Ace Resources

Title 24 Part 6
Residential Triggers Sheet

HVAC Alterations

Split Systems and Packaged Systems	Mandatory Measures					Prescriptive Requirements	
	Setback 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 and 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 §150.1(c)9 §150.2(b)1D	HERS: Refrigerant Charge §150.1(c)7 A §150.2(b)1 F
Change this (and nothing else)							
Whole split or packaged system (no ducts added or replaced)	YES	no	no A	YES B	no	no	YES C, D
Evaporator coil (cooling coil), **condenser coil, or outdoor condensing unit**	YES	no	no A	YES B	no	no	YES C, D
Furnace (air handler)	YES	no	no A	YES B	no	no	YES C, D
Compressor, refrigerant metering device	YES	no	no A	no	no	no	YES C, D
Some ducts	no	maybe E	maybe A, E	YES B	no	YES F	no
"All new" ducts G	no	maybe E	maybe A, E	YES H	YES I	YES F	no
Whole split or packaged system and all new ducts	YES	YES E	YES A, E	YES H	YES I	YES F	YES C, D

NOTE:
- Replacing the blower wheel fan is considered a repair and does NOT trigger the Standards.
- All new HVAC equipment must meet minimum federal efficiency requirements
- 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.

A Heating equipment must meet CBC minimum capacity requirements.

B Unless exceptions apply, duct systems must be sealed and verified if >40 feet 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 a HERS rater.

C HERS verification of refrigerant charge is required in **climate zones 2 and 8–15 only** when a refrigerant containing component of an 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 (July 2014) 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 When adding or replacing >40 feet 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. Mandatory duct insulation requirements (R-6) apply to all new or replacement ducts (not existing or unaltered ducts).

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 >350 CFM per ton, and fan watt draw must be ≤0.58W/CFM. Alternatively, the system can meet the requirements in Table 150.0-C or Table 150.0-D (Return Duct Sizing and Filter Sizing).

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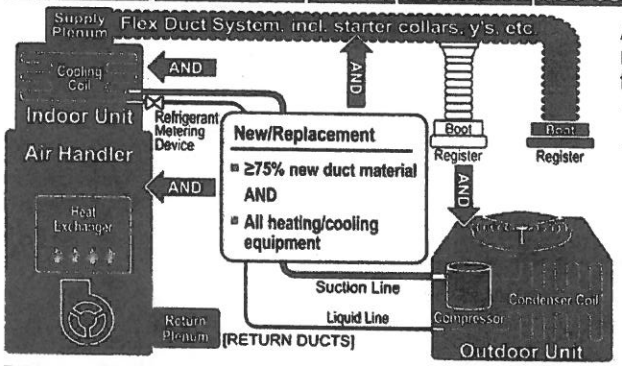
Turn Over

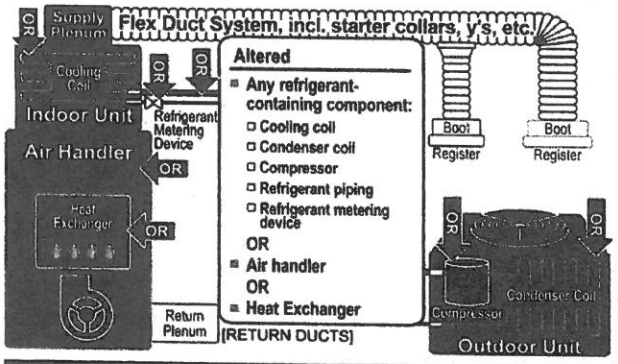
2013 Entirely New or Complete Replacement Space-Conditioning System §150.2(b)1C



A space-conditioning system is considered entirely new or a complete replacement when all of the following are installed or replaced:

- All the system heating/cooling equipment
- ≥75% new duct material [G]

2013 Altered Space-Conditioning System §150.2(b)1E, F

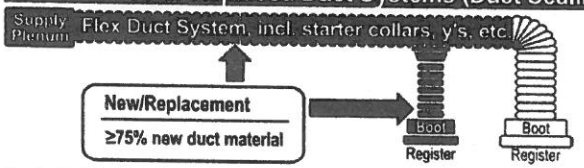


A space-conditioning system is considered altered when it is not a new or replacement system and any of the following components is installed or replaced:

- Any refrigerant-containing component, including:
  - Cooling coil
  - Condenser coil
  - Compressor
  - Refrigerant piping
  - Refrigerant metering device
- Air handler
- Heat exchanger

Replacing other components is considered a repair — not an alteration. For example, replacing the blower wheel fan, but not the heat exchanger or air handler in the furnace, is a repair.

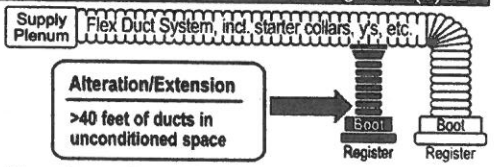
2013 Altered or Replaced Duct Systems (Duct Sealing) §150.2(b)1D



Entirely New or Complete Replacement Ducts

Entirely new or complete replacement duct systems are those that contain at least 75% new duct material. Existing duct system components (up to 25%) may be reused if they are accessible and can be sealed.[G]

The Duct Sealing and Testing HERS measure must demonstrate a leakage rate less than or equal to 6% of the system air handler airflow. In addition, verification of Cooling Coil Airflow and Fan Watt Draw (HERS measure) is required. The system must have airflow >350 CFM per ton of nominal cooling capacity through the return grilles, and an air-handling unit fan efficacy ≤0.58 W/CFM.



Alteration or Extension of Existing Ducts

In all climate zones when more than 40 feet of new or replacement system ducts are installed as an extension of an existing duct system, Duct Sealing and Testing (HERS measure) is required, and the measured leakage shall be equal to or less than 15% of system air handler air flow.

(There are alternatives to meeting the maximum 15% leakage. Consult your Building Department or §150.2(b)1Diib in the Standards.)

Required Documentation

For All HVAC Alterations

All HVAC alterations require:

- Permit — for all HVAC changeouts
- CF1R: Certificate of Compliance: Alteration to an HVAC System (CF1R-ALT-02*-E, or CF1R-ALT-03-E or CF1R-ALT-04-E)
  Submitted to the building department by the contractor or the home owner
- 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

For HERS Measures

Projects with HERS measures require:

- Registration of the CF1R, via HERS Provider
- CF2R-MCH…H: Certificates of Installation for mechanical system with HERS measures
  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…H: Certificates of Field Verification for mechanical system with HERS measures
  Completed and registered by a HERS Rater for each CF2R-H; the HERS Rater or contractor ensures the relevant CF3Rs 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 Duct 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

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