

White Paper BU-LS-001: Sunny Central UP

Sound Power Measurements on Sunny Central UP (-US) central inverters

Performed by:

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Summing up of the Situation

Measurements were taken for one central inverter of the model SC 4600 UP. The sound power measurements were performed in accordance with the DIN EN ISO 9614-2:12/1996 standard, "Determination of sound power levels of noise sources using sound intensity".

The measurements were taken under nominal operating conditions for the inverters, with all inverter fans operating at maximum speed.

Inspection Reference According to EN ISO 3744:2011-02

EN ISO 3744 is used as the basis for determining the noise emissions of the unit under test according to EN ISO 12001:05-2007.

As part of the acoustics, it includes the determination of the sound level of noise sources using the enveloping surface method of accuracy class 2 for essentially free field conditions over a reflective plane. Measurements must be carried out in compliance with IEC 551 and DIN EN 45645-1 according to DIN EN ISO 3744. To position the measurement instruments, the enclosure of the unit under test is considered a main radiation area.

Inspection Reference According to EN ISO 9614-2:2010-11

The sound level is determined according to DIN EN ISO 9614-2 "Determination of sound power levels of noise sources using sound intensity", Part 2: "Measurement by scanning".

This measurement procedure keeps interference on the measurement result caused by noises from the environment to a minimum.

Type of Test / Thresholds and Requirements:

Type of Test / Thresholds and Requirements:	Sound level measurement according to DIN EN ISO 3744:2011-02 and DIN EN ISO 9614-2:2010-11 of sinusoidal, irregularly shaped, transient signals. Classification of ambient conditions in compliance with the German Noise Control Guidelines (TA Lärm). (according to Section 2)
Result:	The requirements were fulfilled.

Result of Measurements

The following rating levels can be determined from the sound power measurements performed:

Inverter type	Sound power level mean value L_{WA}
3 stack devices	
SC 4000 UP(-US), SC 4200 UP(-US) SC 4400 UP(-US), SC 4600 UP(-US) SCS 3450 UP(-US), SCS 3600 UP(-US) SCS 3800 UP(-US), SCS 3950 UP(-US) SCS 3450 UP-XT(-US), SCS 3600 UP-XT(-US) SCS 3800 UP-XT(-US), SCS 3950 UP-XT(-US)	92.97
2 stack devices	
SC 2660 UP(-US), SC 2800 UP(-US) SC 2930 UP(-US), SC 3060 UP(-US) SCS 2300 UP-XT(-US), SCS 2400 UP-XT(-US) SCS 2530 UP-XT(-US), SCS 2630 UP-XT(-US)	90.78

The following tables show the selected distances from the inverter and their corresponding sound pressure levels L_{pA} in dB(A) at nominal AC power.

Distance	3 stack devices	2 stack devices
1 m	81	78
10 m	65	63
20 m	59	57
30 m	55	53
40 m	53	51
50 m	51	49
60 m	49	47
70 m	48	46
80 m	47	45
90 m	46	44
100 m	45	43

Information:

The detailed test report may be requested from SMA Solar Technology AG if necessary.

All values are based on the following reports

910:LE4520

911:LE5020

912:LE3721