Variable Frequency Drive Sizing

Sample document - numeric values are only included in the purchased Pro export.

Project: _____ Part/Position: _____ Prepared by: _____

Overall assessment: PASS

Inputs

Motor rated current from	? ? ?
Motor rated power P_N	? ? ? kW
Supply voltage U (line-to-line)	? ? ? V
Duty class/overload class	? ? ?
Switching frequency	? ? ? kHz
Ambient temperature	? ? ?
Motor cable length (shielded)	? ? ? m
Rated current of the chosen drive I_VFD	? ? ?

Motor current and drive rated current

Motor rated current I_N	? ? ? A
Switching-frequency derating factor k_freq	? ? ?
Temperature derating factor k_temp	? ? ?
Margin factor	? ? ?
Required drive rated current I_VFD,req	? ? ? A
Overload factor	? ? ?
Overload current I_overload (short-time)	? ? ? A

Recommended drive size

Recommended drive rated power	? ? ? kW
Rated current of the recommended size	? ? ? A

Notes and calculation basis

Sizing of a variable frequency drive for a three-phase induction motor based on the actually required current, not on the motor power in kW. Calculation path: motor rated current I_N = P_N*1000/(sqrt(3)*U*cos phi*eta), unless taken directly from the nameplate; switching-frequency and temperature derating factors plus a duty-dependent margin factor (VT/CT/heavy duty) give the required drive rated current I_VFD,req = I_N/(k_freq*k_temp)*Margin; in parallel, the short-time overload current I_overload = I_N*Overload_factor (checks the overload reserve, not part of the continuous-current sizing). The recommended drive size is the next standard size that covers both the motor power and I_VFD,req, plus one size larger for constant torque or heavy duty. If a drive rated current is chosen, the utilisation I_VFD,req/I_VFD is rated with a traffic light. Deliberate simplification: motor protection, EMC filter selection and line reactor remain manufacturer-specific and are not part of this calculation; all factors are guideline values, the drive manufacturer's datasheet is authoritative.