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INSTALLATION CERTIFICATE		CF-6R-MECH-04
Space Conditioning Systems, Ducts and Fans		(Page 1 of 2)
Site Address:	**Enforcement Agency:**	**Permit Number:**

Space Conditioning Systems

Heating Equipment

Equip Type (package-heat pump)	CEC Certified Mfr. Name and Model Number	ARI Reference Number [2]	# of Identical Systems	Efficiency (AFUE, etc.) [1, 3] (≥CF-1R value) [4]	Duct Location (attic, crawl-space, etc.)	Duct R-value	Heating Load (Btu/hr)	Heating Capacity (Btu/hr)
Cooling Type	Mfr. Model			Measure Type				Capacity Measure
382	384	385	386	388	389	391	392	394

Cooling Equipment

Equip Type (package heat pump)	CEC Certified Mfr. Name and Model Number	ARI Reference Number [2]	# of Identical Systems	Efficiency (SEER and EER) [1, 3] (≥CF-1R value) [4]	Duct Location (attic, crawl-space, etc.)	Duct R-value	Cooling Load (Btu/hr)	Cooling Capacity (Btu/hr)
396	398	399	400	402	403	404	405	407
				SEER EER				

1. If project is new construction, see Footnotes to Standards Table 151-B and Table 151-C for duct ceiling alternative compliance.
2. ARI Reference Number can be found by entering the equipment model number at http://www.aridirectory.org/ari/ac.php#
3. Listed efficiency on this page must be greater than or equal (≥) to the value shown on the CF-1R form.
4. When CF-1R is reference it is also applicable to the CF-1R, CF-1R-AA or CF-1R-ALT

ALL BOXES MUST BE CHECKED TO BE A VALID FORM

408 ☐ §110-§113: HVAC equipment is certified by the California Energy Commission.

409 ☐ §150(h): Heating and/or cooling loads calculated in accordance with ASHRAE, SMACNA, or ACCA.

410 ☐ §150(i): Setback Thermostat on all applicable heating and/or cooling systems meet the requirements of §112(c).

411 ☐ §150(j)2: Pipe insulation for cooling system refrigerant suction, chilled water and brine lines meets minimum requirements of Table 150-B and includes a vapor retardant or is enclosed entirely in conditioned space.

Ducts and Fans

§150(m): Duct and Fans

412 ☐ 1. All air-distribution system ducts and plenums installed, sealed and insulated to meet the requirements of CMC Sections 601, 602, 603, 604, 605 and Standard 6-5; supply-air and return-air ducts and plenums are insulated to a minimum installed level of R-4.2 or enclosed entirely in conditioned space. Openings shall be sealed with mastic, tape or other duct-closure system that meets the applicable requirements of UL 181, UL 181A, or UL 181B or aerosol sealant that meets the requirements of UL 723. If mastic or tape is used to seal openings greater than 1/4 inch, the combination of mastic and either mesh or tape shall be used; and

413 ☐ 1. Building cavities, support platforms for air handlers, and plenums defined or constructed with materials other than sealed sheet metal, duct board or flexible duct shall not be used for conveying conditioned air. Building cavities and support platforms may contain ducts. Ducts installed in cavities and support platforms shall not be compressed to cause reductions in the cross-sectional area of the ducts.

414 ☐ 2D. Joints and seams of duct systems and their components shall not be sealed with cloth back rubber adhesive duct tapes unless such tape is used in combination with mastic and draw bands.

415 ☐ 7. Exhaust fan systems have back draft or automatic dampers.

416 ☐ 8. Gravity ventilating systems serving conditioned space have either automatic or readily accessible, manually operated dampers.

417 ☐ 9. Protection of Insulation. Insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind. Cellular foam insulation shall be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation that can cause degradation of the material.

418 ☐ 10. Flexible ducts cannot have porous inner cores.

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 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.**

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):

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INSTALLATION CERTIFICATE		CF-6R-MECH-20-HERS
Duct Leakage Test – Completely New or Replacement Duct System		(Page 1 of 2)
Site Address:	**Enforcement Agency:**	**Permit Number:**

Enter the Duct System Name or Identification/Tag:	23
Enter the Duct System Location or Area Served:	24
Note: Submit one Installation Certificate for each duct system that must demonstrate compliance in the dwelling.	

This certificate is required for compliance for completely new duct systems installed in new dwelling construction, and also for completely new or replacement duct systems in existing dwellings. For existing dwellings, a completely new or replacement duct system can also include existing parts of the original duct system (e.g., register boots, air handler, coil, plenums, etc.) if those parts are accessible and they can be sealed.

Duct Leakage Diagnostic Test – completely new or replacement duct system

Enter a value for the Allowed Leakage (CFM) for the duct system leakage verification. The value entered must be the Verified Low Leakage Ducts in Conditioned Space criteria or one of the three calculated leakage rates described below.

	Allowed Leakage (CFM)
Verified Low Leakage Ducts in Conditioned Space (VLLDCS) Compliance Credit. If compliance credit for verified low leakage ducts in conditioned space is shown in the special features section of the CF-1R, the leakage to outside test method must be used to verify duct leakage (refer to RA3.1.4.3.4), and 25 CFM must be entered for Allowed Leakage.	
Allowed leakage calculation – (select one calculation method from this section). Use 6% (*leakage factor* = 0.06) for calculations if tested at "final" or 4% (*leakage factor* = 0.04) if tested at "rough." When utilizing Low Leakage Air Handler (LLAH) credit, the allowed duct leakage may be specified by the CF-1R to be less than 6%, in which case the user-specified leakage rate must be used in the calculations below. For example, if the user-specified leakage (specified as a percentage of fan airflow) is reported on the CF-1R as 3%, then use a *leakage factor* of 0.03 in the calculations below.	
☐ Cooling system method: Nominal capacity of condenser in Tons 26 x 400 x *leakage factor* = 27 (CFM)	
☐ Heating system method: 21.7 x 28 Output Capacity in Thousands of Btu/hr x *leakage factor* = 29 (CFM)	
☐ Measured airflow method (RA3.3): Enter measured fan flow in CFM here 30 x *leakage factor* = 31 (CFM)	
Enter value for **Actual** leakage (CFM) in the right column, from measurement using applicable duct leakage pressurization test procedure from Reference Residential Appendix RA3.1(CFM @ 25 Pa).	Actual Leakage (CFM)
List **Actual** Leakage from duct leakage test (CFM)	32
Pass if Actual Leakage is less than Allowed Leakage 33 ☐ **Pass** ☐ **Fail**	
For complete replacement of duct systems only, if the 6 percent leakage rate criteria cannot be met, a smoke test should be performed to verify that the excess leakage is coming only from a pre-existing furnace cabinet (air handler cabinet), and not from other *accessible* portions of the duct system. A HERS rater must verify the installation (No sampling allowed). List **Actual** Leakage from smoke test(CFM)	34
Pass if all accessible leaks (except for existing air handler) are sealed using smoke 35 ☐ **Pass** ☐ **Fail**	

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INSTALLATION CERTIFICATE		CF-6R-MECH-20-HERS
Duct Leakage Test – Completely New or Replacement Duct System		(Page 2 of 2)
Site Address:	**Enforcement Agency:**	**Permit Number:**

Compliance Method

This dwelling was: (select one of the following two choices):

36 ☐ Tested at Final

☐ Tested at Rough-in (requires installer to complete the *visual inspection at final construction stage* described below)

Visual Inspection at Final Construction Stage (if applicable)

After installing the interior finishing wall and verifying that the above rough-in tests was completed, the following procedure must be performed:

37 ☐ For all supply and return registers, verify that the spaces between the register boot and the interior finishing wall are properly sealed.

38 ☐ If the house rough-in duct leakage test was conducted without an air handler installed, inspect the connection points between the air handler and the supply and return plenums to verify that the connection points are properly sealed.

39 ☐ Inspect all joints to ensure that no cloth backed rubber adhesive duct tape is used.

40 ☐ Outside air (OA) ducts for Central Fan Integrated (CFI) ventilation systems, shall not be sealed/taped off during duct leakage testing. CFI OA ducts that utilize controlled motorized dampers, that open only when OA ventilation is required to meet ASHRAE Standard 62.2, and close when OA ventilation is not required, may be configured to the closed position during duct leakage testing.

41 ☐ All supply and return register boots must be sealed to the drywall

42 ☐ New duct installations cannot utilize building cavities as plenums or platform returns in lieu of ducts.

43 ☐ Mastic and draw bands must be used in combination with Cloth backed, rubber adhesive duct tape to seal leaks at duct connections.

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):

Registration Number: _____ *Registration Date/Time:* _____ *HERS Provider:* _____

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INSTALLATION CERTIFICATE		CF-6R-MECH-21-HERS
Duct Leakage Test – Existing Duct System		**(Page 1 of 2)**
Site Address:	**Enforcement Agency:**	**Permit Number:**

Enter the Duct System Name or Identification/Tag:	161
Enter the Duct System Location or Area Served:	162
Note: Submit one Installation Certificate for each duct system that must demonstrate compliance in the dwelling.	

This installation certificate is required for compliance for alterations and additions in existing dwellings to space conditioning systems and duct systems.

Note: For existing dwellings, a completely new or replacement duct system can also include existing parts of the original duct system (e.g., register boots, air handler, coil, plenums, etc.) if those parts are accessible and they can be sealed. For a completely new or replacement duct system installed in an existing dwelling, use the Installation Certificate titled "Duct Leakage Test – Completely New or Replacement Duct System."

Duct Leakage Diagnostic Test – Existing Duct System

Select one compliance method from the following four choices.

☐ Option 1. Measured leakage less than 15% of Fan Airflow.

☐ Option 2. Measured leakage to outside less than 10% of Fan Airflow.

163 ☐ Option 3. Reduce leakage by 60% or more, and conduct smoke test to seal all accessible leaks.

☐ Option 4. Fix all accessible leaks using smoke test, and HERS rater must verify.

Note: (One of Options 1, 2 or 3 must be attempted before utilizing Option 4.)

Determine nominal **Fan Airflow** using one of the following three calculation methods.

164 ☐ Cooling system method: Size of condenser in Tons 165 x 400 = 166 CFM

☐ Heating system method: 21.7 x 167 Heating Output Capacity (kBtuh) = 168 CFM

☐ Measured system airflow using RA3.3 airflow test procedures: 169 CFM

1	**Option 1** used then: Allowed leakage = Fan Airflow 170 x 0.15 = 171 CFM Actual leakage = 172 CFM **Pass if Actual leakage is less than Allowed leakage**	173 ☐ Pass ☐ Fail
2	**Option 2** used then: Allowed leakage = Fan Airflow 174 x 0.10 = 175 CFM Actual leakage to outside = 176 CFM **Pass if Actual leakage to outside is less than Allowed leakage**	177 ☐ Pass ☐ Fail
3	**Option 3** used then: Initial leakage prior to start of work= 178 CFM Final leakage after sealing all accessible leaks using smoke test = 179 CFM Initial leakage 180 - Final leakage 181 = Leakage reduction 182 CFM (Leakage reduction 183 / Initial leakage 180) x 100% = % Reduction 184 **Pass if % Reduction ≥ 60%**	185 ☐ Pass ☐ Fail
4	**Option 4** used then: All accessible leaks repaired using smoke test. HERS rater must verify (No sampling). **Pass if all accessible leaks have been sealed using Smoke Test**	186 ☐ Pass ☐ Fail

☐ Outside air (OA) ducts for Central Fan Integrated (CFI) ventilation systems, shall not be sealed/taped off during duct leakage testing. CFI OA ducts that utilize controlled motorized dampers, that open only when OA ventilation is required to meet ASHRAE Standard 62.2, and close when OA ventilation is not required, may be configured to the closed position during duct leakage testing.

☐ All supply and return register boots must be sealed to the drywall if smoke test is utilized for compliance – applies to duct leakage compliance option 3 (leakage reduction by 60%) and option 4 (fix all accessible leaks) described above.

☐ New duct installations cannot utilize building cavities as plenums or platform returns in lieu of ducts.

☐ Mastic and draw bands must be used in combination with cloth backed rubber adhesive duct tape to seal leaks at all new duct connections.

DECLARATION STATEMENT

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- 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.
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- 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.
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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):

Registration Number: _____ *Registration Date/Time:* _____ *HERS Provider:* _____

15 / 100

INSTALLATION CERTIFICATE		CF-6R-MECH-22-HERS
HSPP/PSPP Installation; Cooling Coil Airflow & Fan Watt Draw Test		(Page 1 of 2)
Site Address:	**Enforcement Agency:**	**Permit Number:**

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.

Hole for the placement of a Static Pressure Probe (HSPP), and Permanently installed Static Pressure Probe (PSPP) in the supply plenum

When the Certificate of Compliance (CF1R) indicates Cooling Coil Airflow or Fan Watt Draw verification are required, HSPP or PSPP are required to be installed in each air handler in the dwelling. Procedures for installing HSPP and PSPP are described in Reference Residential Appendix RA3.3. This measure requires verification by a HERS rater.

Select one method from the two choices below for compliance with the HSPP/PSPP requirement for this dwelling.		
140 ☐	HSPP	1/4 inch (6 mm) hole labeled and located downstream of the evaporator coil in the supply plenum as shown in the figure in Section RA3.3.1.1.
☐	PSPP	1/4 inch (6 mm) hole equipped with a permanently installed pressure probe, labeled and located downstream of the evaporator coil in the supply plenum as shown in the figure in Section RA3.3.1.1.

System Name or Identification/Tag	141			
System Location or Area Served	142			
Confirm that a HSPP or PSPP has been installed on the air handler per the requirements of RA3.3.1.1. **Enter Pass or Fail**	143			

Cooling Coil Airflow Verification

When the Certificate of Compliance indicates Cooling Coil Airflow verification is required, the procedures for measuring the cooling coil airflow must be performed as specified in Reference Residential Appendix RA3.3. Results of the cooling coil airflow diagnostic test must be entered in the table below. This measure requires verification by a HERS rater.

Select one method from the three choices below for compliance with the Cooling Coil Airflow test requirement for this dwelling.	
144 ☐	Diagnostic Fan Flow Using Plenum Pressure Matching according to the procedures in RA3.3.3.1.1
☐	Diagnostic Fan Flow Using Flow Grid Measurement according to the procedures in RA3.3.3.1.2
☐	Diagnostic Fan Flow Using Flow Capture Hood according to the procedures in RA3.3.3.1.3

System Name or Identification/Tag	145			
System Location or Area Served	146			
Nominal Cooling Capacity (ton) of the outdoor unit.	147			
Enter the minimum airflow requirement from the CF-1R (CFM/ton).	148			
Calculate the target minimum airflow for the test by multiplying the CFM/ton criteria specified on the CF-1R by the nominal cooling capacity of the outdoor unit (ton). **Target (CFM)**	149			
Enter the diagnostically tested airflow (CFM). **Tested (CFM)**	150			
The system complies if Tested (CFM) is equal or greater than Target (CFM). **Enter Pass or Fail**	151			

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INSTALLATION CERTIFICATE		CF-6R-MECH-22-HERS
HSPP/PSPP Installation; Cooling Coil Airflow & Fan Watt Draw Test		(Page 2 of 2)
Site Address:	**Enforcement Agency:**	**Permit Number:**

Fan Watt Draw Verification

When the Certificate of Compliance indicates Fan Watt Draw verification is required, the procedures for measuring the Fan Watt Draw must be performed as specified in Reference Residential Appendix RA3.3. Results of the Fan Watt Draw diagnostic test must be entered in the table below. This measure requires verification by a HERS rater. Note: Fan watt draw must be measured simultaneously with cooling coil airflow. The fan watt draw measurement and cooling coil airflow measurement must simultaneously meet or exceed their target criteria specified by the CF-1R for the dwelling.

Select one method from the two choices below for compliance with the Fan Watt Draw test requirement for this dwelling.				
152 ☐ Portable Watt Meter Measurement according to the procedures in RA3.3.3.3.1				
☐ Utility Revenue Meter Measurement according to the procedures in RA3.3.3.3.2				
System Name or Identification/Tag	153			
System Location or Area Served	154			
Enter the air handler Tested (CFM) from the cooling coil airflow test table above.	155			
Enter the fan watt draw requirement from the CF-1R (Watt/CFM).	156			
Calculate the target maximum Watt draw for the test by multiplying the Watt/CFM criteria specified on the CF-1R by the air handler Tested (CFM). **Target (Watt)**	157			
Enter the diagnostically tested Watt draw (Watt). **Tested (Watt)**	158			
The system complies if Tested (Watt) is less than or equal to Target (Watt) **Enter pass or Fail**	159			

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- 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.
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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):

Registration Number: _____ *Registration Date/Time:* _____ *HERS Provider:* _____

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INSTALLATION CERTIFICATE		CF-6R-MECH-23-HERS
Verification of High EER Equipment		**(Page 1 of 1)**
Site Address:	**Enforcement Agency:**	**Permit Number:**

Verification of High EER Equipment

Procedures for verification of High EER Equipment are described in Reference Residential Appendix RA3.4. For dwelling units with multiple systems, the procedures must be applied to each system separately. 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.

1	System Name or Identification/Tag	127			
2	System Location or Area Served	128			
3	Certified EER Rating of the installed equipment (Btu/Watt-hr)	129			
4	Make and Model Number of the installed Outdoor Unit	130/131			
5	Make and Model Number of the installed Inside Coil	132/133			
6	Make and Model Number of the installed Furnace or Air Handler.	134/135			
7	Minimum Equipment EER required for compliance as reported on the CF-1R	136			
137	☐ When a high EER system specification includes a time delay relay, the installation of the time delay relay must be verified for compliance credit. Refer to Reference Residential Appendix RA3.4.3 for the Time Delay Relay Verification Procedure.				
139	☐ When installation of specific matched equipment is necessary to achieve a high EER, installation of the specific equipment must be verified for compliance credit. Refer to Reference Residential Appendix RA3.4.3 for the Matched Equipment Verification Procedure.				
8	If the Certified EER Rating in row 3 is equal to or greater than the required minimum EER in row 7, the unit complies. **If the unit complies enter Pass**	139			

DECLARATION STATEMENT

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- 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.
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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):

Registration Number: _____ *Registration Date/Time:* _____ *HERS Provider:* _____

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INSTALLATION CERTIFICATE		CF-6R-MECH-24-HERS
Charge Indicator Display (CID)		(Page 1 of 1)
Site Address:	**Enforcement Agency:**	**Permit Number:**

CHARGE INDICATOR DISPLAY (CID)

Charge Indicator Display (CID) specifications are available in Reference Joint Appendix JA6; HERS verification procedure for the CID is in Reference Residential Appendix RA3.4.2. If refrigerant charge verification is required for compliance, and a CID has been installed on the system, a pass for this CID verification for an installed system is sufficient for demonstrating compliance with the refrigerant charge verification requirement for that system, thus submittal of a standard refrigerant charge verification compliance form (MECH 25) is not required for a system that has a passing CID verification shown in the table below.

CID - Verification of the Presence and Proper Function of a Charge Indicator Display

System Name or Identification/Tag			257			
System Location or Area Served			258			
CID Manufacturer Name and Model Number			377/378			
259	1	☐Yes	☐No	The display module is mounted adjacent to the system thermostat		
260	2	☐Yes	☐No	The manufacturer has certified to the Energy Commission that the CID model meets the requirements of Reference Joint Appendix JA6		
261	3	☐Yes	☐No	The CID was installed by the manufacturer		
262	4	☐Yes	☐No	or if 3 is No, the CID was installed according to the manufacturer's specifications		
Yes to 1 and 2 and yes to either 3 or 4 is a pass				enter Pass or Fail	✓ ☐ Pass	✓ ☐ Fail

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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.
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- 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):

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INSTALLATION CERTIFICATE		CF-6R-MECH-25-HERS
Refrigerant Charge Verification - Standard Measurement Procedure		(Page 1 of 5)
Site Address:	**Enforcement Agency:**	**Permit Number:**

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. 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			243		
	System Location or Area Served			244		
245	1	☐Yes	☐No	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.		
246	2	☐Yes	☐No	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. 354		
	Yes to 1 and 2 is a pass.			Enter Pass or Fail	✓ ☐ Pass	✓ ☐ Fail

STMS - Sensor on the Evaporator Coil

	System Name or Identification/Tag			247		
248	3	☐Yes	☐No	The sensor is factory installed, or field installed according to manufacturer's specifications, or is installed by methods/specifications approved by the Executive Director.		
249	4	☐Yes	☐No	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		
250	5	☐Yes	☐No	The sensor measures the saturation temperature of the coil within 1.3 degrees F		
	Yes to 3, 4, and 5 is a pass. N/A if STMS are not applicable. Otherwise enter Pass or Fail			Enter	✓ ☐ N/A	✓ ☐ Pass ✓ ☐ Fail

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STMS - Sensor on the Condenser Coil

	System Name or Identification/Tag			251		
252	6	☐Yes	☐No	The sensor is factory installed, or field installed according to manufacturer's specifications, or is installed by methods/specifications approved by the Executive Director.		
253	7	☐Yes	☐No	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		
254	8	☐Yes	☐No	The sensor measures the saturation temperature of the coil within 1.3 degrees F		
	Yes to 6, 7, and 8 is a pass. N/A if STMS are not applicable. Otherwise enter Pass or Fail			Enter	✓ ☐ N/A	✓ ☐ Pass ✓ ☐ Fail

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

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 is 55 °F or below, 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	191			
System Location or Area Served	192			
Outdoor Unit Serial #	193			
Outdoor Unit Make	194			
Outdoor Unit Model	195			
Nominal Cooling Capacity (ton)	196			
Date of Verification	197			

Calibration of Diagnostic Instruments

Date of Refrigerant Gauge Calibration	198	(must be re-calibrated monthly)
Date of Thermocouple Calibration	199	(must be re-calibrated monthly)

Measured Temperatures (°F)

System Name or Identification/Tag	200			
Supply (evaporator leaving) air dry-bulb temperature ($T_{supply,\ db}$)	201			
Return (evaporator entering) air dry-bulb temperature ($T_{return,\ db}$)	202			
Return (evaporator entering) air wet-bulb temperature ($T_{return,\ wb}$)	203			
Evaporator saturation temperature ($T_{evaporator,\ sat}$)	204			
Condensor saturation temperature ($T_{condensor,\ sat}$)	205			
Suction line temperature ($T_{suction}$)	206			
Liquid Line Temperature (T_{liquid})	207			
Condenser (entering) air dry-bulb temperature ($T_{condenser,\ db}$)	208			

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	209			
Calculate: Actual Temperature Split = $T_{return,\ db} - T_{supply,\ db}$	210			
Target Temperature Split from Table RA3.2-3 using $T_{return,\ wb}$ and $T_{return,\ db}$	211			
Calculate difference: Actual Temperature Split – Target Temperature Split =	212			
Passes if difference is between -3°F and +3°F or, upon remeasurement, if between -3°F and -100°F **Enter Pass or Fail**	213			

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	214			
Calculated Minimum Airflow Requirement (CFM)	215			
Measured Airflow using RA3.3 procedures (CFM)	216			
Passes if measured airflow is greater than or equal to the calculated minimum airflow requirement. **Enter Pass or Fail**	217			

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	218			
Calculate: Actual Superheat = $T_{suction} - T_{evaporator,\ sat}$	219			
Target Superheat from Table RA3.2-2 using $T_{return,\ wb}$ and $T_{condenser,\ db}$	220			
Calculate difference: Actual Superheat – Target Superheat =	221			
System passes if difference is between -5°F and +5°F **Enter Pass or Fail**	222			

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	223			
Calculate: Actual Subcooling = $T_{condenser,\ sat} - T_{liquid}$	224			
Target Subcooling specified by manufacturer	225			
Calculate difference: Actual Subcooling – Target Subcooling =	226			
System passes if difference is between -3°F and +3°F **Enter Pass or Fail**	227			

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	228			
Calculate: Actual Superheat = $T_{suction} - T_{evaporator,\ sat}$	229			
Enter allowable superheat range from manufacturer's specifications (or use range between 4°F and 25°F if manufacturer's specification is not available)	230			
System passes if actual superheat is within the allowable superheat range **Enter Pass or Fail**	231			

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	232			
System meets all refrigerant charge and airflow requirements. **Enter Pass or Fail**	233			

☐ 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):

RCA C19-352 (19)

INSTALLATION CERTIFICATE		CF-6R-MECH-26-HERS
Refrigerant Charge Verification - Alternate Measurement Procedure		(Page 1 of 2)
Site Address:	Enforcement Agency:	Permit Number:

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. 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			360			
	System Location or Area Served			361			
362	1	☐Yes	☐No	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.		
363	2	☐Yes	☐No	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 to 1 and 2 is a pass.			Enter Pass or Fail	✓ ☐ Pass	✓ ☐ Fail

STMS - Sensor on the Evaporator Coil

	System Name or Identification/Tag			366			
367	3	☐Yes	☐No	The sensor is factory installed, or field installed according to manufacturer's specifications, or is installed by methods/specifications approved by the Executive Director.		
368	4	☐Yes	☐No	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		
369	5	☐Yes	☐No	The sensor measures the saturation temperature of the coil within 1.3 degrees F		
	Yes to 3, 4, and 5 is a pass. N/A if STMS are not applicable. Otherwise enter Pass or Fail			Enter	✓ ☐ N/A	✓ ☐ Pass	✓ ☐ Fail

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STMS - Sensor on the Condenser Coil

	System Name or Identification/Tag			371			
372	6	☐Yes	☐No	The sensor is factory installed, or field installed according to manufacturer's specifications, or is installed by methods/specifications approved by the Executive Director.		
373	7	☐Yes	☐No	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		
374	8	☐Yes	☐No	The sensor measures the saturation temperature of the coil within 1.3 degrees F		
	Yes to 6, 7, and 8 is a pass. N/A if STMS are not applicable. Otherwise enter Pass or Fail			Enter	✓ ☐ N/A	✓ ☐ Pass	✓ ☐ Fail

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INSTALLATION CERTIFICATE		CF-6R-MECH-26-HERS
Refrigerant Charge Verification - Alternate Measurement Procedure		**(Page 2 of 2)**
Site Address:	**Enforcement Agency:**	**Permit Number:**

Alternate Charge Measurement Procedure (for use if outdoor air dry-bulb is below 55 °F)

Procedures for Determining Refrigerant Charge using the Alternate Method 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 alternative charge measurement procedure requires that the system shall be installed and charged in accordance with the manufacturer's specifications for refrigerant charge using the weigh-in charging method.*
- *Installer verification of line lengths and charge adjustment calculation must be documented on CF-6R before starting this procedure.*
- *If outdoor air dry-bulb is 55 °F or above, installer must use the Standard Charge Measure Procedure.*

Weigh-In Charging Method for Refrigerant Charge Verification				
System Name or Identification/Tag	234			
System Location or Area Served	235			
Actual liquid line length (ft)	236			
Manufacturer's Standard liquid line length (ft)	237			
Calculate: difference in length (ft) = Actual length – Standard length	238			
Manufacturer's correction factor (ounces per foot)	239			
Calculate: charge adjustment = correction factor X difference in length	240			
Alternate Charge Measurement Summary: System refrigerant charge has been adjusted to meet the manufacturer's specifications based on actual line length **Enter Pass or Fail**	241			

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.
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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):