PTCS Simplification Changes Webinar

Effective April 1, 2022

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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

PTCS Redesign Changes were published in Oct 2021 IM Change Notice

PTCS Redesign Changes
Six-month advance Change Notice / General Change Notice

Published Oct. 1, 2021. Effective April 1, 2022.

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.

CHANGES	REASONING	IMPACT
PTCS PROGRAM PARTICIPATION REQUIREMENTS **Changes will be made to PTCS program participation requirements to reduce requirements and remove barriers to participation, or add rigor to improve results.**		
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.	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.	PTCS Program Participation Requirements, Trainer Application, Participation FAQ.

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:

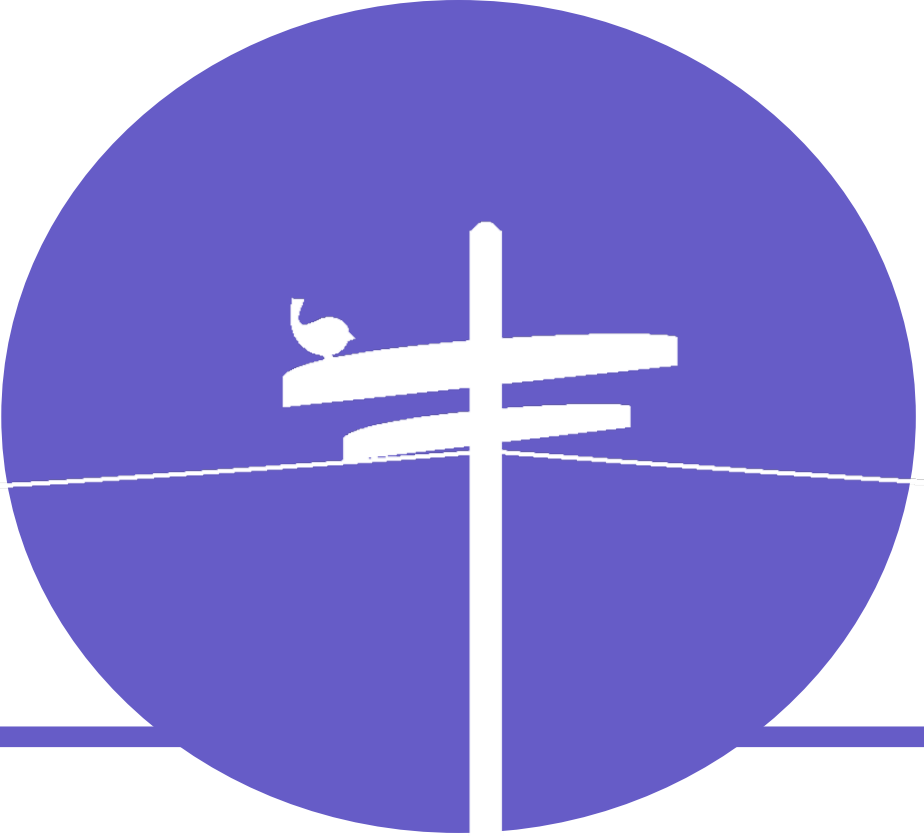
- Time consuming
- Laborious documentation and reporting
- High cost
- Lengthy training

So we improved PTCS and made it easier

Changes effective 4/1/22

What we've simplified:

these changes go into effect on 4/1/22



Simplified Utility to BPA Reporting

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)**

Simplified Utility to BPA Reporting

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:

For customer file

- ✓ Unique Site ID/Address
- ✓ Invoice

BEETS

BPA Energy Efficiency Tracking System

- ✓ UES Upload Template will only require Unique Site ID/Address and Registry Measure ID reflecting "BPA-Approved" status

Questions?

Simplified Contractor to Utility Reporting

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

Simplified Contractor to Utility Reporting

1

Set up

When accessing the PTCS Online Registry at 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

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

Simplified Contractor to Utility Reporting

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

External Static Pressure – CFM Manufacturer Lookup Table

Example of a Manufacturer-Provided External Static Pressure-Airflow Lookup Table (showing total CFM at intersection)

Blower Motor Speed Setting	External Static Pressure (Inches of Water Column)						
	0.10	0.20	0.30	0.40	0.50	0.60	0.70
High	1606	1566	1524	1480	1450	1412	1376
Medium-high	1511	1467	1430	1387	1353	1309	1274
Medium	1300	1250	1210	**1175**	1134	1078	1009
Medium-low	1104	1060	1029	987	912	841	784
Low	913	886	832	765	694	569	530

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

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/settings, 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.

New Specification Changes for PTCS Ground Source Heat Pumps

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

New Specification Changes for PTCS Ground Source Heat Pumps continued

Will remove indoor thermostat section requiring manual changeover

Will move code-compliance references to Best Practices

Will remove requirement for system components to carry a minimum 5-year warranty

Will remove installer checklist for closed-loop ground source heat pump installations from the ground source heat pump form

Changes effective 4/1/22

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

Questions?

Simplified Participation and Training Requirements

Simplified Participation Requirements

For Utilities

It's easier to become a QA inspector. Will remove requirement for installation experience. Utilties 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.

Simplified PTCS Participation Requirements

PTCS training requirements were simplified

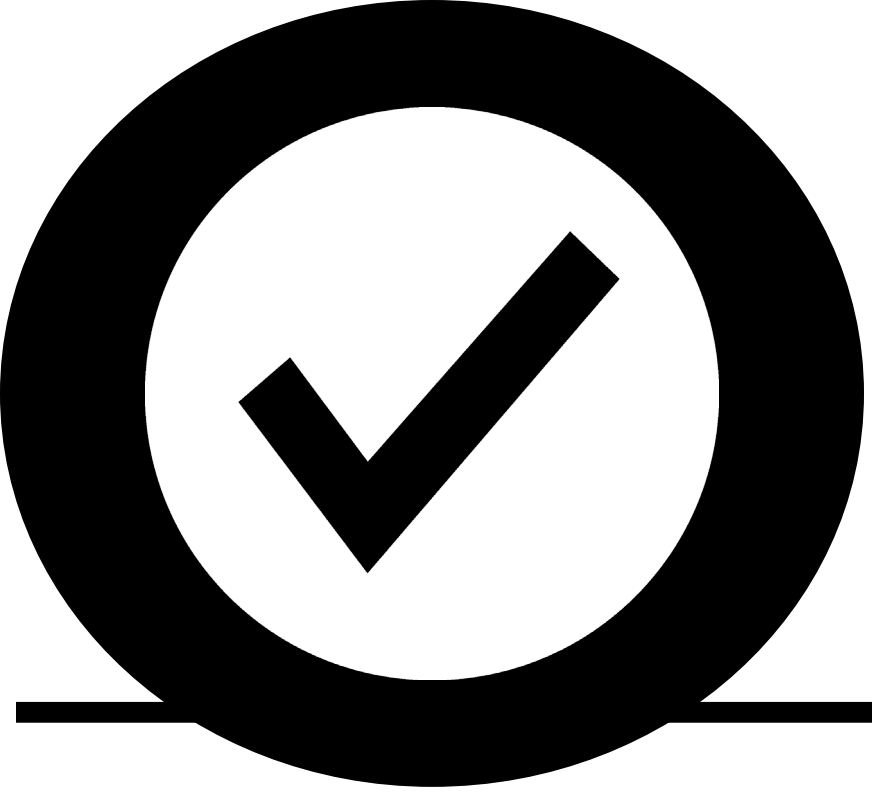
For Prescriptive Duct Sealing Certifications

Will develop a remote/on-demand training (see Virtual PTCS School on bpa.gov or the Online Registry at https://ptcs.bpa.gov). **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)

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)

Already completed

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

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

Additional 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

If you are new to PTCS

Quick PTCS ASHP Specification Primer

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

HSPF/SEER

Details

Spec	9.0 HSPF/ 14 SEER (Below 9.0 HSPF for CC&S)
Contractor Task	Sales staff selects this
PTCS QA Failure rate *('15 – Present)*	4%
Workgroup Feedback	No specific issues
Technician Feedback	Easy to verify from AHRI data

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

Details

Spec	Up to 0.8 In H2O or 200 Pa
Contractor Task	Static pressure tap
PTCS QA Failure rate *('15 – Present)*	13%
Workgroup Feedback	Priority spec
General Expert Feedback	Important; ensures efficient operation of the air handler
Technician Feedback	Easy test, often performed already

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

Details

Spec	**Temp split**: At or above minimum in R-410A table **Subcool**: Manu's requirements or chart
Contractor Task	**Gauges**
PTCS QA Failure rate *('15 – Present)*	**20%**
Workgroup Feedback	Temp split charts helpful
General Expert Feedback	Unanimous consent this is important
Technician Feedback	Subcooling language unclear

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

Auxiliary (Strip) Heat Lockout

Details

Spec	Strip heat locked out above 35F
Contractor Task	Interfacing with the thermostat
PTCS QA Failure rate *('15 – Present)*	31%
Workgroup Feedback	Comfort in the morning and areas w/o a weather station are issues
General Expert Feedback	Savings impact inconclusive, but support keeping
Technician Feedback	Persistency issues if homeowner changes setting

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

Details

Spec	Up to 30F
Contractor Task	Sales staff selecting equipment
PTCS QA Failure rate *('15 – Present)*	4%
Workgroup Feedback	Difficult to enforce and verify
General Expert Feedback	High impact to savings and other specifications, though challenging
Technician Feedback	Sizing tools confusing and time consuming

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

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

Details

Spec	325 – 500 CFM or manu spec
Contractor Task	TrueFlow Test
PTCS QA Failure rate *('15 – Present)*	17%
Workgroup Feedback	Good to verify, but different for VSHPs
General Expert Feedback	Important but testing is a barrier
Technician Feedback	Time consuming and confusing test and costly equipment

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