AIR ECONOMIZER CONTROLS ACCEPTANCE

CERTIFICATE OF ACCEPTANCE		NRCA-MCH-05-A
Air Economizer Controls Acceptance		(Page 1 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:
System Name or Identification/Tag:	System Location or Area Served:	

Note: Submit one Certificate of Acceptance for each system that must demonstrate compliance.	Enforcement Agency Use: Checked by/Date

A. Construction Inspection

1. Supporting documentation needed to perform test includes:
   a. 2016 Building Energy Efficiency Standards Nonresidential Compliance Manual *(NA7.5.4 Air Economizer Controls Acceptance At-A-Glance).*
   b. 2016 Building Energy Efficiency Standards.

2. Instrumentation to perform test includes:
   a. Hand-held temperature probe
      Calibration Date: _____(must be within last year)
   b. Device capable of calculating enthalpy (i.e. psychrometer)
      Calibration Date: _____(must be within last year)
   c. 1.2 k Ohm Resistor (when specified by the manufacturer)

3. Installation: (**all** of the following boxes should be checked)

- ☐ Economizer high limit shutoff control complies with Table 140.4-B found in the 2016 Building Energy Efficiency Standards Section 140.4(e)3.
- ☐ Economizer reliability features are present per 2016 Building Energy Efficiency Standards Section 140.4(e)4:
  - a. 5-year manufacturer warranty of economizer assembly
  - b. Provide a product specification sheet proving capability of at least 60,000 actuations
  - c. Provide a product specification sheet proving compliance with AMCA Standard 500-D damper leakage at 10 cfm/ft^2 at 250 Pascals (1.0 in w.g). A product specification sheet showing the manufacturer's results after following the testing procedures of AMCA Standard 500-D. A product specification sheet showing the economizer outside air and return air damper leakage rates have been certified to the Energy Commission in accordance with Section 110.
  - d. If the high limit setpoint is fixed dry-bulb or fixed enthalpy + fixed dry-bulb then the control shall have an adjustable setpoint.
  - e. Outdoor air, return air, mixed air, and supply air sensors shall be calibrated as follows:
    - i. Dry-bulb and wet-bulb temperatures accurate to ±2°F over the range of 40°F to 80°F
    - ii. Enthalpy accurate to ±3 Btu/lb over the range of 20 Btu/lb to 36 Btu/lb
    - iii. Relative humidity (RH) accurate to ±5% over the range of 20% to 80% RH
  - f. Check that the sensor performance curve(s) is provided by the factory and sensor output values measured during sensor calibration are plotted on the performance curve(s).
  - g. Sensors used for high limit control shall be located to prevent false readings, including but not limited to being properly shielded from direct sunlight.
- ☐ Unitary systems with an economizer have control systems, including two-stage or electronic thermostats, that cycle compressors off when economizers can provide partial cooling.
- ☐ System has return fan speed control, relief dampers, or dedicated relief fans to prevent building over pressurization in full economizer mode.
- ☐ For systems with DDC controls, sensor used for economizer lockout has been factory or field calibrated.
- ☐ For systems with non-DDC controls, manufacturer's startup and testing procedures have been applied.

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B. Functional Testing		**Results**
Is the economizer listed in the CEC equipment certification directory? (if yes, proceed to Section D.)		Yes ○ No ○
Step 1: Disable demand control ventilation systems (if applicable)		
Step 2: Enable the economizer and simulate a cooling demand large enough to drive the economizer fully open. Verify the following:		
a.	Economizer damper modulates 100% open.	Yes ○ No ○
b.	Return air damper modulates 100% closed.	Yes ○ No ○
c.	For systems that meet the criteria of 2016 Building Energy Efficiency Standards Section 140.4(e)1, verify that the economizer remains 100% open with the use of mechanical cooling. This occurs when the cooling demand can no longer be met by the economizer alone.	Yes ◉ No ◉
d.	All applicable fans and dampers operate as intended to maintain building pressure.	Yes ◉ No ◉
e.	The unit heating is disabled (if applicable).	Yes ◉ No ◉ NA ◉
Step 3: Disable the economizer and simulate a cooling demand. Verify the following:		
a.	Economizer damper closes to its minimum position.	Yes ○ No ○
b.	All applicable fans and dampers operate as intended to maintain building pressure.	Yes ◉ No ◉
c.	The unit heating is disabled (if applicable).	Yes ◉ No ◉ NA ◉
Step 4: If the unit is equipped with heating, simulate a heating demand and enable the economizer. Verify the following:		
a.	Economizer damper closes to its minimum position.	Yes ○ No ○ NA ○
b.	Return air damper opens.	Yes ○ No ○ NA ○
Step 5: Turn off the unit and verify the following:		
a.	Economizer damper closes completely.	Yes ○ No ○
Step 6: System returned to initial operating conditions		Yes ◉ No ◉

C. Testing Results	**PASS**	**FAIL**
Step 2: Simulate cooling load and enable the economizer (all answers are Y and/or NA).	○	◉
Step 3: Simulate cooling load and disable the economizer (all answers are Y and/or NA).	◉	◉
Step 4: Simulate heating demand and enable the economizer (all answers are Y and/or NA).	○	◉
Step 5: Turn off the unit (all answers are Y).	◉	◉

D. Evaluation

☐ PASS: All **Construction Inspection** responses are complete and all **Testing Results** responses are "Pass" or the economizer is listed in the CEC equipment cerification directory.

Notes:

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DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Acceptance documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	ATT Certification Identification (If applicable):
City/State/Zip:	Phone:

FIELD TECHNICIAN'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Acceptance is true and correct.
2. I am the person who performed the acceptance verification reported on this Certificate of Acceptance (Field Technician).
3. The construction or installation identified on this Certificate of Acceptance complies with the applicable acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7.
4. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and signed by the responsible builder/installer and has been posted or made available with the building permit(s) issued for the building.

Field Technician Name:	Field Technician Signature:	
Field Technician Company Name:	Position with Company (Title):	
Address:	ATT Certification Identification (if applicable):	
City/State/Zip:	Phone:	Date Signed:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. I am the Field Technician, or the Field Technician is acting on my behalf as my employee or my agent and I have reviewed the information provided on this Certificate of Acceptance.
2. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Acceptance and attest to the declarations in this statement (responsible acceptance person).
3. The information provided on this Certificate of Acceptance substantiates that the construction or installation identified on this Certificate of Acceptance complies with the acceptance requirements indicated in the plans and specifications approved by the enforcement agency, and conforms to the applicable acceptance requirements and procedures specified in Reference Nonresidential Appendix NA7.
4. I have confirmed that the Certificate(s) of Installation for the construction or installation identified on this Certificate of Acceptance has been completed and is posted or made available with the building permit(s) issued for the building.
5. I will ensure that a completed, signed copy of this Certificate of Acceptance shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Certificate of Acceptance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Acceptance Person Name:	Responsible Acceptance Person Signature:	
Responsible Acceptance Person Company Name:	Position with Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed: