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# Installation Manual

## **IMPORTANT SAFETY INSTRUCTIONS**

### Control Box for Rapid Shutdown Systems

### Part# PVR1-GSASWD-1.2(05)


**WARNING:** ALL ELECTRICAL INSTALLATIONS MUST BE PERFORMED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE NEC 2014,NEC 2017, ANSI/NFPA70, CSA C22.1, CANADIAN ELECTRIC CODE, STATE SPECIALTY CODES, LOCAL FIRE AND BUILDING CODES.

**WARNING:** INSTALLATIONS OR REPAIRS SHOULD ONLY BE MADE BY TRAINED AND QUALIFIED PERSONNEL. Rapid Shutdown Systems may contain lethal high voltage levels and should only be serviced when disconnected from all sources of power.

**WARNING:** DC CONTACTORS ARE DESIGNED TO TURN OFF THE OUTPUT POWER TO THE MAIN CABLES ONLY. When the DC Contactors are turned off, BOTH the line and load sides (inputs and outputs) may remain energized. Test for power on both the line side and load side before servicing. Residual power from the inverter will energize the output side of the contactors and cables. Test if the inverter has discharge resistors to identify if back feed power from the inverter back to the output side of the contactors has residual power. May 9,2019

**NOTE:** EE Controls and DC Sunvolt are not liable for the misapplication or mis-installation of its products. The user is cautioned to observe all recommendations, warnings and cautions relating to the safety of personnel, property and equipment. Rapid Shutdown Boxes contain lethal high voltage.

# Installation Information:

Maximum distance 164'ft cable length from Rapid Shutdown box to Remote Controller Unit.
Be wary of mounting box and controller unit over hidden wires behind wall.
Do not mount near flammable gasses or highly combustible materials.
Mount remote controller unit in highly visible and accessible locations for first responders.

**Cable, MC Connectors & Conduit Fittings**
Since wire and conduit sizes vary by application, we do not supply weather proof fittings or strain reliefs. Select the appropriate sized fittings or strain reliefs which have the same NEMA type rating as the enclosure. In order to reduce the possibility of water penetrating the enclosure, do not route the wire or cable through the top of the enclosure.

**NEMA 4X Enclosure Mounting Instructions**

**Mount feet to enclosure bottom with the supplied screws.**

**Make sure the enclosure is balanced and level with the mounting surface**

**Install appropriate screw through each enclosure mounting foot hole and into wall.**

**Grounding for Non-metallic Enclosures:**

1. WARNING, to avoid electrical shock, grounding must be completed during installation. Non-metallic enclosures do not provide a ground between connections.
2. Ground in accordance with the requirements of the National Electrical Code or Canadian Electrical Code.
3. Conduit hubs for metallic conduit must have a grounding bushing attached to the hub inside the enclosure. Grounding bushings provide connections for a grounding wire.
4. Non-metallic conduit and hubs require the use of a grounding wire in the conduit. Grounding bushings are not needed.
5. Any device having a metal portion or portions extending out of the enclosure must also be properly grounded.

**Attention:**
Terminals should be tightened to the torque levels noted below, using a calibrated torque wrench.
Due to the contraction and expansion caused by changing temperatures, we recommend checking the tightness of all terminal connections on a regular basis to insure proper connectivity. Wire terminals torque rating are posted on the enclosures inside cover.
**Wire Size:** 12 – 6 AWG
**Torque:** 12 inch Lbs.

**Grounding:**

The grounding location for the enclosure is marked with a  symbol. Grounding should be performed in accordance with all NEC codes and local regulations.

**Operational Circuitry Explanation:**
When the Mushroom Emergency Stop Button is pressed in, the DC Contactors in the Rapid Shutdown Box are **not** energized, the DC Contactors contacts in the Rapid Shutdown Box are then open (Normally Open Pole), ceasing the transfer of power from the PV modules to the inverter.

When the Mushroom Operator Button is pulled out, 24VDC external control power is then applied to the Rapid Shutdown Box. In the event of loss of power, when power returns, the Rapid Shutdown Box automatically turns the system back ON, transferring power to the inverter.

**Test this Rapid Shutdown System for the presence of power on the input and output circuits.**
**The permissible voltage and current varies depending on the NEC codes for your location. Only touch insulated conductors.**

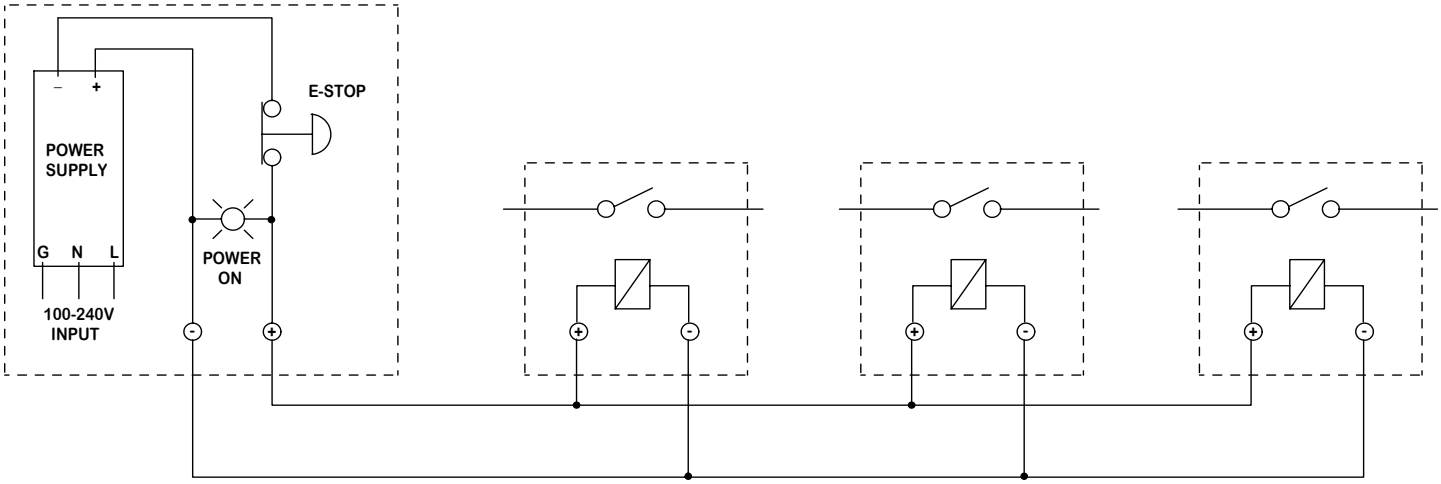
**Power Supply:**
If using this Control Box with DC Sun Volts Rapid Shutdown Box, double check to ensure the power supply is sized correctly for your application, based on cable size, cable length, and the 0.20 Amp current draw per Load Break Contactor in the Rapid Shutdown Box.

**Manual DC Disconnect for Main Power:**
This rapid shutdown system (and most all competitors) do **NOT** include a main power DC LOAD manual disconnect switch. Therefore during servicing , the line and load side may still be “hot” and may cause a shock hazard.

**Wiring Instructions**

1. Connect all ground wire to terminal “G”.
2. Connect AC supply power neutral to terminal “N”.
3. Connect AC supply power line in to terminal “L”.
4. Connect 24VDC output POS to 24VDC POS input terminal in the Rapid Shutdown Box.
5. Connect 24VDC output NEG to 24VDC NEG input terminal in Rapid Shutdown Box.
6. Recheck for correct wiring and torque all connections to proper values.

**Part#: PVR1-GSASWD-1.2**




**WIRING DIAGRAM**

| Part Number | Input Voltage | Output Voltage / Amperage | Enclosure Sizes (in) | Enclosure Type |
|---|---|---|---|---|
| | | | | |
| PVR1-GSASWD-1.2 | 100 – 240VAC | 24VDC / 1.25 Amps | 9.843 x 6.89 x 5.906 | 4X |
| PVR1-GSASWD-02 | 100 – 240VAC | 24VDC / 2.5 Amps | 9.843 x 6.89 x 5.906 | 4X |
| PVR1-GSASWD-05 | 115 – 230VAC | 24VDC / 5 Amps | 10 x 8 x 4 | 4X |