HIGH EFFICIENCY ENGINE HEATER

Energy Analysis - Bradford, UK

Efficiency is Everything

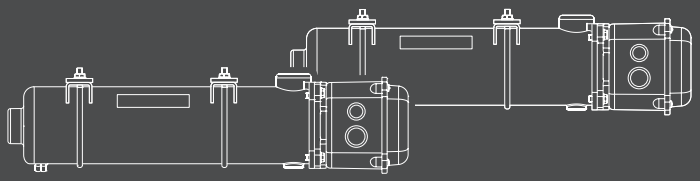
Carbon footprint reduction is a key component of clean building sustainability efforts. Engine heaters on standby generators are an untapped source for energy efficiency. With a retrofit of Hotstart's CVC High Efficiency Engine Heater, end-users can see reduction in energy draw by up to 75% through the use of variable speed air-source heat pump technology.

CVC

Heat Capacity:
Up to 10 kW
GenSet:
1 MW and larger
Refrigerant:
HFC-32
Total FLA:
Up to 20A

Existing Heaters

Reliable redundancy is achieved by plumbing the CVC in series with the existing engine heaters installed by the genset OEM. These resistance heaters work in tandem with the CVC through fully integrated and programmed controls, assuring gensets are properly heated at any ambient temperature. Each testing enclosure contained four Hotstart CL 4kW thermosiphon heaters, two per generator.



CL

Wattage:
4,000 W (4 kW)
Circulation Method:
Thermosiphon (Convection)
Set Temperature:
32 °C (89 °F) [on] / 38 °C (100 °F) [off]

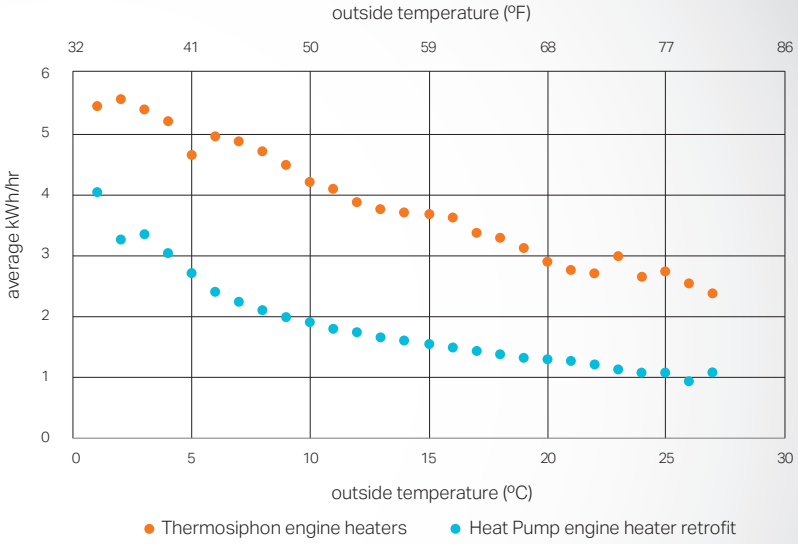
Testing

Two generator enclosures at the site were selected to act as control and test environments for data capture. Each contained two Perkins 4012 12-cylinder engines coupled with a 1.0MW generator and two 4kW thermosiphon heaters for each engine.

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

Enclosure B served as comparison to Enclosure A. The CVC was plumbed in series with the existing engine heaters and served as the primary heater. An additional heat exchanger was included to deliver heated coolant to both engines during the same testing period. CVC 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 local weather station.

Heater average kWh/hr relative to outside temperature



Energy Analysis

The CVC engine heater consumed 2 kWh/hr at 9 °C (48 °F) versus 4.5 kWh/hr for the existing heaters during the testing period. Based on the energy usage model of each heater and weather data for Leeds-Bradford Airport, UK, the CVC is expected to provide an estimated annual savings of 19,000 kWh or 48% reduction as compared to the existing engine heaters energy usage.

	Thermosiphon Engine Heater	Heat Pump Engine Heater	Savings
Model predicted kWh consumed	39,800 kWh	20,700 kWh	19,000 kWh (48%)