



CERTIFICATE OF INSTALLATION

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

A. Ducted Cooling System Information

01	Space Conditioning System Identification or Name	
02	Space Conditioning System Description of Area Served	
03	Indoor Unit Name	
04	System Installation Type	
05	Nominal Cooling Capacity (tons)	
06	Condenser Speed Type	
07	Cooling System Zonal Control Type	
08	Central Fan Integrated (CFI) Ventilation System Status	
09	System Bypass Duct Status	
10	Date of System Airflow Rate Measurement	
11	Airflow Rate Protocol Utilized	
12	Central Fan Ventilation Cooling System Status	

B. Hole for the Placement of a Static Pressure Probe (HSPP), and Permanently Installed Static Pressure Probe (PSPP) in the Supply Plenum

Procedures for installing HSPP or PSPP are specified in RA3.3.1.1

01	Method Used to Demonstrate Compliance with the HSPP/PSPP Requirement	
----	--	--

C. Airflow Rate Measurement Apparatus and Procedure Information

Instrument Specifications are given in RA3.3.1.1, and system airflow rate measurement apparatus information is given in RA3.3.2.

01	Airflow Rate Measurement Type Used for this Airflow Rate Verification	
02	Manufacturer of Airflow Measurement Apparatus	
03	Model number of Airflow Measurement Apparatus	
04	Certification Status of the Airflow Measurement Apparatus Accuracy	

**D. Alternative to Compliance with Minimum System Airflow Requirements for Altered Systems**

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

The installer shall attempt to correct non-compliant system airflow rates by performing the following remedial actions as specified in RA3.3.3.1.5

01	Determine that the air filter media is clean. If the air filter media is dirty, then replace it with clean filter media.	
02	Open all registers and dampers and remove any obstructions.	
03	Replace/Repair all accessible crushed, blocked, restricted, remove excess length, and sharp bends in ducts. Supported every 4 ft max. with a max. 2 in sag.	
08	Clean the evaporator coil according to the manufacturer and ensure the coil is not obstructed.	
05	Air handler fan speed set to high and blower wheel and motor are operating properly.	
06	If determined to be too small, replace the return duct with a larger one and/or add a second return duct.	
07	If determined to be too small, replace the return grille with a larger area grille.	
08	If any of the above were not completed list the Action Required and a description of why the action could not be completed:	

E1. Forced Air System Airflow Rate Measurement

Complete this section with Airflow Rate Measurement Data for Newly Installed Non-Zoned Systems or Zoned Multi-Speed Compressor

The procedures for System Airflow Rate Verification are specified in Reference Residential Appendix RA3.3

01	Actual System Airflow Rate Measurement (cfm)	
02	Required Minimum System Airflow Rate (cfm/ton)	
03	Required Minimum System Airflow Target (cfm)	
04	Compliance Statement:	

E2. Forced Air System Airflow Rate Measurement - All Zones Calling

Complete this section with Airflow Rate Measurement Data for Newly Installed Zoned Single-Speed Compressor Systems

The procedures for System Airflow Rate Verification are specified in Reference Residential Appendix RA3.3

01	Actual System Airflow Rate Measurement (cfm)	
02	Required All Zones Calling Minimum System Airflow Rate (cfm/ton)	
03	Required All Zones Calling Minimum System Airflow Target (cfm)	
04	Compliance Statement:	

E3. Forced Air System Airflow Rate Measurement - Best Airflow Rate Attainable

Complete this section with Airflow Rate Measurement Data for Alternative to Compliance with Minimum System Airflow Requirements for Altered Systems

The procedures for System Airflow Rate Verification are specified in Reference Residential Appendix RA3.3

01	Actual System Airflow Rate Measurement (cfm)	
02	Required Minimum System Airflow Rate (cfm/ton)	
03	Required Minimum System Airflow Target (cfm)	
04	Compliance Statement:	
05	ECC Sample Group Eligibility	

**E4. Forced Air System Airflow Rate Measurement – Heating Only**

Complete this section with Airflow Rate Measurement Data for Newly Installed Heating Only Non-Zoned Systems or Zoned Multi-Speed Compressor Measurement Only – No Minimum Target Requirement

The procedures for System Airflow Rate Verification are specified in Reference Residential Appendix RA3.3.

01	Actual System Airflow Rate Measurement (cfm)	
----	--	--

F. Forced Air System Airflow Rate Measurement – All Other Zonal Control Modes

The procedures for System Airflow Rate Verification are specified in Reference Residential Appendix RA3.3. For compliance with verification in all zonal control modes, it is sufficient to verify airflow rate for operation of each individual zone when the individual zone is the sole zone calling for conditioning. It is not necessary to verify airflow rate for combinations of 2 or more zones that are less than all zones calling (e.g., 2 out of three zones calling).

01	Number of Independently Controlled Zones (i.e., number of thermostats or temperature sensors that independently control one or more dampers.)		
02	Required Minimum Cooling System Airflow Rate (cfm/ton)		
03	Required Minimum Airflow in all Zonal Control Modes (cfm)		
04		05	06
Zone Name		Zone Description	Measured Airflow with All Other Zones Off (CFM)
			Zone Compliance Status
08	Compliance Statement:		

G. Central Fan Ventilation Cooling System Airflow Rate Measurement

The procedures for central fan ventilation cooling system airflow rate verification are specified in Reference Residential Appendix RA3.3.4

01	Required Ventilation System Airflow Rate (cfm)	
02	Actual System Ventilation Airflow Rate Measurement (cfm)	
03	Compliance Statement:	

**H. Additional Requirements**

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

01	Air filters that meet the applicable requirements of Standards Section 150.0(m)12 or 150.0(m)13 were properly installed in the system during system airflow rate measurement identified on this Certificate of Installation.
02	The airflow rate measurement apparatus used to perform the airflow rate measurement identified on this Certificate of Installation was calibrated in accordance with the apparatus manufacturer's specifications and conforms to the instrumentation specifications given in RA3.3.1.
03	A visual inspection shall confirm that bypass ducts that deliver conditioned supply air directly to the space conditioning system return duct airflow are not used on newly constructed zonally controlled systems unless the Performance Certificate of Compliance indicates an allowance for use of a bypass duct. When a bypass duct is accounted for on the Performance Certificate of Compliance, the airflow rate shall conform to the specifications listed on the Certificate of Compliance.
04	All registers were fully open during the diagnostic test.
05	System fan was set at maximum speed during the diagnostic test.
06	If fresh air duct is part of the HVAC system it was not closed during the diagnostic test.
07	Airflow rate and fan watt draw shall be simultaneous measurements when used to calculate the Fan Efficacy tested value.
08	Multi-speed compressor space cooling systems or variable speed compressor systems with controls that vary fan speed subject to the number of zones, as certified by the installer may verify airflow (cfm/ton) and fan efficacy (Watt/cfm) with system operating at maximum compressor capacity and system fan speed with all zones calling for conditioning,
09	For altered systems that do not comply with the minimum 300 cfm per ton airflow rate requirement but opt to comply using the remedial actions on this MCH-23 compliance document according to Section RA3.3.3.1.5, the system's thermostat shall conform to the specifications in Reference Joint Appendix JA5 and shall be capable of receiving and responding to Demand Response Signals prior to final approval of the building permit by the enforcing agency (Section 150.2(b)1Fiia).

**DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

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

RESPONSIBLE PERSON'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 Installation is true and correct.
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 Installation and attest to the declarations in this statement (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
4. I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met.
5. I understand that a completed signed copy of this Certificate of Installation shall be made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
6. I understand that a completed signed copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

NRCI-MCH-23-F User Instructions

Section A. Ducted Cooling System Information

- 1 System Identification or Name: This field is user input. It is referenced from the NRCI-MCH-E, which must be completed prior to this document.
- 2 System Location or Area Served: This field is user input. It is referenced from the NRCI-MCH-E, which must be completed prior to this document.
- 3 Indoor Unit Name: This field is user input. It is referenced from the NRCI-MCH-E, which must be completed prior to this document.
- 4 System Installation Type: Select the appropriate System Installation Type from the following choices:
 - a. New: Use this choice for newly constructed buildings, additions with all-new systems dedicated to the addition, or new systems installed in existing homes where the equipment and ducts are all newly installed (aka, "Cut-in").
 - b. Replacement: Use this choice if the system is a complete replacement space-conditioning system installed as part of an alteration, and includes all the system heating or cooling equipment plus a replacement duct system (150.2(b)1Diia) where the ducts are at least 75% or more newly installed duct material (up to 25% of the finished system may consist of reused parts from the dwelling unit's previously existing duct system, such as registers, grilles, boots, air handler, coil, plenums, duct material); plus a replacement air handler.
 - c. Alteration: Use this choice for existing buildings where any of the following are newly installed or replaced as part of the project and the system does not meet one of the other compliance categories above.:
 - i. 25 feet or more of space-conditioning system ducts are installed in unconditioned space or indirectly conditioned space.
 - ii. Air conditioning or heat pump condenser
 - iii. Heating or cooling coil
 - iv. Air handler (e.g., furnace, fan coil, package unit)
- 5 Nominal Cooling Capacity (tons): This field is user input. It is referenced from the NRCI-MCH-E, which must be completed prior to this document. If the number of indoor units connected to the outdoor unit is equal to one or the system is a packaged system then this field is equal to the nominal cooling capacity of the condenser. If the number of indoor units connected to the outdoor unit is greater than one this field is equal to the indoor unit nominal cooling capacity.
- 6 Condenser Speed Type: This field is user input. It is referenced from the NRCI-MCH-E, which must be completed prior to this document.
- 7 Cooling System Zonal Control Type: This field is user input. It is referenced from the NRCI-MCH-E, which must be completed prior to this document.
- 8 Central Fan Integrated (CFI) Ventilation System Status: If the system has Central Fan Integrated System, then select "CFI System", otherwise select "Not a CFI system".
- 9 System Bypass Duct Status: This field is user input. It is referenced from the NRCI-MCH-E, which must be completed prior to this document.
- 10 Date of System Airflow Rate Measurement: Enter the date that the airflow test was performed.
- 11 Airflow Rate Protocol Utilized: If the system installation type is "New" or "Replacement" then only the RA3.3 airflow methods may be used. If the system installation type is "Alteration", the RA3.3 airflow methods may be used, but the Alternative to Compliance with Minimum System Airflow Requirements ("Best I Can Do" Airflow) is an option for existing systems that may require substantial modification to improve the airflow.

- 12 Central Fan Ventilation Cooling System (CFVCS) Status: This field is user input. It is referenced from the NRCI-MCH-E, which must be completed prior to this document.

Section B. Hole for the Placement of a Static Pressure Probe (HSPP), and Permanently Installed Static Pressure Probe (PSPP) in the Supply Plenum

1. A hole for a static pressure probe (HSPP) or a permanent static pressure probe (PSPP) is required when system airflow verification is required, whether the airflow test method used requires one or not. Select the appropriate choice from the following options using a dropdown box, the Static Pressure Measurement Method:
 - a. If an Hole Static Pressure Probe is installed then select “HSPP Installed”
 - b. If a Permanent Static Pressure Probe is installed then select “PSPP Installed”
 - c. If the system is configured such that an HSPP nor PSPP can be installed, an alternate location that provides access for making supply plenum pressure measurement may be used. Select “An alternative location has been provided and clearly labeled.”
 - d. If the system is such that an HSPP or PSPP is not applicable, select “HSPP/PSPP are not applicable to this system”.

Section C. Airflow Rate Measurement Apparatus and Procedure Information

1. Airflow Rate Measurement Type Used for this Airflow Rate Verification: Select the appropriate airflow test procedure from the following options for the method used to determine actual fan airflow:
 - a. Diagnostic Fan Flow Using Fan Flow Meter (aka Plenum Pressure Matching) according to the procedures in RA3.3.3.1.1
 - b. Diagnostic Fan Flow Using Flow Grid Measurement according to the procedures in RA3.3.3.1.2
 - c. Diagnostic Fan Flow Using Powered Flow Capture Hood according to the procedures in RA3.3.3.1.3
 - d. Diagnostic Fan Flow Using Traditional Flow Capture Hood according to the procedures in RA3.3.3.1.4
2. Manufacturer of Airflow Measurement Apparatus: Enter the name of the manufacturer of the airflow measurement tool used to measure the airflow for this test.
3. Model number of Airflow Measurement Apparatus: Enter the model number of the airflow measurement tool used to measure the airflow for this test.
4. Certification Status of the Airflow Measurement Apparatus Accuracy: The measurement apparatus used to perform an airflow verification measurements must appear on the CEC list of approved devices found at http://www.energy.ca.gov/title24/equipment_cert/ama_fas/index.html, if this is true, select “Certified”, otherwise select “Not Certified”. The latter choice will not allow the system to pass until a certified device is used.

Section D. Alternative to Compliance with Minimum System Airflow Requirements for Altered Systems

(This section is required for altered systems using alternative compliance)

These fields are required for alteration project compliance

1. Refer to section RA3.3.3. for details on this item. Indicate whether completed or not.
2. Refer to section RA3.3.3. for details on this item. Indicate whether completed or not.
3. Refer to section RA3.3.3. for details on this item. Indicate whether completed or not.
4. Refer to section RA3.3.3. for details on this item. Indicate whether completed or not.
5. Refer to section RA3.3.3. for details on this item. Indicate whether completed or not.
6. Refer to section RA3.3.3. for details on this item. Indicate whether completed or not.
7. Refer to section RA3.3.3. for details on this item. Indicate whether completed or not.

8. If any of the above items could not be completed due to inaccessibility or significant cost, provide an explanation here.

Section E1. Forced Air System Airflow Rate Measurement (This section is required for non-zoned systems or zoned systems with multi-speed systems)

1. Required Minimum System Airflow Rate (cfm/ton): This field is filled automatically. The target is based on whether the system is new or altered and whether a value was specified on the NRCI-MCH-E.
2. Required Minimum System Airflow Target (cfm): This field is calculated automatically. It is the product of the minimum airflow rate per ton and the tonnage of the system condenser.
3. Actual System Airflow Rate Measurement (cfm): Enter the actual tested value of the airflow measured using the apparatus specified above.
4. Compliance Statement: This field is filled automatically. Compliance requires that the measured airflow meets the minimum airflow target.

Section E2. Forced Air System Airflow Rate Measurement – All Zones Calling

(This section is required if system is zonally controlled)

1. Required All Zones Calling Minimum System Airflow Rate (cfm/ton): This field is filled automatically. The target is based on whether the system is new or altered and whether a value was specified on the NRCI-MCH-E.
2. Required All Zones Calling Minimum System Airflow target (cfm): This field is calculated automatically. It is the product of the minimum airflow rate per ton and the tonnage of the system condenser.
3. Actual System Airflow Rate Measurement (cfm): Enter the actual tested value of the airflow measured using the apparatus specified above.
4. Compliance Statement: This field is filled automatically. Compliance requires that the measured airflow meets the minimum airflow target.

Section E3. Forced Air System Airflow Rate Measurement - Best Airflow Rate Attainable (This section is required for altered systems using alternative compliance)

1. Required Minimum System Airflow Rate (cfm/ton): This field is filled automatically. The target is always 300 cfm/ton for this option.
2. Required Minimum System Airflow Target (cfm): This field is calculated automatically. It is the product of the minimum airflow rate per ton and the tonnage of the system condenser.
3. Actual System Airflow Rate Measurement (cfm): Enter the actual tested value of the airflow measured using the apparatus specified above.
4. Compliance Statement: This field is filled automatically. Compliance requires that the measured airflow meets the minimum airflow target, however if the criteria of RA3.3.3 is met the best attainable airflow rate will suffice.
5. ECC Sample Group Eligibility: This field is user input. If the minimum airflow rate cannot be met and the criteria of RA3.3.3 is used, the system cannot be included in a ECC sample group.

Section E4. Forced Air System Airflow Rate Measurement (This section is required if system is heating only)

1. Actual System Airflow Rate Measurement (cfm): Enter the actual tested value of the airflow measured using the apparatus specified above.

Section F. Forced Air System Airflow Rate Measurement – All Other Zonal Control Modes

(This section is required for systems with single speed compressor and zonally controlled).

1. Number of Independently Controlled Zones: Enter the number of zones in this system that are independently controlled, i.e., that can call for cooling while other zones can be fully or mostly shut off from system airflow. This usually corresponds to the number of thermostats or zone sensors.
2. Required Minimum Cooling System Airflow Rate (cfm/ton): This field is filled automatically. The target is based on whether the system is new or altered and whether a value was specified on the NRCI-MCH-E.
3. Required Minimum Airflow in all Zonal Control Modes (cfm): This field is user input. If a value other than 350 cfm was claimed in the performance calculations, it will be referenced from the NRCC, otherwise the target is 350 cfm.
4. Zone Name: Enter a unique name for each zone on this system. Examples: Zone 1, Z1, Zone A, etc.
5. Zone Description: Enter a brief description of each zone that is detailed enough allow someone to distinguish it from the others in the field. Examples: upstairs, first floor, east wing, bedrooms only, (list rooms served), etc.
6. Measured Airflow with All Other Zones Off: This test must be performed with only one independently controlled zone calling for cooling (Note: if fan watt verification is required, it must be performed simultaneously to the corresponding airflow from this test). All other zones must not be calling during this test. The zone dampers for the other zones must be in their normal closed position. Enter the airflow value measured for the zone that is calling. This test must be performed for each and every independently controlled zone.
7. Zone Compliance Status: This field is user input. The result is based on whether or not the actual airflow meets the required airflow for this zone.
8. Compliance Statement: This field is user input. The result is based on whether or not the actual airflow meets the required airflow for all zones

Section G. Central Fan Ventilation Cooling System Airflow Rate Measurement

(This section is required if project has a fixed or variable CFVCS.)

1. Required Ventilation System Airflow Rate (cfm): This field is filled automatically. The target is based on the airflow rate specified on the NRCI-MCH-E.
2. Actual System Ventilation Airflow Rate Measurement (cfm): Enter the actual tested value of the airflow measured using the apparatus specified above.
3. Compliance Statement: This field is filled automatically. Compliance requires that the measured airflow meets the airflow target.

Section H. Additional Requirements

1. This field must be a true statement (or not applicable) for the system to comply.
2. This field must be a true statement (or not applicable) for the system to comply.
3. This field must be a true statement (or not applicable) for the system to comply.
4. This field must be a true statement (or not applicable) for the system to comply.
5. This field must be a true statement (or not applicable) for the system to comply.
6. This field must be a true statement (or not applicable) for the system to comply.
7. This field must be a true statement (or not applicable) for the system to comply.
8. This field must be a true statement (or not applicable) for the system to comply.
9. This field must be a true statement (or not applicable) for the system to comply.

CERTIFICATE OF INSTALLATION – USER INSTRUCTIONS	NRCI-MCH-23-F
Space Conditioning System Airflow Rate	(Page 5 of 5)

Documentation Declaration Statements

1. The person who prepared the NRCI will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature.
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature.