

# Idaho Power Heating and Cooling Efficiency Program

## Air-Source Heat Pump Installation Worksheet



An IDACORP Company

This worksheet verifies that an air-source heat pump has been installed to program requirements.  
A copy of this completed form must be submitted with the air-source heat pump incentive application.

### Customer Information

Name (as listed on the Idaho Power account) \_\_\_\_\_ Daytime phone ( ) \_\_\_\_\_  
 Installation address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

### Installer Information

Installer name \_\_\_\_\_ Installer HVAC license # \_\_\_\_\_  
 Company name \_\_\_\_\_ Company phone ( ) \_\_\_\_\_

### New Unit Data

Manufacturer \_\_\_\_\_ AHRI reference # \_\_\_\_\_ Outdoor unit model # \_\_\_\_\_  
 Indoor unit model # \_\_\_\_\_ Serial # \_\_\_\_\_  
 HSPF \_\_\_\_\_ Outdoor unit tonnage \_\_\_\_\_  
 System run-time  Home occupied during day (9 a.m. - 5 p.m.)  Home unoccupied during day (9 a.m. - 5 p.m.)  Other \_\_\_\_\_

### Unit Being Replaced Data

All information requested below may not be available. Please fill out to the best of your knowledge.

Manufacturer \_\_\_\_\_ Outdoor unit model # \_\_\_\_\_ Indoor unit model # \_\_\_\_\_  
 HSPF \_\_\_\_\_ Outdoor unit tonnage \_\_\_\_\_

### Duct Check

Indicate location of majority of ductwork (crawl, attic, etc) in notes section.

When system fan is turned on, does air flow from all supply registers?  Yes  No  
 If No, then provisions must be made for disconnects to be fixed.

Notes

### TrueFlow® Test (see step by step instructions on Page 3)

Tested in <input type="checkbox"/> Heating <input type="checkbox"/> Cooling	Filter size (16x20 etc) _____	1	Stage/capacity tested?
2 _____ Tons		3	Insert plate size <input type="checkbox"/> 14 <input type="checkbox"/> 20
4 Note where plate installed <input type="checkbox"/> Filter slot @ ID unit <input type="checkbox"/> Filter grille		5	Measure normal supply operating pressure (NSOP) _____ (A)
6 Measure supply pressure with plate in (TFSOP) _____ (A)		7	Correction factor (found in Manual) _____
8 Plate pressure _____ (B)		9	Raw flow (CFM) _____
10 Corrected flow (CFM) _____ (raw flow x correction factor)		11	CFM/ton _____

Notes

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## Air-Source Heat Pump Installation Procedure

Follow manufacturer's procedure for charge adjustment. Record all values in below table; **list manufacturer's expected values as a guide**. Remember: more superheat than target means ADD refrigerant; more subcooling than target means REMOVE refrigerant. Subcooling MUST be used for all systems with a TXV on the evaporator.

Refrigerant	<input type="checkbox"/> R-22 <input type="checkbox"/> R410A
Line set length (estimate feet) _____	Standard length for this unit <input type="checkbox"/> 15 <input type="checkbox"/> 25 <input type="checkbox"/> Other _____
Amount of refrigerant added (+)/removed (-) _____	Factory refrigerant charge _____
For the most common sizes of tubing used on these systems, an adjustment of about 0.6 oz of refrigerant per foot of line length shall be made for systems using non-standard line set lengths.	

### Performance Check (Run system at least 15 minutes before taking readings.)

At minimum, compare suction and discharge (head) pressure to manufacturer's target pressures at the measured outdoor temperature. If measured values are not within manufacturer's tolerance, adjust charge and retest. If possible, check subcooling and compare to manufacturer's target.

	Initial		After adjustment	
	Measured	Mfr.'s listed value	Measured	Mfr.'s listed value
Tested In	<input type="checkbox"/> Heating <input type="checkbox"/> Cooling		<input type="checkbox"/> Heating <input type="checkbox"/> Cooling	
Outside temp (°F)				
Suction pressure (psig)				
Suction line temp (°F)				
Evaporator saturation temp (from gauge °F)				
<b>Superheat (°F)</b> <b>Note:</b> Applied only in cooling mode for systems with non-TXV on indoor unit coil.				
Return wet bulb temp (°F)				
Head pressure (psig)				
Condenser saturation temp (from gauge °F)				
Liquid line temp (°F)				
<b>Subcooling (°F)</b> <b>Note:</b> Applied in cooling mode for systems with TXV on indoor coil or in heating mode for systems with TXV on outdoor coil.				
Return dry bulb temp (°F)				
Supply dry bulb temp (°F)				
Temperature split (°F)				
Amount of refrigerant added (+)/removed (-) if adjustment is needed after initial readings taken _____				

Notes

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## Control Setup/Checkout (all systems) Resistance heat elements cannot operate on a Stage 1 heating call.

### Resistance heat cannot operate at outside temperatures above 35°F.

Is compressor Low Ambient Lockout set no higher than 0°F (or not enabled at all)?  Yes

How is auxiliary (strip) heat controlled?  Discharge air sensor (not allowed in single compressor systems)  Add-on outdoor thermostat  OD sensor

### If outdoor sensor is used, check its output and compare to expected value.

Outdoor temperature during test \_\_\_\_\_ Expected output of outdoor sensor (ohms) \_\_\_\_\_ Measured output of outdoor sensor (ohms)\* \_\_\_\_\_

\* If measured output is not within 5% of expected output, check wiring or replace sensor.

## Systems Using Discharge Air Sensors

Compressor stages  Single stage  Multi-stage

Zoning Panel Installed?  Yes  No

### Single Stage Compressor Systems

Is discharge air sensor disabled or uninstalled?  Yes  No

Confirm auxiliary (strip) heat does not operate at outside temperatures above 35°F (or lowest possible temperature allowed by thermostat)  Yes

Indicate how strip heat checkout was performed: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### Multi-Stage Compressor Systems

If discharge air sensor is used to control auxiliary (strip) heat, confirm it is set no higher than 85°F  Yes

OR

If staging temperature is set above 85°F, confirm resistance heat cannot operate at outside temperatures above 35°F  Yes

Indicate how strip heat checkout was performed: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### Acceptance of terms

I hereby certify that all information on this worksheet is accurate, and the items on the worksheet were completed at the time of the installation. I certify that we have complied with all the terms outlined in the Idaho Power Heating and Cooling Efficiency Program HVAC Contractor Participation Agreement for 2009.

Authorized signature \_\_\_\_\_ Date \_\_\_\_\_

## Air-Source Heat Pump Installation Worksheet

### TrueFlow® Meter Test Instructions

1. Turn on air handler (by using fan-only switch or by turning on heat/AC). It is best to call for the flow that will be used during most of the year (probably heating). Make sure you know which stage is operating so you will divide the measured flow by the right number of tons. Check size of outdoor unit to get capacity (tons). Record which stage (if multistage compressor) that you test (**Box 1**) and the tons tested (**Box 2**). Note TrueFlow plate size (**Box 3**) and where you will install the TrueFlow (**Box 4**). Normally you will install the TrueFlow in place of the filter, but you can also install it at a return filter grille if needed.
2. Place static pressure tap in supply plenum; drill hole if needed. The hooked end of the tap should face into the air stream. Note it is generally better to place tap at least 6" away from any take-off or turning vane. If this position was used to measure static pressure as part of the external static pressure measurement, the tap does not need to be moved. If the system tested is a manufactured home, access the supply system through the nearest supply register. Temporarily remove the magnet from the static pressure tap, reach down into the supply boot (look out for sharp edges) and toss the tap back toward the furnace. You can also put this tap in another place on the supply side (refrigerant line penetration into air handler cabinet, for example).
3. Connect other end of hose (that leads to the pressure tap) to the Input side of the pressure gauge (Channel A). Turn on gauge (if using DG-700 or similar). If using DG-700, switch to inches of water mode by using Units switch. Keep gauge in pressure/pressure mode for all tests.
4. Record normal supply operating pressure (NSOP) on worksheet in (**Box 5**). If reading is very "jumpy", press the Average key and wait at least 5 seconds for the average value to display.
5. Now remove system filter and replace with TrueFlow outfitted with any needed spacers. Plate should be positioned so side with labels faces oncoming air flow. Connect plate hoses to Channel B of pressure gauge (if using DG-700); otherwise, connect plate hoses so they will read pressure drop across plate. **If TrueFlow is installed on a non-ducted return (on the top/front of the furnace cabinet or on a return grille), you will need to apply a 1.04 multiplier to the raw flow in addition to any Correction Factor.**
6. Look at the pressure in supply system with TrueFlow installed (TFSOP). This will read from Channel A on the gauge; record on worksheet in (**Box 6**).
7. Look at NSOP and TFSOP. If they differ by more than 3 Pa or 0.02" water, look up a Correction Factor. Use look up table on TrueFlow laminated card to figure any needed correction. Record Correction Factor on worksheet in (**Box 7**).
8. Read pressure across plate; record on worksheet in (**Box 8**).
9. Using plate pressure, look up Raw Flow on laminated card. Make sure you look up the flow for the correct plate (#14 or #20). Record Raw Flow on worksheet in (**Box 9**).
10. Multiply Raw Flow (**Box 9**) by Correction Factor (**Box 7**); this is Corrected Flow. Record on worksheet in (**Box 10**).
11. Divide Corrected Flow (**Box 10**) by Tested Tons (**Box 2**) to get CFM/ton. Record in (**Box 11**). If flow is more than 325 CFM/ton, the system meets program specs.