

FUNDAMENTALS OF OPERATION FOR FRONIUS RAPID SHUTDOWN BOX (RSB)

The Fronius Rapid Shutdown Box (RSB) was designed to be a simple solution with the low part count. This minimizes cost and maximizes field reliability.

The RSB is contained in a NEMA 4X enclosure that is easily mounted on the PV array racking material via the included universal mounting bracket. It may be mounted in any position, or orientation, on or off the racking without affecting operation. NEC stipulates this must be within 10 feet of the PV array.

The basis of the RSB is a 600VDC contactor that is held in the closed position by the voltage from the PV array. Contactor range of operation is the same as the voltage window for inverter operation: 80VDC to 600 VDC.

In the inverter data and communication compartment (DATCOM), there are terminals triggered by a relay that is controlled by the inverter. This relay comes preconfigured from Fronius to trigger based on the state of AC grid. If AC voltage is lost, i.e. due to grid failure, or manual disconnect, relay triggers contactor in RSB to open, interrupting the flow of power from the PV array.

Electronics in the RSB bleed down the PV array feeders and residual energy in inverter to the NEC required <30 VDC in less than 10 seconds.

The signal from the inverter relay is carried to the RSB contactor via a pair of communications wire, allowable sizes from 24 AWG to 14 AWG. As this signal is carried via DC voltage, this communication wire is permitted to share conduit with the PV array conductors.

When AC voltage returns, the relay triggers the contactor to close and pass through voltage and current from the PV array, normal operation.

