

Three Phase Hybrid Storage Inverter








3-30 kW









The Afore AF series three phase storage inverters are designed to increase energy independence for homeowners and commercial users. The power range is from 3.0kW to 30kW, compatible with high voltage (150-800V) batteries.

Energy management is based on time-of-use and demand charge rate structures, significantly reduce the amount of energy purchased from public grid.

Thanks for the UPS function (switch time < 10ms), that enables the crucial loads power on during outages. Additionally, under the backup operation mode, the inverter provides you up to 150% peak output overloading.

- 
SODIUM METAL CHLORIDE BATTERY
Support Sodium metal chloride battery
- 
WIDE RANGE
Voltage Range (150-800V)
- 
100% UNBALANCE
Support Unbalance Load
- 
Max. 1.5
PV OVERSIZE
1.5 Times PV Oversize
- 
Max. 40A
MAX. 40A_{dC}
String Current Up To 40A
- 
<10 ms
UPS FUNCTION
Switch Time < 10ms
- 
INPUT
Support Generator

- Support for Time-of-use Optimization 
- Configurable Operation Modes 
- AFCI (Optional) & Rapid Shutdown Ready 

-  Build in Anti-feed-in Function
-  100% unbalanced output, each phase;
200% unbalanced output, each phase (Below 10kW)
-  Smart Monitoring & Remote Firmware Upgrade

Three Phase Hybrid Storage Inverter


3-12 kW Plus Series









The Afore three phase storage inverters plus series are designed to increase energy independence for homeowners and commercial users. The power range is from 3.0kW to 12kW, compatible with high voltage (80-600V and 120-650V) batteries.

Energy management is based on time-of-use and demand charge rate structures, significantly reduce the amount of energy purchased from public grid.

Thanks for the UPS function (switch time < 10ms), that enables the crucial loads power on during outages. Additionally, under the backup operation mode, the inverter provides you up to 150% peak output overloading.

- 
SODIUM METAL CHLORIDE BATTERY
Support Sodium metal chloride battery
- 
MIN. 80V
Battery Voltage Minimum 80V
- 
MAX. 50A
Max. Charge/Discharge Current 50A
- 
100% UNBALANCE
Support Unbalance Load
- 
Max. 1.5
PV OVERSIZE
1.5 Times PV Oversize
- 
Max. 20A
MAX. 20A_{dC}
String Current Up To 20A
- 
<10 ms
UPS FUNCTION
Switch Time < 10ms

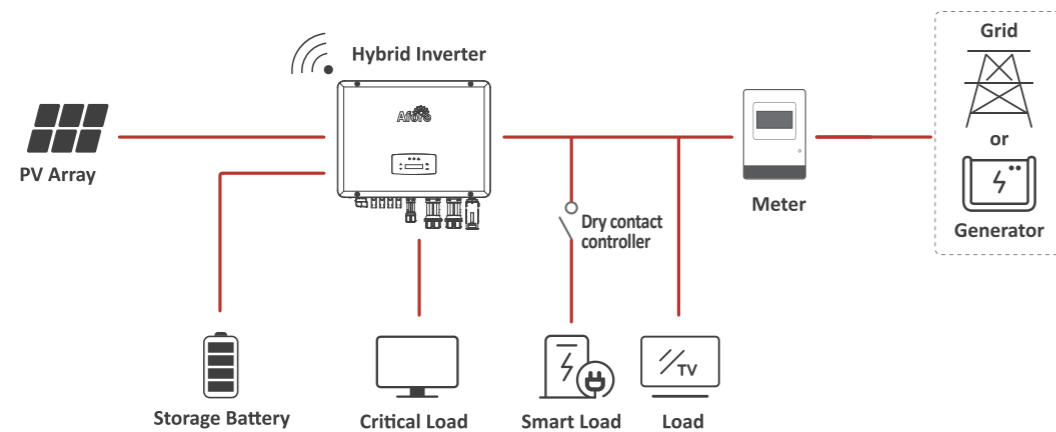
- Support for Time-of-use Optimization 
- Configurable Operation Modes 
- AFCI (Optional) & Rapid Shutdown Ready 

-  Build in Anti-feed-in Function
-  100% unbalanced output, each phase;
200% unbalanced output, each phase (Below 10kW)
-  Smart Monitoring & Remote Firmware Upgrade

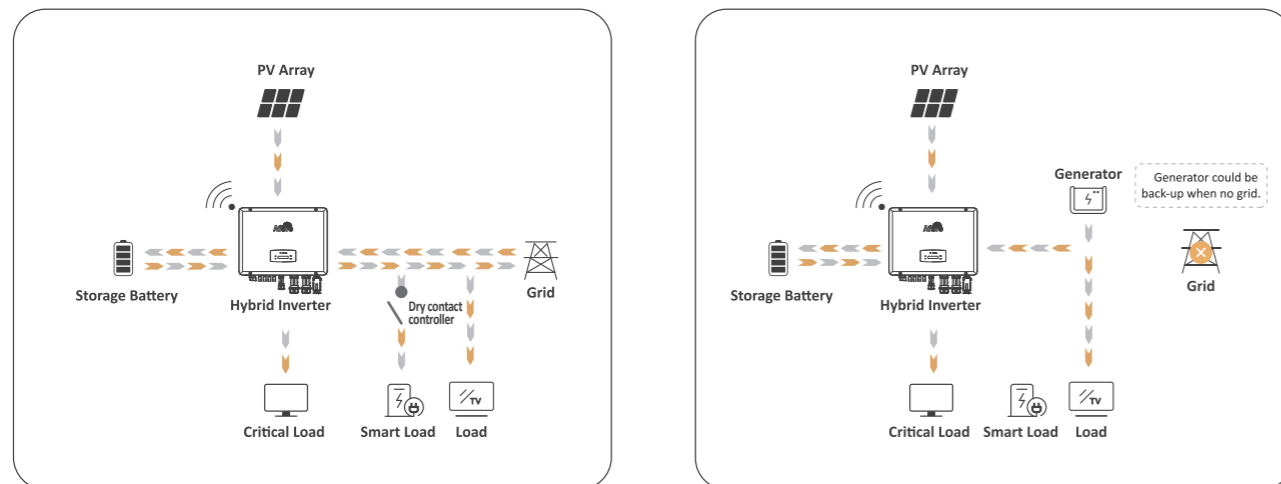
■ Technical Data	AF3K-TH	AF4K-TH	AF5K-TH	AF6K-TH	AF8K-TH	AF10K-TH
PV Input						
Max. DC Input Power (kW)	5	6	7.5	9	12	15
Max. PV Voltage (V)	1000					
Rated DC Input Voltage (V)	620					
DC Input Voltage Range (V)	150-1000					
MPPT Voltage Range (V)	150-850					
Full MPPT Range(V)	200-850		250-850		300-850	
Start-up Voltage (V)	160					
Max. DC Input Current (A)	20x2					
Max. Short Current(A)	30x2					
No. of MPPT Tracker / Strings	2/2					
Battery Port						
Battery Nominal Voltage (V)	200	200	200	250	300	400
Battery Voltage Range (V)	150-800					
Max. Charge/Discharge Current (A)	30					
Max. Charge/Discharge Power (kW)	3	4	5	6	8	10
Charging Curve	3 Stages					
Compatible Battery Type	Li-ion / Lead-acid / Sodium metal chloride battery					
AC Grid						
Nominal AC Output Power (kW)	3	4	5	6	8	10
Max. AC Input/Output Power (kVA)	4.5 / 3.3	6 / 4.4	7.5 / 5.5	9 / 6.6	12 / 8.8	15 / 11
Max. AC Output Current (A)	5.3	7	8.5	10.5	13.5	17
Nominal AC Voltage (V)	230/400					
Nominal AC Frequency (Hz)	50/60					
Power Factor	1 (-0.8-0.8) adjustable					
Current THD (%)	<3%					
AC Load Output (Back-up)						
Nominal Output Power (VA)	3000	4000	5000	6000	8000	10000
Nominal Output Voltage (V)	230/400					
Nominal Output Frequency (Hz)	50/60					
Nominal Output Current (A)	4.4	5.8	7.3	8.7	11.6	14.5
Peak Output Power	3300VA, 60s	4400VA, 60s	5500VA, 60s	6600VA, 60s	8800VA, 60s	11000VA, 60s
THDV (with linear load)	<3%					
Switching Time (ms)	<10					
Efficiency						
Europe Efficiency	97.50%					
Max. Efficiency	98.00%			98.20%		
Battery Charge/Discharge Efficiency	98.00%					
Protection						
Reverse Polarity Protection	Yes					
Over Current / Voltage Protection	Yes					
Anti-islanding Protection	Yes					
AC Short-circuit Protection	Yes					
Leakage Current Detection	Yes					
Ground Fault Monitoring	Yes					
Grid Monitoring	Yes					
Enclosure Protect Level	IP65					
General Data						
Dimensions (W x H x D, mm)	370 x 497 x 192 / 558 x 535 x 260 mm					
Weight (kg)	20.8 / 29kg					
Topology	Transformerless					
Cooling Concept	Natural Convection			Intelligent Fan		
Relative Humidity	0-100%					
Operating Temperature Range (°C)	-25 to 60 °C					
Operating Altitude (m)	<4000					
Noise Emission (dB)	<40					
Standby Consumption (W)	<5					
Display & Communication Interfaces	LCD, LED, RS485, CAN, Wi-Fi, GPRS, 4G					
Certification & Approvals	NRS097, G98/G99, EN50549-1, C10/C11, AS4777.2, VDE-AR-N4105, VDE0126, IEC62109-1, IEC62109-2					
EMC	EN61000-6-2, EN61000-6-3					

■ Technical Data	AF12K-TH	AF15K-TH	AF17K-TH	AF20K-TH	AF25K-TH	AF30K-TH
PV Input						
Max. DC Input Power (kW)	18	22.5	25.5	30	37.5	45
Max. PV Voltage (V)	1000					
Rated DC Input Voltage (V)	620					
DC Input Voltage Range (V)	150-1000					
MPPT Voltage Range (V)	150-850					
Full MPPT Range(V)	500-850					
Start-up Voltage (V)	160					
Max. DC Input Current (A)	20x2	20+32	32x2	40x2		
Max. Short Current(A)	30x2	30+48	48x2	60x2		
No. of MPPT Tracker / Strings	2/2	2/3	2/4	2/4		
Battery Port						
Battery Nominal Voltage (V)	450	500	400	500	500	550
Battery Voltage Range (V)	150-800					
Max. Charge/Discharge Current (A)	30	50	50	50	60	60
Max. Charge/Discharge Power (kW)	12	15	17	20	25	30
Charging Curve	3 Stages					
Compatible Battery Type	Li-ion / Lead-acid / Sodium metal chloride battery					
AC Grid						
Nominal AC Output Power (kW)	12	15	17	20	25	30
Max. AC Input/Output Power (kVA)	18 / 13.2	22.5 / 16.5	25.5 / 18.7	30 / 22	37.5 / 27.5	45 / 33
Max. AC Output Current (A)	21.5	27	30	32	40	48
Nominal AC Voltage (V)	230/400					
Nominal AC Frequency (Hz)	50/60					
Power Factor	1 (-0.8-0.8) adjustable					
Current THD (%)	<3%					
AC Load Output (Back-up)						
Nominal Output Power (VA)	12000	15000	17000	20000	25000	30000
Nominal Output Voltage (V)	230/400					
Nominal Output Frequency (Hz)	50/60					
Nominal Output Current (A)	17.4	21.8	24.7	29	36.3	43.5
Peak Output Power	13200VA, 60s	16500VA, 60s	18700VA, 60s	22000VA, 60s	27500VA, 60s	33000VA, 60s
THDV (with linear load)	<3%					
Switching Time (ms)	<10					
Efficiency						
Europe Efficiency	97.50%		97.80%		98.10%	
Max. Efficiency	98.30%			98.50%		
Battery Charge/Discharge Efficiency	98.00%					
Protection						
Reverse Polarity Protection	Yes					
Over Current / Voltage Protection	Yes					
Anti-islanding Protection	Yes					
AC Short-circuit Protection	Yes					
Leakage Current Detection	Yes					
Ground Fault Monitoring	Yes					
Grid Monitoring	Yes					
Enclosure Protect Level	IP65					
General Data						
Dimensions (W x H x D, mm)	370x497x192/558x535x260			558 x 535 x 260 mm		
Weight (kg)	20.8/29kg			29kg		36kg
Topology	Transformerless					
Cooling Concept	Intelligent Fan					
Relative Humidity	0-100%					
Operating Temperature Range (°C)	-25 to 60 °C					
Operating Altitude (m)	<4000					
Noise Emission (dB)	<40					
Standby Consumption (W)	<5					
Display & Communication Interfaces	LCD, LED, RS485, CAN, Wi-Fi, GPRS, 4G					
Certification & Approvals	NRS097, G98/G99, EN50549-1, C10/C11, AS4777.2, VDE-AR-N4105, VDE0126, IEC62109-1, IEC62109-2					
EMC	EN61000-6-2, EN61000-6-3					

For New Storage System:

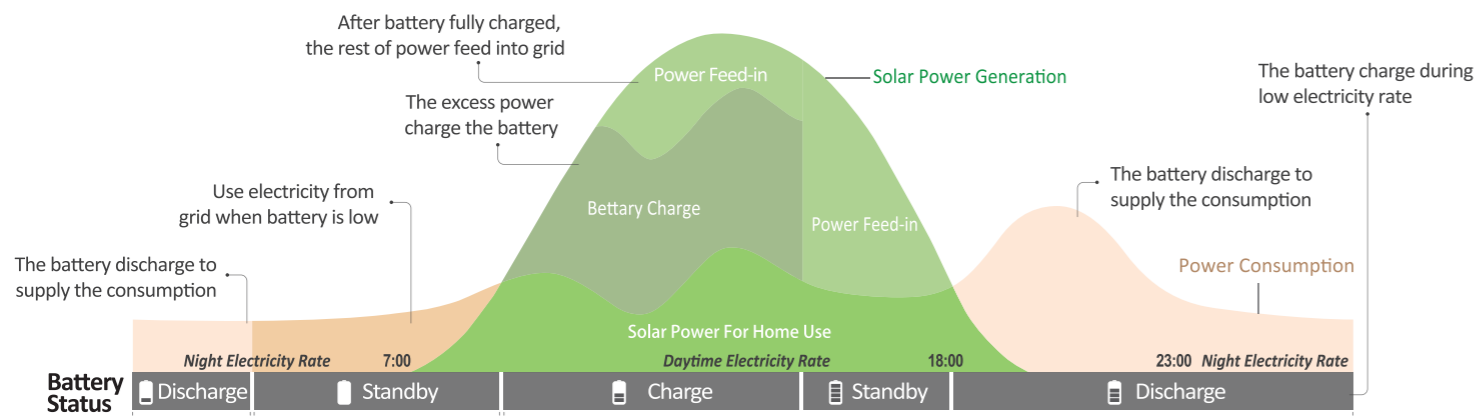


Optimizing Self-Consumption (on-grid) + Emergency Power Supply (off-grid)



Optimizing Self-Consumption Mode

With energy storage system installed, users may also be able to change from a flat rate electricity tariff to a time-of-use tariff. For the areas and regions, where peak shaving can be applied.



Technical Data	AF3K-THP	AF4K-THP	AF5K-THP	AF6K-THP	AF8K-THP	AF10K-THP	AF12K-THP
PV Input							
Max. DC Input Power (kW)	5	6	7.5	9	12	15	18
Max. PV Voltage (V)	1000						
Rated DC Input Voltage (V)	620						
DC Input Voltage Range (V)	150-1000						
MPPT Voltage Range (V)	150-850						
Full MPPT Range(V)	200-850		250-850		300-850		500-850
Start-up Voltage (V)	160						
Max. DC Input Current (A)	20x2						
Max. Short Current(A)	30x2						
No. of MPPT Tracker / Strings	2/2						
Battery Port							
Battery Nominal Voltage (V)	100	100	100	150	200	250	300
Battery Voltage Range (V)	80-600				120-650		
Max. Charge/Discharge Current (A)	50						
Max. Charge/Discharge Power (kW)	3	4	5	6	8	10	12
Charging Curve	3 Stages						
Compatible Battery Type	Li-ion / Lead-acid / Sodium metal chloride battery						
AC Grid							
Nominal AC Output Power (kW)	3	4	5	6	8	10	12
Max. AC Input/Output Power (kVA)	4.5 / 3.3	6 / 4.4	7.5 / 5.5	9 / 6.6	12 / 8.8	15 / 11	18 / 13.2
Max. AC Output Current (A)	5.3	7	8.5	10.5	13.5	17	21.5
Nominal AC Voltage (V)	230/400						
Nominal AC Frequency (Hz)	50/60						
Power Factor	1 (-0.8-0.8)						
Current THD (%)	<3%						
AC Load Output (Back-up)							
Nominal Output Power (VA)	3000	4000	5000	6000	8000	10000	12000
Nominal Output Voltage (V)	230/400						
Nominal Output Frequency (Hz)	50/60						
Nominal Output Current (A)	4.4	5.8	7.3	8.7	11.6	14.5	17.4
Peak Output Power	3300VA, 60s	4400VA, 60s	5500VA, 60s	6600VA, 60s	8800VA, 60s	11000VA, 60s	13200VA, 60s
THDV (with linear load)	<3%						
Switching Time (ms)	<10						
Efficiency							
Europe Efficiency				97.50%			
Max. Efficiency	98.00%			98.20%		98.30%	
Battery Charge/Discharge Efficiency	98.00%						
Protection							
Reverse Polarity Protection	Yes						
Over Current / Voltage Protection	Yes						
Anti-islanding Protection	Yes						
AC Short-circuit Protection	Yes						
Leakage Current Detection	Yes						
Ground Fault Monitoring	Yes						
Grid Monitoring	Yes						
Enclosure Protect Level	IP65						
General Data							
Dimensions (W x H x D, mm)	558 x 535 x 260 mm						
Weight (kg)	29kg						
Topology	Transformerless						
Cooling Concept	Intelligent Fan						
Relative Humidity	0-100%						
Operating Temperature Range (°C)	-25 to 60 °C						
Operating Altitude (m)	<4000						
Noise Emission (dB)	<40						
Standby Consumption (W)	<5						
Display & Communication Interfaces	LCD, LED, RS485, CAN, Wi-Fi, GPRS, 4G						
Certification & Approvals	NRS097, G98/G99, EN50549-1, C10/C11, AS4777.2, VDE-AR-N4105, VDE0126, IEC62109-1, IEC62109-2						
EMC	EN61000-6-2, EN61000-6-3						

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: On-Grid PV Inverter
Tipo prodotto:

Trade name: 
Marchio:

Type/Model: BNT003KTL, BNT004KTL, BNT005KTL, BNT006KTL, BNT008KTL, BNT010KTL,
Riferimento modello: BNT012KTL, BNT013KTL, BNT015KTL, BNT017KTL, BNT020KTL, BNT025KTL

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. 6148888.50
Il presente certificato è rilasciato a causa di un esame da parte di DEKRA, i cui risultati sono riportati in un file riservato n. 6148888.50

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, 22 February 2023 Certificate Number: 6148888.01COC
It expires at the latest on: 22 February 2028

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.

DEKRA Testing and Certification (Shanghai) Ltd.
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Document no. : 6148888.01COC

Ratings of the testing On-Grid PV Inverter:

Valutazioni del test On-Grid PV Inverter:

Specifications table				
Model	BNT003KTL	BNT004KTL	BNT005KTL	BNT006KTL
PV input				
Max PV power (W)	5100	6000	7500	9000
Vmax PV (Vdc) (absolute Max.)	1100	1100	1100	1100
Isc PV (absolute Max.) (A)	25 x 2	25 x 2	25 x 2	25 x 2
Max. PV input current (A)	15 x 2	15 x 2	15 x 2	15 x 2
Number MPP trackers	2	2	2	2
Number input strings	1/1	1/1	1/1	1/1
MPPT voltage range (Vdc)	150-1000	150-1000	150-1000	150-1000
Vdc range @ full power (Vdc)	200-850	200-850	200-850	250-850
AC Grid (output)				
Normal AC Voltage (VAC)	3P+N+PE/3P+PE 230/400			
Frequency (Hz)	50			
Normal AC Current (A)	4.4	5.8	7.3	8.7
Max. cont. output current (A)	5.3	7	8.5	10.5
Normal Power (W)	3000	4000	5000	6000
Rated Apparent Power (VA)	3000	4000	5000	6000
Max. cont. Power (W)	3000	4000	5000	6000
Max. cont. Apparent Power (VA)	3000	4000	5000	6000
Power factor(adjustable)	1.0 (-0.8~ +0.8)			
Others				
Protective class	Class I			
Ingress protection (IP)	IP65			
Temperature (°C)	-25°C to +60°C (Derating 45°C)			
Inverter Isolation	Non-isolated			
Overvoltage category	OVC III (AC Main), OVC II (PV)			

Document no. : 6148888.01COC

Specifications table				
Model	BNT008KTL	BNT010KTL	BNT012KTL	BNT013KTL
PV input				
Max PV power (W)	12000	15000	18000	19500
Vmax PV (Vdc) (absolute Max.)	1100	1100	1100	1100
Isc PV (absolute Max.) (A)	25 x 2	25 x 2	25 x 2	25 x 2
Max. PV input current (A)	15 x 2	15 x 2	15 x 2	15 x 2
Number MPP trackers	2	2	2	2
Number input strings	1/1	1/1	1/1	1/1
MPPT voltage range (Vdc)	150-1000	150-1000	150-1000	150-1000
Vdc range @ full power (Vdc)	300-850	500-850	500-850	500-850
AC Grid (output)				
Normal AC Voltage (VAC)	3P+N+PE/3P+PE 230/400			
Frequency (Hz)	50			
Normal AC Current (A)	11.6	14.5	17.4	18.9
Max. cont. output current (A)	13.5	17	21.5	22
Normal Power (W)	8000	10000	12000	13000
Rated Apparent Power (VA)	8000	10000	12000	13000
Max. cont. Power (W)	8000	10000	12000	13000
Max. cont. Apparent Power (VA)	8000	10000	12000	13000
Power factor(adjustable)	1.0 (-0.8~ +0.8)			
Others				
Protective class	Class I			
Ingress protection (IP)	IP65			
Temperature (°C)	-25°C to +60°C (Derating 45°C)			
Inverter Isolation	Non-isolated			
Overtoltage category	OVC III (AC Main), OVC II (PV)			

Document no. : 6148888.01COC

Specifications table				
Model	BNT015KTL	BNT017KTL	BNT020KTL	BNT025KTL
PV input				
Max PV power (W)	22500	25500	30000	37500
Vmax PV (Vdc) (absolute Max.)	1100	1100	1100	1100
Isc PV (absolute Max.) (A)	30 + 48	48 x 2	48 x 2	48 x 2
Max. PV input current (A)	20 + 32	32 x 2	32 x 2	32 x 2
Number MPP trackers	2	2	2	2
Number input strings	1/2	2/2	2/2	2/2
MPPT voltage range (Vdc)	150-1000	150-1000	150-1000	150-1000
Vdc range @ full power (Vdc)	500-850	500-850	500-850	500-850
AC Grid (output)				
Normal AC Voltage (VAC)	3P+N+PE/3P+PE 230/400			
Frequency (Hz)	50			
Normal AC Current (A)	21.8	24.7	29	36.3
Max. cont. output current (A)	27	30	32	40
Normal Power (W)	15000	17000	20000	25000
Rated Apparent Power (VA)	15000	17000	20000	25000
Max. cont. Power (W)	15000	17000	20000	25000
Max. cont. Apparent Power (VA)	15000	17000	20000	25000
Power factor(adjustable)	1.0 (-0.8~ +0.8)			
Others				
Protective class	Class I			
Ingress protection (IP)	IP65			
Temperature (°C)	-25°C to +60°C (Derating 45°C)			
Inverter Isolation	Non-isolated			
Overtoltage category	OVC III (AC Main), OVC II (PV)			

Document no. : 6148888.01COC

Type of generating unit:

Tipologia di apparato:

Static Conversion Device <i>Dispositivo di conversione statica</i>	Interface Protection <i>Protezione di interfaccia</i>	Interface Protection Device <i>Dispositivo di interfaccia</i>	Rotating Generator Device <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

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:

1. Intertek Testing Services Shanghai

Building No.86, 1198 Qinzhou Road (North), Caohejing Development Zone, Shanghai 200233, China

Accreditation Number: 3309.02 (A2LA-ILAC)

2. 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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