



Details on the Solis Rapid Shutdown Equipment

What it is:

The Solis Rapid Shutdown Device (RSD) is unique in the industry because it is not just a collection of UL recognized components and other listed equipment assembled to meet the requirements of 2014 NEC Article 690.12 (Rapid Shutdown). The Solis rapid shutdown equipment has an Authorization to Mark (to the UL 1741 Standard) that shows that this equipment is listed and **labeled** as “PV rapid shutdown equipment”. It is built for this purpose. Because of this listing, the Ginlong Solis device can be used in other PV systems with inverters from other companies, such as ABB, SMA, Fronius, etc.

How it was designed

Ginlong had a choice when designing the product; we could have made it a dc controlled device or an ac controlled device. Solis chose to design an ac controlled device. We thought it would be easier for first responders to cut the ac power to the building to initiate rapid shutdown (proper placards are required) as opposed to looking for a dc switch. This decision meant that installers would need to carry an ac control circuit (L1 and L2, 240Vac) to the rapid shutdown equipment on the roof.

Wiring the RSD:

Installers initially worried about carrying ac and dc in the same raceway. They thought they might have to run a separate conduit. They were aware of NEC Article 690.31(B) that states that PV source / output circuits cannot be in the same raceway as inverter output circuits. However, the Solis Rapid Shutdown Device requires *ac control circuit conductors* and these conductors can be run in the same raceway (conduit) as the PV source / output circuits per NEC Article 300.3(C)(1).

Regarding the circuit conductors, these conductors must be rated for under 1000 volts and they must have an appropriate insulation rating for the conduit in which they are run, per 300.3(C)(1). The installers will run an L1 and L2 conductor. This circuit will carry 240 Vac nominal and the RSD will draw 0.1 amps. It is very common for installers to use two individual THHN or THWN-2 AWG #16 or #14 conductors for this circuit. The installer will typically land the L1 and L2 RSD conductors at dedicated terminals inside the Solis 6-10 kW inverters however, these conductors can be run through the inverter and landed at a breaker at the POC if desired (again, proper placards are required).

In the Ginlong Solis Rapid Shutdown Device (RSD) Installation Manual, installers will find guidance on how to make their field wire connections. In the earliest versions of this device, Solis had connectors on both the PV string-side and the inverter-side of the RSD. We removed the connectors on the inverter-side of the device because we saw that installers always follow the RSD with a j-box where they will connect the longer wires that will run down to the inverter. Installers were always cutting off our connectors so they could fit the RSD inverter-side conductors into the j-box knockouts. The recent versions of the RSD coming out of the Ginlong factory do not have connectors on the inverter side of the RSD.





Fig 1. Typical Rapid Shutdown Device installation (RSD bonded w/ MLPE Kit, J-box and single conduit)

Grounding the RSD:

Although there are two ways to ground the rapid shutdown equipment on the roof, Ginlong Solis recommends that installer only ground the device once. It is our recommendation that installers physically bond the device to the grounding system that is bonding all the other metallic equipment on the roof (PV modules, module support rails, etc.). For example, the Solis rapid shutdown enclosure can be bonded to the module support rails using a WEEB or an MLPE Kit from SnapNRack.

Solis does not recommend that the installer connect the ground wire that is inside the AC control circuit cable that comes with the RSD from the factory. Installers will find that new versions of the RSD coming out of the Ginlong factory only have the L1 and L2 conductors inside of the ac control circuit cable attached to the RSD.

Detailed installation instructions can be found in the Ginlong Solis Rapid Shutdown Device Installation Manual.