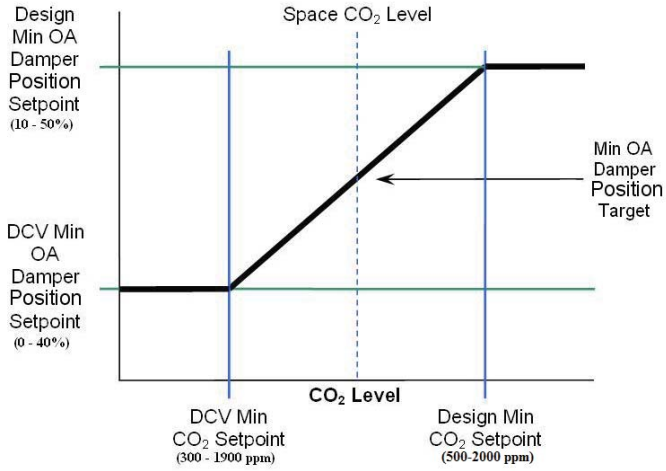
- Building Design Min Position Setpoint - Range: 10-50%
- DCV Min Position Setpoint - Range: 0-40%.

A 10% differential will be enforced between the Design Min Position Setpoint and DCV Min Position Setpoint; the DCV Min Position Setpoint will always be 10% less than the Design Min Position Setpoint. If the unit is configured for DCV and a Remote Min Position value is present on the P0 and P1 terminals, the Remote Min Position will become the Design Min Position Setpoint and the 10% differential will not be enforced.

Sequence of Operation

When the unit is in the occupied mode, the outdoor-air (OA) damper will be controlled between the selected Design Minimum Position and DCV Minimum Position setpoints based on the Space CO_2 value. See Figure 5.

Figure 5. Outdoor air damper position



When the unit is in the unoccupied mode, DCV control is deactivated.

Note: *When using CO_2-based DCV with an RTRM (v8.0 or later) and also an RTEM, set the Design Min Position Setpoint to the minimum outdoor airflow required by the local building code. The DCV Min Position Setpoint is typically based on either 1) the minimum exhaust airflow rate from the building or 2) the base ventilation rate required to dilute building- or process-related contaminants. See HVAC Knowledge Center wave52581 for guidance on determining the CO_2 setpoints and OA damper position setpoints for a given application.*

During normal occupied mode, if the unit is not actually heating or cooling, and the fan mode is set to auto, the supply fan will be off. If the unit is configured for Active DCV control (DCV Mode OPEN), the supply fan will be energized when the space CO_2 level rises above the Lower Limit CO_2 Setpoint and the DCV algorithm will be in control of the outdoor air damper position. When the space CO_2 level falls below the Lower Limit CO_2 Setpoint minus 50 ppm, DCV control will begin to close the damper to the DCV Min Position Setpoint. Once the space CO_2 level is below the Lower Limit CO_2 Setpoint minus 50 ppm and the OA damper is at the DCV Min Position the Supply Fan will de-energize if not requested ON by another function.

The RTEM allows the selection of either Active or Passive DCV control. Installing a jumper across the RAT terminals pins on the RTEM module configures the unit for Passive DCV control. When configured for Passive DCV control, DCV control is not allowed to force on the supply fan, and DCV control will only be allowed when the supply fan is on (commanded ON by another function, such as comfort heating or cooling control, or the supply fan mode set to ON). Passive DCV will operate identically to Active DCV once the Supply Fan is energized.

Important: *While the ReliaTel will allow Active DCV control when the fan mode is set to AUTO (cycle on and off with the compressor or heater), this practice is discouraged because it can result in excessive fan cycling and may not comply with ASHRAE Standard 62.1. If CO_2-based DCV is used, the supply fan mode should be set to ON (operate whenever the zone is occupied) or the unit should be configured for Passive DCV control.*

Minimum Position Setpoint Adjustment Procedure

1. Disconnect the CO_2 sensor from the LTB terminals. See Figure 5 To adjust the DCV Minimum and Design Minimum Position power must be connected to the economizer module.
2. Close the unit's disconnect and place the zone sensor fan selection in the fan "ON" position and the heat/cool selector in the "OFF" position. This will place the damper in the minimum ventilation position.
3. To select the Design Min Position setpoint, turn the Design Minimum Position potentiometer clockwise to "open" (increase the amount of ventilation), or counterclockwise to "close" (decrease the amount of ventilation).
4. To select the DCV Min Position setpoint, reconnect the CO_2 sensor to the LTB terminals. See Figure 2, p. 5.
5. Adjust the DCV Setpoint Upper Limit to the full clockwise position.

6. Adjust the DCV Setpoint Lower Limit to the full clockwise position.

Note: *Step 5 and Step 6 will ensure that the damper only opens to the DCV Minimum Position.*

7. To select the DCV Min Position setpoint, turn the DCV Minimum Position potentiometer clockwise to "open" (increase the amount of ventilation), or counterclockwise to "close" (decrease the amount of ventilation).
8. Adjust the DCV Setpoint Upper Limit to the correct setpoint per the application requirements.
9. Adjust the DCV Setpoint Lower Limit to the correct setpoint per the application requirements.

RTEM w/ RTRM v7.0 and Earlier

For units equipped with an RTRM v7.0 or earlier and also an RTEM, the control will utilize a single CO_2 Setpoint and two separate Damper Minimum Position Setpoints as described below:

Setpoint Selection

Units equipped with an RTRM v7.0 or earlier will utilize a single CO_2 Setpoint. The RTEM will use this setpoint and space CO_2 input value to determine the active OA damper position setpoint between the Bldg Design Min Position and DCV Min Position Setpoints.

For DCV control in these units, the CO_2 Setpoint (UL) will have a range of 500 to 1500 ppm.

The OA Damper Min Position setpoints will be obtained by the position of two onboard potentiometers located on the RTEM:

- Building Design Min Position Setpoint - Range: 10-50%
- DCV Min Position Setpoint - Range: 0-40%.

This scheme enforces a 10% differential between the Bldg Design Min Position and the DCV Min Position Setpoints.

Sequence of Operation

For units equipped with RTRM v7.0 or earlier and an RTEM, only Active DCV control is available, as the DCV Mode Configuration input is not recognized prior to RTRM v8.0.

Supply Fan Mode = ON. When the unit is in the occupied mode, the outdoor-air (OA) damper opens to the DCV Min Position Setpoint. If the space CO_2 level rises above the CO_2 Setpoint, the OA damper will open to the Bldg Design Min Position Setpoint. If the space CO_2 level drops below the CO_2 Setpoint, but is not yet 50 ppm below the setpoint, the OA damper will stop modulating (holding its current position). If the space CO_2 level drops below the CO_2 Setpoint minus 50 ppm, the OA damper will close to the DCV Min Position Setpoint. If there is a call for economizer cooling, the outdoor air damper may be opened further to satisfy the cooling request.

Supply Fan Mode = AUTO (from Zone Sensor or all T-stat Inputs Inactive). When the supply fan is energized (commanded ON by another function, such as comfort heating or cooling control), DCV control will operate as described above ("Supply Fan Mode = ON").

When the supply fan is de-energized, if the space CO_2 level rises above the CO_2 Setpoint, DCV control will energize the supply fan and open the OA damper to the Design Min Position Setpoint. When the space CO_2 level drops below the CO_2 Setpoint, the supply fan will be de-energized and the OA damper will close to 0%.

Minimum Position Setpoint Adjustment Procedure

1. Disconnect the CO_2 sensor from the LTB terminals. See Figure 2, p. 5. To adjust the DCV Minimum and Design Minimum Position power must be connected to the economizer module.
2. Close the unit's disconnect and place the zone sensor fan selection in the fan "ON" position and the heat/cool selector in the "OFF" position. This will place the damper in the minimum ventilation position.
3. To select the Design Min Position setpoint, turn the Design Minimum Position potentiometer clockwise to "open" (increase the amount of ventilation), or counterclockwise to "close" (decrease the amount of ventilation).
4. To select the DCV Min Position setpoint, reconnect the CO_2 sensor to the LTB terminals. See Figure 2, p. 5.
5. Adjust the DCV Setpoint Upper Limit to the full clockwise position.

Note: *This step will ensure that the damper only opens to the DCV Minimum Position.*

6. To select the DCV Min Position setpoint, turn the DCV Minimum Position potentiometer clockwise to "open" (increase the amount of ventilation), or counterclockwise to "close" (decrease the amount of ventilation).
7. Adjust the DCV Setpoint Upper Limit to the correct setpoint per the application requirements.

Single Zone Variable Air Volume Units

Demand Control Ventilation (DCV) for Single Zone VAV Units

Demand Controlled Ventilation for Single Zone VAV configured units will only be performed with the RTEM; the Honeywell Economizer Logic Module is not supported. Units will perform Demand Controlled Ventilation as described above except the unit will require additional OA Damper Minimum position setpoints in order to compensate for the variable supply fan speeds. The additional setpoints will be available on the RTVM board included in the BAYRTVM001AA kit.

CO_2 Setpoints

The CO_2 Setpoints will be obtained through two potentiometers on the RTEM:

- Building Design CO_2 Setpoint (Upper Limit) - Range: 500-2000 ppm
- DCV Minimum CO_2 Setpoint (Lower Limit) - Range: 300-1900 ppm

A 100 ppm differential will be enforced between the Upper Limit CO_2 Setpoint and Lower Limit CO_2 Setpoint.

OA Damper Min Position Setpoints

The OA Damper Min Position setpoints will be obtained by the position of five local potentiometers located on the RTEM and RTVM modules:

1. Design Min Position @ Minimum Fan Speed - Range: 0-100% (RTVM R130)
2. Design Min Position @ 50% Fan Speed Command - Range: 0-100% (RTVM R136)
3. Design Min Position @ 100% Fan Speed Command - Range: 0-50% (RTEM Design Min Position)
4. DCV Min Position @ 0% Fan Speed Command - Range: 0-100% (RTVM R41)
5. DCV Min position @ 100% Fan Speed Command - Range: 0-50% (RTEM DCV Min Position)

A 10% differential will be enforced between the Active Design Min Position Setpoint and Active DCV Min Position Setpoint; the DCV Min Position Setpoint will always be 10% less than the Design Min Position Setpoint. If the unit is configured for DCV and a Remote Min Position value is present on the P0 and P1 terminals, the Remote Min Position will become the Design Min Position Setpoint and the 10% differential will not be enforced.

Sequence of Operation

When the unit is in the occupied mode, the outdoor-air (OA) damper will be controlled between a calculated Active Design Minimum Position and Active DCV Minimum Position setpoints based on the Space CO_2 value vs. the selected CO_2 setpoints and the active fan speed. For additional information, please refer to the IOM.

When the unit is in the unoccupied mode, DCV control is deactivated.

Note: *When using CO_2-based DCV with an RTRM (v8.0 or later) and also an RTEM, set the Design Min Position Setpoints to the minimum outdoor airflow required by the local building code at each fan speed. The DCV Min Position Setpoint is typically based on either 1) the minimum exhaust airflow rate from the building or 2) the base ventilation rate required to dilute building- or process-related contaminants. See HVAC Knowledge Center wave52581 for guidance on determining the CO_2 setpoints and OA damper position setpoints for a given application.*

The RTEM allows the selection of either Active or Passive DCV control. Installing a jumper across the RAT terminals pins on the RTEM module configures the unit for Passive DCV control. When configured for Passive DCV control, DCV control is not allowed to force on the supply fan, and DCV control will only be allowed when the supply fan is on (commanded ON by another function, such as comfort heating or cooling control, or the supply fan mode set to ON). Passive DCV will operate identically to Active DCV once the Supply Fan is energized.

Important: *While the ReliaTel will allow active DCV control when the fan mode is set to AUTO (cycle on and off with the compressor or heater), this practice is discouraged because it can result in excessive fan cycling and may not comply with ASHRAE Standard 62.1. If CO_2-based DCV is used, the supply fan mode should be set to ON (operate whenever the zone is occupied) or the unit should be configured for Passive DCV control.*

Note: *With no fan operation there will be no damper movement. Because of this adjustments will be approximate. Better accuracy can be obtained by connecting a DC voltmeter to the "2-10 Vdc Damper Position" terminals on the ECA module to check/verify the adjustments that have been made. Refer to Table 1 for help approximating the damper blade position.*

Table 1. Voltage to percent open

Approx. DC Voltage	Percent Open
2	0%
3	12.5%
3.8	25%
4.7	37.5%
5.8	50%

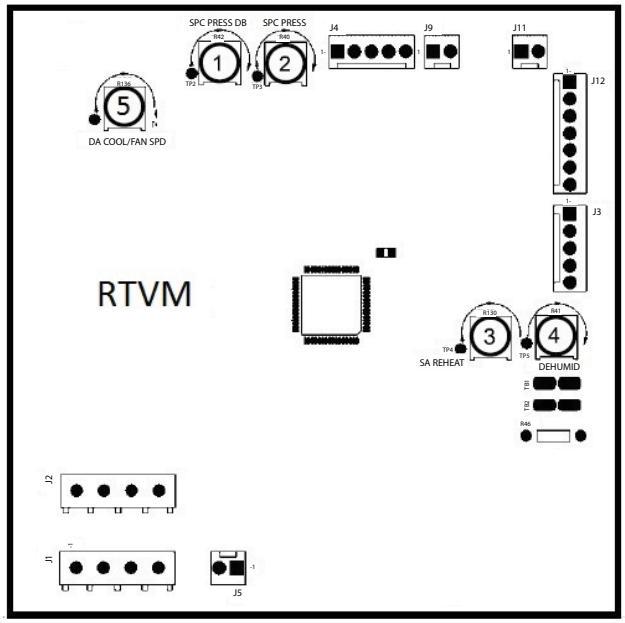
RTVM Module Installation

⚠WARNING

Hazardous Voltage!

Disconnect all electric power, including remote disconnects before servicing. Follow proper lockout/tagout procedures to ensure the power can not be inadvertently energized. Failure to disconnect power before servicing could result in death or serious injury.

Figure 6. ReliaTel ventilation module (RTVM)

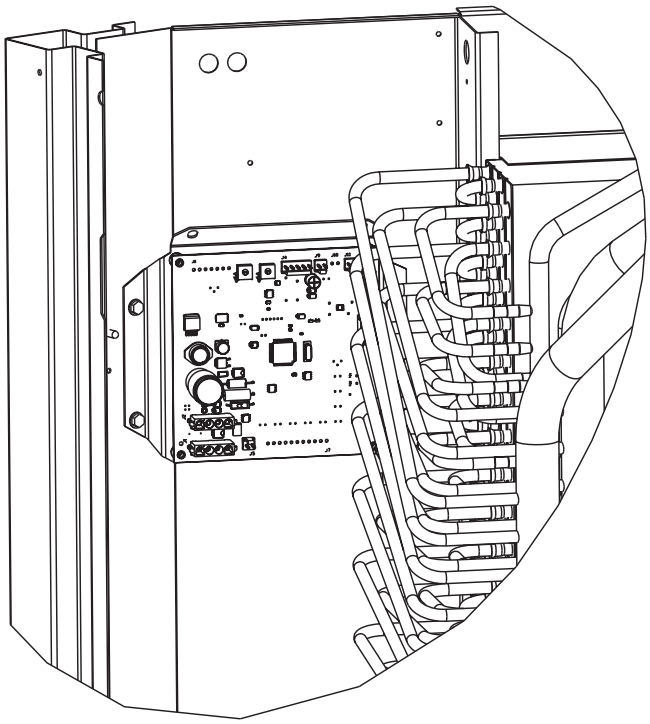


1 = Space Pressure Deadband (iwc)
2 = Space Pressure Setpoint (iwc)
3* = R130 (SA REHEAT SP) = Design Minimum Position Setpoint at Minimum Fan Speed Command
4* = R41 (DEHUMID) = DCV Minimum Position at Minimum Fan Speed Command
5* = R136 (DA COOL/FAN SPD) = Design Minimum Position at 50% Fan Speed Command
*Setpoints only required for Single Zone VAV units with Demand Controlled Ventilation installed.

Installing the RTVM Module in Horizontal Supply Configured Units

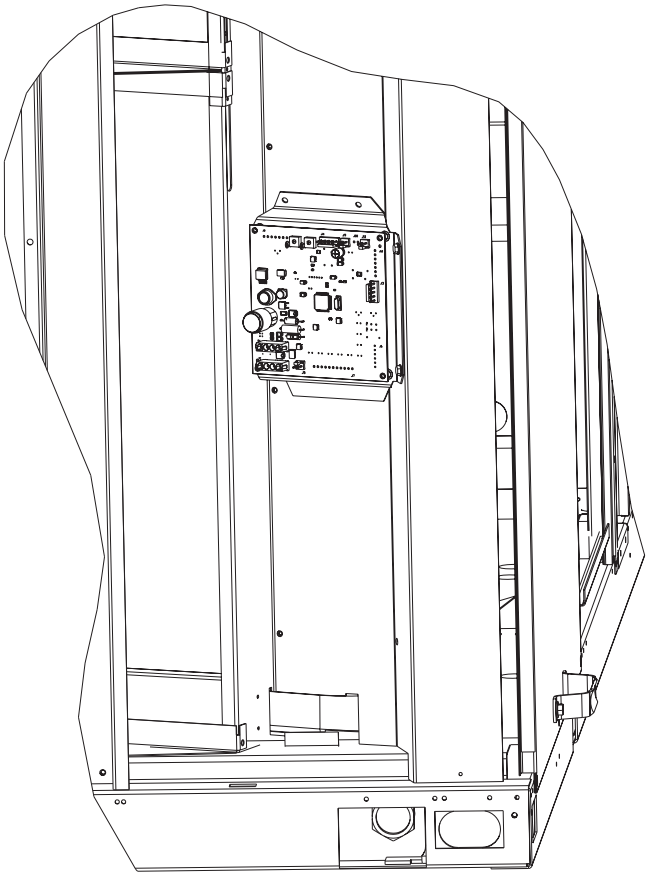
1. Inspect the BAYRTVM001AA kit and locate the following items:
   - RTVM Module - X13651517*
   - 4x #6-32 x 0.75 - X25330033130 Phillips Panhead Screws
   - 4x #10-16 x 0.50 Sheetmetal Screws
   - 1x Mounting Plate - 438573000100
   - RTOM to RTVM Harness - 438573030100
   - RTVM to ECA Harness - 438573030200
   - BAYRTVM001AA Label - X39002335200
2. Remove Control box access panel, Return air/Filter access panel and Fan access panel. See Figure 1, p. 5.
3. Using a #1/8 bit, drill 4x 0.125" diameter holes where necessary as shown in Figure 7 and Figure 8 below.
4. Using 4x 10-16 Sheetmetal screws, mount the 438573000100 RTVM mounting plate to the panel as shown in Figure 7 and Figure 8 below.

Figure 7. Installing the RTVM in horizontal supply configuration (B cabinet)



CO_2 Sensor Installation

Figure 8. Installing the RTVM in horizontal supply configuration (C cabinet)



5. Mount the RTVM to the RTVM mounting plate using the provided 4x #6-32 screws.
6. Return to the unit control box.
7. Locate and remove the following wires connected to the RTOM board at the J2 connector:
   - W54
   - W55
   - W56
   - W57
8. Return to the fresh air section of the unit.
9. Locate and remove the following wires connected to the RTEM board:
   - W54
   - W55
   - W56
   - W57

Note: *Wires W54, W55, W56, and W57 will be replaced with a new harness included in the BAYRTVM001AA kit.*

10. Note the wire routing path for the above wires and remove them from the unit.
11. In the BAYRTVM001AA kit, locate the RTOM to RTVM Harness - 438573030100.
12. Connect the end of the 438573030100 harness labeled "RTOM - J2" to the J2 connection on the Options Module.
13. Using the path noted from wires W54, W55, W56, and W57, route the remainder of the 438573030100 harness through the control box - pull them through the large hole in the far left side of the control box and then through the hole in the divider panel.
14. Connect the end of the 438573030100 harness labeled "RTVM - J1" to the J1 connection on the RTVM module.
15. In the BAYRTVM001AA kit, locate the RTVM to ECA Harness - 438573030200.
16. Connect the end of the 438573030200 harness labeled "RTVM - J2" to the J2 connection on the RTVM Module.
17. Carefully route the wiring of the 438573030200 harness from the RTVM module to the ECA, while avoiding any sharp edges. Connect the end of the 438573030200 harness labeled "ECA" to the 4-pin "MBUS/XFMR1" connection on the RTEM/ECA Module.
18. Using the supplied zip ties, bundle any excess wiring and zip tie it out of any unit interference.
19. Using the supplied zip ties, secure the 438573030200 and 438573030100 harnesses to ensure that there is no loose wiring that could get caught in any moving parts.
20. Install the “BAYRTVM Kit Has Been Installed” label next to the main unit wiring diagram label.

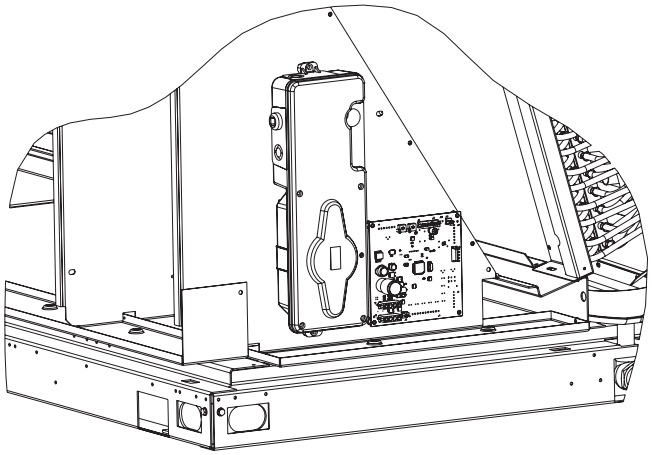
Unit Close up

1. Replace Filter/Coil access panel.
2. Replace Supply fan access panel.
3. Replace Compressor/Control box access panel.

Installing the RTVM Module in Downflow Supply Configured Units

1. Inspect the BAYRTVM001AA kit and locate the following items:
   - RTVM Module - X13651517*
   - 4x #6-32 x 0.75 - X25330033130 Phillips Panhead Screws
   - RTOM to RTVM Harness - 438573030100
   - RTVM to ECA Harness - 438573030200
   - BAYRTVM001AA Label - X39002335200
2. Remove Control box access panel, Return air/Filter access panel and Fan access panel. See Figure 1, p. 5.
3. Using a #32 bit, drill 4x 0.116" diameter holes where necessary as shown in Figure 9.

Figure 9. Installing the RTVM in downflow supply configuration



4. Mount the RTVM module to the panel as shown in Figure 9 using the provided 4x #6-32 screws.
5. Return to the unit control box.
6. Locate and remove the following wires connected to the RTOM board at the J2 connector:
   - W54
   - W55
   - W56
   - W57
7. Return to the fresh air section of the unit.
8. Locate and remove the following wires connected to the RTEM/ECA board :
   - W54
   - W55
   - W56
   - W57

Note: *Wires W54, W55, W56, and W57 will be replaced with a new harness included in the BAYRTVM001AA kit.*

9. Note the wire routing path for the above wires and remove them from the unit.
10. In the BAYRTVM001AA kit, locate the RTOM to RTVM Harness - 438573030100.
11. Connect the end of the 438573030100 harness labeled "RTOM - J2" to the J2 connection on the Options Module.
12. Using the path noted from wires W54, W55, W56, and W57, route the remainder of the 438573030100 harness through the control box - pull them through the large hole in the far left side of the control box and then through the hole in the divider panel.
13. Connect the end of the 438573030100 harness labeled "RTVM - J1" to the J1 connection on the RTVM module.
14. In the BAYRTVM001AA kit, locate the RTVM to ECA Harness - 438573030200.
15. Connect the end of the 438573030200 harness labeled "RTVM - J2" to the J2 connection on the RTVM Module.
16. Carefully route the wiring of the 438573030200 harness from the RTVM module to the ECA, while avoiding any sharp edges. Connect the end of the 438573030200 harness labeled "ECA" to the 4-pin "MBUS/XFMR1" connection on the RTEM/ECA Module.
17. Using the supplied zip ties, bundle any excess wiring and zip tie it out of any unit interference.
18. Using the supplied zip ties, secure the 438573030200 and 438573030100 harnesses to ensure that there is no loose wiring that could get caught in any moving parts.

Install the “BAYRTVM Kit Has Been Installed” label next to the main unit wiring diagram label.

Unit Close up

1. Replace Filter/Coil access panel.
2. Replace Supply fan access panel.
3. Replace Compressor/Control box access panel.

Minimum Position Setpoint Adjustment Procedure

⚠CAUTION

Live Low Voltage Electrical Components!

The following procedure involves working with live low voltage electrical components. Have a qualified licensed electrician or other individual who has been properly trained in handling live electrical components perform this procedure. Failure to follow all electrical safety precautions when exposed to live electrical components could result in minor to moderate injury.

To adjust the DCV Minimum and Design Minimum Position power must be connected to the economizer module.

1. Close the unit's disconnect and place the unit into Step 1 (Fan ON) of Service Test Mode by momentarily shorting the Test terminals at the unit LTB 1.
2. Using caution, adjust the DCV UL and DCV LL potentiometers on the RTEM module to full clockwise.
3. To select the DCV Min Position @ Minimum Fan Speed Command, adjust the potentiometer R41 (labeled DEHUMID) located on the RTVM module to get the desired outside airflow.
4. Using caution, adjust the DCV UL and DCV LL potentiometers on the RTEM module to full counter clockwise.
5. To select the Design Min Position @ Minimum Fan Speed command, adjust the potentiometer R130 (labeled SA REHEAT) located on the RTVM module to get the desired outside airflow.
6. Place the unit into Step 3 (Cool 1) of Service Test Mode by momentarily shorting the Test terminals at the unit LTB 1 until only the 1st compressor is running.
7. To select the Design Min Position @ 50% Fan Speed command, adjust the potentiometer R136 (labeled DA COOL - FAN SPD) located on the RTVM module to get the desired outside airflow.
8. Place the unit into Step 4 (Cool 2) of Service Test Mode by momentarily shorting the Test terminals at the unit LTB 1.
9. To select the Design Min Position @ 100% Fan Speed command, adjust the potentiometer DESIGN MIN POS located on the RTEM module to get the desired outside airflow.
10. Using caution, adjust the DCV UL and DCV LL potentiometers on the RTEM module to full clockwise.
11. To select the DCV Min Position @ 100% Fan Speed command, adjust the potentiometer DCV MIN POS located on the RTEM module to get the desired outside airflow.
12. Adjust the DCV Setpoint Upper Limit to the correct setpoint per the application requirements.
13. Adjust the DCV Setpoint Lower Limit to the correct setpoint per the application requirements.
14. Replace all panels on the unit.
15. Cycle power to the unit.

Unit Close up

Replace all panels.

The manufacturer optimizes the performance of homes and buildings around the world. A business of Ingersoll Rand, the leader in creating and sustaining safe, comfortable and energy efficient environments,the manufacturer offers a broad portfolio of advanced controls and HVAC systems, comprehensive building services, and parts. For more information, visit www.IRCO.com.

The manufacturer has a policy of continuous product and product data improvement and reserves the right to change design and specifications without notice.

ACC-SVN16E-EN 10 Jul 2014
Supersedes ACC-SVN16D-EN (20 Aug 2012)

We are committed to using environmentally conscious print practices that reduce waste.

Ingersoll Rand