Economizer Controller Installation Guide

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Table of Contents

INPUTS 3
OUTPUTS 3
WHILE INSTALLING THIS CONTROLLER 3
ACCESSORIES 3
OPTIONAL ACCESSORIES 3
INSTALLATION AND SETUP 3
WIRING 3-5
POWER UP 6
POWER UP DELAY 6
POWER LOSS 6
USING KEYPAD WITH MENUS 6
USING KEYPAD WITH SETTINGS 6
CONTROLLER INFORMATION 6
MENU STRUCTURE 6
MODES 6
STATUS MENU SETTINGS 7-8
CONFIGURATION MENU SETTINGS 9
CONTROLLER MODE CONFIGURATION SETTINGS 9-10
SETPOINTS MENU SETTINGS 11-12
TEST MENU SETTINGS 13
ALARM MENU SETTINGS 13
TROUBLESHOOTING 14
APPENDIX INFORMATION 15-20
CONTROLLER SEQUENCE OF OPERATIONS 21

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

INPUTS

Analog Inputs:
(J9) = (0-10v) | CO2
(J10) = (0-10V) | VOC
(J11) = (0-10V) | Economizer position reading
(J12) = (0-10V) | Pressure1 (0-5v)
& RTU VFD
(J13) = (0-10V) | Pressure2 (0-5v)
& Enthalpy sensor or Humidity sensor
(J14) = (0-5V) | Building pressure
(J15) = (0-5V) | Outside Air Temperature (OAT)
(J16) = (0-5V) | Supply Air Temperature (SAT)

Digital Inputs:
Input1 = (24VAC) | occupied signal
Input2= (24VAC) | W1
Input3 = (24VAC) | Y1
Input4 = (24VAC) | Y2

OUTPUTS

Analog Outputs:
1 = (0-10V) | Economizer actual position reading
2 = (0-10V) | Modulating powered exhaust control

Digital Outputs:
Relay1 = (DC) | COMP1
Relay2 = (DC) | COMP2
Relay3 = (DC) | PE1
Relay4 = (DC) | PE2

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*0
Mounting Plate | UNV0016

OPTIONAL ACCESSORIES

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

**indicates customer part selections.*

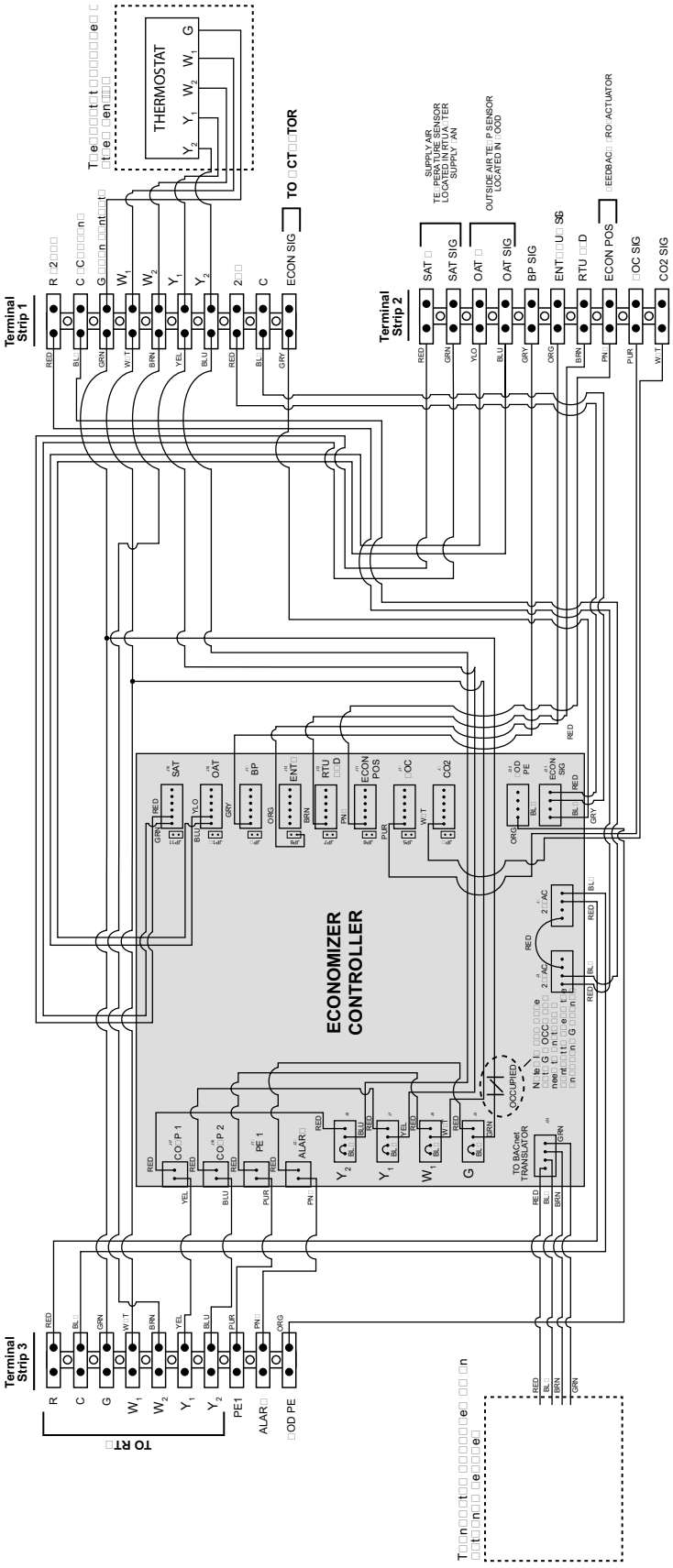
INSTALLATION AND SETUP

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.

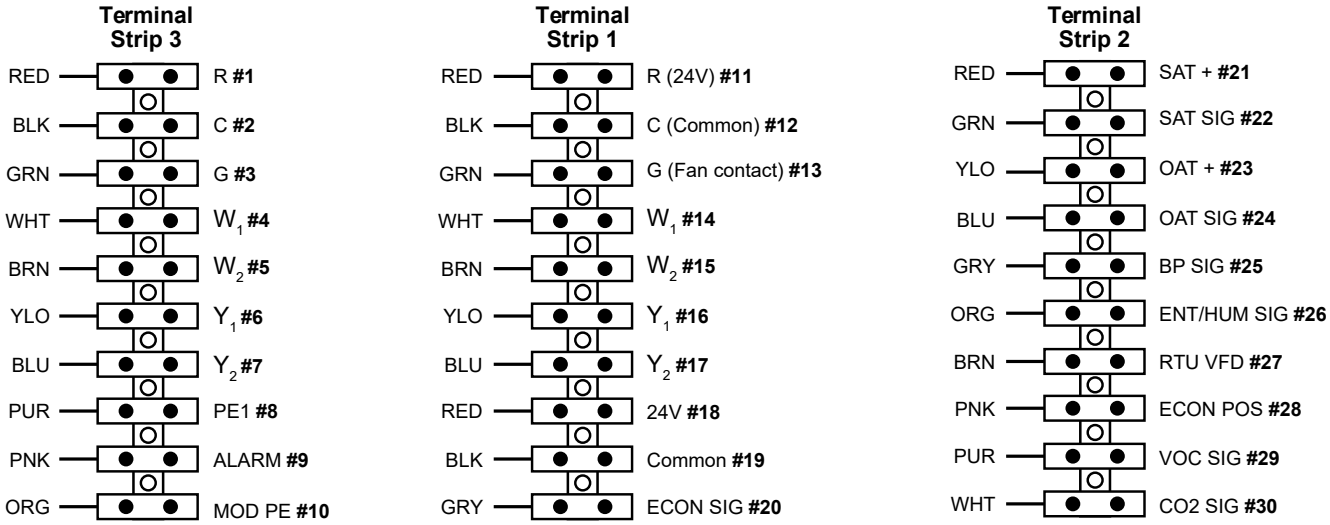
WIRING

All wiring must be in compliance with local applicable electrical codes, or as specified on the installation wiring diagram (page 4 & 5 in this document).

iAIRE Controller Wiring Diagram version 1.4 7/15/2013



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

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 programing, the green power light should be on and the other two lights should be off. If the status and reset slights 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.*

STATUS MENU SETTINGS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Allows you to check the outside air fan speed.

Allows you to check the exhaust air fan speed.

Allows you to check the outside CFM.

Allows you to check the exhaust CFM.

Allows you to check the outside air temperature.

Allows you to check the supply air temperature.

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

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

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

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

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

Allows you to check the operation parameters.

CONFIGURATION MENU SETTINGS

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

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.*

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.

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 calculated 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.

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

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*.

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 DCV 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

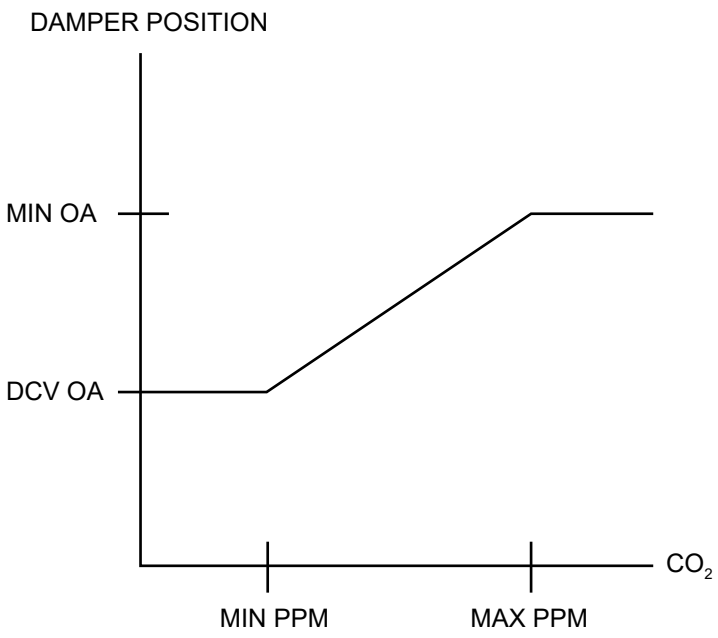
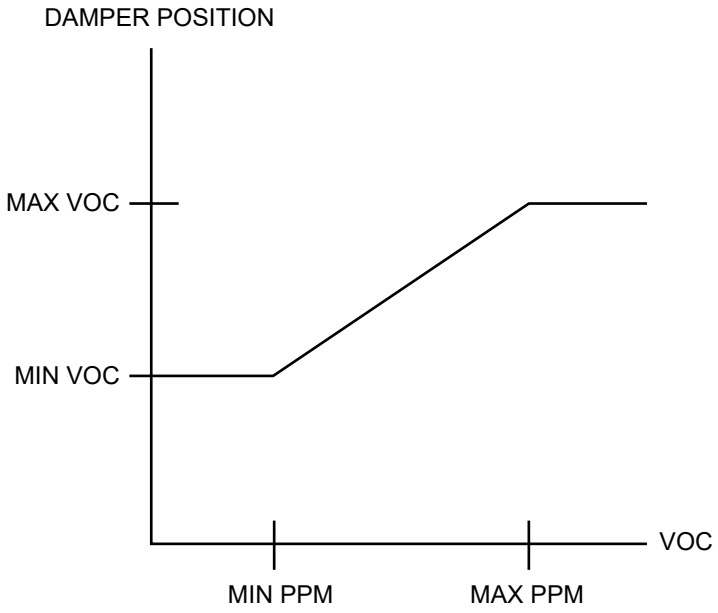


Fig. B



SETPOINTS MENU SETTINGS

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

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

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

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

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

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

Allows you to set where the power exhaust is positioned.

Allows you to set where the power exhaust is positioned.

Allows you to set the building pressure.

Allows you to set the min DCV economizer position.

Allows you to set the max CO2 level.

Allows you to set the min CO2 level.

Allows you to set the min CFM level.

Allows you to set the exhaust CFM offset level.

Allows you to set the min VOC CFM level.

Allows you to set the min VOC PPM level.

Allows you to set the max VOC PPM level.

Allows you to set the min VOC economizer position.

Allows you to set the min VOC economizer position.

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

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

Allows you to set the outside air fan position.

Allows you to set the power exhaust fan position.

Allows you to check outside air ERV min fan speed.

Allows you to check exhaust ERV min fan speed.

Allows you to check outside air ERV DCV fan speed.

Allows you to outside ERV VOC min fan speed.

Allows you to outside ERV VOC max fan speed.

Allows you to check exhaust ERV VOC min fan speed.

Allows you to check exhaust ERV VOC max fan speed.

Allows you to fan dead band.

Allows you to check timer.

TEST MENU SETTINGS

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.

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

ALARM MENU SETTINGS

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

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 7 through 13.

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 15).

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	DCV MIN POSITION	ANALOG		AV	N/A	READ ONLY
19	IAQ Min Position	ANALOG		AV	0%	READ / WR
20	HUMIDITY STATUS	ANALOG		AV	N/A	READ ONLY
21	OUTSIDE ENTHALPY SETPOINT	ANALOG		AV	80 KJ/KG	READ / WR
22	ENTHALPY STATUS	ANALOG		AV	N/A	READ ONLY
23	BUILDING PRESSURE	ANALOG		AV	N/A	READ / WR
24	BLDING PRESS SETPOINT	ANALOG		AV	0.05 IN-WC	READ / WR
25	PWR EXHAUST DMP POSITION	ANALOG		AV	30	READ / WR
26	PWR EXHAUST STATUS	DIGITAL		BV	N/A	READ ONLY
27	PWR EXHAUST %	ANALOG		AV	N/A	READ ONLY
28	HEATING STG 1 INPUT	DIGITAL		BV	N/A	READ ONLY
29	HEATING STG 2 INPUT	DIGITAL		BV	N/A	READ ONLY
30	HEATING STG 1 OUTPUT	DIGITAL		BV	N/A	READ ONLY
31	HEATING STG 2 OUTPUT	DIGITAL		BV	N/A	READ ONLY
32	COOLING STG 1 INPUT	DIGITAL		BV	N/A	READ ONLY
33	COOLING STG 2 INPUT	DIGITAL		BV	N/A	READ ONLY
34	COOLING STG 1 OUTPUT	DIGITAL		BV	N/A	READ ONLY
35	COOLING STG 2 OUTPUT	DIGITAL		BV	N/A	READ ONLY
36	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 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
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

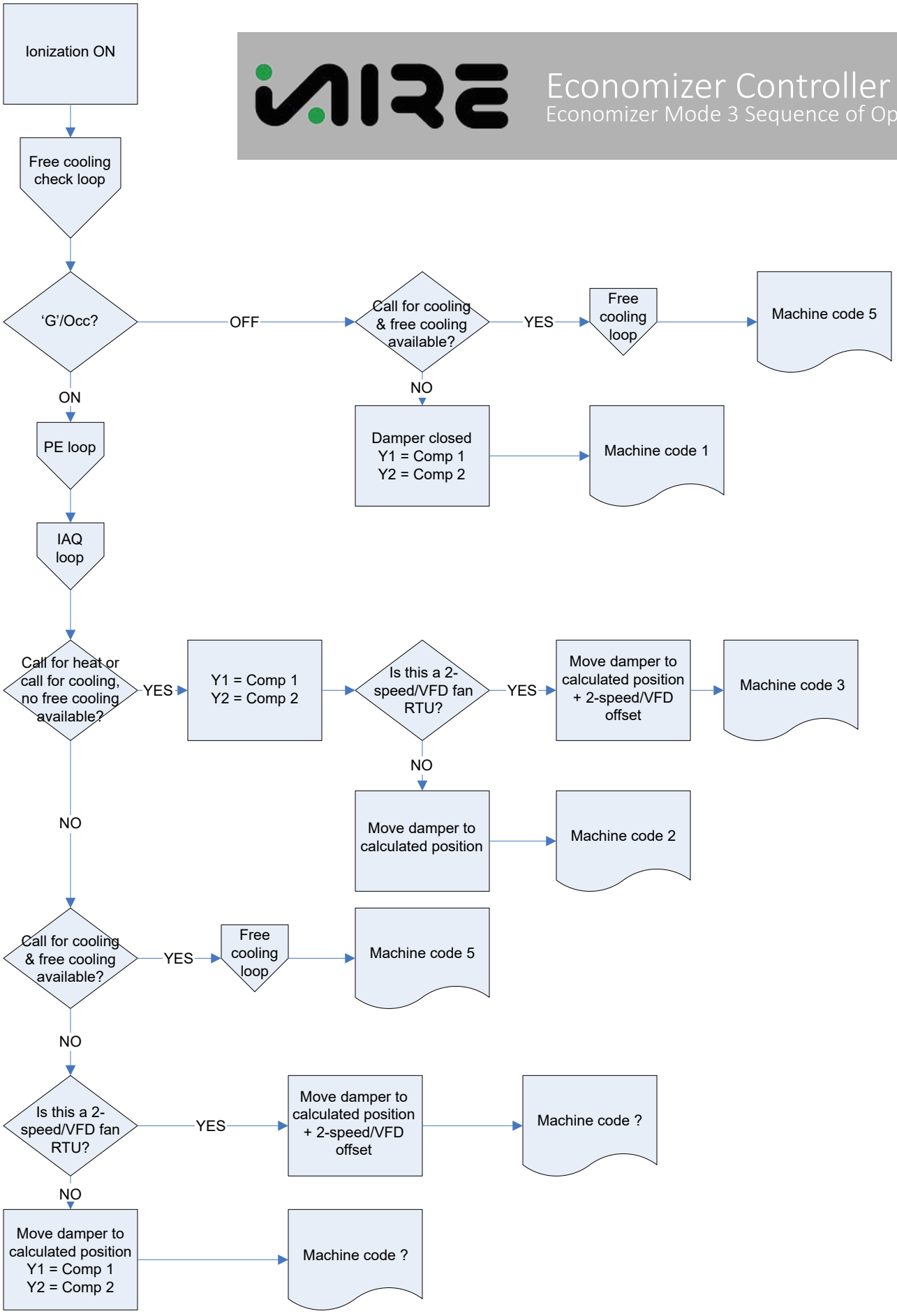
NAME	FUNCTION	DEFAULT SET POINTS
Econ HighTmpLimt Setpoint	Sets the high temperature limit for when free cooling can happen (in degrees F)	65
Econ LowTmpLimt Setpoint	Sets the low temperature limit for when free cooling can happen (in degrees F)	0
Econ Free Cool Sat Setpoint	Discharge temperature setting 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

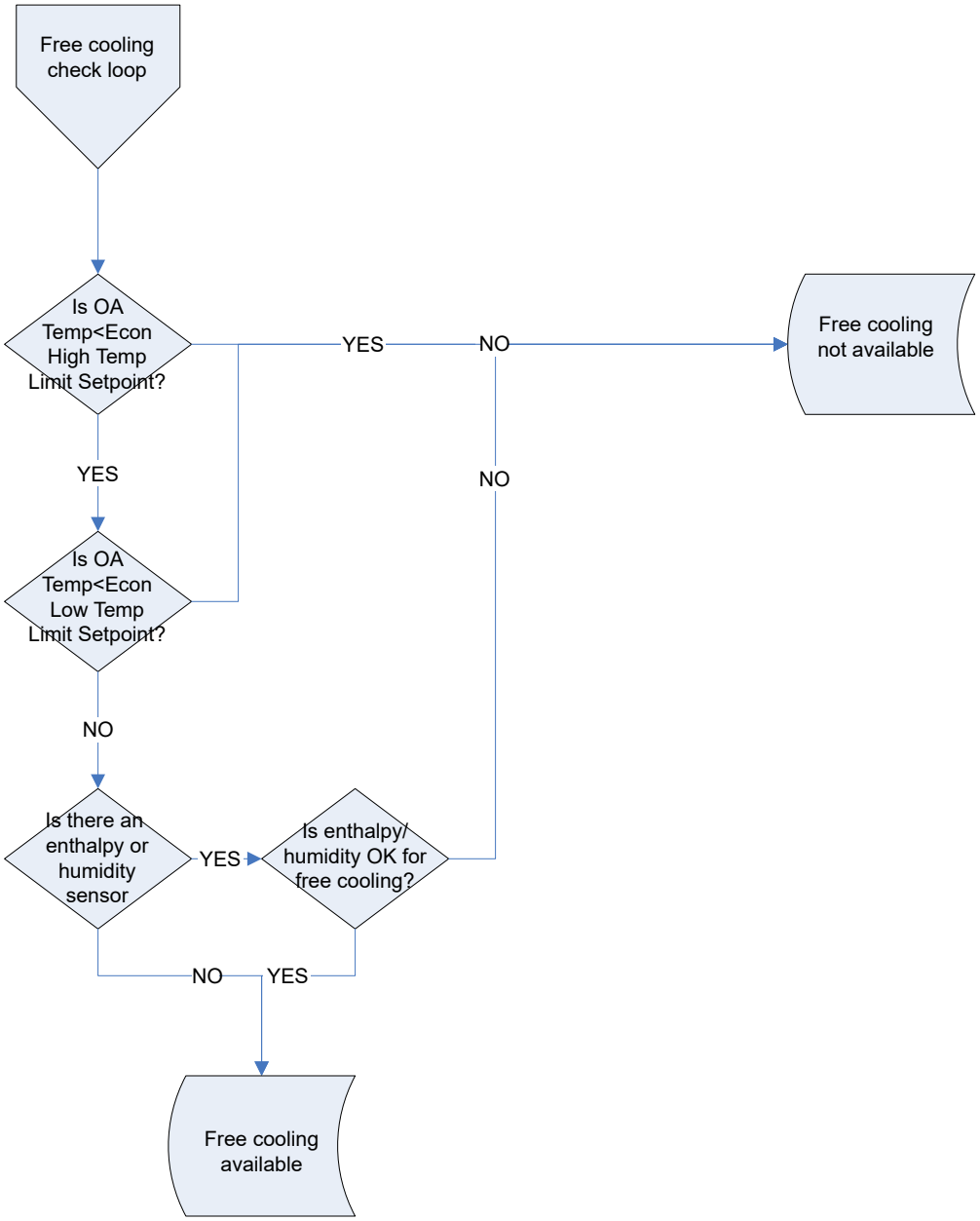
CONTROLLER SEQUENCE OF OPERATIONS

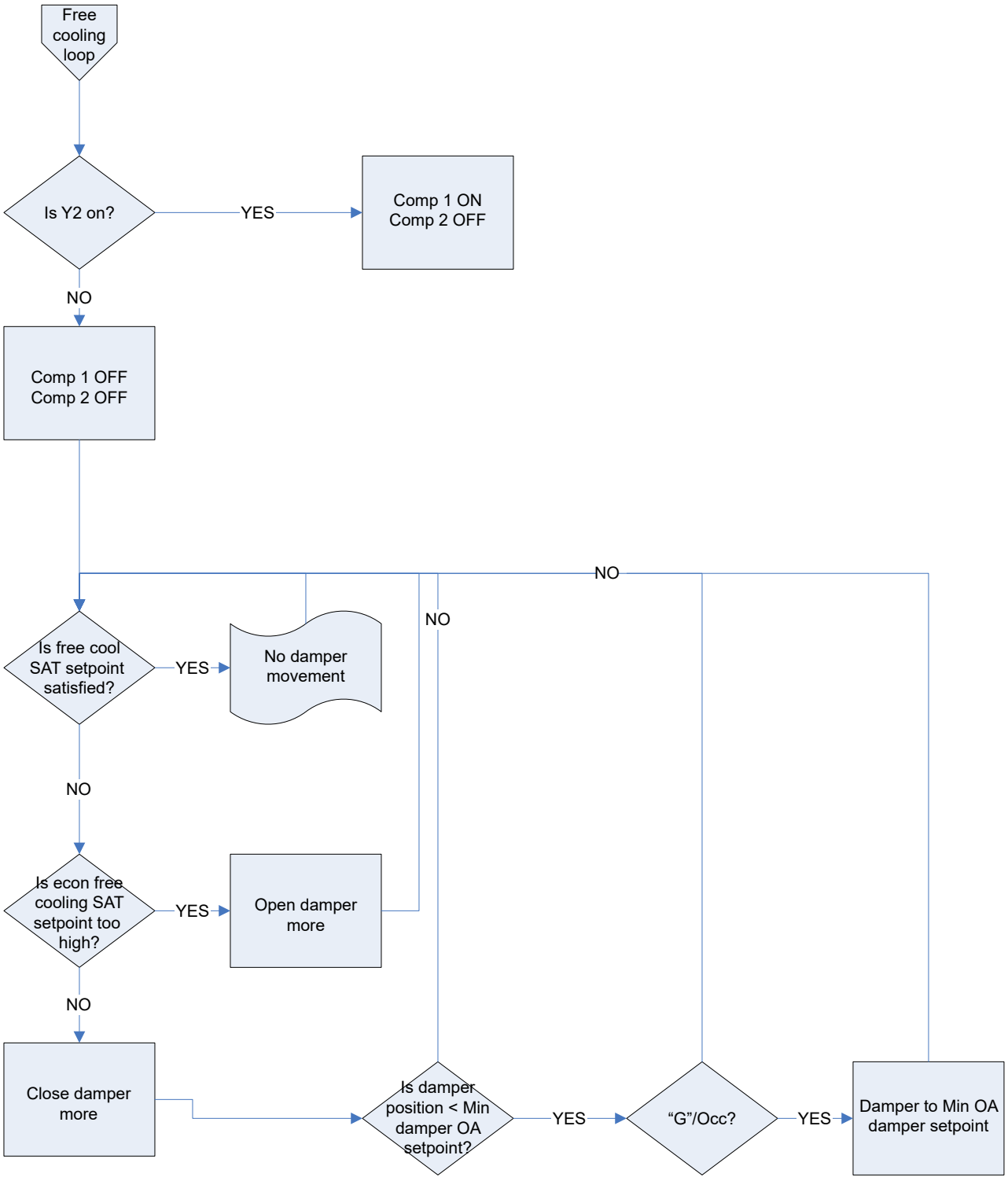
The following pages in this installation guide outline the sequence of operations for the ***iAIRE*** controller.

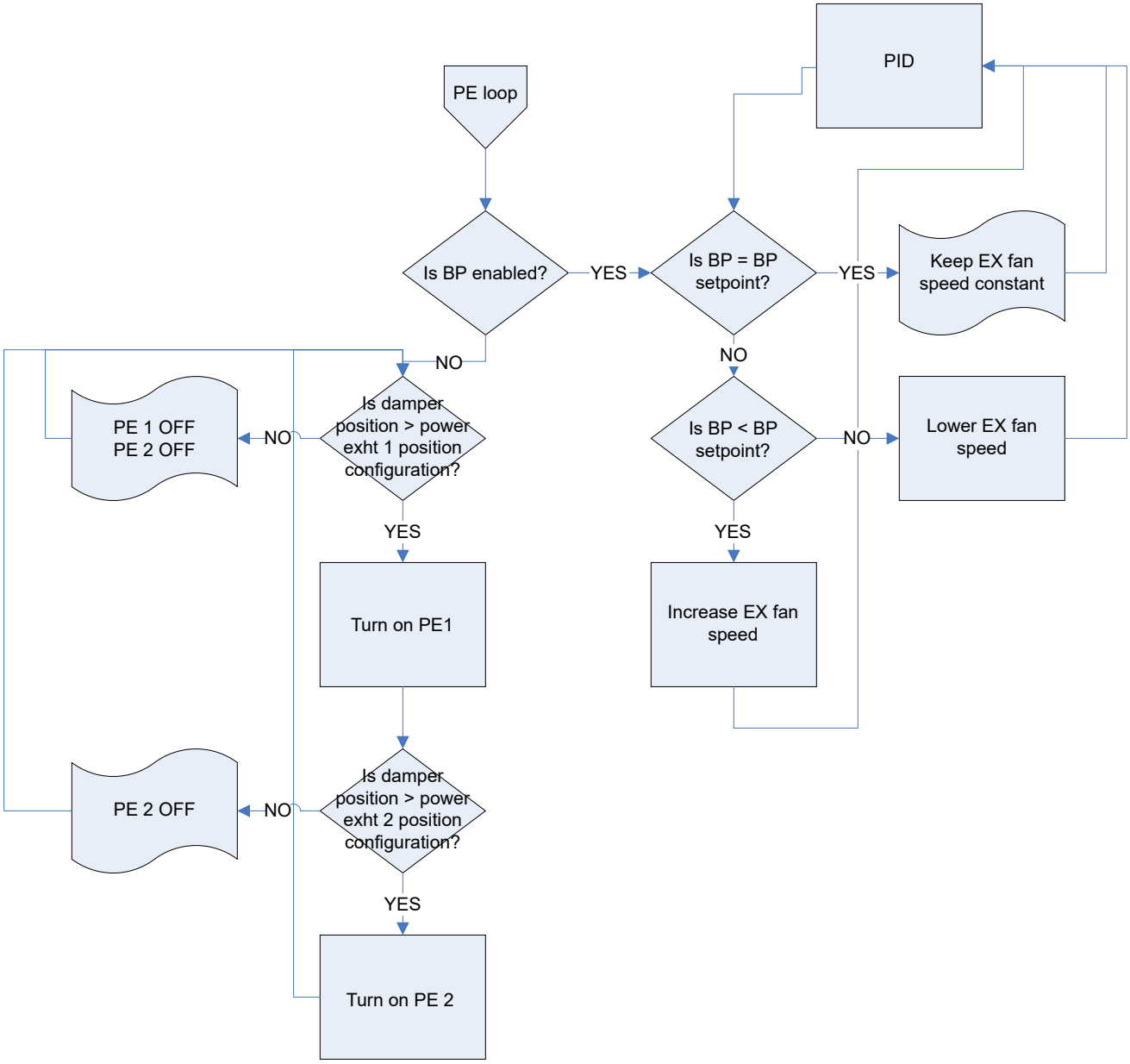
Economizer Controller

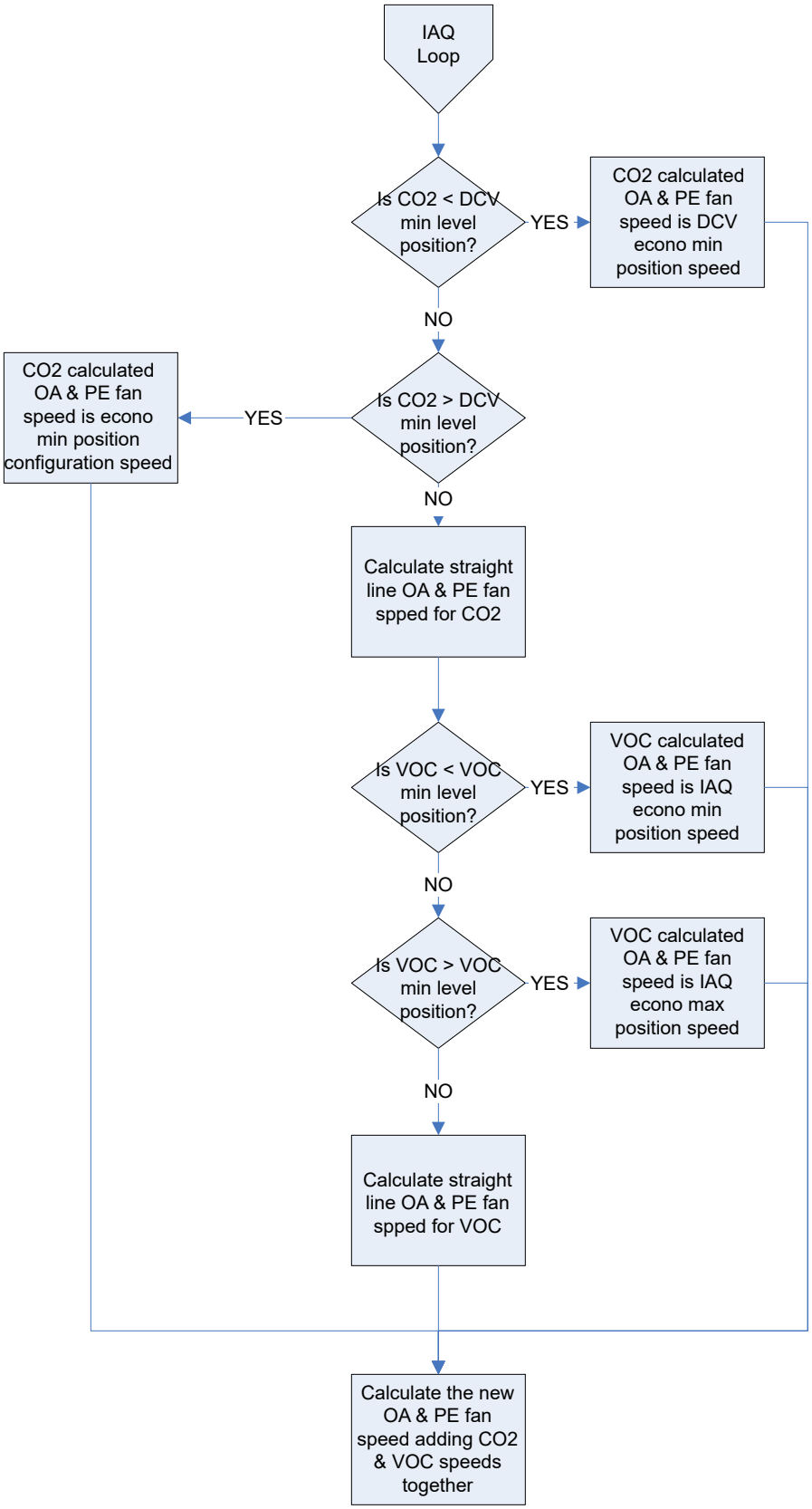
Economizer Mode 3 Sequence of Operations




Free cooling check loop
Is OA Temp<Econ High Temp Limit Setpoint?
YES
NO
Free cooling not available
YES
NO
Is OA Temp<Econ Low Temp Limit Setpoint?
NO
Is there an enthalpy or humidity sensor
YES
Is enthalpy/ humidity OK for free cooling?
NO
YES
Free cooling available


Free cooling loop
Is Y2 on?
YES
Comp 1 ON
Comp 2 OFF
NO
Comp 1 OFF
Comp 2 OFF
NO
NO
Is free cool SAT setpoint satisfied?
YES
No damper movement
NO
Is econ free cooling SAT setpoint too high?
YES
Open damper more
NO
Close damper more
Is damper position < Min damper OA setpoint?
YES
"G"/Occ?
YES
Damper to Min OA damper setpoint


PID
PE loop
Is BP enabled?
YES
Is BP = BP setpoint?
YES
Keep EX fan speed constant
NO
NO
Is damper position > power exht 1 position configuration?
PE 1 OFF
PE 2 OFF
NO
Is BP < BP setpoint?
NO
Lower EX fan speed
YES
YES
Turn on PE1
Increase EX fan speed
Is damper position > power exht 2 position configuration?
PE 2 OFF
NO
YES
Turn on PE 2


IAQ Loop
Is CO2 < DCV min level position?
YES
CO2 calculated OA & PE fan speed is DCV econo min position speed
NO
Is CO2 > DCV min level position?
YES
CO2 calculated OA & PE fan speed is econo min position configuration speed
NO
Calculate straight line OA & PE fan spped for CO2
Is VOC < VOC min level position?
YES
VOC calculated OA & PE fan speed is IAQ econo min position speed
NO
Is VOC > VOC min level position?
YES
VOC calculated OA & PE fan speed is IAQ econo max position speed
NO
Calculate straight line OA & PE fan spped for VOC
Calculate the new OA & PE fan speed adding CO2 & VOC speeds together