



# INSTALLATION INSTRUCTIONS

## CO2 Sensing Kit

**USED WITH:**

Oxbox Rooftop Units  
7.5, 8.5, 10.5, 12.5 Tons

**Models:**

JAYCO2K300\* ASYSTAT901\*  
JAYCO2K301\* ASYSTAT900\*

**BX-SVN-JAYCO2K300-1A-EN**



RECOGNIZE THIS SYMBOL AS AN INDICATION OF IMPORTANT SAFETY INFORMATION

**WARNING**

These instructions are intended as an aid to qualified licensed service personnel for proper installation, adjustment and operation of this unit. Read these instructions thoroughly before attempting installation or operation. Failure to follow these instruction may result in improper installation, adjustment, service or maintenance possibly resulting in fire, electrical shock, property damage, personal injury or death.





**DO NOT DESTROY THIS MANUAL**  
Please read carefully and keep in a safe place for future reference by a serviceman.

## Safety Section

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:

 <b>WARNING</b>	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
 <b>CAUTION</b>	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.
<b>NOTICE</b>	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. Oxbox 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

Oxbox 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**

#### **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 Personal Protective Equipment (PPE) recommended for the work being undertaken. **ALWAYS** refer to appropriate SDS sheets and OSHA guidelines for proper PPE. When working with or around hazardous chemicals, **ALWAYS** refer to the appropriate SDS sheets and OSHA guidelines for information on allowable personal exposure levels, proper respiratory protection and handling recommendations. If there is a risk of arc or flash, technicians **MUST** put on all necessary Personal Protective Equipment (PPE) in accordance with NFPA70E for arc/flash protection **PRIOR** to servicing the unit. Failure to follow recommendations could result in death or serious injury.

### **WARNING**

#### **Follow EHS Policies!**

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

- All Oxbox 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-Oxbox personnel should always follow local regulations.

### **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.

## General Information

An economizer must be installed and functional before attempting to install a CO2 Sensing Kit. These sensors detect and control the carbon dioxide level in the conditioned space by measuring CO2 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 CO2 concentration to a minimum level as selected by the user.

## Parts List

JAYCO2K300*/ ASYSTAT900*	JAYCO2K301*/ ASYSTAT901*
1 - CO2 Demand-Controlled Ventilation Wall-Sensor (X13790422) with instructions and mounting hardware.	1 - CO2 Demand-Controlled Ventilation Duct-Sensor (X13790423) with instructions and mounting hardware.
1 - "CO2 Kit Has Been Installed" Label	1 - "CO2 Kit Has Been Installed" Label

## Inspection

1. Unpack all components of the CO2 Sensing Kit.
2. Check carefully for any shipping damage. If any damage is found it must be reported immediately and a claim made against the transportation company.

## Installation

### 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.

1. Remove compressor access panel.
2. Apply "CO2 Kit Has Been Installed" label next to the main unit wiring diagram label.
3. Install CO2 sensor in conditioned space or return air duct according to instructions provided with the sensor.
4. Make field wiring connections to LTB per unit wiring schematic located on compressor access panel.
5. Route low voltage external field wiring and secure to existing low voltage zone sensor or thermostat wiring.
6. Reinstall the compressor access panel.

## CO2 Sensor Operation for Units With Economizer

### Demand Control Ventilation (DCV) – Standard Economizer

DCV eliminates over-ventilating the space by allowing the fresh air damper to close further than non-CO2 sensing systems, which reduces power consumption. DCV adjusts the fresh air damper between a DCV minimum position and design minimum position. DCV Minimum Position equals non- CO2 sensing systems minimum damper position - 10%, or more, down to 0% open.

When the CO2 level is greater than or equal to the DCV Minimum CO2 setpoint the supply fan is energized and the fresh air damper modulates between the DCV minimum position setpoint and the design minimum setpoint, increasing the amount of outdoor air flow and reducing the CO2 level in the space. The damper will only open up to the design minimum position setpoint. If the CO2 level drops below the DCV minimum CO2 setpoint - 50ppm the fresh air damper will drive to the DCV minimum position. If CO2 level rises above the building CO2 setpoint the fresh air damper will open to the design minimum position setpoint. DCV setpoint potentiometers on the economizer module can be adjusted for CO2 concentrations from 300 - 2000 ppm (lower limit - upper limit).

## Demand Control Ventilation (DCV) – Low Leak Economizer

DCV eliminates over-ventilating the space by allowing the fresh air damper to close further than non-CO2 sensing systems, which reduces power consumption. JADE controller adjusts the fresh air damper between the VENTMIN position and VENTMAX position. VENTMIN position equals non- CO2 sensing systems MIN POS position down to 0% open.

When the CO2 level is greater than or equal to the CO2 ZERO setpoint the supply fan is energized and the fresh air damper modulates between the VENTMIN and the VENTMAX setpoints, increasing the amount of outdoor air flow and reducing the CO2 level in the space. The damper will only open up to the VENTMAX setpoint. If the CO2 level drops below the CO2 ZERO setpoint the fresh air damper will drive to the VENTMIN position. If CO2 level rises above the (CO2 ZERO + CO2 SPAN) setpoint the fresh air damper will open to the VENTMAX setpoint. JADE controller can be adjusted for CO2 concentrations from 0-2000 ppm (lower limit - upper limit).

### DCV Setup, Damper Position and CO2 Setpoint

#### 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.

Before you begin it would be helpful to turn the fan “ON” and conduct the minimum position setpoint procedure used WITHOUT CO2 to obtain and record visually the potentiometer setting and/or the corresponding DC voltage settings for the min and max required to meet ASHRAE standards.

### Standard Economizer CO2 Setup

1. Turn off power to the unit for this procedure.
2. Connect CO2 sensor to LTB terminals per installers guide and ensure CO2 sensor is working correctly.

**Note:** The unit/ Economizer Control Actuator (ECA) module must see a working CO2 sensor at start up in order to enable DCV. DCV will be disabled anytime there is an invalid CO2 reading.

3. Set DCV Minimum Position to meet regulatory requirements using the “MIN POS, DCV MAX” potentiometer.

**Note:** To adjust the position setting for the required ventilation air, turn the “MIN POS, DCV MAX” potentiometer clockwise ‘OPEN’ to increase the amount of ventilation, or counterclockwise ‘CLOSE’ to decrease the amount of ventilation. Full clockwise = 40%, full counterclockwise = 0% (damper closed).

4. Set design minimum position to meet code requirements using “MIN POS, Design” potentiometer.

**Note:** To adjust the position setting for the required ventilation air, turn the MIN POS, Design potentiometer clockwise ‘OPEN’ to increase the amount of ventilation, or counterclockwise “CLOSE” to decrease the amount of ventilation. Full clockwise = 50%, full counterclockwise = 10%.

5. Set DCV Minimum CO2 Setpoint to desired value using “DCV SETPOINT, L” potentiometer.

**Note:** To adjust the potentiometer, turn clockwise to increase ppm, counterclockwise to decrease ppm. Range is 300 - 1900 ppm.

6. Set building CO2 setpoint to desired value using “DCV SETPOINT, UL” potentiometer.

**Note:** To adjust the potentiometer, turn clockwise to increase ppm, counterclockwise to decrease ppm. Range is 1000 - 2000 ppm.

7. DCV damper and CO2 settings are now complete.

**Note:** With no fan operation there will be no damper movement. As a result, adjustments will be approximate. Better accuracy can be obtained by testing and balancing the economizer system. Refer to the table below 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%

## Low Leak Economizer CO2 Setup

1. Turn off power to the unit for this procedure.
2. Connect CO2 sensor to LTB terminal per installers guide and ensure CO2 sensor is working correctly.

**Note:** *The unit economizer module must see a working CO2 sensor at start up in order to enable DCV. DCV parameters will not display or will be invalid.*

3. Go to the SETPOINTS menu on the economizer controller and set DCV SET to meet regulatory requirements. Default setting is 1100ppm and can range from 500-2000 in increments of 100.

**Note:** *Above the setpoint, the outside air dampers will modulate open to bring in additional outside air to maintain a space ppm level below the setpoint.*

4. Set VENTMAX setpoint to meet regulatory requirements. Used for ventilation max cfm setpoint. Displays 2 to 10V if <3 sensors (RA, OA, and MA). Default is 2.8V. With 2-speed fan units VENTMAX L (low speed fan) and VENTMAX H (high speed fan) settings are required. Default for VENTMAX L is 3.2V and VENTMAX H is 2.8V.

**Note:** *VENTMAX is the same setting as MIN POS would be if you did not have the CO2 sensor.*

5. Set VENTMIN setpoint to meet regulatory requirements. Used for ventilation min cfm. This is the ventilation for less than maximum occupancy of the space. Displays 2 to 10 V if <3 sensors (RA, OA, and MA). Default is 2.25V. With 2-speed fan units VENTMIN L (low speed fan) and VENTMIN H (high speed fan) settings are required. Default for VENTMIN L is 2.5V and VENTMIN H is 2.25V.

**Note:** *In DCVCAL ENA mode dampers controlled by CFM for both VENTMAX & VENTMIN setpoints.*

6. Set CO2 ZERO to 400 ppm and the CO2 SPAN to 1600 ppm in the ADVANCED SETUP menu.

**Note:** *Under the ADVANCED SETUP Menu, DCVCAL ENA turns on the DCV automatic control of the dampers and resets ventilation based on the RA, OA, and MA sensor conditions. It requires all sensors (RA, OA, MA, and CO2). This operation is not operable with a 2-speed fan unit.*

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The manufacturer has a policy of continuous data improvement and it reserves the right to change design and specifications without notice. We are committed to using environmentally conscious print practices.

*Representative-only illustrations included in this document.*

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Supersedes (New)

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