

# GOODWE

## ES Series (14A)

3.6-5kW | Single Phase | Hybrid Inverter (LV)

The GoodWe ES series of bi-directional energy storage inverters can be used for both on-grid and off-grid PV systems, with the ability to control the flow of energy intelligently. During the day, the PV array generates electricity which can be provided either to the loads, fed into the grid, or charge the battery, depending on the economics and set-up. The electricity stored can be released when the loads require it during the night, including inductive loads such as air conditioners or refrigerators. Additionally, the power grid can also charge storage devices via the inverter. An all-round intelligent system for maximum energy flexibility.



Charge controller and inverter integrated



Maximum charge and discharge up to 100A



Export control (Zero export)



IP65 dustproof and waterproof



10ms UPS-level Switching



Fanless design, long lifespan

| Technical Data                                                  |                                                 | GW3648D-ES <sup>7</sup><br>GW3648C-ES <sup>7</sup> | GW5048D-ES <sup>8</sup><br>GW5048C-ES <sup>8</sup> |
|-----------------------------------------------------------------|-------------------------------------------------|----------------------------------------------------|----------------------------------------------------|
| Battery Input Data                                              |                                                 |                                                    |                                                    |
| Battery Type <sup>1</sup>                                       |                                                 | Li-Ion                                             |                                                    |
| Nominal Battery Voltage (V)                                     |                                                 | 48                                                 |                                                    |
| Battery Voltage Range (V)                                       |                                                 | 40 ~ 60                                            |                                                    |
| Start-up Voltage (V)                                            |                                                 | 40                                                 |                                                    |
| Number of Battery Input                                         |                                                 | 1                                                  |                                                    |
| Max. Continuous Charging Current (A) <sup>1</sup>               | 75                                              |                                                    | 100                                                |
| Max. Continuous Discharging Current (A) <sup>1</sup>            | 75                                              |                                                    | 100                                                |
| Max. Charging Power (W)                                         | 3600                                            |                                                    | 4600                                               |
| Max. Discharging Power (W)                                      | 3600                                            |                                                    | 4600                                               |
| PV String Input Data                                            |                                                 |                                                    |                                                    |
| Max. Input Power (W)                                            | 4600                                            |                                                    | 6500                                               |
| Max. Input Voltage (V)                                          |                                                 | 580                                                |                                                    |
| MPPT Operating Voltage Range (V) <sup>**</sup>                  |                                                 | 125 ~ 550                                          |                                                    |
| Start-up Voltage (V)                                            |                                                 | 125                                                |                                                    |
| Nominal Input Voltage (V)                                       |                                                 | 360                                                |                                                    |
| Max. Input Current per MPPT (A)                                 |                                                 | 14                                                 |                                                    |
| Max. Short Circuit Current per MPPT (A) <sup>9</sup>            |                                                 | 17.5                                               |                                                    |
| Number of MPP Trackers                                          |                                                 | 2                                                  |                                                    |
| Number of Strings per MPPT                                      |                                                 | 1                                                  |                                                    |
| AC Output Data (On-grid)                                        |                                                 |                                                    |                                                    |
| Nominal Output Power (W)                                        | 3680                                            |                                                    | 5000                                               |
| Nominal Apparent Power Output to Utility Grid (VA) <sup>5</sup> | 3680                                            |                                                    | 5000                                               |
| Max. Apparent Power Output to Utility Grid (VA) <sup>2</sup>    | 3680                                            |                                                    | 5000                                               |
| Max. Apparent Power from Utility Grid (VA)                      | 7360                                            |                                                    | 9200                                               |
| Nominal Output Voltage (V)                                      |                                                 | 230                                                |                                                    |
| Output Voltage Range (V)                                        |                                                 | 0 ~ 300                                            |                                                    |
| Nominal AC Grid Frequency (Hz)                                  |                                                 | 50 / 60                                            |                                                    |
| AC Grid Frequency Range (Hz)                                    |                                                 | 45 ~ 65                                            |                                                    |
| Max. AC Current Output to Utility Grid (A)                      | 16.0 <sup>6</sup>                               |                                                    | 24.5                                               |
| Max. AC Current From Utility Grid (A)                           | 32                                              |                                                    | 40                                                 |
| Power Factor                                                    | ~1 (Adjustable from 0.8 leading to 0.8 lagging) |                                                    |                                                    |
| Max. Total Harmonic Distortion                                  |                                                 | <3%                                                |                                                    |
| AC Output Data (Back-up)                                        |                                                 |                                                    |                                                    |
| Back-up Nominal Apparent Power (VA)                             | 3680                                            |                                                    | 4600                                               |
| Max. Output Apparent Power without Grid (VA) <sup>3</sup>       | 3680 (5520@10sec)                               |                                                    | 4600 (6900@10sec)                                  |
| Max. Output Apparent Power with Grid (VA)                       | 3680                                            |                                                    | 4600                                               |
| Max. Output Current (A)                                         | 16                                              |                                                    | 20                                                 |
| Nominal Output Voltage (V)                                      |                                                 | 230 (±0.2%)                                        |                                                    |
| Nominal Output Frequency (Hz)                                   |                                                 | 50 / 60 (±0.2%)                                    |                                                    |
| Output THDv (@Linear Load)                                      |                                                 | <3%                                                |                                                    |
| Efficiency                                                      |                                                 |                                                    |                                                    |
| Max. Efficiency                                                 |                                                 | 97.6%                                              |                                                    |
| European Efficiency                                             |                                                 | 97.0%                                              |                                                    |
| Max. Battery to AC Efficiency                                   |                                                 | 94.0%                                              |                                                    |
| MPPT Efficiency                                                 |                                                 | 99.9%                                              |                                                    |
| Protection                                                      |                                                 |                                                    |                                                    |
| PV Insulation Resistance Detection                              |                                                 | Integrated                                         |                                                    |
| Residual Current Monitoring                                     |                                                 | Integrated                                         |                                                    |
| PV Reverse Polarity Protection                                  |                                                 | Integrated                                         |                                                    |
| Anti-islanding Protection                                       |                                                 | Integrated                                         |                                                    |
| AC Overcurrent Protection                                       |                                                 | Integrated                                         |                                                    |
| AC Short Circuit Protection                                     |                                                 | Integrated                                         |                                                    |
| AC Overvoltage Protection                                       |                                                 | Integrated                                         |                                                    |
| General Data                                                    |                                                 |                                                    |                                                    |
| Operating Temperature Range (°C)                                |                                                 | -25 ~ +60                                          |                                                    |
| Relative Humidity                                               |                                                 | 0 ~ 95%                                            |                                                    |
| Max. Operating Altitude (m)                                     |                                                 | 3000                                               |                                                    |
| Cooling Method                                                  |                                                 | Natural Convection                                 |                                                    |
| User Interface                                                  |                                                 | LED, APP                                           |                                                    |
| Communication with BMS <sup>4</sup>                             |                                                 | RS485, CAN                                         |                                                    |
| Communication with Meter                                        |                                                 | RS485                                              |                                                    |
| Communication with Portal                                       |                                                 | WiFi                                               |                                                    |
| Weight (kg)                                                     | 28                                              |                                                    | 30                                                 |
| Dimension (W x H x D mm)                                        |                                                 | 516 x 440 x 184                                    |                                                    |
| Noise Emission (dB)                                             |                                                 | <25                                                |                                                    |
| Topology                                                        |                                                 | Non-isolated                                       |                                                    |
| Self-consumption at Night (W)                                   |                                                 | <13                                                |                                                    |
| Ingress Protection Rating                                       |                                                 | IP65                                               |                                                    |
| Mounting Method                                                 |                                                 | Wall Mounted                                       |                                                    |
| Country of Manufacture                                          |                                                 | China                                              |                                                    |

\*1: The actual charge and discharge current also depends on the battery.

\*2: 4600 for VDE 0126-1-1 & VDE-AR-N4105 & NRS 097-2-1, 5100 for CEI 0-21 (GW5048D-ES); 4050 for CEI 0-21 (GW3648D-ES).

\*3: Can be reached only if PV and battery power is enough.

\*4: CAN communication is configured by default. If 485 communication is used, please replace the corresponding communication line.

\*5: 4600 for VDE 0126-1-1 & VDE-AR-N4105 & NRS 097-2-1, 4600 for CEI 0-21 (GW5048D-ES).

\*6: 18 for CEI 0-21.

\*7: FOR AUSTRALIA ONLY. Model GW3648D-ES inverters are designed without DC switch. For inverters designed with DC switch, the model name should be GW3648C-ES.

\*8: FOR AUSTRALIA ONLY. Model GW5048D-ES inverters are designed without DC switch. For inverters designed with DC switch, the model name should be GW5048C-ES.

\*9: For Australia Max. Short Circuit Current per MPPT (A) please refer to 'Manufacturer declaration: short circuit current'.

\*: Please visit GoodWe website for the latest certificates.

\*\* : Please refer to the user manual for the MPPT Voltage Range at Nominal Power.