

These specifications take effect October 1, 2003

## Heat Pump Installation Checklist

Member Name \_\_\_\_\_ Contractor \_\_\_\_\_  
 Address \_\_\_\_\_ Phone Number \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_ Signature \_\_\_\_\_  
 Phone Number \_\_\_\_\_

HSPF (Heating Seasonal Performance Factor) Rating (*minimum of 8 required*) ..... \_\_\_\_\_

SEER (Seasonal Energy Efficiency Ratio) Rating (*minimum of 13, 12 for manufactured homes*). \_\_\_\_\_

Section	<b>C&amp;RD Program Specifications for FY2004</b>	In Compliance	Not in Compliance
2.1	Equipment shall be manufactured by a company appearing in the ARI Unitary Directory		
2.2	Heat pump equipment shall meet the performance as given in the ARI Standard 240		
	Units shall listed by Underwriters' Laboratories or equal and shall display the ARI symbol of certification		
2.4	The compressor shall be protected from abnormal operating conditions by suitable pressure or temperature overload devices		
	A suction line accumulator shall be installed		
3.2	Installers shall provide to the member in writing a manufacturers warranty warranting against defects in materials and workmanship for five years from the startup date – this includes the compressor		
3.4	The installer shall instruct the member in the operation and maintenance of the heat pump including the following: provide the member with the owner's manual, demonstrate filter replacement or cleaning, demonstrate operating of indoor thermostat controls, explain indicator lights, explain the different operating modes of the heat pump, i.e. emergency heat defrost		
4.1.1	Heat loss and cooling gain calculations shall be made using 70°F indoor design temperature for heating and 75°F cooling		
4.1.2	ASHRAE winter design temperature for the nearest weather station shall be used		
4.1.4	Actual construction component U-values and F-values must be used in calculations		
4.1.5	A copy of the whole house heating and cooling load calculations shall be submitted with the bid		
4.1.6	An infiltration rate of 0.5 air changes/hours shall be used in sizing calculations		
4.1.7	Duct system efficiency of 80% shall be used in sizing calculations		
4.2.1	Heat shall be sized using a Balance Point between 30 and 35°F – a Balance Point Worksheet shall be submitted with the bid		
4.3	Central air conditioners shall not be sized greater than 140% of design cooling load		
4.4	Auxiliary heating shall not exceed 150% of the heating design load		
	Supplemental heaters larger than 10 kW must be staged		
4.6	The system shall have demand defrost controls		
5.1	Equipment shall be located for easy access		
5.2	Indoor units shall located to permit smooth duct transitions		
	Secondary drain pans shall be included in attic installations		
5.3	Outdoor units shall be located to avoid restrictions of airstream		
	Outside units shall be installed on a solid and secure pad with proper drainage with a coil elevated a minimum of 3 inches from drainage area		

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5.4	Installer shall refer to manufacturer's guidelines when charging systems and make all necessary adjustments		
	Installer shall use manufacturers recommended techniques for verifying performance including system superheat and subcooling or target pressures as specified		
6.1.1	Flexible duct shall not be used for main supply trunks in crawl spaces		
6.1.3	Supply and return ducts shall be designed on the basis of not more than 0.10 and 0.08 inches loss per 100 feet respectively		
	Supply and return ducts shall not be designed so that the total system static pressure does not exceed the available static pressure provided by the air handler at design CFM		
6.1.4	New duct work shall be designed so air velocities do not exceed the follow: main ducts-900 FPM, branch ducts-600 FPM, supply outlet face velocity-700 FPM, return grills face velocity-500, filter grille face velocity-300 FPM		
	Velocity shall not create unacceptable noise levels and return air shall be sufficient size to meet requirements of installed systems		
6.1.5	Proper diffusers and registers shall be selected and installed in the proper locations		
6.1.6	Branch out runs should be a minimum of 6 inches in diameter except in bathrooms		
6.1.7	All new and all readily accessible existing duct joints, plenum drives, metal joints to include all slips and drives shall be mechanically fastened with screws		
6.2.2.1	All rigid duct work outside the heated area shall be insulated to R-8 with an approved vapor barrier		
6.2.2.2	All ducts and plenums with internal insulation shall be installed in accordance with SMACNA's standards to a minimum of R-8		
6.2.2.3	Flexible ducts shall be a minimum of R-8 as per ADC specifications		
6.2.2.4	Ducts in exterior wall cavities must be insulated to R-14		
6.2.2.5	Duct insulation shall be supported using mechanical fasteners such as plastic straps or nylon twine - tape is not a mechanical fastener		
6.2.3	All new and all accessible existing HVAC supply and return ducts shall be sealed at all joints and corners with approved mastic, excluding longitudinal seams		
6.3.1	All existing duct work shall be inspected to insure compatibility with new equipment		
	The air flow across the indoor coil shall be between 375 to 425 cubic feet per minute (CFM) per 12000 BTU/hr output		
6.4	After installation the total air flow shall be measured using a flow plate or temperature rise test		
7.0	Easily accessible air filters shall not exceed 400 FPM face velocity as specified by the manufacturer – any filter that exceeds 0.22 inches pressure drop shall not be allowed		
8.1	Supply and return shall be sound lined a minimum of 4 feet from the air handler (except manufactured homes)		
8.2	Outdoor units shall be located to prevent objectionable noise and shall not violate state or local noise control ordinances		
9.1	Refrigerant piping shall be clean and sealed Types K and L seamless copper tubing or manufacturer's pre-charged tubing – fittings shall be wrought copper and lines shall be evacuated to 500 microns, soft copper shall not be permitted		
9.2	Refrigerant piping and refrigeration line sets shall be sized in accordance with the manufacturer's instructions and recommendations		

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9.3	Refrigerant piping shall be properly supported in accordance with the manufacturer's specifications		
9.4	Refrigerant piping shall be installed to prevent wear and sound generation and all penetrations properly sealed		
9.5	Section lines shall be insulated with a minimum of ½ " thick continuous closed-cell foam rubber and weatherproof covering where exposed to the elements, vapor and liquid lines shall be separated, manufactured insulated pre-charged lines will be accepted		
9.6	All exposed refrigeration lines must be protected against physical damage		
9.7	All field joints shall be checked for leakage		
10.1	Condensate drain piping shall meet UMC standards		
10.2	Condensate drain lines shall be rapped and run to an open drain outside the building		
10.3	Condensate pump shall be installed to prevent backup and overflow – a check valve shall be installed separately if not included within the pump		
11.1	All wiring shall comply with the National Electric Code (NEC)		
12.1	Indoor thermostats shall be installed according to the manufacturer's instructions and recommendations		
12.2	The first stage of resistance electric heat ("auxiliary stage") shall be controlled by the secondary stage of the indoor thermostat		
12.3	Thermostats shall have a manual change over feature or heating/cooling lockout to prevent cross cycling between heating and cooling –		
12.4	Indoor thermostats shall include a manual selector switch to permit supplemental heaters to operate when refrigerant system is inoperative.		

Additional Comments \_\_\_\_\_

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If you are unsure of the brief description of the specification refer to the “*RFT Air-source Heat Pump System Installation Standards*”