

VFD Cable Selection Guide

Motor Properties: AWG Size Selection Chart per NEC

Drive HP	230V 3Ø AWG	460V 3Ø AWG	575V 3Ø AWG	Drive HP	230V 3Ø AWG	460V 3Ø AWG	575V 3Ø AWG
1/2 - 3	14	14	14	60	4/0	1	2
5	14	14	14	75	300 KCMIL	1/0	1
7 1/2	10	14	14	100	500 KCMIL	3/0	1/0
10	8	14	14	125	—	4/0	3/0
15	6	10	12	150	—	300 KCMIL	4/0
20	4	8	10	200	—	500 KCMIL	300 KCMIL
25	2	6	8	250	—	—	500 KCMIL
30	1	6	8	300	—	—	—
40	2/0	4	6	350	—	—	—
50	3/0	2	4	400 - 500	—	—	—

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

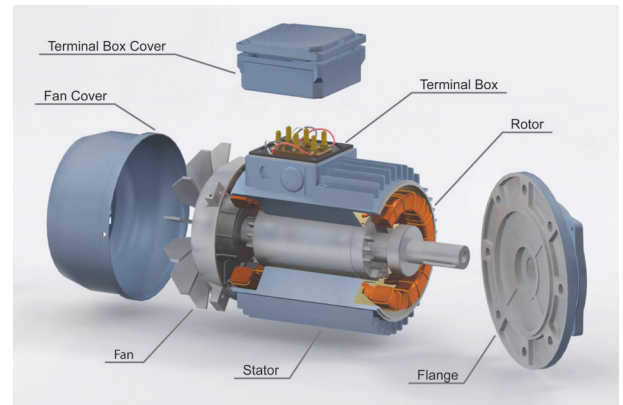
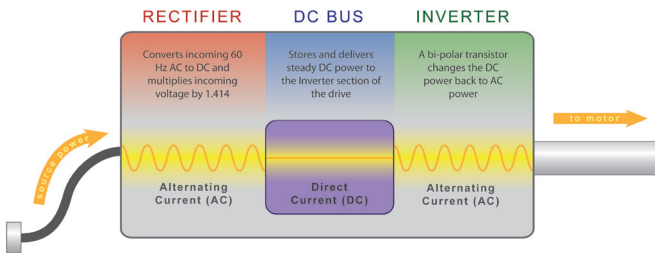
Example:

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 x 125% is required to calculate AWG size.

40A x 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	
	Amps	40A		Power 30 HP
	Hertz	60 Hz		Volts 500V
			Amps 50A	
Model No.		LAPP MOTOR		
Serial No.		LAPP 12345		
ML No.		4DFJKJ48DK		



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 x 0.01914 = 3.83 volts**

In keeping with the principles of the Lapp Group, customer education is at the top of the list. We strive to keep our customers aware of breaking industry changes. For a more detailed technical explanation, please visit Lapp USA's website.