

## ABSTRACT

Heating, Ventilation, and Air-Conditioning (HVAC) is a system that must be owned by the industries, offices, malls, and buildings in supporting air comfort for residents, visitors, machines, equipments, and environments that requires special treatment. The air comfort is forming of controlling air conditions which includes temperature, humidity, air circulation, and clean air quality in the air conditioning system in the building. The most basic components of an HVAC system include the evaporator, compressor, expansion valve, and condenser.

In this study, the design of the HVAC system in the central control room was carried out which included the calculation of the cooling load and the design of heat exchangers (evaporators and condensers). While the compressor and expansion valve are selected according to the working needs in the HVAC system. The type of heat exchanger is designed in the form of a continuous plain finned tube with a staggered tube arrangement. The design of heat exchangers is carried out on the basis of thermal and mechanical calculations.

The result of the cooling load calculation in the central control room is 54.34 kW. The dimensions of the evaporator from the results of thermal design include length, width, and height, namely 2640 mm, 154 mm, and 1320 mm. While the condenser dimensions of the thermal design results include a length of 1689 mm, a width of 154 mm, and a height of 845 mm. Meanwhile, the mechanical design results of the evaporator and condenser are the same, namely a fin thickness of 0.075 and a cap sheets thickness of 1 mm. The compressors and expansion valves used in the design of the HVAC system are reciprocating compressors and thermostatic expansion valves.

**Keywords:** HVAC, Design, Cooling Load, Evaporator, Condenser.