



Development Services Department  
 Building Division  
 311 Vernon Street  
 Roseville, California 95678-2649

2013 Building Energy y Standards-

Residential HVAC Alterations

Prescriptive HVAC requirements and compliance Forms

SUMMARY OF PRESCRIPTIVE HVAC REQUIREMENTS\*\*:

Split Systems and packaged Systems	Mandatory Measures					Prescriptive Requirements	
	Change this (and nothing else)	Set back Thermostat §110.2(c) §150.2(b)F	Cooling Load Calcs §150.0(h) §150.2(b)1C	Heating Load Calcs §150.0(h) §150.2(b)1C	Hers: Duct Seal & Test §150.0(m)1-3 & 11 §150.2(b)1C, D, & E	Hers: Cooling Coil Airflow and Fan Watt Draw §150.0(m)12,13&15 §150.2(b)1C, D	Duct Insulation §150.2(c) 9 §150.2(b)1D
Whole split or packaged system (no ducts added or replaced)	Yes	no	no <sup>A</sup>	Yes <sup>B</sup>	no	no	Yes <sup>C,D</sup>
Evaporator coil (cooling coil), condenser coil, or outdoor condensing unit	Yes	no	no <sup>A</sup>	Yes <sup>B</sup>	no	no	Yes <sup>C,D</sup>
Furnace (air handler)	Yes	no	no <sup>A</sup>	Yes <sup>B</sup>	no	no	Yes <sup>C,D</sup>
Compressor, refrigerant metering device	Yes	no	no <sup>A</sup>	no	no	no	Yes <sup>C,D</sup>
Some ducts	no	may be <sup>E</sup>	may be <sup>A,E</sup>	Yes <sup>B</sup>	no	Yes <sup>F</sup>	no
"All New ducts"	no	may be <sup>E</sup>	may be <sup>A,E</sup>	Yes <sup>H</sup>	Yes <sup>I</sup>	Yes <sup>F</sup>	no
Whole split or packaged system and al new ducts	Yes	Yes <sup>E</sup>	Yes <sup>A,E</sup>	Yes <sup>H</sup>	Yes <sup>I</sup>	Yes <sup>F</sup>	Yes <sup>C,D</sup>
<b>Note :</b> <ul style="list-style-type: none"> <li>Replacing the blower wheel fan is considered a repair and does NOT trigger the standards.</li> <li>All new HVAC equipment must meet minimum federal efficiency requirements</li> <li>Cooling line insulation is triggered if the line set (cooling system, suction line) is replaced or repaired. Line sets ≤ 1.5" in diameter must have 0.5" thick insulation.</li> </ul>							

\*\*Source of Table: ACE Resources

- A Heating equipment must meet CBC minimum capacity requirements.
- B Duct systems must be sealed and verified if >40 ft. of ducts in unconditioned space. Duct system leakage must be ≤15% in total, or ≤10% to the outside. Or, if unable to meet the sealing requirements, all accessible leaks must be sealed and verified by HERS rater.
- C HERS verification of refrigerant charge is required in climate zones 2 and 8-15 when a refrigerant containing component of air conditioner or heat pump is replaced or installed in an existing building.
- D Although there are no commercially available HVAC systems with approved Charge Indicator Display (CID) devices at the time of publication (October 2013), the standards do allow use of a CEC –approved CID should such equipment become available during the 2013 code cycle.
- E Cooling and heating load calculations are required when ducts are added to **serve new conditioned space**, such as an addition.
- F Mandatory duct insulation requirements (R-6) apply to all new or replacement ducts (not existing or unaltered ducts). When replacing >40 ft. of ducts in unconditioned space: CZ 1-10, and 12-13: R-6: CZ 11 and 14-16: R-8. HERS verification is required for insulated ducts in conditioned space.
- G The system is considered to have “all new” ducts when 75% or more of the ducts are new material and up to 25% reused parts from the existing duct system (e.g., registers, grilles, boots, air handler, coil, plenums, duct material) if the reused parts are accessible and can be sealed to prevent leakage.
- H In all climate zones, when new duct systems are installed in unconditioned space, leakage must be ≤6% of the air handler airflow.
- I When new duct systems are installed, cooling coil airflow must be >300CFM per ton, and fan watt draw must be ≤0.58 W/CFM. Alternatively, the system can meet the requirement in Table 150.0-C or Table 150.0-D (Return Duct Sizing and Filter Sizing).

**PRESCRIPTIVE COMPLIANCE FORMS \*\*:**

<b>For All HVAC Alterations:</b>
<p><b>All HVAC alterations require :</b></p> <ul style="list-style-type: none"> <li>• Permit- for all HVAC changeouts</li> <li>• CF1R: Certificate of Compliance: Alteration to an HVAC System (CF1R-ALT-02*-E, or CF1R- ALT-03-E or CF1R-ALT-04-E)</li> <li>• CF2R-MCH-01-H: Certificate of Installation for space Conditioning Systems, Ducts and Fans. Completed and signed by the installing contractor and made available for final inspection by building department.</li> </ul>
<b>For HERS Measures:</b>
<p>Project with HERS measures require:</p> <ul style="list-style-type: none"> <li>• Registration of the CF1R, via HERS provider</li> <li>• CF2R-MCH...H: Certificate of Installation for mechanical system with HERS measures</li> </ul>

- Completed and signed by the installing contractor; must be submitted to a HERS Provider Registry after the contractor has signed it, and made available for inspection by the building department.
- CF3R-MCH: Certificate of Field Verification for mechanical system with HERS measures. Completed and registered by HERS Rater for each CF2R-H; the HERS Rater or contractor ensures the relevant CF3R<sub>s</sub> are available for final inspection by the building department.
- HERS: Duct Leakage Diagnostic Test – CF2R-MCH-20\*-H and CF3R-MCH-20\*-H
- HERS: Fan Efficacy (fan Watt Draw)- CF2R-MCH-22-H and CF3R-MCH-22-H *And*
- HERS: Space Conditioning System Airflow Rate – CF2R-MCH-23\*-H and CF3R-MCH-23\*-H
- HERS: Refrigerant charge Verification – CF2R-MCH-25\*-H and CF3R-MCH-25\*-H *Or* – CF2R-MCH-25f-E (for packaged systems with refrigerant charge certified by manufacturer)

\* Correct version (e.g. “a” or “b” or “c”) varies depending upon the project scope and approach used to demonstrate compliance

For Projects with New or Replacement Systems using Duct and Filter Sizing:

**Projects that use Duct and Filter Sizing instead of the cooling Coil Airflow and Fan Watt Draw Hers Measure require:**

- CF2R-MCH-28-H and CF3R-MCH-28-H

\*\*Source: ACE Resources



CERTIFICATE OF COMPLIANCE	CF1R-ALT-04-E
Alterations - HVAC CZ 2, and 8-15 (formerly CF-1R-ALT-HVAC)	(Page 1 of 1)

<b>Site Address:</b>		<b>Enforcement Agency:</b>		<b>Date Prepared:</b>	<b>Permit#:</b>
Equipment Type		Equipment Efficiency		New Ducting, <i>Plenums, Lineset:</i> Required R-value	Conditioned Floor Area (sq ft)
<input type="checkbox"/> Packaged System	<input type="checkbox"/> Evaporator Coil	___ AFUE	___ COP	<input type="checkbox"/> R-6 (CZ 2, 8-13) Ducting	Served by system
<input type="checkbox"/> Split System	<input type="checkbox"/> Condensing Unit	___ SEER	___ HSPF	<input type="checkbox"/> R-8 <sup>1</sup> (CZ 11, 14, 15) Ducting	___ sqft
<input type="checkbox"/> Mini Split	<input type="checkbox"/> Compressor	___ EER		<input type="checkbox"/> R-6 (all CZ's) Plenums	
<input type="checkbox"/> Furnace	<input type="checkbox"/> Lineset			<input type="checkbox"/> R-5 or R7.5) Lineset <sup>4</sup>	
	<input type="checkbox"/> TXV				<input type="checkbox"/> Setback (If not already present, must be installed)

**HERS VERIFICATION SUMMARY** Installer determines work to be completed and matches to one of the options below. At permit application this form is allowed to be filled out by hand. For final inspection all forms are to be registered (no hand filled forms allowed) and a copy left on site.

<input type="checkbox"/> <b>1. HVAC Changeout/Repair</b>	<b>Required Compliance Documents to be left on site for Final:</b>
All Equipment, Condenser Unit, Evaporator Coil, Compressor, TXV, Lineset, Air Handler/Furnace <sup>2</sup> (Can include new ducting)	CF1R-ALT-02-E CF2R: MECH-01, MECH-20-HERS, MECH-(23 or 24) <sup>2</sup> -HERS, MECH-25-HERS <sup>2</sup> CF3R: MECH-20-HERS, MECH-(23 or 24)-HERS <sup>2</sup> , MECH-25-HERS <sup>2</sup>

**Installer Requirement:** Duct leakage ( $\leq 15\%$ , or  $\leq 10\%$  to outside, or seal all accessible leaks), Air Flow  $\geq 300$  CFM/ton, Refrigerant Charge.  
 Exempted from duct leakage testing if:

- 1. Duct system registered with HERS provider as previously sealed, or
- 2. There is less than 40 linear feet of duct in unconditioned space, or
- 3. Existing duct systems are constructed, insulated or sealed with asbestos (list manufacture date of building \_\_\_\_\_)

<input type="checkbox"/> <b>2. New HVAC System</b>	<b>Required Compliance Documents to be left on site for Final:</b>
All new equipment and All New Ducts <sup>3</sup> including Mini Split	CF1R-ALT-02-E CF2R: MECH-01, MECH-20-HERS, MECH-22-HERS, MECH-(23 or 24)-HERS <sup>2</sup> , MECH-25-HERS <sup>2</sup> CF3R: MECH-20-HERS, MECH-22-HERS, MECH-(23 or 24)-HERS <sup>2</sup> , MECH-25-HERS <sup>2</sup> Mini Splits require CF1R-ALT-02-E, CF2R-MECH-01, and (CF2R-CF3R) MECH-25-HERS

**Installer Requirement:** Duct leakage  $\leq 6\%$ , Fan Efficacy (.58W/CFM), Air Flow  $\geq 350$  CFM/ton (or alternative), Refrigerant Charge

<input type="checkbox"/> <b>3. All New Ducts with Replacement</b>	<b>Required Compliance Documents to be left on site for Final:</b>
All New Ducts <sup>3</sup> and one or more of the following replaced: Condenser Unit, Evaporator Coil, Compressor, TXV, Lineset, Furnace <sup>2</sup>	CF1R-ALT-02-E CF2R: MECH-01, MECH-20-HERS, MECH-(23 or 24)-HERS, MECH-25-HERS CF3R: MECH-20-HERS, MECH-(23 or 24)-HERS, MECH-25-HERS

**Installer Requirement:** Duct leakage  $\leq 6\%$ , Air Flow  $\geq 350$  CFM/ton (or alternative), Refrigerant Charge  
 Exempted from duct leakage testing if:  1. Existing duct systems are constructed, insulated or sealed with asbestos

<input type="checkbox"/> <b>4. New Ducting over 40 feet</b>	<b>Required Compliance Documents to be left on site for Final:</b>
New ducting but less than All New Ducts <sup>3</sup>	CF1R-ALT-02-E, CF2R: MECH-20-HERS, CF3R: MECH-20-HERS

**Installer Required to:** Duct leakage ( $\leq 15\%$  or,  $\leq 10\%$  to outside or, or seal all accessible leaks)  
 EXCEPTION: Existing duct systems constructed, insulated or sealed with asbestos.

<sup>1</sup> All new ducting R-8 required when more than 40 ft installed and R-6 when less than 40 ft installed. This includes in walls, between floors etc.  
<sup>2</sup> Heating only systems and Air Handler/Furnace changes do not require Air Flow MECH-(23 or 24), or Refrigerant Charge verification MECH-25  
<sup>3</sup> All New Ducts is when at least 75 percent of the duct system is new duct material, and up to 25 percent may consist of reused parts from the dwelling unit's existing duct system (e.g., registers, grilles, boots, air handler, coil, plenums, duct material)  
<sup>4</sup> R-5 (1" thick insulation) for linesets 1" and less. R-7.5 (1.5" thick insulation) for linesets over 1 inch. Most mfg will require Suction line Diameter with insulation as the following 1.5-2T-2<sup>5</sup>/<sub>8</sub>", 2.5-3T-2<sup>3</sup>/<sub>4</sub>", 3.5 to 4T-2<sup>3</sup>/<sub>4</sub>", 5T-4<sup>1</sup>/<sub>4</sub>"

**Contractor (Documentation Author's /Responsible Designer's Declaration Statement)**

I certify the following under penalty of perjury, under the laws of the State of California:

- The information provided on this Certificate of Compliance is true and correct.
- I am eligible under Division 3 of the California Business and Professions Code to accept responsibility for the information on this document.
- That the energy features and performance specifications for the design identified on this Certificate of Compliance conform to the requirements of Title 24, Parts 1 and 6 of the California Code of Regulations (CCR).
- That the energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the CCR.
- The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.

Responsible Designer Name:	Responsible Designer Signature:	Date Signed:	License:
Company:	Address:	City/State/Zip:	Phone: