

## Choosing a Generator Compatible with The Enphase Energy Management System

Choosing a generator that is compatible with the Enphase Energy Management System has 2 parts:

1. Understand the minimum generator size needed
2. Select a compatible generator make and model

### Understand the minimum generator size needed

The Enphase Energy Management system limits the usable generator power to a maximum of 11.52kW. This maximum is due to the 60A breaker (48A continuous) and associated power relays supported by the IQ System Controller (previously called the Enpower smart switch) for the generator position. Generator sizes beyond this value will not result in any improvement in terms of charging current or speed.

The minimum generator nameplate rating for pairing with the given number of Encharge units is shown in Table 1. **The minimum generator size must be maintained to ensure a stable microgrid when operating with Encharge and PV. Note that for systems with greater than 10kWh energy storage (i.e., more than 2x Encharge 10 units) the generator nameplate rating required exceeds the usable power (i.e., 11.52kW or 48A at 240V) from the generator. This is to ensure the generator can be safely operated and does not get damaged by inadvertent back-feed from the PV and/or storage.**

The Enphase Installer Toolkit app allows you to connect to the system a lower or higher nameplate rated generator than this value of generator capacity. However as mentioned above using smaller generators than stated herein may compromise microgrid stability and can damage the generator due to inadvertent back-feed.

Table 1: Minimum Generator nameplate rating for a given number of Encharge units

Encharge 3 units	Encharge 10 units	Encharge Energy (kWh)	Encharge Power (kW)	Minimum Generator Nameplate (kW)
1		3.36	1.28	1.83
2		6.72	2.56	3.66
3	(1x Encharge 10)	10.08	3.84	5.49
4		13.44	5.12	7.31
5		16.8	6.4	9.14
6	(2x Encharge 10)	20.16	7.68	10.97
7		23.52	8.96	12.80
8		26.88	10.24	14.63
9	(3x Encharge 10)	30.24	11.52	16.46
10		33.6	12.8	18.29
11		36.96	14.08	20.11
12	(4x Encharge 10)	40.32	15.36	21.94

### Select a Generator Make and Model

Once the size/nameplate of the generator has been identified, an appropriate generator can be selected from the list of generators compatible with the Enphase system.

Different generators have different governor responses to changes in load. Enphase’s storage and solar system also responds to changes in loads. To ensure smooth operation in a microgrid, Enphase has tested various generators and tuned its software to ensure that these responses to changes in loads do not destabilize a microgrid. Generators compatible with the Enphase storage system are listed in Table 2. **Installers must pick generators from the table below to ensure that the generator is compatible with the Enphase storage system.** Enphase requires installers to select a generator make and model during system commissioning using the Enphase Installer Toolkit app. **Only generators that are compatible with Enphase storage systems are available for selection in the Enphase Installer toolkit.**

# Choosing a Generator Compatible with the Enphase Energy Management System - North America

Table 2: List of Generators compatible with Enphase

#	Generator Description	Manufacturer	Model	Rating (Natural Gas/LPG)	Fuel	Start type	Additional hardware needed?
1	Air-cooled / pad mount / standby	Kohler <sup>1</sup>	14RESAL	12kW/14kW	Natural Gas, LPG	2 wire start	No <sup>2</sup>
2	Air-cooled / pad mount / standby	Kohler <sup>1</sup>	12RESV	11kW/12kW	Natural Gas, LPG	2 wire start	No <sup>2</sup>
3	Air-cooled / pad mount / standby	Kohler <sup>1</sup>	14RCA	12kW/14kW	Natural Gas, LPG	2 wire start	No <sup>2</sup>
4	Liquid-cooled/ pad mount/stand by	Kohler <sup>1</sup>	24RCL	21kW/24kW	Natural Gas, LPG	2 wire start	No <sup>2</sup>
5	Air Cooled / Pad mount / Off-Grid rated (Eco Gen) / stand by	Generac	7163	15kW	Natural Gas, LPG	2 wire start	No <sup>2</sup>
6	Air Cooled/ pad mount/stand by	Generac	7171/ 7172	9kW/10kW	Natural Gas, LPG	Utility sense-based start 240 VAC	Yes <sup>3</sup>
7	Air Cooled/ pad mount/stand by	Generac	7176/ 7177/ 7178	16kW/16kW	Natural Gas, LPG	Utility sense-based start 240 VAC	Yes <sup>3</sup>
8	Air Cooled/ pad mount/stand by	Generac	7173/ 7174/ 7175	13kW/13kW	Natural Gas, LPG	Utility sense-based start 240 VAC	Yes <sup>3</sup>
9	Air Cooled/ pad mount/stand by	Generac	7038/ 7039	18kW/20kW	Natural Gas, LPG	Utility sense-based start 240 VAC	Yes <sup>3</sup>
10	Air Cooled/ pad mount/stand by	Generac	7042 / 7043	19.5kW/22kW	Natural Gas, LPG	Utility sense-based start 240 VAC	Yes <sup>3</sup>
11	Air Cooled/ pad mount/stand by	Generac	69981	6kW/7.5kW	Natural Gas, LPG	Utility sense-based start 240 VAC	Yes <sup>3</sup>
12	Air Cooled/ pad mount/stand by	Generac	64371	11kW/11kW	Natural Gas, Propane	Utility sense-based start 240 VAC	Yes <sup>3</sup>
13	Air Cooled/ pad mount/stand by	Generac	7035/ 7036/ 7037	16kW/16kW	Natural Gas, LPG	Utility sense-based start 240 VAC	Yes <sup>3</sup>
14	Air Cooled/ pad mount/stand by	Generac	5505	16kW/17kW	Natural Gas, LPG	Utility sense-based start 240 VAC	Yes <sup>3</sup>
15	Air Cooled/ pad mount/stand by	Generac	7040	20kW/20kW	Natural Gas, LPG	Utility sense-based start 240 VAC	Yes <sup>3</sup>
16	Air Cooled/ pad mount/stand by	Generac	7226	17kW/18kW	Natural Gas, LPG	Utility sense-based start 240 VAC	Yes <sup>3</sup>
17	Air Cooled/ pad mount/stand by	Briggs & Stratton	040590	10.8kW/12kW	Natural Gas, LPG	2 wire start	No <sup>2</sup>
18	Air Cooled/ pad mount/stand by	Briggs & Stratton	40586	18kW/20kW	Natural Gas, LPG	2 wire start	No <sup>2</sup>
19	Air Cooled/ pad mount/stand by	Cummins	C20N6H - A061C601	20kW	Natural Gas, LPG	2 wire start	No <sup>2</sup>

A generator that is not listed above will not be supported by the Enphase system. For a generator not listed above an installer will need to validate whether the generator meets criteria specified in the [Generator Integration with the Enphase Storage System technical brief](#). Once the installer has confirmed that the generator meets the criteria specified, they will need to contact Enphase customer support to request that the generator be checked for compatibility. If the new generator is compatible Enphase personnel will add the new generator to the list of compatible generators in Enphase Installer Toolkit. Only then will the installer be able to select the generator for installation in the Enphase Installer Toolkit.

<sup>1</sup> All Kohler models are compatible.

<sup>2</sup> 2-wire auto start generators require a pair of additional split core current transformers to monitor current on the L1 and L2 conductors running from the generator to the Enpower. Alternatively, if the CT aperture and wire gauges allow, the generator wires can be run through the consumption CTs on the line side of Enpower. This is possible since the consumption CTs do not measure any grid current when the system is off grid and the generator is only connected to the system when off grid.

<sup>3</sup> Utility sense-based generators require additional hardware to work seamlessly with Enphase System. Refer to the [Generator Integration with the Enphase Storage System technical brief](#) for the list of additional hardware. Alternatively, you can buy a remote start kit from Generac ([Part number 7109](#))