

# Three Phase Hybrid Inverter

*FES- HB-LV-1P(10-12kW)*



100

100% unbalanced output, each phase;  
Max. output up to 50% rated power



AC couple to retrofit existing solar system

10

Max.10 pcs parallel for on-grid and off-grid  
operation: Support multiple batteries parallel

240

Max. charging/discharging current of 240A

48

48V low voltage battery, transformer isolation design

6

6 time periods for battery charging/discharging



Support storing energy from diesel generator



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# Technical Data

| Model                                              | FES-10K-HB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | FES-12K-HB |
|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|
| <b>Battery Input Data</b>                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |
| Battery Type                                       | Lead-acid or Lithium-ion                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |            |
| Battery Voltage Range (V)                          | 40-60                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |
| Max. Charging Current (A)                          | 210                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 240        |
| Max. Discharging Current (A)                       | 210                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 240        |
| Charging Strategy for Li-ion Battery               | Self-adaption to BMS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |            |
| Number of Battery Input                            | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |            |
| <b>PV String Input Data</b>                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |
| Max. PV Access Power (W)                           | 20000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 24000      |
| Max. PV Input Power (W)                            | 15000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 18000      |
| Max. PV Input Voltage (V)                          | 800                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |
| Start-up Voltage (V)                               | 160                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |
| MPPT Voltage Range (V)                             | 200-650                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |            |
| Rated PV Input Voltage (V)                         | 550                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |
| Max. Operating PV Input Current (A)                | 20+20                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |
| Max. Input Short-Circuit Current (A)               | 30+30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |
| No. of MPP Trackers/<br>No. of Strings MPP Tracker | 2/1+1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |
| <b>AC Input/Output Data</b>                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |
| Rated AC Input/Output Active Power(W)              | 10000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 12000      |
| Max. AC Input/Output Apparent Power(VA)            | 11000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 13200      |
| Rated AC Input/Output Current (A)                  | 15.2/14.5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 18.2/17.4  |
| Max. AC Input/Output Current (A)                   | 16.7/16                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 20/19.2    |
| Max. Continuous AC Passthrough (grid to load) (A)  | 45                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |
| Peak Power (off-grid) (W)                          | 2 times of rated power, 10s                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |            |
| Power Factor Adjustment Range                      | 0.8 leading to 0.8 lagging                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |            |
| Rated Input/Output Voltage/Range (V)               | 220/380V 230/400V 0.85Un-1.1Un                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |
| Rated Input/Output Grid Frequency/Range(Hz)        | 50/45-55                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |            |
| Grid Connection Form                               | 3L+N+PE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |            |
| Total Current Harmonic Distortion THDi             | <3% (of nominal power)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |
| DC Injection Current                               | <0.5% In                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |            |
| <b>Efficiency</b>                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |
| Max. Efficiency                                    | 97.6%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |
| Euro Efficiency                                    | 97.0%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |
| MPPT Efficiency                                    | >99%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |            |
| <b>Equipment Protection</b>                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |
| Integrated                                         | DC Polarity Reverse Connection Protection, AC Output Overcurrent Protection, Thermal Protection, AC Output Overvoltage Protection, AC Output Short Circuit Protection, DC Component Monitoring, Overvoltage Load Drop Protection, Ground Fault Current Monitoring, Arc Fault Circuit Interrupter (optional), Power Network Monitoring, Island Protection Monitoring, Earth Fault Detection, DC Input Switch, DC Terminal Insulation Impedance Monitoring, Residual Current (RCD)Detection, Surge protection level |            |
| Surge Protection Level                             | TYPE II(DC), TYPE II(AC)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |            |
| <b>Interface</b>                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |
| Communication Interface                            | RS485/RS232/CAN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |
| Monitor Mode                                       | GPRS/WIFI/Bluetooth/4G/LAN(optional)                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |            |
| <b>General Data</b>                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |            |
| Operating Temperature Range (°C)                   | -40 to +60 C, >45 C Derating                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |
| Permissible Ambient Humidity                       | 0-100%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |
| Permissible Altitude                               | 3000m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |
| Noise (dB)                                         | ≤55                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |            |
| Ingress Protection(IP) Rating                      | IP 65                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |
| Inverter Topology                                  | Non-Isolated                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |            |
| Over Voltage Category                              | OVC II(DC), OVC III(AC)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |            |
| Cabinet Size (WxHxD mm)                            | 386×660×250(Excluding Connectors and Brackets)                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |            |
| Weight (kg)                                        | 35.2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |            |
| Type of Cooling                                    | Intelligent Air Cooling                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |            |
| Warranty                                           | 5 Years/10 Years the<br>Warranty period depends on the final installation site of the inverter. For more information, please refer to the warranty policy.                                                                                                                                                                                                                                                                                                                                                        |            |
| Grid Regulation                                    | IEC 61727, IEC 62116                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |            |
| Safety / EMC Standard                              | IEC 61000-6-1/2/3/4, IEC 62109-1, IEC 62109-2                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |            |

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