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science & technology

Straight on a path to success

The Goodwe GW4000-SS is an unadorned 4 kW inverter from China, which has passed the PHOTON test with a more than respectable result: its efficiency is as impressive as its operation is convenient

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Goodwe GW4000-SS

A

97.1% for high irradiation 12/2012

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96.9% for medium irradiation 12/2012

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Highlights

- The Goodwe GW4000-SS is a transformerless, single-phase inverter with a nominal AC power of 4 kW and DC power of 4.15 kW
- The device operates without a fan, with a housing featuring protection type IP 65 and a very wide temperature range; it can be installed at practically any location the user likes, and the display and communication options are good
- The efficiency develops consistently and at a very high level; its power dependency is quite low, and the MPP voltage has even less of an impact on it

Goodwe Power Supply Technology Co. Ltd., based in the Chinese city of Suzhou in the province of Jiangsu, has only been active as an inverter manufacturer since 2010. Until now, none of its products had been tested by PHOTON.

However, if the company will be able to stick to its bold plans to compete with the big inverter players, PHOTON Lab will likely test more Goodwe devices in the future. As a start, PHOTON Lab has tested the GW4000-SS, which boasted an impressive performance.

The inverter operates without a transformer and feeds into the grid on a single phase. With its 4 kW DC power, it is suitable for PV systems with approximately the same generator output (given an optimal alignment of the modules). The device has a very clearly laid out design, which should make it easy to manufacture. Its display, which is convenient to read for the operator, provides much system information. Moreover, it displays inverter output power very precisely. The inverter comes with a good range of communication interfaces – two RS 485 and one USB; Wi-Fi and Bluetooth are optional.

The housing complies with protection type IP 65. The device features a very broad temperature range, which can also be fully utilized, as the reduction in power – which according to specs, occurs at ambient temperatures of 45° C or more – did not materialize at all during testing. Even

conversion efficiency only fell by 0.3 percentage points. The GW4000-SS can be installed both indoors and outdoors in warm locations. Because its cooling system does not feature a fan, it is also relatively impervious to dust.

Dimensioning, in contrast, requires somewhat more precision. The MPP voltage range specified by the manufacturer does not have a sufficient distance to the maximum DC voltage, so the inverter cannot be fully utilized with crystalline and thin-film modules. In any case, the latter cannot be combined with this device anyway due to its transformerless design. The efficiency curve only exhibits a very low dependency on the MPP voltage, and reaches a peak value of 97.8 percent. Because the efficiency declines very little over virtually the entire operating range, the GW4000-SS has attained a PHOTON efficiency of 96.9 percent for medium irradiation and 97.1 percent for high irradiation. This translates into two »A« grades and lands the company a place among the top 10 inverters tested so far in the power class of up to 5 kW (see table, p. 65). ● hn, js

Further information

The full test results are exclusively available to subscribers in an extended PDF version (see appendix, p. 158), which can be downloaded at www.photon.info.