

0602817

CERTIFICATE OF FIELD VERIFICATION & DIAGNOSTIC TESTING (Page 1 of 8)

CF-4R

| | |
|---|---|
| 18 Bethesda Ct. <i>Project Address</i> | Brower Mechanical Inc. / 686451 <i>Contractor Name / License No.</i> |
| <i>Ray Thompson</i> 624-0808 <i>Contractor Contact</i> | 0602817 <i>Permit Number</i> |
| John Flores <i>HERS Rater</i> | 916-624-2092 <i>Telephone</i> |
| <i>[Signature]</i> <i>Certifying Signature</i> | 19627 <i>Sample Group Number</i> |
| | March 31, 2006 <i>Date</i> |
| | CC14-1798360209 <i>Certificate Number</i> |
| Firm: Valley Duct Testing | HERS Provider: CalCERTS |
| Street Address: 6345 Rainier Ave | City/State/Zip: Rocklin / CA / 95677 |

Copies to: Homeowner, HERS Provider and Building Department

This CF-4R has been registered with the CalCERTS® registry in accordance with the Title 24 & Title 20 of the CCR. CalCERTS® is an approved HERS provider by the California Energy Commission.

HERS RATER COMPLIANCE STATEMENT

The house was Tested Approved as part of sample testing, but was not tested. As the HERS rater providing diagnostic testing and field verification, I certify that the house identified on this form complies with the diagnostic tested compliance requirements as checked on this form. The HERS rater must check and verify that the new distribution system is fully ducted and correct tape is used before a CF-4R may be released on every tested building. The HERS rater must not release the CF-4R until a properly completed and signed CF-6R has been received for the sample and tested buildings.

- The installer has provided a copy of the CF-6R (Installation Certificate).
- New Distribution system is fully ducted (i.e., does not use building cavities as plenums or platform returns in lieu of ducts).
- New systems where cloth backed, rubber adhesive duct tape is installed, mastic and drawbands are used in combination with cloth backed, rubber adhesive duct tape to seal leaks at duct connections.

MINIMUM REQUIREMENTS FOR DUCT LEAKAGE REDUCTION COMPLIANCE CREDIT: Main System

| NEW CONSTRUCTION | | | |
|--|---|-----------------|--|
| | | Measured Values | |
| 1 | Enter Tested Leakage Flow in CFM: | N/A | |
| 2 | Fan Flow: Calculated (Nominal <input type="radio"/> Cooling <input checked="" type="radio"/> Heating) or <input type="radio"/> Measured Enter Total Fan Flow in CFM: | 1302 | |
| 3 | Pass if Leakage Percentage $\leq 6\%$ [$100 \times (\text{Line 1} / \text{Line 2})$]: | N/A | N/A |
| ALTERATIONS: Duct System and/or HVAC Equipment Change-Out | | | |
| 4 | Enter Tested Leakage Flow in CFM from CF-6R: Pre-Test of Existing Duct System Prior to Duct System Alteration and/or Equipment Change-Out. | | |
| 5 | Enter Tested Leakage Flow in CFM: Final Test of New Duct System or Altered Duct System for Duct System Alteration and/or Equipment Change-Out. | 110 | |
| 6 | Enter Reduction in Leakage for Altered Duct System [Line 4 - 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 $\leq 6\%$ [$100 \times (\text{Line 5} / \text{Line 2})$]: | | <input type="checkbox"/> Pass <input type="checkbox"/> 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 $\leq 15\%$ [$100 \times (\text{Line 5} / \text{Line 2})$]: | 8.4% | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail |
| 10 | Pass if Leakage to Outside Percentage $\leq 10\%$ [$100 \times (\text{Line 7} / \text{Line 2})$]: | | <input type="checkbox"/> Pass <input type="checkbox"/> Fail |
| 11 | Pass if Leakage Reduction Percentage $\geq 60\%$ [$100 \times (\text{Line 6} / \text{Line 4})$] and Verification by Smoke Test and Visual Inspection | | <input type="checkbox"/> Pass <input type="checkbox"/> Fail |
| 12 | Pass if Sealing of all Accessible Leaks and Verification by Smoke Test and Visual Inspection | | <input type="checkbox"/> Pass <input type="checkbox"/> Fail |
| | Pass if One of Lines #9 through #12 pass | | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail |

CERTIFICATE OF FIELD VERIFICATION & DIAGNOSTIC TESTING (Page 3-4 of 8)

CF-4R

| | |
|---|---|
| 18 Bethesda Ct. | Brower Mechanical Inc. / 686451 |
| Project Address: <u>Ray's Thonby 624-0808</u> | Contractor Name / License No. 0602817 |
| Contractor Contact: <u>John Flores</u> | Permit Number 19627 |
| HERS Rater: <u>[Signature]</u> | Sample Group Number CC14-1798360209 |
| March 31, 2006 | Certificate Number |
| Firm: <u>Valley Duct Testing</u> | HERS Provider: CalCERTS |
| Street Address: <u>6345 Rainier Ave</u> | City/State/Zip: <u>Rocklin / CA / 95677</u> |

Copies to: **Homeowner, HERS Provider and Building Department**

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HERS RATER COMPLIANCE STATEMENT

The house was Tested Approved as part of sample testing, but was not tested. As the HERS rater providing diagnostic testing and field verification, I certify that the house identified on this form complies with the diagnostic tested compliance requirements as checked on this form.

The installer has provided a copy of the CF-6R (Installation Certificate).

THERMOSTATIC EXPANSION VALVE (TXV): Main System

| | |
|---|--|
| 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. | |
| Main System HVAC System TXV | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail |

INSTALLATION CERTIFICATE (Page 3 of 12) **CF-6R**

| | |
|--|---------------------------------|
| Site Address 180 Bethesda Ct | Permit Number 0602817 |
|--|---------------------------------|

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) |
|--------------------------------|--|------------------------------|---|-----------------------------------|------------------------------|-----------------------------|---------------------------------|
| split | Trane | 1 | 93 | attic | 4.2 | | 100K |
| ge | TUYOLOO | | | | | | |
| | R9310 | | | | | | |

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) |
|--------------------------------|--|------------------------------|--|-----------------------------------|-----------------|-----------------------------|---------------------------------|
| split | Trane | 1 | 14 | attic | | | 20K |
| ge | | | | | | | |

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: 3/31/06 |

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:

- 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

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: <input checked="" type="checkbox"/> Cooling <input checked="" type="checkbox"/> Heating) or <input checked="" type="checkbox"/> Measured 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: | 1302 |
| 3 | Pass if Leakage Percentage ≤ 6% for Final or ≤ 4% at Rough-in: [100 x [(Line # 1) / (Line # 2)]] | <input type="checkbox"/> Pass <input type="checkbox"/> 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. | 110 |
| 6 | Enter Reduction in Leakage for Altered Duct System [(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 or ≤ 4% at Rough-in [100 x [(Line # 5) / (Line # 2)]] | <input type="checkbox"/> Pass <input type="checkbox"/> 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 [110 (Line # 5) / 1302 (Line # 2)]] | 8.4 <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail |
| 10 | Pass if Leakage to Outside Percentage ≤ 10% [100 x [(Line # 7) / (Line # 2)]] | <input type="checkbox"/> Pass <input type="checkbox"/> Fail |
| 11 | Pass if Leakage Reduction Percentage ≥ 60% [100 x [(Line # 6) / (Line # 4)]] and Verification by Smoke Test and Visual Inspection | <input type="checkbox"/> Pass <input type="checkbox"/> Fail |
| 12 | Pass if Sealing of all Accessible Leaks and Verification by Smoke Test and Visual Inspection | <input type="checkbox"/> Pass <input type="checkbox"/> Fail |
| Pass if One of Lines # 9 through # 12 pass | | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> 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: <i>[Signature]</i> | Date: 3/21/06 |

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

INSTALLATION CERTIFICATE

(Page 5 of 12) CF-6R

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

THERMOSTATIC EXPANSION VALVE (TXV)

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

| | | | | | |
|---|---|-----------------------------|---|-------------------------------------|--------------------------|
| ✓ | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> 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. | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| | | | 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 -10°F) | | °F |

[Handwritten Signature] 3/31/06