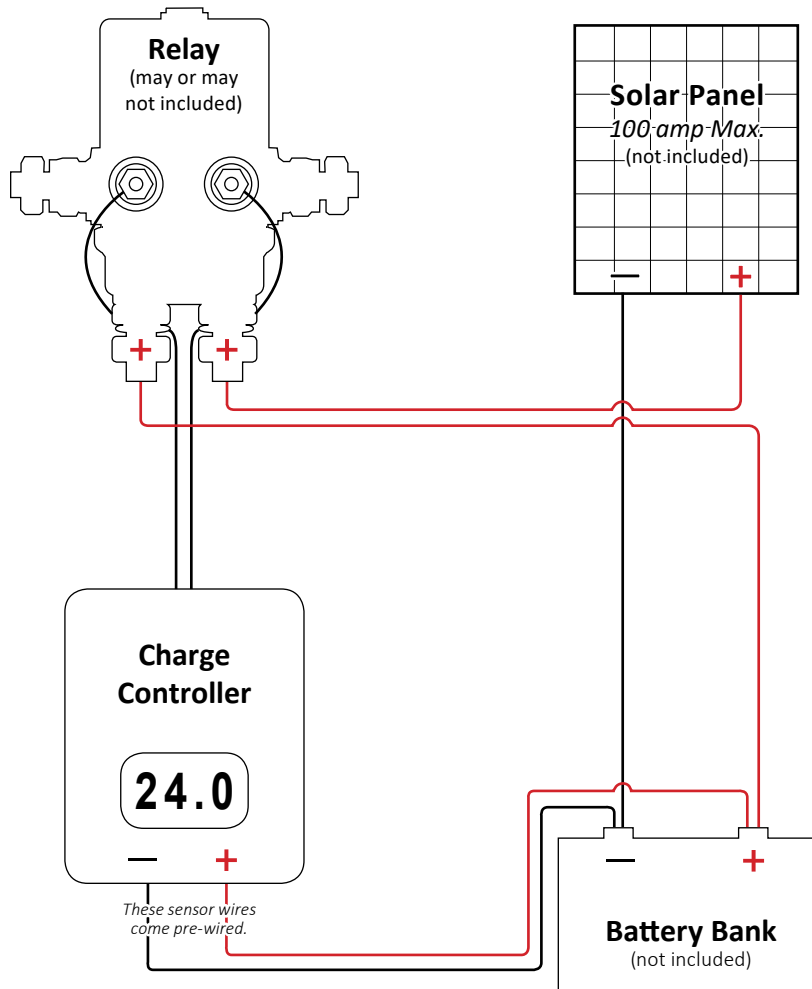


# Charge/Diversion Controller with LED Digital Volt Meter

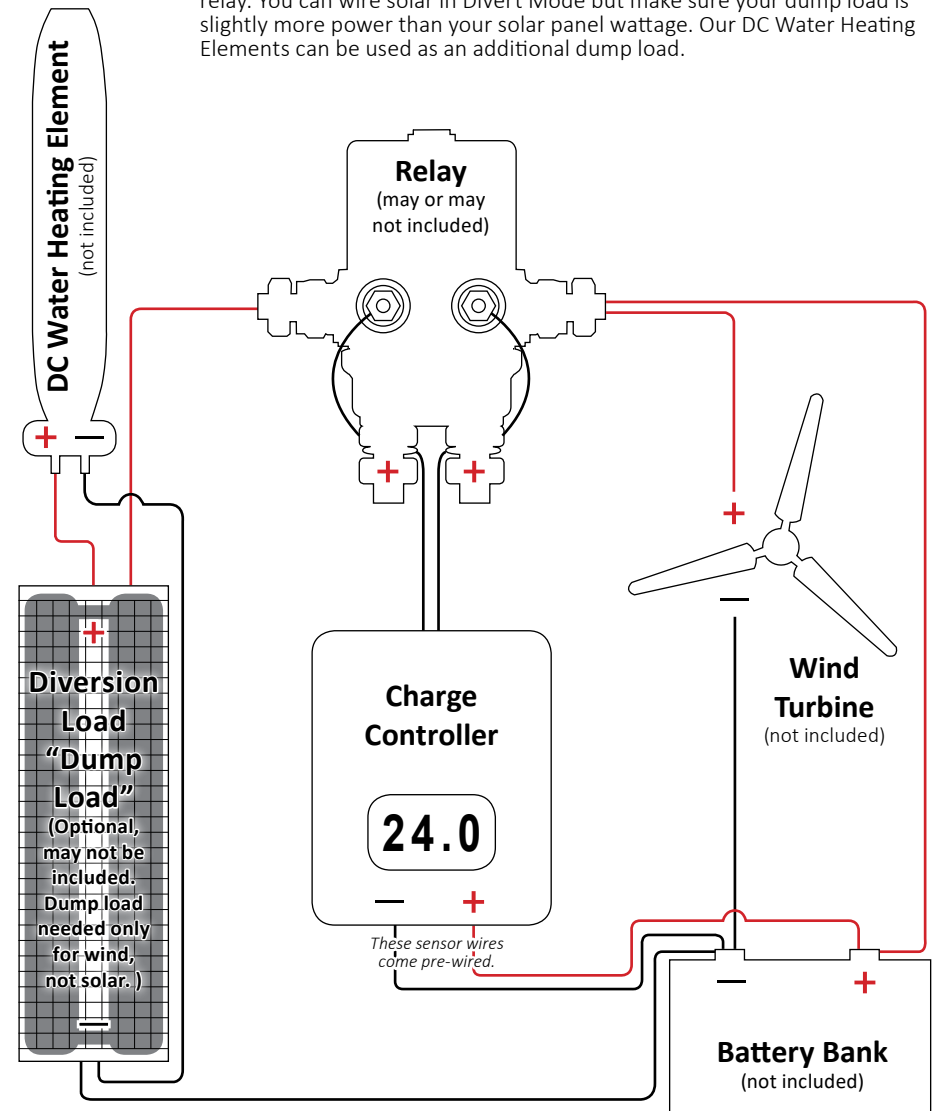
## Disconnect Mode (Solar)

Disconnects solar when batteries are full. Wired exactly like solar panel in diagram below. The bottom posts on the relay disconnect solar panel positive from batteries when they are full (stops solar from charging). Relay may stay disconnected for a period of time. Solar panels do not need a diversion load. However, you can wire solar panels in diversion mode. Just make sure your diversion load has a higher wattage than your total solar wattage. Wind turbines need to be wired in diversion mode and have a diversion load.



## Divert Mode (Wind)

Diverts ("dumps") wind when batteries are full. Uses large side posts on the relay. You can wire solar in Divert Mode but make sure your dump load is slightly more power than your solar panel wattage. Our DC Water Heating Elements can be used as an additional dump load.



# Charge/Diversion Controller with LED Digital Volt Meter

**Read these instruction sheets along with all other component's instruction sheets that will connect to this system.**

- **Do not operate the controller without batteries!** Be sure all four controller wires are connected to batteries before connecting or disconnecting wind and solar.
- You MUST have a dump load when using the controller with a wind turbine or your batteries will overcharge!
- Connect the thin sense wires to batteries only. To extend any charge controller wires, use the same size or larger. **DO NOT hookup backwards!**
- Use proper sized power cables. Undersized cables get hot. This can cause wires to melt and transfer excessive heat to the relay. Oversized cables are always ok.
- Tighten the relay nuts to 4 ft./lbs. max., DO NOT over tighten relay nuts!
- Don't make adjustments to controller's programming unless you are experienced or your system requires it. The buttons are located at the bottom of the digital control unit. See Missouri Wind and Solar's Digital Charge Controller Programmin video on YouTube at: <https://www.youtube.com/watch?v=BFaKxd6xyWo&t=243s>
- Avoid possible electrocution or burns.
- Place controller up high and away from children and pets.
- For indoor use only.
- Only mount relay vertically (standing up as shown) as it will not operate horizontally (laying down).
- **Arc Suppressor:** Mitigates contact arcing when solar is connected. Reinstall as shown on top of solar wires with the arrow facing the same direction as the arrow on the relay.
- Do not exceed 100 amps of solar. Do not exceed 120 amps of dump load or the relay will stick and burn out, possibly causing your batteries to be irreperably damaged. Use the following formulas to calculate what your suspected loads are. The volts will typically always be battery voltage (12, 24, 48).

|   |                  |
|---|------------------|
| — | Black = Negative |
| + | Red = Positive   |

|           |           |
|-----------|-----------|
| V = Volts | V = W ÷ A |
| A = Amps  | A = W ÷ V |
| W = Watts | W = V × A |

## Troubleshooting and additional important information:

- Fully charge your new batteries with no loads drawing from them. Consider equalizing them as well.
- Equalization usually will take a couple of hours. See battery specs for this and do further research to learn how best to equalize batteries.
- Voltage can fluctuate rapidly with fewer batteries. This can cause rapid on/off dumping (clicking sound). Increase the amount of batteries if needed.
- If your solar panel voltage is too high, rapid on/off dumping can occur. Example: 24V solar panels charging 12V batteries. Always check your total solar open voltage before hooking up to the controller.
- 24V solar panels have a VOC (disconnected Open Circuit Voltage) of 32-38 volts. 12V panels have a VOC of 18-22 volts.
- Solar & wind work great together. Wind turbines can charge 24 hours per day. Solar is 8 hours max. Wind turbine bearings may take up to 100 hours of run time to loosen up and make the turbine start up & spin easier.
- Never mix and match batteries. All batteries must be the same type, size, and general age. An old, mismatched, or shorted battery in a bank causes a lot of problems. **NOTE:** New batteries act like old batteries and will need a few cycles before they operate correctly.
- See additional troubleshooting and information page.

**⚠ WARNING:** DO NOT brake your wind turbine in winds over 20 mph (32 km/hr, 5.6 m/sec). Wait for a lull in the wind to brake. DO NOT switch between Brake and Run rapidly. DO NOT wire your turbine rectifiers in series. These things will cause your turbine motor windings to overheat and short. Braking your wind turbine before expected high wind events will prevent turbine failure. Do not allow your turbine to free spin in high winds. The blades can self-destruct and turbine voltages can exceed 100 volts (VOC) and become lethal at any windspeed. With the exception of a blown fuse or breaker. Correct the situation as soon as possible.

**⚠ WARNING:** Charge controller/board may have sharp edges. Also be sure to discard carboard and packing materials around the dump load.