

Inverter ibrido monofase

1 - 6 kW serie



ATON

~~~~~ SERIES



**UNIBODY**  
One-piece  
Aluminum Housing

**Max.  
1.5**

**PV OVERSIZE**  
Oversize FV 1,5 x

**2  
MPPT**

**MPPT CHANNELS**  
Fino 2 canali MPPT

**10  
ms**

**FUNZIONE UPS**  
Switch Time < 10ms

Supporto per ottimizz. del tempo di utilizzo



Modalità di funzionamento configurabili dall'utente



Interruttore di circuito per guasto d'arco (AFCI)



Sistema integrato di non immissione di energia sulla rete



Dimensioni compatte e installazione facile



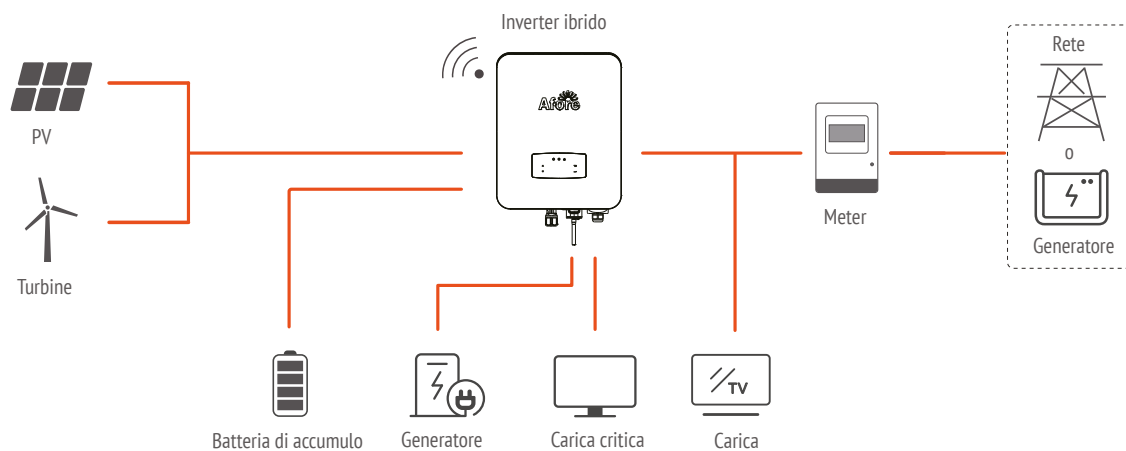
Monitoraggio intelligente e aggiornamento del firmware da remoto

[info@aforeenergy.it](mailto:info@aforeenergy.it) [info@aforeenergy.com](mailto:info@aforeenergy.com)

[www.aforeenergy.it](http://www.aforeenergy.it) [www.aforeenergy.com](http://www.aforeenergy.com)

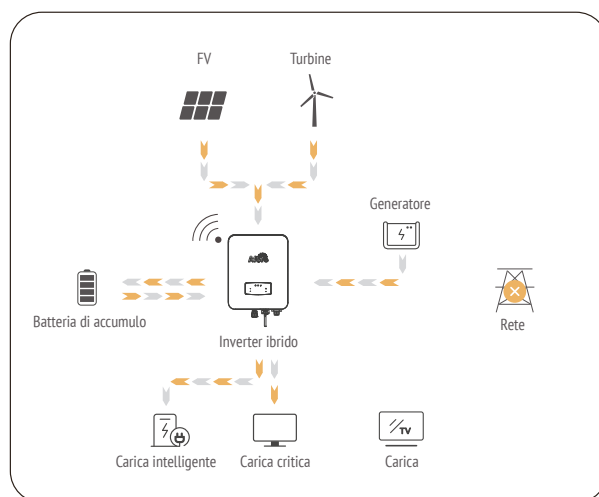
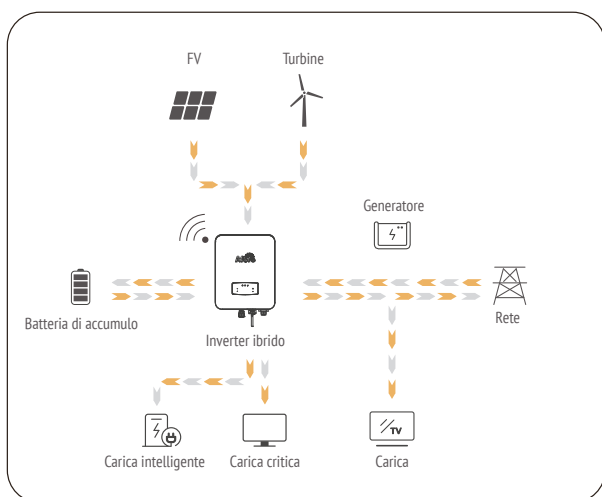
IT: +39 3667426066 CN: +86 2154326236

**Per i nuovi sistemi di stoccaggio:**

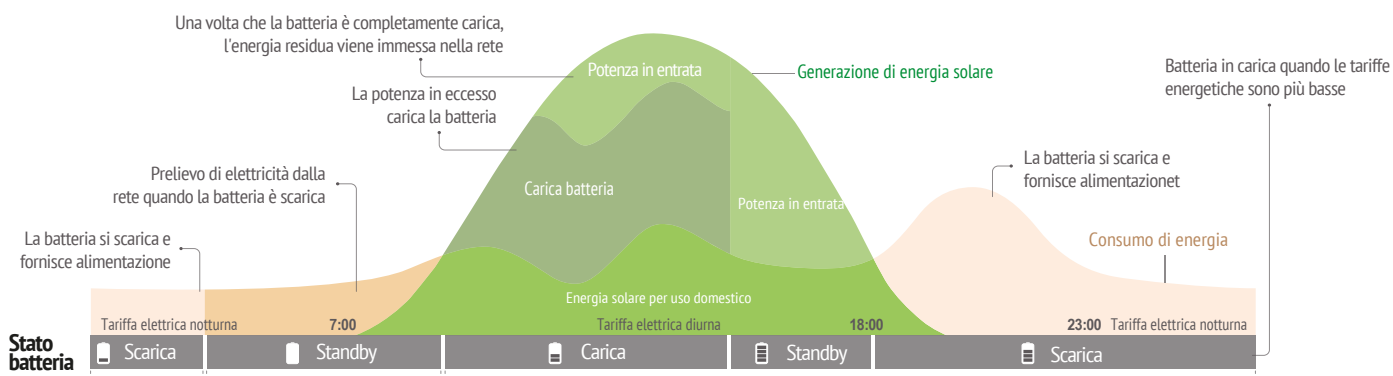


**Ottimizzazione dell'autoconsumo (on-grid)**

**vs. Alimentazione di emergenza (off-grid)**



**Modalità ottimizzazione dell'autoconsumo**



| <b>Ingresso FV</b>                       | <b>AF1K-SL-1</b>                                                                                               | <b>AF1.5K-SL-1</b> | <b>AF2K-SL-1</b> | <b>AF2.5K-SL-1</b> | <b>AF3K-SL-1</b> | <b>AF3.6K-SL-1</b> |
|------------------------------------------|----------------------------------------------------------------------------------------------------------------|--------------------|------------------|--------------------|------------------|--------------------|
| Potenza d'ingresso max. (kW)             | 1,5                                                                                                            | 2,3                | 3,0              | 3,8                | 4,5              | 5,4                |
| Tensione FV max. (V)                     | 550                                                                                                            |                    |                  |                    |                  |                    |
| Gamma MPPT (V)                           | 80 - 500                                                                                                       |                    |                  |                    |                  |                    |
| Gamma MPPT completa (V)                  | 80 - 500                                                                                                       | 90 - 500           | 120 - 500        | 150 - 500          | 170 - 500        | 210 - 500          |
| Tensione normale (V)                     | 360                                                                                                            |                    |                  |                    |                  |                    |
| Tensione di avvio (V)                    | 100                                                                                                            |                    |                  |                    |                  |                    |
| Corrente d'ingresso max. (A)             | 18,5 x 1                                                                                                       |                    |                  |                    |                  |                    |
| Corrente di corto circuito max. (A)      | 26 x 1                                                                                                         |                    |                  |                    |                  |                    |
| N. di MPPT / N. di stringhe FV           | 1 / 1                                                                                                          |                    |                  |                    |                  |                    |
| <b>Porta della batteria</b>              |                                                                                                                |                    |                  |                    |                  |                    |
| Potenza di carica/scarica max. (kW)      | 1,0                                                                                                            | 1,5                | 2,0              | 2,5                | 3,0              | 3,6                |
| Corrente di carica/scarica max. (A)      | 25                                                                                                             | 40                 | 50               | 63                 | 80               | 80                 |
| Tensione normale della batteria (V)      | 51,2                                                                                                           |                    |                  |                    |                  |                    |
| Gamma di tensione della batteria (V)     | 40 - 60                                                                                                        |                    |                  |                    |                  |                    |
| Tipo di batteria                         | Ioni di litio / Piombo-acido, ecc.                                                                             |                    |                  |                    |                  |                    |
| <b>Rete AC</b>                           |                                                                                                                |                    |                  |                    |                  |                    |
| Corrente continua max. (A)               | 5,0                                                                                                            | 7,0                | 10,0             | 12,0               | 14,0             | 17,0               |
| Potenza continua max. (kVA)              | 1,0                                                                                                            | 1,5                | 2,0              | 2,5                | 3,0              | 3,6                |
| Corrente nominale di rete (A)            | 4,6 / 4,4                                                                                                      | 6,9 / 6,6          | 9,1 / 8,7        | 11,4 / 10,9        | 13,7 / 13,1      | 16,4 / 15,7        |
| Tensione nominale di rete (V)            | Da 198 a 242 @ 220 / da 207 a 253 @ 230                                                                        |                    |                  |                    |                  |                    |
| Frequenza nominale di rete (Hz)          | 50 / 60                                                                                                        |                    |                  |                    |                  |                    |
| Fattore di potenza                       | 0,999; regolabile da 0,8 (sovraeccitazione) a 0,8 (sottoeccitazione)                                           |                    |                  |                    |                  |                    |
| THD corrente (%)                         | < 3                                                                                                            |                    |                  |                    |                  |                    |
| <b>Uscita carico AC</b>                  |                                                                                                                |                    |                  |                    |                  |                    |
| Corrente continua max. (A)               | 5,0                                                                                                            | 7,0                | 10,0             | 12,0               | 14,0             | 17,0               |
| Potenza continua max. (kVA)              | 1,0                                                                                                            | 1,5                | 2,0              | 2,5                | 3,0              | 3,6                |
| Corrente max. di picco (A) (10 min)      | 6,9 / 6,6                                                                                                      | 10,5 / 10,0        | 13,7 / 13,1      | 17,3 / 16,6        | 20,5 / 19,6      | 24,6 / 23,5        |
| Potenza max. di picco (kVA) (10 min)     | 1,5                                                                                                            | 2,3                | 3,0              | 3,8                | 4,5              | 5,4                |
| Corrente nominale AC (A)                 | 4,6 / 4,4                                                                                                      | 6,9 / 6,6          | 9,1 / 8,7        | 11,4 / 10,9        | 13,7 / 13,1      | 16,4 / 15,7        |
| Tensione nominale AC L-N (V)             | 220 / 230                                                                                                      |                    |                  |                    |                  |                    |
| Frequenza nominale AC (Hz)               | 50 / 60                                                                                                        |                    |                  |                    |                  |                    |
| Switching Time (s)                       | Senza soluzione di continuità                                                                                  |                    |                  |                    |                  |                    |
| THD tensione (%)                         | < 3                                                                                                            |                    |                  |                    |                  |                    |
| <b>Efficienza</b>                        |                                                                                                                |                    |                  |                    |                  |                    |
| Efficienza CEC (%)                       | 97,0                                                                                                           |                    |                  |                    |                  |                    |
| Efficienza Max. (%)                      | 97,6                                                                                                           |                    |                  |                    |                  |                    |
| Efficienza di batteria FV (%)            | 98,1                                                                                                           |                    |                  |                    |                  |                    |
| Efficienza di DC-AC (%)                  | 96,8                                                                                                           |                    |                  |                    |                  |                    |
| <b>Protezione</b>                        |                                                                                                                |                    |                  |                    |                  |                    |
| Protezione Reverse di polarità FV        | Sì                                                                                                             |                    |                  |                    |                  |                    |
| Protezione da sovracorr./sovratens.      | Sì                                                                                                             |                    |                  |                    |                  |                    |
| Protezione anti-islanding                | Sì                                                                                                             |                    |                  |                    |                  |                    |
| Protezione da cortocircuito AC           | Sì                                                                                                             |                    |                  |                    |                  |                    |
| Rilevamento della corrente residua       | Sì                                                                                                             |                    |                  |                    |                  |                    |
| Monitoraggio delle dispersioni a terra   | Sì                                                                                                             |                    |                  |                    |                  |                    |
| Rilevamento della resist. d'isolamento   | Sì                                                                                                             |                    |                  |                    |                  |                    |
| Rilevamento dell'arco FV                 | Sì                                                                                                             |                    |                  |                    |                  |                    |
| Grado di protezione dell'involucro       | IP65 / NEMA4X                                                                                                  |                    |                  |                    |                  |                    |
| <b>Dati generali</b>                     |                                                                                                                |                    |                  |                    |                  |                    |
| Dimensioni (L x W x H, mm)               | 513 x 370 x 192                                                                                                |                    |                  |                    |                  |                    |
| Peso (kg)                                | 17                                                                                                             |                    |                  |                    |                  |                    |
| Topologia                                | Senza trasformatore                                                                                            |                    |                  |                    |                  |                    |
| Raffreddamento                           | Ventilatore intelligente                                                                                       |                    |                  |                    |                  |                    |
| Umidità relativa                         | 0 - 100 %                                                                                                      |                    |                  |                    |                  |                    |
| Intervallo di temperatura operativa (°C) | - 25 a 60                                                                                                      |                    |                  |                    |                  |                    |
| Altitudine operativa (m)                 | < 4000                                                                                                         |                    |                  |                    |                  |                    |
| Emissioni acustiche (dB)                 | < 25                                                                                                           |                    |                  |                    |                  |                    |
| Consumo in standby (W)                   | < 10                                                                                                           |                    |                  |                    |                  |                    |
| Montaggio                                | Staffa a muro                                                                                                  |                    |                  |                    |                  |                    |
| Comunicazione con RSD                    | SUNSPEC                                                                                                        |                    |                  |                    |                  |                    |
| Interface di visualizz. e comunicaz.     | LCD, LED, RS485, CAN, Wi-Fi, GPRS, 4G                                                                          |                    |                  |                    |                  |                    |
| Certificazioni e omologazioni            | CEI 0-21, NRS97, G98/G99, EN50549-1, C10/C11, AS 4777, VDE-AR-N4105, VDE0126, IEC62040, IEC62109-1, IEC62109-2 |                    |                  |                    |                  |                    |
| EMC                                      | EN61000-6-2, EN61000-6-3                                                                                       |                    |                  |                    |                  |                    |

| <b>Ingresso FV</b>                       | <b>AF3K-SL</b>                                                                                                 | <b>AF3.6K-SL</b> | <b>AF4K-SL</b> | <b>AF4.6K-SL</b> | <b>AF5K-SL</b> | <b>AF5.5K-SL</b> | <b>AF6K-SL</b> |
|------------------------------------------|----------------------------------------------------------------------------------------------------------------|------------------|----------------|------------------|----------------|------------------|----------------|
| Potenza d'ingresso max. (kW)             | 4,5                                                                                                            | 5,4              | 6,0            | 6,9              | 7,5            | 8,3              | 9,0            |
| Tensione FV max. (V)                     | 550                                                                                                            |                  |                |                  |                |                  |                |
| Gamma MPPT (V)                           | 80 - 500                                                                                                       |                  |                |                  |                |                  |                |
| Gamma MPPT Completa (V)                  | 90 - 500                                                                                                       | 110 - 500        | 120 - 500      | 130 - 500        | 150 - 500      | 160 - 500        | 170 - 500      |
| Tensione normale (V)                     | 360                                                                                                            |                  |                |                  |                |                  |                |
| Tensione di avvio (V)                    | 100                                                                                                            |                  |                |                  |                |                  |                |
| Corrente d'ingresso max. (A)             | 18.5 x 2                                                                                                       |                  |                |                  |                |                  |                |
| Corrente di corto circuito max. (A)      | 26 x 2                                                                                                         |                  |                |                  |                |                  |                |
| N. di MPPT / N. di stringhe FV           | 2 / 2                                                                                                          |                  |                |                  |                |                  |                |
| <b>Porta della batteria</b>              |                                                                                                                |                  |                |                  |                |                  |                |
| Potenza di carica/scarica max. (kW)      | 3,0                                                                                                            | 3,6              | 4,0            | 4,6              | 4,8            | 4,8              | 4,8            |
| Corrente di carica/scarica max. (A)      | 80                                                                                                             |                  |                |                  |                |                  |                |
| Tensione normale della batteria (V)      | 51,2                                                                                                           |                  |                |                  |                |                  |                |
| Gamma di tensione della batteria (V)     | 40 - 60                                                                                                        |                  |                |                  |                |                  |                |
| Tipo di batteria                         | Ioni di litio / Piombo-acido, ecc.                                                                             |                  |                |                  |                |                  |                |
| <b>Rete AC</b>                           |                                                                                                                |                  |                |                  |                |                  |                |
| Corrente continua max. (A)               | 14,0                                                                                                           | 17,0             | 19,0           | 22,0             | 23,0           | 26,0             | 28,0           |
| Potenza continua max. (kVA)              | 3,0                                                                                                            | 3,6              | 4,0            | 4,6              | 5,0            | 5,5              | 6,0            |
| Corrente nominale di rete (A)            | 13,7 / 13,1                                                                                                    | 16,4 / 15,7      | 18,2 / 17,4    | 21,0 / 20,0      | 22,8 / 21,8    | 25,0 / 24,0      | 27,3 / 26,1    |
| Tensione nominale di rete (V)            | 198 to 242 @ 220 / 207 to 253 @ 230                                                                            |                  |                |                  |                |                  |                |
| Frequenza nominale di rete (Hz)          | 50 / 60                                                                                                        |                  |                |                  |                |                  |                |
| Fattore di potenza                       | 0.999 (Adjustable from 0.8 overexcited to 0.8 underexcited)                                                    |                  |                |                  |                |                  |                |
| THD corrente (%)                         | < 3                                                                                                            |                  |                |                  |                |                  |                |
| <b>Uscita carico AC</b>                  |                                                                                                                |                  |                |                  |                |                  |                |
| Corrente continua max. (A)               | 14,0                                                                                                           | 17,0             | 19,0           | 22,0             | 23,0           | 26,0             | 28,0           |
| Potenza continua max. (kVA)              | 3,0                                                                                                            | 3,6              | 4,0            | 4,6              | 5,0            | 5,5              | 6,0            |
| Corrente max. di picco (A) (10 min)      | 20,5 / 19,6                                                                                                    | 24,6 / 23,5      | 27,3 / 26,1    | 31,4 / 30        | 34,1 / 32,7    | 37,8 / 36,1      | 41,0 / 39,2    |
| Potenza max. di picco (kVA) (10 min)     | 4,5                                                                                                            | 5,4              | 6,0            | 6,9              | 7,5            | 8,3              | 9,0            |
| Corrente nominale AC (A)                 | 13,7 / 13,1                                                                                                    | 16,4 / 15,7      | 18,2 / 17,4    | 21,0 / 20,0      | 22,8 / 21,8    | 25,0 / 24,0      | 27,3 / 26,1    |
| Tensione nominale AC L-N (V)             | 220 / 230                                                                                                      |                  |                |                  |                |                  |                |
| Frequenza nominale AC (Hz)               | 50 / 60                                                                                                        |                  |                |                  |                |                  |                |
| Switching Time (s)                       | Senza soluzione di continuità                                                                                  |                  |                |                  |                |                  |                |
| THD tensione (%)                         | < 3                                                                                                            |                  |                |                  |                |                  |                |
| <b>Efficienza</b>                        |                                                                                                                |                  |                |                  |                |                  |                |
| Efficienza CEC (%)                       | 97,0                                                                                                           |                  |                |                  |                |                  |                |
| Efficienza Max. (%)                      | 97,6                                                                                                           |                  |                |                  |                |                  |                |
| Efficienza di batteria FV (%)            | 98,1                                                                                                           |                  |                |                  |                |                  |                |
| Efficienza di DC-AC (%)                  | 96,8                                                                                                           |                  |                |                  |                |                  |                |
| <b>Protezione</b>                        |                                                                                                                |                  |                |                  |                |                  |                |
| Protezione Reverse di polarità FV        | Sì                                                                                                             |                  |                |                  |                |                  |                |
| Protezione da sovracorr./sovratens.      | Sì                                                                                                             |                  |                |                  |                |                  |                |
| Protezione anti-islanding                | Sì                                                                                                             |                  |                |                  |                |                  |                |
| Protezione da cortocircuito AC           | Sì                                                                                                             |                  |                |                  |                |                  |                |
| Rilevamento della corrente residua       | Sì                                                                                                             |                  |                |                  |                |                  |                |
| Monitoraggio delle dispersioni a terra   | Sì                                                                                                             |                  |                |                  |                |                  |                |
| Rilevamento della resist. d'isolamento   | Sì                                                                                                             |                  |                |                  |                |                  |                |
| Rilevamento dell'arco FV                 | Sì                                                                                                             |                  |                |                  |                |                  |                |
| Grado di protezione dell'involucro       | IP65 / NEMA4X                                                                                                  |                  |                |                  |                |                  |                |
| <b>Dati generali</b>                     |                                                                                                                |                  |                |                  |                |                  |                |
| Dimensioni (L x W x H, mm)               | 513 x 370 x 192                                                                                                |                  |                |                  |                |                  |                |
| Peso (kg)                                | 17                                                                                                             |                  |                |                  |                |                  |                |
| Topologia                                | Senza trasformatore                                                                                            |                  |                |                  |                |                  |                |
| Raffreddamento                           | Ventilatore intelligente                                                                                       |                  |                |                  |                |                  |                |
| Umidità relativa                         | 0 - 100 %                                                                                                      |                  |                |                  |                |                  |                |
| Intervallo di temperatura operativa (°C) | - 25 to 60                                                                                                     |                  |                |                  |                |                  |                |
| Altitudine operativa (m)                 | < 4000                                                                                                         |                  |                |                  |                |                  |                |
| Emissioni acustiche (dB)                 | < 25                                                                                                           |                  |                |                  |                |                  |                |
| Consumo in standby (W)                   | < 10                                                                                                           |                  |                |                  |                |                  |                |
| Montaggio                                | Staffa a muro                                                                                                  |                  |                |                  |                |                  |                |
| Comunicazione con RSD                    | SUNSPEC                                                                                                        |                  |                |                  |                |                  |                |
| Interface di visualizz. e comunicaz.     | LCD, LED, RS485, CAN, Wi-Fi, GPRS, 4G                                                                          |                  |                |                  |                |                  |                |
| Certificazioni e omologazioni            | CEI 0-21, NRS97, G98/G99, EN50549-1, C10/C11, AS 4777, VDE-AR-N4105, VDE0126, IEC62040, IEC62109-1, IEC62109-2 |                  |                |                  |                |                  |                |
| EMC                                      | EN61000-6-2, EN61000-6-3                                                                                       |                  |                |                  |                |                  |                |



## Introduction

The R-BOX is a state-of-the-art home energy storage system solution. It has a total usable energy capacity of 10kWh. Product features include quick and easy installation, a compact and elegant home style design and great extensibility. The R-BOX can provide smart configurable backup power during grid outages and power smart homes with solar energy, day and night.

## Technical Specifications

| Model                             | R-BOX                                 |
|-----------------------------------|---------------------------------------|
| Total capacity                    | 10.24kWh                              |
| Usable capacity                   | 9.22kWh                               |
| Chemistry                         | Lithium iron phosphate (LFP)          |
| Nominal voltage                   | 51.2V                                 |
| Max. charge/<br>discharge current | 100A                                  |
| Communication                     | CAN, RS485                            |
| Certificate                       | UL1973, CE, UN38.3                    |
| Operating Temperature             | Charge: 32~113°F, Discharge: 14~122°F |
| Altitude                          | < 6562ft (2000m)                      |

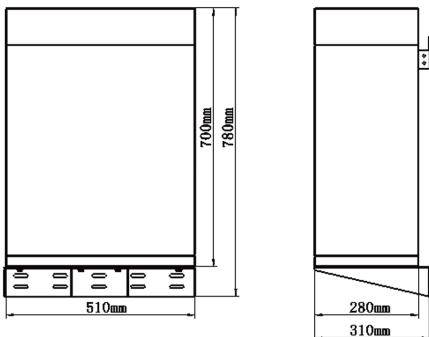
| Mechanical Design  | Parameter                                                                                  |
|--------------------|--------------------------------------------------------------------------------------------|
| Dimensions (L*W*H) | 11.0 * 20.1 * 27.5 inch (30.8 inch H w/ holder)<br>280 * 510 * 700 mm (780 mm H w/ holder) |
| Weight             | 264lbs                                                                                     |
| Mount              | Wall / Floor mount                                                                         |
| Enclosure rating   | IP20                                                                                       |
| Enclosure material | Cool-rolled steel                                                                          |
| Cooling            | Natural convection                                                                         |
| Warranty           | 6000 cycles or 10 years                                                                    |

## Designed for two E-BOX-48100R battery models

### 3D image

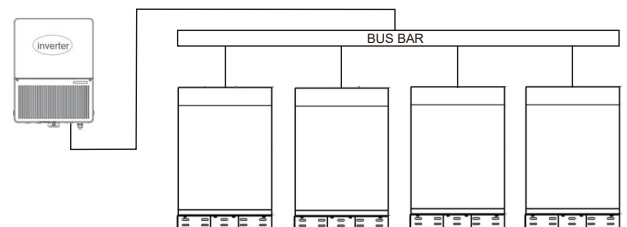


### Mechanical Drawing



### Battery Expansion

PYTES Home Energy Storage System can connect up to 4 pcs R-BOX directly. Please refer to a HUB solution for bigger expansion demands.





## Introduction

E-BOX series, the new generation LFP battery for home energy storage system. It provides safe, well-designed and high-performance standard LFP battery pack for you. The battery pack is compact, easy to install, free of maintenance, and could be deployed to the building block of energy storage system by being assembled in parallel. It is widely applied in home applications, small commercial and industrial energy storage system as well as Telecom stations.

## Features



### Self-Consumption

store excess energy generated by solar panels and use it whenever needed



### Back-Up Power Supply

provide emergency power supply during grid outage



### Electricity Bills Reduction

charge the battery during off-peak period and discharge the battery during peak period



### Smart Energy Management

measure, monitor and manage the system in real-time  
optimize the system life span by intelligent algorithms



### Longest Life and Highest Safety

more than 6000 cycles @90%DOD



### Wide Compatibility

compatible with 16 mainstream inverters in the market

**10 Years Warranty**



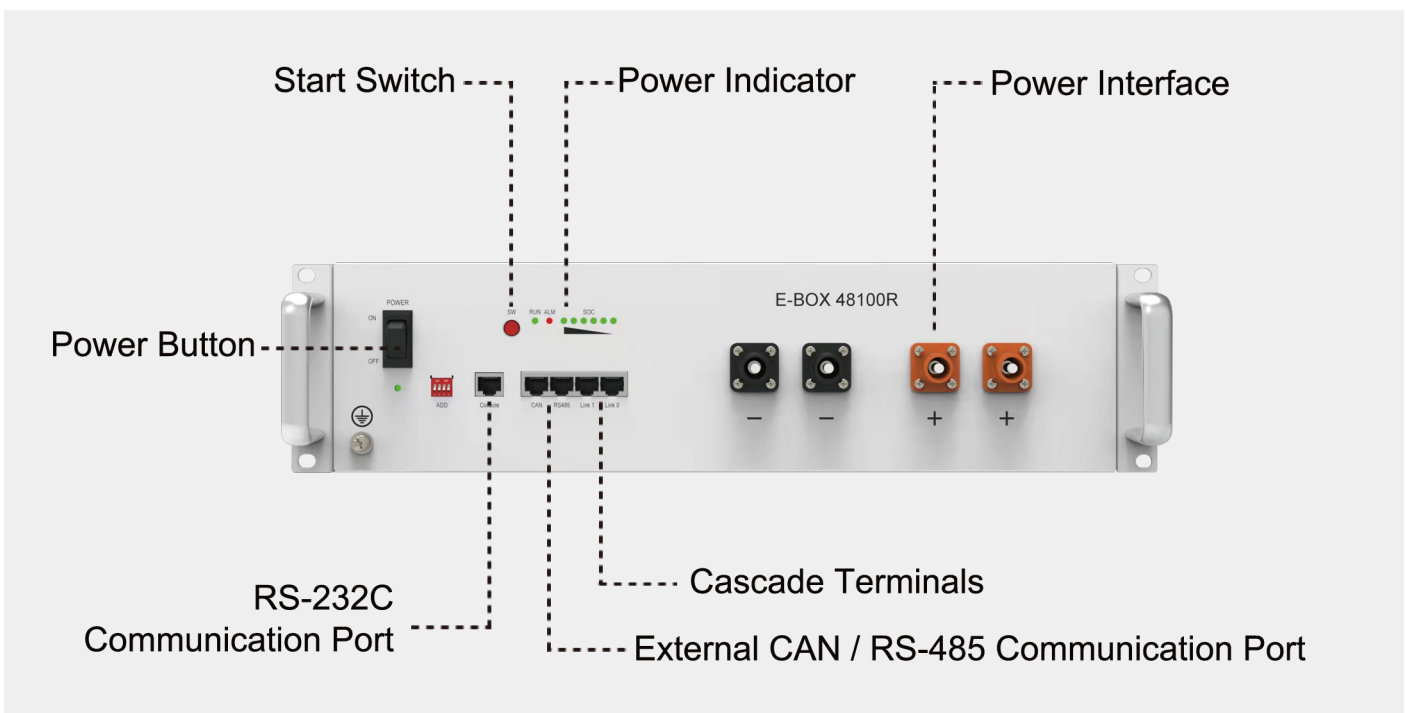
**UN38.3**



# Technical Specifications

| Battery Model           | E-BOX-48100R                                                    |
|-------------------------|-----------------------------------------------------------------|
| Chemistry               | LFP                                                             |
| Nominal Voltage         | 51.2V                                                           |
| Voltage Range           | 47.5V-57.6V                                                     |
| Nominal Capacity        | 100Ah                                                           |
| Nominal Energy          | 5.12kWh                                                         |
| Unit Dimension          | L440mm* W620mm* H117mm (2.6U)                                   |
| Unit Weight             | 51kg                                                            |
| Standard Charge Current | 50A                                                             |
| Maximum Charge Current  | 50A                                                             |
| Standard Discharge      | 50A                                                             |
| Maximum Discharge Rate  | 50A                                                             |
| Round-Trip Efficiency   | ≥95%                                                            |
| Communication Protocol  | RS232, RS485, CAN                                               |
| Cycle Life              | ≥6000cycles                                                     |
| Calendar Life           | ≥10years                                                        |
| Operating Temperature   | -10°C~50°C                                                      |
| Connect style           | Parallel                                                        |
| Storage Temperature     | Within 1month: -20~55°C, 1-3months: 0~35°C, 3-12months: 20~25°C |

# Operation Panel





**DICHIARAZIONE DI CONFORMITÀ ALLE PRESCRIZIONI CEI 0-21:2022-03**  
**DECLARATION OF CONFORMITY WITH CEI REQUIREMENTS 0-21:2022-03**

Con la presente dichiarazione, resa ai sensi degli artt. 46 e 47 DPR 28 Dicembre 2000, n 445, consapevole delle responsabilità e delle sanzioni penali previste dall'art. 76 del citato DPR per false attestazioni e dichiarazioni mendaci, il sottoscritto Chen Wei in qualità di vicepresidente della società Afore New Energy Technology (Shanghai) Co., Ltd. con sede a Building 7, NO.333 Wanfang Road, Minhang District, Shanghai, China

*With this declaration, made pursuant to articles 46 and 47 of Presidential Decree 28 December 2000, n. 445, aware of the responsibilities and penal sanctions provided for by art. 76 of the aforementioned Presidential Decree for false claims and misleading statements, the undersigned Chen Wei as Vice President of the company Afore New Energy Technology (Shanghai) Co., Ltd. based in Building 7, NO.333 Wanfang Road, Minhang District, Shanghai, China*

**DICHIARA**

**DECLARES**

che gli inverter di propria costruzione di cui al nella relazione allegata sono conformi alle prescrizioni della norma CEI 0-21:2022-03. Attesta altresì che la produzione dei dispositivi avviene in regime di qualità (secondo ISO 9001, ed. 2000 e s.m.i.)

*that the inverters of its own construction referred to in the attached report comply with the requirements of the CEI 0-21:2022-03 standard. It also certifies that the production of the devices takes place under a quality regime (according to ISO 9001, ed. 2000 and subsequent amendments)*

Firma

Signature





# CERTIFICATE OF CONFORMITY

## CERTIFICATO DI CONFORMITÀ

Issued to: Afore New Energy Technology (Shanghai) Co., Ltd.  
Rilasciato a: Build No.7, 333 Wanfang Road, Minhang District, Shanghai, China

For the product: Hybrid Inverter  
Tipo prodotto:

Trade name:  
Marchio:

  
**Afore**

Type/Model: AF1K-SL-1, AF1.5K-SL-1, AF2K-SL-1, AF2.5K-SL-1, AF3K-SL-1, AF3.6K-SL-1,  
Riferimento modello: AF3K-SL, AF3.6K-SL, AF4K-SL, AF4.6K-SL, AF5K-SL, AF5.5K-SL, AF6K-SL,  
AF1K-SL-0, AF1.5K-SL-0, AF2K-SL-0, AF2.5K-SL-0, AF3K-SL-0, AF3.6K-SL-0,  
AF4K-SL-0, AF4.6K-SL-0, AF5K-SL-0, AF5.5K-SL-0, AF6K-SL-0

Ratings: See Annex  
Dati di targa:

Manufactured by: Afore New Energy Technology (Shanghai) Co., Ltd.  
Costruttore: Build No.7, 333 Wanfang Road, Minhang District, Shanghai, China

Requirements: CEI 0-21:2022-03  
Requisiti: *Regola tecnica di riferimento per la connessione di Utenti attivi e passivi alle reti BT delle imprese distributrici di energia elettrica*

This Test Certificate is granted on account of an examination by DEKRA, the results of which are laid down in a confidential file no. 6136775.50

*Il presente certificato è rilasciato a causa di un esame da parte di DEKRA, i cui risultati sono riportati in un file riservato n. 6136775.50*

The examination has been carried out on one single specimen or several specimens of the product, submitted by the manufacturer. The certificate does not include an assessment of the manufacturer's production.


Conformity of his production with the specimen tested by DEKRA is not the responsibility of DEKRA.

*Il sottoscritto dichiara che il prodotto di cui sopra è conforme ai requisiti tecnici menzionati. Questo attestato di conformità è rilasciato sulla base dei risultati di prova riferiti nel rapporto sopra menzionato.*

*La valutazione non include una verifica della produzione di serie né del luogo di produzione.*

Shanghai, 16 December 2022 Certificate Number: 6136775.01COC  
It expires at the latest on: 16 December 2027

DEKRA Testing and Certification (Shanghai) Ltd.

  
Cliff Lin  
Certification Manager

© Integral publication of this certificate and adjoining reports is allowed

Accreditation of the certification body by IAS according to ISO/IEC 17065 for products.  
Accreditation is valid in the areas of certification mentioned in the certificate.

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Document no. : 6136775.01COC

## Ratings of the testing Hybrid Inverter:

Valutazioni dell'invertitore ibrido di prova:

| Models                                | AF1K-SL-1                     | AF1.5K-SL-1 | AF2K-SL-1 | AF2.5K-SL-1 | AF3K-SL-1 | AF3.6K-SL-1 |
|---------------------------------------|-------------------------------|-------------|-----------|-------------|-----------|-------------|
| <b>PV input:</b>                      |                               |             |           |             |           |             |
| Max PV voltage (V)                    | 550                           |             |           |             |           |             |
| MPPT voltage range (V)                | 80-500                        |             |           |             |           |             |
| Max PV current (A)                    | 18.5                          |             |           |             |           |             |
| Isc PV (A)                            | 26                            |             |           |             |           |             |
| Max PV power (W)                      | 1500                          | 2300        | 3000      | 3800        | 4500      | 5400        |
| <b>Battery port:</b>                  |                               |             |           |             |           |             |
| Battery type                          | Li-ion / Lead-acid            |             |           |             |           |             |
| Battery normal voltage (range) (Vdc)  | 51.2 (40-60)                  |             |           |             |           |             |
| Max charge/discharge current (A)      | 25                            | 40          | 50        | 63          | 80        | 80          |
| Max charge/discharge power (W)        | 1000                          | 1500        | 2000      | 2500        | 3000      | 3600        |
| <b>AC grid (input and output):</b>    |                               |             |           |             |           |             |
| Rated voltage (V)                     | L/N/PE, 230Vac                |             |           |             |           |             |
| Rated frequency (Hz)                  | 50                            |             |           |             |           |             |
| Max AC current (A)                    | 5                             | 7           | 10        | 12          | 14        | 17          |
| Rated AC power (W)                    | 1000                          | 1500        | 2000      | 2500        | 3000      | 3600        |
| Max AC apparent power (VA)            | 1000                          | 1500        | 2000      | 2500        | 3000      | 3600        |
| Power factor range                    | 1.0 (-0.8 ~ +0.8 adjustable)  |             |           |             |           |             |
| <b>AC load output (stand alone):</b>  |                               |             |           |             |           |             |
| Rated voltage (V)                     | L/N/PE, 230Vac                |             |           |             |           |             |
| Rated frequency (Hz)                  | 50                            |             |           |             |           |             |
| Max AC current (A)                    | 5                             | 7           | 10        | 12          | 14        | 17          |
| Rated continuous AC power (W)         | 1000                          | 1500        | 2000      | 2500        | 3000      | 3600        |
| Max continuous AC apparent power (VA) | 1000                          | 1500        | 2000      | 2500        | 3000      | 3600        |
| <b>General:</b>                       |                               |             |           |             |           |             |
| Protection class                      | I                             |             |           |             |           |             |
| Degree of protection                  | IP65                          |             |           |             |           |             |
| Overvoltage category                  | II(DC), III(AC)               |             |           |             |           |             |
| Ambient temperature                   | -25...+60°C (Derating > 45°C) |             |           |             |           |             |

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| Models                                | AF3K-SL                       | AF3.6K-SL | AF4K-SL | AF4.6K-SL | AF5K-SL | AF5.5K-SL | AF6K-SL |
|---------------------------------------|-------------------------------|-----------|---------|-----------|---------|-----------|---------|
| <b>PV input:</b>                      |                               |           |         |           |         |           |         |
| Max PV voltage (V)                    | 550                           |           |         |           |         |           |         |
| MPPT voltage range (V)                | 80-500                        |           |         |           |         |           |         |
| Max PV current (A)                    | 18.5 x 2                      |           |         |           |         |           |         |
| Isc PV (A)                            | 26 x 2                        |           |         |           |         |           |         |
| Max PV power (W)                      | 4500                          | 5400      | 6000    | 6900      | 7500    | 8300      | 9000    |
| <b>Battery port:</b>                  |                               |           |         |           |         |           |         |
| Battery type                          | Li-ion / Lead-acid            |           |         |           |         |           |         |
| Battery normal voltage (range) (Vdc)  | 51.2 (40-60)                  |           |         |           |         |           |         |
| Max charge/ discharge current (A)     | 80                            |           |         |           |         |           |         |
| Max charge/ discharge power (W)       | 3000                          | 3600      | 4000    | 4600      | 4800    | 4800      | 4800    |
| <b>AC grid (input and output):</b>    |                               |           |         |           |         |           |         |
| Rated voltage (V)                     | L/N/PE, 230Vac                |           |         |           |         |           |         |
| Rated frequency (Hz)                  | 50                            |           |         |           |         |           |         |
| Max AC current (A)                    | 14                            | 17        | 19      | 22        | 23      | 26        | 28      |
| Rated AC power (W)                    | 3000                          | 3600      | 4000    | 4600      | 5000    | 5500      | 6000    |
| Max AC apparent power (VA)            | 3000                          | 3600      | 4000    | 4600      | 5000    | 5500      | 6000    |
| Power factor range                    | 1.0 (-0.8 ~ +0.8 adjustable)  |           |         |           |         |           |         |
| <b>AC load output (stand alone):</b>  |                               |           |         |           |         |           |         |
| Rated voltage (V)                     | L/N/PE, 230Vac                |           |         |           |         |           |         |
| Rated frequency (Hz)                  | 50                            |           |         |           |         |           |         |
| Max AC current (A)                    | 14                            | 17        | 19      | 22        | 23      | 26        | 28      |
| Rated continuous AC power (W)         | 3000                          | 3600      | 4000    | 4600      | 5000    | 5500      | 6000    |
| Max continuous AC apparent power (VA) | 3000                          | 3600      | 4000    | 4600      | 5000    | 5500      | 6000    |
| <b>General:</b>                       |                               |           |         |           |         |           |         |
| Protection class                      | I                             |           |         |           |         |           |         |
| Degree of protection                  | IP65                          |           |         |           |         |           |         |
| Overvoltage category                  | II(DC), III(AC)               |           |         |           |         |           |         |
| Ambient temperature                   | -25...+60°C (Derating > 45°C) |           |         |           |         |           |         |

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| Models                                | AF1K-SL-0                     | AF1.5K-SL-0 | AF2K-SL-0 | AF2.5K-SL-0 | AF3K-SL-0 | AF3.6K-SL-0 |
|---------------------------------------|-------------------------------|-------------|-----------|-------------|-----------|-------------|
| <b>Battery port:</b>                  |                               |             |           |             |           |             |
| Battery type                          | Li-ion / Lead-acid            |             |           |             |           |             |
| Battery normal voltage (range) (Vdc)  | 51.2 (40-60)                  |             |           |             |           |             |
| Max charge/discharge current (A)      | 25                            | 40          | 50        | 63          | 80        | 80          |
| Max charge/discharge power (W)        | 1000                          | 1500        | 2000      | 2500        | 3000      | 3600        |
| <b>AC grid (input and output):</b>    |                               |             |           |             |           |             |
| Rated voltage (V)                     | L/N/PE, 230Vac                |             |           |             |           |             |
| Rated frequency (Hz)                  | 50                            |             |           |             |           |             |
| Max AC current (A)                    | 5                             | 7           | 10        | 12          | 14        | 17          |
| Rated AC power (W)                    | 1000                          | 1500        | 2000      | 2500        | 3000      | 3600        |
| Max AC apparent power (VA)            | 1000                          | 1500        | 2000      | 2500        | 3000      | 3600        |
| Power factor range                    | 1.0 (-0.8 ~ +0.8 adjustable)  |             |           |             |           |             |
| <b>AC load output (stand alone):</b>  |                               |             |           |             |           |             |
| Rated voltage (V)                     | L/N/PE, 230Vac                |             |           |             |           |             |
| Rated frequency (Hz)                  | 50                            |             |           |             |           |             |
| Max AC current (A)                    | 5                             | 7           | 10        | 12          | 14        | 17          |
| Rated continuous AC power (W)         | 1000                          | 1500        | 2000      | 2500        | 3000      | 3600        |
| Max continuous AC apparent power (VA) | 1000                          | 1500        | 2000      | 2500        | 3000      | 3600        |
| <b>General:</b>                       |                               |             |           |             |           |             |
| Protection class                      | I                             |             |           |             |           |             |
| Degree of protection                  | IP65                          |             |           |             |           |             |
| Overvoltage category                  | II(DC), III(AC)               |             |           |             |           |             |
| Ambient temperature                   | -25...+60°C (Derating > 45°C) |             |           |             |           |             |

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| Models                                | AF4K-SL-0                     | AF4.6K-SL-0 | AF5K-SL-0 | AF5.5K-SL-0 | AF6K-SL-0 |
|---------------------------------------|-------------------------------|-------------|-----------|-------------|-----------|
| <b>Battery port:</b>                  |                               |             |           |             |           |
| Battery type                          | Li-ion / Lead-acid            |             |           |             |           |
| Battery normal voltage (range) (Vdc)  | 51.2 (40-60)                  |             |           |             |           |
| Max charge/discharge current (A)      | 80                            | 80          | 100       | 120         | 120       |
| Max charge/discharge power (W)        | 4000                          | 4600        | 5000      | 5500        | 6000      |
| <b>AC grid (input and output):</b>    |                               |             |           |             |           |
| Rated voltage (V)                     | L/N/PE, 230Vac                |             |           |             |           |
| Rated frequency (Hz)                  | 50                            |             |           |             |           |
| Max AC current (A)                    | 19                            | 22          | 23        | 26          | 28        |
| Rated AC power (W)                    | 4000                          | 4600        | 5000      | 5500        | 6000      |
| Max AC apparent power (VA)            | 4000                          | 4600        | 5000      | 5500        | 6000      |
| Power factor range                    | 1.0 (-0.8 ~ +0.8 adjustable)  |             |           |             |           |
| <b>AC load output (stand alone):</b>  |                               |             |           |             |           |
| Rated voltage (V)                     | L/N/PE, 230Vac                |             |           |             |           |
| Rated frequency (Hz)                  | 50                            |             |           |             |           |
| Max AC current (A)                    | 19                            | 22          | 23        | 26          | 28        |
| Rated continuous AC power (W)         | 4000                          | 4600        | 5000      | 5500        | 6000      |
| Max continuous AC apparent power (VA) | 4000                          | 4600        | 5000      | 5500        | 6000      |
| <b>General:</b>                       |                               |             |           |             |           |
| Protection class                      | I                             |             |           |             |           |
| Degree of protection                  | IP65                          |             |           |             |           |
| Overvoltage category                  | II(DC), III(AC)               |             |           |             |           |
| Ambient temperature                   | -25...+60°C (Derating > 45°C) |             |           |             |           |

Type of generating unit:

*Tipologia di apparato:*

| Static Conversion Device<br><i>Dispositivo di conversione statica</i> | Interface Protection<br><i>Protezione di interfaccia</i> | Interface Protection Device<br><i>Dispositivo di interfaccia</i> | Rotating Generator Device<br><i>Dispositivo di generazione rotante</i> |
|-----------------------------------------------------------------------|----------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------------|
| Yes/Sì                                                                | Yes/Sì                                                   | Yes/Sì                                                           | No                                                                     |

REMARK: the device is capable to limit the  $I_{dc}$  to 0,5% of the nominal current

NOTA: Il dispositivo è in grado di limitare la  $I_{dc}$  allo 0,5% della corrente nominale

Firmware release (SW): V06

Revisione firmware (SW): V06

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**The battery used for testing with the Hybrid Inverter covered by this certificate:**

*La batteria utilizzata per i test con l'invertitore ibrido coperto dal presente certificato:*

| Battery Models                                                                                                                                                                                                                                                                                                                 | E-BOX 48100R                    | E-BOX 48100R | E-BOX 48100R | E-BOX 48100R |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|--------------|--------------|--------------|
| Manufacturer                                                                                                                                                                                                                                                                                                                   | Shanghai PYTES Energy Co., Ltd. |              |              |              |
| Number of battery module in parallel                                                                                                                                                                                                                                                                                           | 1                               | 2            | 3            | 4            |
| Nominal Voltage                                                                                                                                                                                                                                                                                                                | 51.2 V                          |              |              |              |
| Nominal capacity                                                                                                                                                                                                                                                                                                               | 100 Ah                          | 200 Ah       | 300 Ah       | 400 Ah       |
| CUS (Storage system useful capacity)                                                                                                                                                                                                                                                                                           | 5.12 kWh                        | 10.24 kWh    | 15.36 kWh    | 20.48 kWh    |
| Battery Models                                                                                                                                                                                                                                                                                                                 | E-BOX 48100R                    | E-BOX 48100R | E-BOX 48100R | E-BOX 48100R |
| Manufacturer                                                                                                                                                                                                                                                                                                                   | Shanghai PYTES Energy Co., Ltd. |              |              |              |
| Number of battery module in parallel                                                                                                                                                                                                                                                                                           | 5                               | 6            | 7            | 8            |
| Nominal Voltage                                                                                                                                                                                                                                                                                                                | 51.2 V                          |              |              |              |
| Nominal capacity                                                                                                                                                                                                                                                                                                               | 500 Ah                          | 600 Ah       | 700 Ah       | 800 Ah       |
| CUS (Storage system useful capacity)                                                                                                                                                                                                                                                                                           | 25.60 kWh                       | 30.72 kWh    | 35.84 kWh    | 40.96 kWh    |
| <p>Remark:</p> <p>When the batteries are connected in parallel, the charge/ discharge current is superimposed and is limited by the maximum current of the battery port of the Hybrid Inverter.</p> <p>The batteries are not integrated into the Hybrid Inverter and must be installed according to the local regulations.</p> |                                 |              |              |              |

**Testing Laboratory:**

**Laboratorio prove:**

Testing Laboratory for CEI 0-21:2022-03  
 DEKRA Testing and Certification (Suzhou) Co., Ltd.  
 No. 99, Hongye Road, Suzhou Industrial Park Suzhou, 215006, P.R. China  
 Accreditation Number: L5313 (CNAS-ILAC)

Testing Laboratory for EMC:

- Intertek Testing Services Shanghai  
 Building No.86, 1198 Qinzhou Road (North), Caohejing Development Zone, Shanghai 200233, China  
 Accreditation Number: 3309.02 (A2LA-ILAC)
- Shanghai Inspection and Testing Institute of Instruments and Automation Systems Co., Ltd.  
 No.103, Caobao Road, Xuhui District, Shanghai, China  
 Accreditation Number: L0130 (CNAS-ILAC)

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