



HIGH EFFICIENCY ENGINE HEATER

Energy Analysis - Spokane, WA

Efficiency is Everything

Carbon footprint reduction is a key component of sustainability efforts. Engine heaters on standby generators are an untapped source for energy efficiency. With a retrofit of Hotstart's HE-18 High Efficiency Engine Heater, end-users can see reduction in energy draw by up to 70% through the use of air-source heat pump technology.

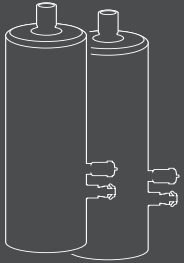
HE-18

Heat Capacity:
Up to 5.25 kW
GenSet:
1 MW and larger
Refrigerant:
HFC-410A
Total FLA:
Up to 10.4A



Existing Heaters

Reliable redundancy is achieved by plumbing the HE-18 in series with the existing engine heaters installed by the genset OEM. These resistance heaters work in tandem with the HE-18 through a programmable control interface, assuring gensets are properly heated at any ambient temperature. The testing environment contained two Watlow 4990W thermosiphon heaters.



Thermosiphon Heaters - QTY 2

Wattage:
9,980 W (9.9 kW) Total
Circulation Method:
Thermosiphon
Set Temperature:
100 °F (on) / 120 °F (off)



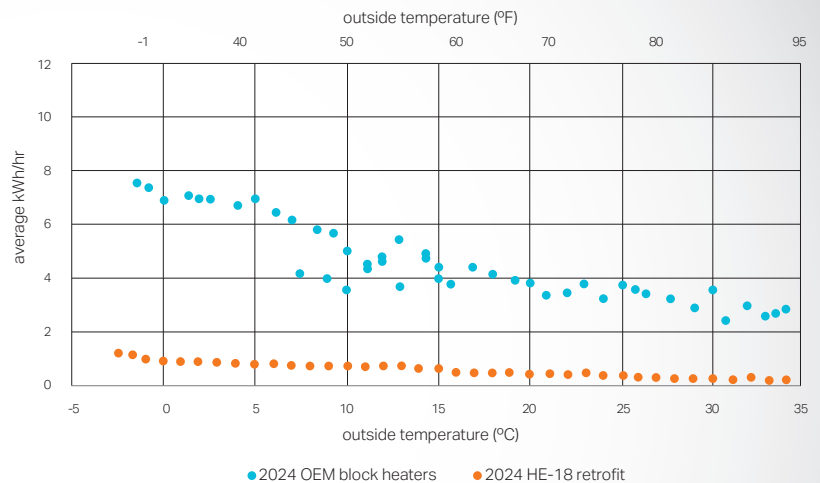
Testing

A concrete generator room at the hospital site was selected to act as control and test environments for data capture. The generator room contained two Cummins KTA50-G3 16-cylinder engines with two 4990W block heaters plumbed in parallel.

Engine A with existing thermosiphon block heaters served as the baseline. Heater energy usage and room temperature was recorded every 30 seconds.

Engine B served as comparison to Engine A. The HE-18 was plumbed in series with the existing engine heaters and heater energy usage and room temperature was captured every 30 seconds. Average hourly energy usage (kWh/hr) was modeled relative to the hourly weather temperatures from the Spokane, Washington NOAA weather station.

Heater average kWh/hr relative to outside temperature



Energy Analysis

The HE-18 heat pump consumed 0.5 kWh/hr at 20 °C versus 3.7 kWh/hr for the existing heaters during the testing period of April 2024 to August 2024. Based on the energy usage model of each heater and weather data for Spokane, Washington, the HE-18 is expected to result in an estimated annual savings of 32,000 kWh or 80% reduction as compared to the existing thermosiphon heaters energy usage.

	Heat Pump	Block heaters	Savings
Model predicted kWh consumed based on 2024	8,000 kWh	40,000 kWh	32,000 kWh (80%)