

Sump Pump Controller, Corrosion Resistant

Every sump pump controller I have seen on the web uses DC to sense the water. This approach is simpler, but eventually causes corrosion of the sensor probes due to electrolysis. The probes then have to be periodically cleaned or replaced. This circuit solves the problem by using AC to sense the water in the sump. You should use a material (like stainless steel) for the probes that will not oxidize or react with chemicals in the water, but at least corrosion due to electrolysis is taken care of here.

The pump starts when the high probe touches water and stops when the low probe no longer touches water. This circuit was designed to be as simple and cheap as possible and still work well.

Change the value of R1 and R7 (15K) if needed to change the probe sensitivity. Increased resistance increases the sensitivity. The electrical conductivity of the water is dependent on its mineral content. The ground probe(s) should be placed fairly close to the sensor probes, because this affects the sensitivity of the sensors. Make the ground probe(s) longer than the sensor probes so that the sensor probes lose contact with the water before the ground probes do to prevent erratic operation.

Any general purpose silicon transistors and small MOSFET may be used in place of those shown in the drawing. The circuit is designed for a 12 volt relay. 1N400X means any diode in the 1N4000 series. Use a 12 volt transformer big enough to power the relay you are using. Do not use an electrolytic for C6.

The signal labeled 12VAC isn't really AC. It's both AC and DC.

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