

# Air Source Heat Pumps (ASHPs): Installation and Operation Best Practices for Contractors and Customers

## Best Practices for Installation

### 1. Condenser Mounting Pads and Stands

As ASHPs are a long-term investment, a best practice would be to install the outdoor equipment on a stand on poured concrete. This is especially true of the larger, double outdoor fan condensers.

There are many brands of durable fabricated pads, and they are best used on single fan condensers.

As ASHPs will drain water in the defrost cycle, all condensers must be elevated above expected snow level, to prevent ice damage to condenser due to defrost cycle water draining and freezing on the built-up snow. For the same reason units should not be installed on walkways or sidewalks.



### 2. Wall Mounted Condensers

When installing condensers on wall mounting brackets, be aware of vibration noise. Avoid installing on bedroom walls. Contractors should discuss with customers in advance.



### 3. Piping and Line Sets

Specify non-VOC (volatile organic compound) foam pipe insulation. This insulation will not degrade the copper tubing and is identified as **ASTM C 534 Grade 3 compliant**. There are multiple brands of non-VOC line sets on the market.

# Air Source Heat Pumps (ASHPs): Installation and Operation Best Practices for Contractors and Customers



## 4. Surge Protectors

Surge Protectors are readily available (low cost and easily installed at the outdoor disconnect switch) to protect the electronic control boards in the outdoor condensers. Storms and possible spikes due to sub-station voltage fluctuations can damage boards, which are expensive to replace.

## 5. Perform AC Check/MS Check to Verify Proper System Charge

All heat pumps have factory installed refrigerant charge. Most new installations, however, will need refrigerant added at installation to work properly, followed by a charge verification test.

All Rhode Island Energy Program Participating Contractors have technicians trained to perform these test procedures:

- *AC Check* for conventional ducted systems (a standard procedure)
- *MS Check* to verify proper charge and electrical usage of “mini split” systems, designed to evaluate multi-speed indoor units and inverter (5 to 10 speed) compressors. With many systems having multiple indoor units and longer connected piping systems, *MS Check* verification of proper installation is important to ensure full performance of the heat pump system.

## Best Practices for Operation

### 1. Temperature Settings - Set It and Forget It

The modern ASHP is a variable speed device that **MAINTAINS** temperature cheaper than it **RECOVERS** temperature.

Every time the condenser increases motor speed, due to raising (in heating) or lowering the setpoint (in cooling) on the remote or wall thermostat, the increased motor speed will increase the electric usage, at times dramatically.

The best way to adjust the ASHP temperature setting during heating or cooling seasons is to alter only 2-3°F at a time. This will allow the outdoor compressor to operate at a lower motor speed, using less electricity.

If you have remote access via WiFi connection, minor 2-3°F adjustments can be done in several steps to raise or lower the unit setting, if returning home after a time away.

# Air Source Heat Pumps (ASHPs): Installation and Operation Best Practices for Contractors and Customers



## 2. Using an ASHP with the Existing Heating System - Stage the Thermostats

As many customers will not be removing the existing heating systems the best way to optimize use of the existing heating system as backup and the ASHP as primary heat source is to **Stage the Two Thermostats**:

1. Set the ASHP thermostat to the desired comfort setting and
2. Set the existing heating thermostat 2-3°F lower.

With this strategy, if the ASHP cannot keep the room comfortable, the existing heat will come on for a short period of time, warm the room, and shut off. The ASHP will then maintain the temperature at the desired setting very economically.

## 3. Night Setback

It may also be desirable to use the existing thermostat to warm the house back from setback, then turn down slightly during the day. This will allow the ASHP to provide heating for most of the time.

## 4. Summer Operation

During the cooling season, the best strategy is **Set It and Forget It!**

ASHPs **Maintain** temperature cheaper than they **Recover** temperature

Frequent thermostat adjustments to the ASHP will increase operating costs.

## 5. Clean the Air Filters

If your ASHP is ductless, the indoor units will have accessible washable filters, and these should be washed/rinsed monthly.

If you have a ducted indoor unit, the filters should be changed, at a minimum, before every heating and cooling season. Depending on how much the system is used, more frequent filter changes may be desirable.