

DOCKETED

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DUCT LEAKAGE DIAGNOSTIC TEST

CEC-CF3R-MCH-20-H (Revised 01/19)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF VERIFICATION		CF3R-MCH-20-H
Duct Leakage Diagnostic Test		(Page 1 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Dwelling Address:	City:	Zip Code:

A. System Information	
01	Space Conditioning System Identification or Name
02	Space Conditioning System Location or Area Served
03	Indoor Unit Name
03	Building Type from CF1R
04	Verified Low Leakage Ducts in Conditioned Space (VLLDCS) Credit from CF1R?
05	Verified Low Leakage Air-handling Unit Credit from CF1R?
06	Duct System Compliance Category
08	Any portions of Duct Located in Garage?

MCH-20c - Low Leakage Air-Handling Unit (LLAHU)
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B. Duct Leakage Diagnostic Test	
01	Air-Handling Unit Airflow (AHU Airflow) Determination Method
02	Condenser Nominal Cooling Capacity (ton)
03	Indoor Unit Nominal Cooling Capacity
04	Heating Capacity (kBtu/h)
05	Conditioned Floor Area Served by this HVAC System (ft ²)
06	Measured AHU Airflow (cfm)
07	Duct Leakage Test Conditions
08	Duct Leakage Test Method
09	Leakage Factor
10	Calculated Target Allowable Duct Leakage Rate (cfm)
11	Actual Duct Leakage Rate from Leakage Test Measurement (cfm)
12	Air-Handling Unit Manufacturer Name
13	Air-Handling Unit Model Number
14	Compliance Statement:
15	Notes:

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C. Additional Requirements for Compliance

01	The Low Leakage Air-handling Unit Model identified on this compliance document is included in the list of certified Low Leakage Air-Handling Units published on the Energy Commission Website at: http://www.energy.ca.gov/title24/equipment_cert/llahu/low_leakage_air_handling_units.pdf	
02	System was tested in its normal operation condition. No temporary taping allowed.	
03	Outside air (OA) duct connections to the central forced air duct system shall not be sealed/taped off during duct leakage testing. OA ducts used for Central Fan Integrated (CFI) Indoor Air Quality ventilation systems, or Central Fan Ventilation Cooling Systems, that utilize dampers that open only when OA is required and automatically close when OA is not required, may configure the OA damper to the closed position during duct leakage testing.	
04	All supply and return register boots were sealed to the drywall.	
05	Building cavities were not used as plenums or platform returns in lieu of ducts.	
06	If cloth backed tape was used it was covered with Mastic and draw bands.	
07	All connection points between the air handler and the supply and return plenums are completely sealed.	
08	Verification Status:	<input type="checkbox"/> <u>Pass</u> - all applicable requirements are met; or <input type="checkbox"/> <u>Fail</u> - one or more applicable requirements are not met. Enter reason for failure in corrections notes field below; or <input type="checkbox"/> <u>All N/A</u> - This entire table is not applicable
09	Correction Notes:	
The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met unless otherwise noted in the Verification Status and the Corrections Notes in this table.		

D. Determination of HERS Verification Compliance

All applicable sections of this document shall indicate compliance with the specified verification protocol requirements in order for this Certificate of Verification as a whole to be determined to be in compliance.

01	
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CERTIFICATE OF VERIFICATION		CF3R-MCH-20-H
Duct Leakage Diagnostic Test		(Page 3 of 3)
Project Name:	Enforcement Agency:	Permit Number:
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DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

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

Documentation Author Name:	Documentation Author Signature:
Company:	Date Signed:
Address:	CEA/HERS Certification Information (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:

- The information provided on this Certificate of Verification is true and correct.
- I am the certified HERS Rater who performed the verification identified and reported on this Certificate of Verification (responsible rater).
- The installed features, materials, components, manufactured devices, or system performance diagnostic results that require HERS verification identified on this Certificate of Verification comply with the applicable requirements in Reference Appendices RA2, RA3, and the requirements specified on the Certificate of Compliance for the building approved by the enforcement agency.
- The information reported on applicable sections of the Certificate(s) of Installation (CF2R) signed and submitted by the person(s) responsible for the construction or installation conforms to the requirements specified on the Certificate(s) of Compliance (CF1R) approved by the enforcement agency.
- I will ensure that a registered copy of this Certificate of Verification 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 registered copy of this Certificate of Verification is required to be included with the documentation the builder provides to the building owner at occupancy.

BUILDER OR INSTALLER INFORMATION AS SHOWN ON THE CERTIFICATE OF INSTALLATION

Company Name (Installing Subcontractor, General Contractor, or Builder/Owner):	
Responsible Builder or Installer Name:	CSLB License:

HERS PROVIDER DATA REGISTRY INFORMATION

Sample Group Number (if applicable):	Dwelling Test Status in Sample Group (if applicable):
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HERS RATER INFORMATION

HERS Rater Company Name:	
Responsible Rater Name:	Responsible Rater Signature:
Responsible Rater Certification Number w/ this HERS Provider:	Date Signed:

CF3R-MCH-20c-H User Instructions**Section A. System Information**

1. *HVAC System Identification or Name:* This field is filled out automatically. It is referenced from the CF2R-MCH-20.
2. *HVAC System Location or Area Served:* This field is filled out automatically. It is referenced from the CF2R-MCH-20.
3. *Indoor Unit Name:* This field is filled out automatically. It is referenced from the CF2R-MCH-20, which must be completed prior to this document.
4. *Building Type:* This field is filled out automatically. It is referenced from the CF2R-MCH-20.
5. *Verified Low Leakage Ducts in Conditioned Space (VLLDCS):* This field is filled out automatically. It is referenced from the CF2R-MCH-20.
6. *Verified Low Leakage Air-handling Unit (VLLAHU) Credit:* This field is filled out automatically. It is referenced from the CF2R-MCH-20.
7. *Duct System Compliance Category:* This field is filled out automatically. It is referenced from the CF2R-MCH-20.
8. *Any portions of Duct Located in Garage:* This field is filled out automatically. It is referenced from the CF2R-MCH-20.

Section B. Duct Leakage Diagnostic Test - MCH-20c - Low Leakage Air-Handling Unit (LLAHU)

1. *Air-Handling Unit Airflow (AHU Airflow) Determination Method:* User will select from the following options:
 - a. Cooling System Method: For systems with cooling, this selection must be made, and the nominal air handler airflow shall be 400 CFM per nominal ton of condensing unit cooling capacity as specified by the manufacturer or the heating only value, whichever is greater (See Section RA3.1.4.2.2 of the 2019 Reference Appendices).
 - b. Heating System Method: For heating only systems the nominal air handler airflow shall be 21.7 CFM per kBtu/hr of rated heating output capacity.
 - c. Measured Airflow Method: The system airflow can be used as the air handler airflow for the purpose of establishing duct leakage percentage (See Section RA3.1.4.2.3 of the 2019 Reference Appendices).
 - d. Default Airflow Method: The Default Airflow Method may only be used for homes where the duct system is being tested before the conditioning and heating system is installed and the equipment specification is not known (See Section RA3.1.4.2.1 of the 2019 Reference Appendices).
 - e. Indoor Unit Method:
2. *Condenser Nominal Cooling Capacity (ton):* Same data given on MCH-01.
3. *Indoor Unit Nominal Cooling Capacity:* Same data given on MCH-01.
4. *Heating Capacity (kBtu/h):* Same data given on MCH-01;
5. *Conditioned Floor Area Served by this HVAC System (ft²):* User will input CFA for zone which should be consistent with the value from the CF1R. User will have the option to leave this field blank because the zone CFA is only required for the default airflow calculation.
6. *Measured AHU Airflow (cfm):* If "Measured Airflow Method" is selected in B07, user must input measured airflow.
7. *Duct Leakage Test Conditions:* User must select from the following options:
 - f. Test Final: Test conducted at final inspection (testing at rough is not an option with this test. See Section RA3.1.4.3.1 of the 2019 Reference Appendices).
8. *Duct Leakage Test Method:* User will select from the following options: Total Leakage.
9. *Leakage Factor:* value will be automatically populated from in CF1R.
10. *Calculated Target Allowable Duct Leakage Rate (cfm):* This value will be automatically populated depending on values in B06, B07, and B08.
11. *Actual Duct Leakage Rate from Leakage Test Measurement (cfm):* User will input this value from actual measurements from leakage test.
12. *Air-Handling Unit Manufacturer Name:* This will be automatically populated from information entered in the MCH-01.
13. *Air-Handling Unit Model Number:* This will be automatically populated from information entered in the MCH-01.
14. *Compliance Statement:* If Actual Duct Leakage Rate from leakage test (B11) is less than or equal to Calculated Target Allowable Duct Leakage Rate (B10), "System passes leakage test" will automatically populate. If not, "System fails leakage test will automatically populate.
15. *Notes:* This field is automatically filled out. The values in B02, B03, B04, B05, B12 and B13 are checked against the values in the same rows of the CF2R-MCH-20 for this system. If they do not match an error message will appear here.

Section C Additional Requirements for Compliance

1. This field must be a true statement (or not applicable) for the system to comply.
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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. *Verification Status:* If this Section does not apply, then select "All N/A". If the system meets all of the additional requirements for compliance then select "Pass", otherwise select "Fail". The latter selection means that the system does not meet the requirements and the system will need to be modified to meet the requirements or airflow and fan efficacy will have to be verified by diagnostic testing.
9. *Correction Notes:* If one or more applicable requirements are not met "Fail" will appear in the row above. When this occurs the rater is required to enter detailed notes here that describes what failed and why.

Section D. Determination of HERS Verification Compliance

1. This field is filled out automatically. Compliance requires that all individual criteria pass.

For information and data collection
only. Not valid until registered with a
HERS provider