

**Economizer
Controls Package
I/O/M manual**

Table of Contents

Economizer Controls Package Description & Part Number Scheme	3
Package Matrix, Add-ons & Tool / Parts - Hardware Included	4
Economizer Controls Installation:	
Supply Air Temperature Sensor	5
Ion Generator(s).....	5
VOC and CO2 Sensors.....	6
Outside Air Temperature Sensor	6
Optional Parts Installation	6
Optional Humidity Sensor	6
Optional Actuator.....	7
Optional BACNet Translator.....	7
Economizer Controls Installation	7
iAIRE Controller Wiring Diagram	8
iAIRE Controller Terminal Detail	9
Economizer Controller Installation Guide:	
Controller I/O and General Information	11
Enthalpy Table and General Keypad Information.....	12
Status Menu Settings.....	13
Configuration Menu and Controller Mode Configuration Settings.....	15
Setpoints Menu Settings	17
Test Menu and Alarm Menu Settings	19
Troubleshooting	20
Appendix Information	20
RTU Open & CCN - Adjusting Set points	21
RTU Open & CCN - Wiring Diagram	22
BACNet Points List	23
Economizer Modes:	
Economizer Mode 3	24
Free Check Cooling Loop	25
Free Cooling Loop.....	26
PE Loop	27
IAQ Loop.....	28
Sequence of Operations:	
Economizer Mode 3	30
Free Check Cooling Loop	31
Free Cooling Loop.....	32
PE Loop	33
IAQ Loop.....	34
Reference Installation Sheets:	
Temperature Probe Install (SEN-0012).....	36
Ion Generator Install (ION-0A*00).....	37
CO2 Sensor Install (SEN-0002).....	38
IAQ Sensor Install (SEN-0071)	39
Duct VOC Sensor Install (SEN-0072)	40
Actuator Install (MTR-000*).....	42
Humidity Sensor Install (SEN-0001)	44
Addendum: Wiring Diagrams	
Existing Controller	46
7212 w/ M7215 Damper Motor and T7300 Thermostat	47
7212 w/ M7215 Damper Motor and T7350 Thermostat	48
7212 w/ M7215 Damper Motor and TB7220 Or TB8220 Thermostat	49
7212 Single Stage Cooling.....	50
7212 Two-Stage Cooling.....	51
7212 Controlling Parallel Actuators.....	52
7213 or 7214 Controlling Heat Pump.....	53

Package Description

The economizer replacement controls package is designed to clean your air and save on utility costs. Packages include ion air cleaners for 400 CFM/Ton nominal Roof Top Units (RTU) & standard loading, VOC sensor, CO2 sensor, 2 temperature probes and an ion mounting plate. If your current system has drastically different CFM/Ton, contact the factory for more information on adjustments that are needed. These economizer controllers are compatible with RTU Open and Carrier Comfort Network.



File# 101141865COL-003

UL 867
CSA C22.2



For information on energy and cost savings for your business, visit: www.myultrapure.com

Part Number

EC - 1 - 2 3 4 5 - 6

type	unit/ton (1)							
EC - ECONOMIZER	26	6075	CHAS12	A-BOX	FND35	PREC810	AFF	SCL34
	712	100	CHAS34	B-BOX	PACK13	VOY12	LXS	SCLHE12
	1525	125	CHAS5	C-BOX	PREC35	VOY12HE	LXL	SCLHE34
	3050	150	CHAS69	D-BOX	PREC48	VOY1525HE	SCS12	PRED
	Controls Only	Carrier	E-BOX	F-BOX	PREC610		SCS34	PREDS
				Lennox		Trane	SCSHE12	SL
							SCSHE34	SLL
							SCL12	SLU
								York

configuration (2)

0 - NO ECON
C - CONVERTIBLE
H - HORIZONTAL
V - VERTICAL

actuator (3)

0 - NO ACTUATOR
A - 20 IN-LB
B - 62 IN-LB
C - 160 IN-LB

controls (4)

0 - ECON ONLY
A - IAQ
B - IAQ (NO IONIZATION)
D - DCV

power exhaust (5)








0 - NO POWER EXHAUST
A - 208/230V 1Φ FIXED PE
B - 208/230V 3Φ FIXED PE
C - 460V 3Φ FIXED PE

options (6)





0 - NONE
B - HUMIDITY
C - BACNET
D - BLDG PRESSURE*
R - RTU OPEN
U - ULTRA LOW LEAK

Note: By adding option "D" any powered exhaust will be modulating.

Package Matrix

	Part #	Quantities							
		EC-26-*	EC-712-*	EC-1525-*	EC-3050-*	EC-6075-*	EC-100-*	EC-125-*	EC-150-*
	Ion Generator mod. # ION-0A*00	1	2	4	8	12	16	20	24
	Ion Generator Mounting Kit mod. # UNV-0016-Kit	1	2	4	8	12	16	20	24
	VOC Sensor mod. # SEN-0071	1	1	1	1	1	1	1	1
	Transformer mod. # TRN-0005 Kit	0	0	1	1	2	2	2	2
	Economizer Controller mod. # CNT-0088	1	1	1	1	1	1	1	1
	CO2 Sensor mod. # SEN-0002	1	1	1	1	1	1	1	1
	Temperature Probe mod. # SEN-0012	2	2	2	2	2	2	2	2
Electrical Data	24v	0.27A	0.44A	N/A	N/A	N/A	N/A	N/A	N/A
	230v	N/A	N/A	0.08A	0.15A	0.22A	0.29A	0.36A	0.43A
	460v	N/A	N/A	0.04A	0.08A	0.11A	0.14A	0.18A	0.21A
Total Weight		1.07 lbs	1.72 lbs	5.52 lbs	8.12 lbs	10.72 lbs	15.82 lbs	18.42 lbs	21.02 lbs

Package Add-Ons

	Humidity Sensor mod. # SEN-0001	If you would like to add enthalpy sensing to your system, include a humidity sensor.
	Actuators mod. # MTR-000*	Allows for feedback to be given. Can replace current actuators without a feedback system. MTR-0002 - 20 in-lbs; MTR-0003 - 60 in-lbs; MTR-0004 - 160 in-lbs
	BACnet Translator mod. # PRG- BACNET- ECON-5.** KIT	For reliable protocol translation, add our BACNet Translator to your system.
	BP Sensor mod. # SEN-0065	Allows for low-pressure measurement for building energy management and comfort control.

Tools/Parts (provided by contractor)

- Wire cutters / strippers
- Screwdriver (small flathead and philips)
- Needle nose pliers
- Drill with 5/16 nut driver bit, step bit and 1/2" drill bit for temperature probe holes.
- Wire (thermostat wire) for VOC, CO2, ion generator, optional humidity, optional transformer, optional BACnet translator, optional actuator and/or mod power exhaust.

Hardware Included with controls package (not shown on pg. 3). Reference pg. 3 for major components.

- Wire connectors (6)
- Screws (40 self tapping)
- Wire ties (5)

Economizer Controls Installation Supply Air Temperature Sensor

⚠ IMPORTANT Before beginning installation, test all Roof Top Unit (RTU) functionality to ensure it is working properly. Once complete, shut off all power to the RTU and follow lock-out tag-out procedures, then continue with the installation below.

Start by removing the blower access panel to gain access for the installation of the supply air temperature sensor (SAT) and ion generator(s).

The SAT should be mounted in the blower (either by inserting into an existing hole, or by using a drill bit to create an opening). See **figures [1.1]** and **[1.2]** below. (For SAT instructions, refer to SEN-0012 install documents in reference documentation (page 41))

The temperature sensor should clear the blower wheel. Make sure to tie wires away from any moving parts or areas that may cause wires to be sucked into the blower.

figure [1.1]

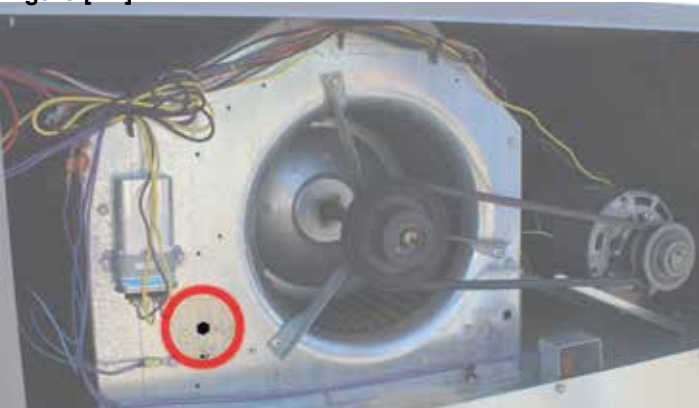
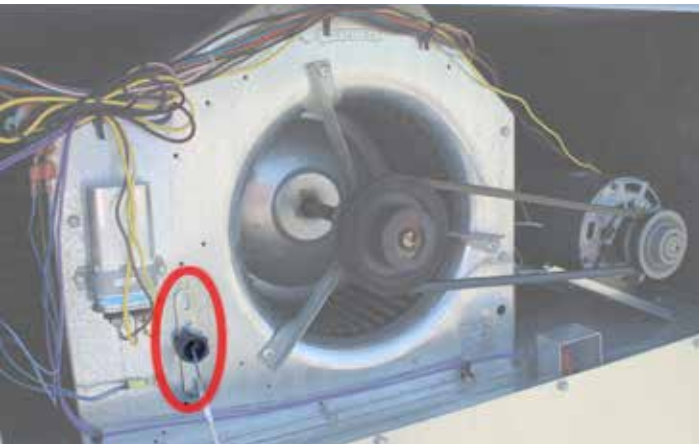


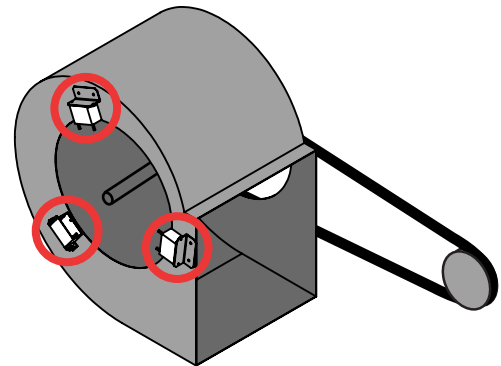
figure [1.2]



Ion Generator(s)

Next, mount your ion generator(s) perpendicular to the air stream between the carbon fiber needles. Some ion generator(s) should be installed by the inlet of the supply fan on the opposite side of the drive shaft and belt. See figure [1.3] below. This may require the removal of the top panel on the RTU. If multiple blowers exist, evenly distribute the number of ion generators between them.

figure [1.3]



If using multiple ion generators, tie the wires of each generator together after mounting (if using the mounting plate, mount the generators to the plate and tie the wires of each generator together before mounting each plate). Be sure to keep all wires away from the generator tips, moving objects and areas that may cause wires to be sucked into the blower.

(For additional instructions, refer to ION-0A*0 install and data sheet documentation (page 42)).

(When wiring to the **iAIRE** economizer controller, the wires will land on the terminal in the spot labeled 24V)

After mounting the SAT and the ion generator(s), run the wiring over to the controller so the wires can land on the controller terminal strip. This may require the removal of the top panel on the RTU. See **figure [1.4]** below.

figure [1.4]



VOC and CO2 Sensors

Wire and mount your VOC and CO2 sensors in the building occupied space at the same level as the thermostat. (Refer to installation documentation for VOC (part # - SEN-0071) on page 44 and CO2 (part # - SEN-0002) on page 43)

"Alternatively, if the air in the duct needs to be monitored, iAire sells dedicated sensors suitable for duct mounting."



(When wiring to the iAIRE economizer controller, the wires will land on the terminal in the spots labeled VOC and CO2)

Outside Air Temperature Sensor

Next, install the Outside Air Temperature sensor (OAT) in the top of the economizer damper. The temperature probe should be mounted in the center of the outside air opening. Use a drill bit to make a 3/4" hole for the probe to be inserted (it should be installed so that the probe is closest to the hood edge of the economizer and does not interfere with the damper blade). See **figure [1.6]** at the top of the next column.

(For OAT instructions, refer to SEN-0012 install documents in reference documentation (page 41))

figure [1.6]



(When wiring to the iAIRE economizer controller, the wires will land on the terminal in the spot labeled OAT)

Optional Parts Installation

After installation of the OAT sensor, if you have purchased the optional humidity sensor, actuator or BACNet translator, follow the installation instructions below. If you do not have any of these additional parts, please skip to the **iAIRE** controller section of the installation (page 7).

Optional Humidity Sensor

The humidity sensor should be mounted in the hood of the RTU. Make sure the probe is in the outside air flow. See **figure [1.7]** below.

(For humidity instructions, refer to SEN-0001 install documents in reference documentation (page 47))

figure [1.7]



(When wiring to the iAIRE economizer controller, the wires will land on the terminal in the spot labeled ENT/HUM)

Optional Actuator

The replacement actuator should be mounted in the same location as the original actuator. See **figure [1.8]** below. If moving the mounting location, please reference the actuator installation documents for mounting instructions.

(For actuator instructions, refer to MTR-000 install documents in reference documentation (page45))*

figure [1.8]



*(When wiring to the **iAIRE** economizer controller, the wires will land on the terminal in the spot labeled ECON SIG, if you have feedback, that will land in the spot labeled ECON POS)*

Optional BACNet Translator

The BACnet Translator should be mounted to the back of the controller plate. (shown in **figure [1.9]**)

*(When wiring to the **iAIRE** economizer controller, the wires will plug in the controller in the spot labeled RS485)*

Economizer Controls Installation Controller

Once all parts have been installed, you will remove the old economizer controller (refer to page 10 for information on where wires should land on the new controller from the old economizer controller). Next, you will mount the new **iAIRE** economizer controller to the top of the economizer damper. The controller should be mounted far enough to the back of the economizer damper that the screws clear the damper blades and the controller wires do not interfere with the RTU cover panel. See **figure [1.9]** at the top of the next column.

figure [1.9]



After the new **iAIRE** economizer controller is mounted, begin landing the wires from the sensors, ion generator(s) and temperature probes. Reference the **iAIRE** economizer controller wiring schematic on page 8 and the terminal detail on page 9 for further information on where wires should land.

iAIRE has provided some wire connectors with the package to assist in landing multiple wires under one screw terminal.

When the wiring is complete, restore power to the RTU and run the controller in IAQ mode, making sure that all set-points for this mode are correct. Once confirmed, make sure all panels and doors on the RTU are in place and resecured.

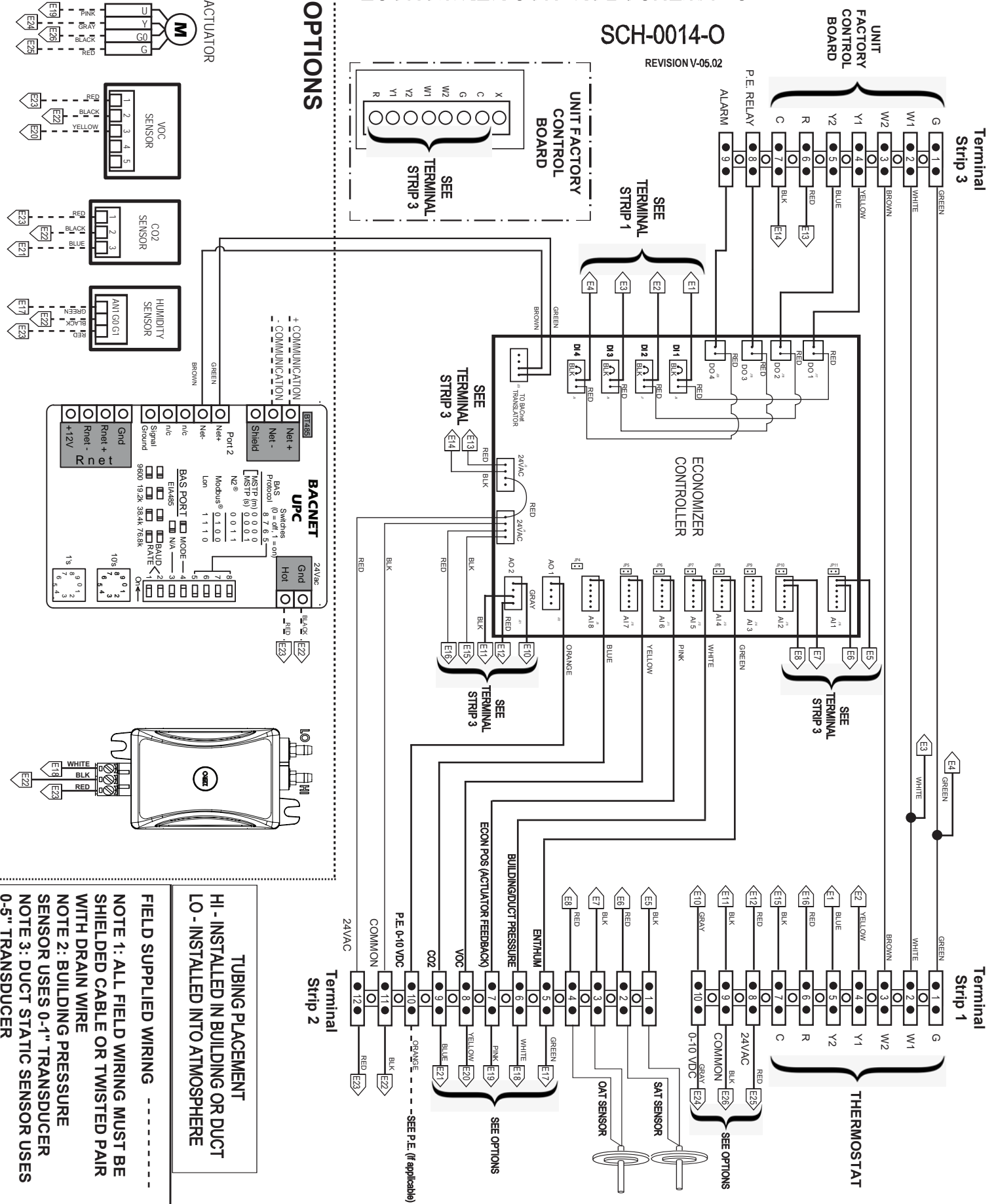
Additional installation questions? Contact us:

iAIRE LLC
2100 Consulate Dr. Suite 102, Orlando, FL. 32837 Toll Free: 844-348-9168

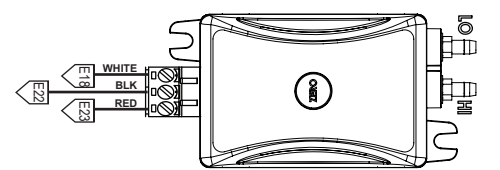
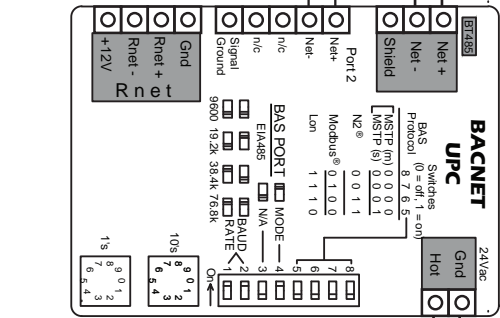
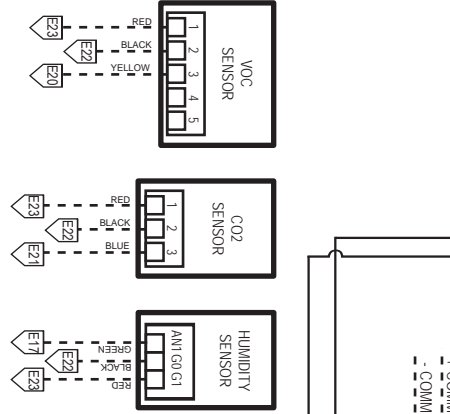
ECONOMIZER CONTROL SCHEMATIC

SCH-0014-O

REVISION V-05.02



OPTIONS

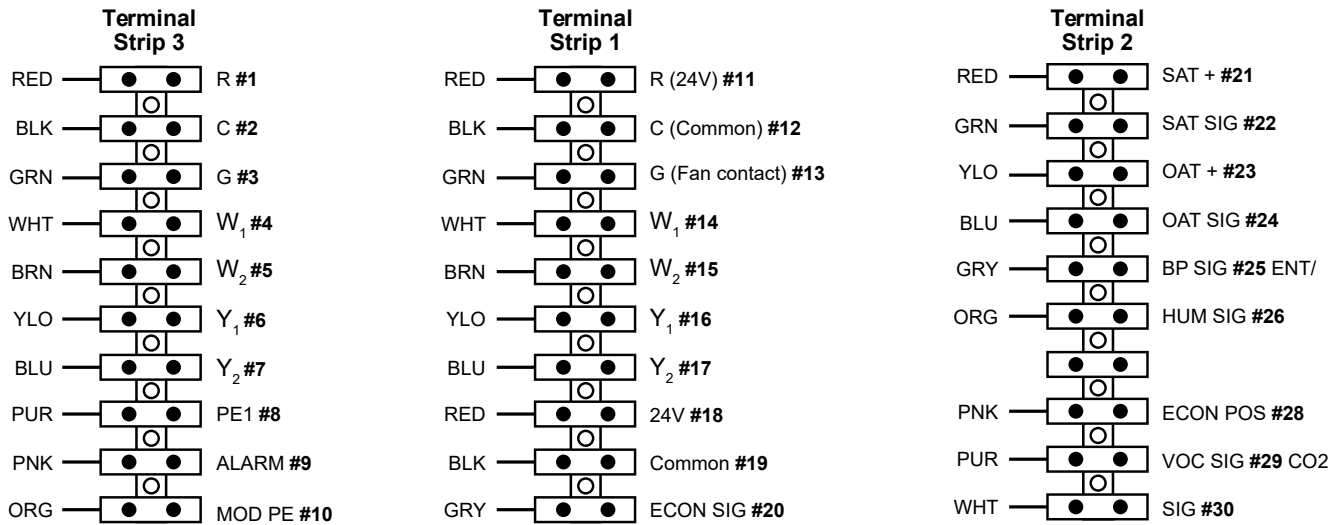


TUBING PLACEMENT
HI - INSTALLED IN BUILDING OR DUCT
LO - INSTALLED INTO ATMOSPHERE

FIELD SUPPLIED WIRING -----

NOTE 1: ALL FIELD WIRING MUST BE SHIELDED CABLE OR TWISTED PAIR WITH DRAIN WIRE
NOTE 2: BUILDING PRESSURE SENSOR USES 0-1" TRANSDUCER
NOTE 3: DUCT STATIC SENSOR USES 0-5" TRANSDUCER

iAIRE Controller Terminal Detail



Actuator

Power should land on #1
 Common should land on #2
 Signal should land on #20
 Feedback signal should land on #28 (*optional*)

SAT Sensor

Power should land on #21
 Common should land on #22

OAT Sensor

Power should land on #23
 Common should land on #24

Ion Generator(s)

Power should land on #18
 Common should land on #19

VOC Sensor

Power should land on #11
 Common should land on #12
 Signal should land on #29

CO2 Sensor

Power should land on #18
 Common should land on #19
 Signal should land on #30

Humidity Sensor (*optional*)

Power should land on #11
 Common should land on #12
 Signal should land on #26

Building Pressure Sensor (*optional*)

Power should land on #18
 Common should land on #19
 Signal should land on #25

MOD PE (*optional*)

Signal should land on #10

BACnet Translator (*optional*)

Plug provided for direct insertion into the economizer controller at the spot labeled RS485.

ALARM Signal (*optional*)

Signal should land on #9

Economizer Controller Installation Guide



This document describes wiring, power up, basic troubleshooting and common installation issues for the **iAIRE** economizer controller.

INPUTS

Analog Inputs:

- (AI1) = (0-5v) Supply Air Temperature (SAT)
- (AI2) = (0-5v) Outside Air Temperature (OAT)
- (AI3) = (0-5v)
- (AI4) = (0-10v) Outside Air Humidity (Enthalpy)
- (AI5) = (0-10v) Building/Duct Pressure
- (AI6) = (0-10v) Econ Pos Feedback
- (AI7) = (0-10v) Room VOC
- (AI8) = (0-10v) Room CO2

Digital Inputs:

- (DI1) = (24vac) Y2 In
- (DI2) = (24vac) Y1 In
- (DI3) = (24vac) W1 In
- (DI4) = (24vac) Occupied

OUTPUTS

Analog Outputs:

- (AO1) = (0-10v) Modulating PE
- (AO2) = (0-10v) Actuator Signal

Digital Outputs:

- (DO1) = (24vac) Y1 Out
- (DO2) = (24vac) Y2 Out
- (DO3) = (24vac) PE Relay
- (DO4) = (24vac) Alarm

WHILE INSTALLING THIS CONTROLLER

Installer must be an experienced and trained service technician.

Be sure to read instructions thoroughly. Incorrect installation could result in damage to the controller or create a hazard to those performing the installation.

Verify the ratings in the instructions and on the product to ensure it is suitable for your application.

Once the installation is complete, review controller operations provided with this installation document.

Additional Questions?

Visit our website at www.myiaire.com to view product data sheets, or email us at support@myiaire.com.

ACCESSORIES

- Temp. Probe | SEN-0012
- CO2 Sensor | SEN-0002
- VOC Sensor | SEN-0071
- Ion Generator | ION-0A*00
- Mounting Plate | UNV0016

OPTIONAL ACCESSORIES

- Humidity Sensor | SEN-0001
- BP Sensor | SEN-0065
- BACnet Translator | TRN-0005-Kit

**indicates customer part selections.*

INSTALLATION AND SETUP

The **iAIRE** economizer controller can be mounted at any orientation. When mounting, allowing for proper viewing of the controller LCD screen and use of the buttons should be taken into consideration.

WIRING

All wiring must be in compliance with local applicable electrical codes, or as specified on the installation wiring diagram (page 8 & 9 in this document).

Enthalpy Table

Enthalpy (but/lb/da)	Point P1		Point P2	
	Temp. °F	Humidity %RH	Temp. °F	Humidity %RH
32.4	86.0	38.9	72.4	80.3
28.0	80.0	36.8	66.3	80.1
26.0	75.0	39.6	63.3	80.0
24.0	70.0	42.3	59.7	81.4
22.0	65.0	44.8	55.7	84.2
20.0	60.0	46.9	51.3	88.5

The enthalpy table above shows sample enthalpy to help you determine what your enthalpy set points should be.

POWER UP

After the controller is mounted and wired, restore power to the RTU.

POWER UP DELAY

When powering up the VOC and humidity sensors, the VOC sensor has a first time warm up period of 48 hours. After first start-up, the warm up period is one (1) hour. The humidity sensor has a start-up delay of 3 minutes.

POWER LOSS

All setpoints and advanced settings are restored to the defaults after any power loss or interruption.

USING KEYPAD WITH MENUS

When using the keypad to navigate between menus:

- The up arrow is used to move to a previous menu.
- The down arrow is used to move to the next menu.
- The enter button will display the first item in the currently selected menu.
- The esc button is used to exit a menu's item and return to the list of menus.

USING KEYPAD WITH SETTINGS

- Navigate to the desired menu.
- Press enter to display the first item in the selected menu.
- Use the up and down arrows to scroll and select the desired parameter.
- Press enter to display the value of the current selection.
- Press the up arrow to increase or the down arrow to decrease the parameter value.

- Press enter to accept the value and store it.
- Press enter again to return to the selected menu
- Press esc to return to the previous menu.

CONTROLLER INFORMATION

There are (3) three lights that are visible from the front of the controller at different times of operation. These lights are:

- Status - Red Light
- Reset - Red Light
- Power - Green Light

When power is applied to the controller and it has the correct programming, the green power light should be on and the other two lights should be off. If the status and reset lights are flashing red, it is indicating the unit is in alarm.

MENU STRUCTURE

1. STATUS
Allows user to check current system statuses
2. SET POINTS
Allows user to enter system set points
3. CONFIGURATION
Allows user to set modes and configure set points
4. TEST
Allows user to put system into test mode to check individual functionality of system components
5. ALARMS
Allows user to view system alarms

MODES

1. Econo Mode
2. DCV Mode
3. IAQ Mode
4. IAQ ERV

* For mode details, see pages 9 and 10.-REPAGE

STATUS MENU SETTINGS

Using the up and down arrows on the controller, find the status menu and hit enter.

STATUS
MENU

Using the up and down arrows, you will be able to check the system status for items listed below using the enter button:

ECONO POS
COMMAND STATUS

Allows you to view the controller commanded set points of the economizer damper.

ECONO POS
READ STATUS

Allows you to view the current actual position of the economizer damper.

MOD PWREXHT POS
COMMAND STATUS

Allows you to check to see if the power exhaust command is on.

COMPRESSOR1
OUTPUT STATUS

Allows you to check if the compressor 1 output is active or de-active.

COMPRESSOR2
OUTPUT STATUS

Allows you to check if the compressor 2 output is active or de-active.

POWER EXHAUST 1
STATUS

Allows you to check if the power exhaust 1 output is active or de-active.

POWER EXHAUST2
STATUS

Allows you to check if the power exhaust 2 output is active or de-active.

OCCUPIED
INPUT STATUS

Allows you to check if the economizer enable option is active or de-active.

HVAC W1
INPUT STATUS

Allows you to check if the HVAC heating stage 1 from the thermostat is active or de-active.

COMPRESSOR1
INPUT STATUS

Allows you to check if the compressor 1 input from the thermostat is active or de-active.

COMPRESSOR2
INPUT STATUS

Allows you to check if the compressor 2 input from the thermostat is active or de-active.

IAQ CO2
INPUT STATUS

Allows you to check the current CO2 PPM reading coming from the sensor.

ERV HEAT WHEEL
INPUT STATUS

Allows you to check if the ERV heat wheel is active or de-active.

ERV MAKEUPFAN
STATUS

Allows you to check if the ERV make up fan is active or de-active.

ERV PE1
STATUS

Allows you to check if the power exhaust fan is active or de-active.

ERV PE2
STATUS

Allows you to check if the power exhaust fan is active or de-active.

ERV OA FANSPEED
STATUS

Allows you to check the outside air fan speed.

ERV EX FANSPEED
STATUS

Allows you to check the exhaust air fan speed.

ERV OA CFM
STATUS

Allows you to check the outside CFM.

ERV EX CFM
STATUS

Allows you to check the exhaust CFM.

OUTSIDE AIR TEMP
STATUS

Allows you to check the outside air temperature.

SUPPLY AIR TEMP
STATUS

Allows you to check the supply air temperature.

VOC
STATUS

Allows you to check the current VOC PPM reading coming from the sensor.

MACHINE STATE
STATUS

Allows you to check the current machine state. (this helps when troubleshooting)

HUMIDITY PERCENT
STATUS

Allows you to check the current humidity reading coming from the sensor.

ENTHALPY
STATUS

Allows you to check the current calculated btu/lb reading.

FREE COOLING
STATUS

Allows you to check if free cooling is available or not.

OPERATION
PARAMETERS

Allows you to check the operation parameters.

CONFIGURATION MENU SETTINGS



CONFIGURATION
MENU

Using the up and down arrows, you will be able to configure your system using items listed below:



CONTROLLER MODE
CONFIGURATION

The controller mode allows the user to select which mode the controller will run in. There are (4) modes to choose from:

Econo Mode / DVC mode / IAQ mode / IAQ ERV mode

**for mode details, see CONTROLLER MODE CONFIGURATION SETTINGS in the next column.*



HVAC 2SPEED
CONFIG

This setting should be “disabled” unless the RTU has a 2-speed fan or a variable speed fan. If the RTU has a 2-speed fan or a variable speed fan, this setting should be “enabled”. If the setting is “enabled”, it allows the controller to have a damper offset to account for the difference in the static pressure coming in the outside air hood between the varying speeds of the motor and allows the damper to bring in the correct outside air regardless of blower speed.



HUMIDITY SENSOR
CONFIG

This setting should be “disabled” unless you have installed a humidity sensor into the control scheme. If a humidity sensor is installed, this setting should be “enabled”. Once the setting is “enabled”, the controller will calculate the outside air enthalpy and allow the user to input an enthalpy setting into the system to prevent free cooling from happening on humid cooler days.



ACTUATOR
FEEDBK CONFIG

Allows you to check if the Actuator Feedback is active or not.



SOFTWARE VER
CONFIG

This setting tells the user the version and revision of the software loaded into the controller.

CONTROLLER MODE CONFIGURATION SETTINGS

The controller mode allows the user to select which mode the controller will run in. To select the mode, use the up and down buttons to bring up the screen for the mode you would like and hit the enter button to enable the selection.

Mode 1 – Econo Mode

The controller is in the standard economizer mode of operation. The user selects a minimum outside air set-point. This set-point does not change unless the controller determines that free cooling is available. If free cooling is available, the controller will modulate the damper to control the SA set-point in the RTU.

Mode 2 - DCV mode

The controller is in demand control ventilation mode. In this mode, there is a CO2 sensor present. The user will select a minimum outside air setting (the maximum air that is brought into the RTU) and a DCV set-point (the minimum air that is brought into the RTU). The user selects a minimum CO2 PPM and a maximum CO2 PPM to go with these airflow set-points. The CO2 sensor will sense occupancy and output a PPM. If this PPM is less than the minimum CO2 PPM set-point, the damper will be open to the DVC set-point. If the CO2 PPM is more than the maximum CO2 PPM set-point, the damper will be open to the minimum outside air setting. If the CO2 PPM is in-between the minimum and maximum CO2 set-points, the controller determines a straight line between the 2 points to determine the damper position. If free cooling is available, the controller will modulate the damper to control the SA set-point in the RTU. Refer to Fig. A.

For information how to adjust RTU Open or Carrier Comfort Network set points, see page 29.

Mode 3 – IAQ mode

The controller is in indoor air quality mode. In this mode, there is both a CO2 & VOC sensor present. The user will select a minimum outside air setting (the maximum air that is brought into the RTU) and a DCV set-point (the minimum air that is brought into the RTU). The user selects a minimum CO2 PPM and a maximum CO2 PPM to go with these airflow set-points. The CO2 sensor will sense occupancy and output a PPM. If this PPM is less than the minimum CO2 PPM set-point, the damper will be open to the DVC set-point. If the CO2 PPM is more than the maximum CO2 PPM set-point, the damper will be open to the minimum outside air setting. If the CO2 PPM is in-between the minimum and maximum CO2 set-points, the controller determines a straight line between the 2 points to determine the damper position.

The user will select a minimum VOC set-point and a maximum VOC set-point. The user selects a minimum VOC

PPM and a maximum VOC PPM to go with these airflow set-points. The VOC sensor will sense occupancy and output a PPM. If this PPM is less than the minimum VOC PPM set-point, the damper will be open to the DVC set-point. If the VOC PPM is more than the maximum VOC PPM set-point, the damper will be open to the minimum outside air setting. If the VOC PPM is in-between the minimum and maximum VOC set-points, the controller determines a straight line between the 2 points to determine the damper position.

The controller will add the CO₂ damper position and the VOC damper position together to determine the actual damper position. If free cooling is available, the controller will modulate the damper to control the SA set-point in the RTU. Refer to Fig. A and Fig. B.

Mode 4 – IAQ ERV

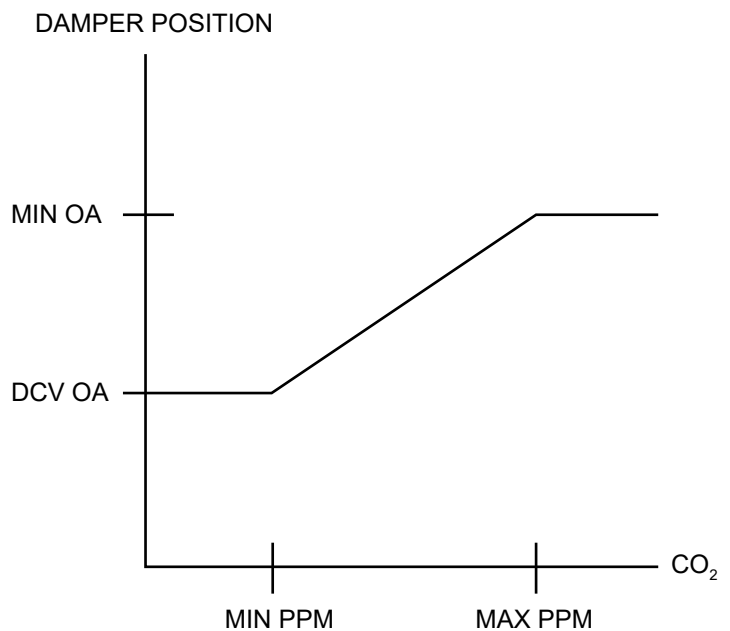
The controller is in indoor air quality mode with an ERV present. In this mode, the ERV has fixed speed blowers. These blowers run continuously. They are meant to bring in air at the minimum required levels. All other air is brought into the space by opening the by-pass damper.

In this mode, there is both a CO₂ & VOC sensor present. The user will select a minimum outside air setting (the maximum air that is brought into the RTU) and a DVC set-point (the minimum air that is brought into the RTU). The user selects a minimum CO₂ PPM (zero) and a maximum CO₂ PPM to go with these airflow set-points. The CO₂ sensor will sense occupancy and output a PPM. If this PPM is less than the minimum CO₂ PPM set-point, the damper will be open to the DVC set-point. If the CO₂ PPM is more than the maximum CO₂ PPM set-point, the damper will be open to the minimum outside air setting. If the CO₂ PPM is in-between the minimum and maximum CO₂ set-points, the controller determines a straight line between the 2 points to determine the damper position.

The user will select a minimum VOC set-point and a maximum VOC set-point. The user selects a minimum VOC PPM (zero) and a maximum VOC PPM to go with these airflow set-points. The VOC sensor will sense occupancy and output a PPM. If this PPM is less than the minimum VOC PPM set-point, the damper will be open to the DVC set-point. If the VOC PPM is more than the maximum VOC PPM set-point, the damper will be open to the minimum outside air setting. If the VOC PPM is in-between the minimum and maximum VOC set-points, the controller determines a straight line between the 2 points to determine the damper position.

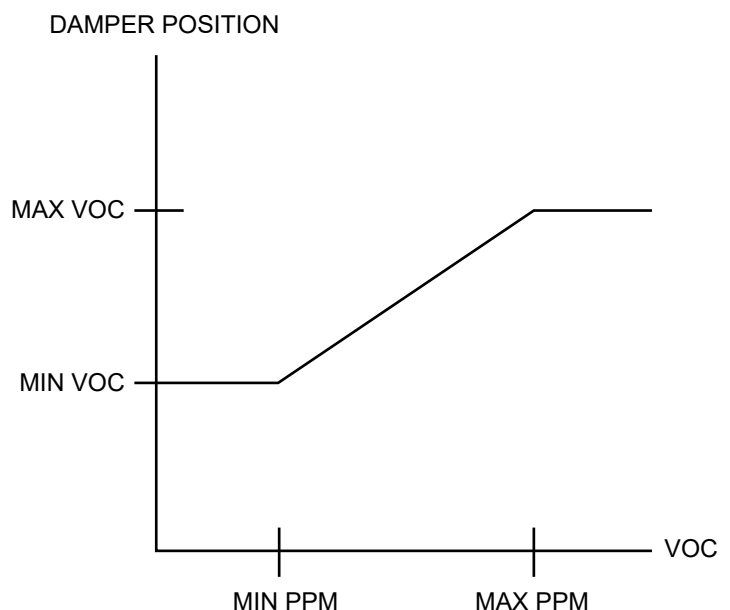
The controller will add the CO₂ damper position and the VOC damper position together to determine the actual damper position. If free cooling is available, the controller will modulate the damper to control the SA set-point in the RTU. In free cooling the ERV blowers shut off.

Fig. A



+

Fig. B



SETPOINTS MENU SETTINGS

SETPOINTS
MENU

Using the up and down arrows, you will be able to change system set points for items listed below using the enter button:

ECON HIGHTMPLMT
SETPOINT

Allows you to set the high temperature limit for the economizer.

ECON LOWTMPLMT
SETPOINT

Allows you to set the low temperature limit for the economizer.

ECON FREECOOLSAT
SETPOINT

Allows you to set the free cooling temperature limit for the supply air.

ECON MIN POS
SETPOINT

Allows you to set the min outside air position for the economizer.

ECON MAX POS
SETPOINT

Allows you to set the max position of allowable damper stroke.

POWER EXHT 1 POS
SETPOINT

Allows you to set where the power exhaust is positioned.

POWER EXHT2 POS
SETPOINT

Allows you to set where the power exhaust is positioned.

BUILDING PRESS
SETPOINT

Allows you to set the building pressure.

DCV ECONO MIN
POS

Allows you to set the min DCV economizer position.

MAX DCV LEVEL
POS (PPM)

Allows you to set the max CO2 level.

MIN DCV LEVEL
POS (PPM)

Allows you to set the min CO2 level.

MIN OA CFM
LEVEL

Allows you to set the min CFM level.

EXHAUST CFM OFFE
LEVEL

Allows you to set the exhaust CFM offset level.

IAQ OA CFM
LEVEL

Allows you to set the min VOC CFM level.

MIN VOC LEVEL
PPM

Allows you to set the min VOC PPM level.

MAX VOC LEVEL
PPM

Allows you to set the max VOC PPM level.

VOC ECONO MIN
POS

Allows you to set the min VOC economizer position.

VOC ECONO MAX
POS

Allows you to set the max VOC economizer position.

HVAC 2SPEED ECON
OFFSET POS

Allows you to set the economizer offset position if you are using a 2 speed unit.

ENTHALPY
SETPOINT

Allows you to set the btu/lb point for enthalpy for free cooling.

ERV OA FAN
SETPOINT

Allows you to set the outside air fan position.

ERV PE FAN
SETPOINT

Allows you to set the power exhaust fan position.

OA ERV MIN FAN
SPEED

Allows you to check outside air ERV min fan speed.

EX ERV MIN FAN
SPEED

Allows you to check exhaust ERV min fan speed.

OA ERV DCV
FAN SPEED

Allows you to check outside air ERV DCV fan speed.

OA ERV VOC
MIN FAN SPEED

Allows you to check outside ERV VOC min fan speed.

OA ERV VOC
MAX FAN SPEED

Allows you to check outside ERV VOC max fan speed.

EX ERV VOC MIN
FAN SPEED

Allows you to check exhaust ERV VOC min fan speed.

EX ERV VOC
MAX FAN SPEED

Allows you to check exhaust ERV VOC max fan speed.

FAN SPEED
DEAD BAND

Allows you to set fan dead band.

FAN SPEED
TIMER

Allows you to check timer.

TEST MENU SETTINGS



TEST MODE
MENU

Using the test menu you will be able to turn off and on the test mode for the system to check the functionality of the system components.



TEST MODE

After hitting enter, you can use the arrow buttons to select yes or no for enabling the test mode.

ALARM MENU SETTINGS



ALARMS
MENU

Using the up and down arrows, you will be able to view system alarms for items listed below:



CO2 ALARM STAT
ALARM XXX



VOC ALARM STAT
ALARM XXX



OATEMP STAT
ALARM XXX



SATEMP STAT
ALARM XXX



OADAMPER STAT
ALARM XXX



HUMIDITY STAT
ALARM XXX



DIRTY FILTER
ALARM XXX

Each screen displays alarm status as either active or deactive in place of the "xxx" shown in the picture.

TROUBLESHOOTING

1. Make sure the unit has power and the green power light on the controller is on.
2. If the unit has flashing red status and reset lights, it is indicating the unit has an alarm.

Go to the controller screen and push the up arrow until you get to the alarm menu and hit enter.

Once you are in the alarm menu, scroll through the following possible alarms to see which one(s) are active:

1. **CO₂** - If active, the controller does not sense the CO₂ sensor. Check the wiring to make sure the sensor is wired up to the unit correctly. You must have the ground, power & signal wires all attached for the sensor to work. If the sensor is wired correctly and has power, check the sensor to make sure there is a 0-10 VDC output coming from the sensor. When the alarm is active, the controller automatically moves the economizer damper to the Econo Min Position so the building is receiving the appropriate amount of air.

2. **VOC** - If active, the controller does not sense the VOC sensor. Check the wiring to make sure the sensor is wired up to the unit correctly. You must have the ground, power & signal wires all attached for the sensor to work. If the sensor is wired correctly and has power, check the sensor to make sure there is a 0-10 VDC output coming from the sensor. When the alarm is active, the controller automatically moves the economizer damper to the Econo Min Position so the building is receiving the appropriate amount of air.

3. **Outside Air temperature sensor (OAT)** - If active, the controller does not sense the OAT sensor. Check the wiring to make sure the sensor is wired up to the unit correctly. If the wiring is correct, the sensor is bad.

4. **Supply Air temperature sensor (SAT)** - If active, the controller does not sense the SAT sensor. Check the wiring to make sure the sensor is wired up to the unit correctly. If the wiring is correct, the sensor is bad.

5. **Outside Air Damper** - If active, the controller does not have feedback from the economizer actuator. If the controller was used as a replacement for a system already in the field, the previous actuator may not have feedback. If feedback is not present, this alarm will be (and remain) active. The system will continue to function normally with this alarm on.

To assist with troubleshooting the system, it may be helpful to put the controller in test mode. The mode allows the user to test the controller by forcing certain items in the system to see if they are operational. The user can force the following:

- Economizer position
- Modulating PE speed
- Comp
- Comp
- PE
- PE
- ERV wheel
- ERV OA fan
- ERV OA fan speed
- ERV EX fan speed

APPENDIX INFORMATION

The default set points and configurations for each mode are outlined on pages 21 through 27.

If a field replacement of an existing controller is needed, please contact the manufacturer by phone or email at: 844-348-9168 | sales@myiaire.com.com

If the optional BACNet translator is being used, please see the reference points list on the next page (page 29).

RTU Open / CCN Adjustment Instructions

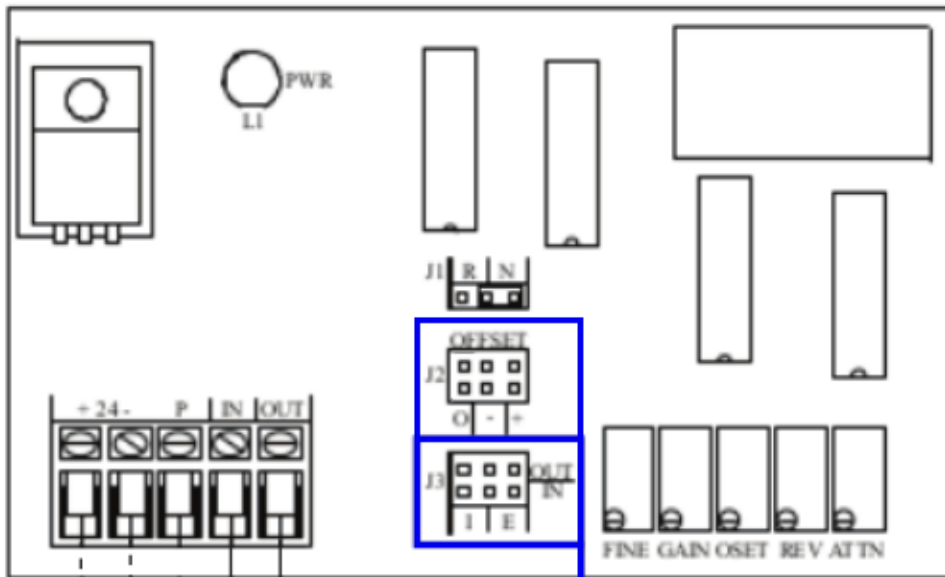
iAire Economizer Controls are compatible with RTU Open as long as the following adjustments are made.

The RTU Open controller is expecting a 4-20mA signal from an IAQ sensor. However, the iAire Economizer Controller already receives an IAQ signal from a CO2 sensor and outputs a 0-10V signal from Analogue Output 1 to instruct the economizer blades to open or shut accordingly. To use that signal the 0-10V output from the iAire Economizer Controller must be feed through an Analog Rescaling Device (CNT-0043) to be converted into a 4-20mA signal. On the Analog Rescaling device, set up the J3 jumper to allow for a voltage signal in and a current signal out.

Also, due to the added VOC sensor, the output from the iAire Controller to the Analog Rescaling Module must be shifted up 2V. Shift the output signal range up by setting the "OFFSET" jumper shunt "J2" in the "+" position and adjust the "OFFSET" trim pot until you increase the voltage reading on the meter to match the desired minimum output voltage. When the iAire system is outputting 0V to the Analog Rescaling Module (meaning the system is below the minimum requirements on CO2 and VOC), then we want to adjust the signal going to RTU Open up to 2V. (Remember, this also increases the maximum output signal by the same amount.) Follow the wiring diagram below to connect the three devices.

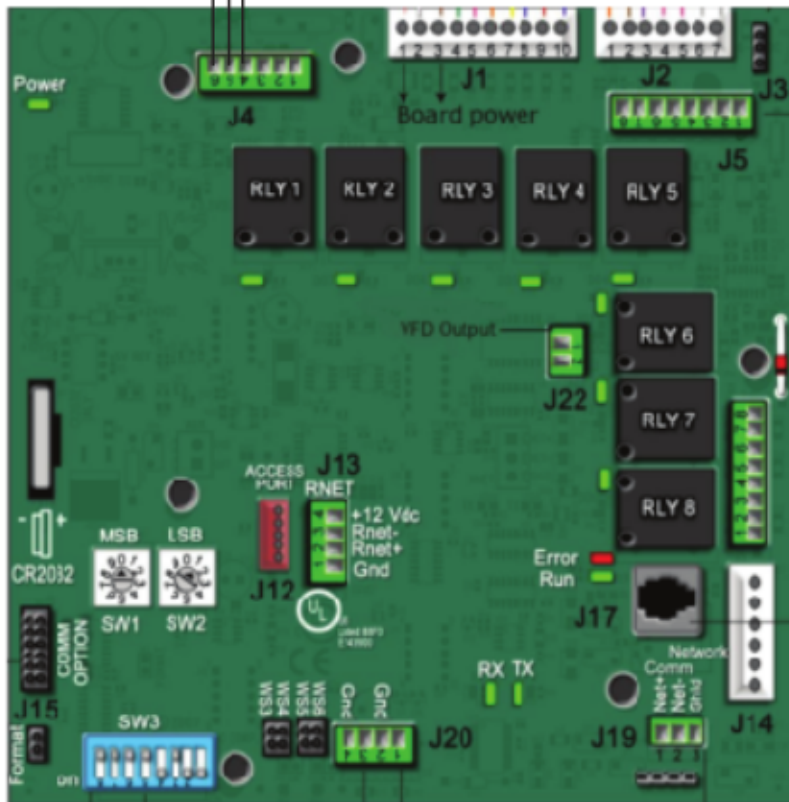
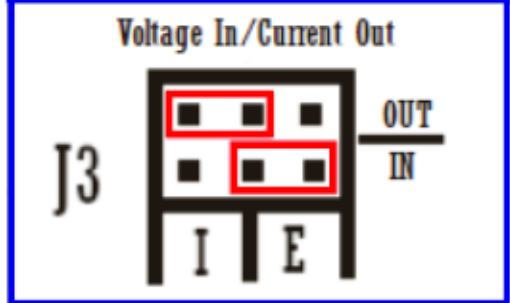
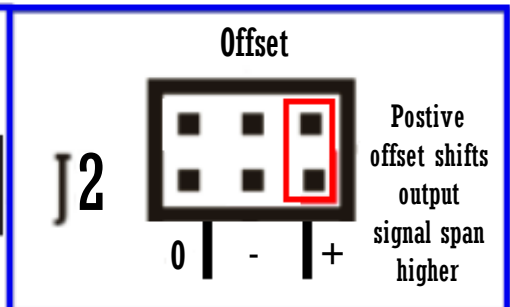
The RTU open controller does not have the same output settings as the iAire Economizer Controller and thus the setting must be change. Using an RS485 dongle, adjust the Vent Dmpr Pos/DCV Min Pos to 0% open. This set point in the minimum outdoor air damper position maintained during occupied periods. Also, adjust the DCV Max Vent Damper Pos set point to 75% open.

RTU Open Wiring Diagram



24 VAC/DC
Power Supply

Analog Input Signal
From iAire Controller A01



BACnet Points List

OBJECT ID	IAIRE POINT NAME	POINT TYPE	BACNET OBJECT NAME	OBJECT TYPE	DEFAULT SET POINTS	READ ACCESS
1	OUTSIDE AIR TEMPERATURE	ANALOG		AV	N/A	READ ONLY
2	SUPPLY AIR TEMPERATURE	ANALOG		AV	N/A	READ ONLY
3	ECON HIGH LIMIT SETPOINT	ANALOG		AV	65 DEGF	READ / WRITE
4	ECON LOW LIMIT SETPOINT	ANALOG		AV	0 DEGF	READ / WRITE
5	ECON FREE COOL SETPOINT	ANALOG		AV	55 DEGF	READ / WRITE
6	ECON MIN POSITION SETPOINT	ANALOG		AV	20%	READ / WRITE
7	ECON MAX POSITION SETPOINT	ANALOG		AV	100%	READ / WRITE
8	ECONOMIZER DAMPER POSITION	ANALOG		AV	N/A	READ ONLY
9	ECONOMIZER DAMPER COMMANDED	ANALOG		AV	N/A	READ ONLY
10	VOC STATUS	ANALOG		AV	N/A	READ ONLY
11	VOC MAX SETPOINT	ANALOG		AV	900 PPM	READ / WRITE
12	VOC MIN SETPOINT	ANALOG		AV	400 PPM	READ / WRITE
13	VOC MIN POSITION	ANALOG		AV	0%	READ / WRITE
14	VOC MAX POSITION	ANALOG		AV	15%	READ / WRITE
15	CO2 STATUS	ANALOG		AV	N/A	READ ONLY
16	CO2 MAX SETPOINT	ANALOG		AV	900 PPM	READ / WRITE
17	CO2 MIN SETPOINT	ANALOG		AV	500 PPM	READ / WRITE
18	IAQ Min Position	ANALOG		AV	0%	READ / WRITE
19	HUMIDITY STATUS	ANALOG		AV	N/A	READ ONLY
20	OUTSIDE ENTHALPY SETPOINT	ANALOG		AV	80 KJ/KG	READ / WRITE
21	ENTHALPY STATUS	ANALOG		AV	N/A	READ ONLY
22	BUILDING PRESSURE	ANALOG		AV	N/A	READ / WRITE
23	BUILDING PRESSURE SETPOINT	ANALOG		AV	0.05 IN-WC	READ / WRITE
24	PWR EXHAUST DMP POSITION	ANALOG		AV	30	READ / WRITE
25	PWR EXHAUST STATUS	DIGITAL		BV	N/A	READ ONLY
26	PWR EXHAUST %	ANALOG		AV	N/A	READ ONLY
27	HEATING STG 1 INPUT	DIGITAL		BV	N/A	READ ONLY
28	HEATING STG 2 INPUT	DIGITAL		BV	N/A	READ ONLY
29	HEATING STG 1 OUTPUT	DIGITAL		BV	N/A	READ ONLY
30	HEATING STG 2 OUTPUT	DIGITAL		BV	N/A	READ ONLY
31	COOLING STG 1 INPUT	DIGITAL		BV	N/A	READ ONLY
32	COOLING STG 2 INPUT	DIGITAL		BV	N/A	READ ONLY
33	COOLING STG 1 OUTPUT	DIGITAL		BV	N/A	READ ONLY
34	COOLING STG 2 OUTPUT	DIGITAL		BV	N/A	READ ONLY
35	FREE COOLING STATUS	DIGITAL		BV	N/A	READ ONLY

Standard Economizer Mode

NAME	FUNCTION	DEFAULT SET POINTS
Econ HighTmpLimt Setpoint	Sets the high temperature limit for when free cooling can happen (in degrees F)	65
Econ LowTmpLimt Setpoint	Sets the low temperature limit for when free cooling can happen (in degrees F)	0
Econ Free Cool Sat Setpoint	Discharge temperature setting that damper is controlling temperature to	55
Econo Min Position Configuration	High CO2 damper setpoint & maximum design outside air condition	20
Econo Max Position Configuration	Maximum stroke of economizer damper	100
Power Exht1 Position Configuration	Damper setpoint where user desire PE1 relay to energize	30
Power Exht2 Position Configuration	Damper setpoint where user desire PE2 relay to energize	70
Building Pressure	Inside building pressure if using modulating powered exhaust (inches H2O)	0.05
HVAC 2-speed Conf	Is the unit a 2-speed fan RTU?	Deactive
HVAC 2-speed ECON offset	Damper default when the RTU is goes to high fan speed	-10
Humidity Sensor Config	Does the system have a humidity sensor	Deactive
Enthalpy Set Point	Free cooling is possible less than this default setting (KJ/KG)	80

DCV Economizer with CO2 Mode

NAME	FUNCTION	DEFAULT SET POINTS
Econ HighTmpLimt Setpoint	Sets the high temperature limit for when free cooling can happen (in degrees F)	65
Econ LowTmpLimt Setpoint	Sets the low temperature limit for when free cooling can happen (in degrees F)	0
Econ Free Cool Sat Setpoint	Discharge temperature setting that damper is controlling temperature to	55
Econo Min Position Configuration	High CO2 damper setpoint & maximum design outside air condition	20
Econo Max Position Configuration	Maximum stroke of economizer damper	100
Power Exht1 Position Configuration	Damper setpoint where user desire PE1 relay to energize	30
Power Exht2 Position Configuration	Damper setpoint where user desire PE2 relay to energize	70
Building Pressure	Inside building pressure if using modulating powered exhaust (inches H2O)	0.05
HVAC 2-speed Conf	Is the unit a 2-speed fan RTU?	Deactive
HVAC 2-speed ECON offset	Damper default when the RTU is goes to high fan speed	-10
Humidity Sensor Config	Does the system have a humidity sensor	Deactive
Enthalpy Set Point	Free cooling is possible less than this default setting (KJ/KG)	80
IAQ Econo Min position	Low CO2 damper setpoint	0
Min IAQ Level Pos	Low CO2 PPM setpoint	500
Max IAQ Level Pos	High CO2 PPM setpoint	900

IAQ Economizer with CO2 and VOC Mode

NAME	FUNCTION	DEFAULT SET POINTS
Econ HighTmpLimt Setpoint	Sets the high temperature limit for when free cooling can happen (in degrees F)	65
Econ LowTmpLimt Setpoint	Sets the low temperature limit for when free cooling can happen (in degrees F)	0
Econ Free Cool Sat Setpoint	Discharge temperature setting that damper is controlling temperature to	55
Econo Min Position Configuration	High CO2 damper setpoint & maximum design outside air condition	20
Econo Max Position Configuration	Maximum stroke of economizer damper	100
Power Exht1 Position Configuration	Damper setpoint where user desire PE1 relay to energize	30
Power Exht2 Position Configuration	Damper setpoint where user desire PE2 relay to energize	70
Building Pressure	Inside building pressure if using modulating powered exhaust (inches H2O)	0.05
HVAC 2-speed Conf	Is the unit a 2-speed fan RTU?	Deactive
HVAC 2-speed ECON offset	Damper default when the RTU is goes to high fan speed	-10
Humidity Sensor Config	Does the system have a humidity sensor	Deactive
Enthalpy Set Point	Free cooling is possible less than this default setting (KJ/KG)	80
IAQ Econo Min position	Low CO2 damper setpoint	0
Min IAQ Level Pos	Low CO2 PPM setpoint	400
Max IAQ Level Pos	High CO2 PPM setpoint	1000
Min VOC Level PPM	Low VOC PPM setpoint	400
Max VOC Level PPM	High VOC PPM setpoint	1000
VOC Econo Min Pos	Low VOC damper setpoint	0
VOC Econo Max Pos	High VOC damper setpoint	15

IAQ Sized ERV Mode

NAME	FUNCTION	DEFAULT SET POINTS
Econ HighTmpLmt Setpoint	Sets the high temperature limit for when free cooling can happen (in degrees F)	65
Econ LowTmpLmt Setpoint	Sets the low temperature limit for when free cooling can happen (in degrees F)	0
Econ Free Cool Sat Setpoint	Discharge temperature setting that damper is controlling temperature to	55
Econo Min Position Configuration	High CO2 damper setpoint & maximum design outside air condition	20
Econo Max Position Configuration	Maximum stroke of economizer damper	100
Power Exht1 Position Configuration	Damper setpoint where user desire PE1 relay to energize	30
Power Exht2 Position Configuration	Damper setpoint where user desire PE2 relay to energize	70
Building Pressure	Inside building pressure if using modulating powered exhaust (inches H2O)	0.05
HVAC 2-speed Conf	Is the unit a 2-speed fan RTU?	Deactive
HVAC 2-speed ECON offset	Damper default when the RTU is goes to high fan speed	-10
Humidity Sensor Config	Does the system have a humidity sensor	Deactive
Enthalpy Set Point	Free cooling is possible less than this default setting (KJ/KG)	80
IAQ Econo Min position	Low CO2 damper setpoint	0
Min IAQ Level Pos	Low CO2 PPM setpoint	400
Max IAQ Level Pos	High CO2 PPM setpoint	1000
Min VOC Level PPM	Low VOC PPM setpoint	400
Max VOC Level PPM	High VOC PPM setpoint	1000
VOC Econo Min Pos	Low VOC damper setpoint	0
VOC Econo Max Pos	High VOC damper setpoint	15
OA ERV fan speed	ERV OA outside air fan speed setpoint	75
EX ERV fan speed	ERV EX outside air fan speed setpoint	75
Min ERV damper position	Minimum damper position that econo damper will be in free cooling	20

Min IAQ Sized ERV Mode

NAME	FUNCTION	DEFAULT SET POINTS
Econ HighTmpLimt Setpoint	Sets the high temperature limit for when free cooling can happen (in degrees F)	65
Econ LowTmpLimt Setpoint	Sets the low temperature limit for when free cooling can happen (in degrees F)	0
Econ Free Cool Sat Setpoint	Discharge temperature setting that damper is controlling temperature to	55
Econo Min Position Configuration	High CO2 damper setpoint & maximum design outside air condition	20
Econo Max Position Configuration	Maximum stroke of economizer damper	100
Power Exht1 Position Configuration	Damper setpoint where user desire PE1 relay to energize	40
Power Exht2 Position Configuration	Damper setpoint where user desire PE2 relay to energize	75
IAQ Econo Min position	Low CO2 damper setpoint	0
Min IAQ Level Pos	Low CO2 PPM setpoint	400
Max IAQ Level Pos	High CO2 PPM setpoint	1000
Min VOC Level PPM	Low VOC PPM setpoint	400
Max VOC Level PPM	High VOC PPM setpoint	1000
VOC Econo Min Pos	Low VOC damper setpoint	0
VOC Econo Max Pos	High VOC damper setpoint	15
OA ERV fan speed	ERV OA outside air fan speed setpoint	1000
EX ERV fan speed	ERV EX outside air fan speed setpoint	1000
Min ERV damper position	Minimum damper position that econo damper will be in free cooling	20

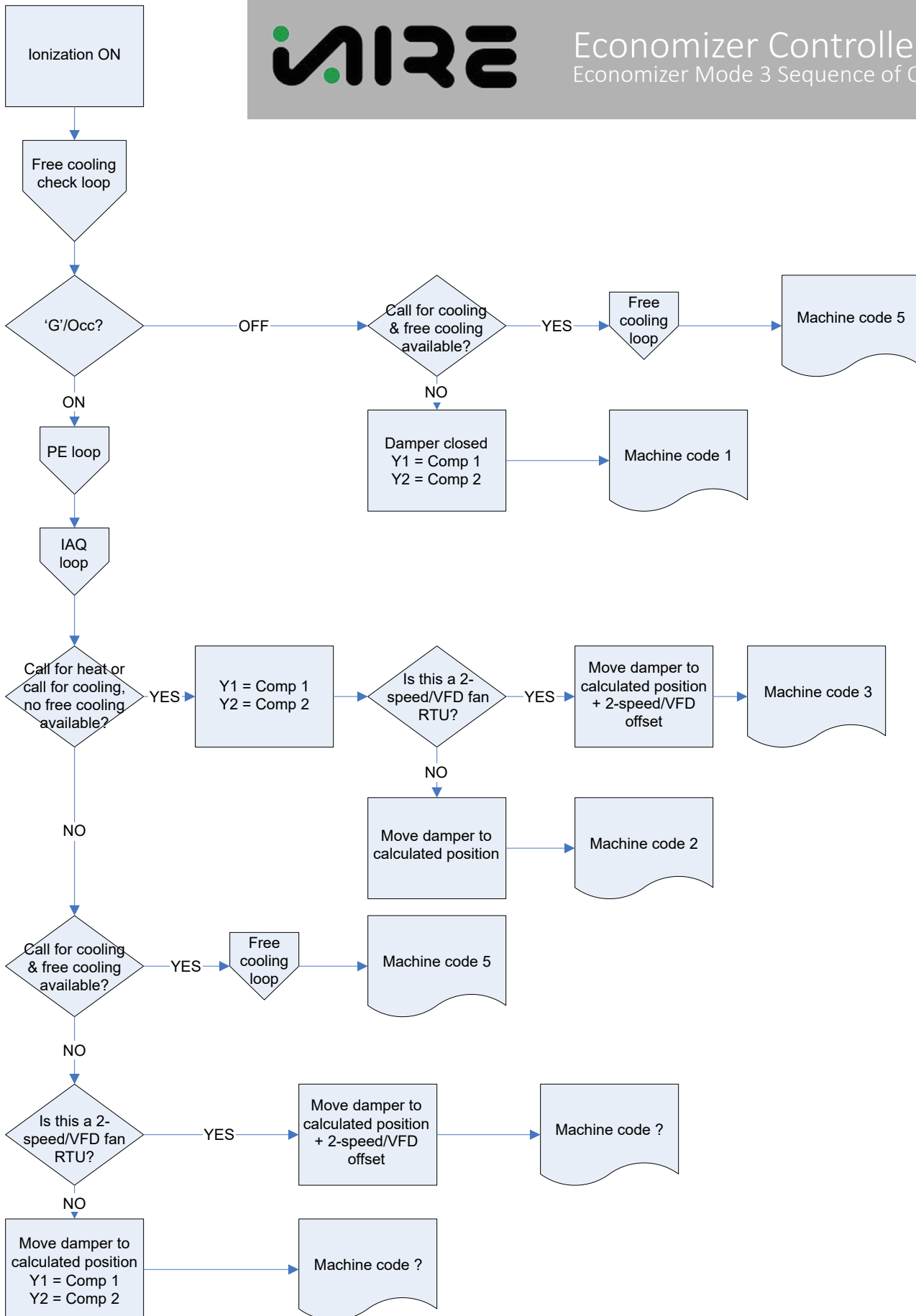
CONTROLLER SEQUENCE OF OPERATIONS

The following pages in this installation guide outline the sequence of operations for the *iAIRE* controller.



Economizer Controller

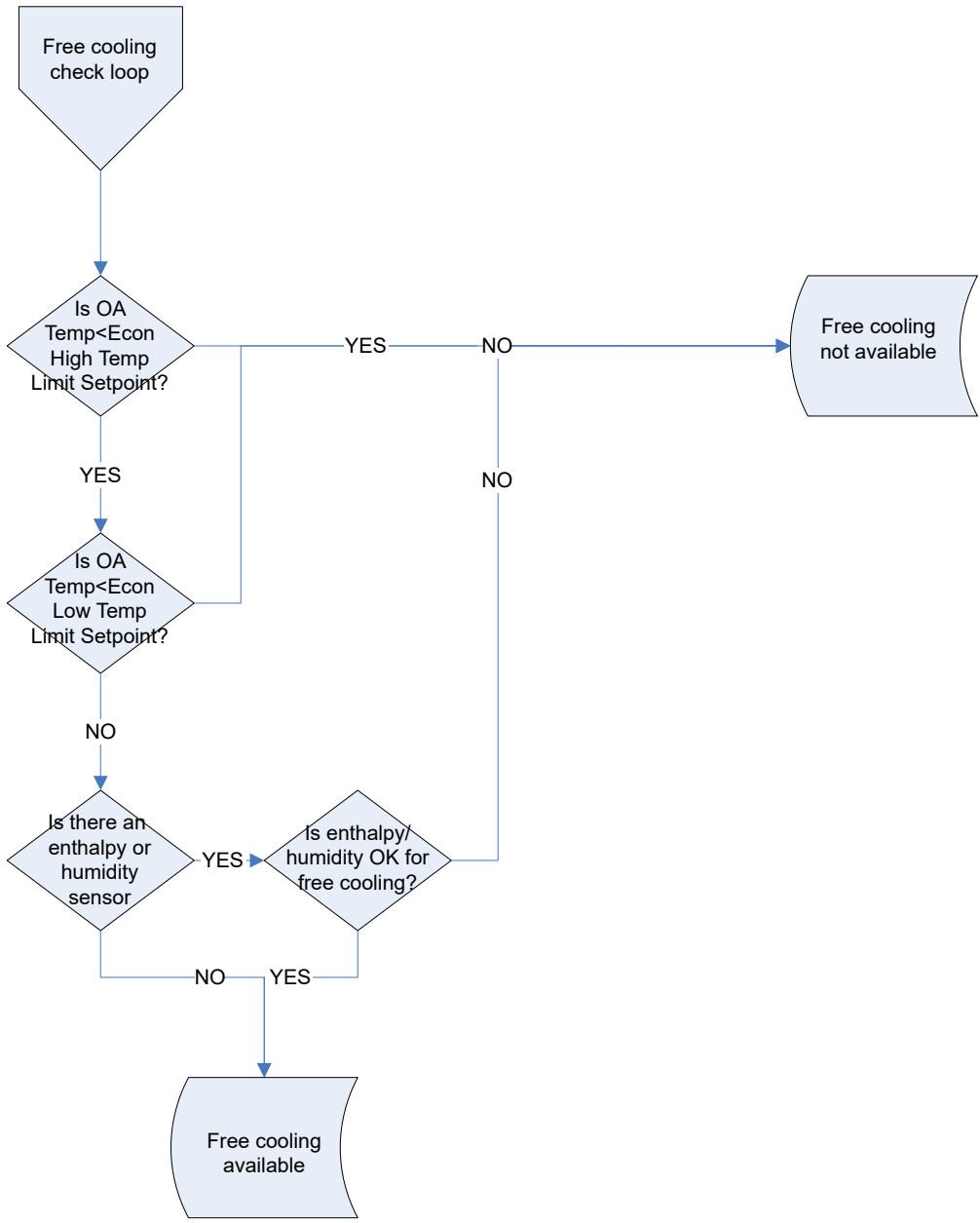
Economizer Mode 3 Sequence of Operations





Economizer Controller

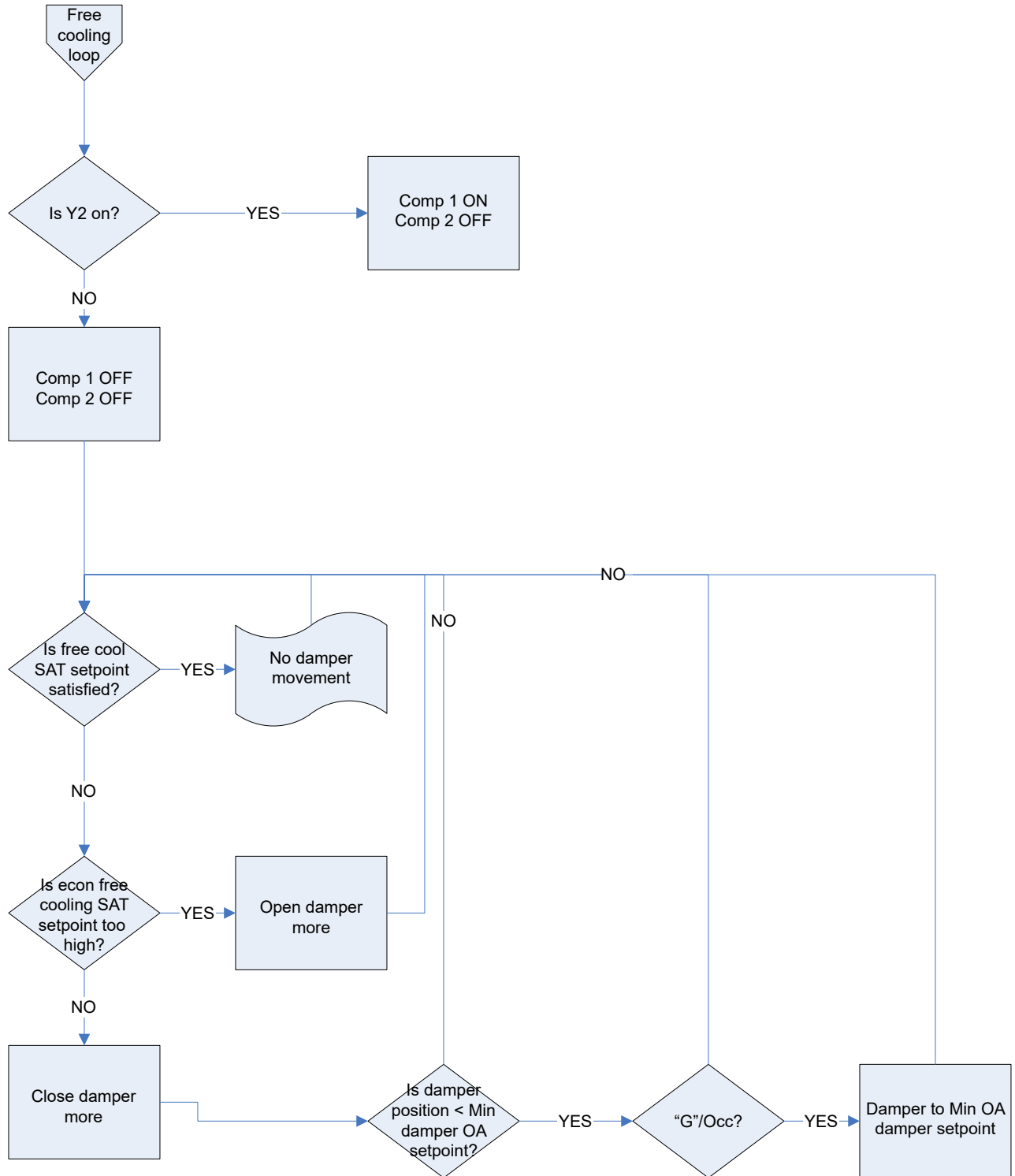
Free Check Cooling Loop



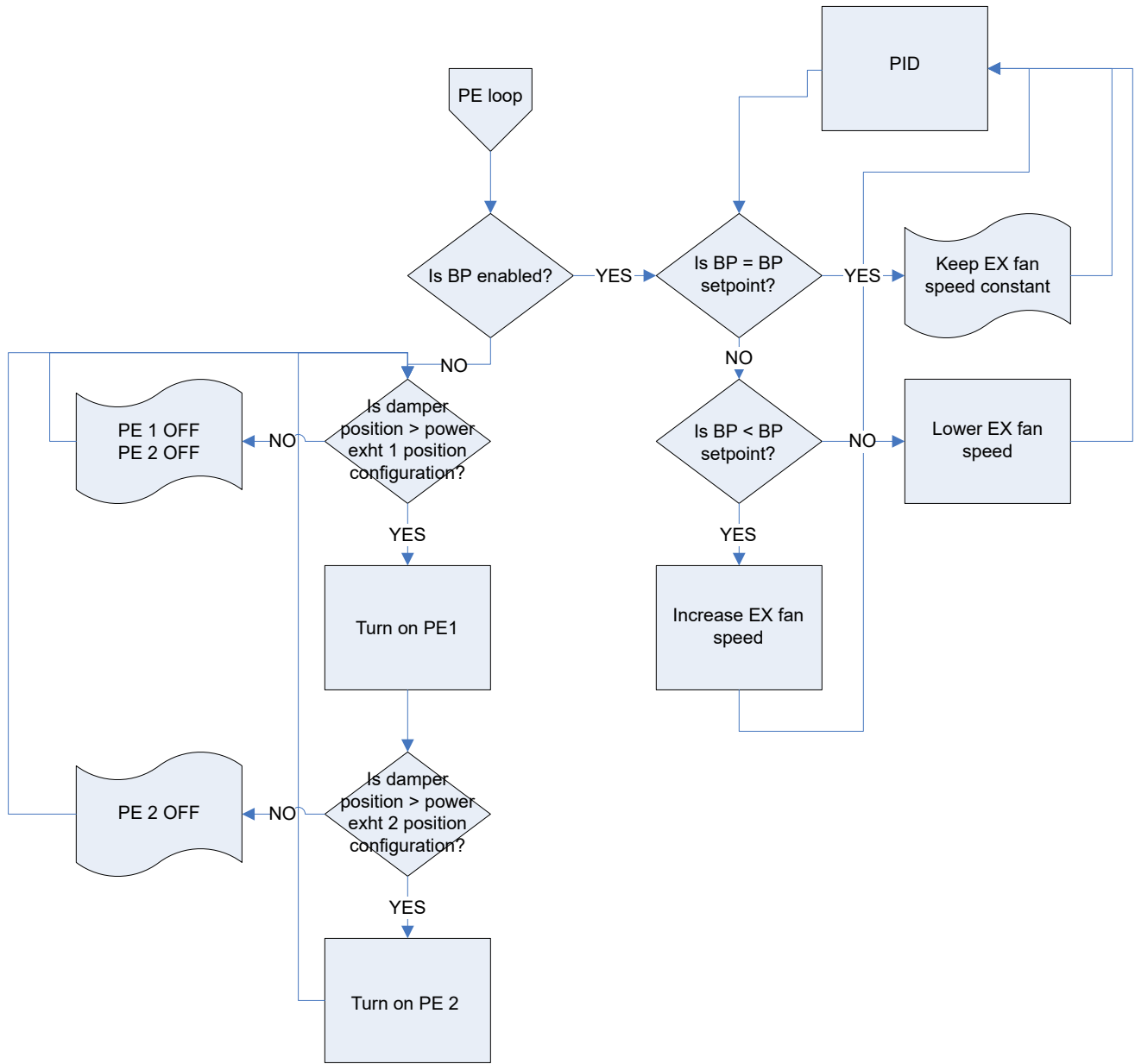


Economizer Controller

Free Cooling Loop

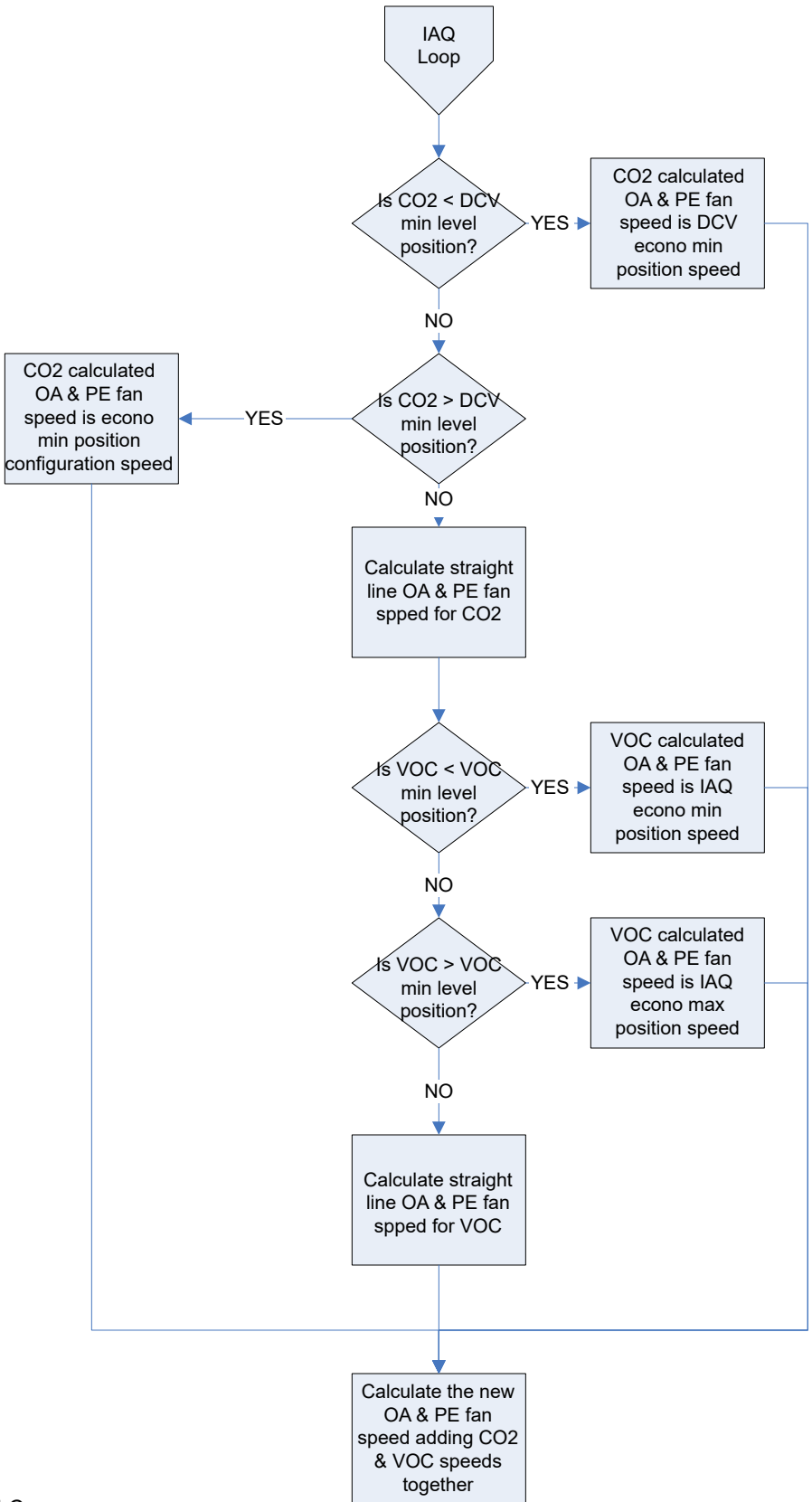


iAIRE Economizer Controller PE Loop





Economizer Controller IAQ Loop



**The following are reference
product installation sheets**

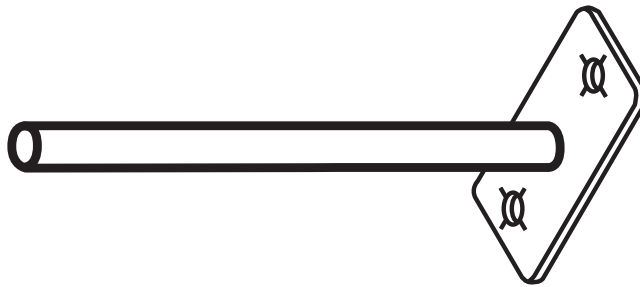
READ THESE INSTRUCTIONS BEFORE BEGINNING INSTALLATION

INSTALLATION

The **iAIRE** temperature probe is both non-polarity and non-position sensitive. All thermistor type room units are supplied with a two-pole terminal block. It is recommended to use 18-20 AWG twisted pair wire or shielded cable for sensor installation (10 ft. provided).

MOUNTING

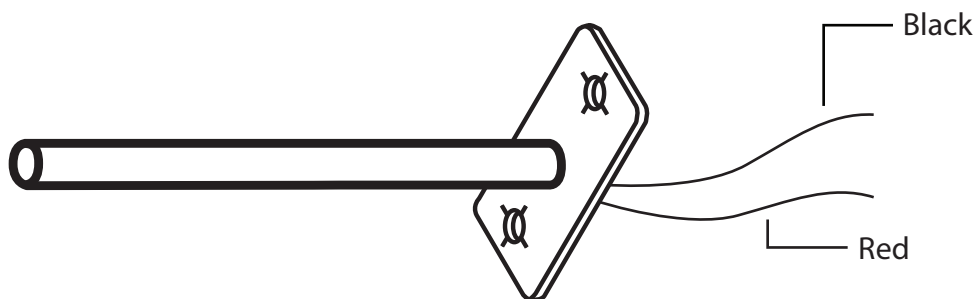
The temperature probe should be mounted using (2) two screws through the existing screw holes.
(Unit can be mounted in any position or angle)



WIRING

The wires for the temperature probe should land at the desired location (either the SAT or OAT location on your controller).

 *(Be sure to follow all local and electrical codes. Turn off power to the unit before mounting or making any connections.)*





ION-0A*00 INSTALL

Ion Generator for AHUs, Heating and AC Units

READ THESE INSTRUCTIONS BEFORE BEGINNING INSTALLATION

INSTALLATION

The **IAIRE** ion generator is a versatile product and can be mounted in any type HVAC system. It is designed for airflows of up to 2,500 CFM and standard VOC loading. 1250 CFM in smoking environments.

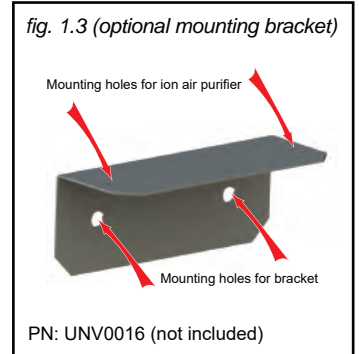
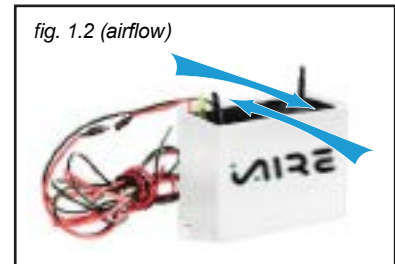
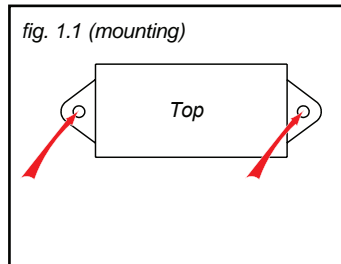
MOUNTING

Find a suitable location in the air stream. The optimal location is at the inlet to the supply fan. Keep the carbon fiber needles far enough away from any conductive surface to prevent arcing.

The ion air purifier has two mounting flanges with a hole to accommodate 1/8" self tapping sheet metal screws [figure 1.1]. With the provided metal screws, mount the ion air purifier perpendicular to and in the middle of the air stream such that air will flow between the carbon fiber needles [figure 1.2]. The exposed end of the screw should not protrude from the unit where someone can be cut on the screw tip.

In some cases, to properly mount the ion air purifier, the optional mounting bracket (not included) is required [figure 1.3].

This bracket has (4) holes: (2) that accommodate mounting of the ion air purifier and (2) for mounting with #10 hardware to a surface so the air purifier is perpendicular to the air stream.



MAINTENANCE

A small cleaning brush (GNP-0148) is included for easy, routine maintenance. This should be done as the ion brushes become dirty, usually once a month.

⚠ (Be sure to follow all local and electrical codes. Turn off power to the unit before mounting or making any connections.)

ION - 0A * 00

VOLTAGE:

- A - 24VAC / VDC, 1φ
- D - 115VAC, 1φ
- G - 208/230VAC, 1φ

- Verify the product will not overload the power requirement for the HVAC system before wiring.
- Check the label on the product and wire it only to the voltage range shown. The 24V product accepts VAC/VDC power and can be utilized as a lower voltage block with less output.
- Unit should be interlocked to fan operation ("G" terminal) or other similar control.
- Inline C-Class Fusing:
 - 500mA @ 24V; (FUS-0037)
 - 200mA @ 115V/208V/230V (FUS-0048)
- Green LED will illuminate when powered and operating.

35 inch red = Positive (HVAC "G" Terminal)

35 inch black = Neutral or Ground (HVAC "C" Terminal) or chassis in case of furnace

Inline C-Class Fuse



UL STD 867
UL STD 2998
CAN/CSA
STD C22.2



File# 101141865COL-003





SEN-0002 INSTALL

READ THESE INSTRUCTIONS BEFORE YOU BEGIN INSTALLATION

INSTALLATION

The **iAIRE** CO2 sensor is a versatile product and can be mounted to any standard wall. It is designed for real-time CO2 detection in basic HVAC and Ventilation systems.

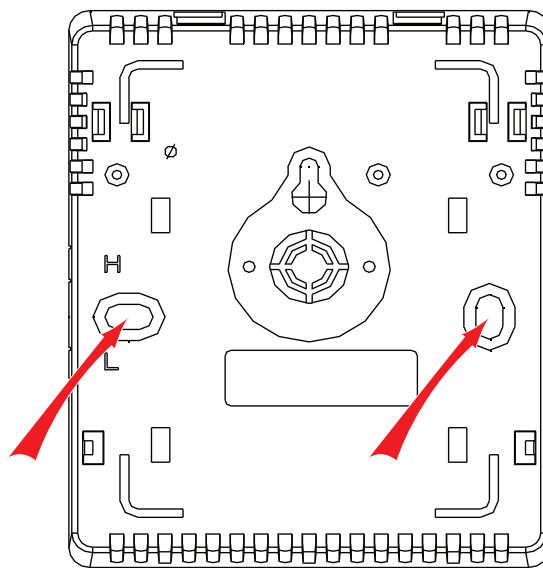
MOUNTING

Find a suitable location on the wall to mount the sensor. The sensor should be mounted at a similar height to the thermostat.

⚠ (It is recommended when mounting on a wall to secure the unit using drywall anchors or to wall studs directly.)

Using screws, mount the sensor to the wall ensuring it is secure.
(Unit should be mounted vertically so that product labels are facing up)

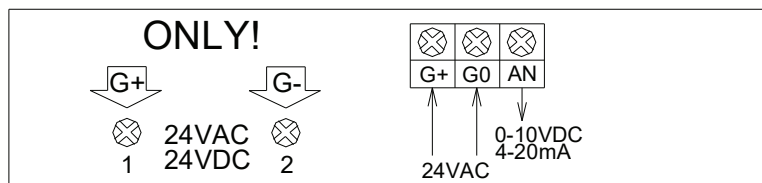
(hole for wall mounting located on back of device)



WIRING

⚠ (Be sure to follow all local and electrical codes. Turn off power to the unit before mounting or making any connections.)

- Only 0~10VDC output





SEN-0071 INSTALL

SEN-0071 - Indoor Air Quality Indicator & Transmitter

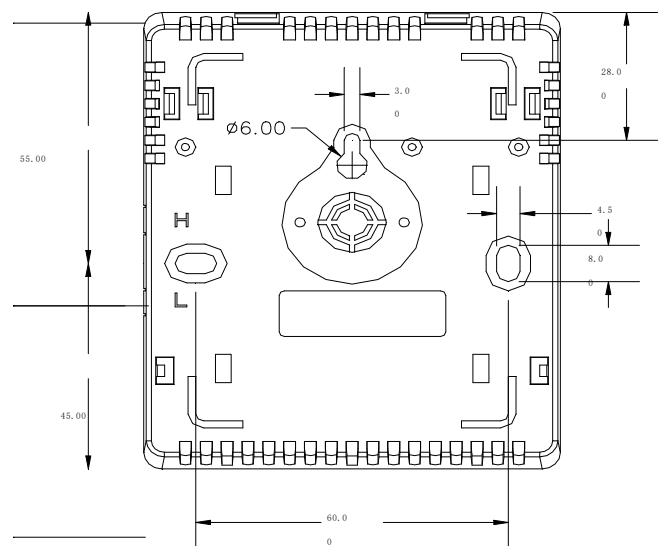
READ THESE INSTRUCTIONS BEFORE BEGINNING INSTALLATION

INSTALLATION

- ◆ Always cut off power before mounting, removing, or cleaning the monitor.
- ◆ Notice the supply power voltage of the transmitter: 24VAC/VDC. Do not install the transmitter on voltages higher than marked on the transmitter. 24VAC/VDC.



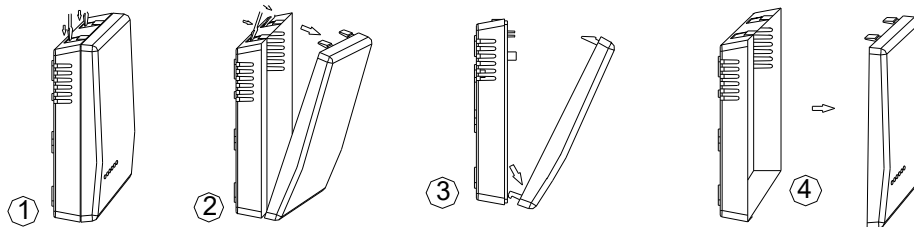
Figure.1



Mounting and Wire Connection

- ◆ With power off, put a flat head screwdriver deep inside of the hole on the top of the detector housing following step 1 in figure 2. Then slant the screwdriver and gently separate the cover from the wall plate by following steps 2 through 4.

Figure.2
Opening steps



- ◆ The transmitter should be mounted near the place where you want to detect VOC level. However, do not mount the detector near a steam source, such as a diffuser, or in direct sunlight.



SEN-0072 Install

SEN-0072 Duct VOC Sensor

READ THESE INSTRUCTIONS BEFORE YOU BEGIN INSTALLATION

INSTALLATION

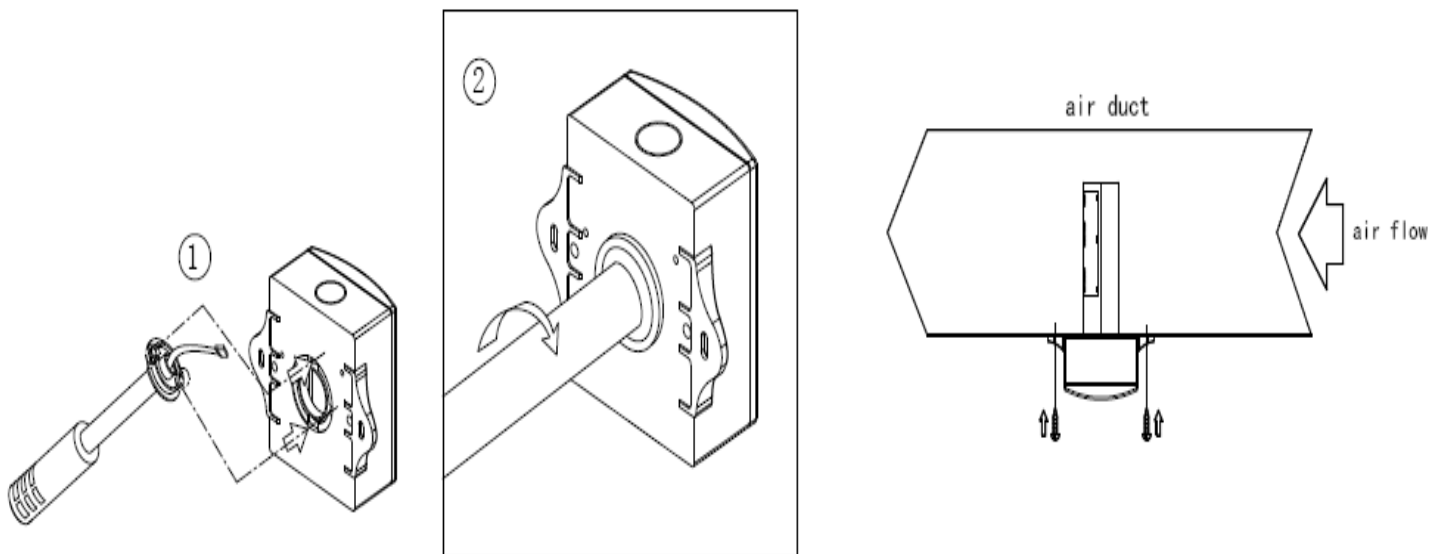
The **iAIRE** VOC sensor is a versatile product and can be mounted to any standard duct. It is designed for real-time VOC detection in basic HVAC and Ventilation systems.

MOUNTING

Drill a 1-1/8" [28mm] hole in the air duct.

Slide a sealing ring onto the pitot tube and insert into the hole in the air duct. Orientate the pitot tube (see dimension drawing) based upon the direction of the airflow. Use a Phillips screwdriver to secure the pitot tube to the air duct with screws.

Slide main unit in horizontally (top of main unit is downstream) and then rotate it on the pitot tube interface 90 degrees clockwise. This will fix the main unit in place.



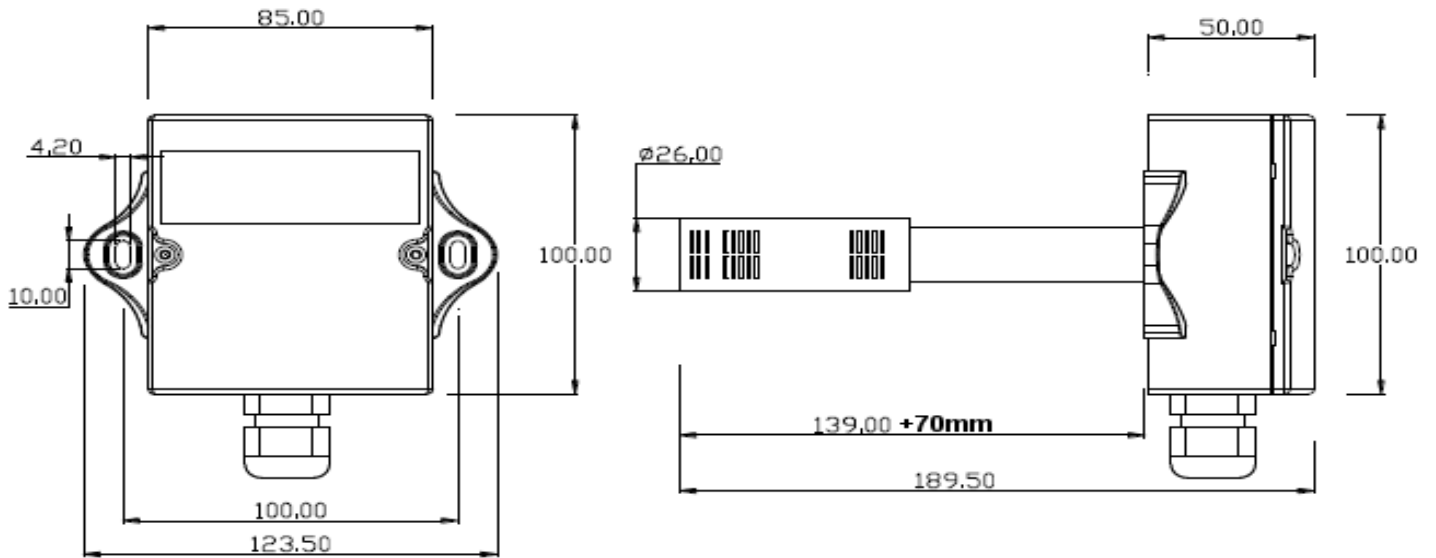
Install or move the probe

The air flow direction


Open the casing for the electrical wiring by removing the (2) screws.

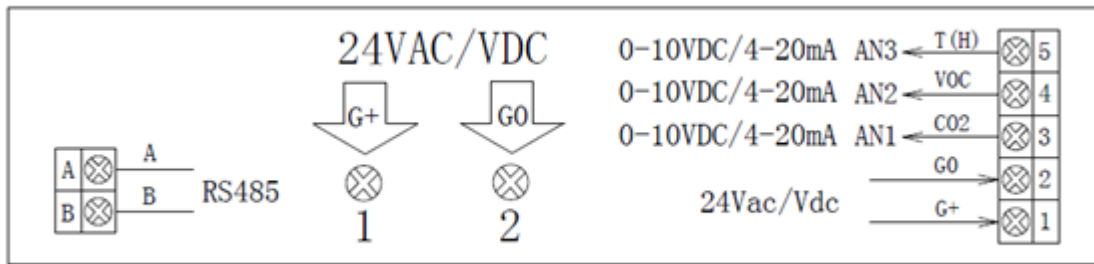
After wiring the connections (see wiring diagram below), lock the inlet of the waterproof connection by tightening it securely. Replace the electrical casing and secure with the (2) screws.

DIMENSIONS



WIRING

 (Be sure to follow all local and electrical codes. Turn off power to the unit before mounting or making any connections.)





MTR-000* INSTALL

READ THESE INSTRUCTIONS BEFORE YOU BEGIN INSTALLATION

INSTALLATION

The **IAIRE** actuators have standardized footprints, wiring configurations and checkout procedures allowing for fast installation resulting in lower installed cost.

MOUNTING

There are several mounting options for the MTR-000* actuators.

For easy mounting on short shafts without special accessories, the self-centering shaft adapter can be mounted on the backside of the actuator. Each actuator includes an adapter so that the position indicator is still easily viewed [figure 1.1].

The frame mounting kit (MTR-0002) is used when the actuator cannot be directly mounted on the damper shaft due to space limitations [figure 1.2].

Easily replace existing Honeywell, Johnson and Barber-Colman modulating motors using the foot mounting kit (MTR-0003). The foot mounting kit can also be used for placing the actuator in the air stream and linking to the damper blades [figure 1.3].

Other kits provide additional mounting options such as wall mounting (MTR-0004) [figure 1.4].

(For all kits, parts are included, except for the damper rod.)

fig. 1.1
(short shaft mounting)

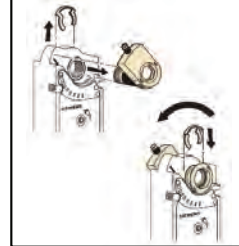


fig. 1.2
(frame mounting)

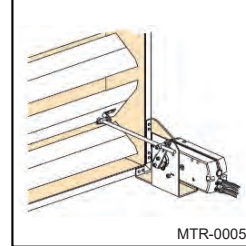


fig. 1.3
(foot mounting)

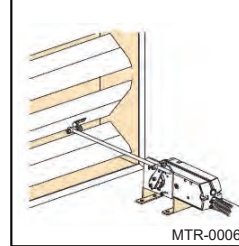
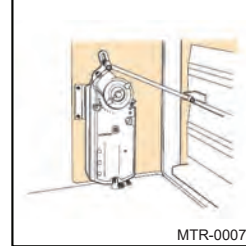


fig. 1.4
(wall mounting)



WIRING

⚠ (Be sure to follow all local and electrical codes. Turn off power to the unit before mounting or making any connections.)

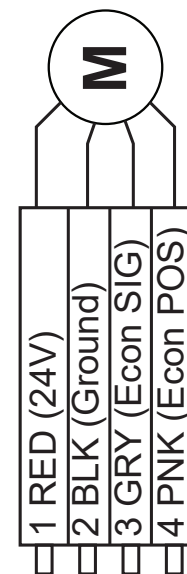
Multiple acutators can be powered off of one transformer (up to ten on one transformer) [figure 2.1].

Actuators can be wired in parallel with one signal driving up to ten actuators. Feedback should not be wired together and can be read off of one of the actuators [figure 2.2].

Actuators can be wired in parallel with one signal driving a bank of up to ten actuators. Multiple transformers can power multiple actuators. Feedback should not be wired together and can be read off of one of the actuators [figure 2.3].

Master and slave actuators can be tandem mounted for 0 to 10 V applications. This effectively doubles the torque produced by one actuator. This unique feature allows the actuators to operate in a wider range of applications [figure 2.4].

With the settings shown in [figure 2.5], two 0 to 10 V actuators can be sequenced such that the first one will operate at 0 to 2 V and the second at 2 to 10 V. This feature allows for specialized applications, such as staging or minimum required airflow.



MTR-000* INSTALL

WIRING CONFIGURATIONS

fig. 2.1
(one transformer)

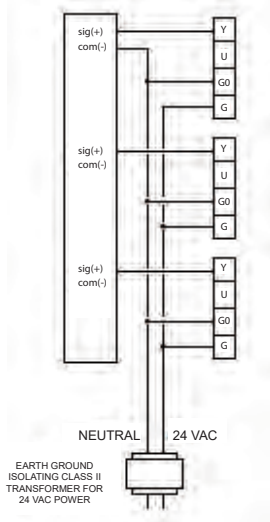


fig. 2.2
(parallel w/ one signal)

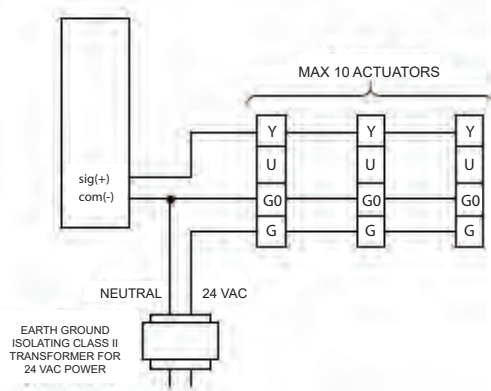


fig. 2.3
(parallel w/ multiple transformers)

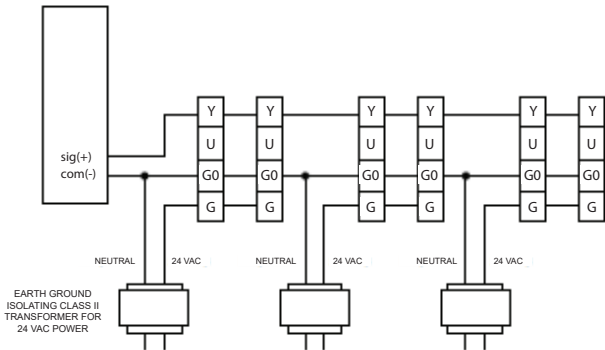


fig. 2.4
(master and slave)

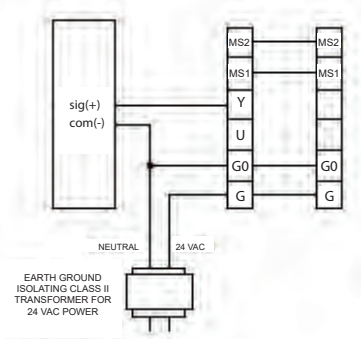
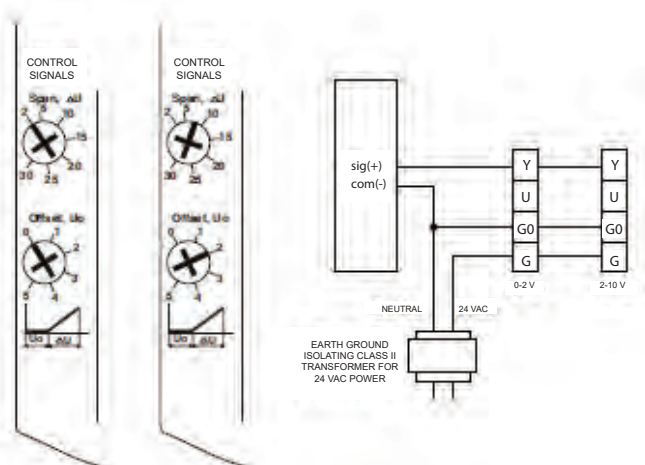


fig. 2.5
(sequencing)





SEN-0001 INSTALL

READ THESE INSTRUCTIONS BEFORE YOU BEGIN INSTALLATION

INSTALLATION

The **iAIRE** Humidity sensor is a versatile product and can be mounted to any standard wall. The unit is designed to transmit relative humidity and temperature measurements.

MOUNTING

Find a suitable location on the wall to mount the sensor.

⚠ (It is recommended when mounting on a wall to secure the unit using drywall anchors or to wall studs directly.)

Using screws, mount the sensor to the wall ensuring it is secure.

(Unit should be mounted vertically so that product labels are facing up)



WIRING

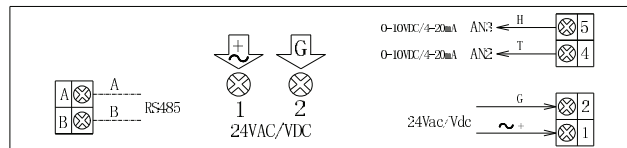
⚠ (Be sure to follow all local and electrical codes. Turn off power to the unit before mounting or making any connections.)

- 2x0~10VDC (default) or 2x4~20mA(selectable by jumpers)
- 2x0~5VDC (selected when order is placed)

To change the output, follow steps below:

- Power off and remove the face cover, you can see a set of short-circuit block jumpers S1-S4 in the middle of the PCB board. When you block the top two pins of the S1-S4, the analog output is voltage output. Blocking the lower two pins sets analog output.

- There is a set of short circuit block jumpers J1-J3 in the top of the PCB board. Connecting or disconnecting the J1 will switch between 0-10V and 4-20mA outputs.

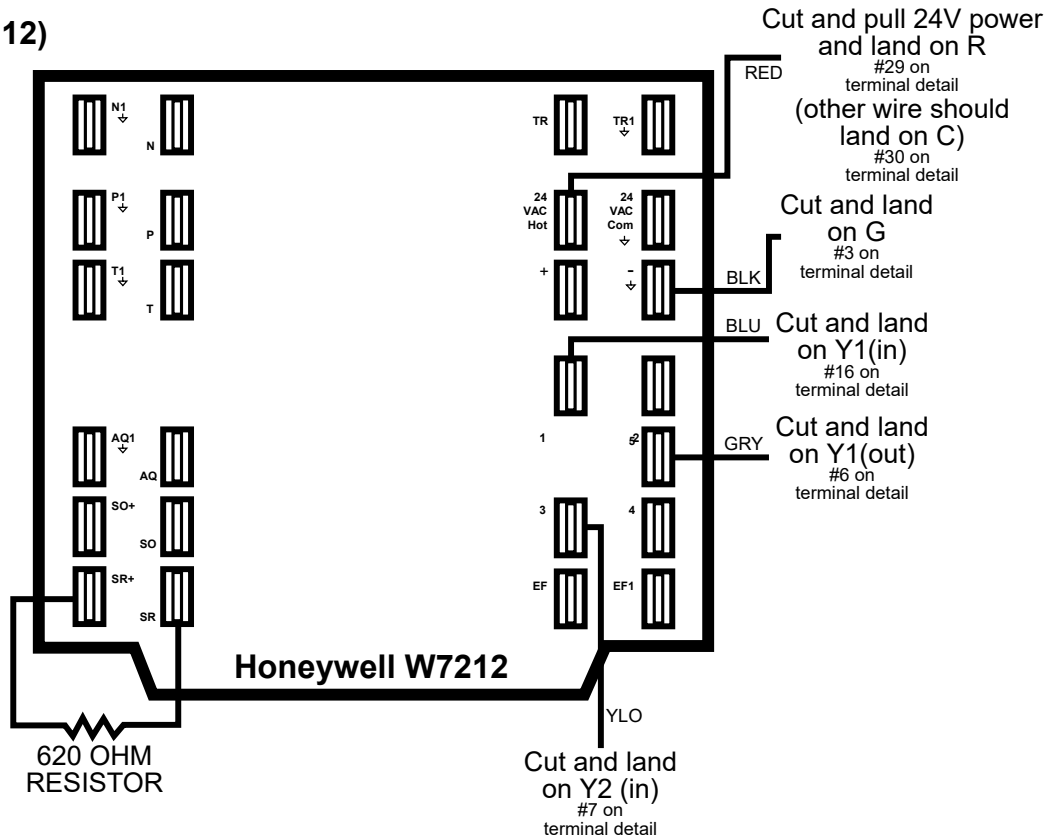


Addendum: Wiring Diagrams

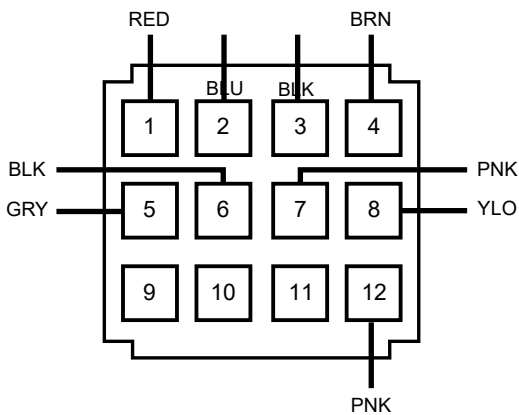
Existing Controller Wiring Diagrams

When replacing the economizer controller, use the diagrams below to verify where wires should be cut and landed to the new **iAIRE** economizer controller terminal strips.

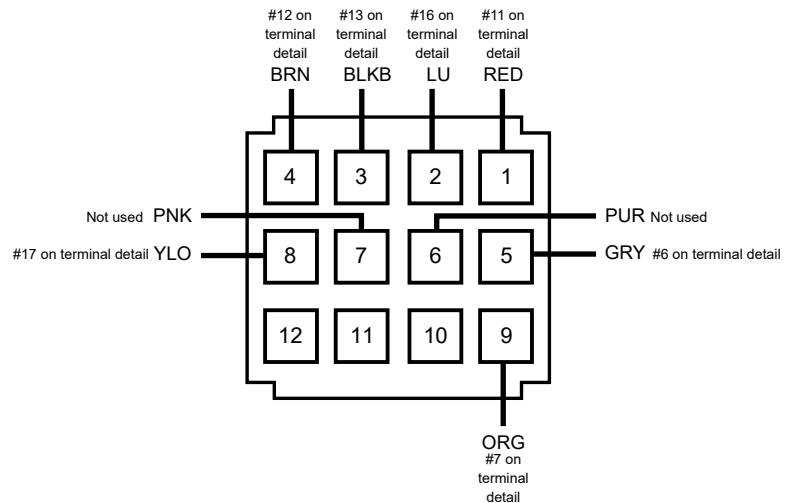
(Honeywell W7212)



HARNESS TO RTU

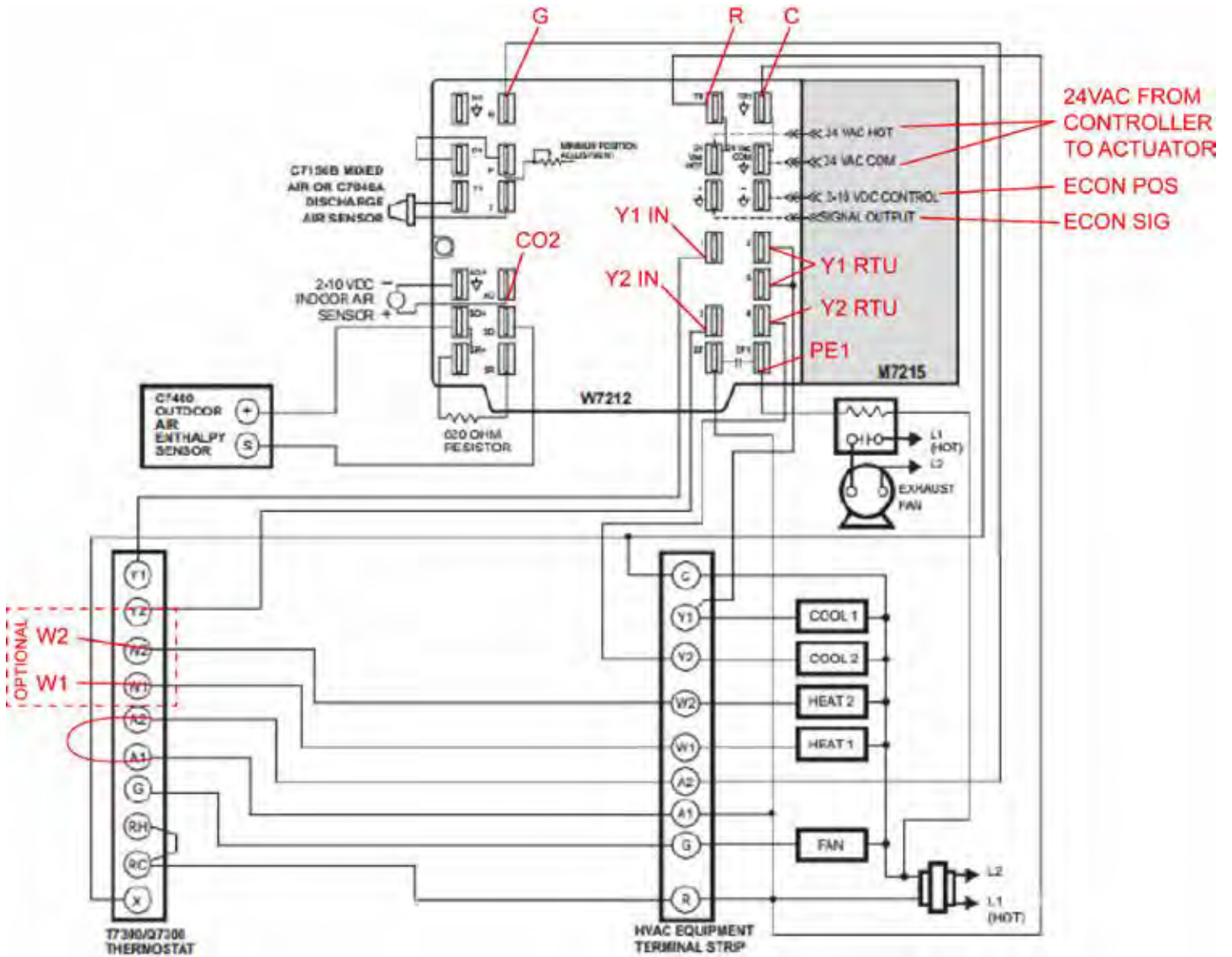


HARNESS TO CONTROLLER

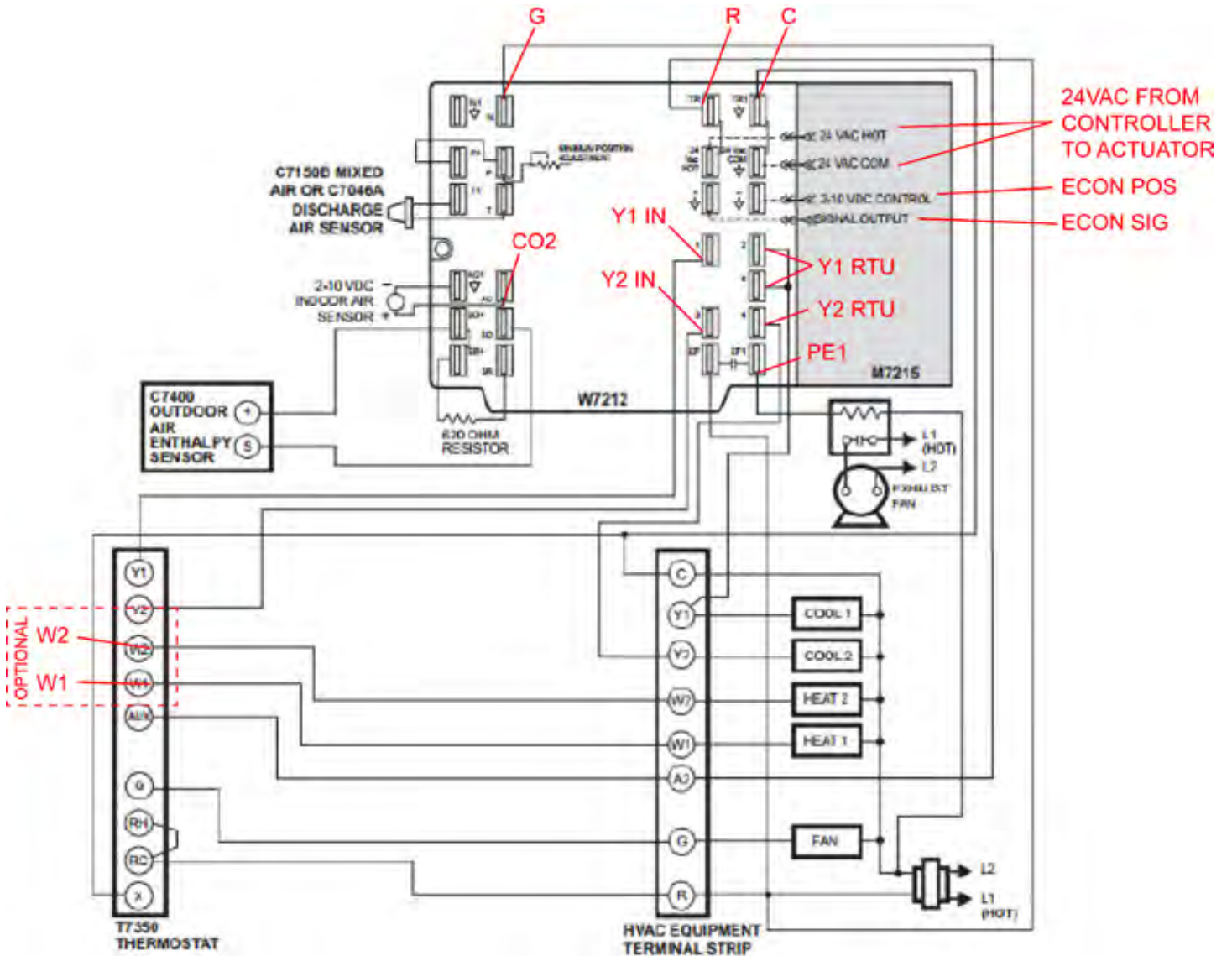


Leave the two halves of the harness plugged together. Tie wires off of harness to the controller plug end to the **iAIRE** terminal strips.

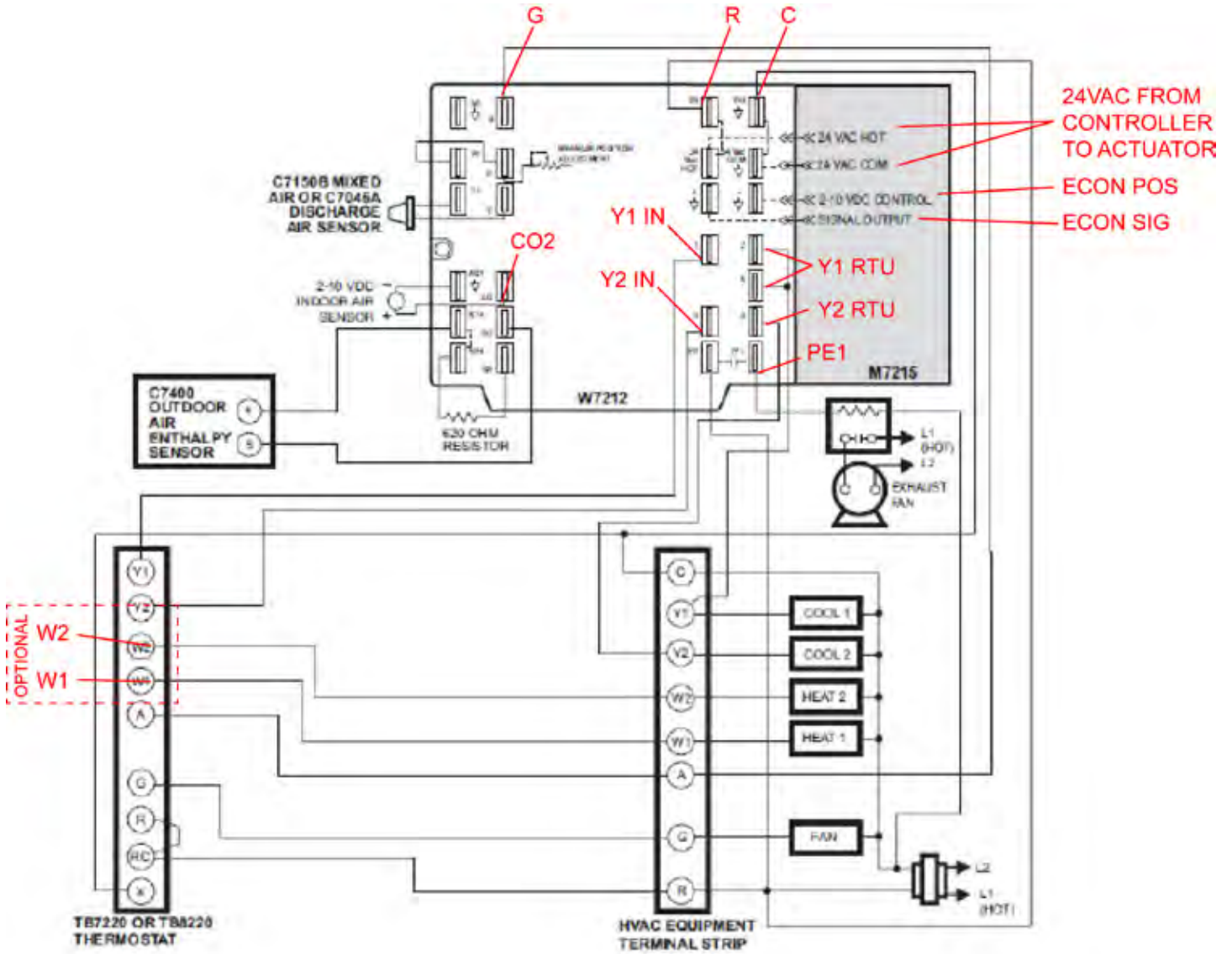
All other wires are not needed. Either discard extra wires or make sure they will not interfere with the new **iAIRE** controls system.



7212 with M7215 damper motor and T7300 thermostat

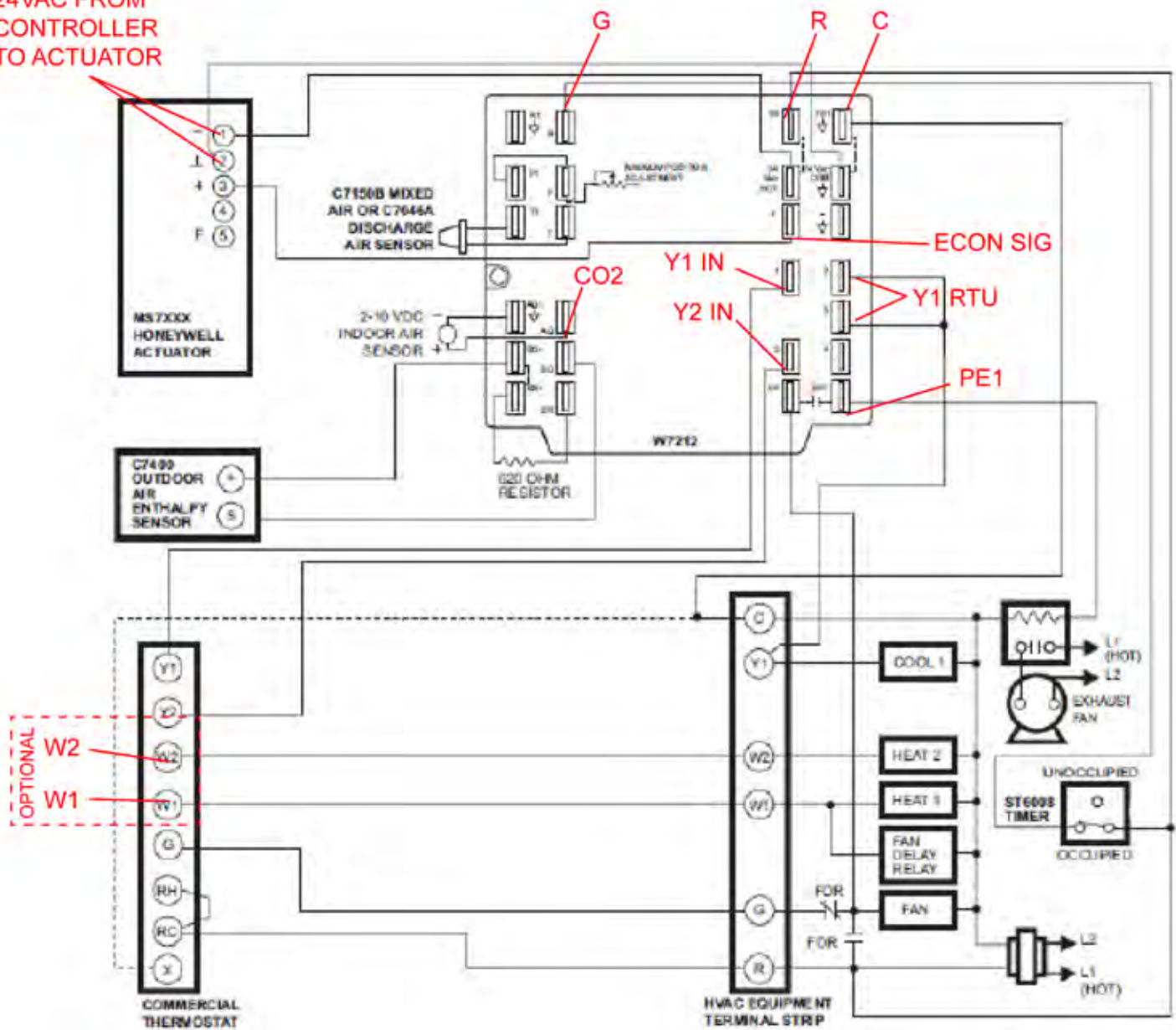


7212 with M7215 damper motor and T7350 thermostat

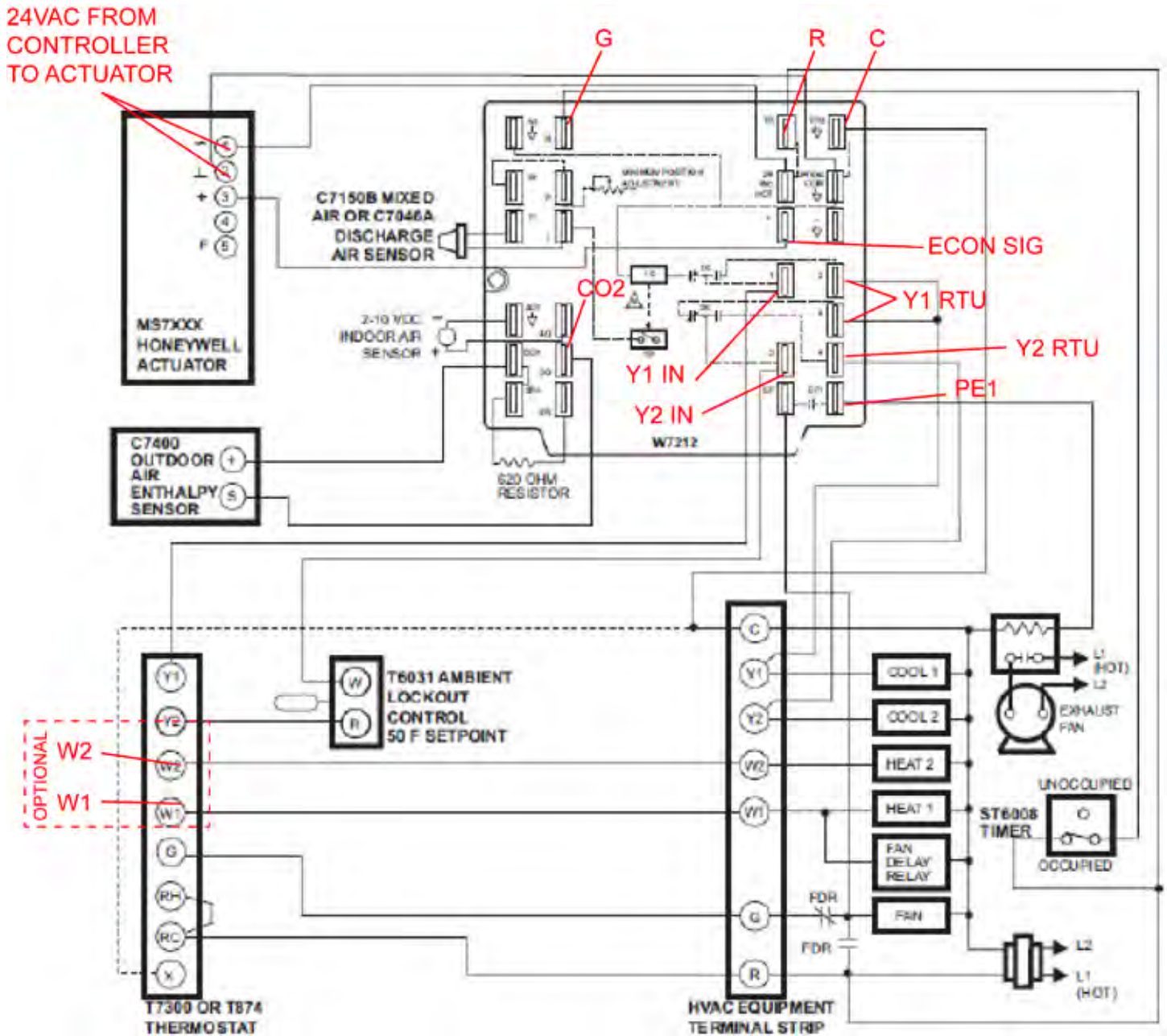


7212 with M7215 damper motor and TB7220 or TB8220 thermostat

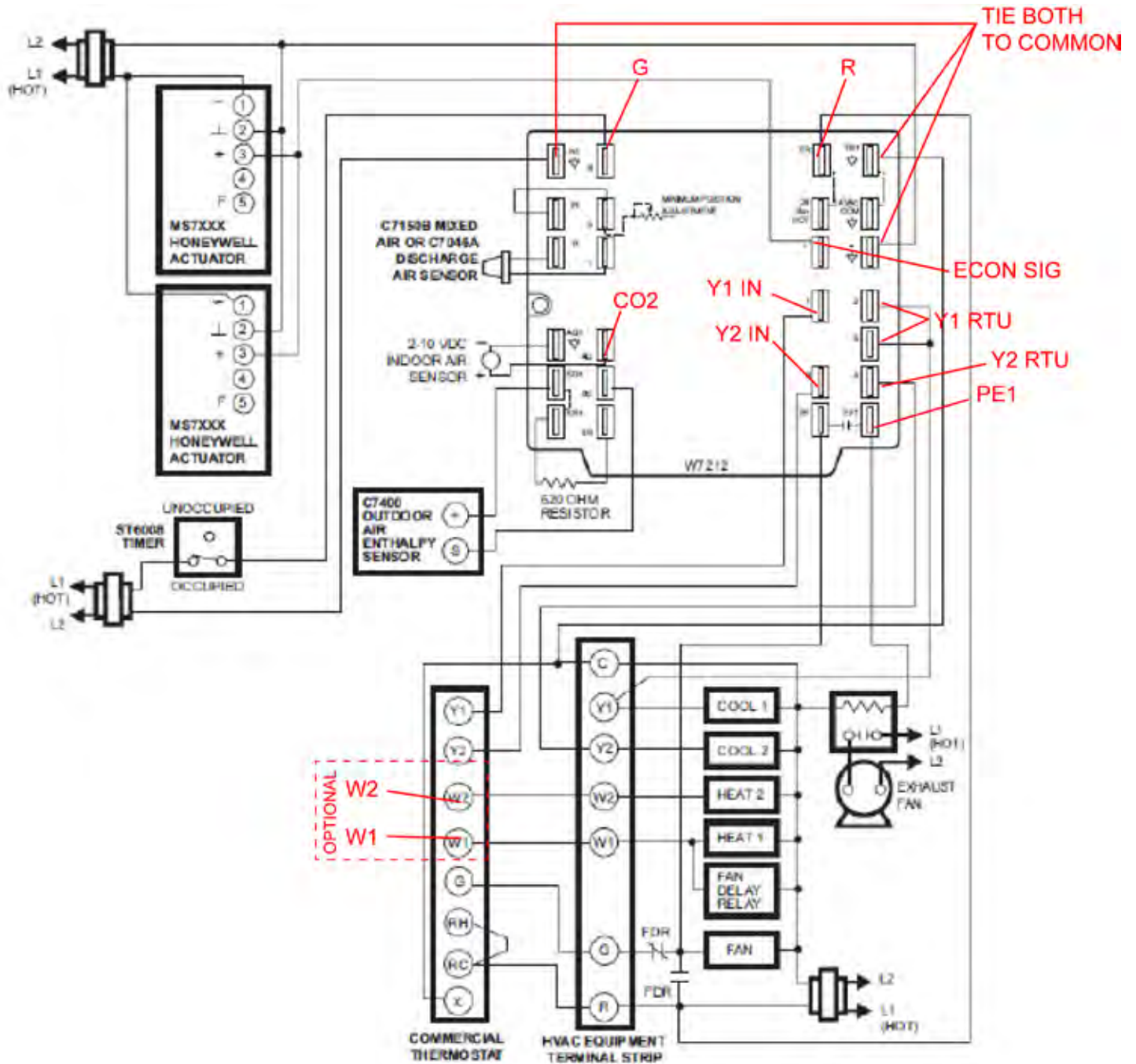
24VAC FROM CONTROLLER TO ACTUATOR



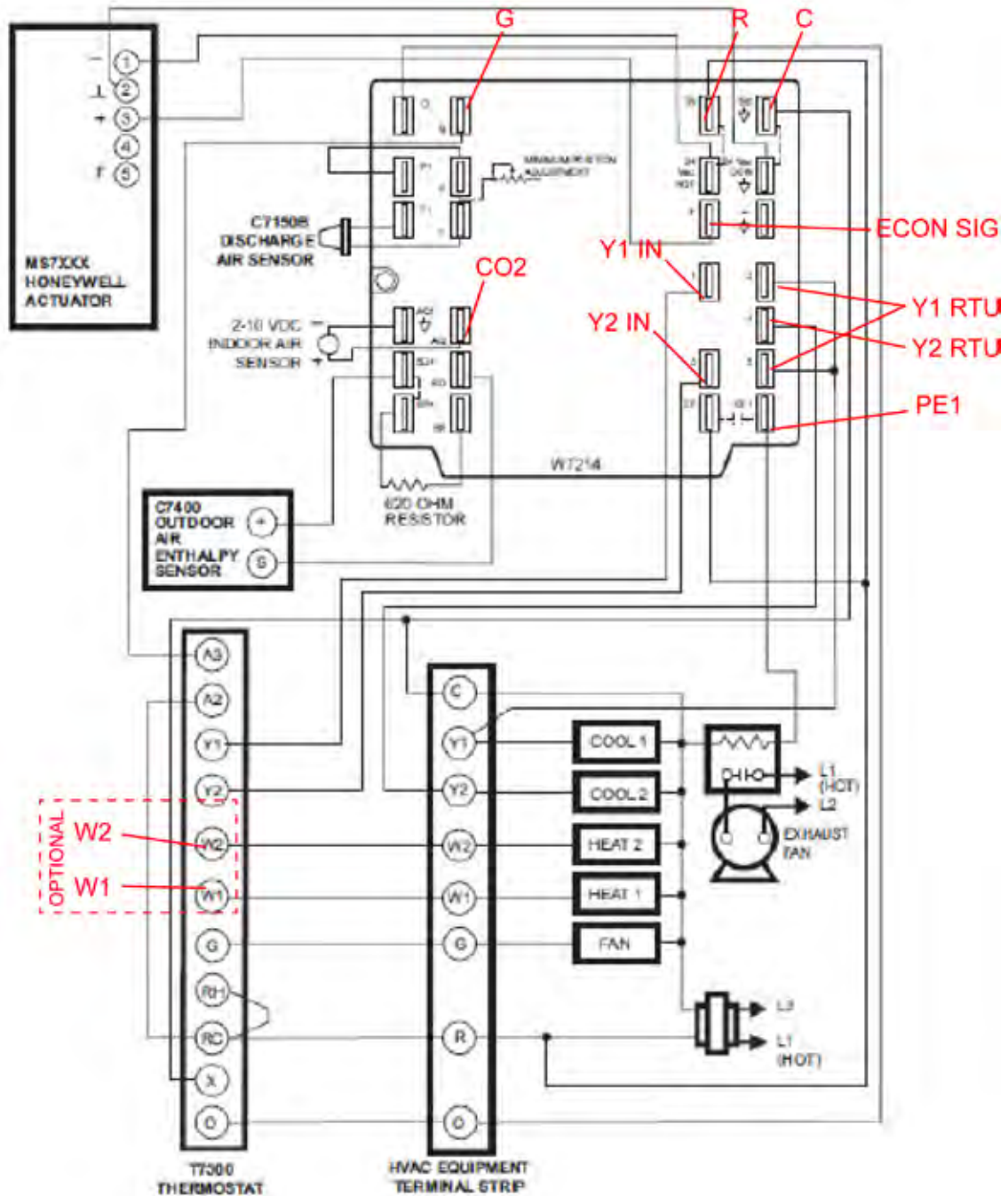
7212 with single-stage cooling system with single enthalpy changeover and Honeywell actuator and time clock for occupancy.



7212 with two-stage cooling system with Honeywell Series 72 Actuator and time clock for occupancy.



7212 controlling parallel-wired Honeywell Series 72 Actuators and time clock for occupancy.



7213, 7214 controlling heat pump system.