

Amperage Circuit for Electrical Motors

Running electrical equipment on a circuit which is undersize for the amperage rating of the motor can create nuisance tripping of the power supply circuit breaker. Always run the machine on a circuit that is rated higher than the amperage draws of the machine. A sign that the incorrect amperage circuit is being used cord is the tripping on. Always insure that the machine is properly grounded and connected to the correct circuit as per National Electrical Code (NEC), Local Electrical Codes, and NEMA (National Electrical Manufacturer's Code).

For example: a 5hp 230-volt motor which is rated at a 20.6 AMP should be run on a 25 AMP circuit as it is the next larger size.





Note: You will see 200volt/230 volt and 240 volt listings. What's the difference besides 20 volts? They are basically the same. You will see a lot of things listed as 110/120 or 220/240. Most electric services allow a 5% or 10% variance in the voltage.

Length Extension Cord for the Motor Size

Too long or too thin of gauge cords can create low voltage/high amperage levels which can damage the electric motor and degrade the saw's performance. Most motor trouble is the result of too small gauge or too long of extension cord. A sign that the extension cord is the incorrect size is tripping of the circuit breaker when the machine is turned on. The incorrect extension cord will cause the motor to overheat and trip the thermal reset on the motor.

Extension Cord Size and Length					
Most motor trouble is the result of too small or too long of an extension cord. Extension cords must be one-piece and as short as possible. Cords should be no longer than shown in the following table.					
Motor Horse Power	1-1/2 to 2hp		3hp		5hp
Wire Gauge	115v	230v	115v	230v	230v
6 AWG	-NA-	-NA-	75'	250'	150'
8 AWG	75'	250'	50'	150'	100'
10 AWG	50'	150'	25'	100'	50'
12 AWG	25'	100'	-NA-	50'	50'

For best operation always connect to 230 volt supply.

6 Gauge		55 Amps Feeder and large appliance wire
8 Gauge		40 Amps Feeder and large appliance wire
10 Gauge		30 Amps Dryers, appliances, and air conditioning
12 Gauge		20 Amps Appliance, laundry and bathroom circuits

Correct Voltage

Always connect the machine to the same voltage and phase as the motor was designed for. Connecting a machine up to the incorrect voltage or phase can damage the motor or create shock hazard.

For example, 230-volt 3 phase should only be connected to 230-volt 3 phase and not to 230-volt 1 phase.

Some motors are classified as a dual voltage motors. These motors are designed to run on one of two different voltages that are related to one another. For example, a 115-230-volt 1 phase motor can run on either 115-volt

or 230-volt 1 phase power. With the Norton Manufactured Masonry saws of this classification, simply wire the motor to the same voltage as the circuit is. **NOTE: Do not run the motor set to the incorrect voltage of the circuit.**

Generators: Using a generator that is too low of Wattage can damage the electrical motor.

Motor Horse Power	Volts	Phase	Minimum Generator Size*	
			Watts (W)	Kilowatts (kW)
1-1/2hp	115 volts	1	5,000 W	5 kW
1-1/2hp	230 volts	1	5,000 W	5 kW
2hp	115 volts	1	6,000 W	6 kW
2hp	230 volts	1	6,000 W	6 kW
5hp	230 volts	1	15,000 W	15 kW
5hp	230 volts	3	9,000 W	9 kW
5hp	460 volts	3	9,000 W	9 kW
7-1/2hp	230 volts	3	14,000 W	14 kW
7-1/2hp	460 volts	3	14,000 W	14 kW

*1,000 watts (W) = 1 kilowatts (kW), Watts= (Amps x Volts) x 3 (Startup Factor)

746 Watts = 1 Hp
 X 746 Watts
 ----- = AMPS
 Voltage

Watts=Amps X Volts
 16.9 Amps x 220 volts = 3,718 Watts
 So start up wattage needed is 3,718 x 3 = 11,154
 Watts

5 Hp Motor At 220 Volts
 Is
 5 Hp X 746 Watts
 ----- = 16.90 Amps
 220 Volts

Estimating Motor Current Draw
 At 115 volts, a single phase motor draws approximately 10
 amps per horsepower.
 At 230 volts, a single-phase motor draws approximately 5
 amps per horsepower.
 At 230 volts, a 3-phase motor draws approximately 2.5 amps
 per horsepower.
 At 460 volts, a 3-phase motor draws approximately 1.27
 amps per horsepower.