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Note: If installation of a Charge Indicator Display (CID) is utilized as an alternative to refrigerant charge verification for compliance, a MECH-24 Certificate (instead of this MECH-25 Certificate) should be used to demonstrate compliance with the refrigerant charge verification requirement. TMAH and STMS are not required for compliance when a CID is utilized for compliance.

As many as 4 systems in the dwelling can be documented for compliance using this form. Attach an additional form(s) for any additional systems in the dwelling as applicable.

Temperature Measurement Access Holes (TMAH) and Saturation Temperature Measurement Sensors (STMS)
Procedures for installing TMAH are specified in Reference Residential Appendix RA3.2. If refrigerant charge verification is required for compliance, TMAH are also required for compliance, unless the TMAH Compliance Option is chosen.

STMS are only required for completely new or replacement space-conditioning systems that utilize prescriptive compliance method.

TMAH - Access Holes in Supply and Return Plenums of Air Handler

System Name or Identification/Tag					
System Location or Area Served					
1	5/16 inch (8 mm) access hole upstream of evaporative coil in the return plenum and labeled according to Figure in Section RA3.2.2.2.2.	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
1a	Return side of the duct system is located entirely within conditioned space and return airflow temperature to be measured at the return grille.	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
2	5/16 inch (8 mm) access hole downstream of evaporative coil in the supply plenum and labeled according to Figure in Section RA3.2.2.2.2.	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
The TMAH Compliance Option should be checked *only* if it is physically impossible to drill the TMAH as required by Section RA3.2.2.2.2. Using this Compliance Option requires the HVAC installer to annotate on the HERS Provider's data registry an explanation as to why the TMAH cannot be installed on the system, and photographs of the equipment on which the TMAH cannot be installed. Use of this Compliance Option also requires minimum airflow verification through the direct measurement of airflow per RA3.3. For more information see http://www.energy.ca.gov/title24/2008standards/special_case_appliance/					
TMAH Compliance Option		☐	☐	☐	☐
Yes to 1 *and* 2, *or* Yes to 1a *and* 2, *or* checking the TMAH Compliance Option, is a pass. Enter Pass or Fail		☐ Pass ☐ Fail	☐ Pass ☐ Fail	☐ Pass ☐ Fail	☐ Pass ☐ Fail

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STMS - Sensor on the Evaporator Coil

System Name or Identification/Tag					
3	The sensor is factory installed, or field installed according to manufacturer's specifications, or is installed by methods/specifications approved by the Executive Director.				
		☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
4	The sensor wire is terminated with a standard mini plug suitable for connection to a digital thermometer. The sensor mini plug is accessible to the installing technician and the HERS rater without changing the airflow through the condenser coil				
		☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
5	The sensor measures the saturation temperature of the coil within 1.3 degrees F				
		☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Yes to 3, 4, and 5 is a pass. Enter N/A if STMS are not applicable. Otherwise enter Pass or Fail		☐ N/A ☐ Pass ☐ Fail	☐ N/A ☐ Pass ☐ Fail	☐ N/A ☐ Pass ☐ Fail	☐ N/A ☐ Pass ☐ Fail

STMS - Sensor on the Condenser Coil

System Name or Identification/Tag					
6	The sensor is factory installed, or field installed according to manufacturer's specifications, or is installed by methods/specifications approved by the Executive Director.				
		☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
7	The sensor wire is terminated with a standard mini plug suitable for connection to a digital thermometer. The sensor mini plug is accessible to the installing technician and the HERS rater without changing the airflow through the condenser coil				
		☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
8	The sensor measures the saturation temperature of the coil within 1.3 degrees F				
		☐Yes ☐No	☐Yes ☐No	☐Yes ☐No	☐Yes ☐No
Yes to 6, 7, and 8 is a pass. Enter N/A if STMS are not applicable. Otherwise enter Pass or Fail		☐ N/A ☐ Pass ☐ Fail	☐ N/A ☐ Pass ☐ Fail	☐ N/A ☐ Pass ☐ Fail	☐ N/A ☐ Pass ☐ Fail

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Standard Charge Measurement Procedure (for use if outdoor air dry-bulb temperature is 55 °F or above)

Procedures for determining Refrigerant Charge using the Standard Charge Measurement Procedure are available in Reference Residential Appendix RA3.2. As many as 4 systems in the dwelling can be documented for compliance using this form. Attach an additional form(s) for any additional systems in the dwelling as applicable.

- *The system should be installed and charged in accordance with the manufacturer's specifications before starting this procedure.*
- *The system must meet minimum airflow requirements as prerequisite for a valid refrigerant charge test.*
- *If outdoor air dry-bulb temperature is less than 55 °**F** , the installer must use the RA3.2.3 Alternate Charge Measurement Procedure (Weigh-In Charging Method). If the Weigh-In Method is used, the dwelling cannot be included in a sample group for HERS verification compliance.)*

Space Conditioning Systems

System Name or Identification/Tag				
System Location or Area Served				
Outdoor Unit Serial #				
Outdoor Unit Make				
Outdoor Unit Model				
Nominal Cooling Capacity (ton)				
Date of Verification				

Calibration of Diagnostic Instruments

Date of Refrigerant Gauge Calibration		(must be re-calibrated monthly)
Date of Thermocouple Calibration		(must be re-calibrated monthly)

Measured Temperatures (°F)

System Name or Identification/Tag				
Supply (evaporator leaving) air dry-bulb temperature ($T_{supply, db}$)				
Return (evaporator entering) air dry-bulb temperature ($T_{return, db}$)				
Return (evaporator entering) air wet-bulb temperature ($T_{return, wb}$)				
Evaporator saturation temperature ($T_{evaporator, sat}$)				
Condensor saturation temperature ($T_{condensor, sat}$)				
Suction line temperature ($T_{suction}$)				
Liquid Line Temperature (T_{liquid})				
Condenser (entering) air dry-bulb temperature ($T_{condenser, db}$)				

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Minimum Airflow Requirement

Temperature Split Method Calculations for determining Minimum Airflow Requirement for Refrigerant Charge Verification. The temperature split method is specified in Reference Residential Appendix RA3.2.				
System Name or Identification/Tag				
Calculate: Actual Temperature Split = $T_{return,\ db} - T_{supply,\ db}$				
Target Temperature Split from Table RA3.2-3 using $T_{return,\ wb}$ and $T_{return,\ db}$				
Calculate difference: Actual Temperature Split – Target Temperature Split =				
Passes if difference is between -3°F and +3°F or, upon remeasurement, if between -3°F and -100°F **Enter Pass or Fail**				
Note: Temperature Split Method Calculation is not necessary if actual Cooling Coil Airflow is verified using one of the airflow measurement procedures specified in Reference Residential Appendix RA3.3. If actual cooling coil airflow is measured, the value must be equal to or greater than the Calculated Minimum Airflow Requirement in the table below.				
Calculated Minimum Airflow Requirement (CFM) = Nominal Cooling Capacity (ton) X 300 (cfm/ton)				
System Name or Identification/Tag				
Calculated Minimum Airflow Requirement (CFM)				
Measured Airflow using RA3.3 procedures (CFM). Indicate measurement method: ☐ Plenum Pressure Matching ☐ Flow Grid ☐ Flow Capture Hood				
Passes if measured airflow is greater than or equal to the calculated minimum airflow requirement. **Enter Pass or Fail**				

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Superheat Charge Method Calculations for Refrigerant Charge Verification. This procedure is required to be used for fixed orifice metering device systems				
System Name or Identification/Tag				
Calculate: Actual Superheat = $T_{suction} - T_{evaporator,\ sat}$				
Target Superheat from Table RA3.2-2 using $T_{return,\ wb}$ and $T_{condenser,\ db}$				
Calculate difference: Actual Superheat – Target Superheat =				
System passes if difference is between -5°F and +5°F **Enter Pass or Fail**				

Subcooling Charge Method Calculations for Refrigerant Charge Verification. This procedure is required to be used for thermostatic expansion valve (TXV) and electronic expansion valve (EXV) systems.				
System Name or Identification/Tag				
Calculate: Actual Subcooling = $T_{condenser,\ sat} - T_{liquid}$				
Target Subcooling specified by manufacturer				
Calculate difference: Actual Subcooling – Target Subcooling =				
System passes if difference is between -3°F and +3°F **Enter Pass or Fail**				

Metering Device Calculations for Refrigerant Charge Verification. This procedure is required to be used for thermostatic expansion valve (TXV) and electronic expansion valve (EXV) systems.				
System Name or Identification/Tag				
Calculate: Actual Superheat = $T_{suction} - T_{evaporator,\ sat}$				
Enter allowable superheat range from manufacturer's specifications (or use range between 4°F and 25°F if manufacturer's specification is not available)				
System passes if actual superheat is within the allowable superheat range **Enter Pass or Fail**				

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Refrigerant Charge Verification – Standard Measurement Procedure

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Standard Charge Measurement Summary: System shall pass both refrigerant charge criteria, metering device criteria (if applicable), and minimum cooling coil airflow criteria based on measurements taken concurrently during system operation. If corrective actions were taken, all applicable verification criteria must be re-measured and/or recalculated.				
System Name or Identification/Tag				
System meets all refrigerant charge and airflow requirements. **Enter Pass or Fail**				

☐ Residential Appendix RA3.2.2 requires that if the outdoor temperature is between 55°F and 65°F the return air dry bulb temperature shall be maintained above 70°F during the Standard Charge Measurement Procedure. The signature of the Responsible Person in the declaration statement below certifies this requirement has been met for all applicable system verifications reported on this certificate.

DECLARATION STATEMENT

- I certify under penalty of perjury, under the laws of the State of California, the information provided on this form is true and correct.
- I am eligible under Division 3 of the Business and Professions Code to accept responsibility for construction, or an authorized representative of the person responsible for construction (responsible person).
- I certify that the installed features, materials, components, or manufactured devices identified on this certificate (the installation) conforms to all applicable codes and regulations, and the installation is consistent with the plans and specifications approved by the enforcement agency.
- I understand that a HERS rater will check the installation to verify compliance, and that that if such checking identifies defects, I am required to take corrective action at my expense. I understand that Energy Commission and HERS provider representatives will also perform quality assurance checking of installations, including those approved as part of a sample group but not checked by a HERS rater, and if those installations fail to meet the requirements of such quality assurance checking, the required corrective action and additional checking/testing of other installations in that HERS sample group will be performed at my expense.
- I reviewed a copy of the Certificate of Compliance (CF-1R) form approved by the enforcement agency that identifies the specific requirements for the installation. I certify that the requirements detailed on the CF-1R that apply to the installation have been met.
- **I will ensure that a completed, signed copy of this Installation Certificate shall be posted, or made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a signed copy of this Installation Certificate is required to be included with the documentation the builder provides to the building owner at occupancy.** I will ensure that all Installation Certificates will come from a HERS provider data registry for multiple orientation alternatives, and beginning October 1, 2010, for all low-rise residential buildings.

Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)		
Responsible Person's Name:		Responsible Person's Signature:
CSLB License:	Date Signed:	Position With Company (Title):
Is this installation monitored by a Third Party Quality Control Program (TPQCP)? ☐Yes ☐No		Name of TPQCP (if applicable):