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| **A. System Information**  HERS Rater to field-verify all system information, discrepancies to be noted by overwriting entry. | | |
| 01 | Space Conditioning System Identification or Name |  |
| 02 | Space Conditioning 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 | Liquid Line Filter Drier Installed According to Manufacturer’s Specifications (if applicable) |  |
| 10 | System Installation Type |  |
| 11 | Fault Indicator Display (FID) Status  (Note: Even systems with a FID must have refrigerant charge verified by installer) |  |
| 12 | Is the system of a type that the minimum airflow can be verified using an approved measurement procedure (RA3.3 or RA3.3.3)? |  |
| 13 | 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)? |  |
| 14 | Date of HERS Rater Refrigerant Charge Verification for this System |  |
| 15 | Refrigerant Charge Verification Method Used by Installer |  |
| 16 | Person Who Performed the Refrigerant Charge Verification Reported on the Certificate of Installation |  |
| 17 | HERS Verification Compliance Requirement Status |  |
| 18 | Refrigerant Charge Verification Method Used by HERS Rater |  |

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| **MCH-25b - Refrigerant Charge Verification - Subcooling Method** |

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| **B. Metering Device Verification**  HERS Rater is required to visually field verify all information from C2R. Subcooling Method can only be used on systems that have a variable metering device. | | |
| 01 | Refrigerant Metering Device |  |
| 02 | Subcooling Method Applicability Status |  |

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| **C. Instrument Calibration**  HERS Raters are required to calibrate their diagnostic tools. Procedures for instrument calibration are given in Reference Residential Appendix RA3.2.2 and RA3.2.2.2 | | |
| 01 | Date of Digital Refrigerant Gauge Calibration |  |
| 02 | Date of Digital Thermocouple Calibration |  |
| 03 | Digital Refrigerant Gauge Calibration Status |  |
| 04 | Digital Thermocouple Calibration Status |  |

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| **D. 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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| **E. Minimum System Airflow Rate Verification**  Procedures for verifying minimum system airflow are specified in Reference Residential Appendix RA3.3.3. | | |
| 01 | 02 | 03 |
| Indoor Unit Name or Description of Area Served | Minimum Required System Airflow Rate (cfm) | System Airflow Rate Verification Status |
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| 04 | Compliance Statement: | |
| Notes: | | |

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| **F. Data Collection and Calculations**  HERS Rater must independently collect all data in this section. Procedures for Refrigerant Charge using the Standard Charge Verification Procedure are given in Reference Residential Appendix RA3.2.2. | | |
| 01 | Lowest Return Air Dry-bulb Temperature that Occurred During the Refrigerant Charge Verification Procedure (°F) |  |
| 02 | Measured Condenser Air Entering Dry-bulb Temperature  (T condenser, db) |  |
| 03 | Outdoor Temperature Qualification Status |  |
| 04 | Measured Liquid Line Temperature (Tliquid) (°F) |  |
| 05 | Measured Liquid Line Pressure (Pliquid) (psig) |  |
| 06 | Condenser Saturation Temperature (Tcondensor, sat) from Digital Gauge or P-T Table using Line F05 (°F) |  |
| 07 | Measured Subcooling (Line F06 – Line F04) (°F) |  |
| 08 | Target Subcooling from Manufacturer (°F) |  |
| 09 | Compliance Statement: |  |

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| **G. Metering Device Verification**  HERS Rater must independently collect all data in this section. Procedures for the verification of proper metering device operation are specified in RA3.2.2.6.2 | | |
| 01 | Measured Suction line temperature (Tsuction) (°F) |  |
| 02 | Measured Suction line pressure (Psuction) (psig) |  |
| 03 | Evaporator saturation temperature (Tevaporator, sat) from digital gauge or P-T Table using line G02 (°F) |  |
| 04 | Measured Superheat (Line G01 – Line G03) (°F) |  |
| 05 | Measured Superheat (Line G04) is between 3°F and 26°F (inclusive) |  |
| 06 | Measured Superheat (Line G04) is within Manufacturer’s Specifications (if known) |  |
| 07 | Compliance Statement: |  |

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| **H. 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. | |
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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:   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: |

**CF3R-MCH-25b-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 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 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). If applicable, a liquid line filter drier shall be installed according to the manufacturer’s specifications.
10. 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.
11. 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 Fault Indicator Display (FID). Qualifying FID’s may exempt a system from HERS refrigerant charge verification. FID’s are described in Joint Appendix JA6.1. Qualfying FID’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 FID 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 FID is required. Other requirements may also be triggered.
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 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.
13. 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.
14. HERS rater to input date of their refrigerant charge verification.
15. 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°F); this verification method can only be used when the outdoor temperature is at or above 55°F. 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°F); this verification method can only be used when the outdoor temperature is at or above 55°F. 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; 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°F); the Winter Setup verification method is a special version of the Subcooling method. It can be used when the outdoor temperature is between 37°F and 55°F. 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.

1. 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.
2. 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 A15 and A16 on the CF2R. Group Sampling procedures are detailed in Residential Appendix RA2.3.
3. Specify the refrigerant charge verification used by the HERS rater. Choices vary depending on what method was specified in A11, A12, and A15.

**Section B. Metering Device Verification**

1. This information is automatically pulled from the Certificate of Installation (CF2R-MCH-25). Installer is to have selected the correct metering device used on the system being verified. This will check against the refrigerant charge verification method selected in A15. An error message will appear in B02 if the wrong verification method may have been selected. Superheat verification can only be used on systems with fixed orifice and Subcool verification can only be used on systems with variable metering devices (TXV or EXV). This entry must match installed system to pass.
2. This information is automatically pulled from the Certificate of Installation (CF2R-MCH-25). Superheat verification can only be used on systems with fixed orifice and Subcool verification can only be used on systems with variable metering devices (TXV or EXV).

**Section C. Instrument Calibration**

1. Enter the date of most recent Digital Refrigerant Gauge Calibration Field Check by rater. Analog gauges are not allowed for verification purposes under the 2016 Standards. Specification for pressure gauges is found in Residential Appendix RA3.2.2.2.3. Procedures for the field check procedure are detailed in RA3.2.2.4.2. Calibration field check must happen at least once every 30 days.
2. Enter the date of the most recent Digital Thermocouple Calibration by rater. Specifications for thermocouples and temperature sensors can be found in Residential Appendix RA3.2.2.2.2. Procedures for calibration are detailed in RA3.2.2.4.1. Calibration must happen at least once every 30 days.
3. Digital Refrigerant Gauge Calibration status will appear automatically. If the date entered in C01 is more than 30 days prior to date of verification this row will indicate that calibration is required and you will not be allowed to continue filling out this document until calibration is performed.
4. Digital Thermocouple Calibration status will appear automatically. If the date entered in C02 is more than 30 days prior to date of verification this row will indicate that calibration is required and you will not be allowed to continue filling out this document until calibration is performed.

**Section D. 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.

**Section E. Minimum System Airflow Rate Verification**

1. This information is automatically calculated based on the information given in A10. 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.

**Section F. Subcooling Charge Verification Method – Data Collection**

1. The Rater must independently collect this data. Measure and record the lowest return air dry-bulb temperature that occurred during the refrigerant charge procedure in °F. This temperature must remain above 70°F during the verification procedure. This requirement is detailed in Residential Appendix RA3.2.2.5.
2. The Rater must independently collect this data. Measure and record the condenser air dry-bulb temperature (Tcondenser) in °F. This value must be at least 55°gF and no more than 115°F to use the Subcooling Charge Verification Method.
3. If a value less than 55°F or greater than 115°F is entered in F02 the Subcooling Method cannot be used.
4. The Rater must independently collect this data. Measure and record the liquid line temperature (Tliquid) in °F. This procedure is detailed in RA3.2.2.5. This value is used to calculate the measured subcool temperature.
5. The Rater must independently collect this data. Measure and record the liquid line pressure (Pliquid) in psig. This procedure is detailed in RA3.2.2.5. This value is used to determine the condenser saturation temperature (Tcondenser,sat) from a pressure temperature chart for the appropriate refrigerant (can be internal to a digital gauge), which is entered into F06.
6. Enter the condenser saturation temperature (Tcondenser,sat) from the digital gauge or a separate pressure-temperature chart that corresponds to the liquid line pressure entered in F05, in °F.
7. Measured Subcooling is automatically calculated as the difference between the liquid line temperature (F04) and the condenser saturation temperature (F06)
8. The Rater must independently collect this data. Enter target subcooling from manufacturer. This may be a challenge to find for older equipment. Internet searches can sometimes result in archived equipment specifications for the equipment in question, or sometimes a very similar model. If the manufacturer’s target cannot be found the Commission’s Executive Director may provide additional guidance for compliance.
9. System passes Subcooling method when F08 is within plus or minus 6°F of F07. Note that the target for the installer, on the CF2R, is plus or minus 3°F.

**Section G. Metering Device Verification**

1. The Rater must independently collect this data. Measure and record the suction line temperature (Tsuction) in °F. This procedure is detailed in RA3.2.2.5. This value is used to calculate the measured superheat.
2. The Rater must independently collect this data. Measure and record the suction line pressure (Psuction) in psig. This procedure is detailed in RA3.2.2.5. This value is used to determine the evaporator saturation temperature (Tevaporator,sat) from a pressure temperature chart for the appropriate refrigerant (can be internal to a digital gauge), which is entered into G03.
3. Enter the evaporator saturation temperature (Tevaporator,sat) from the digital gauge or a separate pressure-temperature chart that corresponds to the suction line pressure entered in G02, in °F.
4. Measured superheat is automatically calculated as the difference between the suction line temperature (G01) and the evaporator saturation temperature (G03).
5. There are two possible criteria for passing. If the manufacturer’s specification is known it should be used, otherwise the CEC requirement is that the superheat be between 4°F and 25°F, inclusive. This row checks the CEC requirement.
6. If the manufacturer’s target superheat for ensuring proper metering device operation is known, it supersedes the CEC requirement of being between 4°F and 25°F. If “Yes, documentation to be provided upon request.” is selected, the installer should be prepared to provide documentation for the target values used.
7. There are two possible criteria for passing. If the manufacturer’s specification is known it should be used, otherwise the CEC requirement is that the superheat be between 4°F and 25°F, inclusive. If “Yes, documentation to be provided upon request.” is selected in G06, the installer should be prepared to provide documentation for the target values used.

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| **A. System Information**  HERS Rater to field-verify all system information, discrepancies to be noted by overwriting entry. | | |
| 01 | Space Conditioning System Identification or Name | <<auto filled text: referenced from CF2R. If installed system does not match this entry, it can be overwritten by rater but it will be flagged as a possible fail.>> |
| 02 | Space Conditioning System Location or Area Served | <<auto filled text: referenced from CF2R. If installed system does not match this entry, it can be overwritten by rater but it will be flagged as a possible fail.>> |
| 03 | Condenser (or package unit) Make or Brand | <<auto filled text: referenced from CF2R. If installed system does not match this entry, it can be overwritten by rater but it will be flagged as a possible fail.>> |
| 04 | Condenser (or package unit) Model Number | <<auto filled text: referenced from CF2R. If installed system does not match this entry, it can be overwritten by rater but it will be flagged as a possible fail.>> |
| 05 | Nominal Cooling Capacity (tons) of Condenser | <<auto filled text: referenced from CF2R. If installed system does not match this entry, it can be overwritten by rater but it will be flagged as a possible fail.>> |
| 06 | Condenser (or package unit) Serial Number | <<auto filled text: referenced from CF2R. If installed system does not match this entry, it can be overwritten by rater but it will be flagged as a possible fail.>> |
| 07 | Refrigerant Type | <<auto filled text: referenced from CF2R. Possible entries are “R-22” or “R-410a”, or "other". If installed system does not match this entry, it can be overwritten by rater but it will be flagged as a possible fail.>> |
| 08 | Other Refrigerant Type (if applicable) | << if A07 value = R-22 or R-410A then value in this field = N/A; elseif value in A07= other, then user input text in this field to identify the refrigerant type>> |
| 09 | Liquid Line Filter Drier Installed According to Manufacturer’s Specifications (if applicable) | <<auto filled text: referenced from CF2R. Possible entries are “Yes” or “NA”. If installed system does not match this entry, it can be overwritten by rater but it will be flagged as a possible fail>> |
| 10 | Project Type | <<auto filled text: referenced from CF2R. Possible entries are “Completely New”, “Replacement”, or “Alteration”. If installed system does not match this entry, it can be overwritten by rater but it will be flagged as a possible fail.>> |
| 11 | Fault Indicator Display (FID) Status  (Note: Even systems with a FID must have refrigerant charge verified by installer) | <<auto filled text: referenced from CF2R. Possible entries are “This system has a factory installed FID”; or “This system has a field installed FID”; or “This system does not have a FID device installed”.>> |
| 12 | Is the system of a type that the minimum airflow can be verified using an approved measurement procedure (RA3.3 or RA3.3.3)? | <<auto filled text: referenced from CF2R. Possible entries are “yes” or “no”.>> |
| 13 | 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)? | <<auto filled text: referenced from CF2R. Possible entries are “yes” or “no”.>> |
| 14 | Date of HERS Rater Refrigerant Charge Verification for this System | <<user input: date: use validated date format>> |
| 15 | Refrigerant Charge Verification Method Used by Installer | <<auto filled text: referenced from CF2R. Possible entries are:   * Superheat (outdoor temperature must be ≥ 55 degF); or * Subcooling (outdoor temperature must be ≥ 55 degF); or * Weigh-in with Installer independent; or * Weigh-in with HERS Rater observation; or * Winter Setup (applicable when outdoor temperature is < 55 degF); or * New Package Unit Factory Charge >> |
| 16 | Person Who Performed the Refrigerant Charge Verification Reported on the Certificate of Installation | <<auto filled text: referenced from CF2R. Possible entries: HVAC System Installer or HERS Rater.>> |
| 17 | HERS Verification Compliance Requirement Status | <<auto filled text: referenced from CF2R. Possible entries:  "System does not qualify for Group Sampling"; or  ”System qualifies for Group Sampling.”>> |
|  | Generate list for next row (this is hidden from user) | If A11 = “no FID” and A15 = “Superheat”, then list =  Superheat  Else, If A11 = “no FID” and A15 = “Subcooling”, then list =  Subcooling  Winter Setup  Else, If A11 = “no FID” and A15 = “Weigh-In with Installer independent”, then list =  Superheat  Subcooling  Winter Setup  Else if A11 = “no FID” and A15 = “Weigh-in with HERS Rater observation”, then list =  Weigh-In Observation  Else, If A11 = “factory installed FID” or “field installed FID”, then list =  FID Verification  Else, If A11 = “no FID” and A15 = “Winter Setup”, then list =  Subcool  Winter Setup  Else, If A15 = “New Package Unit Factory Charge”, then do not proceed. A CF3R-MCH-25 is not required when a CF2R-MCH-25f is used.  Else, If A12 = “No”, or A13 = “No”, then list =  Weigh-In Observation |
| 18 | Refrigerant Charge Verification Method Used by HERS Rater | <<user pick one from list generated in previous row>>> |
|  | determine compliance method for this document; display applicable tables below;  (this row not visible to user) | <<calculated field:  If A18=Superheat; then display method:  25a Superheat Charge Verification Procedure;  elseif A18= Subcooling; then display method:  25b. Subcooling Charge Verification Method;  elseif A18= Weigh-in Observation; then display method:  25c. Weigh-in Observation Procedure;  elseif A18=Winter Setup; then display method:  25e. Winter Setup for Standard Charge Verification;  elseif A18= FID Verification; then display method:  25d. FID Verification Method; |

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| **MCH-25b - Refrigerant Charge Verification - Subcooling Method** |

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| **B. Metering Device Verification**  HERS Rater is required to visually field verify all information from C2R. Subcooling Method can only be used on systems that have a variable metering device. | | |
| 01 | Refrigerant Metering Device | <<autofill, reference from C2R. Choices are Thermostatic Expansion Valve or Electronic Expansion Valve. If installed system does not match this entry, it can be overwritten by rater but it will be flagged as a possible fail.>> |
| 02 | Subcooling Method Applicability Status | << If B01 = Thermostatic Expansion Valve or Electronic Expansion Valve; then display text:  “Subcooling Method is applicable to this system”;  else, display text:  ”Subcooling Method is not applicable to this system” (do not proceed)>> |

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| **C. Instrument Calibration**  HERS Raters are required to calibrate their diagnostic tools. Procedures for instrument calibration are given in Reference Residential Appendix RA3.2.2 and RA3.2.2.2 | | |
| 01 | Date of Digital Refrigerant Gauge Calibration | <<user input: date of calibration: use validated date format>> |
| 02 | Date of Digital Thermocouple Calibration | <<user input: date of calibration: use validated date format>> |
| 03 | Digital Refrigerant Gauge Calibration Status | <<if A14 compared to C01 is greater than one month, then display text:  "Digital Refrigerant Gauge requires Calibration (do not proceed)";  elseif A14 compared to C01 is ≥ 0 and ≤one month; then display text:  "calibration is current">> |
| 04 | Digital Thermocouple Calibration Status | <<if A14 compared to C02 is greater than one month, then display text:  "Digital Thermocouple Gauge requires Calibration (do not proceed)"  elseif A14 compared to C01 is ≥ 0 and ≤one month; then display text:  "calibration is current">> |

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| **D. 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 | << reference value from CF2R as default; allow user to override the default and pick one from list:   * "MAH installed and labeled consistent with Figure 3.2-1"; or * "Return side of system is located entirely within conditioned space such that an accurate return air dry-bulb temperature can be taken at the return grille"; or * "MAH cannot be installed consistent with Figure 3.2-1. An alternative location has been provided and clearly labeled">> * MAH is not installed. System does not comply |

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| **E. Minimum System Airflow Rate Verification**  Procedures for verifying minimum system airflow are specified in Reference Residential Appendix RA3.3.3.  <<require 1 row of data for each indoor unit listed in the "HERS Verification Requirements for Duct Systems" table on the MCH-01> | | | | |
| 01 | | | 02 | 03 |
| Indoor Unit Name or Description of Area Served | | | Minimum Required System Airflow Rate (cfm) | System Airflow Rate Verification Status |
| <<reference value from the "HERS Verification Requirements for Duct Systems" table on the MCH-01 for the "SC System Description of Area Served" value in A02>> | | | <calculated field, numeric xxxx.:  **if** A10= New or Replacement, and the system type on the MCH-01 is one of the following two:  \*small duct high velocity AC  \*small duct high velocity HP  **then**  value =A05\*250;  **elseif** A10= New or Replacement,  **then** display numeric value =A05\*350;  **elseif** A10=Alteration,  **then** display numeric value =A05\*300; | <<if the CF2R-MCH-01 indicates a MCH-28 is required for alternate minimum airflow rate compliance, then  if the system has a registered CF3R-MCH-28 that indicates compliance with Table 150.0-B or C return duct design requirements, then result =**system complies using Table 150.0-B or C alternative return duct design criteria**.  else result=**System does not comply. A registered CF3R-MCH-28 is required** (do not allow this MCH-25 to be registered).  elseif the CF2R-MCH-01 indicates a MCH-23 is required for minimum airflow rate compliance, then  if this system has a registered CF3R-MCH-23a or CF3R-MCH-23b that meets the compliance criterion in E01, then result = **System complies with minimum airflow rate requirements**;  elseif A10=Alteration, then  if the system complies with the alternative airflow compliance method on a registered CF3R-MCH23c; then result =**system complies using the alternative remedial actions specified in RA3.3.3.1.5**. **This System does not qualify for Group Sampling.**  else result=**System does not comply. A registered CF3R-MCH-23 for this system is required** . (do not allow this MCH-25 to be registered)>> |
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| 04 | | Compliance Statement: << If all indoor units listed in E01 indicate a compliant result in E03, then text result= "SC system complies with Minimum System Airflow Rate Verification"; else text result= "SC system does not comply with with Minimum System Airflow Rate Verification", and do not allow this MCH-25 to be registered. | | |
| Notes: | | | | |

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| **F. Data Collection and Calculations**  HERS Rater must independently collect all data in this section. Procedures for determining Refrigerant Charge using the Standard Charge Verification Procedure are given in Reference Residential Appendix RA3.2.2. | | |
| 01 | Lowest Return Air Dry-bulb Temperature that Occurred During the Refrigerant Charge Verification Procedure (°F) | <<user input: numeric: xxx.x, (in order to have a verification that complies, the return air drybulb temperature must remain above 70F during the verification procedure), range = 0 to 130>> |
| 02 | Measured Condenser Air Entering Dry-bulb Temperature  (T condenser, db) | <user input: numeric: xxx.x, check range), range = 0 to 130> |
| 03 | Outdoor Temperature Qualification Status | <<if F02<55F, then display text: " Subcooling refrigerant charge verification methods are not allowed to be used when the outdoor temperature is less than 55F", do not proceed>> |
| 04 | Measured Liquid Line Temperature (Tliquid) (°F) | <user entry, check range = -40 to 150> |
| 05 | Measured Liquid Line Pressure (Pliquid) (psig) | <user entry, check range = 0 to 800> |
| 06 | Condenser Saturation Temperature (Tcondensor, sat)  from Digital Gauge or P-T Table using Line F05 (°F) | <user entry, check range = -40 to 150> |
| 07 | Measured Subcooling (Line F06 – Line F04) (°F) | <<temperature, calculated (F06 – F04)>> |
| 08 | Target Subcooling from Manufacturer (°F) | <user entry, check range = 0 to 50> |
| 09 | Compliance Statement: <<if F01 ≥ 70, ABS(F07 – F08) ≤ 6, and F07 ≥ 2, then display text: “System Complies with Subcooling Method – Must also pass Metering Device Verification, next section.” | |

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| **G. Metering Device Verification**  HERS Rater must independently collect all data in this section. Procedures for the verification of proper metering device operation are specified in RA3.2.2.6.2 | | |
| 01 | Measured Suction Line Temperature (Tsuction) (°F) | <user entry, check range = -40 to 150> |
| 02 | Measured Suction Line Pressure (Psuction) (psig) | <user entry, check range = 0 to 400> |
| 03 | Evaporator Saturation Temperature (Tevaporator, sat)  from Digital Gauge or P-T Table using line G02 (°F) | <user entry, check range = -40 to 150> |
| 04 | Measured Superheat (Line G01 – Line G03) (°F) | <<temperature, calculated, Line G01 – Line G03>> |
| 05 | Measured Superheat (Line G04) is between 3°F and 26° F (inclusive) | <<if 3 ≤ G04 ≤ 26 then display text “Passes CEC requirement”>> |
| 06 | Measured Superheat (Line G04) is within Manufacturer’s Specifications (if known) | <<user entry, choose “Not known”, “Yes, documentation to be provided upon request”, or “No”>> |
| 07 | Compliance Statement: << If G05 = “Passes CEC requirement” and G06 = “Not known”, or G06 = “Yes, documentation to be provided upon request”, then display text: “Metering Device Verification Passes” | |

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| **H. 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 | <<if C03 and C04=calibration is current; and D01≠ System does not comply; andE02≠ System does not comply; and F09= System complies with Subcooling Method; and G07= Metering Device Verification Passes; then display: Complies: All specified verification protocol requirements on this document are met; else display: Does not comply: One or more specified verification protocol requirements on this document are not met >> |

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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:   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: |