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DESIGN AND DEVELOPMENT OF A HIGH SPEED ROTARY VALVE FOR OPERATION IN A PRESSURE WAVE REFRIGERATOR

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Content :

A Pressure wave refrigerator comprises a pressure oscillating tube. When a high pressure gas is injected into the oscillating tube, it compresses the gas with a shock wave and when the same is connected to a low pressure reservoir the compressed gas is refrigerated by means of an expansion wave. To facilitate this, the oscillating tube has to connect alternatively with high pressure and low pressure reservoir and a rotary valve is used for this purpose. The typical operating frequency of this type refrigerator is 30-50 Hz. Such high frequency rotary valve is not available in the market

In this paper, the design and development of a high speed rotary valve is presented. The valve fitted with a turbine is driven by a part of the process gas which helps to place the rotary valve in the cold region. The RPM of valve under various inlet pressure loading conditions is calibrated and the calibration results are presented in the paper.

Primary authors : Mr. KARRI, VEERANDRA YADAV (IIT Kharagpur)

Co-authors : Mr. YADAV, VIPIN KUMAR (IIT Kharagpur) ; Mr. GUPTA, SUDEEP (IIT Kharagpur) ; Dr. NANDI, TAPAS KUMAR (IIT Kharagpur)

Presenter : Mr. KARRI, VEERANDRA YADAV (IIT Kharagpur)

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