Rapid Shutdown Kit - Installation and Configuration for Three Phase Inverters

This document describes how to install the rapid shutdown kit in the SolarEdge Safety Switch, and how to enable the rapid shutdown feature in the inverter in order to provide the functionality described in the Rapid Shutdown clause of NEC2014 690.12 (1) through (4).

Kit Contents

- Five (5) rapid shutdown cables for five inverters
- Ten (10) lug terminals (one hole, single barrel post)
- Micro-SD card and SD card adapter with firmware files (Note: DO NOT THROW AWAY THE CARD AND THE ADAPTER; keep them for installation of other rapid shutdown kits)

Cable Installation

Perform this procedure before connecting the strings to the Safety Switch [Chapter 4: Connecting the AC and the Strings to the Safety Switch in the *SolarEdge Installation Guide*].

1 Turn the inverter ON/OFF switch to OFF. If installing the kit in an inverter that is already operating, wait until the LCD indicates that the DC voltage is safe (<50V), or wait five minutes before continuing to the next step.

2 Turn the Safety Switch and the AC switch on the main circuit board to OFF.

> ⚠️ **WARNING!**
> If you cannot see the inverter panel, or if a malfunction is indicated on the LCD panel, wait five minutes for the input capacitors of the inverter to discharge.

3 Loosen the four Allen screws on the front cover of the Safety Switch, and open the cover.

4 Depending on the Inverter model, do one of the following:

- Three-phase inverters SE9KUS, SE10KUS, SE20KUS:

  a. Carefully disconnect the two DC cables from the left side of the switch and from the DC connection spring clamp terminals, as illustrated below. Use a standard straight-bladed screwdriver to disconnect the cables from the terminals.
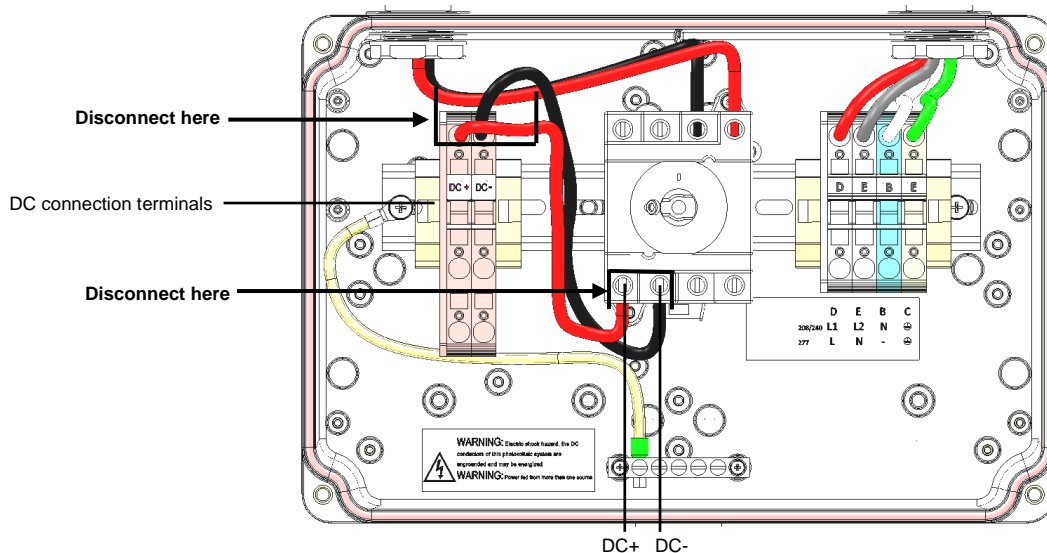

Figure 1: Three-phase inverter Safety Switch with DC terminal blocks

  b. The rapid shutdown cables have a resistor connected to one end (on the red cable). Connect these ends to the switch: Connect the red end to the DC+ terminal (the bottom left-most terminal) of the switch, and connect the black end to the DC- terminal of the switch. Apply torque of 2 N*m (18 lb*in).

c. Use a standard straight-bladed screwdriver to connect the other ends of the cable to the DC terminal blocks: red to DC+ (on the left) and black to DC- (on the right).
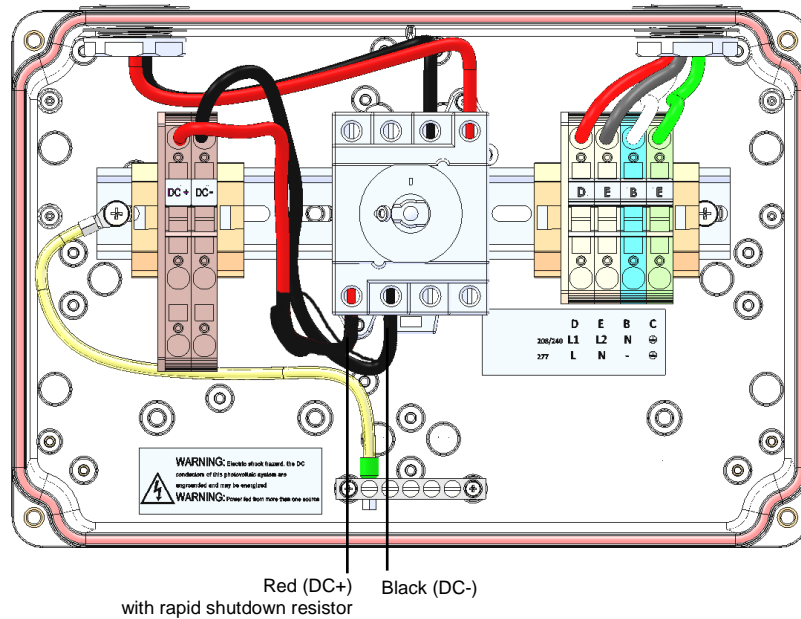

Red (DC+)   Black (DC-)
with rapid shutdown resistor

Figure 2: Three-phase inverter Safety Switch – connecting the Rapid Shutdown cable

■ Three phase inverters SE14.4KUS, SE33.3KUS:

a. Use a standard Phillips screwdriver to release the screws connecting the cables to the E-shaped bracket on the left side of the switch, as illustrated below. *Do not* disconnect the E-shaped bracket from the fuses.

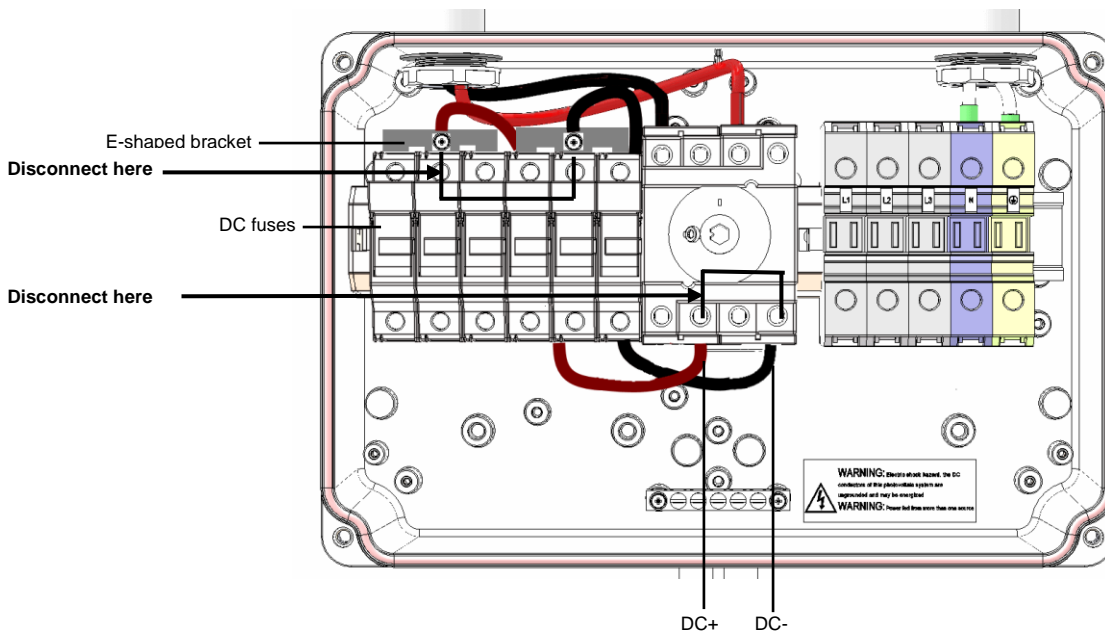b. Disconnect the cables from the bottom of the switch.

DC+   DC-

Figure 3: SE14.4KUS, SE33.3KUS Three-phase inverter Safety Switch

c. The rapid shutdown cables have a resistor connected to one end (on the red cable). Connect these ends to the switch: Connect the red end to the DC+ terminal (the bottom left-most terminal) of the switch, and connect the black end to the DC- terminal of the switch. Apply torque of 2 N*m (18 lb*in).

d. Connect the other ends of the cable to the E-shaped bracket on the DC fuses: red to DC+ (on the left) and black to DC- (on the right).
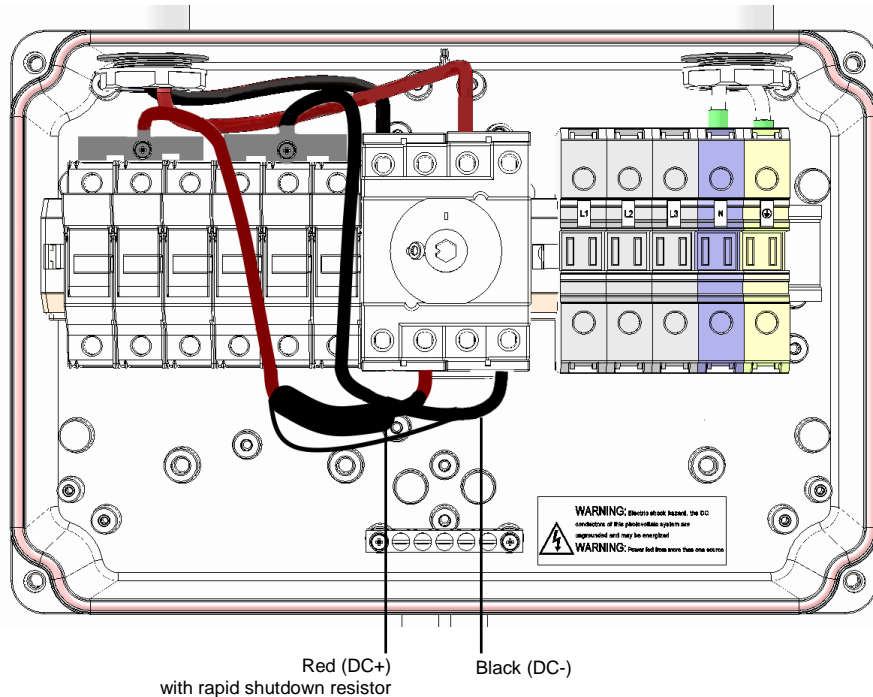
Red (DC+)
with rapid shutdown resistor   Black (DC-)

Figure 4: Rapid shutdown cables connected

5   Check that the cables are located and connected in the correct positions to ensure the rapid shutdown functionality.

6   Close the cover: Attach the switch cover and secure it by tightening the four screws with a torque of 0.9 ft.*lb / 1.2 N*m.

# Inverter Software Compatibility Check and Upgrade

Perform this procedure after activating the inverter [Step 1 in Chapter 5: Commissioning the Installation of the *SolarEdge Installation Guide*], and before pairing (Step 2 in Chapter 5 of the *SolarEdge Installation Guide*).

To use the rapid shutdown feature, the inverter communication board firmware (CPU) must be:

- Version 2.0700 or higher, if the CPU version is 2.0xxx
- Version 3.0700 or higher, if the CPU version is 3.0xxx

► To check the inverter CPU version:

1   Verify that the inverter has been activated using the activation card supplied with the inverter.

2   Press the LCD light button short presses until the screen below is reached.

```
I D :   # # # # # # # #   # #
D S P 1 / 2 : x . x x x x / x . x x x x
C P U   : 0 0 0 2 . 0 7 0 0
C o u n t r y : X X X X X
```
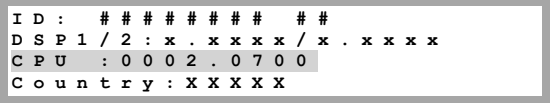
3   Check the CPU version number:

- If the CPU version is 2.0xxx but lower than 2.0700, upgrade the inverter software as described below; otherwise proceed to "Power Optimizer Pairing".
- If the CPU version is 3.0xxx but lower than 3.0700, upgrade the inverter software as described below; otherwise proceed to "Power Optimizer Pairing".

► To upgrade the inverter software:

Use the supplied SD card adapter or the micro-SD card, which can be removed from the adapter, according to the activation card slot on your inverter communication board, labeled ⬇ CARD ⬇.

1   Verity that:

- The inverter ON/OFF switch is OFF
- The Safety Switch is OFF
- The AC breaker connected to the inverter is OFF.

2 Open the inverter cover's six Allen screws and carefully pull the cover horizontally before lowering it, as described in its manual.

3 Insert the card into the card slot on the communication board. If the communication board has an SD card slot, use the supplied SD card adapter. If there is a micro-SD card slot, remove the micro-SD card from the adaptor and insert it.

4 Turn the AC on. If upgrade is required (as described above), it starts automatically.

> ⚠ **WARNING!**
> ELECTRICAL SHOCK HAZARD. Do not touch uninsulated wires when the inverter cover is removed.

5 Wait for the message "Done" to be displayed on the LCD.

6 Verify the correct version as described above.

7 Remove the card from the inverter and keep it for additional kit installations.

8 Close the inverter cover.

Power Optimizer Pairing

Pairing at this stage will reprogram the power optimizers to perform rapid shutdown.

1 Verify that the ON/OFF switch at the bottom of the inverter is OFF.

2 Turn ON the AC breaker and the Safety Switch.

3 Perform Pairing as described in Step 2: Pairing, of Chapter 5: Commissioning of the *SolarEdge Installation Guide*.

Enabling Rapid Shutdown

There is an option in setup mode to enable the functionality of rapid shutdown.

1 Verify that the ON/OFF switch at the bottom of the inverter is ON.

2 Enter Setup mode by pressing and holding the LCD light button.

3 Select Maintenance ➔ Optimizer Conf. ➔ Set Rapid Shutdown.

> **NOTE:**
> Whenever replacing, removing or adding a component in the string, perform Pairing and rapid shutdown setting.

Troubleshooting

If the inverter does not enter production mode and the LCD displays **Night Mode**, the connection order of the rapid shutdown cables may be incorrect. Recheck the cable connections and make sure that the rapid shutdown cables connected to the bottom of the switch are <u>reversed</u> relative to the cables connected at the top of the switch (see Figure 2 and Figure 3).