



**BUREAU
VERITAS**

Certificate of compliance

Certificate No.: 2088AP0917N006046

Equipment: Hybrid Inverter

Brand Name:



Model: HYD 3000-EP, HYD 3680-EP, HYD 4000-EP, HYD 4600-EP,
HYD 5000-EP, HYD 5500-EP, HYD 6000-EP

Applicant:

Shenzhen SOFARSOLAR Co., Ltd.

401, Building 4, AnTongDa Industrial Park, District 68, XingDong Community,
XinAn Street, BaoAn District, Shenzhen, China

Report No.: PVSP200917N006-9

Applied rules and standards

UNE 217001 IN:2015

Requirements and testing of systems to avoid energy emissions to distribution networks
Royal Decree No. 244 / 2019 of 5 April sets out the administrative, technical and economic conditions for
self generation. Annex I: systems to prevent energy emissions to the network.



Name: James Huang
Technical Manager / New Energy Team
Date: 2021-03-25

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Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch.
Information given in this document is related to the tested specimen of the described electrical sam



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Ratings.....:	HYD 3000-EP	HYD 3680-EP	HYD 4000-EP
Full load MPP DC voltage range [V]:	160-520V	180-520V	200-520V
Input DC voltage range[V].....:	90-600V		
Input DC current [A].....:	Max. 13A/13A		
Output AC voltage [V].....:	L/N/PE, 230Vac, 50Hz		
Output AC current [A].....:	15,0	16,0	20,0
Output power [W].....:	3000	3680	4000
Max. output power [VA].....:	3300	3680	4400
Output DC voltage range [V].....: [Battery charge].....:	42-58V		
Input/Output DC current [A].....: [Battery charge/discharge].....:	Max. 75A	Max. 80A	Max. 85A
Charge and discharge power[W]...:	Max. 3750	Max. 4000	Max. 4250
Output AC voltage [V].....:	L/N/PE, 230Vac, 50Hz		
Max. Input/Output AC current [A] ..: [Battery charge/discharge mode] ...:	13,6	16,0	18,2
Max. Input/Output AC power [VA]..: [Battery charge/discharge mode] ...:	3000	3680	4000



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Ratings.....	HYD 4600-EP	HYD 5000-EP	HYD 5500-EP	HYD 6000-EP
Full load MPP DC voltage range [V] :	230-520V	250-520V	250-520V	300-520V
Input DC voltage range[V]..... :	90-600V			
Input DC current [A]..... :	Max. 13A/13A			
Output AC voltage [V]..... :	L/N/PE, 230Vac, 50Hz			
Output AC current [A]..... :	20,9	21,7	25,0	27,3
Output power [W]..... :	4600	5000	5000	6000
Max. output power [VA]..... :	4600	5000	5500	6000
Output DC voltage range [V]..... : [Battery charge]..... :	42-58V			
Input/Output DC current [A]..... : [Battery charge/discharge]..... :	Max. 100A			
Charge and discharge power[W]... :	Max. 5000			
Output AC voltage [V]..... :	L/N/PE, 230Vac, 50Hz			
Max. Input/Output AC current [A] .. : [Battery charge/discharge mode] ... :	20,9	22,7	22,7	22,7
Max. Input/Output AC power [VA].. : [Battery charge/discharge mode] ... :	4600	5000	5000	5000



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General information of external current transducer/ power meter		
Power meter		
Model	DDSU666	ACR10R-D24TE (spare material)
Electrical parameter		
Regulated working voltage range Phase to neutral [Vac]	0,9-1,1Un	1,2Un
Support network Single Phase / three Phase.....	Single Phase	
self -consumption	≤2W/10VA	≤0,2VA
communication		
Supported communication interfaces	RS485/ Modbus-RTU	
Communication protocol.....	Modbus-RTU	
Reaction time.....	1s	



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General information of external current transducer/ power meter	
Current transducer	
Model :	HY94C2
Primary rated current	200 A
Secondary rated current	100 mA
Accuracy class @ $R_L \leq 20\Omega$ (IEC 60044-1:2003)..... :	0,5
R.m.s.voltage for AC isolation test @50Hz,1 min..... :	2kV
Voltage transformer ratio	2000:1
Insulation resistance @500V DC .. :	100M Ω
Ambient storage temperature..... :	-45°C ..+90°C
Ambient operating temperature..... :	-40°C ..+85°C
Environmental relative humidity :	$\leq 90\%RH$
Highest voltage for equipment..... :	0,72kV
Length of secondary wires..... :	1 $\pm 3\%$ m
Working frequency	50...400Hz
Primary aperture..... :	24*24mm
Overload rating	120%
Altitude	$\leq 1000m$
Working environment	No serious pollution No strong vibration



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Description of the vector system to depict test results:

The regarded system of the voltage and current vectors is the generator reference system:

- If the inverter feeds to the grid the active power is measured with positive sign.
- If the load consumes from grid the active power is measured with negative sign.

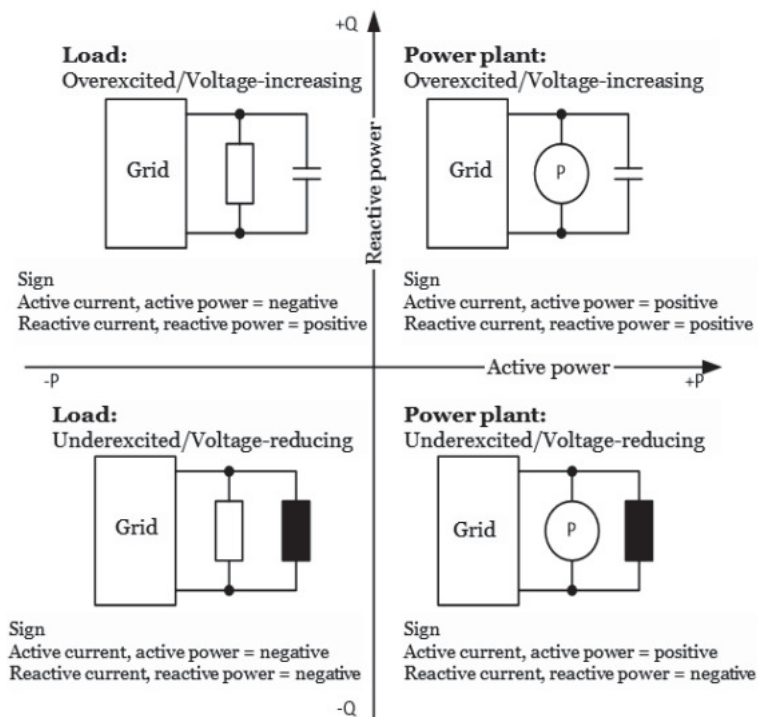


Figure 1 – Generator reference arrow system

General product information:

The inverter converts DC voltage, generated by photovoltaic modules, into AC voltage.

The units are single-phases hybrid-inverter.

Rate of change of frequency (RoCoF) detection was used for LOM protection.

Description of the electrical circuit

The internal control is redundant built. It consists of Main DSP(U4) and slave DSP(U43).

The Main DSP(U4) can control the relays, measures voltage, and frequency, AC current with injected DC, insulation resistance and residual current, In addition it tests the array insulation resistance and the RCMU circuit before each start up.

The slave DSP(U43) is using for controlling the relays, measuring the voltage , frequency, inject a dc AC current, the residual current, and communicating with the master DSP(U4). And if the communicating with the master DSP, the slave DSP will disconnect the relays.

The unit provides two relays in series on Line and Neutral conductors. When single-fault applied to one relay, alarm an error code in display panel, another redundant relay provides basic insulation maintained between the PV array and the mains. All the relays are tested before start up. Both controllers Main DSP(U4), Slave DSP(U43) can open the relays.

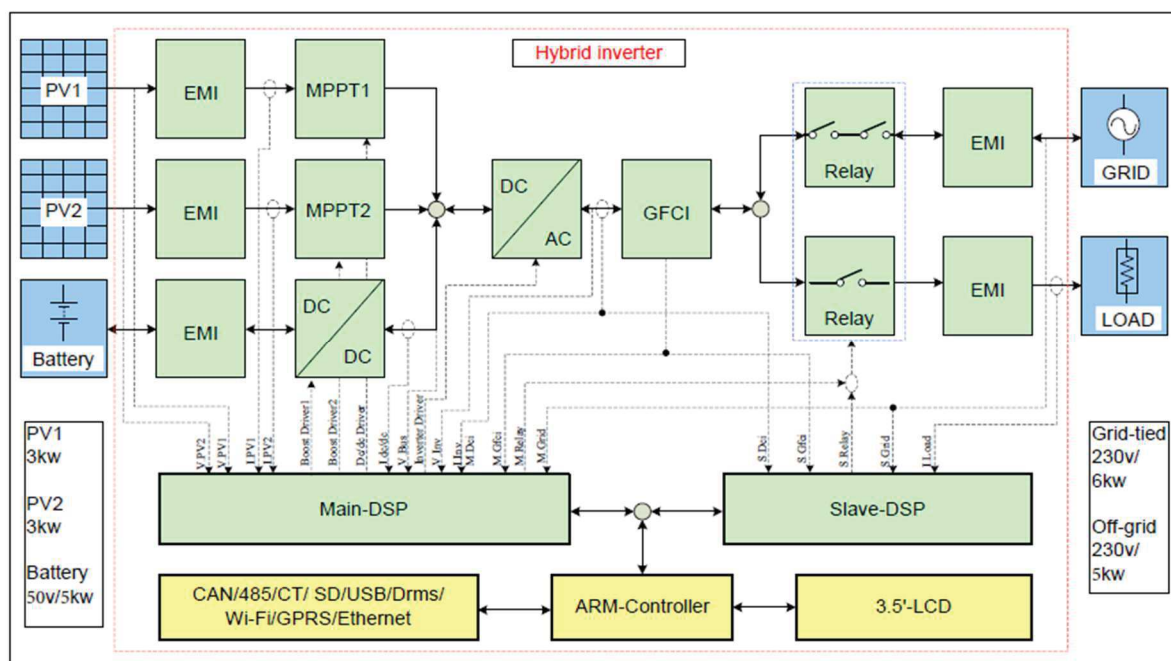


Figure 2 – Block diagram



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Application Scenarios:

Single machine photovoltaic power generation system: Solar inverter + smart power sensor + current sensor

The smart power sensor is used to realize power restriction for household energy management. It adopts RS485 communication, which can realize the electrical quantity measurement, energy metering function and in respond to the upper host for the real-time data query.

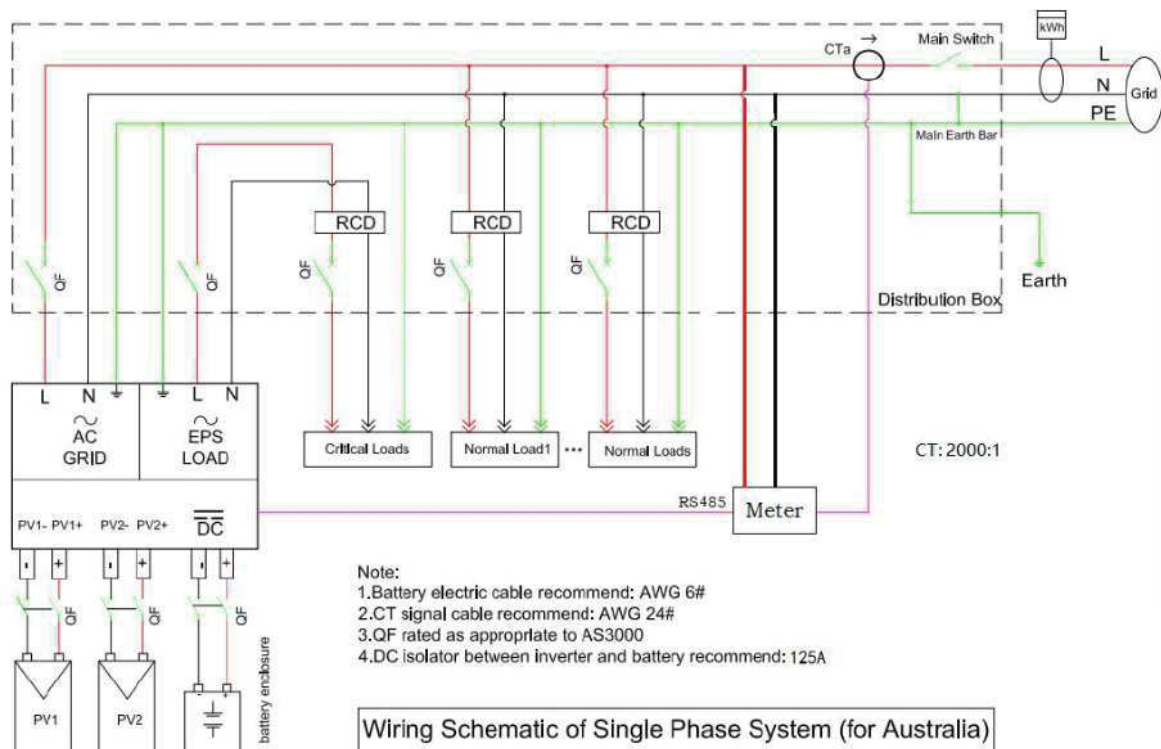


Figure 3 –Scheme of Single machine photovoltaic power generation system