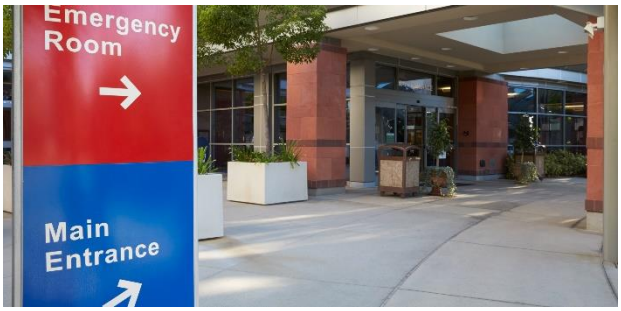
PHILLIPS & TEMRO industries®

WHITE PAPER

Automotive | Off Road | Heavy Duty | **Power Gen**

# Prevent Engine Heater Hassles in Power Generators

*Reduce Low-Coolant Alarms, Low-Temperature Alarms and Service Calls*




A power generator's engine heater is a critical component in providing fast, clean engine starts. Choosing and correctly installing a properly sized, high-quality heater protects the genset investment and ensures performance.

Many diesel-power generator dealers, packagers, equipment rental companies and maintenance professionals are familiar with the frustration and cost of excessive low-coolant and low-temperature alarms resulting in service calls. Coolant evaporation can be caused by a thermosiphon circulation (TC) heater or incorrect installation of the heater. Dealers and packagers with service contracts are paying the price with replacement heaters and added service calls.

Engine heater service issues are especially problematic for level-one care facilities, such as nursing homes and hospitals, where backup gensets must meet the NFPA 110, Type 10 regulation and start in less than 10 seconds. In Canada, CSA 282 requires engines to maintain a temperature between 100º and 120ºF (38º and 49ºC) to ensure quick startup. Mandatory for power generators, starting engines at these temperatures minimize wear and increase operating life.

## Limited Engine Heater Choices

To be cost-competitive, or due to lack of application information, gensets are often shipped with a low-cost engine heater. These heaters may not be suitable for all applications or meet the customer requirements. The dealer may need to upgrade the heater before the power generator is installed or in the field. To select the right engine pre-heater, it is important to be aware of new, more reliable products available today.

## Engine Heater Technology

Forced-flow circulation (FFC) and TC heaters elevate the temperature of engine coolant used to maintain engine block temperature. The difference between FFC and TC is in the method of circulating the engine coolant.

## Thermosiphon Circulation Heaters

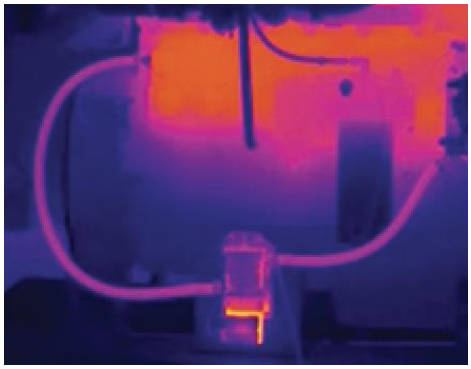
A thermosiphon circulation (TC) heater operates with passive heat exchange based on natural convection, which circulates fluid without a mechanical pump. A TC heater has a slow coolant flow and operates at an elevated supply temperature to facilitate the thermosiphon effect. Laboratory testing of TC heaters demonstrated the coolant reaching a boiling temperature. This results in localized coolant evaporation, hot spots and extra maintenance. Adding to service and efficiency issues, TC heaters are frequently installed suboptimally without a proper rise to the hoses, which impedes the natural flow.

*Thermosiphon Circulation Heater Coolant Boiling*

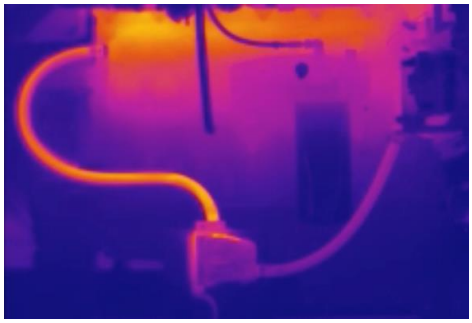
*Forced-Flow Circulation Heater Prevents Coolant Boiling*

**Forced-Flow Circulation Heaters**

Forced-flow circulation (FFC) heating systems use a pump to move coolant past the heating element and throughout the engine. FFC heaters maintain a uniform temperature throughout the engine block, eliminating hot spots in the engine and hoses. This type of heater also prevents coolant boiling, low-coolant alarms and coolant concentration issues.



*Forced-Flow Circulation Heater*



*Thermosiphon Heater Hot Spots, Boiling Temperature*

**Right-Sized**

For optimal performance and reliability, heater size should be based on the amount of coolant that needs to be heated, the surface area of the engine, the temperature differential, the type of genset package, and environmental conditions. If undersized for the application, these standard specifications may result in low-temperature alarms and an engine that doesn't start or is not ready to accept the load.

**Swap It Out**

Once the power generator is delivered, the dealer or packager may replace the heater for a different size or type before it is installed in the field. Customers may be given a choice of a normal or cold-climate heating package. If a heater is underperforming in the field, the technician will exchange the coolant heater during a service call for one that is more appropriate for the application.

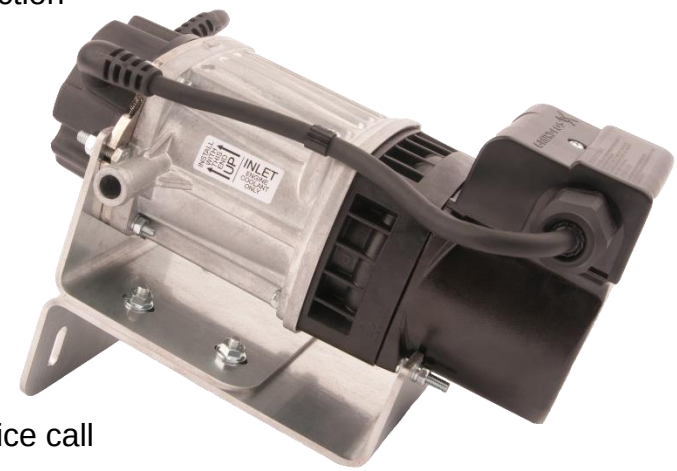
ZEROSTART HEATING PRODUCTS

## Zerostart Forced-Flow Circulation Heaters

Many distributors are replacing existing heaters with a Zerostart Forced-Flow Circulation heating system. Currently available in 1,500W and 2,700W models, Zerostart heaters circulate warm coolant throughout the engine, providing uniform heat distribution.

## Zerostart Features

- Die-cast aluminum housing
- Durable pump and motor with non-magnetic impeller
- Corrosion-resistant steel brackets
- Thermostatic control with overheat protection




## Zerostart Benefits

- Maintains uniform heat distribution
- Increases reliability and uptime
- Ensures optimal starting temperature
- Minimizes low-level coolant alarms
- Reduces maintenance and service calls
- Pays for itself in just one eliminated service call
- Promotes longer life
- Reduces hose and coolant degradation from overheating

To learn more, visit phillipsandtemro.com, call +1 952.941.9700 or email sales@phillipsandtemro.com.