

## Three Phase Inverters – Design Guidelines (North America)

### Background

The three phase inverters: SE14.4KUS, SE43.2KUS & SE33.3KUS, and three phase inverters with synergy technology: SE66.6KUS & SE100KUS, differ in some of their design guidelines from other SolarEdge inverters. This document details these guidelines, which should be followed in addition to all instructions in the [SolarEdge Installation Guide](#).

### Over-sizing

#### Inverter oversizing

PV inverters are designed so that generated output power will not exceed the maximum AC power. In many cases, oversizing the inverter, i.e. having more DC power than the inverter AC power, may increase power output in lower light conditions, thus allowing the installation of more DC power for a given inverter. DC/AC oversizing is defined as the ratio between the array STC power and the inverter AC power.

The maximum DC/AC oversizing of all SolarEdge inverters, including the three phase inverters with synergy technology, is **135%**. Maintaining this limit ensures the lifetime of the inverter and is needed for keeping the inverter covered by its warranty. However, the maximum oversizing is not necessarily the optimal oversizing. In many cases, you may design with lower sizing to ensure that the inverter does not clip power. SolarEdge recommends performing proper simulations before oversizing the inverter. You may refer to the Site Designer application to estimate the generated energy from the installation and the energy that may be lost due to clipping.

For further details regarding inverter oversizing please refer to the document [Oversizing of SolarEdge Inverters](#).

#### String oversizing

The SE14.4KUS, SE43.2KUS and SE33.3KUS three phase inverters have three pairs of DC inputs and the three phase inverters with synergy technology have three pairs of DC inputs per unit, allowing to connect up to 3 strings per unit without the need for an external combiner box.

In order to reach 135% inverter oversizing without connecting more strings than inputs, these inverters support higher string power subject to a few conditions. The table below summarizes the string power oversizing supported and the conditions required:

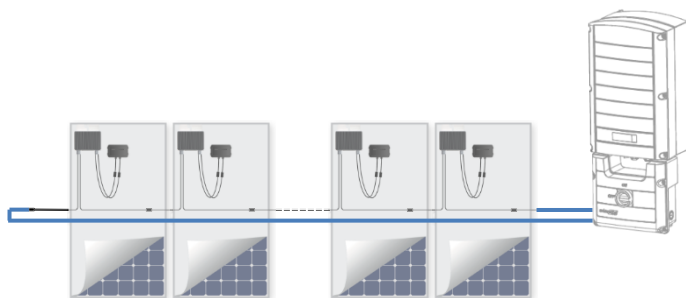
	SE14.4KUS, 43.2KUS	SE33.3KUS, SE66.6KUS, SE100KUS
Number of strings connected per unit	3	3
Maximum power difference between the strings	Up to 1,000W	Up to 2,000W
Power optimizer model	P600/P700/P730	P600/P700/P730
String oversizing	Up to 6,500W per string	Up to 15,000W per string

If the conditions specified above are not met, maximum string power is 6,000W for the SE14.4KUS & 43.2KUS, and 12,750W for the SE33.3KUS, SE66.6KUS & SE100KUS.

When connecting these inverters with P800 power optimizer models, the regular over sizing is higher, therefore there is no extended oversizing.

## Optimizer – Inverter Allowed Distance

The total cable length of the string from the extended power three phase inverter to the farthest power optimizer is 1,150ft (2,300ft from DC+ to DC- of the inverter).



## DC Input

The extended power and commercial three phase inverters are provided with an integrated DC Safety Switch and with terminal blocks for the connection of three strings per unit, eliminating the cost of an external DC combiner box. If an external combiner box is preferred, a field replacement kit for 1 pair of inputs designed to carry the full current may be purchased (part number: DCD-3PH-1TBK). If DC fuses are needed, a field replacement kit for 3 pairs of fuses and holders may be purchased (part number: DCD-3PH-6FHK-S1).