

# Thermal Modeling and Operating Tests for the Gas Engine Driven Heat Pump Systems

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## Abstract

Gas engine driven heat pump (GEHP) is a heating and cooling system with the advantage of reducing the electric power in both heating and cooling modes of operation.

In this paper the thermal modeling of gas engine driven heat pumps including both the heat pump (consisting a compressor, condenser, expansion valve and evaporator) and engine systems was performed and the system operating parameters such as operating pressures, coefficient of performance (COP) and fuel consumption of GEHP were computed.

The comparison of modeling results and the experimental measured values for various amounts of suction and discharge pressures, fuel consumption (natural gas) and COP showed 3.4%, 4%, 6.7% and 7.2% average difference percentage for cooling mode and 3.7%, 5.4%, 8.1% and 7.8% for heating mode respectively, which indicated an accepted agreement of modeling and experimental results.

**Keywords: Gas engine driven heat pump, coefficient of performance, fuel consumption, cooling/heating capacity, energy flow**

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