عنوان مقاله:

Effect of Diffuser Height on Thermocline in Stratified Chilled Water Storage Tank

محل انتشار:

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خلاصه مقاله:

Chilled water energy storage using thermal stratification technique currently used in the vast area because it contributes to reducing energy consumption and refrigeration capacity as well as its maintenance, operating and capital costs are low. In this paper, experimental tests were carried out on a small-scale vertical cylindrical storage tank equipped with an elbow-type conventional diffuser at inlet heights of ۲۰, ۱۷۰, ۳۲۰ and ۴۷۰mm for flow charging rates from ۱.۵-۷.۵l/min. in order to obtain a good thermal separation. The degree of stratification was estimated by means of temperature distributions and performance metrics, which involve thermocline thickness, the half-cycle figure of merit and equivalent lost tank height. The results show that the decrease in diffuser height above the tank floor tends to the steep thermocline or satisfactory thermal separation, the stratification and thermal performance were obtained at diffuser height of ۲۰ mm within the limiting volume flow rates ۱.۵-۴.۵ l/min. better than those at volume flow .rates ranging from ۵.۵-۷.۵l/min. and much better than at diffuser heights of ۱۷۰, ۳۲۰ and ۴۷۰mm for various flow rates

کلمات کلیدی:

Cool thermal energy storage, Stratification, Diffuser height, Thermal performance, Inlet diffuser