

# Application Note - Three Phase Inverters for 3-Wire Grids (Europe & APAC)

## Version History

- Version 1.6 - July 2021
  - Updated PV system design table

## Introduction

In some countries, the SolarEdge three phase inverters can be connected to 220/230 L-L 3-wire grids (inverter CPU version V3.2171 and above is required).



### NOTE

If the 3-wire ratings need to appear on the inverter certification label, use inverters with Belgian part numbers: SExxK-BExxlxxxx.

Prior to system installation, refer to the Supported Countries application note to confirm compatibility:

[http://www.solaredge.com/sites/default/files/se\\_inverters\\_supported\\_countries.pdf](http://www.solaredge.com/sites/default/files/se_inverters_supported_countries.pdf); installing without confirmation may void the inverter warranty.

SolarEdge three phase inverters<sup>(1)</sup> are equipped with two fuse holders and a fuse; the Three Phase Inverter with synergy technology has two fuse holders and a fuse in each of its units.

The position of the fuse configures the AC grid connection: 4-wire (3 Lines/PE/N) or 3-wire (3 Lines/ PE) grid connection. By default, the fuse is located in the 4-wire fuse holder of the inverter, and in the 3-wire fuse holder there is a plastic dummy fuse.

To set the inverter for 3-wire grid connection, you must move the fuse from the 4-wire fuse holder, marked as Y GRID, to the 3-wire fuse holder, marked as Δ GRID (see *Figure 2*).



### CAUTION!

The only supported 3-wire grids are the 3 Lines / PE. Corner grounding is not supported. Connecting the inverter to other 3-wire grids may damage the inverter and will void the warranty.

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(1)Part numbers: SExxK-Xxxx0xxxx, SExxK-Xxxx8xxxx

## Design Rules

Inverters connected to the delta grid will operate with reduced AC power rating, due to the lower L-L grid voltage; for full specifications refer to the inverter datasheets:

- [SE7K-SE10K](#)
- [SE12.5K-SE17K](#)
- [SE25K-SE33.3K](#)
- [SE50K, SE55K, SE82.8K](#)
- [SE66.6K, SE100K](#)

The following tables details PV system design for 3-wire grids.

PV System Design Using a SolarEdge Inverter <sup>(1)</sup>		SE6K-SE17K		SE17.5K-SE33.3K*	
Compatible Power Optimizers		P370, P500	P404, P405, P485, P505, P601	P370, P500	P404, P405, P485, P505, P601
Minimum String Length	Power Optimizers	10	8	10	8
	PV Modules				
Maximum String Length	Power Optimizers	25			
	PV Modules				
Maximum Continuous Power per String		6,000W			
Maximum Allowed Connected Power per String <sup>(2)</sup> (Permitted only when the difference in connected power between strings is 1000W or less)		7200W			
		2 strings or more - 7800W		3 strings or more - 7800W	
Parallel Strings of Different Lengths or Orientations		Yes			

PV System Design Using a SolarEdge Inverter <sup>(3)(4)(5)</sup>		SE25K (14.5KW), SE30K (17.3KW), SE27.6K*(16KW), SE33.3K* (19.2KW)		SE25K (14.5KW), SE27.6K* (16KW), SE30K (17.3KW), SE33.3K* (19.2KW)	
Compatible Power Optimizers		P605	P650, P701, P730, P801	P605	P800p, P850, P860, P950, P960, P1100
Minimum String Length	Power Optimizers	8			
	PV Modules				
Maximum String Length	Power Optimizers	30			
	PV Modules				
Maximum Continuous Power per String		6,000		7,200	
Maximum Allowed Connected Power per String <sup>(2)</sup> (Permitted only when the difference in connected power between strings is 1000W or less)		7200W		8400W	
		3 strings or more - 7800W		4 strings or more - 7800W	
Parallel Strings of Different Lengths or Orientations		Yes			

\*The same rules apply for Synergy units of equivalent power ratings, that are part of the modular Three Phase Inverter with Synergy Technology.

(1) It is not allowed to mix P404/P485/P505/P601 with P370/P401/P500 in one string

(2) To connect more STC power per string, design your project in the SolarEdge Designer.

(3) P650/P701/P730/P801 can be mixed in one string only with P650/P701/P730/P801/ P605 can't be mixed with any other power optimizer in the same string

(4) For each string, a Power Optimizer may be connected to a single PV module if 1) each Power Optimizer is connected to a single PV module or 2) it is the only Power Optimizer connected to a single PV module in the string

(5) For SE16K and above, the minimum STC DC connected power should be 11KW

## Installation Guidelines

- In a case of an odd number of PV modules in one string it is allowed to install one P650-P1100 Power Optimizer connected to one PV module.
- Power optimizers intended for use with two PV modules each (2:1 connection), can be used with a single PV module (1:1 connection), as long as the entire string uses 1:1 connections.

You can create and/or verify your PV system design using the Designer tool, by selecting the 3-wire grid option in the project info page:

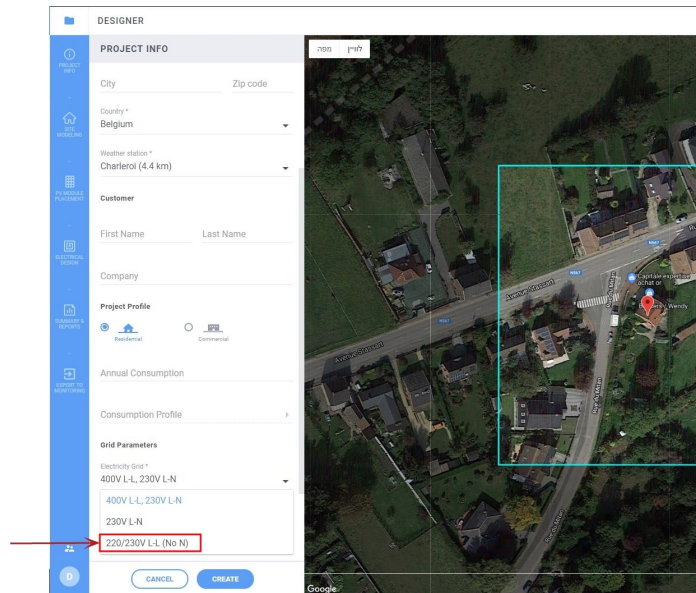


Figure 1: Selecting the 3-wire grid option in the Designer

## Setting the Inverter to Support 3-Wire Grids

→ To set the inverter for 3-wire grid connection:

**NOTE**



This procedure is relevant for the following inverter models:

- 3 phase commercial inverter, part numbers SEXXX-XXXX0/8BXX4

This procedure is *not* relevant for inverters with the following part numbers: SEXXX-XXXXIBXX4

**NOTE**



For 3 phase inverters with Synergy technology, move the fuse in *all* inverter units.

- Remove the inverter cover: Open the inverter cover's six Allen screws and carefully pull the cover horizontally before lowering it.
- Identify the fuse locations and the markings as described in *Figure 2*.

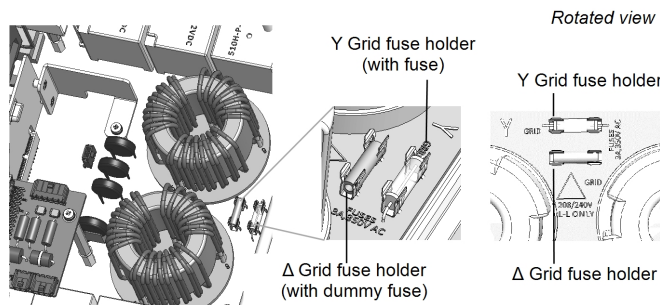


Figure 2: Fuse locations and markings

- Remove the dummy fuse from the 3-wire grid fuse holder and set it aside.
- Move the fuse from the 4-wire grid fuse holder to the 3-wire grid fuse holder.

5. Place the dummy fuse in the 4-wire grid fuse holder.
6. During system setup, set the country to the appropriate 3-wire grid option.

**CAUTION!**

Using the non-3-wire setting may result in incorrect system operation

→ To set country, grid and language:

1. From the **Commissioning** screen select **Country & Grid**.
2. From the **Country & Grid** drop-down list, select the required option and tap **Set Country & Grid**.
3. From the **Language** drop-down list, select your language and tap **Set Language**.

**CAUTION!**

If the fuse was moved to support one of the grid types, do not connect the inverter to the other grid type without switching the fuse back to the correct holder. Connecting the inverter to grids when the fuse is incorrectly located may damage the inverter and void the warranty.