Fault Detection	Problem	Diagnostic Action (in addition to alarm stored / transmitted)	Potential Cause	CA Fault Code
OAT sensor out of range	Sensor is returning a value that is out of the predetermined range	• Economizing functionality disabled • OA damper returns to minimum position • Compressor low temp lockout disabled	• Thermistor failure • Damage to wire affecting resistance output	A, B
OAT sensor not detected	Sensor previously installed is not detected or sensor has not been installed	• Economizing functionality disabled • OA damper returns to minimum position • Compressor low temp lockout disabled	• Sensor never installed • Installed sensor has open or short • Wire harness broken	A, B
OAH sensor out of range	Sensor is returning a value that is out of the predetermined range - **Single Enthalpy**	• Economizing functionality disabled • OA damper returns to minimum position	• Supply voltage too high • Sensor electronics failure • Sensor element failure • Sensor used is not correct range	A, B
	Sensor is returning a value that is out of the predetermined range - **Differential Enthalpy**	• Economizing functioning by differential temperature with return air humidity limit		A
OAH sensor not detected	Sensor previously installed is not detected or sensor has not been installed - **Single Enthalpy**	• Economizing functionality disabled • OA damper returns to minimum position	• Sensor inadvertently installed, not deleted • Supply power missing • Sensor electronics open • Wire harness broken	A, B
	Sensor previously installed is not detected or sensor has not been installed - **Differential Enthalpy**	• Economizing functioning by differential temperature with return air humidity limit		A
RAT sensor out of range	Sensor is returning a value that is out of the predetermined range - **Differential Temperature**	• Economizing functioning by OAT single dry bulb • Change over limit modified to suit single dry bulb	• Thermistor failure • Damage to wire affecting resistance output	A
	Sensor is returning a value that is out of the predetermined range - **Differential Enthalpy**	• Economizing functioning by OAE single enthalpy • Change over limit modified to 28btu/lb 75°F		A
RAT sensor not detected	Sensor is returning a value that is out of the predetermined range - **Differential Temperature**	• Economizing functioning by OAT single dry bulb • Change over limit modified to suit single dry bulb	• Installed sensor has open or short • Wire harness broken	A
	Sensor is returning a value that is out of the predetermined range - **Differential Enthalpy**	• Economizing functioning by OAE single enthalpy • Change over limit modified to 28btu/lb 75°F		A
RAH sensor out of range	Sensor is returning a value that is out of the predetermined range	• Economizing functioning by OAE single enthalpy • Change over limit modified to 28btu/lb 75°F	• Supply power too high • Sensor electronics failure • Sensor element failure	A
RAH sensor not detected	Sensor previously installed is not detected	• Economizing functioning by OAE single enthalpy • Change over limit modified to 28btu/lb 75°F	• Supply power missing • Sensor electronics open • Wire harness broken	A

Fault Detection	Problem	Diagnostic Action (in addition to alarm stored / transmitted)	Potential Cause	CA Fault Code
RAH sensor detected but OAH sensor not detected	Sensor previously installed is not detected or sensor has not been installed - **Differential Enthalpy**	• Economizing functioning by differential temperature with return air humidity limit	• Intended configuration of differential enthalpy not completed or OAH sensor failed • Intended configuration of single enthalpy, OAH sensor inadvertently placed on RAH terminal • OAH sensor deleted or set to not installed, but RAH sensor left installed	A, B
RAH sensor detected but RAT sensor not detected	Sensor previously installed is not detected or sensor has not been installed - **Differential Enthalpy**	• Economizing functioning by OAE single enthalpy • Change over limit modified to 28 Btu/lb 75°F	• Intended configuration of differential enthalpy not completed or RAT sensor failed • RAT sensor deleted, but RAH sensor left installed	A, B
SAT sensor out of range	Sensor is returning a value that is out of the predetermined range	• Economizing functionality disabled • Freeze detection based on OAT only • Low discharge limit control 45°F disabled • Compressor SAT drop error detection disabled • Limiting 2nd stage operation based on low SAT (SAT Y2 limit) disabled	• Thermistor failure • Damage to wire increasing resistance	A, B
SAT sensor not detected	Sensor previously installed is not detected or sensor has not been installed	• Economizing functionality disabled • Freeze detection based on OAT only • Low discharge limit control 45°F disabled • Compressor SAT drop error detection disabled • Limiting 2nd stage operation based on low SAT (SAT Y2 limit) disabled	• Sensor never installed • Installed sensor has open or short • Wire harness broken	A, B
Y2 present without Y1	Call for Y2 without call for Y1	• Enable 1st stage free cooling or mechanical cooling in accordance change over configuration • If Y1 follows Y2, 2nd stage integrated or mechanical cooling will be enabled	• Miswired or reverse wired thermostat • Miswired ZIP Economizer • Thermostat failure • Wire harness broken	N/A
SAT drop for CC1 or CC2 insufficient	SAT sensor determined that temperature downstream of evaporator did not drop by at least 5°F after 4 min of CC1 or CC2 being energized	• Informational only - no action	• Filters or coils are dirty or blocked – inspect • SAT sensor in a location where it is not mixed - perform temperature traverse • Indoor fan is inoperable - check relay, belt, motor, bearings • Condenser fan is inoperable - check relay, motor, head pressure control • Compressor is faulty (internal damage) - check amperage, pressures • Contactor energizes but compressor is off on internal/external overload • High voltage problem to compressor - check wiring, phases, contactor • Low on refrigerant - check charge	N/A
Damper Pos value missing	Economizer is not sensing feedback from actuator	• Logic reconfigured to use setpoint as reference for items dependent on actual position (i.e. integrated cooling) • Damper stuck fault detection capability is disabled	• Actuator wires not properly terminated • Actuator without feedback capability used • Wire harness broken • Actuator electronic failure	E
SAT should be lower	When damper is greater than 85% open, and in free cooling, SAT sensor determined that temperature is not within 10°F of OAT	• Informational only - no action	• Damper linkage failure • Actuator clamp / interface between damper is not secure • Damper blades are not secured to damper shaft properly • Outside air damper and return damper do not stroke properly • Return damper does not closes tightly when outdoor damper is full open • OAT sensor is poorly located • SAT sensor is poorly located	B
Damper is stuck	Feedback signal is not within range of commanded position	• If rotation is less than 85%, then integrated cooling will be disabled	• Damper linkage failure • Damper blocked with foreign object • Actuator limit stop engaged • Damper rotation has not been scaled using Economizer Acceptance Test	B, C, D, E

Fault Detection	Problem	Diagnostic Action (in addition to alarm stored / transmitted)	Potential Cause	CA Fault Code
Energy Module is missing	Expansion module previously installed is not detected	• Logic reconfigured to ignore devices attached to Energy Module, although maintains settings in memory • Menu reconfigured to remove devices • If CO2 sensor attached, lowest minimum position is Vent Min Pos • Functionality for pre-occupancy purge, power exhaust, remote damper override, DCV, and low speed fan control not available	• Module was not installed tight initially and became loose • Module was intentionally removed	N/A
Exhaust fan not detected	Power exhaust fan control circuit is not detected	• Logic reconfigured to ignore exhaust fan operation, although maintains settings in memory	• EF intentionally removed, not deleted • Exhaust fan relay coil failure • Wire harness broken	N/A
Compressor 1 not detected	Control circuit connected to CC1 is not detected	• 1st stage of mechanical cooling is impossible • Integrated cooling is impossible • Logic and FDD dependent on 1st stage is disabled	• Compressor safety open (LP, HP, current) • Compressor contactor coil failure • Damage to wire increasing resistance • Wire harness broken	N/A
Compressor 2 not detected	Control circuit connected to CC2 is not detected	• 2nd stage of mechanical cooling is impossible • Logic and FDD dependent on 2nd stage is disabled	• Compressor safety open (LP, HP, current) • Compressor contactor coil failure • Damage to wire increasing resistance • Wire harness broken • Only 1 compressor in unit, wiring inadvertently terminated at CC2, not deleted	N/A
2 Speed fan not detected	Control circuit connected to IF is not detected	• Logic reconfigured to high speed fan operation only, although maintains settings in memory	• Low speed fan control circuit failure • Wire harness broken • Damage to wire increasing resistance • Wire harness broken	N/A
CO2 sensor not detected	Sensor previously installed is not detected	• Logic reconfigured to ignore DCV configuration, although maintains settings in memory • Menu reconfigured to remove DCV associated entities • Lowest minimum position is Vent Min Pos	• CO2 sensor loses power • Wire harness broken • CO2 sensor electronics failure	E
CO2 sensor out of range	Sensor is returning a value that is not within 250-2200 ppm range	• Logic reconfigured to ignore DCV configuration, although maintains settings in memory • Menu reconfigured to remove DCV associated entities • Lowest minimum position is Vent Min Pos	• CO2 sensor out of calibration • Wire harness broken • CO2 sensor electronics failure	E
Heat and cool both present	Signal present on both Y1 and W1 at the same time	• Logic dependencies requiring W1 are disabled • Allows Y1 call to be processed	• Miswired thermostat • Thermostat failure • Wire harness short • RTU is a heat pump, but “Heat Pump Op” not set to on in settings menu	N/A

California Title 24 Fault Detection & Diagnostics Fault Categories

A. Air temperature sensor failure/fault.

B. Not economizing when it should.

C. Economizing when it should not.

D. Damper not modulating.

E. Excess outdoor air.

Refer to California Energy Commission (CEC) 2013 Building Energy Efficiency Standard/2013 Title 24/Part 6/Section 120.2

California Title 24 FDD Certification Number BZE1245

Troubleshooting

Problem	Possible Cause	Action
The ZIP Economizer / Mechanical Cooling Not Operating	No input power	Using a voltmeter set to read AC voltage, verify that there is 24 VAC +/- 20% (19 VAC – 29 VAC) as measured at the “R” and “C” terminals on the ZIP-ECON-BASE terminal strip on the base unit. If no voltage, check transformer output voltage at RTU. If 24 volts not present, check primary input power to transformer. If voltage present, check transformer circuit breaker, and check transformer for open coil. If no voltage present, check primary input power to RTU, fuses, disconnect, circuit breaker.
	Setup not complete	If the display reads “Setup Incomplete”, then not all of the required setup parameters values for minimum damper position and zip code have not been entered. Enter required information in Settings menu. See setup information.
	Brownout	If voltage is below 19 volts, then the ZIP Economizer may be in Brownout Protection mode. This mode diables the compressors to protect them from low voltage operation damage. When the power is back to normal the Economizer and RTU will operate normally (see Brownout below).
	In acceptance test or manual mode	If the Yellow LED is lighted, then the ZIP Economizer is in a mode other than Automatic. End Mode by finding menu Item "Return to Automatic". Refer to menu flow diagram.
There are No Characters Displayed on the ZIP Economizer	No input power	Using a voltmeter set to read AC voltage, verify that there is 24 VAC +/- 20% (19 VAC – 29 VAC) as measured at the “R” and “C” terminals on the ZIP-ECON-BASE terminal strip on the base unit. If no voltage, check transformer output voltage at RTU. If 24 volts not present, check primary input power to transformer. If voltage present, check transformer circuit breaker, and check transformer for open coil. If no voltage present, check primary input power to RTU, fuses, disconnect, circuit breaker.
	Ambient temperature below display range	Below this value, the display may not be clearly visible. It should still control properly even though the display may be blank below this temperature.
The Display Shows “Brownout”	Input voltage is below 18VAC / connected load is too much for transformer	Using a voltmeter set to read AC voltage, verify that that the voltage is low. If the voltage is low check primary voltage into the RTU. If primary voltage is below the rated RTU voltage as listed on nameplate or product documentation, the primary power is in a brownout state. If voltage is within specified range, it is possible that the load on the transformer is larger than VA rating. Verify connected current, if OK, consider replacing transformer.
The Display Shows “Setup Incomplete”	The initial setup of the ZIP Economizer has not completed	The ZIP Economizer requires parametizing of specific settings prior to operation of the economizer or compressors. As a minimum the Vent Min Pos and ZIP Code / Postal Code need to have a value set and entered. If additional devices are attached (e.g. CO2, EF,..) then additional parametizing is required.
	Additional devices have been added after initial setup	Some additional devices that may be added at anytime during the life of the ZIP Economizer will require additional setup. Upon connection of these devices the economizer will notify that the device has been detected and will prompt setup. Until setup is complete, the ZIP Economizer will function as if the devices are not there. Proceed to Settings menu and look for menu items that have a blank value, press OK and enter value. Once all values have been paramatized, the ZIP Economizer will function as intended.
There is No Free Cooling	Display shows “OAT sensor out of range economizing is disabled”	Sensor is returning a value that is out of the predetermined range. This disables the economizer functions and outdoor air damper will return/remain at minimum position. This is a mandatory sensor and must be functional! Repair or replace. Verify sensor value by disconnection sensor leads from ZIP-ECON-BASE and measure resistance with Ohm meter across sensor leads and compare to 10K type 2 Thermistor Table values to measured values to the value of a temperature instrument. If values are significantly different, replace sensor.
	Display shows “OAT Sensor not detected economizing is disabled”	Sensor is not present/not detected. This disables the economizer functions and damper will return/remain at minimum position. This is a mandatory sensor and must be functional! Repair or replace. Verify sensor value by disconnection sensor leads from ZIP-ECON-BASE and measure resistance with Ohm meter across sensor leads and compare to 10K type 2 Thermistor Table value to measured value to the value of a temperature instrument. If value is close, determine if there is any intermediate wiring. If so, check continuity. If all checks are good, attach sensor to ZIP-ECON-BASE and see if it is detected. If not detected, try another 10k type 2 sensor. If still not detected, replace ZIP-ECON-BASE.
	Display shows “OAH Sensor out of range economizing is disabled”	If the economizer was originally set for enthalpy high limit changeover, then the economizer will not function without a valid OAH signal. The valid range for reading an OAH sensor for auto detection is 0.6VDC (6%RH) to (100%RH) up to 11.0 VDC. Using a voltmeter set to read AC input voltage at TH sensor terminal R, verify that there is 24 VAC +/- 20% (19 VAC – 29 VAC). If input voltage is not with in range, verify input voltage at ECON-ZIP-BASE terminals R and C, if also out of range, troubleshoot RTU control circuit. If the input voltage is within range, remove wires from RH+ and RH- and measure across the two terminal using voltmeter set to DC. If DC output voltage is not within valid range above, replace sensor.
	Display shows “OAH Sensor not detected economizing is disabled”	If the economizer was originally set for enthalpy high limit changeover, then the economizer will not function without a valid OAH signal. The valid range for reading an OAH sensor for auto detection is 0.6VDC (6%RH) to (100%RH) up to 11.0 VDC. Using a voltmeter set to read AC input voltage at TH sensor terminal R, verify that there is 24 VAC +/- 20% (19 VAC – 29 VAC). If input voltage is not with present, check continuity of wiring between ECON-ZIP-TH sensor and ECON-ZIP-BASE, If voltage is present, remove wires from RH+ and RH- and measure across the two terminal using voltmeter set to DC. If DC output voltage is within valid range above, check continuity of RH+ and RH- output wires between ECON-ZIP-TH sensor and ECON-ZIP-BASE. If continuity OK, go to settings menu and submenu Device 2. Verify that display for OAH is Auto or Installed. If Auto, change it to Installed and see if Alarm disappears or a value OAH value is displayed in Monitor Live Conditions menu. Also can try to delete alarm and see if sensor is again auto detected.

Problem	Possible Cause	Action
There is No Free Cooling	Display shows “SAT sensor out of range economizing disabled”	Sensor is returning a value that is out of the predetermined range. This disables the economizer functions and outdoor air damper will return/remain at minimum position. This is a mandatory sensor and must be functional! Repair or replace. Verify sensor value by disconnecting sensor leads from ZIP-ECON-BASE and measure resistance with Ohm meter across sensor leads and compare to 10K type 2 Thermistor Table values to measured values to the value of a temperature instrument. If values are significantly different, replace sensor.
	Display shows “SAT sensor not detected economizing disabled”	Sensor is not present/not detected. This disables the economizer functions and damper will return/remain at minimum position. This is a mandatory sensor and must be functional! Repair or replace. Verify sensor value by disconnecting sensor leads from ZIP-ECON-BASE and measure resistance with Ohm meter across sensor leads and compare to 10K type 2 Thermistor Table value to measured value to the value of a temperature instrument. If value is close, determine if there is any intermediate wiring. If so, check continuity. If all checks are good, attach sensor to ZIP-ECON-BASE and see if it is detected. If not detected, try another 10k type 2 sensor. If still not detected, replace ZIP-ECON-BASE.
	The ZIP Economizer is in another operating mode	Check Status screen for current operating mode or state. Please see sequence description for more information.
A Sensor is Not Detected or Out of Range	OAT sensor	Please see troubleshooting action under Problem "There is no Free Cooling".
	SAT sensor	Please see troubleshooting action under Problem "There is no Free Cooling".
	OAH sensor	When operating in single enthalpy limit configuration, Please see troubleshooting action under Problem "There is no Free Cooling", otherwise see below.
	OAH Sensor. Display shows “OAH sensor not detected operation by diff temp”	Sensor previously detected is not present. Previously configured for differential enthalpy, now economizing will be based on differential dry bulb using RAH sensor to monitor space humidity to ensure it is not getting too high. The valid range for reading an OAH sensor for auto detection is 0.6VDC (6%RH) to (100%RH) up to 11.0 VDC. Using a voltmeter set to read AC input voltage at TH sensor terminal R, verify that there is 24 VAC +/- 20% (19 VAC – 29 VAC). If input voltage is not with present, check continuity of wiring between ECON-ZIP-TH sensor and ECON-ZIP-BASE, If voltage is present, remove wires from RH+ and RH- and measure across the two terminal using voltmeter set to DC. If DC output voltage is within valid range above, check continuity of RH+ and RH- output wires between ECON-ZIP-TH sensor and ECON-ZIP-BASE. If continuity OK, go to settings menu and submenu Devices 2. Verify that display for OAH is Auto or Installed. If Auto, change it to Installed and see if Alarm disappears or a value OAH value is displayed in Monitor Live Conditions menu. Also can try to Delete alarm and see if sensor is again auto detected.
	OAH Sensor. Display shows “RAH sensor detected but OAH sensor not detected”	Sensor previously detected is not present. Previously configured for differential enthalpy, now economizing will be based on differential dry bulb using RAH sensor to monitor space humidity to ensure it is not getting too high.
	RAT Sensor. Display shows “RAT sensor not detected operation by OAT dry bulb"	Sensor previously detected is not present. Previously configured for differential dry bulb, now economizing will be based on single OAT dry bulb. Verify sensor value by disconnection sensor leads from ZIP-ECON-BASE and measure resistance with Ohm meter across sensor leads and compare to 10K type 2 Thermistor Table value to measured value to the value of a temperature instrument. If value is close, determine if there is any intermediate wiring. If so, check continuity. If all checks are good, attach sensor to ZIP-ECON-BASE and see if it is detected. If not detected, try another 10k type 2 sensor. If still not detected, replace ZIP-ECON-BASE.
	RAT Sensor. Display shows “RAT sensor not detected operation by OAH enthalpy”	Sensor previously detected is not present. Previously configured for differential enthalpy, now economizing will be based on single enthalpy. Verify sensor value by disconnecting sensor leads from ZIP-ECON-BASE and measure resistance with Ohm meter across sensor leads and compare to 10K type 2 Thermistor Table value to measured value to the value of a temperature instrument. If value is close, determine if there is any intermediate wiring. If so, check continuity. If all checks are good, attach sensor to ZIP-ECON-BASE and see if it is detected. If not detected, try another 10k type 2 sensor. If still not detected, replace ZIP-ECON-BASE.
	RAT Sensor. Display shows “RAH sensor detected but RAT sensor not detected”	This configuration is not allowed. You need an RAT sensor for differential enthalpy high limit changeover. Verify that RAT sensor installed and correctly wired. Troubleshoot as above for RAT.
	RAH Sensor. Display shows “RAH sensor out of range operation OAH enthalpy”	Sensor previously detected is not present. Previously configured for differential enthalpy, now economizing will be based on single enthalpy. The valid range for reading an RAH sensor for auto detection is 0.6VDC (6%RH) to (100%RH) up to 11.0 VDC. Using a voltmeter set to read AC input voltage at TH sensor terminal R, verify that there is 24 VAC +/- 20% (19 VAC – 29 VAC). If input voltage is not with in range, verify input voltage at ECON-ZIP-BASE terminals R and C, if also out of range, troubleshoot RTU control circuit. If the input voltage is within range, remove wires from RH+ and RH- and measure across the two terminal using voltmeter set to DC. If DC output voltage is not within valid range above, replace sensor. If sensor was intentionally disconnected then go to: Alarm, Delete Alarms, select the alarm. When prompted to, press enter to permanently delete, press OK.

Problem	Possible Cause	Action
A Sensor is Not Detected or Out of Range	RAH Sensor. Display shows "RAH sensor not detected operation by OAH enthalpy"	Sensor previously detected is not present. Previously configured for differential enthalpy, now economizing will be based on single enthalpy. The valid range for reading an RAH sensor for auto detection is 0.6VDC (6%RH) to (100%RH) up to 11.0 VDC. Using a voltmeter set to read AC input voltage at TH sensor terminal R, verify that there is 24 VAC +/- 20% (19 VAC – 29 VAC). If input voltage is not present, check continuity of wiring between ECON-ZIP-TH sensor and ECON-ZIP-BASE, If voltage is present, remove wires from RH+ and RH- and measure across the two terminal using voltmeter set to DC. If DC output voltage is within valid range above, check continuity of RH+ and RH- output wires between ECON-ZIP-TH sensor and ECON-ZIP-BASE. If continuity OK, go to settings menu and submenu Devices 2. Verify that display for RAH is Auto or Installed. If Auto, change it to Installed and see if Alarm disappears or a value RAH value is displayed in Monitor Live Conditions menu. Also can try to Delete alarm and see if sensor is again auto detected. If sensor was intentionally disconnected then go to: Alarm, Delete Alarms, select the alarm. When prompted to, press enter to permanently delete, press OK.
Alarm "Y2 Present Without Y1"	Potential wiring or thermostat problem	Thermostat input to ZIP Economizer has energized Y2 (2nd stage cooling) and has not energized Y1 (1st stage cooling). This configuration is not allowed. The economizer will recognize this and will treat Y2 signal as if it is Y1 and will energized 1st stage cooling (Mechanical or Free Cooling). Check to see if wires are reversed between thermostat and economizer input. Verify continuity to see if circuit could be open or wire could be broken. Test to see thermostat 1st stage relay is closing (Y1 has 24 VAC). Make sure there are no jumpers between R and Y2.
Alarm "Heat and Cool Both Present"	Potential wiring or thermostat problem	This alarm indicates that 24 VAC is at both terminal Y1 and W1 on the ZIP-ECON-BASE. Check for wiring problems. Note: this alarm is disabled when Heat Pump operation has been turned to On in Settings menu.
Alarm "SAT Drop for CC1 Insufficient Cooling System Problem"	Potential compressor, refrigerant, or supply fan problem	The ZIP Economizer reads the SAT value just before energizing 1st stage mechanical cooling. After compressor has started and 4 minutes have elapsed, SAT value is again checked. If SAT has not dropped by at least 5°F then this alarm is generated. Some possibilities are: • Filters or coils are dirty or blocked – inspect. • SAT sensor in location where are is not mixed - perform temperature traverse. • Indoor fan is inoperable - check relay, belt, motor, bearings. • Condenser fan is inoperable - check relay, motor, head pressure control. • Compressor is faulty (internal damage) - check amperage, pressures. • Contactor energizes but compressor is out on internal/external overload. • High voltage problem to compressor -check wiring, phases, contactor. • Circuit 1 is low on refrigerant - check charge. • Cycle power
Alarm "SAT Drop for CC2 Insufficient Cooling System Problem"	Potential compressor, refrigerant, or supply fan problem	The ZIP Economizer reads the SAT value just before energizing 2nd stage mechanical cooling. After compressor has started and 4 minutes have elapsed, SAT value is again checked. If SAT has not dropped by at least 5°F then this alarm is generated. Troubleshoot as above for 1st stage.
Alarm "SAT Should Be Lower"	Potential damper, linkage, or actuator problem	When in Free Cooling and damper still open, if the SAT is not within 10°F or the OAT, then this alarm will be generated. Exception when the damper is modulated to obtain the SAT setpoint of 55°F. Some possibilities are: • Check damper linkages. • Check actuator clamp / interface between damper is secure. • Check that damper blades secured to damper shaft properly. • Check that both outside air damper and return damper stroke properly. • Check that return damper closes tightly when outdoor damper is full open. • Check that OAT sensor is in the airflow path and not subjected to solar radiation. • Check that SAT sensor is in a location that airflow is mixed.
Alarm "Damper Pos Value Missing"	Actuator or wiring problem	The connected actuator must have a feedback wire terminated at ACT5 on the ECON-ZIP-BASE. The range should be between 2-10 VDC. Verify voltage with multimeter. Remove feedback wire and check voltage between terminal C and the feedback wire. If no voltage, replace actuator.
Alarm "Damper is Stuck"	Damper or linkage problem	The feedback from the actuator is used to determine the position of the damper. If the ZIP Economizer commands the damper to drive open to a designated % and the feedback measured does not achieve the commanded value, then this alarm will be generated. • Check damper linkages. • Check to see if anything is in the way of damper. • Check that actuator limit stop not adjusted to smaller angle.
	Damper rotation below what is allowed	If the damper rotation is less than 85% and the Economizer Test has not been run to scale the output to the damper travel, this alarm may occur.
Alarm "Compressor 1 Not Detected" Alarm "Compressor 2 Not Detected"	CC1 output circuit is open	When the ZIP Economizer is first powered, it detects the presence of the compressor control circuit. If the circuit is detected as open, this alarm will be generated. Check all wiring, connectors, and devices in series between CC1 and contactor coil.

Problem	Possible Cause	Action
Alarm "Compressor 1 Not Detected" Alarm "Compressor 2 Not Detected"	Compressor safety open	• Check Low Pressure control. • Check High Pressure control. • Check Compressor Current protector.
	Compressor contactor coil bad	Check that there is resistance through the coil and compare to min requirements in technical document.
	Inability to auto detect	If all items above have been verified good and circuit continuous, then in Settings menu under Devices 1, change Compressor Qty from Auto to 1 or 2 to match number of compressors in the RTU. Once the Qty selected, the alarm will clear, the user **must verify** the compressor does enable when it is supposed too.
There is No Integrated Cooling	Potential damper, linkage, actuator problem, or wiring problem	In order for the ZIP Economizer to enter into Integrated Cooling mode, the damper must be close to full open (> 85%) and Y2 must be enabled. See sequence of operation for more information. Check damper and linkage components as addressed above. Check Y2 signal.
	Damper rotation not scaled	If the damper rotation is less than 85% and the Economizer Test has not been run to scale the output to the damper travel, then Integrated cooling will not ever occur.
	SAT Y2 limit	If the SAT Y2 Limit is on in Settings menu, then Integrated Cooling will be disabled when SAT is below the specified temperature. See sequence of operation for more information.
	In time delay	There is a time delay after the damper reaches open till 2nd stage Integrated Cooling can occur. See sequence of operation for more information.
Alarm "Energy Module is Missing. Module Functions Disabled"	ZIP Economizer cannot detect the ZIP-ECON-EM, which was previously detected as installed	The following functions (if they were utilized) will be disabled: • Purge. • Remote damper override potentiometer. • CO2 sensing and Demand Control Ventilation. • Low Speed indoor fan control. Full unplug per mounting instructions. Check plug and socket for any debris. Clean carefully if necessary. Re-install Energy Module per IOM manual instructions until you hear a snap indicating it is locked into place. If this does not resolve problem, replace ZIP-ECON-EM.
Alarm "Exhaust Fan Not Detected"	Energy Module not detected	Check that the Energy Module is Connected in the "Present Devices" menu. If not troubleshoot as above.
	Wiring or exhaust fan relay problem	When the ZIP Economizer is first powered, it detects the presence of the Exhaust Fan control circuit. If the circuit is detected as open, this alarm will be generated. Check all wiring, connectors, and relay coil. Check that there is resistance through the coil and compare to min requirements in technical document.
	Inability to auto detect	If the two potential problems above have been verified, then there may be a problem with auto detecting. In "Settings" menu under Devices 1, verify the set value is Auto or Installed. If set on Auto try setting value to Installed . Once Installed, the alarm will clear, the user **must verify** the fan does enable as the damper passes the Exhaust Fan On Pos.
Alarm "2 Speed Fan Not Detected"	Energy Module not detected	Check that the Energy Module is Connected in the "Present Devices" menu. If not troubleshoot as above.
	Wiring or indoor fan relay problem	When the ZIP Economizer is first powered, it detects the presence of the Indoor Fan control circuit. If the circuit is detected as open, this alarm will be generated. Check all wiring, connectors, and relay coil. Check that there is resistance through the coil and compare to min requirements in technical document.
	Inability to auto detect	If the two potential problems above have been verified, then there may be a problem with auto detecting. In "Settings" menu under Devices 1, verify the set value is Auto or Available. If set on Auto try setting value to Available. Once set to Available, the alarm will clear, the user **must verify** proper operation of IF output.
Alarm "CO2 Sensor Not Detected. DCV Functions Disabled"	Energy Module not detected	Check that the Energy Module is Connected in the "Present Devices" menu. If not troubleshoot as above.
	Wiring or CO2 sensor problem	When the ZIP Economizer is first powered, it detects the presence of power from the CO2 sensor. If the input signal at CO2 input from Energy Module is missing and has been previously detected. DCV will be disabled. The damper will return to Vent Min Pos. If the voltage input to CO2+ and CO2- is < 0.5 VDC then this alarm will occur. Check the following: • Verify CO2 Sensor is set to 0-2000ppm working range - 0VDC (0ppm) to 10VDC (2000ppm). • Verify that 24 VAC power is available at sensor. If not, correct. If so, continue below. • Validate reading of CO2 at sensor with a calibrated instrument. • Check to see that sensor output voltage is correct (0.005 x actual ppm reading). Example: a measured CO2 reading at the sensor is 1000ppm. Voltage output from sensor should be .005 x 1000 = 5 VDC. • Verify wiring continuity between sensor and ZIP-ECON-EM input CO2+ CO2-.
Alarm "CO2 Sensor Out of Range. DCV Functions Disabled"	Wiring or CO2 sensor problem	When the ZIP Economizer is first powered, it detects the presence of power from the CO2 sensor. If the input signal at CO2 input from Energy Module is out of range and has been previously detected. DCV will be disabled. The damper will return to Vent Min Pos. If the voltage input to CO2+ and CO2- is < 1.25 VDC (250 ppm)or > 11 VDC (2200ppm) then this alarm will occur. Troubleshoot as above "C02 Sensor not detected".