

Study on Piston Offset and Efficiency of Linear Compressor for Large Refrigerating Capacity J-T Throttle Refrigerator

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The valved linear compressor provides the pressure ratio and flow rate of the J-T throttling cycle, and its efficiency has a key influence on the performance of the J-T throttling refrigerator. Large refrigeration capacity J-T throttling refrigerator requires a large capacity, high pressure ratio, high efficiency linear compressor, so it is necessary to improve the capacity and efficiency of the compressor. Due to the imbalance of the gas pressure on both sides of the piston, the piston of the valved linear compressor will be offset. The piston offset increases the clearance volume (dead volume), which seriously affects capacity and efficiency of the linear compressor. This paper tests the piston offset of the valved linear compressor under different working conditions, which is consistent with the simulation results of the linear compressor piston offset model. In addition, the relationship between piston offset and compressor capacity and efficiency has been systematically studied through three methods: AC + DC voltage drive, increasing spring mechanical stiffness, and pre-adjusting the compressor mover mechanical center.