

Connected Heat Pump Water Heaters



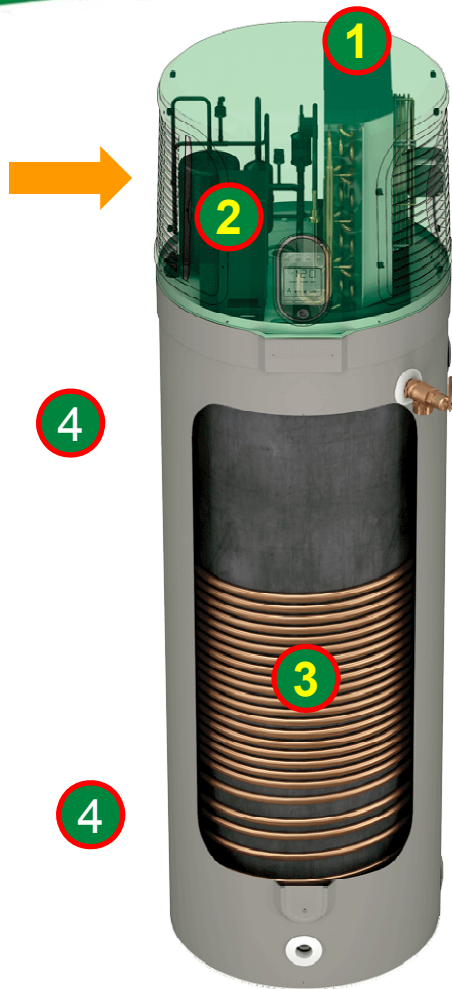
50, 66, 80 Gallon



80, 120 Gallon



Operation



1. Evaporator
2. Compressor
3. Condenser
4. Resistive Electric Heating Elements
 - a. Faster recovery
 - b. Allow hot water production when the conditions are outside of the heat pump operating parameters i.e. too cold air temp
5. The end result is very efficient production of hot water, up to 66% more efficient than standard electric water heaters.

Control Potential

- Operating Mode – heat pump, hybrid, electric, vacation
- Compressor on- off
- Upper element on – off
- Lower element on off
- Set temperature up - down

Grid Commands – Partial List



- Run Normal
- Basic Shed
- Critical Peak
- Grid Emergency
- Energy Storage Query
- Load Up
- Price Driven Events

Communication Technology Options

- Wi- Fi
- CTA-2045
 - Wi-Fi
 - FM
 - ZigBee
 - Z-Wave
 - Thread
 - 900 MHz
 - Power line carrier
 - Bluetooth
 - Cellular
 - Pager
 - Other – new- faster-cheaper



Advantages of an Open Standard

- Allows for volume production – Limited models
- Reduced engineering, BoM, production cost
- Simplifies customer support and related costs

- Simplifies distribution channel – Limited models
- Reduces inventory carrying costs
- Reduces floor space (Retail distribution)
- Provides future proofing for mfg., distributor, utility, end user

- Market driven specification

Challenges



Out of Sight Out of Mind -
Replacements Not Planned

Consumers may have no direct
interaction with their water heater
for years !

Challenges



Replacement is an Emergency
(24 hours – 48 hours max)

Folks can go without other major appliances for days, but not Hot water!

Challenges

Emergency Replacements are what is on the Contractors Truck



Challenges

90% + of Electric water heater replacements are lowest cost models

Water Heaters are a Commodity - Low Cost is main contractor purchase criteria



Challenges

