



## POWTS FACTSHEET

# ELECTRICAL FOR POWTS

### BUREAU OF FIELD SERVICES

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### RESOURCES

Click on the heading to be directed to the resource

[§101.862\(4\)\(d\) Wis Stats](#)  
[§101.862\(4\)\(p\) Wis Stats](#)  
[§101.875\(1\) Wis Stats](#)

[SPS 316.300\(1\)](#)

[VIDEO – POWTS UPDATE  
October 2022](#)

### SUMMARY

Many Private Onsite Wastewater Treatment Systems (POWTS) require some type of electrical connection to operate pumps, alarms or other devices. §101.862 requires all persons who install, repair or maintain electrical wiring and systems in Wisconsin to be licensed as an electrician. §101.862(4)(p) allows an exemption for *“a person engaged in installing, repairing or maintaining a POWTS..., if the activity only involves installing or modifying a conductor going from the system’s junction, pull or device box to the nearest disconnecting point and the conductor is buried with the system.”* This exemption is from the licensing requirements ONLY. The electrical components must still be installed per the code requirements. This factsheet will help address some of those requirements.

### I AM A POWTS INSTALLER, WHAT ELECTRICAL COMPONENTS CAN I INSTALL?

If you are not a licensed electrician, you can:

- 1) Install (bury) the conductor (wire or cable) from the building (if this is the nearest disconnecting point) to the POWTS enclosure or panel.
- 2) Mount the junction or pull box on the manhole riser.
- 3) Mount the control panel.
- 4) Install the pumps and float tree in the pump tank.
- 5) Pull the pump and alarm wires from the tank through the junction or pull box and into the device box or control panel.
- 6) Plug a pump cord into a receptacle or control panel that has been or will be wired by a licensed electrician.
- 7) Properly connect the alarm wire to a conductor – this connection is less than 100 volts and is exempt per §101.862(4)(d)

### HOW MANY WIRES DO I NEED TO BURY?

This depends on how many devices will need to be powered. In a simplex pump situation, there will generally need to be two conductors – one for the alarm and one for the pump. SPS 316.300 requires that effluent pumps shall be supplied by a separate branch circuit supplying no other loads. In addition, it indicates that alarm wiring may not be connected to the pump circuit and that the neutral conductor may not be common to both alarm and pump circuits.

### WHAT TYPE AND SIZE OF WIRE MUST BE BURIED?

All conductors and cables in contact with the ground must be rated for direct bury. An underground feeder “UF” cable is direct bury rated, for example. Conductors run for low voltage uses, such as alarms, also need to be rated for direct bury. The size of the conductor is based on a number of things - but can be calculated based on the source voltage, amp draw of the pump and length of cable. The NEC allows a 3% voltage drop in the conductor. This can go to 5% if there is a combined feeder. Most applications will be 3%. A cable size calculator can be found by clicking [HERE](http://www.paigewire.com/pumpWireCalc.aspx). <http://www.paigewire.com/pumpWireCalc.aspx>

### HOW DEEP DOES THE CONDUCTOR NEED TO BE BURIED?

There are some variables, but generally 18" for residential applications and 24" for commercial applications. NEC Table 300.5 can be referred to for exact minimum cover requirements which includes direct bury, conduit use, GFCI protection and other parameters.

### DO I NEED TO PROTECT THE WIRE FROM DAMAGE?

Yes. SPS 316.300(1)(a)3. requires that all above ground cables and flexible cords be enclosed to protect them against physical damage. Also, NEC 300.5(D)(1) requires conductors emerging from underground to be installed in adequate conduit to provide protection from physical damage. In addition, there is at least one vulnerable location for wire damage specific to a POWTS install and this is where the wire crosses the edge of the tank. This part of the conductor must also be protected.

### WHAT TYPE OF CONDUIT DO I USE?

Be sure to use conduit listed for electrical use (NEC 352.6) – white plumbing PVC is **not** rated for electrical.

### WHAT TYPE OF ENCLOSURES DO I USE?

Be sure to use enclosures listed for the intended use. All enclosures must meet NEMA 3 standards at a minimum.

### CAN I USE AN LB ENCLOSURE TO PLUG IN A PUMP?

No. A female plug is not UL listed to be wired directly to direct bury conductors, like UF. The pump must be plugged into a listed receptacle wired by a licensed electrician. In addition, an LB does not provide adequate space for this type of connection. Also, there needs to be proper separation between the alarm and pump circuits. Because of the size of most conduit bodies like an LB, this separation cannot be achieved.

### CAN I USE AN LB TO CONNECT AN ALARM?

Maybe. Ensure all proper sizes and ratings are adhered to.

### WHAT DOES THE CODE SAY ABOUT SEALING THE ENDS OF THE CONDUIT?

NEC 300.5(H) requires a busing or terminal fitting to be used at the end of the conduit or raceway that terminates underground. SPS 316.300(1)(a)5. requires adequate sealing between the tank and enclosure. This can be done by using an approved sealing compound or a number of manufactured conduit seals.

### ARE FROST SLEEVES REQUIRED ON CONDUIT?

Yes. NEC 300.5(J) requires where raceways are subject to earth movement, they shall be arranged so as to prevent damage to the conductors or equipment connected to the raceways, with the use of expansion fittings or slip sleeves.

### WHO INSPECTS THE ELECTRICAL COMPONENTS?

§101.875 requires that all inspections of electrical wiring be performed by inspectors certified by the department. SPS 305.629 provides registered electrical inspection agencies to perform these inspections. If a POWTS Inspector finds an electrical safety concern, they should contact a State Electrical Inspector. Contact information can be found [HERE](#)

<https://dsps.wi.gov/Documents/Programs/Maps/ElectricalPermitInspectionMap.pdf>