

CITY OF SACRAMENTO

1231 I Street, Sacramento, CA 95814

Permit No: 0614555

Insp Area: 1

Thos Bros: 297H5

Site Address: 720 38TH ST SAC

Parcel No: 004-0282-010

CONTRACTOR

A & P HEATING AND COOLING INC  
6423 ELVAS AV  
SACRAMENTO CA 95819

PAID  
CITY OF SACRAMENTO  
SEP 19 2006

OWNER

CONWAY MARY  
720 38TH ST  
SACRAMENTO CA 95819

NEIGHBORHOODS PLANNING  
AND DEVELOPMENT SERVICES

Sub-Type: RES

Housing (Y/N): N

ARCHITECT

Nature of Work: C/O ROOF-MOUNTED PACKAGE HVAC SYSTEM \*\*ALL COMPLIANCE DOCS REQ'D @ INSPECTION

CONSTRUCTION LENDING AGENCY : I hereby affirm under penalty of perjury that there is a construction lending agency for the performance of the work for which this permit is issued (Sec. 3097, Civ. C).

Lender's Name

Lender's Address

LICENSED CONTRACTORS DECLARATION: I hereby affirm under penalty of perjury that I am licensed under provisions of Chapter 9 (commencing with section 7000) of Division 3 of the Business and Professions Code and my license is in full force and effect.

License Class C/O

License Number 877831

Date 9/19/06

Contractor Signature

OWNER-BUILDER DECLARATION: I hereby affirm under penalty of perjury that I am exempt from the contractors License Law for the following reason (Sec. 7031.5, Business and Professions Code; any city or county which requires a permit to construct, alter, improve, demolish, or repair any structure, prior to its issuance, also requires the applicant for such permit to file a signed statement that he or she is licensed pursuant to the provisions of the Contractors License Law (Chapter 9 (commencing with Section 7000) of Division 8 of the Business and Professions Code) or that he or she is exempt therefrom and the basis for the alleged exemption. Any violation of Section 7031.5 by any applicant for a permit subjects the applicant to a civil penalty of not more than five hundred dollars (\$500.00);

I, as a owner of the property, or my employees with wages as their sole compensation, will do the work, and the structure is not intended or offered for sale (Sec. 7044, Business and Professional Code: The Contractors License Law does not apply to an owner of property who builds or improves thereon, and who does such work himself or herself or through his/her own employees, provided that such improvements are not intended or offered for sale. If, however, the building or improvement is sold within one year of completion, the owner-builder will have the burden of proving that he/she did not build or improve for the purpose of sale.)

I, as owner of the property, am exclusively contracting with licensed contractors to construct the project (Sec. 7044, Business and Professions Code: The Contractors License Law does not apply to an owner of property who builds or improves thereon, and who contracts for such projects with a contractor(s) licensed pursuant to the Contractors License Law).

I am exempt under Sec. B & PC for this reason:

Date

Owner Signature

IN ISSUING THIS BUILDING PERMIT, the applicant represents, and the city relies on the representation of the applicant, that the applicant verified all measurements and locations shown on the application or accompanying drawings and that the improvement to be constructed does not violate any law or private agreement relating to permissible or prohibited locations for such improvements. This building permit does not authorize any illegal location of any improvement or the violation of any private agreement relating to location of improvements.

I certify that I have read this application and state that all information is correct. I agree to comply with all city and county ordinances and state laws relating to building construction and hereby authorize representative(s) of this city to enter upon the abovementioned property for inspection purposes.

Date 9/19/06

Applicant/Agent Signature

WORKER'S COMPENSATION DECLARATION: I hereby affirm under penalty of perjury one of the following declarations:

I have and will maintain a certificate of consent to self-insure for workers' compensation as provided for by Section 3700 of the Labor Code, for the performance of work for which the permit is issued.

I have and will maintain workers' compensation insurance, as required by Section 3700 of the Labor Code, for the performance of the work for which this permit is issued. My workers' compensation insurance carrier and policy number are:

Carrier STATE FUND

Policy Number 713-0015947

Exp Date 01/01/2007

(This section need not be completed if the permit is for \$100 or less) I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any manner so as to become subject to the workers' compensation laws of California and agree that if I should become subject to the workers' compensation provisions of Section 3700 of the Labor Code, I shall forthwith comply with those provisions.

Date 9/19/06

Applicant Signature

WARNING: FAILURE TO SECURE WORKER'S COMPENSATION COVERAGE IS UNLAWFUL AND SHALL SUBJECT AN EMPLOYER TO CRIMINAL PENALTIES AND CIVIL FINES UP TO ONE HUNDRED THOUSAND DOLLARS (\$100,000) IN ADDITION TO THE COST OF COMPENSATION, DAMAGES AS PROVIDED FOR IN SECTION 3706 OF THE LABOR CODE, INTEREST AND ATTORNEY'S FEE.

THIS PERMIT SHALL EXPIRE BY LIMITATION IF WORK IS NOT COMMENCED WITHIN 180 DAYS.

**CERTIFICATE OF FIELD VERIFICATION & DIAGNOSTIC TESTING (Page 3 of 9) CP-4R**

Project Address <b>700 30<sup>th</sup> St</b>	APR 95016	System Name <b>A/P Heating &amp; Cooling</b>
Manufacturer <b>TenSky Louisa</b>	Telephone <b>(912) 257-9600</b>	Plan Number <b>21010555</b>
Model <b>Chilled Water</b>	Telephone <b>(912) 202-0777</b>	Service Order Number
Contractor <b>[Signature]</b>	Date <b>9/21/06</b>	Climate Zone <b>12</b>
Field Engineer <b>[Signature]</b>		Sample Flow Number
Field Engineer Name <b>Donald M. R. Katers</b>		Field Engineer <b>[Signature]</b>
Field Engineer Address <b>1578 6<sup>th</sup> St</b>		City/State/Zip <b>Redlands CA 92673</b>

**Copy to: LOCAL HEALTH DEPARTMENT AND BUILDING DEPARTMENT**

**FIELD RATER COMPLIANCE STATEMENT**

The house was  Tested  Approved after sample testing, but was not tested

As the FIELD RATER provides diagnostic testing and reports on the diagnostic testing compliance requirements or conditions, the FIELD RATER certifies that the house identified on this form complies with the applicable requirements of the applicable code (see applicable code).

The installer has provided a copy of CP-4R (Installation Certificate).

**THERMOSTATIC EXPANSION VALVE (TXV) COMPLIANCE** (Applicable RI)

Procedure for field verification:

		Answer to question: <b>Yes</b>	TXV is installed	TXV is functional	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	TXV is installed	TXV is functional	TXV is functional	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

**REFRIGERANT CHARGE MEASUREMENT**

Verification by External Refrigerant Charge Measurement (Standard Method) or Internal Refrigerant Charge Measurement (Alternative Method) without Thermostatic Expansion Valve

Outdoor Unit Model #	
Location	
Outdoor Unit Make	
Outdoor Unit Model	
Cooling Capacity	
Date of Verification	
Date of External Refrigerant Charge Measurement	
Date of Internal Refrigerant Charge Measurement	

**Standard Method:** The system should be installed and charged in accordance with the manufacturer's specifications and installer verification.

**Alternative Method:** The system should be installed and charged in accordance with the manufacturer's specifications and installer verification.

Note: The system should be installed and charged in accordance with the manufacturer's specifications and installer verification. If outdoor air dry-bulb is below 55 °F, refer to the Alternative Charge Measurement Procedure.

Procedure for External Refrigerant Charge Measurement (Standard Method) are available in RACM, Appendix B02.

**Y**  **N** A copy of CP-4R (Installation Certificate) has been provided with refrigerant charge measurement documented.

**CERTIFICATE OF FIELD VERIFICATION & DIAGNOSTIC TESTING (Page 1 of 3) CE-02**

Project Address <b>720 30th St Gibby Lane #200</b>	City/County <b>San Diego</b>	Builder or Installer Name <b>95816 951614549609 9512570777</b>	Builder or Installer Phone <b>(619) 454-9609</b>	Builder or Installer License Number <b>0614555</b>	Builder or Installer State Number
Contractor Name <b>Robert O'Neil</b>	Contractor License Number <b>7/21/06</b>	Contractor State Number	Contractor State Number	Contractor State Number	Contractor State Number
Contractor Address <b>1001 10th St 7513</b>	Contractor City/County <b>San Diego</b>	Contractor Phone <b>619-257-0777</b>	Contractor License Number	Contractor State Number	Contractor State Number

Contractor: **Robert O'Neil**  
 License: **7/21/06**  
 State: **CA 95073**

**HERS RATER COMPLIANCE STATEMENT**

The house was:  Tested  Approved as per sample testing, but was not tested

As the HERS rater providing diagnostic testing and verification, I certify that the house identified on this form complies with the diagnostic testing requirements on the HERS Rater Manual. The HERS rater must check and verify that the new distribution system is fully tested and correct per the HERS Rater Manual. The HERS Rater Manual may be released on every tested building. The HERS Rater Manual may not be released for the CE-02 and a HERS Rater Manual may be released for the sample and tested buildings.

The installer has provided the CE-02 (Installation Checklist) to the HERS Rater.

New ducts are fully tested and verified per the HERS Rater Manual.

New ducts with cloth lined joints are used in combination with cloth lined, rubber lined, or metal lined ducts.

**MINIMUM REQUIREMENTS FOR LEAKAGE TESTING COMPLIANCE CREDIT**

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

**Duct Diagnostic Leakage Test Results**

Test Description	Measured Value	Pass	Fail
<b>NEW CONSTRUCTION:</b>			
1. Duct Leakage Flow in CFM			
2. Fan Flow, Calculated (Measured: 800)	800	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
3. Fan Total Fan Flow in CFM		<input type="checkbox"/>	<input type="checkbox"/>
4. Fan Leakage Percentage < 6% [100 x (Line # 1) / (Line # 2)]		<input type="checkbox"/>	<input type="checkbox"/>
<b>ALTERATION Duct System and/or HVAC Equipment Change-Out:</b>			
5. Duct Leakage Flow in CFM (Pre-Test of Existing Duct System Prior to Duct System Alteration and/or Equipment Change-Out)			
6. Duct Leakage Flow in CFM (Post-Test of New Duct System or Altered Duct System for Duct System Alteration and/or Equipment Change-Out)			
7. Fan Flow in CFM (Measured)		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
8. Fan Leakage Percentage < 6% [100 x (Line # 5) / (Line # 6)]		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
9. Fan Leakage Percentage < 14% [100 x (Line # 5) / (Line # 2)]		<input type="checkbox"/>	<input type="checkbox"/>
10. Fan Leakage to Outside Percentage < 10% [100 x (Line # 7) / (Line # 2)]		<input type="checkbox"/>	<input type="checkbox"/>
11. Fan Leakage Reduction Percentage > 60% [100 x (Line # 6) / (Line # 5)]		<input type="checkbox"/>	<input type="checkbox"/>
12. Fan Leakage Reduction Percentage > 60% [100 x (Line # 6) / (Line # 5)]		<input type="checkbox"/>	<input type="checkbox"/>

<b>INSTALLATION CERTIFICATE</b>		(Page 5 of 12) CF-6B
Site Address 720 38 <sup>th</sup> St 95814	Permit Number 0614555	

**THERMOSTATIC EXPANSION VALVE (TXV)**  
 Procedures for field verification of thermostatic expansion valves are available in RACM, Appendix RJ.

✓	<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	No

**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 RD.

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 (T <sub>supply</sub> , db)	F
Return (evaporator entering) air dry-bulb temperature (T <sub>return</sub> , db)	F
Return (evaporator entering) air wet-bulb temperature (T <sub>return</sub> , wb)	F
Evaporator entering temperature (T <sub>evaporator</sub> , sat)	F
System line temperature (T <sub>line</sub> , db)	F
Condenser (entering) air dry-bulb temperature (T <sub>condenser</sub> , db)	F

**Superheat Charge Method Calculations for Refrigerant Charge**

Actual Superheat = T <sub>return</sub> , db - T <sub>evaporator</sub> , sat	F
Target Superheat (from Table RD-6)	F
Actual Superheat - Target Superheat (System passes if between -3 and +3°F)	F

**Temperature Split Method Calculations for Adequate Airflow**

Split Method Calculations is not necessary if Adequate Airflow credit is taken

Actual Temperature Split = T <sub>return</sub> , db - T <sub>supply</sub> , db	F
Target Temperature Split (from Table RD-6)	F
Actual Temperature Split - Target Temperature Split (System passes if between -3°F and +3°F or, upon measurement, if between -10°F and -10°F)	F

<b>INSTALLATION CERTIFICATE</b>		(Page 5 of 12) CP-6R
Site Address 720 38 <sup>th</sup> St 95814	Permit Number 0614555	

**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 compliance with the manufacturer's specifications before starting this procedure.

**Measured Temperatures**

Supply (evaporator leaving) air dry-bulb temperature (T <sub>supply</sub> , db)		°F
Return (evaporator entering) air dry-bulb temperature (T <sub>return</sub> , db)		°F
Return (evaporator entering) air wet-bulb temperature (T <sub>return</sub> , wb)		°F
Evaporator saturation temperature (T <sub>evaporator</sub> , sat)		°F
System line temperature (T <sub>line</sub> , db)		°F
Condenser (entering) air dry-bulb temperature (T <sub>condenser</sub> , db)		°F

**Superheat Charge Method Calculations for Refrigerant Charge**

Actual Superheat = T <sub>return</sub> , db - T <sub>evaporator</sub> , sat		°F
Target Superheat (from Table RD-6)		°F
Actual Superheat - Target Superheat (System passes if between -3 and +5°F)		°F

**Temperature Split Method Calculations for Adequate Airflow**

Split Method Calculations are not necessary if Adequate Airflow exists in system

Actual Temperature Split = T <sub>return</sub> , db - T <sub>supply</sub> , db		°F
Target Temperature Split (from Table RD-6)		°F
Actual Temperature Split - Target Temperature Split (System passes if between -3°F and +3°F or 100% refrigerant. If between -3°F and -10°F)		°F

(Page 4 of 12) CF-6R
<b>INSTALLATION CERTIFICATE</b>
Site Address: <u>720 38<sup>th</sup> St</u> Permit Number: <u>95816</u> <u>0614555</u>
<b>INSTALLER COMPLIANCE STATEMENT FOR DUCT LEAKAGE</b>

**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 owner 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 CONSTRUCTIONS		Measured Values	
1	Enter Tested Leakage Flow in CFM:		
2	Fan Flow: Calculated (Heating) <input checked="" type="checkbox"/> Cooling <input checked="" type="checkbox"/> Heating) or <input type="checkbox"/> Measured If Fan Flow is Calculated as 400 cfm/ton x number of tons or as 21.7 cfm/(Btu/hr) x Heating Capacity in Thousands of Btu/hr, enter total calculated or measured fan flow in CFM here:	300	✓ ✓
3	Pass if Leakage Percentage < 6% for Final or < 4% at Rough-in without air handler: [100 x (Line # 1) / (Line # 2)]		<input type="checkbox"/> Pass <input type="checkbox"/> Fail
<b>ALTERATIONS: Duct System and/or HVAC Equipment Change-Out</b>			
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 [ (Line # 4) Minus (Line # 5) ] - (Only if Applicable)		
7	Enter Tested Leakage Flow in CFM to Outside (Only if Applicable)		✓ ✓
8	Enter New Duct System - Pass if Leakage Percentage < 6% for Final. [100 x (Line # 5) / (Line # 7)]	51	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
<b>TEST OR VERIFICATION STANDARDS: For Altered Duct System and/or HVAC Equipment Change-Out Use one of the following Test or Verification Standards for compliance:</b>			
9	Pass if Leakage Percentage < 15% [100 x (Line # 5) / (Line # 2)]		<input 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)]		<input type="checkbox"/> Pass <input type="checkbox"/> Fail
12	Pass if Sealant of all Accessible Leaks and Verification by Smoke Test and Visual Inspection Pass if One of Lines # 9 through # 12 pass		<input 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 retrofitted Air-Distribution System Ducts, Plenums and Fans comply with Mandatory requirements specified in Section 150 (a) of the 2005 Building Energy Efficiency standards.

Installing Subcontractor (Co. Name) OR General Contractor (Co. Name) OR Owner	
Signature: <u>T. J. [Signature]</u>	Date: <u>9/21/06</u>

Copy to: BUILDING DEPARTMENT, MISSOURI (IF APPLICABLE) BUILDING OWNER AT OCCUPANCY

<b>INSTALLATION CERTIFICATE</b>		(Page 3 of 12) <b>CF-6R</b>
Site Address <b>720 30th St</b>	Unit Number <b>95016</b>	Parcel Number <b>0614555</b>

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 or occupant, per Section 10-103(a).

**HVAC SYSTEMS:**

**Heating Equipment**

Equip Type (See Test Form)	CDC Certified Mfr. Name and Model Number	# of Identical Systems	Efficiency (AFUE, etc.) (See Test Form)	Dist Location (See Test Form)	Dist or Piping System	Heating Load (Btu/hr)	Heating Capacity (Btu/hr)
PKA	46402461100	1	90%	ATTIC	R-6		

**Cooling Equipment**

Equip Type (See Test Form)	CDC Certified Mfr. Name and Model Number	# of Identical Systems	Efficiency (SEER or EER) (See Test Form)	Dist Location (See Test Form)	Dist System	Cooling Load (Btu/hr)	Cooling Capacity (Btu/hr)
PKA	46402461100	1	14 SEER	ATTIC	R-6	22,000	24,000

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

(X), the undersigned, verify that equipment listed above is: 1) 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 Owner	
Contractor (Co. Name) OR Owner	
Signature: <i>Todd Ballinger</i>	Date: <i>9/21/06</i>

Copies for BUILDING DEPARTMENT, ~~FIELD BATES~~ (IF APPLICABLE) BUILDING OWNER AT OCCUPANCY

**CERTIFICATE OF FIELD VERIFICATION & DIAGNOSTIC TESTING (Page 2 of 3) CP-4R**

Project Address <b>700 30<sup>th</sup> St</b>	Telephone <b>45816</b>	Installer Name <b>ASP Heating &amp; Cooling</b>
City <b>Tenaya Canyon</b>	Telephone <b>(916) 245-7460</b>	Plan Number <b>21010555</b>
Contractor <b>Diagnostico Alameda</b>	Telephone <b>(916) 702-0777</b>	Sample House Number <b>12</b>
Contractor License Number	Date <b>9/21/06</b>	Sample House Number
Installer <b>Diagnostico HVAC Katers</b>		Installer Provider <b>CHIEFERS</b>
Street Address <b>1578 6<sup>th</sup> St</b>		City/State/Zip <b>Rocklin, CA 95673</b>

**California Building Energy Efficiency and Building Department  
HEAT RATE COMPLIANCE STATEMENT**

The house was  Tested  Approved only for sample testing, but was not tested  
 As the HEAT RATE compliance testing was performed, the installer certifies that the house identified on this form complies with the diagnostic tested compliance requirements or criteria.  
 The installer has provided a copy of CP-4R (Installation Certificate).

THERMOSTATIC EXPANSION VALVE (TXV) COMPLIANCE (See Appendix RI)  
 Procedure for field verification:

<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Answer to question 1: Inspection. The TXV is installed on the condenser.	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No
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REFRIGERANT CHARGE MEASUREMENT (See Appendix RII)  
 Verification by Required Reference Charge Method (Standard Method) without Thermostatic Expansion Valve

Outdoor Unit Model #	
Location	
Outdoor Unit Make	
Outdoor Unit Model	
Cooling Capacity	Btu/hr
Date of Verification	
Date of Required Charge Measurement	
Date of Compressor Discharge	

**CHIEFERS**

Standard Charge Measurement Method (See Appendix RII) and Note:  
 Note: The system should be installed and charged in accordance with the manufacturer's specifications and installer verification shall be documented on CP-4R before starting this procedure. If outdoor air dry-bulb is below 55 °F refer shall use the Alternative Charge Measurement Procedure.

Procedure by Alternative Reference Charge Method (Standard Method) available in RACM, Appendix RII.  
 Yes  No A copy of CP-4R (Installation Certificate) has been provided with refrigerant charge measurement documented.



**CERTIFICATE OF FIELD VERIFICATION & DIAGNOSTIC TESTING (Page 1 of 2) CE-42**

Project Address <b>120 30th St</b>	Telephone <b>95216</b>	Builder or Installer Name <b>P J P Heating &amp; Cooling</b>
Builder or Installer Contact <b>Guidy Lupton</b>	Telephone <b>(661) 454-9609</b>	Plan/Permit (Address or Alteration) Number <b>PL14555</b>
Name <b>Rebecca Overstreet</b>	Telephone <b>(442) 257-0777</b>	Builder's Office Number
Contractor License (Number)	Date <b>7/21/06</b>	Class No. <b>12</b>
City <b>Wheatland WY</b>		Builder's Office Number
State <b>WY</b>		HERS Provider <b>CHERS</b>
Street Address <b>7513 6th St</b>		City/State/Zip <b>Riverton WY 83473</b>

**CE-42: BUILDER, FIELD PROVIDER AND BUILDING DEPARTMENT**

**HERS RATER COMPLIANCE STATEMENT**  
 The house was:  Tested  Approved on sample testing, but was not tested  
 As the HERS rater providing diagnostic testing and verification, I certify that the house identified on this form complies with the HERS rater providing diagnostic testing and verification requirements as set forth in the HERS Rater Manual. The HERS rater must check and verify that the new distribution system is fully tested and approved per the HERS Rater Manual. All HERS Rater Manual forms must be released on every tested building. The HERS Rater Manual forms must be released on every tested building. The HERS Rater Manual forms must be released on every tested building.

The installer has provided a copy of the HERS Rater Manual to the homeowner (see return to flow of ducts).  
 New ducts are fully tested.  
 New ducts with cloth backed, rubber backed, or other approved materials are used in combination with cloth backed, rubber backed, or other approved materials.

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

**Duct Diagnostic Leakage Test**

NEW CONSTRUCTION:		Measured Values	
1	Duct Pressurization Test		
2	Blower Door Leakage Flow in CFM <sub>50</sub>	800	✓ ✓
3	Pass/Fail Leakage Percentage < 6% [100 x (Line # 2) / (Line # 1)]		<input type="checkbox"/> Pass <input type="checkbox"/> Fail
<b>ALTERATION: Duct System and/or HVAC Equipment Change-Out</b>			
4	Blower Door Leakage Flow in CFM <sub>50</sub> Pre-Test of Existing Duct System Prior to Duct System Alteration and/or Equipment Change-Out		
5	Blower Door Leakage Flow in CFM <sub>50</sub> Post-Test of New Duct System or Altered Duct System		
6	Blower Door Leakage Flow in CFM <sub>50</sub> (Line # 5) / (Line # 4)		
7	Pass/Fail Leakage Percentage < 6% [100 x (Line # 5) / (Line # 4)]		✓ ✓
8	Pass/Fail Leakage Percentage < 6% [100 x (Line # 5) / (Line # 4)]		<input type="checkbox"/> Pass <input type="checkbox"/> Fail
<b>TEST ON VERIFICATION STANDARDS For Altered Duct System and/or HVAC Equipment Change-Out</b>			
9	Pass/Fail Leakage Percentage < 14% [100 x (Line # 5) / (Line # 2)]		<input type="checkbox"/> Pass <input type="checkbox"/> Fail
10	Pass/Fail Leakage to Outside Percentage < 10% [100 x (Line # 7) / (Line # 2)]		<input type="checkbox"/> Pass <input type="checkbox"/> Fail
11	Pass/Fail Leakage Reduction Percentage > 60% [100 x (Line # 6) / (Line # 4)]		<input type="checkbox"/> Pass <input type="checkbox"/> Fail
12	Pass/Fail Leakage Reduction Percentage > 60% [100 x (Line # 6) / (Line # 4)]		<input type="checkbox"/> Pass <input type="checkbox"/> Fail
13	Pass/Fail Leakage Reduction Percentage > 60% [100 x (Line # 6) / (Line # 4)]		<input type="checkbox"/> Pass <input type="checkbox"/> Fail

<b>INSTALLATION CERTIFICATE</b>		(Page 5 of 14) CP-6R
Site Address 720 38 <sup>th</sup> St 95814	Permit Number 0614555	

**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 (T <sub>supply</sub> , db)		T
Return (evaporator entering) air dry-bulb temperature (T <sub>return</sub> , db)		T
Return (evaporator entering) air wet-bulb temperature (T <sub>return</sub> , wb)		T
Evaporator saturation temperature (T <sub>evaporator</sub> , sat)		T
suction line temperature (T <sub>suction</sub> , db)		T
Condenser (entering) air dry-bulb temperature (T <sub>condenser</sub> , db)		T

**Standard Charge Method Calculations for Refrigerant Charge**

Actual Superheat = T <sub>suction</sub> , db - T <sub>evaporator</sub> , sat		T
Target Superheat (from Table RD-3)		T
Actual Superheat - Target Superheat (System passes if between -3 and +3°F)		T

**Temperature Split Method Calculations for Adequate Airflow**

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

Actual Temperature Split = T <sub>return</sub> , db - T <sub>supply</sub> , db		T
Target Temperature Split (from Table RD-3)		T
Actual Temperature Split - Target Temperature Split (System passes if between -3°F and +3°F or, upon manufacturer's, if between -3°F and -10°F)		T

<b>INSTALLATION CERTIFICATE</b>		(Page 5 of 12) CP-6R
The Address 720 38 <sup>th</sup> St 95814	Permit Number 0614555	

**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 (T <sub>supply</sub> , db)			°F
Return (evaporator entering) air dry-bulb temperature (T <sub>return</sub> , db)			°F
Return (evaporator entering) air wet-bulb temperature (T <sub>return</sub> , wb)			°F
Evaporator subcooling temperature (T <sub>evaporator</sub> , sat)			°F
System line temperature (T <sub>line</sub> , db)			°F
Condenser (entering) air dry-bulb temperature (T <sub>condenser</sub> , db)			°F

**Refrigerant Charge Method Calculations for Refrigerant Charge**

Actual Superheat = T <sub>return</sub> , db - T <sub>evaporator</sub> , sat			°F
Target Superheat (from Table RD-8)			°F
Actual Superheat - Target Superheat (System passes if between -5 and +5°F)			°F

**Temperature Split Method Calculations for Adequate Airflow**

Full Method Calculation is not necessary if Adequate Airflow result is okay

Actual Temperature Split = T <sub>return</sub> , db - T <sub>supply</sub> , 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 measurement, if between -1°F and -10°F)			°F

<b>INSTALLATION CERTIFICATE</b>	(Page 6 of 12) CF-6R
Site Address 760 38 <sup>th</sup> St	Permit Number 95816 0614555

**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.
  - Make bare 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		Measured Value	
	Duct Pressurization Test Results (CFM @ 25 Pa)		
1	Enter Tested Leakage Flow in CFM:		
2	Fan Flow: Calculated (Heating <input checked="" type="checkbox"/> Cooling <input checked="" type="checkbox"/> Heating) or <input type="checkbox"/> Measured IF Fan Flow is Calculated as 400 cfm/ton x number of tons or as 21.7 cfm/(RBTU/hr) x Heating Capacity in Thousands of Btu/hr, enter total calculated or measured fan flow in CFM here:	300	✓ ✓
3	Pass if Leakage Percentage < 6% for Final or < 4% at Rough-in without air handler: $100 \times [ \frac{\text{Line \# 1}}{\text{Line \# 2}} ]$		<input type="checkbox"/> Pass <input type="checkbox"/> Fail
<b>ALTERATIONS: Duct System and/or HVAC Equipment Change-Out</b>			
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 $[ \frac{\text{Line \# 4}}{\text{Line \# 5}} ] \times 100$ - (Only if Applicable)		
7	Enter Tested Leakage Flow in CFM to Outside (Only if Applicable)		✓ ✓
8	Enter New Duct System - Pass if Leakage Percentage < 6% for Final. $100 \times [ \frac{\text{Line \# 7}}{\text{Line \# 5}} ] \times \frac{\text{Line \# 2}}{\text{Line \# 1}}$	51	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail
<b>TEST OR VERIFICATION STANDARDS: For Altered Duct System and/or HVAC Equipment Change-Out Use one of the following Pass Test or Verification Standards for compliance:</b>			
9	Pass if Leakage Percentage < 15% $100 \times [ \frac{\text{Line \# 5}}{\text{Line \# 2}} ]$		<input type="checkbox"/> Pass <input type="checkbox"/> Fail
10	Pass if Leakage to Outside Percentage < 10% $100 \times [ \frac{\text{Line \# 7}}{\text{Line \# 2}} ]$		<input type="checkbox"/> Pass <input type="checkbox"/> Fail
11	Pass if Leakage Reduction Percentage > 60% $100 \times [ \frac{\text{Line \# 6}}{\text{Line \# 4}} ]$		<input type="checkbox"/> Pass <input type="checkbox"/> Fail
12	Pass if Sealant 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 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 with the undersigned, also certify that the newly installed or retrofitted Air-Distribution System Ducts, Plenums and Fans comply with Mandatory requirements specified in Section 150 (a) of the 2005 Building Energy Efficiency standards.

Installing Subcontractor (Co. Name) OR General Contractor (Co. Name) OR Owner	
Signature: <i>T. J. Kelly</i>	Date: 9/21/06

Copy to: BUILDING DEPARTMENT, FIELD BAY (IF APPLICABLE) BUILDING OWNER AT OCCUPANCY

<b>INSTALLATION CERTIFICATE</b>		(Page 3 of 12) <b>CF-6R</b>
Site Address <b>720 30th St</b>	Permit Number <b>95016</b>	Permit Number <b>06/4555</b>

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 or occupant, per Section 16-103(a).

**EVAC SYSTEMS:**

*Heating Equipment*

Equip Type (e.g., heat pump)	CEC Certified Mfr. Name and Model Number	# of Heating Circuits	Efficiency (AFUE, etc.) (%CF-IR value)	Dist Location (e.g., 00)	Dist or Piping R-value	Heating Load (BTU/hr)	Heating Capacity (BTU/hr)
PK9	4640246110R	1	90%	0002	R-4		

*Cooling Equipment*

Equip Type (e.g., heat pump)	CEC Certified Mfr. Name and Model Number	# of Heating Circuits	Efficiency (EER or SEER) (%CF-IR value)	Dist Location (e.g., 00)	Dist R-value	Cooling Load (BTU/hr)	Cooling Capacity (BTU/hr)
PK9	4640246110R	1	14 SEER	ATTC	R-6	22,000	24,000

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

✓ [E1], the undersigned, verify that equipment listed above is: 1) 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 of Part 6*), where applicable.

Installing Subcontractor (Co. Name) OR General Contractor (Co. Name) OR Owner	
Signature: <i>Wald Balthazy</i>	Date: <i>9/21/06</i>

Copy to BUILDING DEPARTMENT, THIS DATE (IF APPLICABLE) BUILDING OWNER AT OCCUPANCY