



Manufacturer's Declaration

Decoupling Protection According to VDE-AR-N 4110

The internal decoupling protection function of the inverter is independent of open-loop and closed-loop control functions (particularly of the FRT control/configuration).

Table 1 shows the AC voltage and frequency ranges in which the inverters can be permanently operated.

Type of Power-Generating Unit	AC Voltage Range	Frequency Range
SHP 180-21	552 V – 793 V (L-L)	44 Hz – 65 Hz
SHP 172-21	528 V – 759 V (L-L)	44 Hz – 65 Hz
SHP 150-21	480 V – 690 V (L-L)	44 Hz – 65 Hz
SHP 100-21	177 V – 477 V (L-L)	44 Hz – 65 Hz
STP 110-60	320 V – 472 V (L-L)	44 Hz – 65 Hz
STP 125-70	320 V – 480 V (L-L)	45 Hz – 65 Hz
SHP 75-10, STP 60-10, STPS 60-10	324 V – 530 V (L-L)	44 Hz – 65 Hz
STP 50-40, STP 50-41	195.5 V – 305 V (L-N)	44 Hz – 65 Hz
STP 50-80, STP 60-80	180 V – 305 V (L-N)	45 Hz – 65 Hz
STP 25-50, STP 20-50, STP 15-50, STP 12-50	176 V – 275 V (L-N)	44 Hz – 56 Hz
STPS 50-20, STPS 30-20	340 V – 477 V (L-L)	44 Hz – 66 Hz
SI50-20, SI30-20	187 V – 528 V (L-L)	44 Hz – 66 Hz

Table 1: AC voltage and frequency range for quasi-steady-state operation for various power-generating units.

With the corresponding configuration of the respective disconnection times, the inverter can be disconnected with a delay in order to prevent the dynamic grid support from being disturbed. The defined voltage and frequency range matches the settings for the decoupling protection. Voltages and/or frequencies outside of this range persisting longer than the defined disconnection time results in grid disconnection (self-protection).

The decoupling protection unit and the integrated interface switches of the inverter are supplied with voltage on the DC side. A grid voltage failure does not, therefore, impact their functionality. The following requirements are complied with: the protective device being supplied with auxiliary power which is not purchased from the grid (protective functions are available for at least 5 seconds which is the duration of a grid failure) and the switch being tripped immediately in case the protective device is not supplied with auxiliary power.

The inverters feature fail-safe decoupling protection which has been tested as part of certification to IEC 62109, but which does not feature interfaces for testing the protection function. This internal protection is accepted by some grid operators as a decoupling protection unit for the power-generating unit. This is to be agreed upon with the grid operator and documented.



However, if a protection test is required for the decoupling protection at the power-generating units (inverters), one would have to consider that such tests are very work-intensive for PV systems with many decentralized power-generating units (with the need to check the protection in each individual unit). In this case, it is strongly recommended to install interface protection with an external interface switch assigned to it as a separate unit. The technical design or alternative solution concepts for achieving the interface protection with interfaces for protection function tests are to be agreed upon with the grid operator and set out in writing.

Niestetal, 2026-03-24

SMA Solar Technology AG

A handwritten signature in blue ink, reading "i.V. Sven Bremicker". The signature is fluid and cursive, with the initials "i.V." clearly visible at the beginning.

i. V. Sven Bremicker

Chief Engineer – Home & Business Solutions