High Frequency on/off hybrid solar inverter

PH1800 PLUS SERIES (2KW-5.5KW)

MUST
Solar Inverter
MUST
Solar Inverter

PH1800 Plus series hybrid solar inverter, it can realize self-consumption and feed-in to the grid from solar energy with best solution according to your setting. During the daytime solar power can run your home appliances and if there is extra solar power it will feed-in to the grid or you can choose to save them on the battery to backup when power failure or nighttime.

MUST

Features

- Rated Power 2KW-5.5KW
- Pure sine wave output
- Self-consumption and Feed-in to the grid
- Programmable supply priority for PV, Battery or Grid
- User-adjustable battery charging current suits different types of batteries
- Programmable multiple operation modes: Grid-tie, off-grid and grid-tie with backup
- Multiple communication for USB, RS-485, Modbus
- Monitoring software & Wifi Kit for real-time status display and control
- Parallel operation up to 3 units

Rated power
2kw-5.5kw

Battery Voltage
24VDC/48VDC

MAX charging current
140A

WIFI remote
monitoring

Multi Protection

High frequency above
93% high efficiency

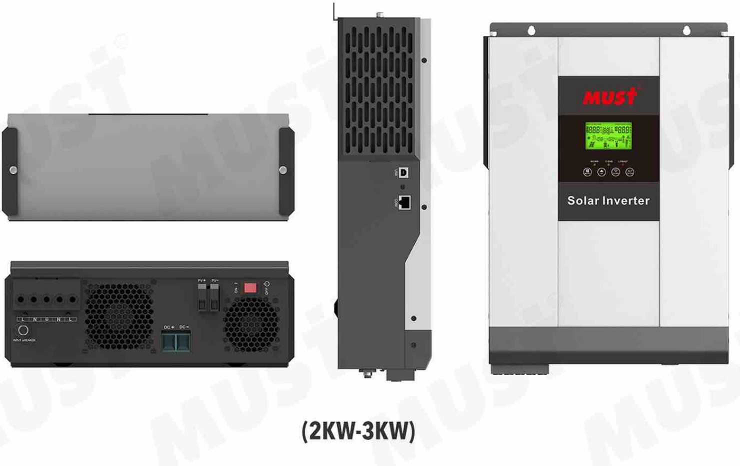
Wide AC input
90-280V

Lead-acid/Lithium Battery
Optional

Appearance

MUST

MUST
Solar Inverter


MUST
Solar Inverter
PV+
PV−
DC+
DC−
INPUT BREAKER

(2KW-3KW)

MUST
Solar Inverter
AC INPUT
AC OUTPUT
INPUT BREAKER
DC+
DC−
PV+
PV−
ON
OFF

(3KW-5.5KW)

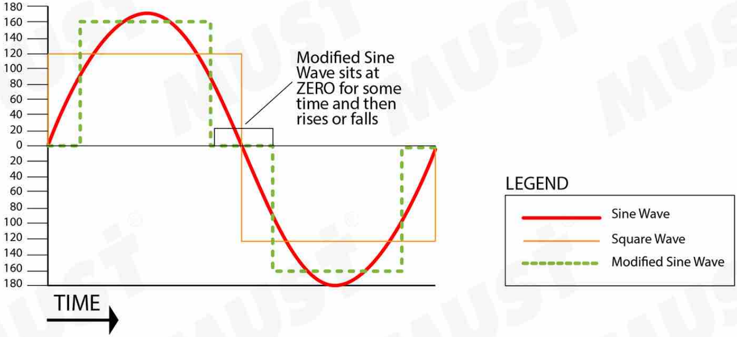
Inside Structures

MUST
Solar Inverter

MUST®

PRODUCT FEATURES

SMART & INTELLIGENT FEATURES

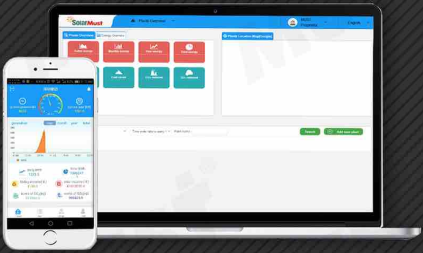


Pure Sine Wave Output

The electrical waveform output of PH1800 is a pure sine wave, which has the same quality as utility and/or domestic power. This type of waveform is suitable for most all electrical devices, appliances and tools. This pure sine wave unit provides more capabilities than modified sine wave inverters, because it is a cleaner form of power. The pure sine wave also effectively reduces the noise produced while using appliances.

MUST®

WiFi-RTU
8000-10633-00
PN:B1417310199145
PWR
LINK
TXD
RXD
Wi-Fi RTU
RESET
ANT
RS-232



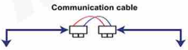
Wifi communication

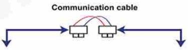
you can download this app on your cellphone and monitor the whole system, you will know know how much electricity the system generate and sell to utility.

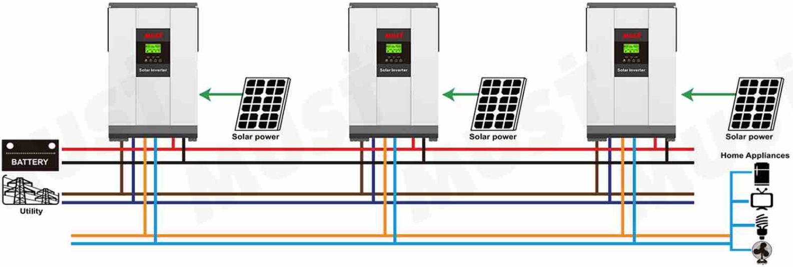
Android

ISO

MUST MUST MUST MUST


Communication cable


Communication cable

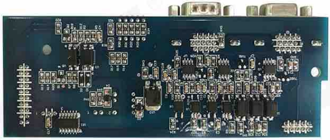

Solar inverter
Solar inverter
Solar inverter
Solar power
Solar power
Solar power
BATTERY
Utility
Home Appliances

3-5.5KW Parallel function

Customer can use 2pcs or 3 pcs inverters to expand the system capacity. Maximum 3pcs parallel to single phase or three phase.

Parallel kit picture as below:

A B C D
250-00450-00
2016-3-1
CN8
1071001807120401

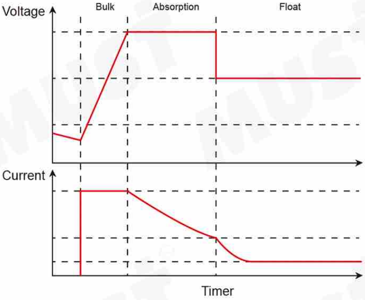


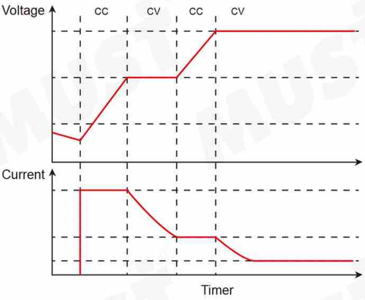
Charging algorithm

3-Step (Flooded Battery, AGM/Gel/Lithium Battery),4-Step(LI)

Charging algorithm for lead acid battery

Charging algorithm for Lithium battery





JOINT UTILITY AND SOLAR CHARGING		
Inverter model	2KW-3KW 24VDC	3KW-5.5KW 48VDC
MPPT CHARGER		
Max Charging Current	140A	140A
Default Charging Current	80A	80A

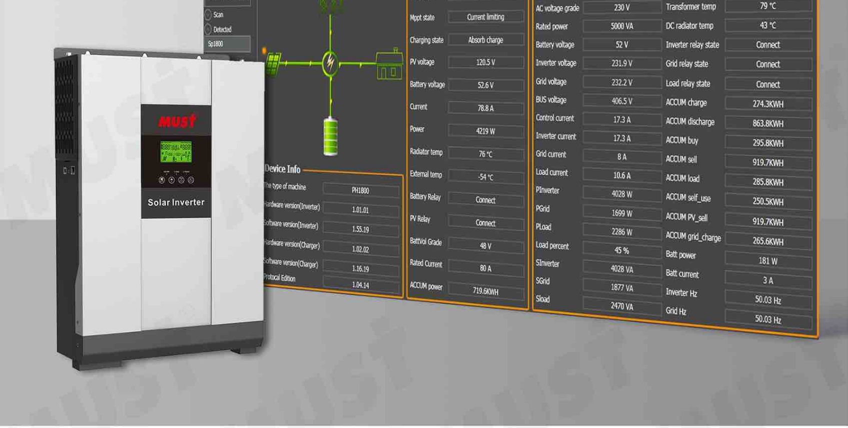
1358 x 722
erMonitor
Sp1800
Data
AppParamters
PortSetting
Themes
Login
Help
Ports
Id4

☑ COM22-Scan
☑ COM26-Working

Charger message
Work state: Work Mode

Inverter message
Work state: Grid-Tie
AC radiator temp: 44 °C

MUST


must
Solar Inverter
Scan
Detected
Sp1800

Device Info

The type of machine	PH1800
Hardware version(Inverter)	1.01.01
Software version(Inverter)	1.55.19
Hardware version(Charger)	1.02.02
Software version(Charger)	1.16.19
Protocal Edition	1.04.14

Mppt state	Current limiting
Charging state	Absorb charge
PV voltage	120.5 V
Battery voltage	52.6 V
Current	78.8 A
Power	4219 W
Radiator temp	76 °C
External temp	-54 °C
Battery Relay	Connect
PV Relay	Connect
BattVol Grade	48 V
Rated Current	80 A
ACCUM power	719.6KWH

AC voltage grade	230 V
Rated power	5000 VA
Battery voltage	52 V
Inverter voltage	231.9 V
Grid voltage	232.2 V
BUS voltage	406.5 V
Control current	17.3 A
Inverter current	17.3 A
Grid current	8 A
Load current	10.6 A
PInverter	4028 W
PGrid	1699 W
PLoad	2286 W
Load percent	45 %
SInverter	4028 VA
SGrid	1877 VA
Sload	2470 VA

Transformer temp	79 °C
DC radiator temp	43 °C
Inverter relay state	Connect
Grid relay state	Connect
Load relay state	Connect
ACCUM charge	274.3KWH
ACCUM discharge	863.8KWH
ACCUM buy	295.8KWH
ACCUM sell	919.7KWH
ACCUM load	285.8KWH
ACCUM self_use	250.5KWH
ACCUM PV_sell	919.7KWH
ACCUM grid_charge	265.6KWH
Batt power	181 W
Batt current	3 A
Inverter Hz	50.03 Hz
Grid Hz	50.03 Hz

USB/RS485 monitoring

You can connect inverter with PC with communication cable and monitor the inverter woking status and all inverter parameter, you even can set these parameters such as AC voltage, battery voltage, charge current, working mode etc

Easy to read all working modes and parameters in LCD

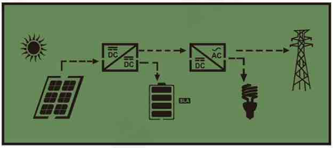
MUST

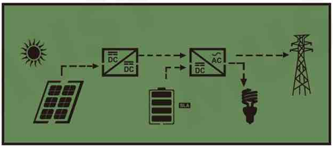
INPUT PV BATT TEMP
OUTPUT GRID INV LOAD
CHARGING
AC/INV
CHG
FAULT
MENU
UP
DOWN
ENTER

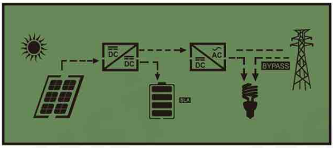
Sell state

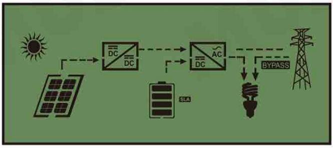
Note:

*Sell mode: The system generates electricity when the sun shines, supplying power to your home and sending any excess power back tothe grid.


DC
DC
AC
DC
SLA

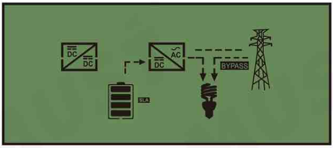

DC
DC
AC
DC
SLA


DC
DC
AC
DC
BYPASS
SLA


DC
DC
AC
DC
BYPASS
SLA

Match load state

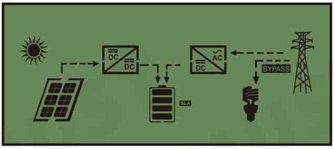
Note: DC power produced from your solar array is converted by the inverter into AC power, which is then sent to your main electrical panel to be used by your household appliances. Any

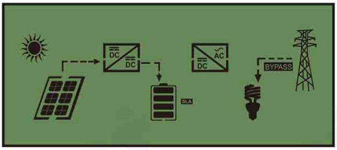

DC
DC
AC
DC
BYPASS
SLA

excess power generated is not sold back to the grid, but stored in battery.

Charge state

PV energy and grid can charge batteries.


DC
DC
AC
DC
BYPASS
SLA

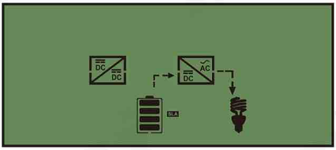

DC
DC
AC
DC
BYPASS
SLA

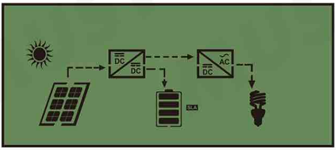
Bypass state

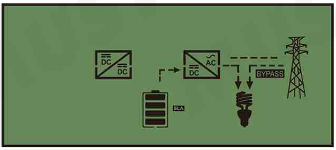
Error are caused by inside circuit error or external reasons such as over temperature, output short circuited and so on.

Off-Grid state

The inverter will provide output power from battery and PV power.


DC
DC
AC
DC
SLA

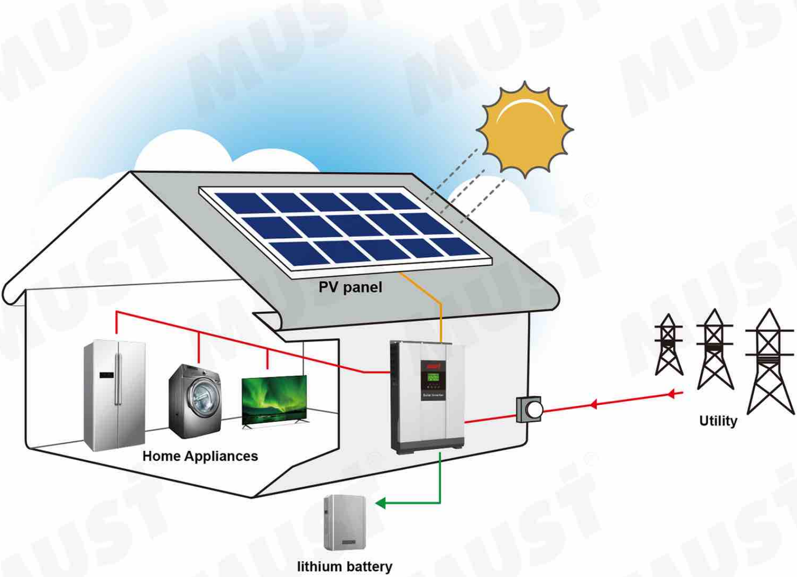

DC
DC
AC
DC
SLA


DC
DC
AC
DC
BYPASS
SLA

MUST

PH1800 series intelligent working mode

Grid-Tie with Battery Back-UpGrid tie with backup system is intelligent to run your house, it generates electricity when the sun is shining, and supplies power to your house while selling any excess power back to the utility to reduce your electric bill. However, the PV energy system continues to operate during a grid outage. The batteries provide quiet, uninterrupted back-up power for loads such as refrigerators, lights, pumps, and computers, while your PV array continues to produce power and charge the batteries during the day. When the grid is restored, the inverter/chargers help recharge the batteries to their full state of charge while the grid powers all AC loads. Once the batteries are recharged, the system returns to normal operation.

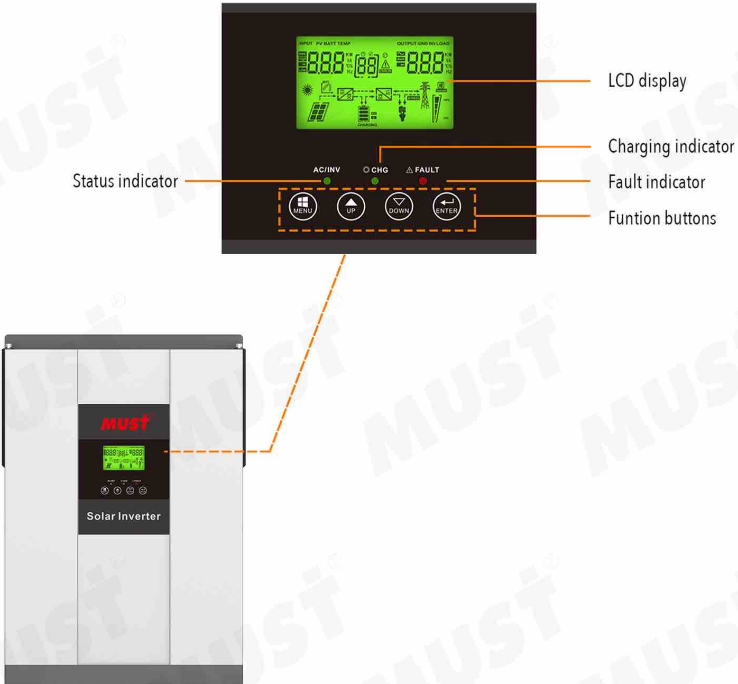

PV panel
Home Appliances
Utility
lithium battery

MUST

PRODUCT DETAILS

MUST HELP YOU CONTROL EVERY DETAIL

Details reflect quality


INPUT PV BATT TEMP
OUTPUT GRID INV LOAD
CHARGING
AC/INV
CHG
FAULT
MENU
UP
DOWN
ENTER
MUST
Solar Inverter

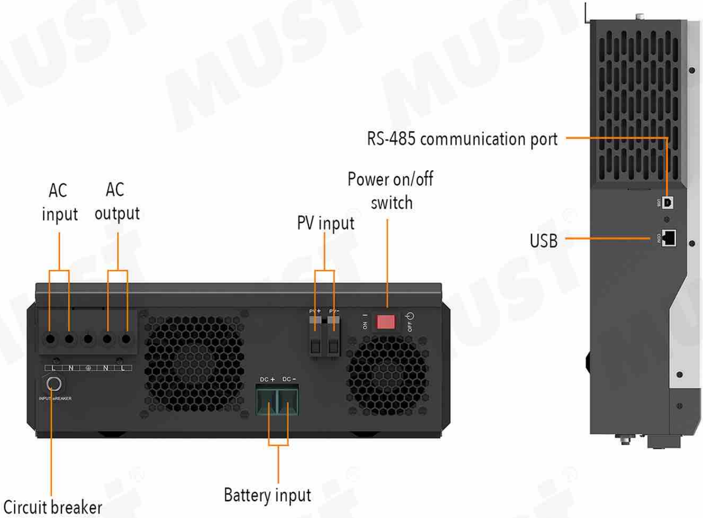
LCD display

Charging indicator

Status indicator

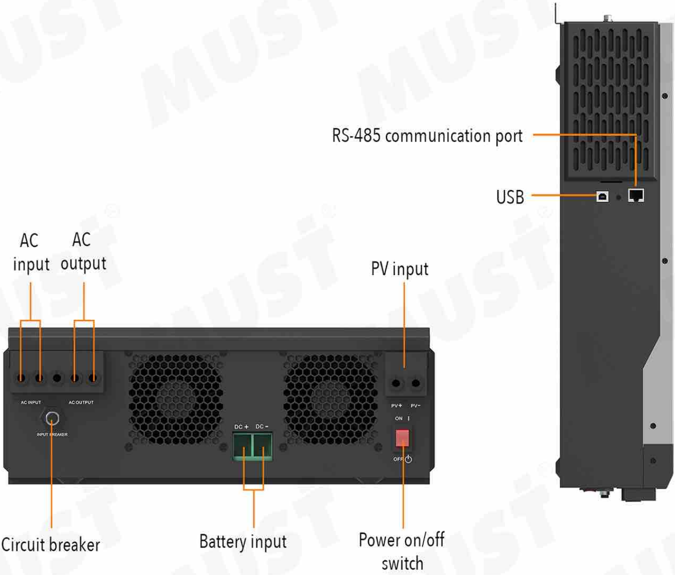
Fault indicator

Funtion buttons


RS-485 communication port
Power on/off switch
AC input
AC output
PV input
USB
PV +
PV −
ON
OFF
L
N
⊕
N
L
INPUT BREAKER
DC +
DC −
USB
COM
Circuit breaker
Battery input

(2KW-3KW)

MUST

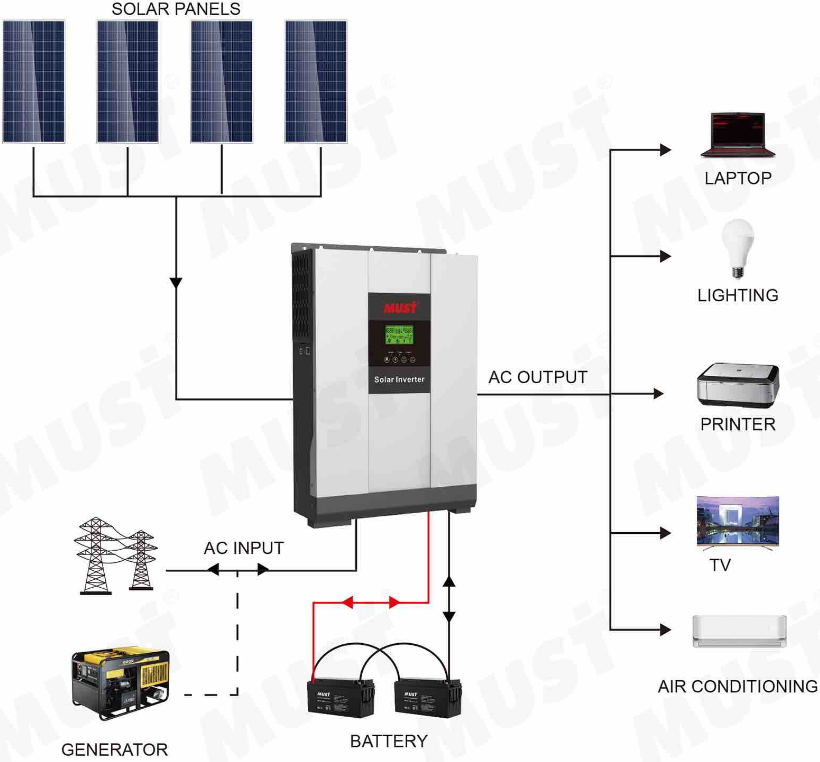

RS-485 communication port
USB
AC input
AC output
PV input
AC INPUT
AC OUTPUT
INPUT BREAKER
DC + DC −
PV+ PV−
ON
OFF
Circuit breaker
Battery input
Power on/off switch

(3KW-5.5KW)

INVERTER SYSTEM CONNECTION

INVERTER + SOLAR PANELS + GRID + APPLICATION LOADS

MUST


SOLAR PANELS
MUST
Solar Inverter
AC OUTPUT
LAPTOP
LIGHTING
PRINTER
TV
AIR CONDITIONING
AC INPUT
GENERATOR
BATTERY

PRODUCT PARAMETERS

MAKE SURE EACH PARAMETER IS TRUE

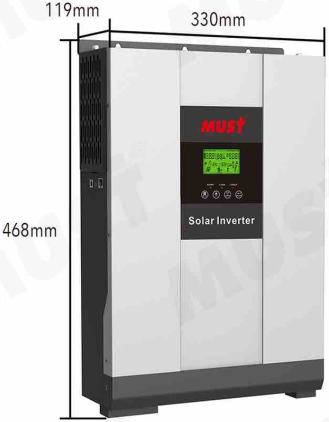
MUST®

Learn more about the product

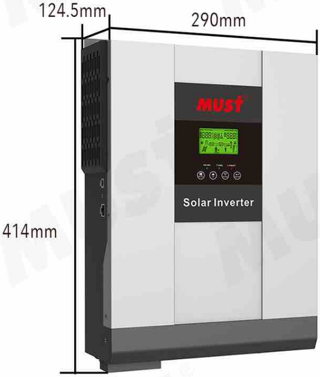
MODEL		PH18-2024 Plus	PH18-3024 Plus	PH18-3048 Plus	PH18-4048 Plus	PH18-5048 Plus	PH18-5548 Plus
Nominal Battery System Voltage		24VDC		48VDC			
INVERTER OUTPUT	Rated Power	2000W	3000W	3000W	4000W	5000W	5500W
	Surge Power	4000W	6000W	6000W	8000W	10000W	11000W
	Waveform	Pure Sine Wave					
	AC Voltage Regulation (Batt. Mode)	220VAC~240VAC(setting)					
	Electric Current	8.7A	13A		17.4A	21.7A	23.9A
	Inverter Efficiency(Peak)	93%					
	Transfer Time	10ms(For For Personal Computers) 20ms(For Other Home Appliance)					
AC INPUT	Voltage	230VAC					
	Selectable Voltage Range	170~280VAC(For Personal Computers), 90~280VAC(For Home Appliances), 184~253VAC(VDE4105)					
	Frequency Range	50Hz/60Hz (Auto Sensing)					
BATTERY	Normal Voltage	24VDC		48VDC			
	Floating Charge Voltage	27.4VDC		54.8VDC			
	Overcharge Protection	30VDC		60VDC			
SOLAR CHARGER & AC CHARGER	Maximum PV Array Open Circuit Voltage	145VDC					
	PV Array MPPT Voltage Range	30~130VDC		64~130VDC			
	Standby Power Consumption	2W					
	Maximum PV Array Power	2000W		4000W			
	Maximum Solar Charge Current	80A					
	Maximum Efficiency	98%					
	Maximum AC Charge Current	60A					
	Maximum Charge Current	140A					

MECHANICAL SPECIFICATIONS	Machine Dimensions (W*H*D)	272*355*100 mm	297.5*468*125 mm
	Net Weight(KG)	7.4	14
	Package Dimensions(W*H*D)	485*393*251	638*395*241
	Gross Weight(KG)	9.5	16.4
OTHER	Humidity	5% to 95% Relative Humidity (Non-condensing)	
	Operating Temperature	0°C ~55°C	
	Storage Temperature	-15°C ~60°C	

Size

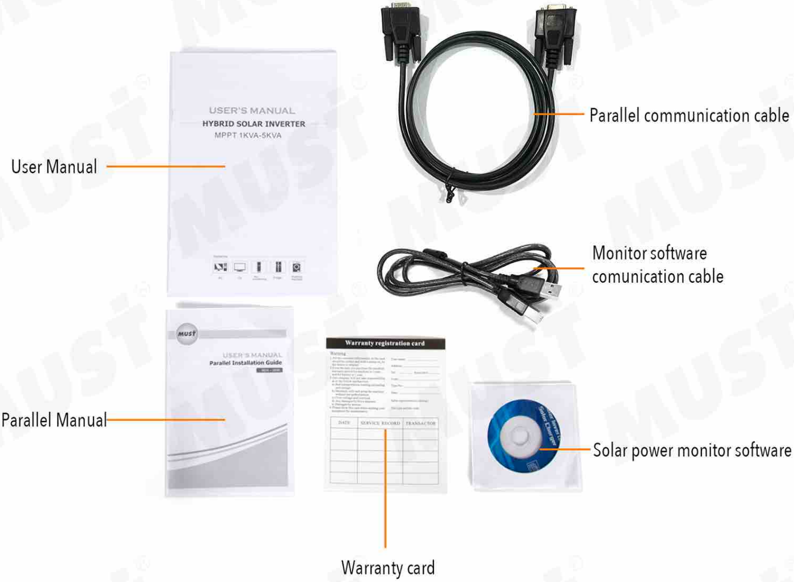

119mm
330mm
468mm
MUST
Solar Inverter

(3-5.5KW)


124.5mm
290mm
414mm
MUST
Solar Inverter

(2-3KW)

Package


USER'S MANUAL
HYBRID SOLAR INVERTER
MPPT 1KVA-5KVA
User Manual
Parallel communication cable
Monitor software comunication cable
MUST
USER'S MANUAL
Parallel Installation Guide
Parallel Manual
Warranty registration card
DATE
SERVICE RECORD
TRANSACTOR
Solar Inverter
Solar Charger
Solar power monitor software
Warranty card

COLOR BOX DIMENSION	
2KW-3KW：540*395*241MM	4KW-5.5KW：638*295*241MM

LOADING		
20GP	40GP	40HQ
450pcs / 500pcs	900pcs / 1000pcs	1100pcs / 1300pcs

MUST

MUST
Solar Inverter
Green Energy Advocates
USER'S MANUAL
HYBRID SOL
Warranty registration card
Installation Guide
CE

Packaging

Applicable appliances

ELECTRONIC PRODUCT	APPLIANCE	ELECTRONIC PRODUCT	APPLIANCE	ELECTRONIC PRODUCT	APPLIANCE
LED LIGHT	✓	WASHING MACHINE	✓	ELECTRIC IRON	✓
INCANDESCENT LAMP	✓	HAND MILL	✓	HOT WATER BOTTLE	✓
FAN	✓	HAND DRILL	✓	DRYER	✓

MUST

DESKTOP PC	✓	IMPACT DRILL	✓	PROJECTOR	✓
LAPTOP	✓	SUBMERSIBLE PUMP	✓	AIR DUCT	✓
ELECTIRC COOKER	✓	AIR-CONDITIONING FAN	✓	PRINTER	✓
TV	✓	CRT TV	✓	VACUUM CLEANER	✓
REFRIGERATOR	✓	SOYMILK MACHINE	✓	DIGITAL PRODUCT	✓

MUST®

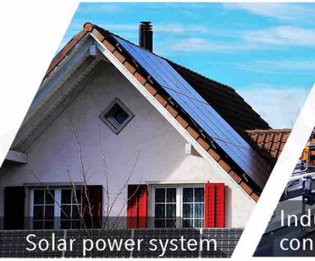
PRACTICAL APPLICATION

APPLICABLE PLACE

CCTV

Shop / Supermarket

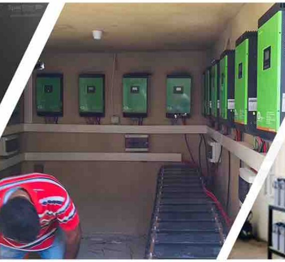
Office


Solar power system

Industrial intellectual control system

Ventilation systems

PROJECT REFERENCE

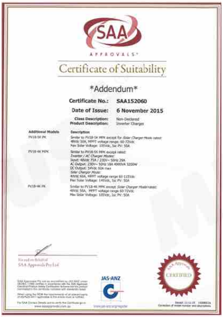


MUST®

PROFESSIONAL CERTIFICATION

CE IEC EMS SAA ISO9001

High quality and high standard



SAA
APPROVALS

Certificate of Suitability

Addendum

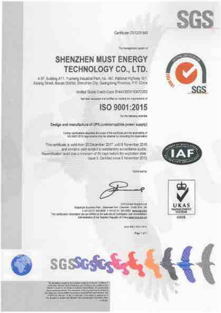
Certificate No.: SAA152060
Date of Issue: 6 November 2015
Class Description: Non-Declared
Product Description: Inverter Charges

Additional Models	Description
PV18-5K PK	Similar to PV18-5K MPK except for *Solar Charger Mode rated:* 48Vdc 50A, MPPT voltage range: 60-72Vdc Max Solar Voltage: 105Vdc, Isc PV: 50A
PV18-4K MPK	Similar to PV18-5K MPK except rated: *Inverter / AC Charger Mode:* Input: 48Vdc 75A / 230V~ 50Hz 29A AC Output: 230V~ 50Hz 18A 4000VA 3200W DC Output: 54Vdc 60A max *Solar Charger Mode:* 48Vdc 60A, MPPT voltage range 60-115Vdc Max Solar Voltage: 145Vdc, Isc PV: 50A
PV18-4K PK	Similar to PV18-4K MPK except *Solar Charger Mode rated:* 48Vdc 50A, MPPT voltage range 60-72Vdc Max Solar Voltage: 105Vdc, Isc PV: 50A

For and on Behalf of
SAA Approvals Pty Ltd

JAS-ANZ

CERTIFIED



SGS

Certificate CN12/31440

SHENZHEN MUST ENERGY TECHNOLOGY CO., LTD.

4-5F, Building A11, Yusheng Industrial Park, No. 467, National Highway 107, Xixiang Street, Baoan District, Shenzhen City, Guangdong Province, P.R. China

ISO 9001:2015

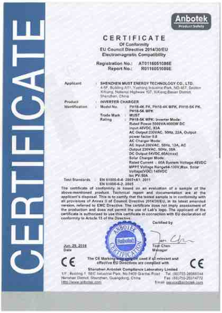
Design and manufacture of UPS (uninterruptible power supply)

This certificate is valid from 20 December 2017 until 9 November 2018 and remains valid subject to satisfactory surveillance audits. Recertification audit due a minimum of 60 days before the expiration date. Issue 3. Certified since 9 November 2012

IAF

UKAS MANAGEMENT SYSTEMS
0005

Page 1 of 1



CERTIFICATE

Anbotek
Product Safety

CERTIFICATE
Of Conformity
EU Council Directive 2014/30/EU
Electromagnetic Compatibility

Registration No.: AT0116051086E
Report No.: R0116051086E

Applicant : SHENZHEN MUST ENERGY TECHNOLOGY CO., LTD.
4-5F, Building A11, Yusheng Industrial Park, NO.467, Section Xixiang, National Highway 107, XiXiang,Baoan District, Shenzhen, China

Product : INVERTER CHARGER

Identification : Model No. : PH18-4K PK, PH18-4K MPK, PH18-5K PK, PH18-5K MPK

Trade Mark : MUST

Rating : PH18-5K MPK: Inverter Mode:
Rated Power:5000VA/4000W DC
Input:48VDC, 93A
AC Output:230VAC, 50Hz, 22A, Output power factor 0.8
AC Charger Mode:
AC Input:230VAC, 50Hz, 13A, AC
Output:230VAC, 50Hz, 38A
DC Output:54VDC,60A(max)
Solar Charger Mode:
Rated Current : 60A System Voltage:48VDC
MPPT Voltage Range64-130V,Max. Solar Voltage(VOC):145VDC
Isc PV:50A

Test Standards : EN 61000-6-4: 2007+A1: 2011
EN 61000-6-2: 2005

The certificate of conformity is based on an evaluation of a sample of the above-mentioned product. Technical report and documentation are at the applicant's disposal. This is to certify that the tested sample is in conformity with all provisions of Annex II of Council Directive 2014/30/EU, in its latest amended version, referred to EMC Directive. The certificate does not imply assessment of the production and does not permit the use of Lab's logo. The applicant of the certificate is authorized to use this certificate in connection with EU declaration of conformity to Article 15 of the Directive.

Certified by

Jun. 29, 2016
Date

Tom Chen
Manager

The CE Marking may only be used if all relevant and effective EU Directives are complied with.

Shenzhen Anbotek Compliance Laboratory Limited
1/F., Building 1, SEC Industrial Park, No.0409 Qianhai Road, Nanshan District, Shenzhen, Guangdong, China
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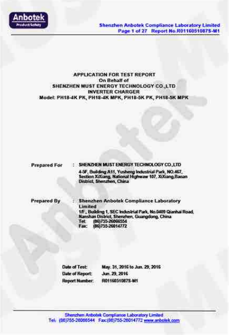
TEST REPORT

Have quality inspection to use with confidence

MUST



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APPLICATION FOR TEST REPORT
On Behalf of
SHENZHEN MUST ENERGY TECHNOLOGY CO.,LTD
INVERTER CHARGER
Model: PH18-4K PK, PH18-4K MPK, PH18-5K PK, PH18-5K MPK

Prepared For : SHENZHEN MUST ENERGY TECHNOLOGY CO.,LTD
4-5F, Building A11, Yusheng Industrial Park, NO.467,
Section XiXiang, National Highwaw 107, XiXiang,Baoan
District, Shenzhen, China

Prepared By : Shenzhen Anbotek Compliance Laboratory Limited
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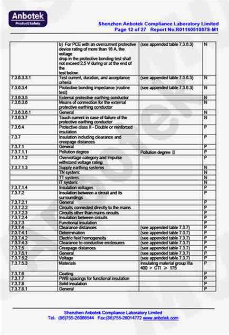
Date of Test: May. 31, 2016 to Jun. 29, 2016
Date of Report: Jun. 29, 2016
Report Number: R01160510875-M1

Shenzhen Anbotek Compliance Laboratory Limited
Tel: (86)755-26066544 Fax:(86)755-26014772 www.anbotek.com



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	b) For PCE with an overcurrent protective device rating of more than 16 A, the voltage drop in the protective bonding test shall not exceed 2,5 V during or at the end of the test below.	(see appended table 7.3.6.3)	N
7.3.6.3.3.1	Test current, duration, and acceptance criteria	(see appended table 7.3.6.3)	N
7.3.6.3.4	Protective bonding impedance (routine test)	(see appended table 7.3.6.3)	N
7.3.6.3.5	External protective earthing conductor		N
7.3.6.3.6	Means of connection for the external protective earthing conductor		N
7.3.6.3.6.1	General		N
7.3.6.3.7	Touch current in case of failure of the protective earthing conductor		N
7.3.6.4	Protective class II - Double or reinforced insulation		P
7.3.7	Insulation including clearance and creepage distances		P
7.3.7.1	General		P
7.3.7.1.1	Pollution degree	Pollution degree II	P
7.3.7.1.2	Overvoltage category and impulse withstand voltage rating		P
7.3.7.1.3	Supply earthing systems		N
	TN system:		N
	TT system:		N
	IT system:		N
7.3.7.1.4	Insulation voltages		P
7.3.7.2	Insulation between a circuit and its surroundings		P
7.3.7.2.1	General		P
7.3.7.2.2	Circuits connected directly to the mains		P
7.3.7.2.3	Circuits other than mains circuits		P
7.3.7.2.4	Insulation between circuits		P
7.3.7.3	Functional insulation		P
7.3.7.4	Clearance distances	(see appended table 7.3.7)	P
7.3.7.4.1	Determination	(see appended table 7.3.7)	P
7.3.7.4.2	Electric field homogeneity	(see appended table 7.3.7)	P
7.3.7.4.3	Clearance to conductive enclosures	(see appended table 7.3.7)	P
7.3.7.5	Creepage distances	(see appended table 7.3.7)	P
7.3.7.5.1	General	(see appended table 7.3.7)	P
7.3.7.5.2	Voltage	(see appended table 7.3.7)	P
7.3.7.5.3	Materials	Insulating material group IIIa 400 > CTI ≥ 175	P
7.3.7.6	Coating		P
7.3.7.7	PWB spacings for functional insulation		P
7.3.7.8	Solid insulation		P
7.3.7.8.1	General		P

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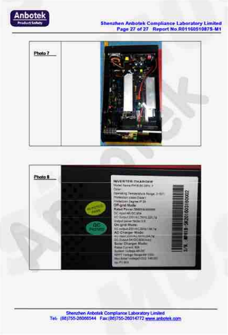

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Photo 7

Photo 8

INVERTER CHARGER
QC PASSED

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