FREQUENTLY ASKED QUESTIONS

Evaporator Fan:

1. What is the advantage of a variable speed evaporator fan?

- As the ambient temperature drops, more air is needed to move across the evaporators to extract energy to transfer. The Veritus® variable speed fan allows it to increase the fan speed at lower ambient temperatures to reduce overall capacity loss.
- Minimizes ambient noise by lowering fan speed to provide only the required air flow
- Maximizes efficiency of the system by reducing power consumption

2. What changes the speed on the evaporator fan?

- Fan speed is determined by ambient temperature; reference I&O manual for details

3. Can the evaporator fan overcome additional static pressure?

- No; Veritus requires a neutral pressure differential when installed indoors and ducted.
- If ducting is required please contact the factory for design considerations.

Refrigerant:

1. Why does Veritus use R513A?

- R513A was chosen for Veritus due to its advantages.
  - · It has a low Global Warming Potential (GWP) of 575.
  - · Non-toxic
  - · Non-flammable
  - · Low pressure
  - · Readily available across the US
  - · Properties are very similar to R134a (a commonly used refrigerant in HVAC equipment that the industry is familiar with).
  - · Capable of Multi-pass and Single pass
  - · Can handle recirculation loop temperature maintenance without an extra tank
  - · Water outlet temperatures ~160°F

Start up & Operation:

1. What is the minimum ambient temperature for Veritus?

- Veritus operates below freezing to 23°F

2. What is the maximum outlet temperature?

- Veritus can provide 160°F outlet temperatures from an ambient temperature of 45°F & above.
- Veritus can provide maximum set point of 140°F outlet temperatures at minimum operating temperature of 23°F.
- Veritus maximum setpoint at 40° F is 150° F

3. Does Veritus continue to operate below the minimum ambient temperature?

- No, to protect the compressor, Veritus will shut down heat pump operation. In these conditions Veritus can control optional back up heat alternatives.

4. Is there factory installed heat tracing for cold weather?

- Yes, Veritus comes standard with heat trace added to the condensate pan, condenser and inlet piping between the condenser and jacket. Additionally, there are auxiliary connections on the terminal strip closest to the pump that allows for additional control of job installed heat trace.
  - · Axillary Terminal output voltage is 120v
  - · Axillary Current limitation is 3 amps

5. Can glycol be used with Veritus for freeze protection and power outages?

- Yes, Veritus is suitable for use with polypropylene glycol up to 50% concentration. The de-rate associated with the glycol will vary per glycol manufacturer.
- If glycol is used, potable water must be isolated from the glycol with a secondary heat exchanger.

6. Does Veritus have the capability to enable gas fired or electric heat pump system containing backup units for peak loading or hybrid systems?

- Yes; Veritus has the capability to enable gas fired or electric backup units for peak loading.
- Reference Service Manual and I&O for details.

7. Is the defrost cycle time based like other heat pumps in the market?

- No; the Veritus patent-pending defrost logic is not based solely on time. Defrost will trigger based on a combination of evaporator and ambient temperatures. The duration and interval will also be dependent on these factors.

8. What is the typical defrost cycle for Veritus?

- During defrost conditions, a typical cycle has a duration of 3 minutes with every 90 minutes of run time.

9. Will cold water be delivered to the storage tank during a defrost cycle?

- Yes; Approximately 1-2 GPM of 50F water will enter the storage tank during a defrost cycle.

10. Do the published COP values account for defrost cycles?

- No; it is not required by DOE test standard

11. Can the units be stacked?

- No, installed units cannot be stacked. It is acceptable to stack 3 high, when warehousing.

12. Is a vacuum break required on the condensate drain line?

- Yes. A P-Trap with vacuum break is required to be installed in the condensate drain line. Detailed information can be found in section 3 of the I&O manual.

13. Can Veritus be ordered without the pump?

- No, the provided pump is required for proper operation.

14. Can a different or upsized pump be used with Veritus?

- No. Heat pump operation is specifically designed and tuned for the pump provided with the product.

15. Can Veritus units be installed indoors without ducting?

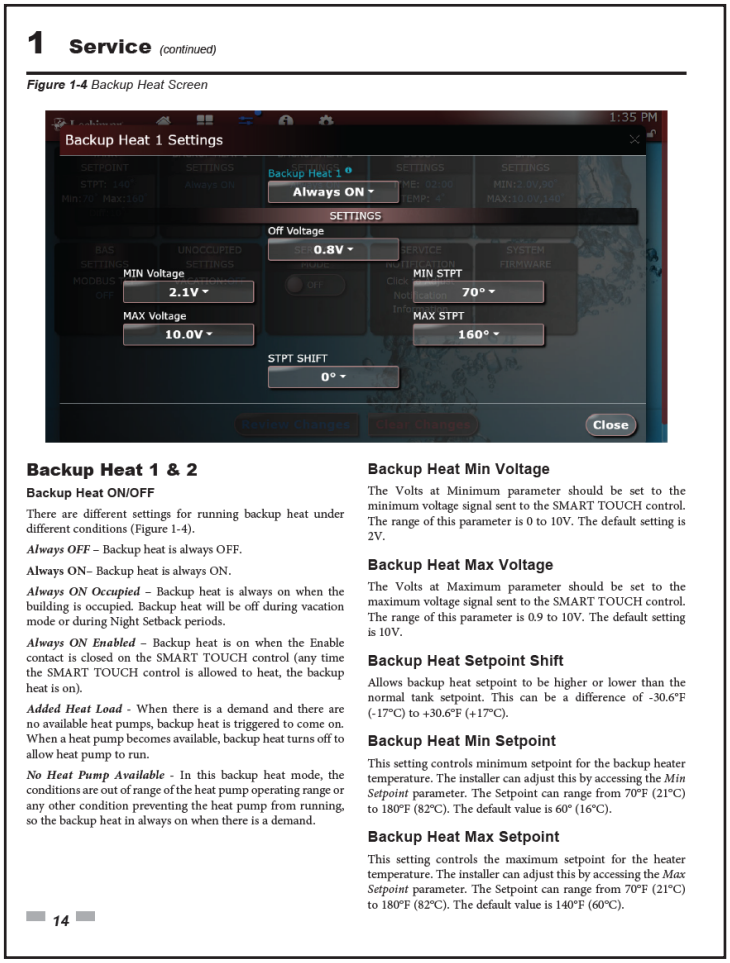
- Yes, if adequate make-up air can be provided.

16. Is there corrosion protection for Veritus when installed in coastal regions?

- Yes, we offer an optional field applied coating for the evaporator recommended to be reapplied annually or whenever coils are cleaned, whichever comes first.
- Additionally, the standard cabinet for Veritus has undergone a 9000-hour salt spray test.

17. What are the water quality requirements for Veritus?

- See table 9-1 in chapter 9 of I&O manual



1 Service (continued)

Figure 1-4 Backup Heat Screen

Backup Heat 1 & 2

Backup Heat ON/OFF

There are different settings for running backup heat under different conditions (Figure 1-4).

Always OFF – Backup heat is always OFF.

Always ON– Backup heat is always ON.

Always ON Occupied – Backup heat is always on when the building is occupied. Backup heat will be off during vacation mode or during Night Setback periods.

Always ON Enabled – Backup heat is on when the Enable contact is closed on the SMART TOUCH control (any time the SMART TOUCH control is allowed to heat, the backup heat is on).

Added Heat Load - When there is a demand and there are no available heat pumps, backup heat is triggered to come on. When a heat pump becomes available, backup heat turns off to allow heat pump to run.

No Heat Pump Available - In this backup heat mode, the conditions are out of range of the heat pump operating range or any other condition preventing the heat pump from running, so the backup heat in always on when there is a demand.

Backup Heat Min Voltage

The Volts at Minimum parameter should be set to the minimum voltage signal sent to the SMART TOUCH control. The range of this parameter is 0 to 10V. The default setting is 2V.

Backup Heat Max Voltage

The Volts at Maximum parameter should be set to the maximum voltage signal sent to the SMART TOUCH control. The range of this parameter is 0.9 to 10V. The default setting is 10V.

Backup Heat Setpoint Shift

Allows backup heat setpoint to be higher or lower than the normal tank setpoint. This can be a difference of -30.6°F (-17°C) to +30.6°F (+17°C).

Backup Heat Min Setpoint

This setting controls minimum setpoint for the backup heater temperature. The installer can adjust this by accessing the *Min Setpoint* parameter. The Setpoint can range from 70°F (21°C) to 180°F (82°C). The default value is 60° (16°C).

Backup Heat Max Setpoint

This setting controls the maximum setpoint for the heater temperature. The installer can adjust this by accessing the *Max Setpoint* parameter. The Setpoint can range from 70°F (21°C) to 180°F (82°C). The default value is 140°F (60°C).

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Condensate Drain Line

The HPWH unit must be plumbed to permit condensate drainage. Drain piping connected to the HPWH unit should be a minimum 1 inch PVC or equivalent. A condensate trap must be used to overcome the internal vacuum to permit proper drainage. See Figure 3-2 for recommended drain trap dimensions.

The condensate must be discharged to a suitable drain. If a drain is inaccessible, use a condensate pump.

NOTICE Drain trap must be flooded to prevent water from backing up into the drain pan

Electrical:

1. How many Bacnet/Modbus gateways are needed per system?

- Only 1 gateway is needed per control panel. If multiple modules are cascaded together with one control, only one gateway is needed.

2. How many heaters, pumps and panels can be wired to the optional single point electrical connection?

- There are two sizes available that only apply to models AHP200-350. These options are sized according to the power needs of 2 or 3 modules and are identified as such in the price book.
- For systems larger the AHP350, the single point electrical panel does not apply.

3. Can one control panel control multiple and various units of different sizes?

- Yes. A single control panel can communicate with up to 64 heat pump modules.

4. What is the outdoor rating for the control panel?

- The control panel is rated for outdoor installations by UL per standard 60335-2-40. The rating is closely equivalent to IPX4.

***5. Is the single-point electrical outdoor rated?**

- Yes. The single-point electrical is equivalent to NEMA 3R Rating intended for indoor/outdoor installation.

***6. Is the step-up transformer outdoor rated?**

- Yes. The transformer is constructed with NEMA 3R Enclosures for outdoor installation.

7. How many electrical supply connections does Veritus require?

- Each module requires a single 480v/3ph power supply. Each control panel (1 per system) requires a single 120v power supply.

Miscellaneous:

1. What certifications and listings does Veritus have?

- UL 60335-2-40
  - Product Sourcing and Certifications Database | UL Solutions
- CSA Low Lead
  - CSA Group Product Listing - CSA Group
- MA Accepted Plumbing Products
  - ma-dpl.my.salesforce-sites.com/MAPlumbingProducts/ppPlumbProdFinal
- CEC, JA-14
  - MAEDBS Login (ca.gov)
- NEEA, QPL
  - Northwest Energy Efficiency Alliance (NEEA) | View NEEA's Advanced...

***2. Is the condensor ASME Rated?**

- No. The condenser is built to ASME standards to accommodate designed system pressures.

* updated or added with latest revision