

OUTDOOR AIR ACCEPTANCECEC-NRCA-MCH-02-A (Revised ~~MM/YY~~)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-02-A
Outdoor Air 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:	

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

Intent:	Verify measured outside airflow reading is within $\pm 10\%$ of the total required outside airflow. Required for all newly installed HVAC units. Reference MECH-3C (Column H or Column I) or Mechanical Equipment Schedules.
----------------	--

A. Construction Inspection	
<i>Note: MCH-02-A can be performed in conjunction with MCH-07-A Supply Fan VFD Acceptance (if applicable) since testing activities overlap.</i>	
1.	Supporting documentation needed to perform test includes: <ul style="list-style-type: none"> a. As-built and/or design documents (for example, Mechanical Equipment Schedules, Equipment Start-Up Sheets or Balancing Reports). b. 20132016 Building Energy Efficiency Standards Nonresidential Compliance Manual (NA7.5.1.1 Ventilation Systems: Variable Air Systems At-A-Glance and NA7.5.1.2 Constant Volume Systems Outdoor Air Acceptance At-A-Glance). c. 20132016 Building Energy Efficiency Standards.
2.	Instrumentation needed to perform test includes: <ul style="list-style-type: none"> a. Watch b. Calibrated means to measure airflow (i.e. hot-wire anemometer, velocity pressure probe, etc.). <ul style="list-style-type: none"> i. Method and equipment used: _____ ii. Equipment calibration date (must be within one year): _____
3.	System type (check either VAV or CAV): <input type="checkbox"/> VAV <input type="checkbox"/> CAV <ul style="list-style-type: none"> a. Check if Variable Air Volume (VAV) and complete the following: <ul style="list-style-type: none"> i. Outside airflow is either factory calibrated or field calibrated. <ul style="list-style-type: none"> <input type="checkbox"/> Check if factory calibrated and attach calibration certification. <input type="checkbox"/> Check if field calibrated and attach calibration results. ii. Damper Control (must be checked): <ul style="list-style-type: none"> <input type="checkbox"/> Dynamic damper control is being used to control outside air. -(This is NOT a fixed minimum position). iii. One of the following dynamic controls is being utilized to control outside air (check method used) <ul style="list-style-type: none"> <input type="checkbox"/> Outdoor Air CFM Compensation <input type="checkbox"/> Energy Balance Method <input type="checkbox"/> Demand Control Ventilation <input type="checkbox"/> Return Fan Tracking <input type="checkbox"/> Injection Fan Method <input type="checkbox"/> Dedicated Minimum Ventilation Damper with Pressure Control <input type="checkbox"/> Other Active Control, Describe: _____ b. Check if Constant Air Volume (CAV) and verify the following: <ul style="list-style-type: none"> <input type="checkbox"/> System is designed to provide a fixed minimum OSA when the unit is on.
4.	Method of delivering outside air to the unit (check one of the following): <ul style="list-style-type: none"> <input type="checkbox"/> Outside air is ducted to the return air plenum. Confirm that outside air is ducted to either (check one of the following): <ul style="list-style-type: none"> <input type="checkbox"/> Within five ft. of the unit. <input type="checkbox"/> Within 15 ft of the unit, with the air directed substantially toward the unit. <input type="checkbox"/> Return air plenum is NOT used to distribute outside air to the unit. (i.e. outside air is ducted directly to the unit or outside air is provided independent of the unit.)
5.	Pre-occupancy purge has been programmed for the 1-hour period immediately before the building is normally occupied to provide (one of the following methods must be verified and checked): <ul style="list-style-type: none"> a. The conditioned floor area times the ventilation rate from the 20132016 Building Energy Efficiency Standards TABLE 120.1-A, or 15 cfm per person times the expected number of occupants, whichever is less. b. 3 <u>C</u>omplete air changes to the zone served by the air handler.

OUTDOOR AIR ACCEPTANCE

CEC-NRCA-MCH-02-A (Revised MM/YY)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-02-A
Outdoor Air Acceptance		(Page 2 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:
System Name or Identification/Tag:	System Location or Area Served:	

B. NA7.5.1.1 Outdoor Air Acceptance Functional Testing	<input type="checkbox"/> CAV	<input type="checkbox"/> VAV
Step 1: Disable demand control ventilation (if applicable)		
Step 2: Verify unit is not in economizer mode during test (economizer disabled).	<input type="checkbox"/>	<input type="checkbox"/>
<i>Note: Shaded boxes do not apply for CAV systems</i>		
Step 3: CAV and VAV testing at full supply airflow		
a. Adjust supply air to achieve design airflow or maximum airflow at full cooling. -Record VFD speed (Hz).		Hz
b. Measured outdoor airflow reading (cfm)	cfm	cfm
c. Required outdoor airflow (cfm) (from MCH-03, Column I, or Mechanical Equipment Schedules).	cfm	cfm
d. Time for outside air damper to stabilize after full supply airflow is achieved (minutes):		min
Step 4: VAV testing at reduced supply airflow	CAV	VAV
a. Adjust supply airflow to either the sum of the minimum zone airflows, full heating, or 30% of the total design airflow. -Record VFD speed (Hz).		Hz
b. Measured outdoor airflow reading (cfm)		cfm
c. Required outdoor airflow (cfm) (from MCH-03, Column I, or mechanical equipment schedules).		cfm
d. Time for outside air damper to stabilize after reduced supply airflow is achieved (minutes):		min
Step 5: Return to initial conditions (check)	<input type="checkbox"/>	<input type="checkbox"/>

C. Testing Calculations & Results		
Determine Percent Outside Air at full supply airflow (%OA _{FA}) for Step 3		
a. %OA _{FA} = Measured outdoor airflow reading / Required outdoor airflow (Step 3b/Step 3c)	%	%
b. %OA _{FA} is within 10% of design Outside Air. (%OA _{FA} ≤ 110%)	Y / N	Y / N
c. Outside air damper position stabilizes within 5 minutes (Step 3d < 5 minutes)		Y / N
Determine Percent Outside Air at reduced supply airflow (%OA _{RA}) for Step 4 (VAV only)		
a. %OA _{RA} = Measured outdoor airflow reading / Required outdoor airflow reading (Step 4b/Step 4c)		%
b. %OA _{RA} is within 10% of design Outside Air. (OA _{RA} ≤ 110%)		Y / N
c. Outside air damper position stabilizes within 5 minutes (Step 4d < 5 minutes)		Y / N
Note: The intent of this test is to ensure that 1) all air handlers provide the minimum amount of OSA and 2) VAV air handlers use dynamic controls to avoid over ventilation.		

D. Evaluation	
<input type="checkbox"/>	PASS: All Construction Inspection responses are complete and Testing Calculations & Results responses are positive (Y - yes)

OUTDOOR AIR ACCEPTANCE

CEC-NRCA-MCH-02-A (Revised MM/YY)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF ACCEPTANCE		NRCA-MCH-02-A
Outdoor Air Acceptance		(Page 3 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Project Address:	City:	Zip Code:
System Name or Identification/Tag:	System Location or Area Served:	

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:		
<ol style="list-style-type: none"> The information provided on this Certificate of Acceptance is true and correct. I am the person who performed the acceptance verification reported on this Certificate of Acceptance (Field Technician). 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. 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:		
<ol style="list-style-type: none"> 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. 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). 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. 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. 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:

NRCA-MCH-02-A User Instructions

This form is used to document results of the minimum outdoor air ventilation tests for both constant and variable air volume fan systems. A separate form should be completed for each system tested. The form is separated into several basic sections: construction inspection; functional testing; testing calculations and results; and pass/fail evaluation. Each section consists of a combination of data entry requirements and check boxes.

Section A. Construction Inspection

This pre-test section consists of check boxes and data entry requirements for both constant and variable air volume systems. Complete only the check boxes associated with the appropriate system type.

Section B. NA7.5.1.1 Outdoor Air Acceptance - Functional Testing

This section consists of check boxes and data entry requirements for both constant and variable air volume systems. Enter data associated with the appropriate system type as instructed.

Section C. Testing Calculations and Results

This section consists of data entry requirements for both constant and variable air volume systems. Enter data associated with the appropriate system type as instructed.

Section D. Evaluation

This section contains check boxes to indicate the pass/fail results of the test(s). Check the appropriate box. Any portion that fails should be explained in the given rows.

Declaration Statements

This section contains fillable fields for three declaration statements: one from the Documentation Author, one from the Field Technician, and one from the Responsible Person. Each area contains a combination of check boxes and data entry requirements, including signature; date; and license number. Complete check boxes and enter data as instructed.

The Documentation Author is the person completing the form. The Field Technician is responsible for performing and documenting the results of the acceptance procedures on the Certificate of Acceptance forms. The Field Technician must sign the Certificate of Acceptance to certify that the information he or she provides on the Certificate of Acceptance is true and correct. It is important to note that the Field Technician is not required to have a contractor's, architect's or engineer's license. A Responsible Person is eligible under Division 3 of the Business and Professions code in the applicable classification to take responsibility for the scope of work specified by the Certificate of Acceptance document. The Responsible Person can also perform the field testing and verification work, and if this is the case the Responsible Person must complete and sign both the Field Technician's signature block and the Responsible Person's signature block on the Certificate of Acceptance form. The Responsible Person assumes responsibility for the acceptance testing work performed by the Field Technician agent or employee.