



## PTCS Ground Water Source Open Loop Heat Pump Installation Specifications

Updated: April 1, 2015

1. **Applicability.** This specification outlines the installation requirements for new, water-source open loop heat pumps that are ENERGY STAR® rated.
  - a. System installer shall be an IGSHPA Accredited Installer and a PTCS Certified Heat Pump Technician.
  - b. System shall be certified as a “PTCS Commissioned Heat Pump” by an IGSHPA Accredited and PTCS Certified Heat Pump Technician. In addition, the technician shall test and document startup measurements using the “PTCS Ground Source Heat Pump” form.
2. **Compressor Control.** The system shall meet manufacturer’s minimum low water supply temperature control requirements to avoid freeze damage to the unit.
3. **Equipment Selection and Sizing.** The heat pump system shall be sized, rounding up or down to the nearest 6000 Btu/hr capacity at AHRI rating conditions, using a balance point of 25°F or less.
  - a. Heating loss and cooling gain calculations shall be made using 70°F indoor design temperature for heating and 75°F for cooling.
  - b. The recommended ASHRAE winter design temperature and cooling design temperature shall use the nearest weather station representative of the installation.
  - c. The recommended method and form for calculations is available in the Air Conditioning Contractors of America (ACCA) Manual J. Alternate computer or manual methods of calculating heating and cooling loads may be used if approved in advance by the utility.
  - d. Component U-values and F-values used in the heat loss and heat gain coefficients shall reflect the actual construction of the building and be generally consistent with those found in ACCA Manual J 7th Edition, or later.
  - e. In sizing calculations, an infiltration rate of 0.5 air changes per hour (ACH) shall be used for houses built during or after 1980 and 0.8 ACH shall be used for houses built before 1980, unless a house (de)pressurization test has been performed and an estimate is made using the result of the test. Where available, the results of duct pressurization testing shall be used to estimate the duct system efficiency used in sizing calculations. If a duct pressurization test has not been performed on the house, a default duct system loss of 25% shall be used.  
*[Exception: If the air handler and all ductwork are within the thermal envelope of the house, 0% shall be used as the duct system loss in sizing calculations.]*
4. **Auxiliary Heat Sizing.** Installed auxiliary heat capacity shall not exceed 125% of the heating design load.
5. **Auxiliary Heat Control.** Auxiliary heat shall be controlled in the following manner depending on system type:
  - a. Auxiliary heat shall be controlled in such a manner that it does not engage when the outdoor air temperature is above 30°F, except when a heat pump shutdown is necessary to avoid water freezing in the system or when emergency heating is required during a refrigeration cycle failure.
6. **Penetrations.** Openings in the unit cabinet or the building structure created for piping and electrical conduit shall be sealed to eliminate air flow through the openings. Building structure openings shall also be caulked to prevent water intrusion.
7. **Indoor Thermostats.** Thermostats used for both heating and cooling shall have a manual changeover feature or heating/cooling lockout to prevent cross-cycling between heating and cooling.

8. **Compliance with Applicable Codes and Manufacturer Requirements.** Installation must comply with all applicable codes including water well rejection or water discharge. System shall be installed according to IGSHPA guidelines and manufacturer's specifications, including, but not limited to those for: sizing, airflow, water flow (GPM/ton), protective devices, low supply water temperature cutout, water supplied to and discharged from the heat pump, heat exchanger flushing, field wiring, equipment placement, air filter access, condensate drain lines and pumps, refrigerant piping, refrigerant charge, condensate management, and fossil fuel back-up systems.
- a. **Refrigerant Charge.** Verify refrigerant charge using methods recommended by the manufacturer.
  - b. **Air Flow.** Air flow across the indoor coil shall be as specified in the heat pump manufacturer's literature, or at least 300 cubic feet per minute (CFM) per 12,000 Btu/hr output at AHRI rating conditions if the manufacturer's literature is not specific. Approved measurement methods include using a TrueFlow plate or using the duct pressurization fan matching method per plate or fan manufacturer's instructions.
  - c. **External Static Pressure.** The total external static pressure acting on the system air handler shall not exceed 0.8 inches of water (200 Pa).
9. **Warranty:** All system components shall carry a minimum of a 5 year warranty.