





Booster Fan Ducting Kit Installation Instruction for Hybrid Electric Heat Pump Water Heaters

	This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.
 DANGER	DANGER indicates an imminently hazardous situation which, if not avoided, will result in injury or death.
 WARNING	WARNING indicates a potentially hazardous situation which, if not avoided, could result in injury or death.
 CAUTION	CAUTION indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.
CAUTION	CAUTION used without the safety alert symbol indicates a potentially hazardous situation which, if not avoided, could result in property damage.

INTRODUCTION

Heat is absorbed from air entering the inlet (left or top, depending on the model) side of the compressor unit on top of the water heater and transferred to the water inside the storage tank. Cooler dehumidified air exiting the outlet (right) side of the compressor unit is a normal by-product of operation. In standard installations (using ambient air) a minimum installed space is required.

- 1st generation (plastic top shroud) - 750 ft³ (21.2 m³).
- 2nd generation (metal top shroud) - 700 ft³ (19.8 m³).

Duct adaptors can be used to redirect inlet and/or outlet air from or to other locations to permit installation in confined spaces, improve performance and maintain comfort in occupied areas of the home.

See the instruction manual that is shipped with the water heater for further instructions on using ducting kits for installation in confined spaces of less than minimum spaces listed above.

INSTALLATION LIMITATIONS

There are two duct adaptors; one connects to the outlet side of the top shroud and one to the inlet side (optional). The two cannot be interchanged. Ensure the correct adaptor(s) is ordered prior to installation. Installation of the duct adaptors requires field supplied 8" flexible duct that can be obtained from a local HVAC supply store or home center. Use of smaller diameter ducting is not permitted.

Air can be drawn from or expelled to the outdoors, an attic space, or to another room inside the home.

Ducting must be connected to the outlet and may be connected as an option to the inlet (requires both duct adaptors), though the total length of duct must be installed per the ducting section is defined in this instruction.

INSTALLATION CONSIDERATIONS

The compressor unit on the water heater is disabled when the temperature of the air flowing to the inlet is lower than 45°F (7.2°C) or higher than 109°F (42.8°C). Air expelled from the outlet will be 7°F (4°C) to 9°F (5°C) cooler than the inlet air. These operational parameters must be considered when determining if a location to duct air from/to will be suitable.

IMPORTANT NOTE

If the compressor unit is disabled for long periods of time due to inlet air temperature being too hot or too cold, the potential energy savings a heat pump water heater is able

to provide may be significantly reduced.

AIR INLET


Outdoor air temperatures will often be lower than 45°F (7.2°C) in many regions during fall and winter months.

Attic temperature will often exceed 109°F (42.8°C) in many regions during spring and summer months.

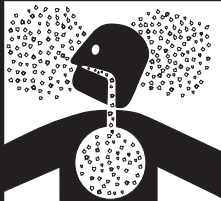
For units installed in conditioned spaces - ducting outdoor air to the air inlet of the unit may place additional load on space heating and cooling equipment unless the air outlet is also ducted to an alternate location.

Air being drawn from an alternate location inside the home may cause a negative pressure condition inside that area. As a result, cold or hot air from outdoors may be drawn into the structure and place additional load on the space heating and cooling equipment.

AIR OUTLET

 **WARNING**

Breathing Hazard - Carbon Monoxide Gas



- Do not duct air from a garage or other space where potentially harmful fumes from solvents, chemicals or exhaust from automobiles are present into any other space in the building structure.
- Gas and carbon monoxide detectors are available.

Breathing carbon monoxide can cause brain damage or death. Always read and understand instruction manual.

The air outlet from a unit installed in a garage or any area where solvents or other chemicals that emit potentially harmful fumes are stored or automobiles are located must never be ducted to any other space inside the building structure. This would include all occupied and unoccupied spaces such as attics or basements. Potentially harmful fumes and vapors from solvents and cleaners or automobile exhaust gases could be introduced into living spaces.

Cold air blowing from the outlet into an alternate location inside the home may cause cooling discomfort and be objectionable.

Cold air blowing from the outlet into an alternate location inside the home may place additional load on space

heating equipment during fall and winter months. Ducting outlet air only to an alternate location may cause a negative air pressure in the installed space. As a result cold or hot air from outdoors may be drawn into the structure and place additional load on the space heating and cooling equipment.

KIT PARTS LIST

BOOSTER FAN KIT		
PART #	DESCRIPTION	QTY
100088429	PRESSURE SENSING SWITCH KIT	1
100082340	BOOSTER FAN	1
100029527	JUNCTION BOX	1
100003967	JUNCTION BOX COVER	1
100088421	3/8" CABLE FITTING	2
100081727	KIT INSTRUCTIONS	1
100081831	CARTON BOOSTER KIT	1

Table 1.

The following kit must be purchased to complete the installation:

1st Generation (plastic top shroud)

Required: Outlet Air Duct Kit PN 100272470

Optional: Inlet Air Duct Kit PN 100272481

2nd Generation (metal top shroud)

Duct Kit (both inlet and outlet) PN 100269724

Tools required: #2 Phillips screwdriver, wire cutters, scissors.

Supplies needed: nut driver, drill, 8" insulated flex duct, duct clamp, or strap, appropriate duct termination, duct tape, 8" metal duct connector, and junction box mounting screws.

Important: Use only factory authorized replacement parts. If you lack the necessary skills to properly perform the installation, you should not proceed, but get help from a qualified service technician.

PRIOR TO INSTALLING THE DUCT ADAPTORS

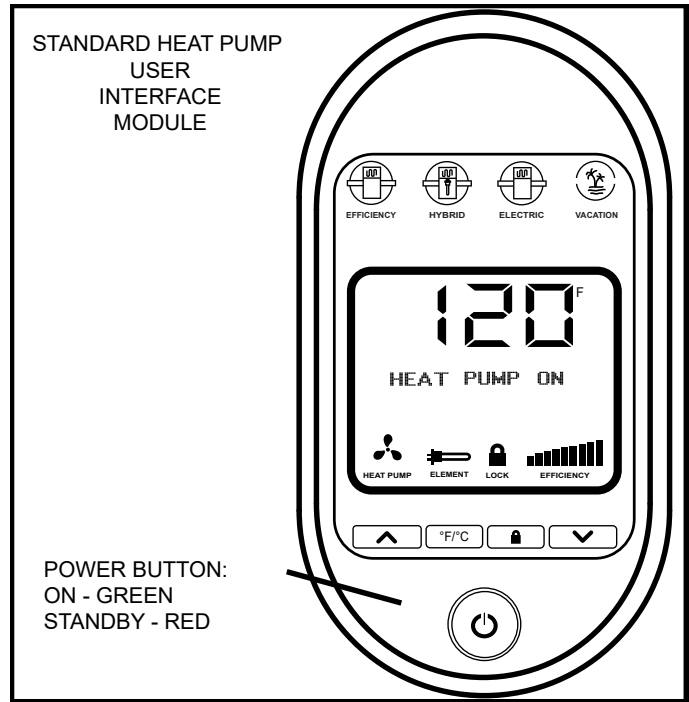


Figure 1. - 1st Generation Models

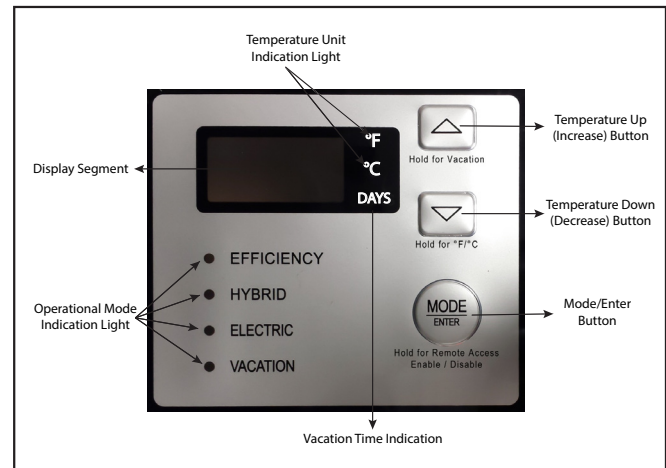


Figure 2. - 2nd Generation Models

INSTALLATION OF THE DUCT ADAPTOR:

NOTE: For 2nd Generation models with a metal shroud, follow kit instructions 100269724

1. Remove the screws from the right louvered access panel and remove the panel. See Figure 3.

NOTE: These Adaptors are not interchangeable.

2. If installing the inlet duct adaptor Remove the 8 screws from the left louvered access panel of the unit.

⚠ WARNING

Electrical Shock Hazard

- Before removing any access panels or servicing the water heater, make sure the electrical supply to the pump station is turned "OFF".
- Failure to do this could result in death, serious bodily injury, or property damage.

1. Press the power button on the User Interface Module (UIM) to place the water heater in Standby Mode see Figure 1. (For 2nd Generation models, skip to step 2)
Note: Power to the board is still present at this time.
2. Turn off all power to the unit at the breaker/fuse panel prior to removing any panels.

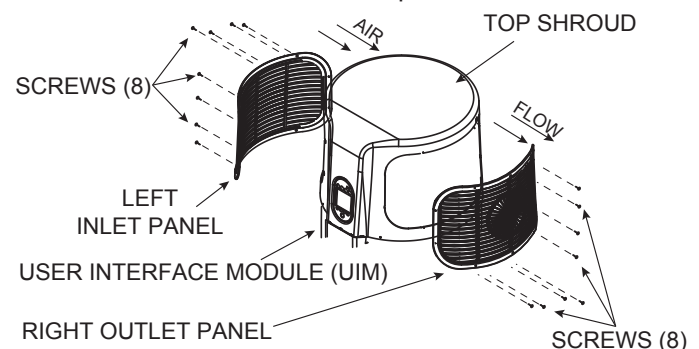


Figure 3.

- Using the eight (8) screws removed earlier attach the new duct adaptor panel to the top shroud of the unit. The new duct adaptor panel should be oriented with the louvered portion of the panel located at the bottom of the panel to ensure that the panel lines up with the existing holes see Figure 4.



Figure 4.

INSTALLATION OF THE DUCTWORK

- After the desired length of 8" duct has been determined (see tables), carefully cut completely around and through the duct insulation with a pair of scissors.
- Using a pair of wire cutters, cut the wire inside the core duct. Fold the insulation jacket back away from the core duct see Figure 5.

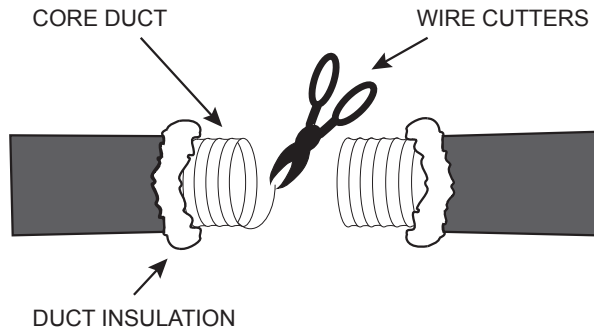


Figure 5.

- Slide at least 1" of the core duct over the ducting adaptor lip and seal with at least two (2) wraps of duct tape. Additionally, secure the core duct with a band clamp or duct strap placed over the ducting adaptor and tape see Figure 6.

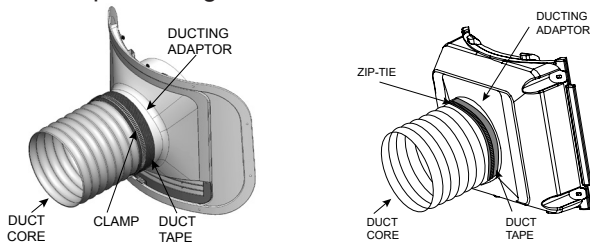


Figure 6.

- Slide insulation back over the duct core and the lip of the inlet duct adaptor. Use duct tape to secure the insulation to the inlet duct assembly see Figure 7.

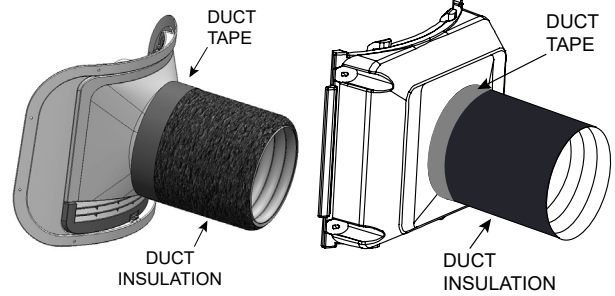


Figure 7.

- Add support to the duct work as necessary with ducting tube hooks or as required by local codes. Special attention must be given to prevent large droops in the duct work which could allow moisture to pool.
- The appropriate duct termination shall be added to the termination end of the duct. This termination shall prevent any debris or rodents from entering the duct work and shall minimally restrict the airflow through the ducting. In addition the termination shall be designed to prevent rain from entering into the duct work if terminated to the outside.
- The flow area termination must be at least 40 sq in. to avoid overloading the fan.

BOOSTER FAN

	<p>⚠ WARNING</p> <p>Electrical Shock Hazard</p>
	<ul style="list-style-type: none"> • Before removing any access panels or servicing the water heater, make sure the electrical supply to the pump station is turned "OFF". • Failure to do this could result in death, serious bodily injury, or property damage.

Install the booster fan per it's included instructions.
 NOTE: The booster fan is only to be located on the outlet side of the installation. Ensure the airflow is pulling away from the unit.

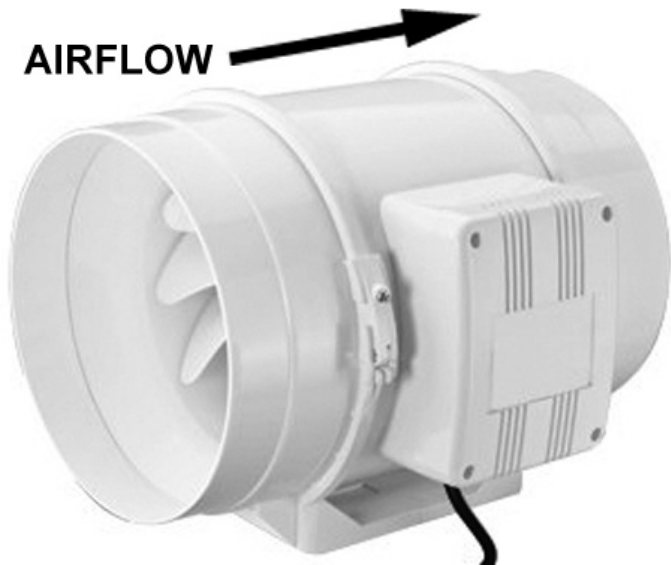


Figure 8.

DUCTING INLET AND OUTLET PORTS LOCATION

SINGLE DUCT INSTALLATIONS STRAIGHT

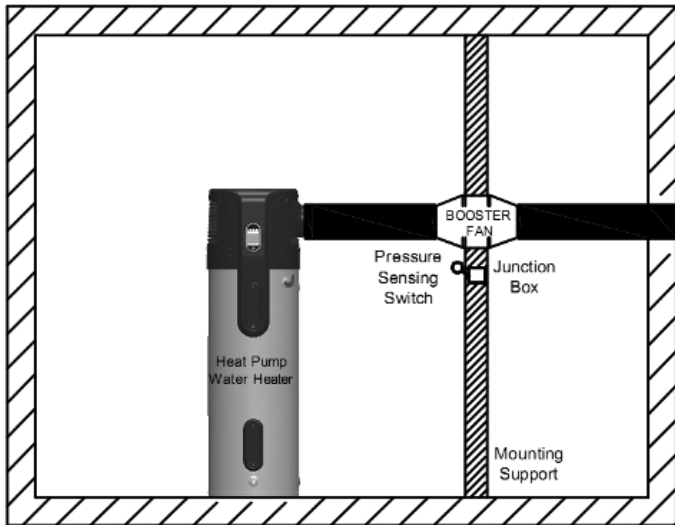


Figure 9.

SINGLE DUCT INSTALLATIONS ELBOWED / 90° TURNS

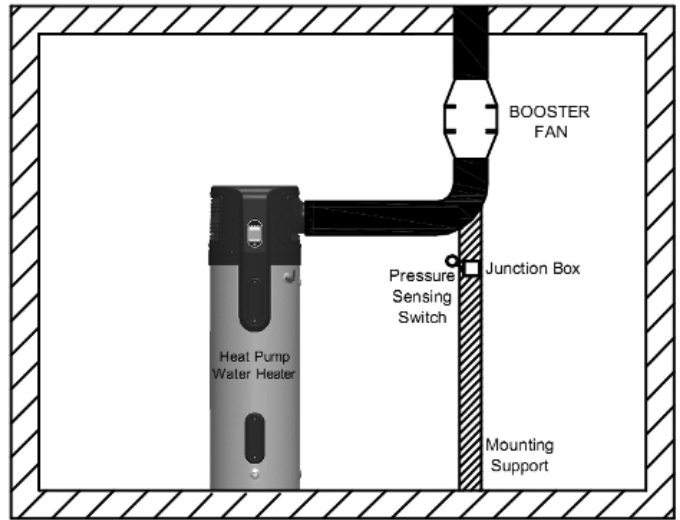


Figure 10.

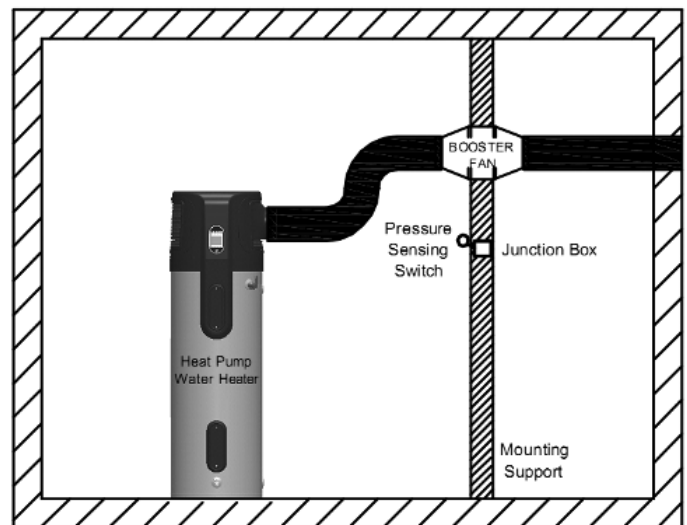


Figure 11.

TYPE	FIGURE 9.	FIGURE 10.	FIGURE 11.
ELBOWS/90°	0	1	2
1ST GEN MAX EQUIVALENT LENGTH	25'	25'	20'
2ND GEN MAX EQUIVALENT LENGTH	100'	100'	95'

Maximum Elbows or 90° turns is 2.

Table 2.

DUAL DUCT INSTALLATIONS STRAIGHT

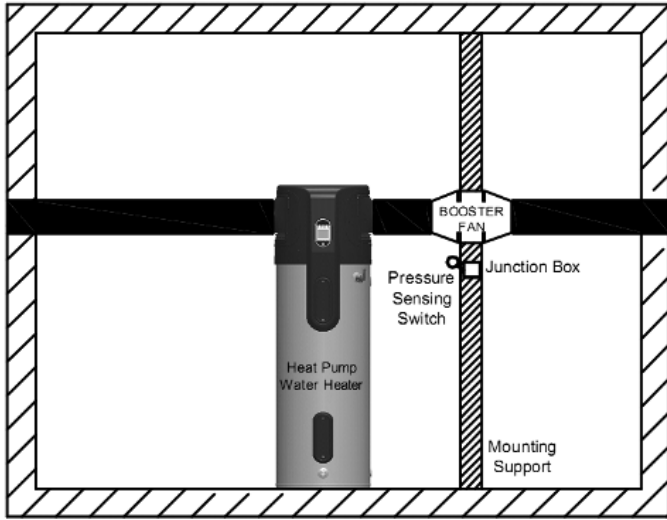


Figure 12.

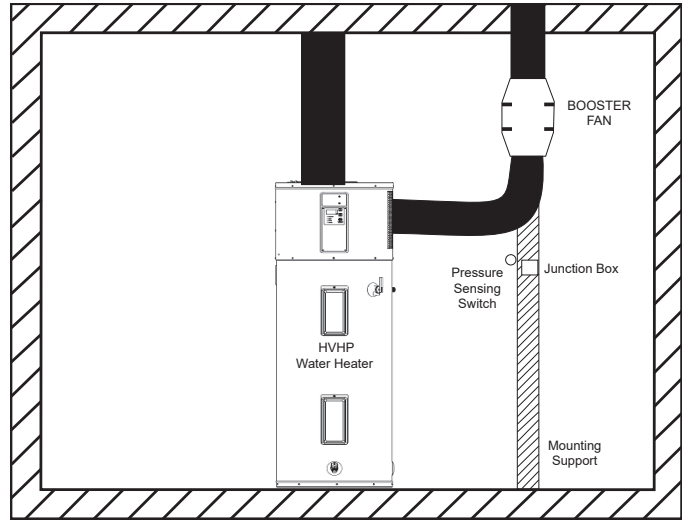


Figure 15.

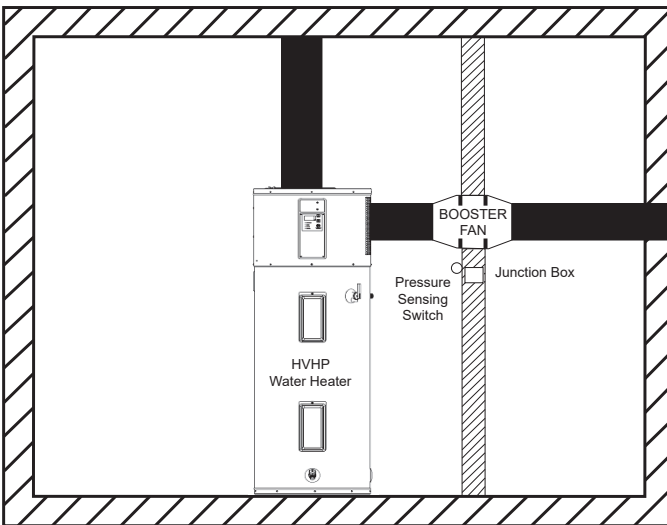


Figure 13.

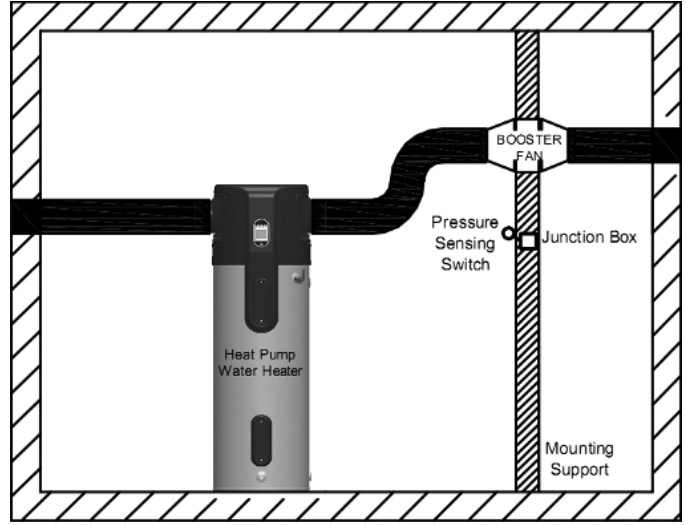


Figure 16.

DUAL DUCT INSTALLATIONS ELBOWED / 90° TURNS

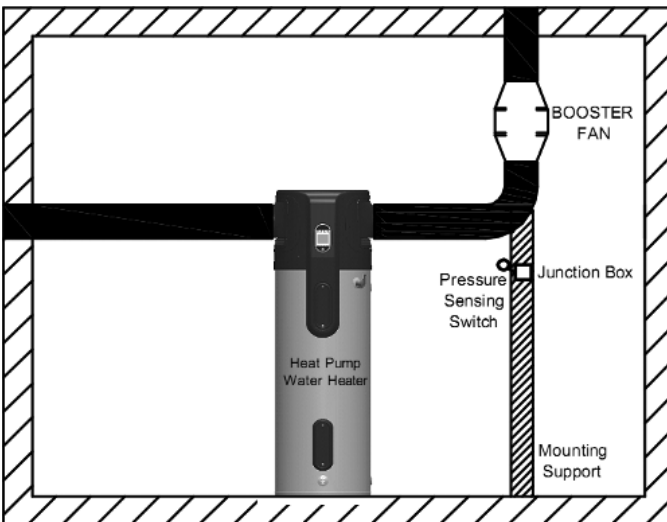


Figure 14.

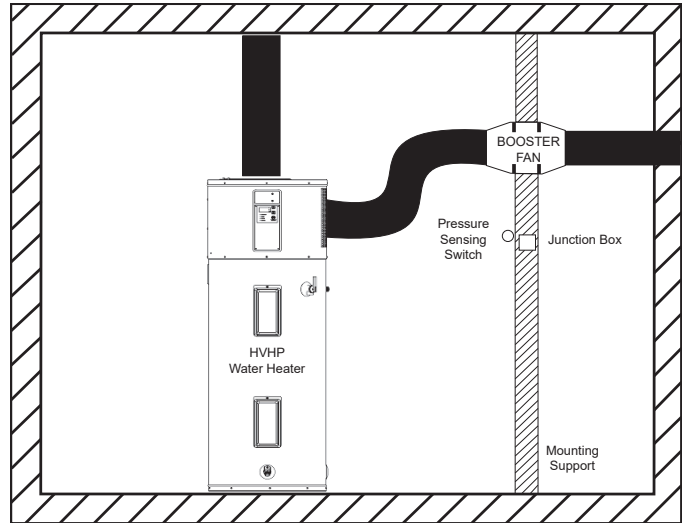


Figure 17.

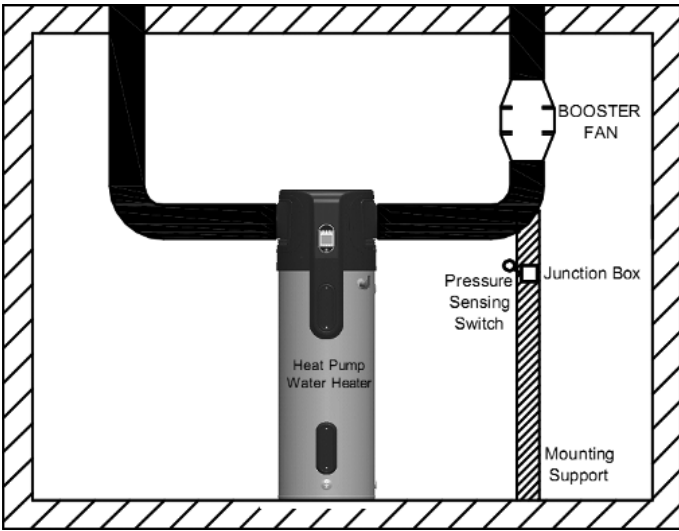


Figure 18.

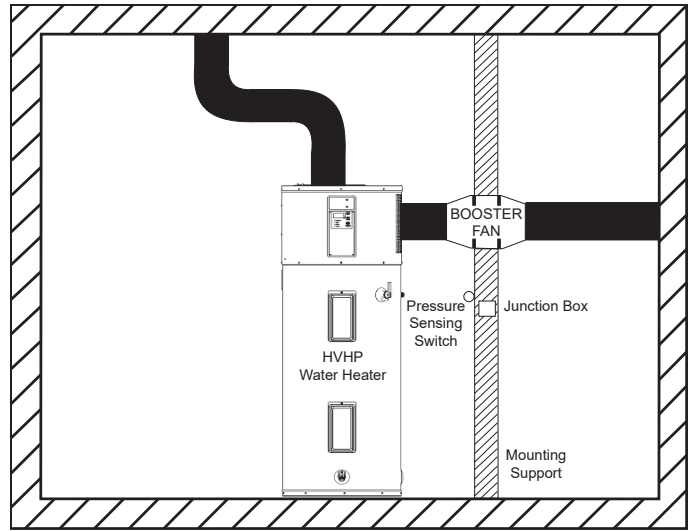


Figure 21.

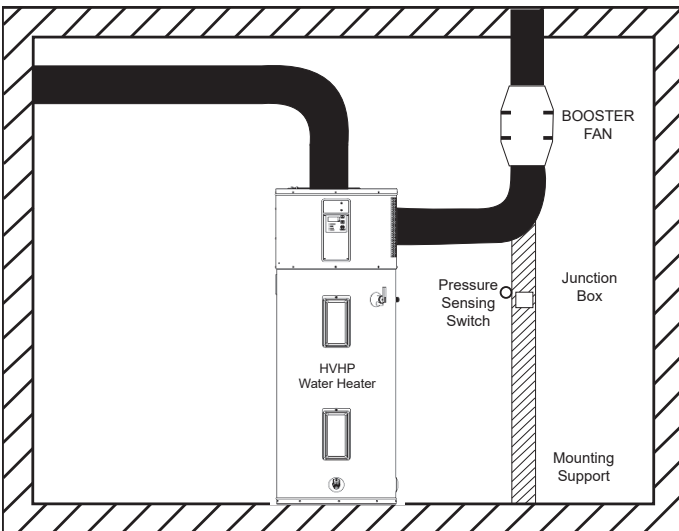


Figure 19.

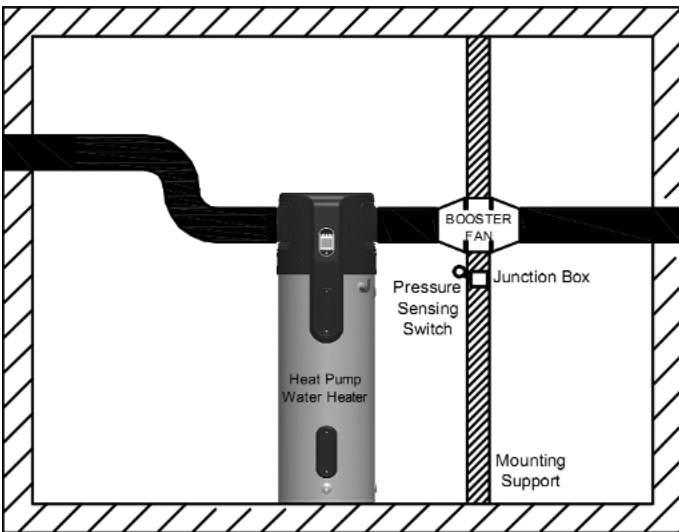


Figure 20.

Maximum Elbows or 90° turns is 2.

TYPE	FIGURE 12.	FIGURE 14.	FIGURE 16.	FIGURE 18.	FIGURE 20.
ELBOWS/ 90°	0	1	2	2	2
1ST GEN MAX. EQUIV. LENGTH	20'	20'	15'	15'	15'

Table 3.

TYPE	FIGURE 13.	FIGURE 15.	FIGURE 17.	FIGURE 19.	FIGURE 21.
ELBOWS/ 90°	0	1	2	2	2
2ND GEN MAX EQUIV. LENGTH	60'	60'	55'	55'	55'

Table 4.

FLEX DUCT CONNECTOR / SPLICE

In order to securely mount the pressure switch air tube to the flex duct an 8" metal connector may be purchased at a local home goods store.

1. Drill a 1/4" to 5/16" hole in the connector per Figure 22.
2. Remove any burrs or sharp edges from the hole.

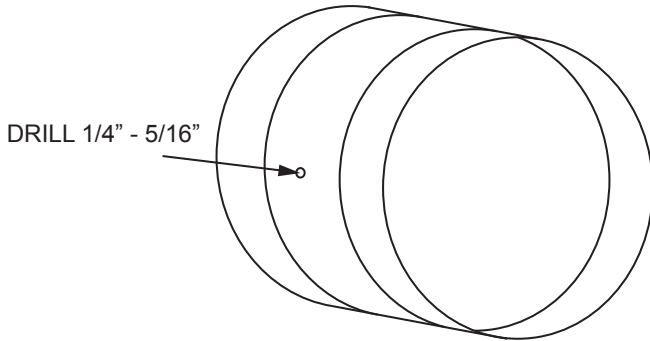


Figure 22.

3. Insert the pressure tube grommet into the drilled hole. A lubricant may be used to ease the grommet installation.
4. Insert the pressure tube through the grommet to a depth of 1/4" per figure Figure 23.

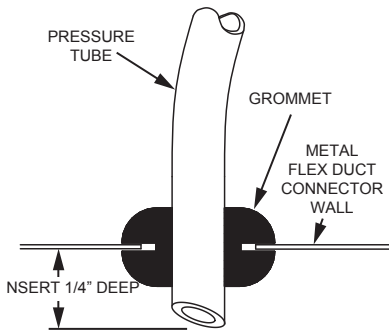


Figure 23.

5. Cut the flex duct using the same technique from the section "Installation of the Ductwork" on page 3.
6. The splice must be inserted at a maximum of 3 feet from the planned location of the pressure switch.
7. Install the connector and tape securely.

PRESSURE SENSING SWITCH AND JUNCTION BOX

The pressure switch must be located within 30 inches of the duct connector spliced into the flex duct. The junction box should be fixed on the solid support, and the location should be determined to meet following requirements:

- Make the pressure sensing switch to be within 3 feet distance from the edge of air outlet part on the heat pump water heater.
- Make the junction box within 3 feet distance from the booster fan junction box. If the distance has to be further than 3 feet, then a 3 core cable (maximum current 1.0 amps) needs to be prepared to replace the booster fan cable.
- The pressure switch diaphragm must be mounted vertically see Figure 24.

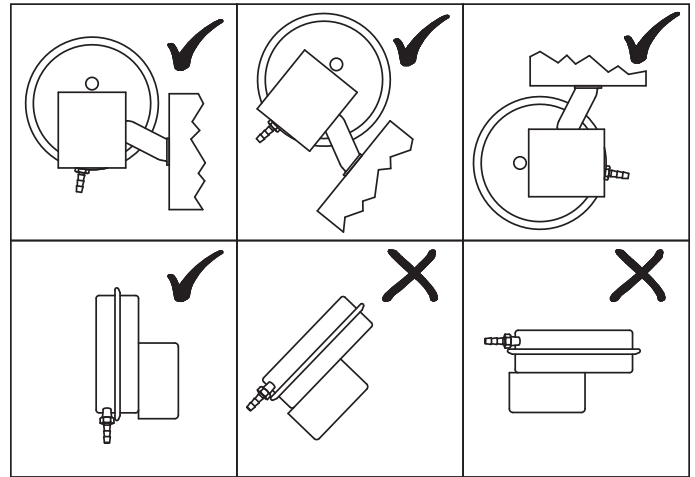
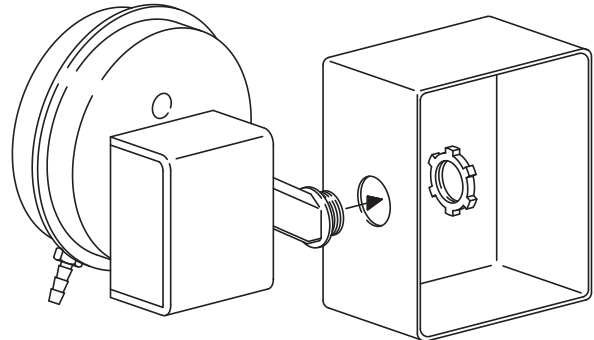


Figure 24.

1. Mount the pressure switch to the junction box per Figure 25.



NOTE: WIRING NOT SHOWN FOR CLARITY

Figure 25.

2. Mount the junction box to a wall per Figure 26. A studded wall mount is preferable.

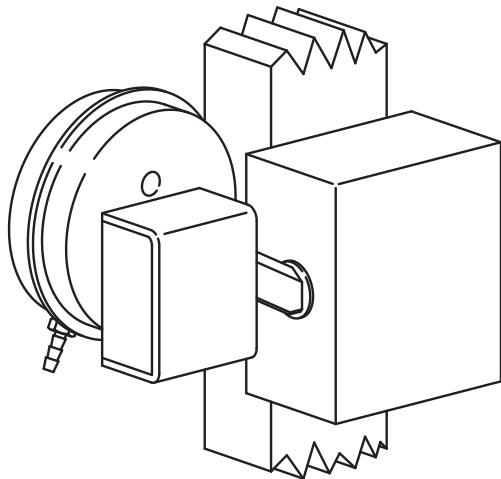


Figure 26.

3. Connect the pressure tube to the fitting on the air switch diaphragm. See Figure 27.

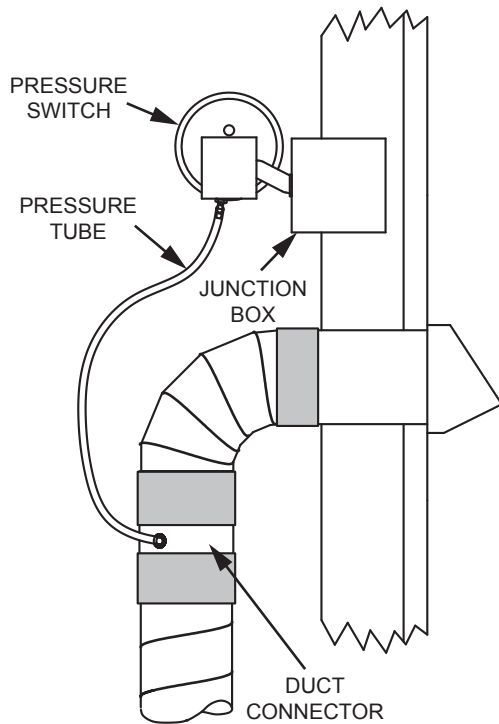


Figure 27.

WIRING

	<h3>⚠ WARNING</h3>
	<h4>Electrical Shock Hazard</h4> <ul style="list-style-type: none"> • Before removing any access panels or servicing the pump station, make sure the electrical supply to the unit is turned off. • Failure to do this could result in death, serious bodily injury, or property damage.

1. Install two cable fittings on the junction box. One is for wiring the booster fan cable into the junction box, the other one is for wiring the power line into the junction box.
2. Wire the booster fan cable into the junction box and fix by fastening the two screws of the cable fitting.
3. Use the wire nuts provided in the pressure sensing switch kit to wire the pressure switch, fan cable and the power line based see Figure 28.

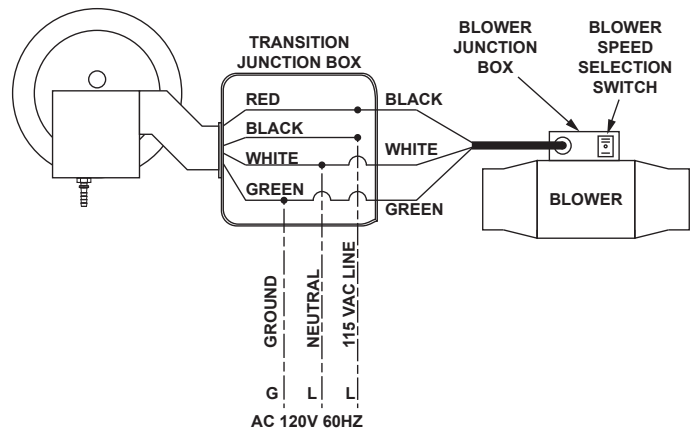


Figure 28.

NOTE! DO NOT CONNECT POWER SUPPLY UNTIL THE DUCTING KIT IS COMPLETELY INSTALLED.

4. Install the junction box cover.
5. The ducting kit installation is complete.

RESTORING OPERATION

1. Restore power to the water heater at the breaker/fuse panel. Press the power button on the UIM see Figure 1.
NOTE: When powered on the unit may start to run a diagnostic which takes several minutes.
2. Follow the Operating Your Water Heater section found in the Installation Instructions and Use and Care Guide for restarting your heat pump water heater.
3. Check the UIM for any errors and correct accordingly.

TRIAL OPERATION

1. Power on the unit and the junction box for the booster fan and pressure switch.
2. Start the heat pump water heater in hybrid mode or efficiency mode.
3. Wait for the unit fan to start (listen to the sound and observe the air flow inside of the ducting tube, this may take around ten minutes).
4. The booster fan should start around 5 seconds after the unit fan start.

Refer to the trouble shooting section on the pressure sensing switch installation instructions for trouble shooting if the booster fan could not start successfully.

If the booster fan still fails to start, contact profession service people for additional technical support.

MAINTENANCE

Please refer to the booster fan user's manual for fan cleaning procedures.

Please refer to the heat pump water heater's manual for the heat pump water heater maintenance information.

TROUBLESHOOTING

Please refer to the pressure sensing switch installation instructions for the trouble shooting method.

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