| **INSTALLATION CERTIFICATE** | **(Page 3 of 12) CF-6R** |
|---|---|
| Site Address | Permit Number |

An installation certificate is required to be posted at the building site or made available for all appropriate inspections. (The information provided on this form is required) After completion of final inspection, a copy must be provided to the building department (upon request) and the building owner at occupancy, per Section 10-103(a).

## HVAC SYSTEMS:

***Heating Equipment***

| Equip Type (pkg. heat pump) | CEC Certified Mfr. Name and Model Number | # of Identical Systems | Efficiency (AFUE, etc.)[1] (≥CF-1R value) | Duct Location (attic, etc.) | Duct or Piping R-value | Heating Load (Btu/hr) | Heating Capacity (Btu/hr) |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

***Cooling Equipment***

| Equip Type (pkg. heat pump) | CEC Certified Mfr. Name and Model Number | # of Identical Systems | Efficiency (SEER or EER)[1] (≥CF-1R value) | Duct Location (attic, etc.) | Duct R-value | Cooling Load (Btu/hr) | Cooling Capacity (Btu/hr) |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

1. ≥ symbol reads *greater than or equal to what is indicated on the CF-1R value.*
   Include both SEER and EER if compliance credit for high EER air conditioner is claimed.

✓ ☐ I, the undersigned, verify that equipment listed above is: 1) is the actual equipment installed, 2) equivalent to or more efficient than that specified in the certificate of compliance (Form CF-1R) submitted for compliance with the *Energy Efficiency Standards* for residential buildings, and 3) equipment that meets or exceeds the appropriate requirements for manufactured devices (from the *Appliance Efficiency Regulations* or Part 6), where applicable.

| Installing Subcontractor (Co. Name) OR General Contractor (Co. Name) OR Owner | |
|---|---|
| Signature: | Date: |

**Copies to: BUILDING DEPARTMENT, HERS RATER (IF APPLICABLE) BUILDING OWNER AT OCCUPANCY**

| Site Address | Permit Number |
|---|---|
| | |

# INSTALLER COMPLIANCE STATEMENT FOR DUCT LEAKAGE

**INSTALLER COMPLIANCE STATEMENT**

The building was: ✓ ☐ Tested at Final ✓ ☐ Tested at Rough-in

**INSTALLER VISUAL INSPECTION AT FINAL CONSTRUCTION STAGE FOR NEW DUCTS:**

☐ Remove at least one supply and one return register, and verify that the spaces between the register boot and the interior finishing wall are properly sealed.

☐ 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.

☐ Inspect all joints to ensure that no cloth backed rubber adhesive duct tape is used *on new ducts.*

✓ ☐ **DUCT LEAKAGE REDUCTION**

***Procedures for field verification and diagnostic testing of air distribution systems are available in RACM, Appendix RC4.3***

| | | | |
|---|---|---|---|
| **NEW CONSTRUCTION:** | | | |
| | Duct Pressurization Test Results (CFM @ 25 Pa) | Measured Values | |
| 1 | Enter Tested Leakage Flow in CFM: | | |
| 2 | Fan Flow: Calculated (Nominal: ✓ ☐ Cooling ✓ ☐ Heating) or ✓ ☐ Measured<br>If Fan Flow is Calculated as 400 cfm/ton x number of tons or as 21.7 cfm/(kBtu/hr) x Heating Capacity in Thousands of Btu/hr, enter total calculated or measured fan flow in CFM here: | | ✓ ✓ |
| 3 | Pass if Leakage Percentage < 6% for Final or < 4% at Rough-in without air handle:<br>[100 x [_____(Line # 1) / _____(Line # 2)]] | | ☐ Pass ☐ Fail |
| **ALTERATIONS: Duct System and/or HVAC Equipment Change-Out** | | | |
| 4 | Enter Tested Leakage Flow in CFM from **Pre-Test** of Existing Duct System Prior to Duct System Alteration and/or Equipment Change-Out. | | |
| 5 | Enter Tested Leakage Flow in CFM from **Final Test** of New Duct System or Altered Duct System for Duct System Alteration and/or Equipment Change-Out. | | |
| 6 | Enter Reduction in Leakage for Altered Duct System<br>[ _____(Line # 4) Minus _____(Line # 5)] – (Only if Applicable) | | |
| 7 | Enter Tested Leakage Flow in CFM to Outside (Only if Applicable) | | ✓ ✓ |
| 8 | Entire New Duct System - Pass if Leakage Percentage < 6% for Final.<br>[100 x [_____(Line # 5) / _____Line # 2)]] | | ☐ Pass ☐ Fail |
| **TEST OR VERIFICATION STANDARDS: For Altered Duct System and/or HVAC Equipment Change-Out Use one of the following four Test or Verification Standards for compliance:** | | | ✓ ✓ |
| 9 | Pass if Leakage Percentage < 15% [100 x [ _____(Line # 5) / _____ (Line # 2)]] | | ☐ Pass ☐ Fail |
| 10 | Pass if Leakage to Outside Percentage < 10% [100 x [_____ (Line # 7) /_____ (Line # 2)]] | | ☐ Pass ☐ Fail |
| 11 | Pass if Leakage Reduction Percentage > 60% [100 x [_____(Line # 6) / _____ (Line # 4)]]<br>and Verification by Smoke Test and Visual Inspection | | ☐ Pass ☐ Fail |
| 12 | Pass if Sealing of all Accessible Leaks and Verification by Smoke Test and Visual Inspection | | ☐ Pass ☐ Fail |
| | **Pass if One of Lines # 9 through # 12 pass** | | ☐ Pass ☐ Fail |

✓ ☐ I, the undersigned, verify that the above diagnostic test results were performed in conformance with the requirements for compliance credit. I, the undersigned, also certify that the newly installed or retrofit Air-Distribution System Ducts, Plenums and Fans comply with Mandatory requirements specified in Section 150 (m) of the 2005 Building Energy Efficiency standards.

| Installing Subcontractor (Co. Name) OR General Contractor (Co. Name) OR Owner | |
|---|---|
| Signature: | Date: |

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## ✓☐ THERMOSTATIC EXPANSION VALVE (TXV)

*Procedures for field verification of thermostatic expansion valves are available in RACM, Appendix RI.*

| | | | | ✓ | ✓ |
|---|---|---|---|---|---|
| ✓ | ☐ Yes | ☐ No | Access is provided for inspection. The procedure shall consist of visual verification that the TXV is installed on the system and installation of the specific equipment shall be verified. | ☐ | ☐ |
| | | | Yes is a pass | Pass | Fail |

## ✓☐ REFRIGERANT CHARGE MEASUREMENT

Verification for Required Refrigerant Charge and Adequate Airflow for Split System Space Cooling Systems without Thermostatic Expansion Valves

| | | |
|---|---|---|
| Outdoor Unit Serial # | | |
| Location | | |
| Outdoor Unit Make | | |
| Outdoor Unit Model | | |
| Cooling Capacity | | Btu/hr |
| Date of Verification | | |
| Date of Refrigerant Gauge Calibration | | (must be checked monthly) |
| Date of Thermocouple Calibration | | (must be checked monthly) |

**Standard Charge Measurement Procedure** (outdoor air dry-bulb 55°F and above):

*Procedures for Determining Refrigerant Charge using the Standard Method are available in RACM, Appendix RD2.*

Note: The system should be installed and charged in accordance with the manufacturer's specifications before starting this procedure.

Measured Temperatures

| | | |
|---|---|---|
| Supply (evaporator leaving) air dry-bulb temperature (Tsupply, db) | | °F |
| Return (evaporator entering) air dry-bulb temperature (Treturn, db) | | °F |
| Return (evaporator entering) air wet-bulb temperature (Treturn, wb) | | °F |
| Evaporator saturation temperature (Tevaporator, sat) | | °F |
| Suction line temperature (Tsuction, db) | | °F |
| Condenser (entering) air dry-bulb temperature (Tcondenser, db) | | °F |

Superheat Charge Method Calculations for Refrigerant Charge

| | | |
|---|---|---|
| Actual Superheat = Tsuction, db – Tevaporator, sat | | °F |
| Target Superheat (from Table RD-2) | | °F |
| Actual Superheat – Target Superheat (System passes if between -5 and +5°F) | | °F |

Temperature Split Method Calculations for Adequate Airflow

*Split Method Calculation is not necessary if Adequate Airflow credit is taken*

| | | |
|---|---|---|
| Actual Temperature Split = T return, db Tsupply, db | | °F |
| Target Temperature Split (from Table RD3) | | °F |
| Actual Temperature Split Target Temperature Split (System passes if between -3°F and +3°F or, upon remeasurement, if between -3°F and -100°F) | | °F |

| Site Address | Permit Number |
|---|---|
| | |

## ☐ FAN WATT DRAW

*Procedures for measuring the air handler watt draw are available in RACM, Appendix RE3.2.*

| ✓ | | Method For Fan Watt Draw Measurement | | | |
|---|---|---|---|---|---|
| ☐ | RE3.2.1 | Portable Watt Meter Measurement | | | |
| ☐ | RE3.2.2 | Utility Revenue Meter Measurement | | | |
| | | | | | |
| | | Measured Fan Watt Draw | | | Watts |
| | | Measured Fan Flow (enter total cfm from airflow verification) | | | cfm |
| | | Enter results of Watts/cfm | | | Watts/cfm |
| | | | ✓ | ✓ | |
| ✓ ☐ Yes | ☐ No | Measured fan watt/cfm draw is equal to or lower than the fan watt/cfm draw documented in CF-1R | ☐ | ☐ | |
| | | **Yes is a pass** | Pass | Fail | |

## ☐ ADEQUATE AIRFLOW VERIFICATION

*Procedures for measuring the airflow are available in RACM, Appendix RE3.1.*

| ✓ | | Method For Airflow Measurement | | | |
|---|---|---|---|---|---|
| ☐ | RE4.1.1 | Diagnostic Fan Flow Using Flow Capture Hood | | | |
| ☐ | RE4.1.2 | Diagnostic Fan Flow Using Plenum Pressure Matching | | | |
| ☐ | RE4.1.3 | Diagnostic Fan Flow Using Flow Grid Measurement | | | |
| ☐ Yes | ☐ No | Duct design exists on plans | | | |
| | | Measured Airflow: | | | Total cfm |
| | | Rated Tons cfm/ton | | | cfm/ton |
| | | | | | |
| ✓ ☐ Yes | ☐ No | Measured airflow is greater than the criteria in Table RE-2 | ✓ | ✓ | |
| | | **Yes is a pass** | ☐ Pass | ☐ Fail | |

## ☐ MAXIMUM COOLING CAPACITY

*Procedures for determining maximum cooling load capacity are available in RACM, Appendix RF3.*

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | ✓ | ☐ Yes | ☐ No | Adequate airflow verified (see adequate airflow credit) | | |
| 2 | ✓ | ☐ Yes | ☐ No | Refrigerant charge or TXV | | |
| 3 | ✓ | ☐ Yes | ☐ No | Duct leakage reduction credit verified | | |
| 4 | ✓ | ☐ Yes | ☐ No | Cooling capacities of installed systems are ≤ to maximum cooling capacity indicated on the Performance's CF-1R and RF-3. | | |
| 5 | ✓ | ☐ Yes | ☐ No | If the cooling capacities of installed systems are > than maximum cooling capacity in the CF-1R, then the electrical input for the installed systems must be ≤ to electrical input in the CF-1R. | ✓ ☐ | ✓ ☐ |
| | | | | Yes to 1, 2, and 3; and Yes to either 4 or 5 is a pass | Pass | Fail |

## ☐ HIGH EER AIR CONDITIONER

*Procedures for verification are available in RACM, Appendix RI.*

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | ✓ | ☐ Yes | ☐ No | EER values of installed systems match the CF-1R | | |
| 2 | ✓ | ☐ Yes | ☐ No | For split system, indoor coil is matched to outdoor coil | ✓ ☐ | ✓ ☐ |
| 3 | ✓ | ☐ Yes | ☐ No | Time Delay Relay Verified (If Required) | | |
| | | | | Yes to 1 and 2; and 3 (If Required) is a pass | Pass | Fail |

| Installing Subcontractor (Co. Name) OR General Contractor (Co. Name) OR Owner | |
|---|---|
| Signature: | Date: |

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