AlphaWire

Cables you trust. Service you deserve.

Gauge Size Based Upon NEC 430.250 & NEC 310.16 Information

(Based on XHHW-2 or RHW-2 Insulated Conductors Rated at 90C)

Drive, HP	Wire Gauge Size, 115 VAC, 3-Φ	Full Load Current, Amps	Alpha Wire P/N	Wire Gauge Size, 230 VAC, 3-Φ	Full Load Current, Amps	Alpha Wire P/N	Wire Gauge Size, 460 VAC, 3-Φ	Full Load Current, Amps	Alpha Wire P/N
1/2	No. 18 AWG	4.4	VF16016	No. 18 AWG	2.2	VF16016	No. 18 AWG	1.1	VF16016
3/4	No. 18 AWG	6.4	VF16016	No. 18 AWG	3.2	VF16016	No. 18 AWG	1.6	VF16016
1	No. 18 AWG	8.4	VF16016	No. 18 AWG	4.2	VF16016	No. 18 AWG	2.1	VF16016
1-1/2	No. 18 AWG	12.0	VF16016	No. 18 AWG	6.0	VF16016	No. 18 AWG	3.0	VF16016
2	No. 18 AWG	13.6	VF16016	No. 18 AWG	6.8	VF16016	No. 18 AWG	3.4	VF16016
3	---	---	---	No. 18 AWG	9.6	VF16016	No. 18 AWG	4.8	VF16016
5	---	---	---	No. 14 AWG	15.2	VF16014	No. 18 AWG	7.6	VF16016
7-1/2	---	---	---	No. 12 AWG	22	VF16012	No. 18 AWG	11	VF16016
10	---	---	---	No. 10 AWG	28	VF16010	No. 16 AWG	14	VF16016
15	---	---	---	No. 8 AWG	42	VF16008	No. 12 AWG	21	VF16012
20	---	---	---	No. 6 AWG	54	VF16006	No. 10 AWG	27	VF16010
25	---	---	---	No. 4 AWG	68	VF16004	No. 8 AWG	34	VF16008
30	---	---	---	---	---	---	No. 8 AWG	40	VF16008
40	---	---	---	---	---	---	No. 6 AWG	52	VF16006
50	---	---	---	---	---	---	No. 4 AWG	65	VF16004

See NEC Tables 310.16 & NEC Table 430.250 for Correction Factors and Other Possible Constraints.

- Alpha Wire cannot recommend a specific cable for a specific drive system since we do not know all drive system parameters.
- Since every drive system essentially consists of four (4) components, sic, the power source, the VFD, the VFD cable, and the motor, we can address the cable in terms of the power source only.
- Simply looking at the cable in terms of the source of power, i.e., neglecting the influences of harmonics, issues with respect to the AC-to-DC-to-AC conversion, power distortions, non-linear spikes, reflections, etc., we can provide some direction as to what cables could be considered for use with these drives since the least common denominator will be essentially NEC Table 430.22, Requirements for Conductors Supplying a Single Motor Used in a Continuous Duty Application (plus the requirements for conductors to handle 125% of the full load phase current on the motor) and the Article 310.16, Allowable Ampacities table.
- Since Alpha Wire employs either XHHW-2 or RHW-2, 90C rated XLPE insulated single conductors we can go to the NEC Table 310.16 which provides allowable ampacities of insulated conductors rated 0 through 2000 volts, 60C through 90C, for not more than 3-current-carrying conductors in a raceway or direct buried (else de-rating must be taken into account.)
- The ampacity data from one has been overlaid into the second table to provide a table that provides a quick view of the power source requirements for the drives under normal conditions. Remember if the conductors are far away, corrections must be made for voltage drop due to length, if the ambient temperature is different than 30C, corrections would have to be made for that as well, etc.