

ABSTRAK

Latar belakang penulisan tugas akhir ini yaitu untuk mengetahui performa mesin pendingin type water chiller kapasitas 300TR refrigeran R134a pada sistem HVAC PT. X, karena beban pendingin pada sistem HVAC berubah setiap waktu disebabkan perubahan temperatur udara lingkungan tiap jam-nya.

Performa mesin pendingin dapat dilihat dari beberapa parameter seperti temperatur dan tekanan yang bisa dilihat dari perhitungan yang akan dibahas yaitu enthalpy R134a siklus kompresi uap, kerja kompresor, penyerapan kalor di evaporator dan pelepasan kalor di kondensor yang menghasilkan nilai performa serta laju pendinginan air.

Pada hasil penelitian performa chiller saat temperature udara lingkungan mencapai 32 °C kerja kompresor turun hingga 2,09 kJ/kg hingga 6,51 kJ/kg. Dan penyerapan kalor di evaporator mencapai nilai 65,6975 kJ/kg sampai 58,9475 kJ/kg. dan pada pelepasan kalor pada kondensor 180.205 kJ/kg sampai 170.915 kJ/kg. Performa chiller berbanding lurus pada penyerapan kalor di evaporator. Karena ketika temperatur water chiller naik dan laju pendinginan air tidak maksimal refrigeran yg di kompresi tidak mencapai suhu yg seharusnya sehingga kerja katup ekspansi bekerja besar maka pelepasan kalor pada kondensor tidak sempurna. Ini berarti ada korelasi antara temperatur water chiller terhadap performa chiller.

Kata kunci: mesin pendingin, performa chiller, Refrigeran R134a.

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ABSTRACT

The background of this final report is to determine the performance of the refrigeration machine water chiller with refrigerant R134a capacity 300TR in HVAC systems PT. X, because the cooling load on the HVAC system changes all the time due to changes in air temperature every hour of his environment.

Cooling the engine performance can be seen on several parameters such as temperature and pressure can be seen from calculation to be discussed is the enthalpy of the vapor compression cycle R134a, compressor, heat absorption in the evaporator and condenser heat release in the yield value of the performance as well as the pace cooling water.

In the research performance of the chiller when ambient air temperature reached 32 C compressor drops to 2.09 kJ / kg to 6.51 kJ / kg. And heat absorption in the evaporator reaches the value of 65.6975 kJ / kg to 58.9475 kJ / kg. and the release of heat in the condenser 180 205 kJ / kg to 170 915 kJ / kg. Chiller performance is directly proportional to the heat absorption in the evaporator. Because when the chiller water temperatures rise and the maximum rate of cooling water in the compression refrigerant who do not reach a temperature that is supposed to work, the expansion valve is working great deliverance heat in the condenser is not perfect. This means that there is a correlation between the temperature of the water chiller chiller performance.

Keywords: *refrigeration, chiller performance, Refrigerant R134a.*

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