Calculate Heat Dissipation for VFDs

One Mechanical Horsepower is equal to 745.7 Watts.

When you're building an enclosure containing Variable Frequency Drives (VFDs), it's easy to underestimate the contribution of heat your VFD adds toward the enclosure's heat load.

VFDs generate a significant amount of heat and unless the heat is removed through the use of enclosure thermal management, the drives can overheat and trip, causing equipment problems.

Obtaining the watt loss VFD from the manufactures of the specific unit is the most accurate way to calculate your thermal management needs but if that is not available here is a simple guide to calculate the heat dissipation requirements for VFDs.

The efficiency of most VFDs is between 93 to 98 percent and the balance of the energy is lost as heat. The power dissipated is calculated by subtracting the efficiency from 100 percent and multiplying the result by the power consumption of the drive. The heat loss of a 95 percent efficient, 100 horsepower drive can be estimated as 5 percent of 100 horsepower which equals 5 horsepower or 3729 watts.

In order to make this it's essential to obtain the VFD drive efficiency at the design load from the equipment supplier.

Don't forget to take into account the thermal losses of other equipment such as reactors, transformers, power supplies. Their heat losses must be added to the total heat load.

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