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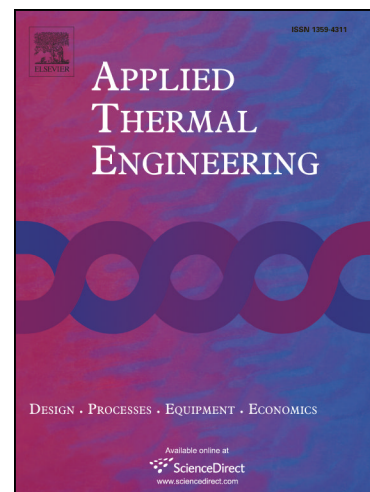
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Investigation of a scroll expander driven by compressed air and its potential applications to ORC

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ABSTRACT

Micro combined heat and power systems using an organic Rankine cycle (ORC) as a prime mover are under development. The ORC is capable of utilizing various heat sources. The key component in the ORC is an expander to produce the electric power, yet such an expander for residential applications has, to date, not been commercially available. The present study aims to investigate the performance of a scroll expander that has been converted from a commercial refrigeration scroll compressor, as these scroll machines are generally mass-produced as compressors in refrigeration applications. The viability of converting a scroll compressor into an expander for use in an ORC was examined in this paper. A test rig was built where the expander was driven by compressed air and the scroll expander was evaluated under various operating conditions, providing fundamental data that could form the basis for ORC applications. It has been found that conversion of a scroll compressor into an expander is feasible without major modifications. Experiments showed that the power output of the expander increased significantly

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