



## Dedicated Circuits for Rainwater Pumps

### What is a Dedicated Circuit?

All electricity goes through a circuit breaker box. Your circuit breaker box has individual circuits and breakers that provide electricity to different parts of your home or business. To protect and prevent electrical hazards, certain appliances and equipment require their own circuit often referred to as a *dedicated circuit*.

### Why does my pump need a dedicated circuit?

Typical electrical circuits may have several items plugged into the same circuit. Just like most motor-driven appliances like a furnace or air compressor, a water pump consumes increased electrical current as the pump motor starts. This start-up current can demand nearly all of the capacity for an electrical circuit and therefore requires its own dedicated circuit.

### What wire gauge does my circuit need?

Your electrician should be able to determine this for you, given the input voltage and maximum amperage of the pump and pump controller. The electrician will also take the circuit (wire) length into consideration because longer circuits will experience voltage drop, or *line loss*, which must be compensated by increased wire gauge.

**Experts say that voltage drop should never be greater than 3 percent.**

Approximate line loss voltage drop for a typical single-phase 115V, 15 amp water pump:

	14 Gauge		12 Gauge		10 Gauge		8 Gauge		6 Gauge	
	V. drop	%	V. drop	%	V. drop	%	V. drop	%	V. drop	%
50 feet, 115V, 15A	3.79	3.30%	2.38	2.07%	1.50	1.30%	0.94	0.82%	0.59	0.51%
100 feet, 115V, 15A	7.58	6.59%	4.76	4.14%	3.00	2.61%	1.88	1.63%	1.19	1.03%
200 feet, 115V, 15A	15.15	13.17%	9.53	8.29%	5.99	5.21%	3.77	3.28%	2.37	2.06%

Excess line loss as indicated in **RED** will cause the circuit amperage to increase which can lead to poor performance, increased heat generation, damaged system components, tripped breakers, burned wiring and a potential fire hazard.

As a general rule, keep all wiring as short as possible to reduce line loss. If the pump is supplied with a power cord, any excess cord should be eliminated when the final wiring connections are made.

### What kind of plug does my circuit need?

This will depend on the configuration of the pump system but most water pump systems require a junction box near the location of the pump controller. Pump controllers are often hard-wired into the junction box but can sometimes be connected using a plug. If mounted outside, a waterproof enclosure and possibly GFCI protected circuit may be required. Your electrician will advise you of the local electrical codes and requirements.