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Short Communication

Development of a helium compressor from a reciprocating-type refrigeration compressor

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Abstract

Helium gas compressor is one of the critical components of a pulse-tube or Gifford–McMahon (GM) cryocooler. It serves as the gas source for generating the pressure waveform (with high and low pressures) in a pulse-tube/GM-type cryocooler. Commercial helium compressors of capacities less than 10 kW of input power are mostly of scroll type. In this paper, a simple method is described for converting a reciprocating-type refrigeration compressor into a helium compressor. The performance of this system has been evaluated using a single-stage pulse-tube cryocooler. The compressor has already clocked more than 1000 h of operation. The method can be used to convert the reciprocating-type refrigeration compressor to other monoatomic gases such as argon or neon as well.

Keywords: Helium compressor, pulse-tube cryocooler, reciprocating-type refrigeration compressor.

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