

VFD Cable Selection Guide

Motor Properties: AWG Size Selection Chart per NEC

Drive HP	230V 3Ø	460V 3Ø	575V 3Ø
1/2 - 2	16*, 14 AWG	16*, 14 AWG	16*, 14 AWG
3 - 5	14 AWG	16*, 14 AWG	16*, 14 AWG
7 1/2 - 10	10 AWG	14 AWG	14 AWG
15	6 AWG	10 AWG	12 AWG
20	4 AWG	10 AWG	10 AWG
25	4 AWG	8 AWG	10 AWG
30	3 AWG	8 AWG	8 AWG
40	1 AWG	6 AWG	6 AWG
50	2/0 AWG	4 AWG	6 AWG

Drive HP	230V 3Ø	460V 3Ø	575V 3Ø
60	3/0 AWG	3 AWG	4 AWG
75	250 KCMIL	1 AWG	3 AWG
100	350 KCMIL	2/0 AWG	1 AWG
125	—	3/0 AWG	2/0 AWG
150	—	4/0 AWG	3/0 AWG
200	—	350 KCMIL	250 KCMIL
250	—	500 KCMIL	350 KCMIL
300	—	—	500 KCMIL
350 - 500	—	—	—

* 16 AWG may be used depending on compliance with the applicable sections of NEC. Final determination can only be provided by the local AHJ.

Note: The above table references the suggested wire AWG to use based on horse power (HP) and the full load current (FLC) × 125% per NEC Art. 430-122 (A).

Ampers (FLC) were determined from NEC Art. 430-250:

Example:

To calculate AWG size, three factors must be known: motor HP, motor voltage, and full load current (FLC).

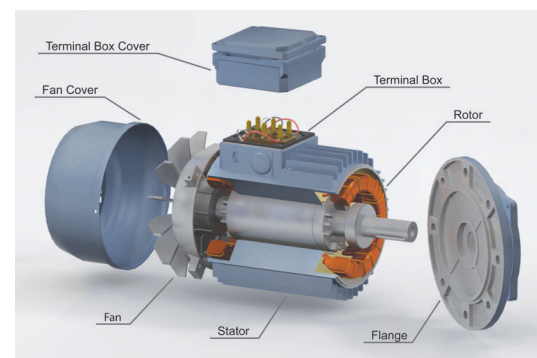
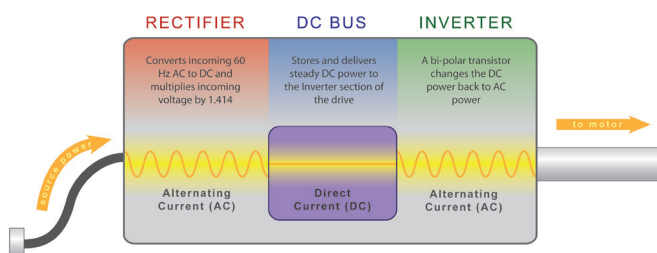
For a 30 HP and 460V motor, the FLC is 40A. Per NEC, FLC × 125% is required to calculate AWG size.

40A × 125% = 50 A, therefore the right AWG wire is 6 AWG per NEC Article 310.15.

See NEC table 310.15(B)(16) on previous page. 60°C column ampacities are referenced to avoid safety hazards that can occur when the maximum allowable temperature ratings of equipment and other non-cable components have been exceeded.

ADJUSTABLE SPEED DRIVE					
REG No. LAPP MOTOR EXAMPLE					
Power Input	Volts	460V	Power Output	Power	30 HP
	Amps	40A		Volts	500V
	Hertz	60 Hz		Amps	50A
Model No. LAPP MOTOR					
Serial No. LAPP 12345					
ML No. 4DFJK48DK					

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Voltage Drop Factors, Volts at FLC @ 20°C

Drive HP	Voltage Drop Factor (Vdf)			Drive HP	Voltage Drop Factor (Vdf)		
	230V 3Ø	460V 3Ø	575V 3Ø		230V 3Ø	460V 3Ø	575V 3Ø
1/2	0.00696	0.00348	0.00285	25	0.01575	0.01627	0.02030
3/4	0.01013	0.00506	0.00411	30	0.01732	0.01914	0.02406
1	0.01329	0.00665	0.00538	40	0.01203	0.01843	0.01962
1 1/2	0.01899	0.00949	0.00759	50	0.01185	0.01506	0.01843
2	0.02152	0.01076	0.00854	60	0.01125	0.01667	0.01436
3	0.03038	0.01519	0.01234	75	0.00872	0.01385	0.01667
5	0.04809	0.02405	0.01930	100	0.00676	0.01130	0.01429
7 1/2	0.02868	0.03481	0.02848	125	—	0.01139	0.01139
10	0.02105	0.04430	0.03481	150	—	0.00818	0.01052
15	0.02009	0.02738	0.03335	200	—	0.00655	0.00872
20	0.01914	0.02030	0.02868	250	—	—	0.00660

The above table references the voltage drop over distances. It was determined by using selection criteria of the Motor Properties Table. In order to determine the voltage drop, multiply the length by the data above.

Example:

To calculate voltage drop over a specified distance, two factors must be known: the distance to the motor and the voltage drop factor.

For a 30 HP and 460V motor, the voltage drop for a distance of 200 feet would be **200 × 0.01914 = 3.83 volts**

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