

## PTCS® Ground Source Heat Pump Form (required)

All fields must be completed. Work must be performed by one or more technicians certified in PTCS and/or IGSHPA. Multiple technicians may be employed to meet these certification requirements, but all must be present at the time of the install.

- 1) **Enter data on a mobile device or computer** at [ptcs.bpa.gov](http://ptcs.bpa.gov) using the installing technician's account. Issues entering data? Submit this form for entry:
  - Customers of Bonneville Power Administration (BPA) utilities: email [ResHVAC@bpa.gov](mailto:ResHVAC@bpa.gov), fax to 1.877.848.4074, or call 1.800.941.3867
- 2) **Submit documentation to the customer utility**, including this form, the Registry Installation Report (found online), and any required backup documentation.

|  |                    |  |                         |                 |
|--|--------------------|--|-------------------------|-----------------|
| <b>Site Information</b>  |                    | <b>Install Date</b>  | <b>Electric Utility</b> |                 |
| <b>PTCS Tech Name</b>  | <b>PTCS Tech #</b> | <b>IGSHPA Tech Name</b>  |                         | <b>IGSHPA #</b> |
| <b>Installation Site Address</b>   |                    | <b>Site City</b>   | <b>Site State</b>       | <b>Site Zip</b> |
| <b>Home Type:</b> <input type="checkbox"/> Existing Site Built <input type="checkbox"/> New Construction Site Built <input type="checkbox"/> Manufactured: # of Sections <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3  |                    |  |                         |                 |
| <b>Heated Area: Sq Ft</b>  |                    | <b>Foundation Type (Site Built):</b> <input type="checkbox"/> Crawlspace <input type="checkbox"/> Full Basement <input type="checkbox"/> Half Basement <input type="checkbox"/> Slab |                         |                 |
| <b>Existing Heating System Being Replaced (If new home, indicate heating system installed):</b><br><input type="checkbox"/> Electric Forced Air w/out AC <input type="checkbox"/> Electric Forced Air w/ AC <input type="checkbox"/> Electric Zonal <input type="checkbox"/> Air Source Heat Pump <input type="checkbox"/> Ground Source Heat Pump<br><input type="checkbox"/> Natural Gas Furnace (Gas Company: _____) <input type="checkbox"/> Other Non-Electric Space Heating: _____ |                    |  |                         |                 |
| <b>Back up Heat:</b> <input type="checkbox"/> None <input type="checkbox"/> Electric Forced Air <input type="checkbox"/> Electric Zonal <input type="checkbox"/> Natural Gas Furnace <input type="checkbox"/> Non-Electric Space Heating   |                    |  |                         |                 |

### New Heat Pump Equipment Data

*\*PTCS requires GSHPs to be Energy Star qualified. Visit [energystar.gov](http://energystar.gov).*

|  |   |  |   |  |
|--|---|--|---|--|
| <b>*ENERGY STAR®?</b><br><input type="checkbox"/> Y <input type="checkbox"/> N   | <b>AHRI#</b>  | <input type="checkbox"/> Closed Loop<br><input type="checkbox"/> Open Loop <input type="checkbox"/> Pond | <input type="checkbox"/> Vertical Loop<br><input type="checkbox"/> Horizontal Loop                                      | <input type="checkbox"/> Forced Air Furn.<br><input type="checkbox"/> Hydronic |
| <b>Heat Pump Make</b>  | <b>Heat Pump Model #</b>  |  | <b>Capacity (tons)</b>  |  |
| <input type="checkbox"/> Non-Variable Speed HP<br><input type="checkbox"/> Variable Speed HP   | <b>What is the Balance Point?</b> _____<br>Provide BP documentation to utility. |  | <b>Are the refrigeration piping/other penetrations sealed?</b> <input type="checkbox"/> Yes <input type="checkbox"/> No |  |
| <b>For Closed Loop Systems</b><br>Total external loop length: _____ft  |   | For Horizontal ground loop<br>Average in-ground loop depth: _____ft.                                     | For Vertical Loop<br>No. _____ and depth _____ ft. of boreholes   |  |
| <b>For Open Loop Systems</b> Supply side depth (elevation difference between water source and heat pump): _____ ft.<br>Return water: Re-injected into ground. Re-injection depth (elevation difference between heat pump and re-injection point): _____ ft.<br>Discharged onto the surface. Specify surface: _____ |   |  |   |  |

### True Flow Test

*Not necessary for Water to Water systems.*

|   |   |   |  |  |                |
|---|---|---|--|--|----------------|
| Testing Mode Used:<br><input type="checkbox"/> Heating <input type="checkbox"/> Cooling | External Static Pressure  |   | Plate Location: <input type="checkbox"/> Air Handler <input type="checkbox"/> Return Grille<br><input type="checkbox"/> Other: | Units:<br><input type="checkbox"/> Pa <input type="checkbox"/> H2O |                |
| Plate Size  | <b>Plate 1</b><br><input type="checkbox"/> 14 <input type="checkbox"/> 20 | <b>Plate 2</b><br><input type="checkbox"/> 14 <input type="checkbox"/> 20 | <b>Plate 3</b><br><input type="checkbox"/> 14 <input type="checkbox"/> 20  | <i>True Flow Test Notes</i>  |                |
| NSOP [A]  |   |   |  |  |                |
| TFSOP [B]   |   |   |  |  |                |
| Plate Pressure  |   |   |  |  |                |
| Correction Factor<br>[C] = $\sqrt{([A]/[B])}$ or from table                             |   |   |  |  |                |
| Raw Flow CFM from tables [D]  |   |   |  |  |                |
| Corrected Flow CFM = [C] x [D]  |   |   |  | <b>Total CFM</b>   | <b>CFM/ton</b> |

## Auxiliary Heating System

Auxiliary (strip) heat lockout:  greater than 30°F  Other (specify):

## Flow Rate in GPM

*\*For GPM flow rate use manufacture's startup instructions, numbers in PTCS specs, or measure directly.*

|                                |                       |  |
|--------------------------------|-----------------------|--|
| Loop In Pressure [A]           | Loop Out Pressure [B] | Pressure Drop [A-B]  |
| GPM flow rate from Mfg. table* | Calculate GPM/ton     | GPM/ton requirement met: <input type="checkbox"/> Y <input type="checkbox"/> N |

## PTCS Commissioned Ground Source Installation Checklist

|  |         |         |                                     |         |         |
|--|---------|---------|-------------------------------------|---------|---------|
| Temperature Rise/Drop across Ground Loop. Tests to be performed w/o desuperheater after 15 min continuous operation. |         |         |                                     |         |         |
| Mode unit tested in: <input type="checkbox"/> Heating <input type="checkbox"/> Cooling                               |         |         |                                     |         |         |
| Existing Condition   | Cooling | Heating | After Adjusted Cond. (If necessary) | Cooling | Heating |
| Loop in Temp.  | °F      | °F      | Loop in Temp.                       | °F      | °F      |
| Loop out Temp.   | °F      | °F      | Loop out Temp.                      | °F      | °F      |
| Temp. Diff.  | °F      | °F      | Temp. Diff.                         | °F      | °F      |
| Target Diff.**   | °F      | °F      | Target Diff.**                      | °F      | °F      |
| Temperature Rise/Drop across Air Coil Check after 15 minutes of continuous operation.                                |         |         |                                     |         |         |
| Existing Condition   | Cooling | Heating | After Adjusted Cond. (If necessary) | Cooling | Heating |
| Supply Air Temp.   | °F      | °F      | Supply Air Temp.                    | °F      | °F      |
| Return Air Temp.   | °F      | °F      | Return Air Temp.                    | °F      | °F      |
| Temp. Diff.  | °F      | °F      | Temp. Diff.                         | °F      | °F      |
| Target Diff.**   | °F      | °F      | Target Diff.**                      | °F      | °F      |

**\*\*Refer to manufacturer's installation guide for target loop and air-side temperature splits. If measured splits do not meet the manufacturer's specifications, repair and re-test until specs are met**

## Notes

## Closed Loop GSHP Specification Requirements Checklist (Specification dated October 4, 2011)

|   |  |  |   |  |
|---|--|--|---|--|
| <b>Installation</b>   | Equipment, including filter(s), is accessible. <input type="checkbox"/> Y <input type="checkbox"/> N   | All direct potable water connections protected by approved backflow prevention devices. <input type="checkbox"/> Y <input type="checkbox"/> N                |   |  |
| <b>Pump(s)</b>  | ≤ 165 Watts/nominal ton and sized to provide 3 GPM/ton. <input type="checkbox"/> Y <input type="checkbox"/> N  | Pumps are cast iron and or bronze. <input type="checkbox"/> Y <input type="checkbox"/> N   | Flow centers have filling and air purge ports. <input type="checkbox"/> Y <input type="checkbox"/> N    |  |
| <b>Pipe</b>   | HDPE & PEX piping rated/designed for GSHP systems per IGSHPA. <input type="checkbox"/> Y <input type="checkbox"/> N  | HDPE socket weld, electro-fusion, or butt weld. <input type="checkbox"/> Y <input type="checkbox"/> N  | Only non-metallic connections on PEX. <input type="checkbox"/> Y <input type="checkbox"/> N             |  |
| <b>Controls</b>   | Installed auxiliary heat capacity does not exceed 125 percent of the heating design load. <input type="checkbox"/> Y <input type="checkbox"/> N                        | Auxiliary heat does not operate during a 1 <sup>st</sup> stage heating call, except in emergency heat. <input type="checkbox"/> Y <input type="checkbox"/> N |   |  |
| <b>Horizontal Loops</b> <input type="checkbox"/> NA           | Designed and sized for 30°F min Entering Water Temperature (EWT). <input type="checkbox"/> Y <input type="checkbox"/> N  |  |   |  |
| <b>Vertical Ground Loop</b> <input type="checkbox"/> NA       | Designed/sized for 30°F min EWT. <input type="checkbox"/> Y <input type="checkbox"/> N   | Detailed drilling log for boreholes. <input type="checkbox"/> Y <input type="checkbox"/> N   | Boreholes grouted correctly. <input type="checkbox"/> Y <input type="checkbox"/> N                      |  |
| <b>Pond/Lake Loop</b> <input type="checkbox"/> NA             | Heat exchanger is installed beneath at least 8 feet of water in all seasons and designed/sized for 30°F min EWT. <input type="checkbox"/> Y <input type="checkbox"/> N |  |   |  |
| <b>Hydronic Systems</b> <input type="checkbox"/> NA           | Newly poured concrete slabs designed for 100°F design water delivery temperatures. <input type="checkbox"/> Y <input type="checkbox"/> N                               | Insulation R-15 4' perimeter and R-10 under the rest of the slab. <input type="checkbox"/> Y <input type="checkbox"/> N                                      |   |  |
| <b>Desuperheater</b> <input type="checkbox"/> NA              | Approved for model by manufacturer. <input type="checkbox"/> Y <input type="checkbox"/> N  | Vented double-wall heat exchanger. <input type="checkbox"/> Y <input type="checkbox"/> N   | Constructed of copper, cupronickel, or stainless. <input type="checkbox"/> Y <input type="checkbox"/> N |  |
| <b>Desuperheater Pump</b> <input type="checkbox"/> NA         | Is rated by UL or ETL-US. <input type="checkbox"/> Y <input type="checkbox"/> N  | Bronze construction. <input type="checkbox"/> Y <input type="checkbox"/> N   | Potable water rated. <input type="checkbox"/> Y <input type="checkbox"/> N                              |  |
| <b>Desuperheater Preheat Tank</b> <input type="checkbox"/> NA | IAPMO/NSF/GAMA rated electric tank manufacturer. <input type="checkbox"/> Y <input type="checkbox"/> N   | GAMA EF rating 0.93. <input type="checkbox"/> Y <input type="checkbox"/> N   | Glass Lined Steel tank, 50 gal min size. <input type="checkbox"/> Y <input type="checkbox"/> N          |  |