PTCS Simplification Changes Webinar
Effective April 1, 2022

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Gary Smith, PTCS Program Manager
December 2, 2021
Today we are covering the base rule simplifications for PTCS participation

Local utilities have their own requirements based on their customer needs

Changes effective 4/1/22
PTCS Redesign Changes
Six-month advance Change Notice / General Change Notice


For the past two years, BPA has worked with regional and national experts to simplify the Performance Tested Comfort Systems, or PTCS, and update the technical specifications of the program to respond to changes in HVAC technologies. BPA worked with internal and external stakeholders to support these and other changes, and accepted and incorporated them into the PTCS program.

This document, which details the PTCS Redesign changes, will be in the Oct. 1, 2021 Change Notice. They will also be available on the bpa.gov PTCS Essentials page and the Online Registry. The changes — which are not compliance-related and are not reflected in the Implementation Manual — will be presented at a PTCS webinar during calendar year Q4 2021 or Q1 2022.

<table>
<thead>
<tr>
<th>CHANGES</th>
<th>REASONING</th>
<th>IMPACT</th>
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</thead>
<tbody>
<tr>
<td>PTCS PROGRAM PARTICIPATION REQUIREMENTS</td>
<td>Changes will be made to PTCS program participation requirements to reduce requirements and remove barriers to participation, or add rigor to improve results.</td>
<td>PTCS Program Participation Requirements, Trainer Application, Participation FAQ.</td>
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<tr>
<td>For PTCS trainers: will add provisional approval after an application that meets participation requirements is received. Full approval is granted after a BPA-certified PTCS trainer observes a training.</td>
<td>This change improves our orientation step with a peer review, makes it easier for a new trainer to get started in the process, and better clarifies expectations.</td>
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Link is in IM Section 10.7.2 for “PTCS Change Notice Summary”
BPA heard your PTCS challenges

PTCS feedback we received in a 2-year Work Group process:

- Time consuming
- Laborious documentation and reporting
- High cost
- Lengthy training

So we improved PTCS and made it easier
What we’ve simplified:

- Reporting from Utilities to BPA
- Reporting from Contractors to Utilities
- Implementation in the Field
- Participation
- Quality Assurance (QA)
- Training

these changes go into effect on 4/1/22
Changes effective 4/1/22

Simplified Utility to BPA Reporting
The following PTCS forms are *optional*. Utilities will no longer be required to store them in the Customer File. The Online Registry will be used instead.

- **PTCS Air Source (AS) Heat Pump Form** *(renamed Optional Data Collection Tool)*
- **PTCS Heat Pump and Central Air Conditioner Sizing Calculator**
- A heat load/heat loss calculation and associated balance point worksheet (i.e. a calculator, graph, or chart)
- **CheckMe!® Heat Pump Protocol Data Entry Form for PTCS Summer and Winter**
- **PTCS Duct Sealing Form** *(renamed Optional Data Collection Tool)*
In addition, the following documentation will no longer be required in the Customer File (for any PTCS measure):

- Ground Source (GS) Heat pump heat load/heat loss calculation and associated balance point worksheet (i.e. a calculator, graph, or chart)
- GS Heat pump loop design documentation
- Registry Installation Report
- Documentation that measure requirements have been met (manufacturer, model number, type, size and quantity of equipment or product installed or used)
- Proof that the required forms for the claimed measure have been accepted in the PTCS site registry of certified systems
Simplified Utility to BPA Reporting

Here are the new simplified PTCS Documentation Requirements:

- Unique Site ID/Address
- Invoice

- UES Upload Template will only require Unique Site ID/Address and Registry Measure ID reflecting “BPA-Approved” status
Questions?
Simplified Contractor to Utility Reporting

Changes effective 4/1/22
Simplified Contractor to Utility Reporting

PTCS Registry: New Off-Line Entry Feature

The Registry will be enhanced to include Off-Line entry with simple manual uploading/syncing when back online.

Enter project info while on the job-site whether you have internet access or not

Project info will be uploaded when you have internet access

BPA will develop an on-demand training video to support the new Off-Line Entry feature, available via Virtual PTCS School at CLEAResult.Moodle.School
Simplified Contractor to Utility Reporting

PTCS Registry: New Off-Line Entry Feature

Users will be able to record data, even when internet is unavailable

1. Set up
2. Enter data
3. Upload

Changes effective 4/1/22
Simplified Contractor to Utility Reporting

When accessing the PTCS Online Registry at [https://ptcs.bpa.gov](https://ptcs.bpa.gov), a small, self-contained set of entry forms will automatically download to your device.

*Have an Apple device? Use Safari! It doesn’t play well with Chrome or Firefox on Apple devices.*

Thereafter, if you try to access the PTCS site without internet connection, the self-contained site will come up instead.
Simplified Contractor to Utility Reporting

2

Enter data

Enter measure information on pages that mirror the online PTCS forms.
Real-time data checking ensures data is entered correctly, and any calculations are within expected norms (e.g. CFM).

When you’ve finished data entry, a small file is generated, to be uploaded when you do have access to the PTCS website.

Even if the data is incomplete, it will be saved and can be filled in after being uploaded.

Changes effective 4/1/22
Simplified Contractor to Utility Reporting

3

Upload

When you next log into the PTCS website, go to the “Upload Offline Entries” link on the homepage

Click the “Browse” button and find the file generated by the Offline process, and Upload to Registry

Your measure(s) will be entered and processed all the way through to their determination

If there are any errors in processing, they will be explained on this page, with links to fix them
The online site Registry has been updated to accommodate all the PTCS Redesign and simplification changes, and continues to be the central tool and repository for reporting PTCS UES measures.

The following handwritten PTCS forms will now be optional, though utilities can still require them for their own programs:

- PTCS Air Source Heat Pump - Optional Data Collection Tool (also used for VSHPs and CC&S)
- PTCS Ground Source Heat Pump - Optional Data Collection Tool
- PTCS Duct Sealing - Optional Data Collection Tool
- Prescriptive Duct Sealing Form (optional only if Registry is also used, otherwise its required)
Questions?
Simplified Field Implementation
Simplified Field Implementation with a new alternative

Introducing a new alternative to the True Flow Plate air-flow method:

External Static Pressure (ESP) and Cubic Feet per Minute (CFM) Manufacturer Look-up Table Method

An on-demand training video will soon be available via Virtual PTCS School at CLEAResult.Moodle.School.
New Specification Changes for PTCS Air Source and Variable Speed Heat Pumps

Balance point and proper sizing are still required, but detailed guidance on sizing assumptions will move to Best Practices.

Will update the balance point calculation method to be "consistent with" or "equivalent to" ACCA Manual J rather than specifying exactly how the calculation must be done.

Will add new External Static Pressure – CFM lookup table as an acceptable alternative to use of TrueFlow Plate to measure airflow. Utilities can require one method or allow both. Solves a cost barrier to participation as contractors no longer have to buy a True Flow plate.

Changes effective 4/1/22
New Specification Changes for PTCS Air Source and Variable Speed Heat Pumps continued

- Will remove spec requirement to disable or lock out compressor to 5 degrees F or less
- Will change specification terminology for sub-cooling test, replacing “discharge temp” with “liquid saturation temp”
- Will remove spec requirement for multi-stage constant speed-system controls to lock out strip heat if supply temperature is above 85 degrees F

Changes effective 4/1/22
New Specification Changes for PTCS Variable Speed Heat Pumps (only)

Will require external static pressure, airflow, and refrigerant charge be **confirmed as specified in manufacturer’s documentation.**

**External static pressure** measurements will still be required.

**Airflow** measurements will no longer be required. Options to confirm airflow include: On-board readouts of CFM, either shown via blinking LED lights or a thermostat display, dip switches/setting, ESP-CFM Manufacturer Lookup table, or other manufacturer setup instructions.

**Refrigerant charge** check using temperature split during heating (or subcooling during cooling), will no longer be reported. Instead, technician needs confirm refrigerant charge meets manufacturer requirements through weigh-in or other measurements, such as sub-cooling or superheat, per installation instructions.

All other PTCS spec requirements, i.e. for sizing, and controls/strip-heat lockout still apply.
Will combine the PTCS Ground Water Source Open Loop Installation Specifications and Residential Ground Source Heat Pump System Installation Standards into one specification.

Will align ground source heat pump airflow requirements with air source heat pump specification to include new External Static Pressure-CFM Manufacturer Lookup Table.

Balance point and proper sizing are still required, but detailed guidance on HP sizing assumptions to use will move to Best Practices.
New Specification Changes for PTCS
Ground Source Heat Pumps continued

- Will remove Auxiliary Heat Sizing requirement of “Installed auxiliary heat capacity shall not exceed 125% of the heating design load”
- Will remove compressor-lockout setting requirement
- Will move cabinet and exterior building penetration sealing requirement to Best Practices
- Will update auxiliary heat control section to remove unnecessary wording that addresses system freezing

Changes effective 4/1/22
New Specification Changes for PTCS Ground Source Heat Pumps continued

- Will remove indoor thermostat section requiring manual changeover
- Will remove requirement for system components to carry a minimum 5-year warranty
- Will move code-compliance references to Best Practices
- Will remove installer checklist for closed-loop ground source heat pump installations from the ground source heat pump form
New Specification Changes for Duct Sealing (both PTCS and Prescriptive)

Will move these duct sealing general requirements to Best Practices:

Presence of insulation shall not be considered a barrier to accessibility, unless asbestos is suspected to be present.

Installation must comply with all applicable codes.

Changes effective 4/1/22
Questions?
Changes effective 4/1/22

Simplified Participation and Training Requirements
Simplified Participation Requirements

**For Utilities**

It’s easier to become a QA inspector. Will remove requirement for installation experience. Utilities can request to have their staff become Quality Assurance Inspectors (QAIs) by passing a test and demonstrating skills without the requirement of past installations.

**For PTCS trainers**

Will add provisional approval after an application that meets participation requirements is received. Full approval is granted after a BPA-certified PTCS trainer observes a training.

**For Contractor HVAC technicians**

BPA will relax the requirements to become Quality Assurance Inspectors. Now, only 10 installations required, instead of 30 (other requirements remain).
Simplified PTCS Participation Requirements

For new PTCS technicians

Will require they inform the PTCS program of the first 3 projects input into the Registry to allow PTCS trainers an opportunity to help improve quality of their PTCS commissioning work.

For more experienced PTCS technicians

Will require they be subject to increased quality assurance inspections should they experience high quality assurance inspection failure rates. Quality assurance inspectors will monitor performance and propose a course of action that may include refresher training and/or remote quality assurance inspections, prior to a Performance Improvement Plan.

Changes effective 4/1/22
Simplified PTCS Participation Requirements

**PTCS training requirements were simplified**

**For Prescriptive Duct Sealing Certifications**
Will develop a remote/on-demand training (see Virtual PTCS School on bpa.gov or the Online Registry at [https://ptcs.bpa.gov](https://ptcs.bpa.gov)). **Available now!**

**For experienced Heat Pump Technicians**
Will develop on-demand training (see Program Participation Requirements document for Alternative Certifications). **Available now!**
Questions?
Simplified Quality Assurance (QA)

Compressor lockout will be removed from QA forms

Heat Pump QA Grading Scale will change grading options to ‘A’ or ‘F’ grade only (i.e. pass/fail)

BPA developed and piloted a new Remote Quality Assurance capability, featuring live-chat, video sharing and photo options. Provides real-time quality control.

Already completed

Changes effective 4/1/22
Simplified Quality Assurance (QA)

For variable speed heat pumps

QA Inspection forms will notify inspector that airflow measurement is not required. However, airflow should be confirmed if performing a “remote” QA inspection at the time of installation.
Simplified Quality Assurance (QA)

Will change Heat pump QA Inspection forms and the Registry to identify which airflow testing method was performed and include ‘A’ grade options for:

- Airflow confirmed by flow plates between 325-500 CFM ton, or no test completed for variable speed systems
- External Static Pressure-CFM methodology meeting program standards
- Systems not meeting 325-500 CFM/ton if they meet manufacturer specifications
Simplified Quality Assurance (QA)

For variable speed systems

Heat pump QA Inspection forms will be updated to show airflow testing and refrigerant charge testing is not required during quality assurance inspections, but airflow and charge must be as specified in manufacturer documentation.

Heat pump QA Inspection forms will be updated to include “Maximum ESP allowed by manufacturer if VSHP” and ‘A’ grade definition will be updated to confirm that “ESP is less than the maximum allowed by the manufacturer if VSHP.” Our intent is to continue testing for ESP during onsite quality assurance inspections.
Simplified Quality Assurance (QA)

For remote QA inspections
Heat pump remote QA Inspection form will be revised to clarify that if any one item fails during remote inspection, the project is disqualified and the issue must be remediated.

For field QA inspections
We have different criteria for failing an inspection, instead pointing to the overall inspection grade.
Questions?
Resources
Training for technicians will be available on the Registry on 3/1/22

PTCS call center available for questions: 800-941-3867

Energy Efficiency Representatives and Program Managers are available for questions

Learn more about free PTCS ASHP or Duct Sealing Training by emailing ResHVAC@BPA.gov
Additional Resources

Changes become effective on April 1, 2022

PTCS Updates can be found on the PTCS Online Registry announcement section or in CLEAResult newsletters

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Thank you
Quick PTCS ASHP Specification Primer

Additional background on planned changes to the PTCS Air Source Heat Pump Specification.
**Details**

<table>
<thead>
<tr>
<th>Spec</th>
<th>9.0 HSPF/14 SEER (Below 9.0 HSPF for CC&amp;S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contractor Task</td>
<td>Sales staff selects this</td>
</tr>
<tr>
<td>PTCS QA Failure rate</td>
<td>4% (*15–Present)</td>
</tr>
<tr>
<td>Workgroup Feedback</td>
<td>No specific issues</td>
</tr>
<tr>
<td>Technician Feedback</td>
<td>Easy to verify from AHRI data</td>
</tr>
</tbody>
</table>

**HSPF/SEER**

**Requirements:**
- 9.0+ HSPF
- CC&S measure offered for installations below 9.0

**Rationale:**
- Easy to understand
- Majority of sales still below 9.0 HSPF; higher HSPF increases cost
- CC&S customer service measure for some utilities
  - 9.0 HSPF heat pumps available in manufactured homes
- Considering future research into HSPF as an indicator of savings
External Static Pressure

Requirements:

● Maintain External Static Pressure within required range

Rationale:

● Significant indicator of air handler performance

● High ESP indicates an overly restrictive duct system, creating potential efficiency penalties

● Important to capture ESP to ensure ECM fan motor power is not excessive, especially for variable speed systems
  ○ ECM motors are more commonplace now
Refrigerant Charge Check

**Requirements:**

- Test the refrigerant charge according to specification

**Rationale:**

- Refrigerant charge a challenge in the region
- Under-charging may have energy penalties as high as 23%; over-charging may have energy penalties as high as 15%
- Temp split test may not identify overcharging; manufacturers recommend revisiting and retesting, which is not implementable
- New tools and the “Charge Assist” feature will be reviewed to further simplify testing

<table>
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<tr>
<th>Spec</th>
<th>Temp split: At or above minimum in R-410A table</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Subcool: Manu’s requirements or chart</td>
</tr>
<tr>
<td>Contractor Task</td>
<td>Gauges</td>
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<tr>
<td>PTCS QA Failure rate</td>
<td>20%</td>
</tr>
<tr>
<td>(*15 – Present)</td>
<td>Temp split charts helpful</td>
</tr>
<tr>
<td>Workgroup Feedback</td>
<td>Unanimous consent this is important</td>
</tr>
<tr>
<td>General Expert Feedback</td>
<td>Subcooling language unclear</td>
</tr>
</tbody>
</table>
Auxiliary (Strip) Heat Lockout

Requirements:

- Lock out strip heat according to the specification

Rationale:

- PTCS has been shown to positively influence this spec despite the high failure rate
- Limited information on impact to savings, but we see a benefit to continue requiring this specification
- Improving education on the benefits of this spec and what other issues to look for that might be causing comfort problems
- Other long-term solutions being discussed to solve persistency
Balance Point Sizing

Requirements:

- Balance point sizing is required

Rationale:

- High impact to other specifications
- Remove sizing documentation requirement due to significant variation and challenges in understanding the documentation
- Increase the training infrastructure:
  - Piloting new sizing tools, requiring sizing training of sales staff, and improving overall technician support to properly size systems

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Airflow (CFM/ton)

Requirements:

- Technicians may estimate the airflow based on the External Static Pressure and the manufacturer look-up tables, or
- Use the TrueFlow test (BPA considering options to not require the correction factor)

Rationale:

- Low airflow may reduce capacity/efficiency
- Referencing external static pressure significantly reduces cost and time
- Inaccuracy found with TrueFlow equipment that is not maintained
- TrueFlow correction factor confusing and currently more automated

Note: Both options still require ESP.
Each utility can choose which option to allow