Technical Information

Compatibility between common grid configurations and SMA inverters and SMA charging stations

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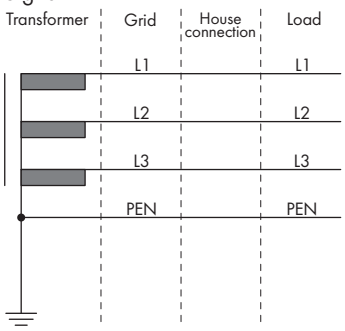
1 Common Grid Configurations

There are various possibilities, or grid configurations, for the setup of a utility grid. The respective grid configurations at the installation site can therefore differ. However, not all SMA products can be connected to all grid configurations.

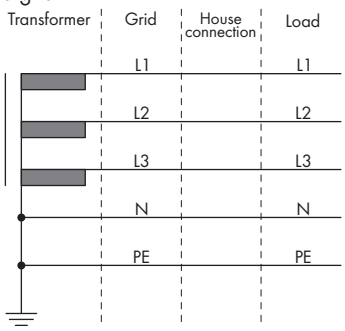
This document gives an overview of the common grid configurations and the compatible SMA products.

In the following you will find an overview of the most common grid configurations.

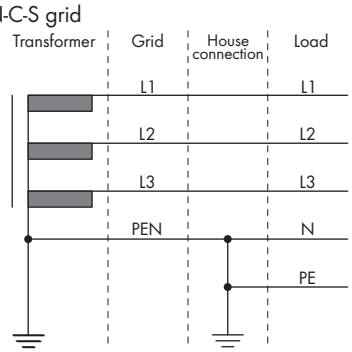
TN-C grid



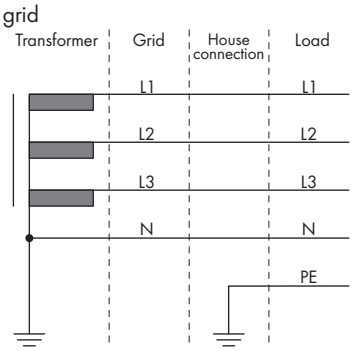
TN-S grid



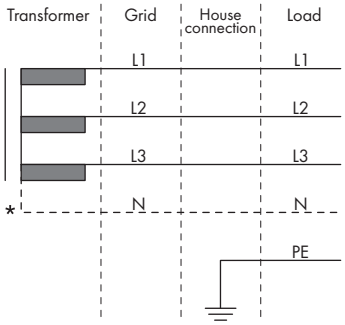
TN-C-S grid



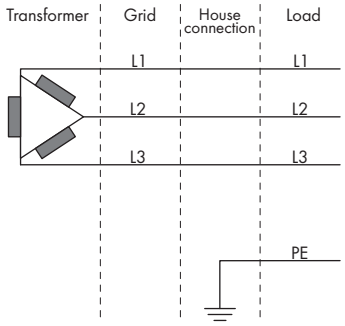
TT grid



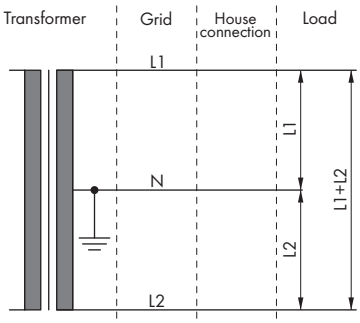
IT grid



Delta IT grid



Split Phase



* There are IT utility grids both with and without a neutral conductor

2 Compatibility Table

Device type	IT	Delta-IT	TN-C	TN-S	TN-C-S	TT	Split phase
Sunny Boy							
SB1.5-1VL-40	Yes[1]	Yes[1]	Yes[2]	Yes[2]	Yes[2]	Yes[2], if U_{N_PE} < 30 V	Yes[1]
SB2.0-1VL-40	Yes[1]	Yes[1]	Yes[2]	Yes[2]	Yes[2]	Yes[2], if U_{N_PE} < 30 V	Yes[1]
SB2.5-1VL-40	Yes[1]	Yes[1]	Yes[2]	Yes[2]	Yes[2]	Yes[2], if U_{N_PE} < 30 V	Yes[1]
SB3.0-1AV-41	Yes[1]	Yes[1]	Yes[2]	Yes[2]	Yes[2]	Yes[2], if U_{N_PE} < 20 V	Yes[1]
SB3.6-1AV-41	Yes[1]	Yes[1]	Yes[2]	Yes[2]	Yes[2]	Yes[2], if U_{N_PE} < 20 V	Yes[1]
SB4.0-1AV-41	Yes[1]	Yes[1]	Yes[2]	Yes[2]	Yes[2]	Yes[2], if U_{N_PE} < 20 V	Yes[1]
SB5.0-1AV-41	Yes[1]	Yes[1]	Yes[2]	Yes[2]	Yes[2]	Yes[2], if U_{N_PE} < 20 V	Yes[1]
SB6.0-1AV-41	Yes[1]	Yes[1]	Yes[2]	Yes[2]	Yes[2]	Yes[2], if U_{N_PE} < 20 V	Yes[1]
Sunny Boy Smart Energy							
SBSE3.6-50	No	Yes	Yes	Yes	Yes	Yes[5]	No
SBSE4.0-50	No	Yes	Yes	Yes	Yes	Yes[5]	No
SBSE5.0-50	No	Yes	Yes	Yes	Yes	Yes[5]	No
SBSE6.0-50	No	Yes	Yes	Yes	Yes	Yes[5]	No
Sunny Boy Storage							
SBS2.5-1VL-10	Yes[1]	Yes[1]	Yes[2]	Yes[2]	Yes[2]	Yes[2], if U_{N_PE} < 30 V	Yes[1]
SBS3.7-10	Yes[1.3]	Yes[1.3]	Yes[2]	Yes[2]	Yes[2]	Yes[2], if U_{N_PE} < 20 V	Yes[1]
SBS5.0-10	Yes[1.3]	Yes[1.3]	Yes[2]	Yes[2]	Yes[2]	Yes[2], if U_{N_PE} < 20 V	Yes[1]
SBS6.0-10	Yes[1.3]	Yes[1.3]	Yes[2]	Yes[2]	Yes[2]	Yes[2], if U_{N_PE} < 20 V	Yes[1]
Sunny Tripower							
STP3.0-3AV-40	No	Yes[1.3]	Yes	Yes	Yes	Yes, if U_{N_PE} < 20 V	No

Device type	IT	Delta-IT	TN-C	TN-S	TN-C-S	TT	Split phase
STP4.0-3AV-40	No	Yes[1.3]	Yes	Yes	Yes	Yes, if U_{N_PE} < 20 V	No
STP5.0-3AV-40	No	Yes[1.3]	Yes	Yes	Yes	Yes, if U_{N_PE} < 20 V	No
STP6.0-3AV-40	No	Yes[1.3]	Yes	Yes	Yes	Yes, if U_{N_PE} < 20 V	No
STP8.0-3AV-40	No	Yes[1.3]	Yes	Yes	Yes	Yes, if U_{N_PE} < 20 V	No
STP10.0-3AV-40	No	Yes[1.3]	Yes	Yes	Yes	Yes, if U_{N_PE} < 20 V	No
STP 12-50	No	No	Yes	Yes	Yes	Yes	No
STP 15-50	No	No	Yes	Yes	Yes	Yes	No
STP 20-50	No	No	Yes	Yes	Yes	Yes	No
STP 25-50	No	No	Yes	Yes	Yes	Yes	No
STP 50-41	No	No	Yes	Yes	Yes	Yes	No
STP 110-60	No	No	Yes	Yes	Yes	Yes	No
STP 125-70	No	No	Yes	Yes	Yes	Yes, if U_{N_PE} < 20 V	No
Sunny Tripower Smart Energy							
STP5.0-3SE-40	No	No	Yes	Yes	Yes	Yes, if U_{N_PE} < 20 V	No
STP6.0-3SE-40	No	No	Yes	Yes	Yes	Yes, if U_{N_PE} < 20 V	No
STP8.0-3SE-40	No	No	Yes	Yes	Yes	Yes, if U_{N_PE} < 20 V	No
STP10.0-3SE-40	No	No	Yes	Yes	Yes	Yes, if U_{N_PE} < 20 V	No
Sunny Tripower Storage							
STPS30-20	No	No	Yes	Yes	Yes	Yes	No
STPS50-20	No	No	Yes	Yes	Yes	Yes	No
Sunny Island							
SI30-20	No	No	Yes	Yes	Yes	Yes	No
SI50-20	No	No	Yes	Yes	Yes	Yes	No
Sunny Highpower							
SHP 100-21	Yes	Yes	Yes	Yes	Yes	Yes	No

Device type	IT	Delta-IT	TN-C	TN-S	TN-C-S	TT	Split phase
SHP 150-21	No	No	Yes	Yes	Yes	Yes	No
SHP 172-21	No	No	Yes	Yes	Yes	Yes	No
SHP 180-21	No	No	Yes	Yes	Yes	Yes	No
SMA EV Charger							
EVC7.4-1AC-10	Yes	Yes	Yes	Yes	Yes	Yes[4], if U_{N_PE} < 10 V	No
EVC22-3AC-10	Yes	Yes	Yes	Yes	Yes	Yes[4], if U_{N_PE} < 10 V	No
SMA eCharger							
EVC22-3AC-20	Yes	Yes	Yes	Yes	Yes	Yes[4], if U_{N_PE} < 10 V	No

[1] The protective conductor monitor must be deactivated when the inverter is connected to an IT grid. In this case, it may be necessary to connect a second protective conductor due to local installation regulations.

[2]Regardless of the grid type, the protective conductor monitor can be deactivated (after consultation with the local grid operator) to prevent faulty triggering, e.g., due to grid problems. In this case, it may be necessary to connect a second protective conductor due to local installation regulations.

[3] These inverters have a relatively high leakage current to ground. The present leakage current may be detected as a residual current by an insulation monitoring unit usually installed in IT / delta IT grids. This might trigger an error message. An uninterrupted operation is thus not possible. Some battery-backup systems with automatic transfer switch create a TN grid when switching to battery-backup operation. Check whether the switch to the TN grid meets local installation and safety requirements (e.g., regarding the automatic transfer switch with article number 10012xxx_Vxx from the Company enwitec electronic GmbH & Co.KG).

[4] If the ground resistance is > 100 ohms, a transformer must be installed upstream of the charging station.

[5] It must be ensured that the local grounding has a sufficiently low-impedance connection to the grounding of the transformer, otherwise operational leakage currents can lead to potential differences. For error-free operation, the ground potential at the neutral point of the transformer must be the same as that of the grounding conductor connection on the inverter. SMA Solar Technology AG recommends a bridge between N and grounding conductor at the point of interconnection to ensure error-free operation. Improper implementation of the transformer/grid connection with regard to low-impedance grounding/zeroing of the neutral point can lead to a device defect that is not covered by the warranty.

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