REFRIGERANT CHARGE VERIFICATION

CERTIFICATE OF VERIFICATION		CF3R-MCH-25-H
Refrigerant Charge Verification		(Page 1 of 4)
Project Name:	Enforcement Agency:	Permit Number:
Dwelling Address:	City:	Zip Code:

A. System Information

HERS Rater to field-verify all system information, discrepancies to be noted by overwriting entry.

01	System Identification or Name	
02	System Location or Area Served	
03	Condenser (or package unit) Make or Brand	
04	Condenser (or package unit) Model Number	
05	Nominal Cooling Capacity (tons) of Condenser	
06	Condenser (or package unit) Serial Number	
07	Refrigerant Type	
08	Other Refrigerant Type (if applicable)	
09	System Installation Type	
10	Charge Indicator Display (CID) Status (Note: Even systems with a CID must have refrigerant charge verified by installer)	
11	Is the system of a type that the minimum airflow can be verified using an approved measurement procedure (RA3.3 or RA3.2.2.7)?	
12	Is the system of a type that approved refrigerant charge verification procedures can be used to verify compliance with the refrigerant charge verification requirements when temperatures are ≥ 55°F (RA3.2.2, or RA1)?	
13	Date of HERS Rater Refrigerant Charge Verification for this System	
14	Refrigerant Charge Verification Method Used by Installer	
15	Person Who Performed the Refrigerant Charge Verification Reported on the Certificate of Installation:	
16	HERS Verification Compliance Requirement Status	
17	Refrigerant Charge Verification Method Used by HERS Rater	

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MCH-25c - Refrigerant Charge Verification - Weigh In Observation Procedure

B. Measurement Access Hole (MAH) Verification – HERS Raters are required to visually field verify MAH

Procedures for installing MAH are specified in Reference Residential Appendix RA3.2.2.3

01	Method Used to Demonstrate Compliance with the Measurement Access Hole (MAH) Requirement	

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C. Minimum System Airflow Rate Verification

Procedures for verifying minimum system airflow are specified in Reference Residential Appendix RA3.2.2.7.

01	Minimum Required System Airflow Rate (cfm)	
02	System Airflow Rate Verification Status	

D. Weigh In Charge Procedure – HERS Rater Must Observe and Confirm All Data Collected

Procedures for Refrigerant Charge using the Weigh-in Charging Procedure are given in Reference Residential Appendix RA3.2.2.2 and RA3.2.3.

01	Measured Condenser Air Entering Dry-bulb Temperature ($T_{condenser, db}$)	
02	Specify the Method of Weigh-in	
03	Manufacturer's Standard Charge for Condenser (lbs)	
04	Manufacturer's Standard Liquid Line Length (ft)	
05	Manufacturer's Standard Liquid Line Diameter (in)	
06	Manufacturer's Standard Indoor Coil Size (tons)	
07	Installed Liquid Line Length (ft)	
08	Installed Liquid Line Diameter (in)	
09	Installed Indoor Coil Size (tons)	
10	Charge Adjustment to Standard Charge from Manufacturer's Specifications (ounces, positive = add, negative = remove)	
11	Refrigerant Required to be Weighed-in by the Installer (lbs, oz)	
12	Refrigerant Weighed-in by Installer (lbs, oz)	
13	Verification Status: (Note: If Verification Status for this table indicates "Fail", the reason shall be described in the correction notes for this table.)	

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.

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E. Weigh In Charge Procedure – Additional Requirements

01	The indoor coil correction to refrigerant weight is used if it is supplied by the manufacturer	
02	Prior to introducing refrigerant, system is evacuated to 500 microns or less and, when isolated, has risen no more than 300 microns after 5 minutes.	
03	Verification Status: (Note: If Verification Status for this table indicates "Fail", the reason shall be described in the correction notes for this table.)	

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.

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Dwelling Address:	City:	Zip Code:

F. 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-25-H
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Project Name:	Enforcement Agency:	Permit Number:
Dwelling Address:	City:	Zip Code:

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:

1. The information provided on this Certificate of Verification is true and correct.
2. I am the certified HERS Rater who performed the verification identified and reported on this Certificate of Verification (responsible rater).
3. 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.
4. 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.
5. 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):

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

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CF3R-MCH-25c-H User Instructions

Section A. System Information

1. This information is automatically pulled from the Certificate of Installation (CF2R-MCH-25). If installed system does not match this entry, it can be overwritten by rater but it will be flagged as a possible fail.
2. This information is automatically pulled from the Certificate of Installation (CF2R-MCH-25). If installed system does not match this entry, it can be overwritten by rater but it will be flagged as a possible fail.
3. This information is automatically pulled from the Certificate of Installation (CF2R-MCH-25). If installed system does not match this entry, it can be overwritten by rater but it will be flagged as a possible fail.
4. This information is automatically pulled from the Certificate of Installation (CF2R-MCH-25). If installed system does not match this entry, it can be overwritten by rater but it will be flagged as a possible fail.
5. This information is automatically pulled from the Certificate of Installation (CF2R-MCH-25). If installed system does not match this entry, it can be overwritten by rater but it will be flagged as a possible fail.
6. This information is automatically pulled from the Certificate of Installation (CF2R-MCH-25). If installed system does not match this entry, it can be overwritten by rater but it will be flagged as a possible fail.
7. This information is automatically pulled from the Certificate of Installation (CF2R-MCH-25). If installed system does not match this entry, it can be overwritten by rater but it will be flagged as a possible fail. Choose the type of refrigerant used by the system being verified. R-22 and R-410A are the most common, but other types may occasionally be encountered.
8. This information is automatically pulled from the Certificate of Installation (CF2R-MCH-25). If "Other" is chosen in Row A07, then installer will indicate the type of refrigerant being used. If R-22 or R-410A is being used (regardless of trade name, Puron, Genetron, etc.) it should be indicated in Row A07, not here. This row is only for refrigerants other than R-22 and R-410a. Documentation of other refrigerants should be requested. If installed system does not match this entry, it can be overwritten by rater but it will be flagged as a possible fail.
9. This information is automatically pulled from the Certificate of Installation (CF2R-MCH-25). These are defined in detail the Residential Compliance Manual. If installed system does not match this entry, it can be overwritten by rater but it will be flagged as a possible fail. Indicate whether the HVAC system is Completely New, Replacement or an Alteration.
10. This information is automatically pulled from the Certificate of Installation (CF2R-MCH-25). Installer is to select the appropriate choice regarding whether this system has a Charge Indicator Display (CID). Qualifying CID's may exempt a system from HERS refrigerant charge verification. CID's are described in Joint Appendix JA6.1. Qualfying CID's must appear on a list of approved devices kept by the Commission. If installed system does not match the description here, it fails. Note: Installation of a CID does not exempt the installer from proper refrigerant charge verification. It may only exempt the need for third party refrigerant charge verification. Third party verification of the CID is required. Other requirements may also be triggered.
11. This information is automatically pulled from the Certificate of Installation (CF2R-MCH-25). Most ducted split systems and package systems are of the type that minimum airflow can be verified using an approved measurement procedure. Examples of systems that do not meet this description are ductless systems. Selecting "No" here may subject the project to additional scrutiny by enforcement personnel.
12. This information is automatically pulled from the Certificate of Installation (CF2R-MCH-25). Most ducted split systems and package systems are of the type that approved refrigerant charge verification procedures detailed in Residential Appendix RA3.2.2 or RA1 can be used (i.e., Standard Charge Verification or Winter Setup Verification procedures). Examples of systems that may not meet this description are "mini splits" or variable refrigerant flow systems that may only be charged using weigh-in procedures. Selecting "No" here may subject the project to additional scrutiny.
13. HERS rater to input date of their refrigerant charge verification.
14. This information is automatically pulled from the Certificate of Installation (CF2R-MCH-25). The installer is to have selected the refrigerant charge verification method used from the choices provided:
    - Superheat (outdoor temperature must be ≥ 55 degF); this verification method can only be used when the outdoor temperature is at or above 55 degF. It is only used on systems with fixed orifice refrigerant metering devices (non-variable metering devices). This method is detailed in Reference Appendix RA3.2.2.6.1. Systems verified using this method may be eligible for HERS verification compliance using Group Sampling. Choosing this option will generate a CF2R-MCH-25a.
    - Subcooling (outdoor temperature must be ≥ 55 degF); this verification method can only be used when the outdoor temperature is at or above 55 degF. It is only used on systems with variable metering devices (TXV or EXV). This method is detailed in Reference Appendix RA3.2.2.6.2. Systems verified using this method may be eligible for HERS verification compliance using Group Sampling. Choosing this option will generate a CF2R-MCH-25b.

- Weigh-in with Installer independent, or Weigh-in with HERS Rater observation; this verification method can be used by the installer at any outdoor temperature allowed by the equipment manufacturer. This method is detailed in Reference Appendix RA3.2.3. Systems verified using this method are NOT eligible for HERS verification compliance using Group Sampling. Choosing this option will generate a CF2R-MCH-25c.
    - Winter Setup (applicable when outdoor temperature is < 55 degF); the Winter Setup verification method is a special version of the Subcooling method. It can be used when the outdoor temperature is between 37 and 55 degF. It can only be used on equipment where the manufacturer has specifically approved it for the equipment being tested. The Winter Setup procedure is details in Residential Appendix RA1.2. Choosing this option will generate a CF2R-MCH-25e.

- New Package Unit Factory Charge; the installer should choose this option when a new package unit is being installed that has an AHRI rating. This helps ensure that the unit was properly charged at the factory. HERS verification of refrigerant charge may not be required in this case. Choosing this option will generate a CF2R-MCH-25f.

15. This information is automatically pulled from the Certificate of Installation (CF2R-MCH-25). The installer (or rater) is to have identified who performed the verification that is documented on the Certificate of Installation. Note that HERS verification compliance by Group Sampling requires that the installer perform their own refrigerant charge verification as part of the installation of the equipment prior to the system being put into a sample group for possible selection by a HERS rater for verification. If Group Sampling is not intended, the HERS Rater may perform the refrigerant charge verification on behalf of the Installing Contractor (applies to any method but Weigh-In) and the Rater will enter same results on both the CF2R and CF3R.
16. This information is automatically pulled from the Certificate of Installation (CF2R-MCH-25). The Group Sampling status is automatically displayed based on the input results of Row A14 and Row A15 on the CF2R. Group Sampling procedures are detailed in Residential Appendix RA2.3.
17. Specify the refrigerant charge verification used by the HERS rater. Choices vary depending on what method was specified in Row A10, A11, and A14.

Section B. Measurement Access Hole (MAH) Verification

1. This information is automatically pulled from the Certificate of Installation (CF2R-MCH-25). Installer is to have indicated the method used to demonstrate compliance with the MAH requirement by selecting the appropriate method from the drop down list. Procedures for installing MAH's are detailed in RA3.2.2.3. Selecting that the MAH cannot be installed consistent with Figure 3.2-1 may result in additional scrutiny by enforcement personnel.) If installed system does not match this entry, it can be overwritten by rater but it will be flagged as a possible fail. If A11 = NO, then system is exempt from the MAH requirement and a special message will show up here.

Section C. Minimum System Airflow Rate Verification

1. This information is automatically calculated based on the information given in line A09. This is the target minimum system airflow required for the system being verified.
2. This information is automatically calculated based on either the CF3R-MCH-23, or CF3R-MCH-28, which documents the rater's measured airflow of the system being verified (or alternative method). If the measured airflow is not adequate it will not comply with the airflow requirements and refrigerant charge verification cannot be performed until the airflow meets the requirement. If A11 = NO, then system is exempt from the airflow rate requirement and a special message will show up here.

Section D. Weigh In Charge Procedure

1. HERS rater must visually observe the installer taking this measurement and confirm that correct values are entered into the CF2R. Measure and record the outside air dry-bulb temperature in degrees F. This will affect the procedures that may be used for HERS verification.
2. HERS rater must confirm that correct values are entered into the CF2R. Specify the method of weigh-in. There are two options that may be used. One is to add or remove a small, weighed portion of refrigerant from a factory charged unit (Charge Adjustment). The other is to weigh the entire charge of refrigerant before introducing it into the system (Total Charge). Select either one. Note: The amount of refrigerant in systems that are not newly installed cannot be assumed to be the factory charge. Altered systems using existing refrigerant must use the Total Charge method. Only new, factory installed equipment can utilize the Charge Adjustment method.
3. HERS rater must confirm that correct values are entered into the CF2R. Enter the Manufacturer's Standard Charge for condenser in pounds and ounces. This is the amount of refrigerant that the manufacturer specifies for a "standard" installation (typical coil match, typical line set size and length). For the Charge Adjustment method, this is the amount of refrigerant that factory charges the system to. Rater should request to see manufacturer's documentation to support this value.
4. HERS rater must confirm that correct values are entered into the CF2R. The Manufacturer's Standard Charge, specified in E03 is based on a standard liquid line length, typically 25 feet. Enter the value here, in feet. Be prepared to provide manufacturer's documentation to support this value.
5. HERS rater must confirm that correct values are entered into the CF2R. The Manufacturer's Standard Charge, specified in E03 is based on a standard liquid line diameter. Enter the value here, in inches (for example: 1/4", 3/8", etc.). Rater should request to see manufacturer's documentation to support this value.
6. HERS rater must confirm that correct values are entered into the CF2R. The Manufacturer's Standard Charge, specified in E03 is based on a standard indoor (evaporator) coil size. Enter the value here, in tons. Rater should request to see manufacturer's documentation to support this value.
7. HERS rater must confirm that correct values are entered into the CF2R. Enter the length of the liquid line installed on the system being verified, in feet. This value must be compared to the standard liquid line length entered in E04 and used to determine if the Manufacturer's Standard Charge entered in E03 is appropriate.
8. HERS rater must confirm that correct values are entered into the CF2R. Enter the diameter of the liquid line installed on the system being verified, in inches (for example: 1/4", 3/8", etc.). This value must be compared to the standard liquid line diameter entered in E05 and used to determine if the Manufacturer's Standard Charge entered in E03 is appropriate.
9. HERS rater must confirm that correct values are entered into the CF2R. Enter the size of the indoor (evaporator) coil installed on the system being verified, in tons. This value must be compared to the standard coil size entered in E06 and used to determine if the Manufacturer's Standard Charge entered in E03 is appropriate.

10. HERS rater must confirm that correct values are entered into the CF2R. Enter the Charge Adjustment to Standard Charge, in ounces. This is the amount of refrigerant that the manufacturer specifies to add to, or remove from, the Manufacturer's Standard Charge entered in E03. This value must come from manufacturer's specifications using the standard values entered in Rows E04 through E06 to the installed values entered in Rows E07 through E09. If refrigerant is to be added, this value should be a positive number. If refrigerant is to be removed, this value should be a negative number. Rater should request to see manufacturer's documentation to support this value.
11. HERS rater must confirm that correct values are entered into the CF2R. This value is calculated automatically. If "Charge Adjustment" was specified in Row E02, then the value shown here will be the same as the value shown in Row E10. This is the amount of weighed refrigerant that will be added or removed from the factory charged unit. If refrigerant is to be added, this value should be a positive number. If refrigerant is to be removed, this value should be a negative number. If "Total Charge" was specified in Row E02, then the value shown here will be the value in row E03 added to the value in row E10. This is the total amount of refrigerant that will be in the system, all of which must be weighed before introducing into the system.
12. HERS rater must confirm that correct values are entered into the CF2R. Enter the amount of refrigerant weighed and added to, or removed from, system. If refrigerant is to be added, this value should be a positive number. If refrigerant is to be removed from a factory charged system, this value should be a negative number. This value must match the value in E11 for the system to pass.
13. HERS rater to indicate whether system passes or not. If not, use the next line to provide notes as to why system did not pass.

Section E. Weigh In Charge Verification – Additional Requirements

1. The Rater must confirm that a correction is made to the refrigerant weight to allow for the indoor coil when that information is supplied by the Manufacturer as required by Residential Appendix RA3.2.3.1.5.
2. The Rater must confirm refrigerant lines were checked for leaks by evacuating to 500 microns or less and rising by no more than 300 microns after 5 minutes as required by Residential Appendix RA3.2.3.1.5.