
DNS G4 and MS G4, the Best Have Just Become Better



Three years after GoodWe launched its remarkable residential on-grid inverter DNS G3 and MS G3, we have upgraded the already-successful series even further to make them more suitable for the emerging market and customer needs. With the fourth generation of DNS and MS series, GoodWe intends to set another standard for this segment.

As their names imply, D (dual MPPT) N (new) S (single phase) G4 comes with 2 MPPTs that cover the power range from 3kW to 6kW, and M (multiple MPPT) S (single phase) G4 with 3MPPTs covering from 7.5kW to 10kW.

The residential on-grid product series are where GoodWe started its journey, with its very first commercial inverter product SS-5500 (which is a single phase, single MPPT on-grid inverter) in 2010. After 15 years, although GoodWe has exponentially expanded its product category to storage inverter, battery, BIPV, IOT, heat pump etc., we have not forgotten where we came from. And since the transformation of renewable energy is still a long way to go and billions of residential rooftops are still available there for solar installation, we shall never underestimate the role that the seemingly small inverters play in the whole course.

Small doesn't mean static. Since the market and customer needs are dynamic, we must continuously review the performance and design of our products to ensure they can meet the latest demands. This article is intended to introduce to you the improvements and new features of DNS G4 and MS G4, and why these matter to our customers.

01. User Friendly Design



Smaller and lighter

The first thing one will notice when shown to these two new products is the size and weight. This has always been a point that inverter manufacturers focus on when developing a new product. One can easily imagine how this will affect the installation and operation of inverters ---- being small means less space which matters a lot for a residential application scenario, and being light means easier installation and maintenance.

Compared with the G3 series, the DNS G4 and MS G4 series have reduced weight by 28% and 16% to 9.2kg and 16kg respectively. Not only do they beat the last generation vastly, but also with this weight these two series can hardly find any competitors in the market.

Compared with the G3 series

DNS G4 reduced weight
-28% ↓ 9.2kg

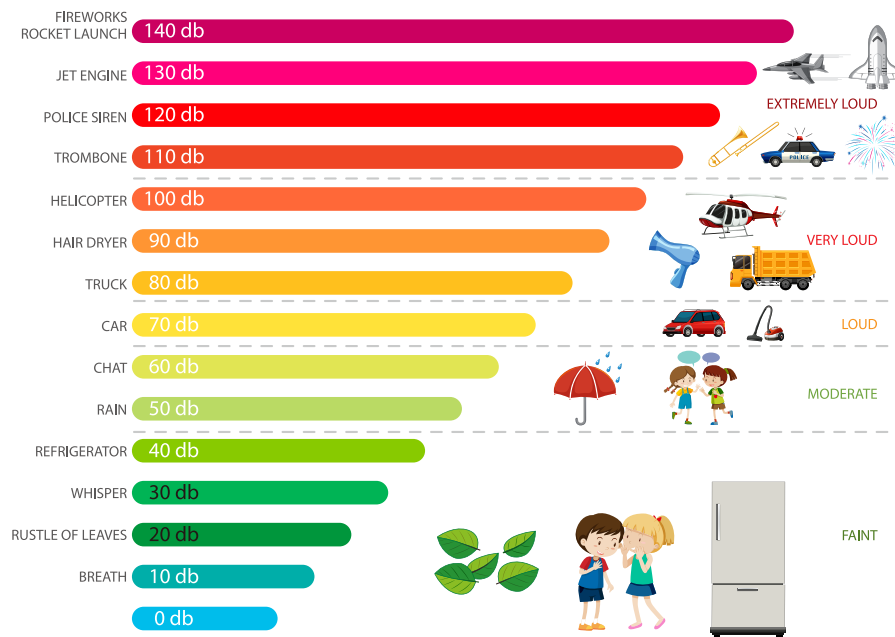
Compared with the G3 series

MS G4 reduced weight
-16% ↓ 16kg



Quieter

Another easy-to-feel feature of DNS G4 and MS G4 is their noise level. Thanks to the new structural design and components selection, the noise level for DNS G4 and MS G4 are 25dB and 30dB respectively. What does this mean? Well, take a look at the below figure.



Imagine the sound of rustling leaves and whispering on your ear, that's how loud (or shall I say how quiet) the DNS G4 and MS G4 sound when operating at its nominal power. One can hardly consider this as disturbing.



02. Wide Compatibility



High PV over-sizing ratio

When speaking about inverter's performance, over-sizing has always been a topic on table. This means how much PV power you can install over the nominal power of inverter. For example, a 10kW inverter connected to 12kW PV modules results in a 1.2 over-sizing ratio. Because PV module is not always operating at its nominal power, having a low over-sizing ratio often means waste of inverter capability. To minimize this waste and the initial capital investment of a power plant, installers especially in cost-sensitive markets such as India and Brazil are often looking for as high as possible over-sizing ratio inverters.

When we look at the Maximum Input Power of DNS G4 and MS G4, we'll find that the two series have pushed the ratio to almost the upper limit, which is 2*.

Maximum Input Power of DNS G4*

Model	GW3K-DNS-G40	GW3.6K-DNS-G40	GW4.2K-DNS-G40	GW5K-DNS-G40	GW6K-DNS-G40
Maximum Input Power (kW)	6	7.2	8.4	10	12

Maximum Input Power of MS G4*

Model	GW7.5K-MS-G40	GW8.5K-MS-G40	GW10K-MS-G40
Maximum Input Power (kW)	15	17	20

**The actual value depends on the specific input power of PV panel*



Compatible with mainstream PV modules

From M6 (166mm) to M10 (182mm) to G12 (210mm), PV modules have shown the trend of increasing cell size. Along with this comes the increase of Maximum Power Current (Imp). Taking a typical 210mm PV module for example, the Imp under standard condition can reach 17.4A, under BNPI condition plus backside power gain the Imp can reach 19.3 A.

ELECTRICAL DATA (STC & NOCT & BNPI)																		
Testing Condition	STC	NOCT	BNPI	STC	NOCT	BNPI	STC	NOCT	BNPI	STC	NOCT	BNPI	STC	NOCT	BNPI	STC	NOCT	BNPI
Peak Power Watts- $P_{MAX}(W_p)^*$	695	531	770	700	534	776	705	540	781	710	543	787	715	547	792	720	551	798
Power Selection (W)**	0 ~ +5																	
Maximum Power Voltage- V_{MPP} (V)	40.3	37.9	40.3	40.5	38.0	40.5	40.7	38.3	40.7	40.9	38.5	40.9	41.1	38.7	41.1	41.3	38.8	41.3
Maximum Power Current- I_{MPP} (A)	17.25	14.00	19.11	17.29	14.04	19.15	17.33	14.08	19.19	17.36	14.12	19.23	17.40	14.14	19.28	17.44	14.19	19.32
Open Circuit Voltage- V_{oc} (V)	48.3	45.9	48.3	48.6	46.1	48.6	48.8	46.3	48.8	49.0	46.5	49.0	49.2	46.7	49.2	49.4	46.9	49.4
Short Circuit Current- I_{sc} (A)	18.28	14.72	20.25	18.32	14.76	20.30	18.36	14.80	20.34	18.40	14.83	20.39	18.44	14.86	20.43	18.49	14.90	20.49
Module Efficiency η_m (%)	22.4			22.5			22.7			22.9			23.0			23.2		
STC: Irradiance 1000W/m ² , Cell Temperature 25°C, Air Mass AM1.5. NOCT: Irradiance at 800W/m ² , Ambient Temperature 20°C, Wind Speed 1m/s. BNPI: Irradiance: front 1000W/m ² , rear 135W/m ² , Temperature 25°C, Air Mass AM1.5 *Measuring tolerance: ± 3%. **Power selection up to: ± 3%.																		

Electrical characteristics with different power bin (reference to 5% & 10% backside power gain)												
Backside Power Gain	5%	10%	5%	10%	5%	10%	5%	10%	5%	10%	5%	10%
Peak Power Watts- $P_{MAX}(W_p)^*$	730	765	735	770	740	776	746	781	751	787	756	792
Maximum Power Voltage- V_{MPP} (V)	40.3	40.3	40.5	40.5	40.7	40.7	40.9	40.9	41.1	41.1	41.3	41.3
Maximum Power Current- I_{MPP} (A)	18.11	18.98	18.15	19.02	18.20	19.06	18.23	19.10	18.27	19.14	18.31	19.18
Open Circuit Voltage- V_{oc} (V)	48.3	48.3	48.6	48.6	48.8	48.8	49.0	49.0	49.2	49.2	49.4	49.4
Short Circuit Current- I_{sc} (A)	19.19	20.11	19.24	20.15	19.28	20.20	19.32	20.24	19.36	20.28	19.41	20.34

Power Bifaciality: 80±5%.

Datasheet of a 210mm PV module

There is no doubt that the G3 series with the Maximum Input Current of 16A is no longer able to accommodate the new large modules. However, with a Maximum Input Current of 20A, the DNS G4 and MS G4 series have no limits in terms of which modules to be compatible with.

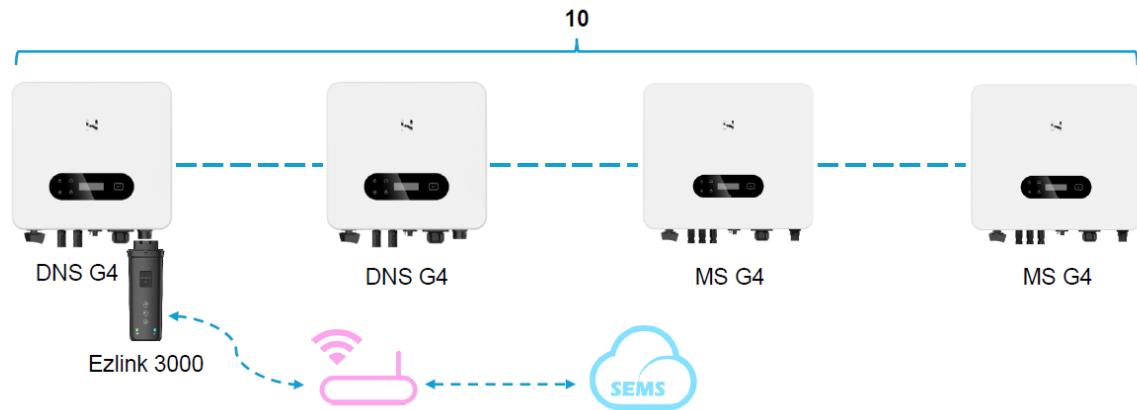
03. Flexible Parallel



Parallel connection with Ezlink

In the past, parallel connection was only possible for three phase inverters as parallel connection is usually only required in large solar systems. But imagine this case: you have installed one single phase inverter, after half a year you decide to expand your solar system and the existing one cannot accommodate more PV modules so you have to replace with a larger one. Wouldn't it be more attractive if I tell you that you can just add one same inverter to the existing system now, like building LEGO? And what if I tell you that to achieve this you only need to replace the old communication dongle with a special dongle called Ezlink?

As it's name implies, Ezlink is intended to make the link between inverters more easily. Compared with the traditional datalogger parallel method, parallel solution with Ezlink does not need complex wiring, configuration and special place for datalogger. It's meant to be used for small parallel scenarios with no more than 10 inverters. As a result, the cost of parallel connection with Ezlink is lower than the traditional datalogger as well.



In an Ezlink parallel system, the Ezlink is plugged into one of the inverters which connects with other inverters in a hand-in-hand manner. The Ezlink acts as the controller of the system and interacts with Goodwe's cloud via WiFi or LAN, just like the ordinary communication dongle.

The more exciting news is, DNS G4 and MS G4 can be mix paralleled in one system, which enables more flexibility in installation.

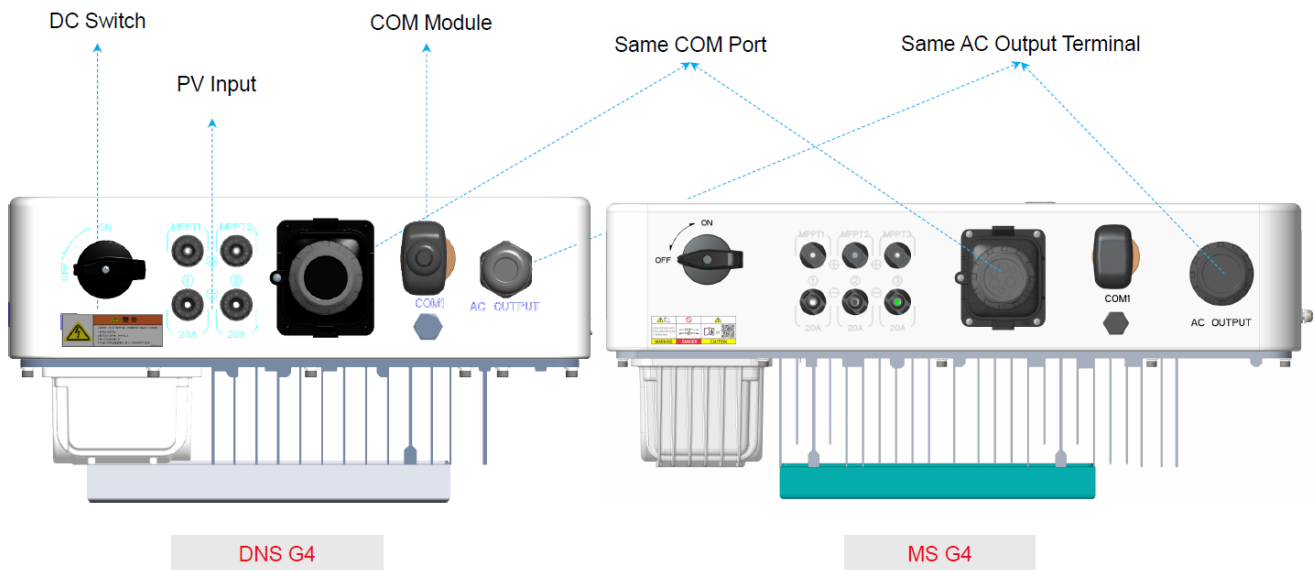
04. Streamlined Design

One of the things GoodWe has strived to achieve is the streamlined design, as this will not only reduce the complexity of installation but also help shape Goodwe's style. This concept becomes especially obvious for DNS G4 and MS G4.



In fact, if they are not put together, one can hardly tell which one is which.

The streamlined design does not only happen with the outside appearance, but also with the structural design. For example, DNS G4 and MS G4 share the same layout of terminals and connectors, even the pin holes of the communication board. This means one can automatically know how to install MS G4 when he knows how to install DNS G4, vice versa.



05. Summary

The DNS G4 and MS G4 is a break-through of Goodwe's already mature residential on-grid inverter portfolio, their market-leading performance and innovative design reflect Goodwe's continuous effort in R&D and close attention to market and customer's needs. With these two new series now available in the marketplace, Goodwe is ready to make more value for its customers and contribute to the decarbonization of our energy system.