

Frequently Asked Questions (FAQs)

Making Emergency Power more Reliable and Affordable.

Answers to common questions about heat pumps.

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1) Why is it necessary to heat standby diesel engines?

Diesel engine operation is based on the COMPRESSION IGNITION principle. It works on the theory that the air in the cylinder is compressed to obtain the minimum temperature necessary to ignite the diesel fuel.

Without exception, all standby diesel engines were originally designed as vehicular engines. When they are used in vehicles, they are equipped with some type of starting aid. Usually, glow plugs, ether, or both. The operating manuals will also recommend that the engines be allowed to idle until the engine has completely warmed-up, before the vehicle is operated. This warm-up period gives the dissimilar metals within the engine time to expand to their proper operating tolerances, thereby reducing the chance of a catastrophic engine failure. Therefore, in the standby mode, diesel engines are heated for two most important reasons:

- A. To insure starting of the engine.
- B. To prevent catastrophic failure by expanding the dissimilar metals to their operating

2) What temperature do manufacturers specify for engines in standby mode?

Typically, factory specifications recommend that heaters come on at 100°F and off at 120°F, or an average temperature of 110°F. There are exceptions to this general rule. Variables, such as location and engine make and model, can and do effect starting characteristics, and a higher temperature may be desirable

3) How often are the resistance heaters on?

Probably, much more than anyone would guess. In most cases the resistance heaters are on anywhere between 60% and 100% of the time. Each engine will be different, depending on its environment and the size of the resistance heaters compared to the size of the engine to be heated. In medium size engines with two resistance heaters, one heater is dominant, and runs more than the other.

4) How often are the patented process GEO-THERMAL SYSTEMS, INC. ® heat pumps on?

The heat pump runs for a shorter period of time than the resistance heaters. Usually around 50% to 80% of the time. The time can vary, of course, depending on the environment, and the model heat pump installed.

5) Why the difference in run times?

The reason is quite simple. The heat pump doesn't make heat, however, it moves heat already supplied by nature. And because it takes less energy to move heat than it does to make it, the heat pump delivers more than three units of heat for each unit of electricity required...a coefficient of performance (COP) of 3 to 1. Meaning for every \$1 of energy consumed by the heat pump there are \$3 worth of heat generated. The COP of the resistance heaters is 1 to 1, or \$1 of energy produces \$1 of heat.

6) What happens if the entering air temperature gets too cold?

The patented process GEO-THERMAL SYSTEMS, INC.® heat pump is designed to shut off if the ambient air temperature passing over the coils drops below 40°F. This is to avoid freeze up of the unit. When this happens, electrical contacts in the heat pump are energized, so that power is available to the resistance heaters. The resistance heaters are used as the engine heating source until the ambient air temperature rises above 40°F, at which time the heat pump would resume operation. ([return to top](#))

7) Are there benefits other than cost savings, when a GTS unit is installed?

The addition of a heat pump provides a redundant heating source to the engine resistance heaters. The objective of this redundancy is to provide increased system reliability. An additional benefit relates to the reduction of power consumption and a dramatic reduction in the carbon footprint. We believe in a firm commitment to a clean and safe environment.

8) How much disruption results from the installation of a GTS system?

Disruption to the system is very minimal. The actual installation of the heat pump, once electricity is available to connect the system, seldom takes longer than 90 minutes. The engine is only off-line a few minutes during this period.

