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DESIGN AND OPTIMIZATION OF FLAT TYPE LOOP HEAT PIPE WITH MULTIPLE PARALLEL EVAPORATORS

Abstract

Aiming at the problems of uneven flow distribution and unsuccessful start-up in the flat type loop heat pipe system with multiple parallel evaporators (MELHP), the heat transfer and flow characteristics have been analyzed theoretically. According to the results of theoretical analysis, an optimized MELHP system has been designed and the corresponding experiment system has been established. An experimental prototype has been fabricated to study its operating characteristics including start-up from the cold state, transient state and steady state at different heat loads and to analyze the effects of the flow rate of the liquid, the species of working fluid, the liquid charge ratio and the heat sink temperature on its operating characteristics. The experimental results show that, the optimized MELHP system can effectively improve the problem of uneven flow distribution in the evaporator, and the system can run stably in a certain range of heat load.