

H-Max series variable frequency drive kilowatt calculation statement

Eaton H-Max series variable frequency drive (VFD) uses a power calculation that has been proven and tested from many years of power electronic design and validation. Eaton calculates it based off the energy that flows through the converter, specifically the motor current, motor voltage and the phase angle between the current and voltage measurement. With these variables we are able to calculate instantaneous power this is flowing to the motor with the following equation:

$$\text{Sqrt}(3) * U * I * \cos(\text{phi})$$

where U is the motor voltage, I is the motor current and “phi” is the instantaneous phase difference between motor voltage and current waves.

With the use of external meters, it has been tested and proven that the overall accuracy of the VFD output power (including the effect of current measurement ripple and phase angle variations) is better than +/- 4% of the unit nominal power.

When input power is calculated using the output power, the VFD efficiency of 96% is taken into account and the theoretical overall accuracy is +/- 5%.

During the burn-in test procedure that Eaton performs on each VFD, Eaton validates that the output amps and torque values are within our manufacturing tolerance before the drive is shipped. The burn-in testing is part of ISO 9001 manufacturing and quality assurance procedures.



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Additional Help

In the US or Canada: please contact the Technical Resource Center at 1-877-ETN-CARE or 1-877-386-2273, option 2, option 6.

All other supporting documentation is located on the Eaton web site at www.eaton.com/drives

