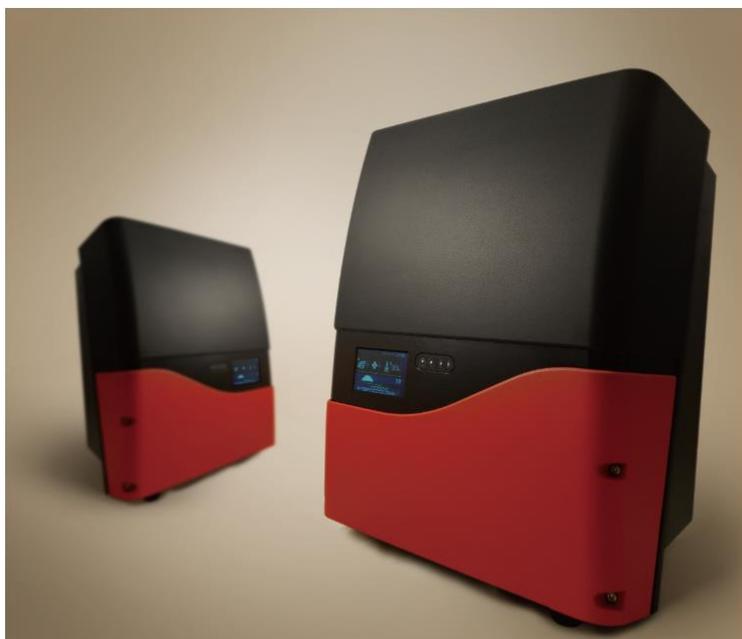


# THREE PHASE ON-GRID PV INVERTER

PV-5000T-U & PV-8000T-U & PV-10000T-U & PV-15000T-U & PV-20000T-U



## Installation & Operation Manual

# 1. Safety Precautions

Before beginning your journey, please read the following safety instructions carefully.



## ***Danger!***

High voltage inside inverter can cause Electric shock, even when inverter is not operating. Wait for at least 30 minutes before opening the enclosure.



## ***PV Modules ONLY!***

Designed for PV and solar power conversion only; do not use for other DC sources or conversion purposes.



## ***Qualified Personnel ONLY!***

Only Qualified technicians shall install or service unit(s) in accordance with local wiring regulations.



## ***Hot Surface***

Metallic parts of enclosure may be hot during operation.



## ***Recycle***

Do not throw this electronic device in a trash dumpster when being disposed of. To minimize pollution of environment, please consult your local service provider.

## 2. Contact Information

**Asian Power Devices Inc.**  
(Trade mark: PrimeVOLT )



TEL: +886-2-695-5388

FAX:+886-2-2693-1009

ADD: 11F., No.211, Nanyang St., Xizhi Dist.,New Taipei City 221, TAIWAN

Official Website: <http://www.primevolt.com>

## 3. Warranty Information

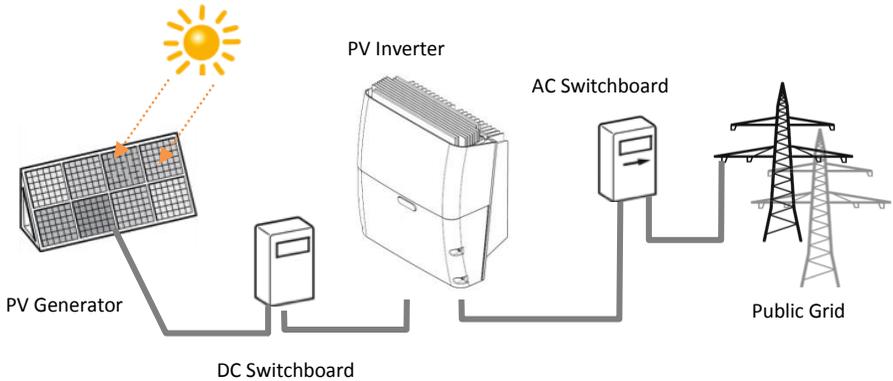
Warranty or liability will be void if damage caused by, but not limited to the following:

1. Unauthorized opening of unit
2. Installation faults such as improper environment, wiring and applications
3. Working conditions beyond specified
4. Improper operation of unit
5. Violation of safety instructions in this manual
6. Damage during transportation
7. Any internal modifications
8. Replacing or installation of unauthorized software
9. Unforeseen calamity or force majeure

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## 4. PV System

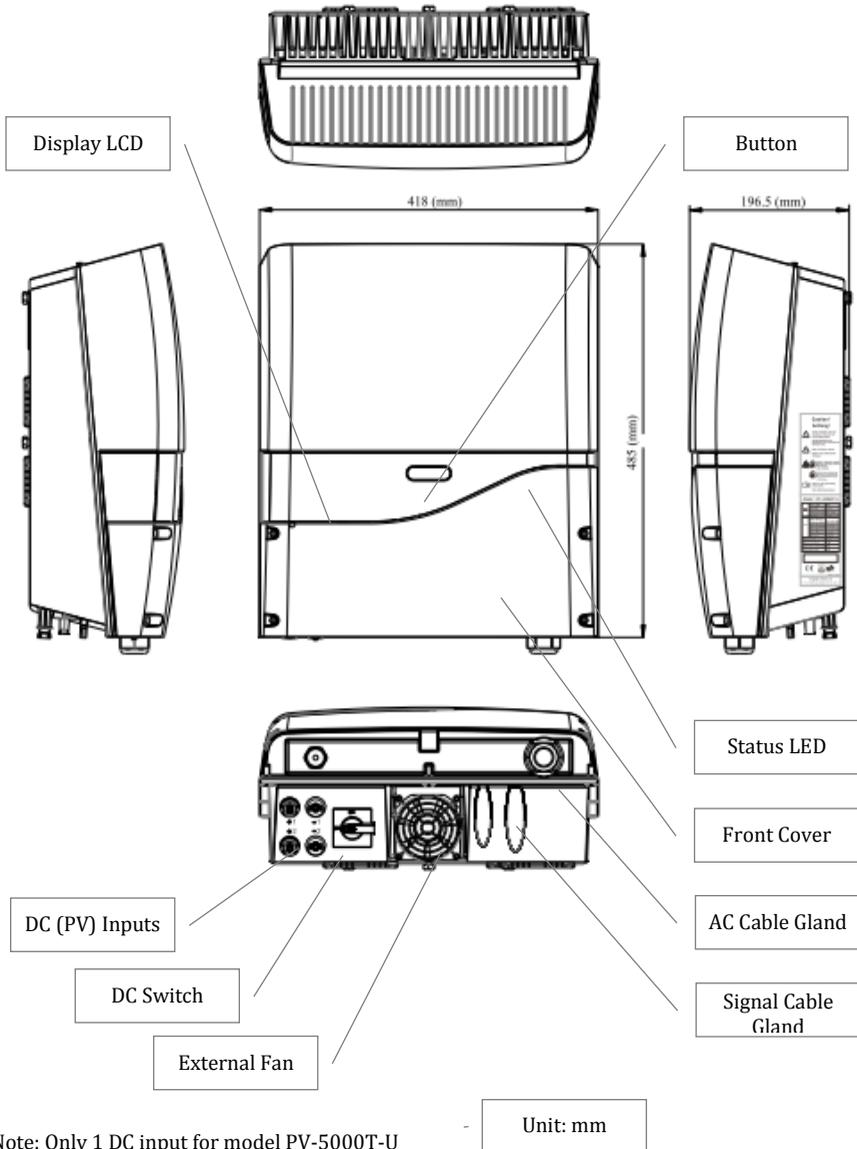


A typical PV system contains:

1. PV Generator: Receive sunlight and generate DC power
2. DC Switchboard: Links between PV panels and PV inverter, include of DC switch and surge protection
3. Inverter's DC Switch: PV Inverter with DC Switch(Optional).
4. PV Inverter: Converts DC power by PV panels to AC output power for public grid
5. AC Switchboard: Links between PV inverter and public grid
6. Public Grid: Provides utility for homes

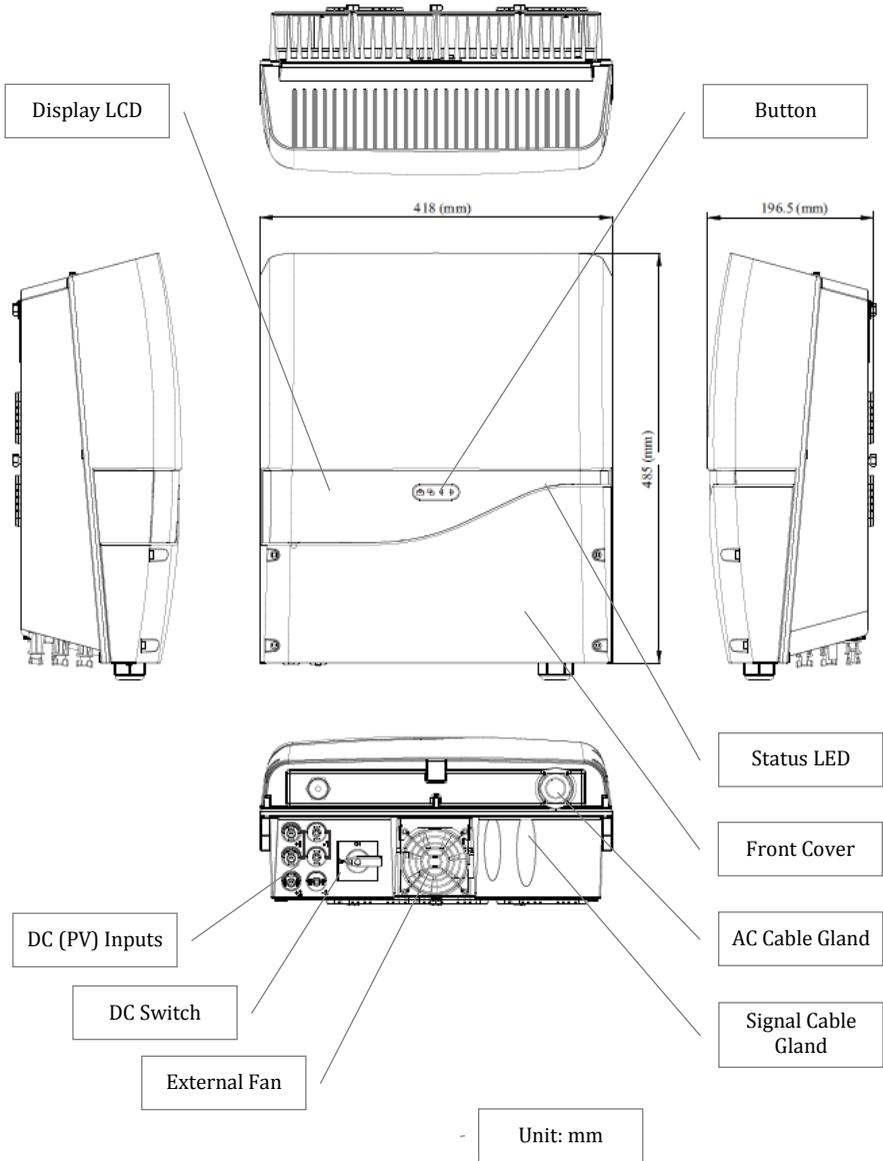
# 5. Product Overview

**PV-5000T-U/PV-8000T-U/PV-10000T-U**

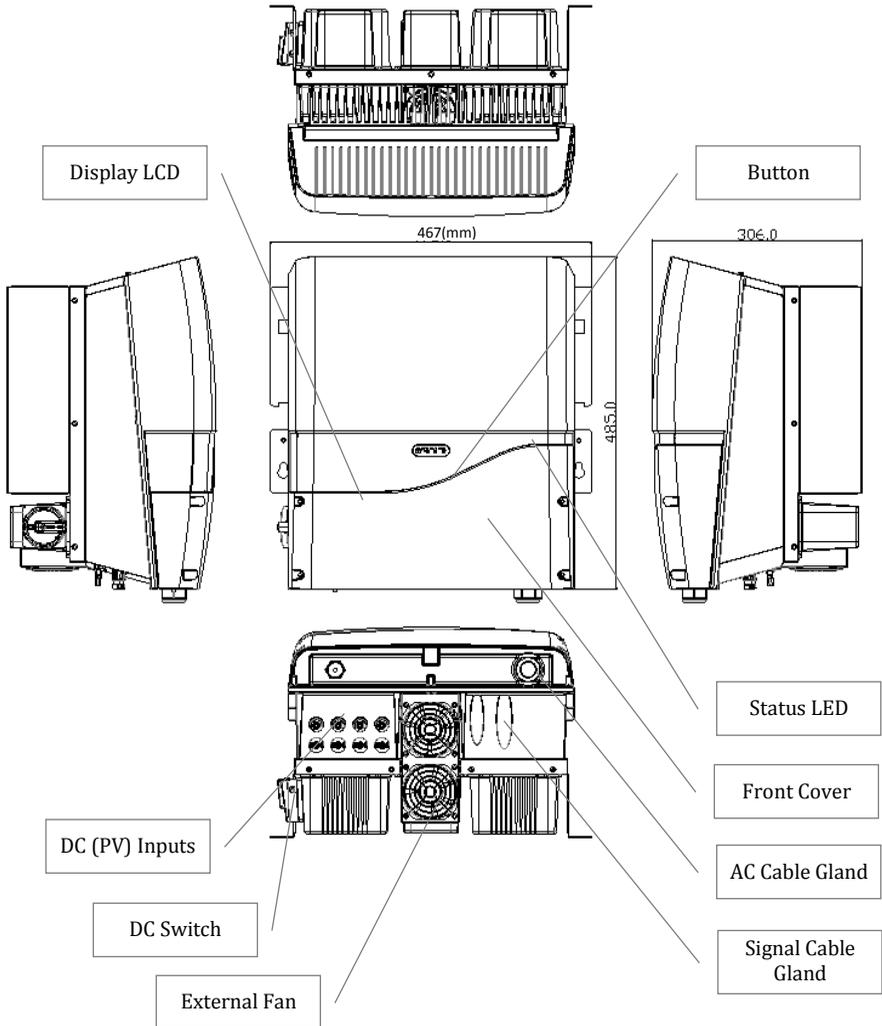


Note: Only 1 DC input for model PV-5000T-U

# PV-15000T-U



# PV-20000T-U



Unit: mm

■ Product Labels

<b>PrimeVOLT</b> Model : PV-5000T-U	
$V_{max. PV}$	980V
$I_{sc PV}$	14A
MPPT working range	180 ~ 980V
MPPT operating range (full load)	550 ~ 850V
IDC max.	10A
Rated Voltage (3W+N+PE)	220 / 230 / 240V
Rated Frequency	50 / 60 Hz
Rated Current	7.6 / 7.2 / 6.9A
Rated Power	5000W
SE max.	5000VA
Protective class	Class I
Degree of protection	IP 65
Power factor at rated power	0.99
Power factor range	± 0.8
  	
<small>www.tuv.com</small> <small>© 1990-2008</small> Made in Taiwan	

<b>PrimeVOLT</b> Model : PV-8000T-U	
$V_{max. PV}$	980V
$I_{sc PV}$	14A x 2
MPPT working range	180 ~ 980V
MPPT operating range (full load)	550 ~ 850V
IDC max.	10A x 2
Rated Voltage (3W+N+PE)	220 / 230 / 240V
Rated Frequency	50 / 60 Hz
Rated Current	12.1 / 11.6 / 11.1A
Rated Power	8000W
SE max.	8000VA
Protective class	Class I
Degree of protection	IP 65
Power factor at rated power	0.99
Power factor range	± 0.8
  	
<small>www.tuv.com</small> <small>© 1990-2008</small> Made in Taiwan	

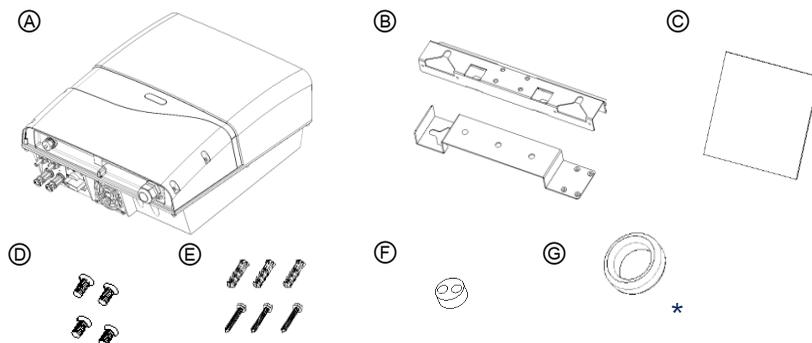
<b>PrimeVOLT</b> Model : PV-10000T-U	
$V_{max. PV}$	980V
$I_{sc PV}$	14A x 2
MPPT working range	180 ~ 980V
MPPT operating range (full load)	550 ~ 850V
IDC max.	10A x 2
Rated Voltage (3W+N+PE)	220 / 230 / 240V
Rated Frequency	50 / 60 Hz
Rated Current	15.1 / 14.5 / 13.9A
Rated Power	10000W
SE max.	10000VA
Protective class	Class I
Degree of protection	IP 65
Power factor at rated power	0.99
Power factor range	± 0.8
  	
<small>www.tuv.com</small> <small>© 1990-2008</small> Made in Taiwan	

<b>PrimeVOLT</b> Model : PV-15000T-U	
$V_{max. PV}$	980V
$I_{sc PV}$	28A / 14A
MPPT working range	180 ~ 980V
MPPT operating range (full load)	550 ~ 850V
IDC max.	20A / 10A
Rated Voltage (3W+N+PE)	220 / 230 / 240V
Rated Frequency	50 / 60 Hz
Rated Current	22.7 / 21.7 / 20.8A
Rated Power	15000W
SE max.	15000VA
Protective class	Class I
Degree of protection	IP 65
Power factor at rated power	0.99
Power factor range	± 0.8
  	
<small>www.tuv.com</small> <small>© 1990-2008</small> Made in Taiwan	

<b>PrimeVOLT</b> Model : PV-20000T-U	
$V_{max. PV}$	980V
$I_{sc PV}$	28A x 2
MPPT working range	180 ~ 980V
MPPT operating range (full load)	550 ~ 780V
IDC max.	20A x 2
Rated Voltage (3W+N+PE)	220 / 230 / 240V
Rated Frequency	50 / 60 Hz
Rated Current	30.3 / 29 / 27.8A
Rated Power	20000W
SE max.	20000VA
Protective class	Class I
Degree of protection	IP 65
Power factor at rated power	0.99
Power factor range	± 0.8
  	
<small>www.tuv.com</small> <small>© 1990-2008</small> Made in Taiwan	

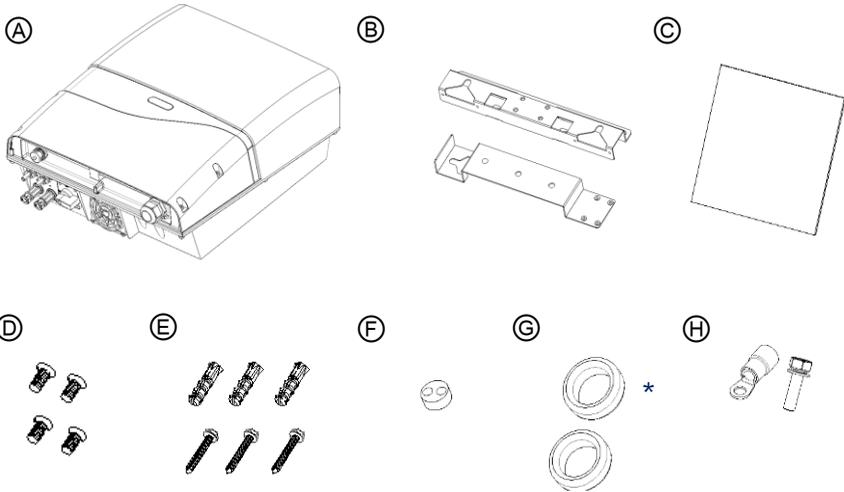
## 6. Installation

### Unpacking PV-5000T-U/PV-8000T-U/PV-10000T-U



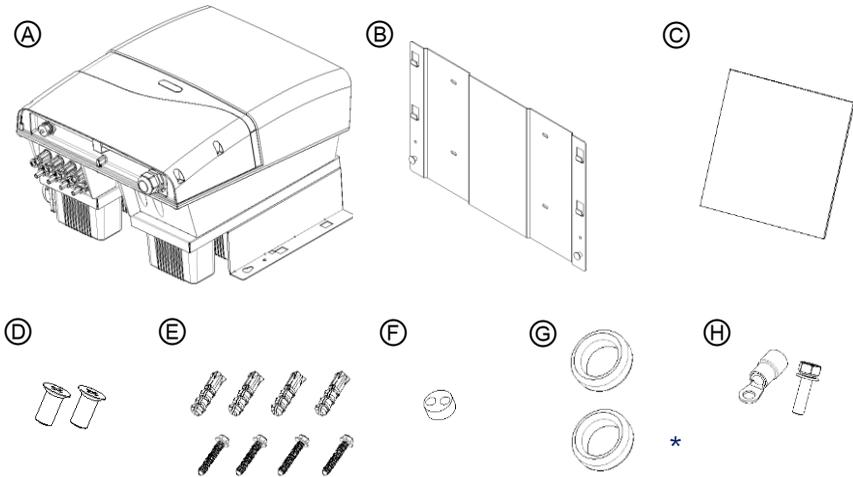
Item	Description
Ⓐ	Inverter
Ⓑ	Mounting Bracket Assembly
Ⓒ	User Manual
Ⓓ	M4 Flat Screws × 4, used for bracket
Ⓔ	Plastic Anchor & Screws × 3. Used to fix bracket on wall
Ⓕ	Rubber Sealing for Ethernet, RS485, RCR. M25 × 1
Ⓖ*	Gray EMI core × 1 ( Ethernet cable RJ45 ) Note : S-Serial ONLY

## Unpacking PV-15000T-U



Item	Description
(A)	Inverter
(B)	Mounting Bracket Assembly
(C)	User Manual
(D)	M4 Flat Screws × 4, used for bracket
(E)	Plastic Anchor & Screws × 3. Used to fix bracket on wall
(F)	Rubber Sealing for Ethernet, RS485, RCR and buzzer wires. M25 × 1
(G)*	Gray EMI core × 1 ( Ethernet cable RJ45 ) Gray EMI core × 1 ( RCR/RS485 ) Note : S-Serial ONLY
(H)	Insulated core end terminals (6.0 mm <sup>2</sup> ) × 1, M4 crew × 1

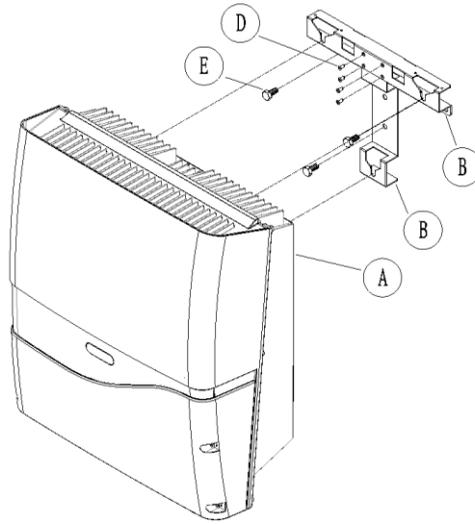
## Unpacking PV-20000T-U



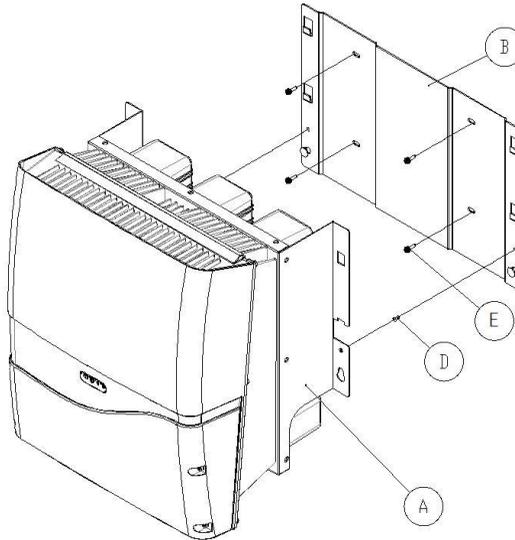
Item	Description
Ⓐ	Inverter
Ⓑ	Mounting Bracket Assembly
Ⓒ	User Manual
Ⓓ	M4 Flat Screws × 2, used for bracket
Ⓔ	Plastic Anchor & Screws × 4. Used to fix bracket on wall
Ⓕ	Rubber Sealing for Ethernet, RS485, RCR and buzzer wires. M25 × 1
Ⓖ*	Gray EMI core × 1 ( Ethernet cable RJ45 ) Gray EMI core × 1 ( RCR/RS485 ) Note : S-Serial ONLY
Ⓖ	Insulated ring terminal (6.0 mm <sup>2</sup> ) × 1, M4 crew × 1

## 6.1 Assembly Chart

**PV-5000T-U/PV-8000T-U/PV-10000T-U/PV-PV15000T-U**

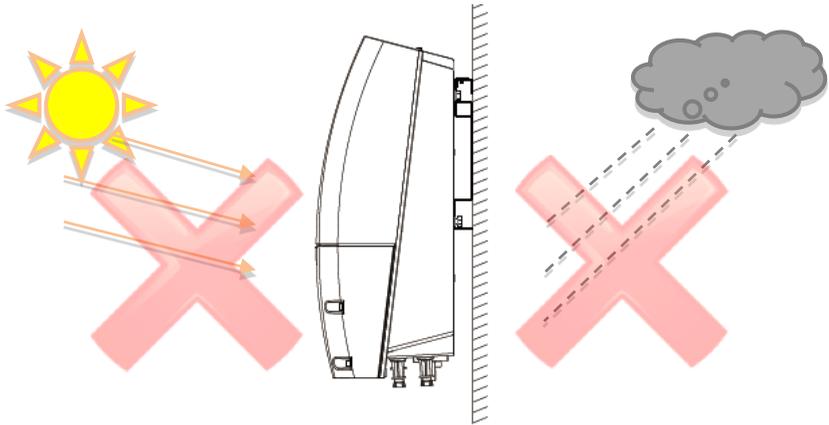


**PV-20000T-U**



## 6.2 Choosing Proper Installation Site

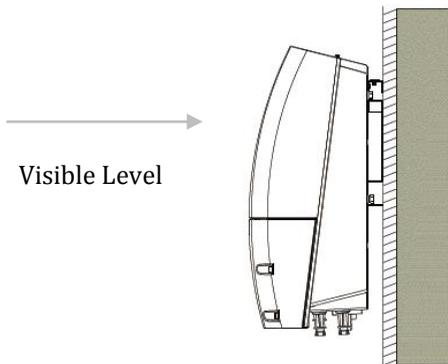
Avoid exposing the inverter in direct sunlight or to rain.



Direct Sunlight

Direct Rain

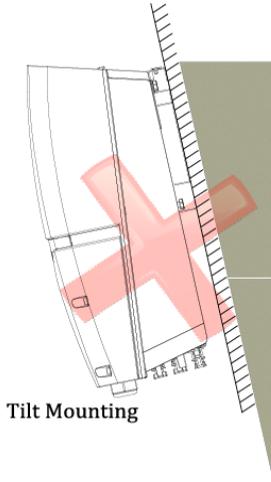
Mount the inverter in vertical direction; tilt or horizontal mounting should be avoided.



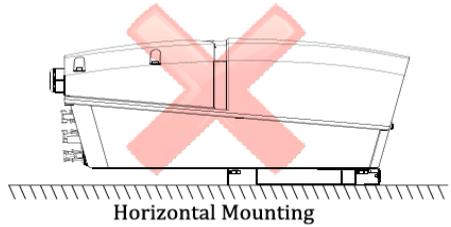
Mounting Surface	OK or NOT?
Concrete	OK
Metal	OK
Stone	OK
Plastics/Acrylic	Not Recommended
Wood	Not Recommended

## 6.3 Mounting Properly

### ■ Orientation



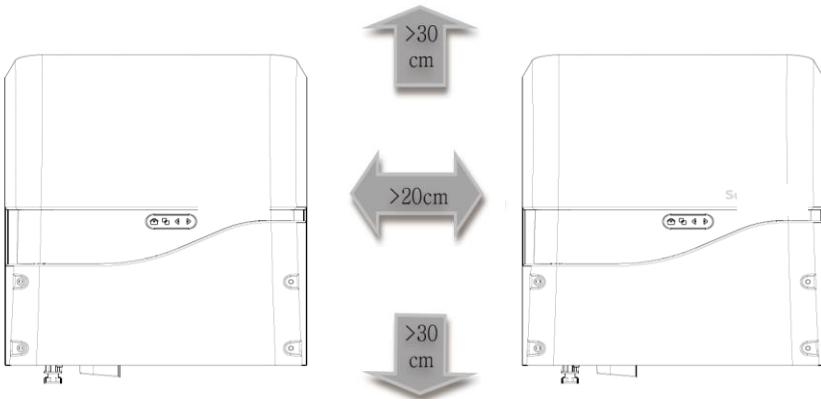
Tilt Mounting



Horizontal Mounting

### ■ Keeping Clearance

To retain the good cooling condition, keep each of unit over 20cm left and right, 30cm upper and down and ensure no any object is put around the units to affect the cooling.

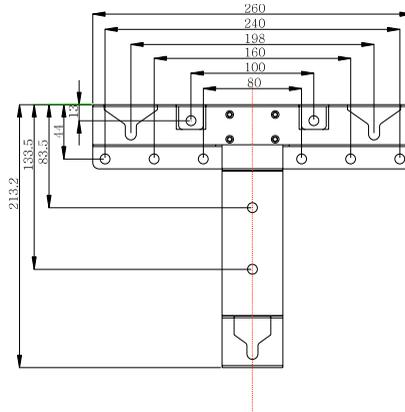


## 6.4 Mounting Procedure

### PV-5000T-U/PV-8000T-U/PV-10000T-U/PV-PV15000T-U

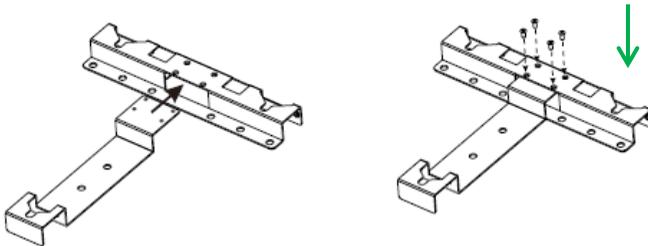
#### ■ Dimensions of Bracket

The bracket is used to support inverter on wall. Refer to the recommendations below to complete mounting.



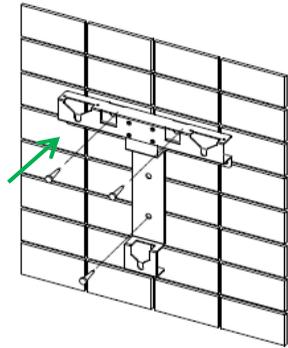
#### ■ Assembling Bracket

Before fixing on wall, assemble the bracket as below. (use M4 flat Screws x 4) item ① of accessory kit



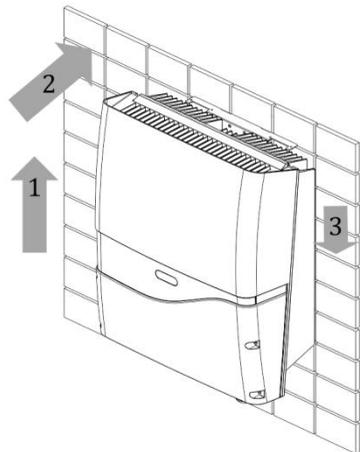
### ■ Mounting Bracket

1. Place the assembled bracket on where the inverter will be installed. Make proper drill holes and mount the assembled bracket with ⑤ screws from accessory kit.
2. For safe and firm mounting, make at least 3 drill holes in a triangular manner as demonstrated on right.
3. Use ⑤ item (torque: 1.0-1.2Nm) to install mounting bracket on wall.



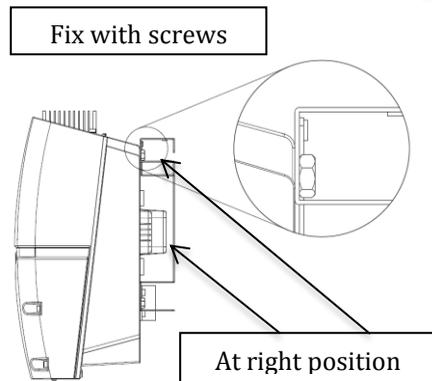
### ■ Attaching Inverter

1. Lift inverter slightly higher than bracket; Make sure all fixing points on back are at correct positions.
2. Attach inverter on bracket.
3. Hang inverter on bracket slowly.



### ■ Checking

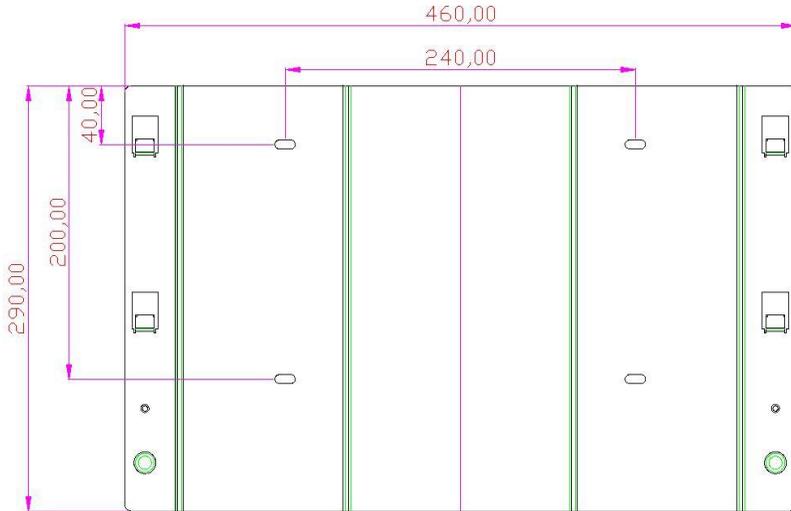
1. All supporting points are firm.
2. Lock caps are tightened with screws.
3. Inverter is well installed and secured on wall.



## PV-20000T-U

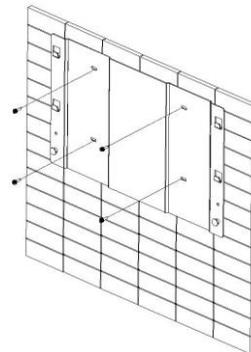
### ■ Dimensions of Bracket

The bracket is used to support inverter on wall. Refer to the recommendations below to complete mounting.



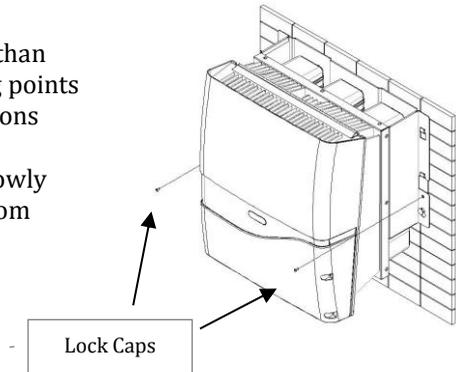
### ■ Mounting Bracket

1. Place the assembled bracket on where the inverter will be installed. Make proper drill holes and mount the assembled bracket with screws from accessory kit. (use item ③ to install mounting bracket on wall)
2. For safe and firm mounting, make at least 4 drill holes in a triangular manner as demonstrated on right.



## ■ Attaching Inverter

- 1 Lift inverter slightly higher than bracket; Make sure all fixing points on back are at correct positions
- 2 Attach inverter on bracket
- 3 Hang inverter on bracket slowly
- 4 Fix lock caps with screws from accessory kit



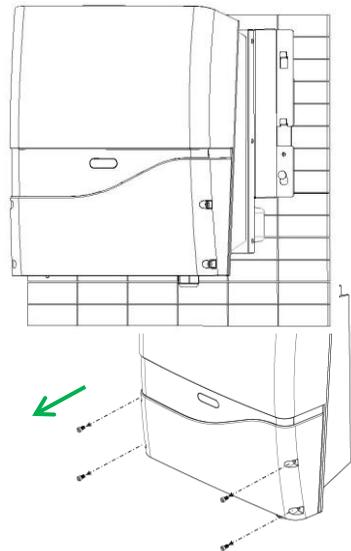
## ■ Checking

1. All supporting points are firm
2. Lock caps are tightened with screws
3. Inverter is well installed and secured on wall

## 6.5 Wire Connections

### ■ Opening Front Cover

1. Remove the 4 screws on cover as shown on right
2. Take off the cover gently

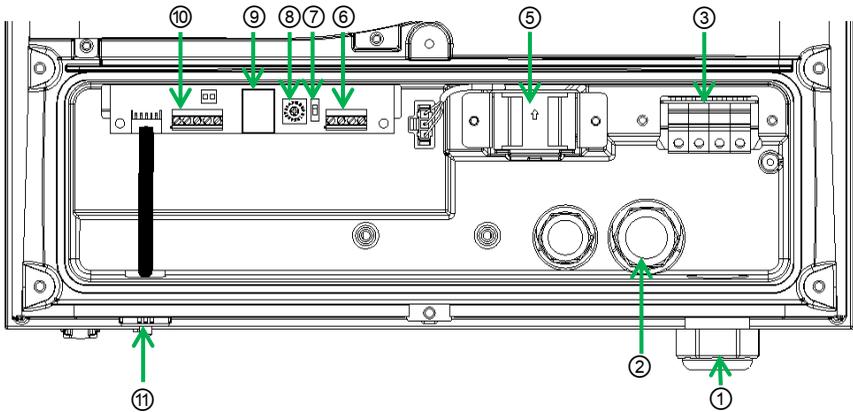


### ■ Overview of Connection Area

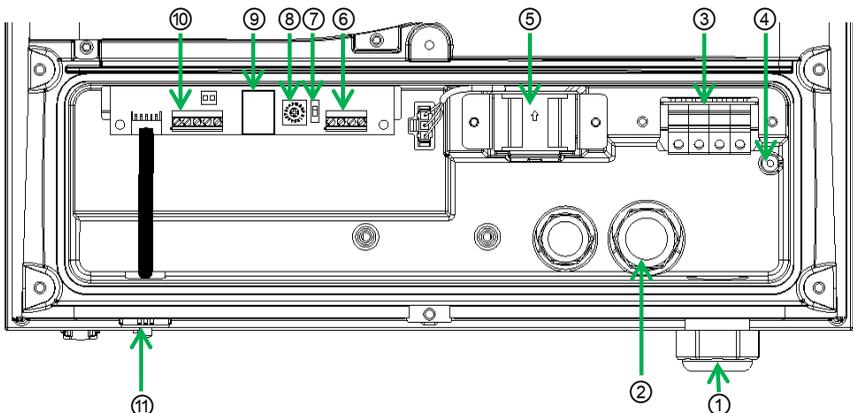
## S-Series

- AC Cable Gland M32 (AC cables)
- Signal Cable Gland M25 (Ethernet/RS485)
- AC terminal block (L1/L2/L3/N/PE)
- PE or GND(⊖) is located separately
- Internal cooling fan
- RS485 terminal
- RS485 associated terminal switch
- RS485 address selector
- RJ45 socket
- Ripple control receiver (RCR)
- USB socket

### PV-5000T-U/PV-8000T-U/PV-10000T-U



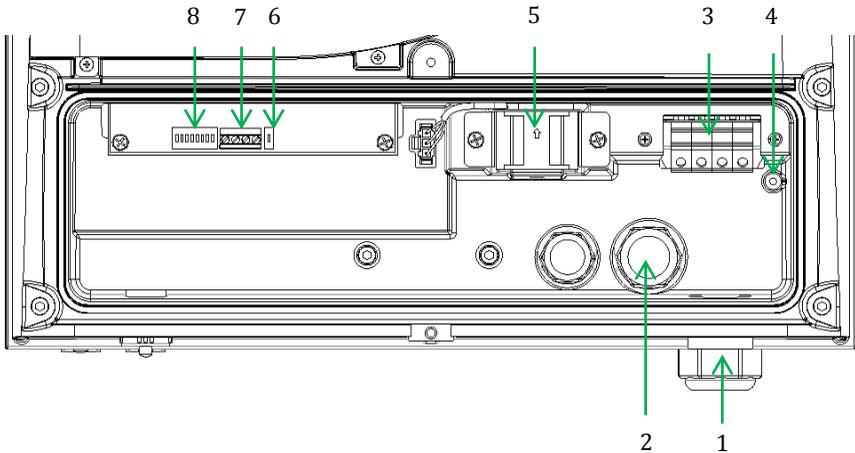
### PV-15000T-U/PV-20000T-U



## E-Series

### PV-15000T-U/PV-20000T-U (E-Series)

1. AC Cable Gland - AC cables
2. Signal Cable Glands - RS485
3. AC terminal block (L1/L2/L3/N)
4. PE or GND is located separately
5. Internal cooling fan
6. RS485 associated terminal switch
7. RS485 terminal
8. RS485 address selector



#### *Note on AC Circuit Breakers*

For safety reasons, place an independent circuit breaker between inverter and grid BEFORE all connections. Make sure inverter will be safely disconnected from the grid in all circumstances. It is recommended to use certified 250V/10A (PV-5000T-U) or 250V/20A (PV-8000T-U & PV-10000T-U) or 250V/30A (PV-15000T-U) or 250V/35A (PV-15000T-U & PV-20000T-U) circuit breakers.

## ■ AC Wiring

1. Prepare cables as recommended below

Cross Section (mm <sup>2</sup> )	Maximum Length for 1% Loss (M)				
	PV-5000T-U	PV-8000T-U	PV-10000T-U	PV-15000T-U	PV-20000T-U
2.5	17	11	9	N/A	N/A
4	28	18	14	N/A	N/A
6	42	26	21	14	N/A
10	N/A	N/A	N/A	23	17
14	N/A	N/A	N/A	N/A	24

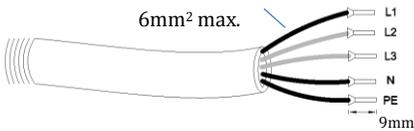
Table above is based on single-core copper wires with maximum temperature rise of 60°C. The following factors should be taken into account when it comes to actual wiring:

- Ambient temperature
- Wiring nearby
- Cooling

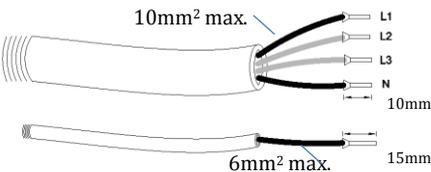
Please follow local standards if figures above are different from.

2. Remove strip insulation ~ 9 or 10 mm
3. Remove sealing plug, twist off the AC cable gland
4. Insert AC cable through M32 rubber sealing and hole
5. Fix L1 (Line 1), L2, L3, N (Neutral) and PE (⊕) on terminal block
6. Tighten cable gland to secure cables in position

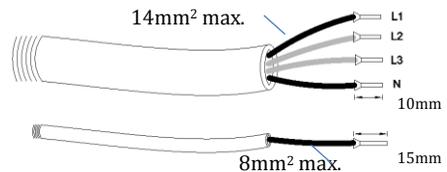
### PV-5000T-U/PV-8000T-U/PV-10000-U



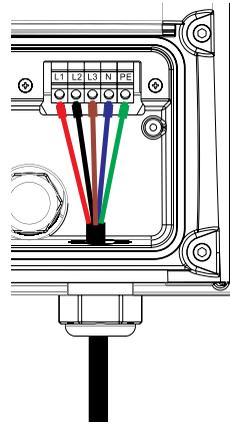
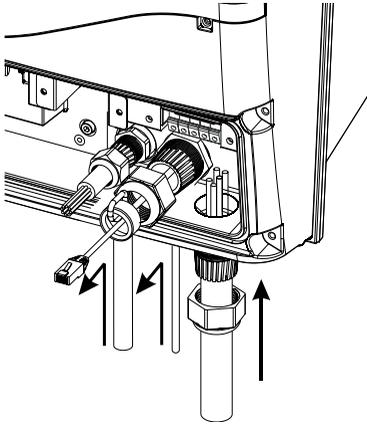
### PV-15000T-U



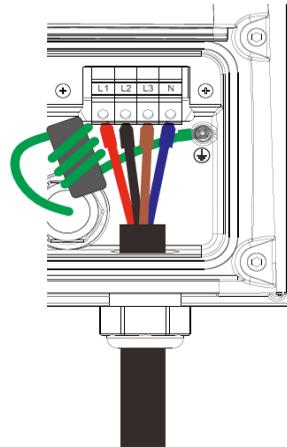
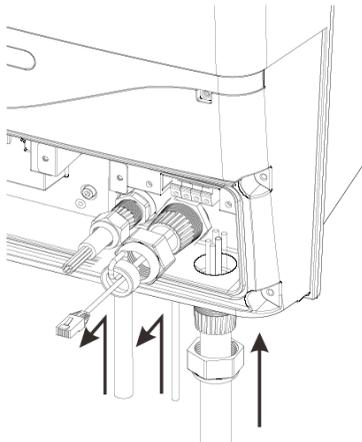
### PV-20000T-U



PV-5000T-U/PV-8000T-U/PV-1000T-U



PV-15000T-U/PV-20000T-U



The EMI core in figure above comes from item J in Ch.6.2 Unpacking PV-15000T-U & Ch.6.3.1 Unpacking PV-20000T-U on P.13, P.14 & P.15. Please make sure the GND cable (green) is wound thru a grey EMI core with 3 turns for noise immunity, as illustrated above.



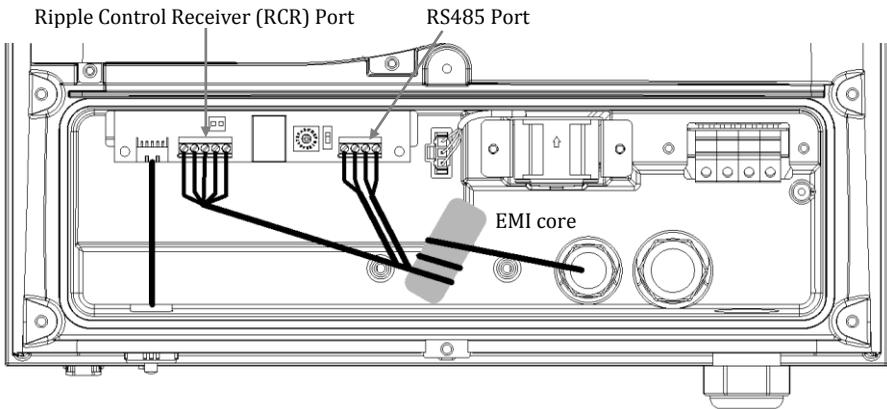
**Note on Wire Selection**

To safely secure cable on terminal block, please use solid wires. If stranded wires are used, apply core end terminals supplied in accessories.

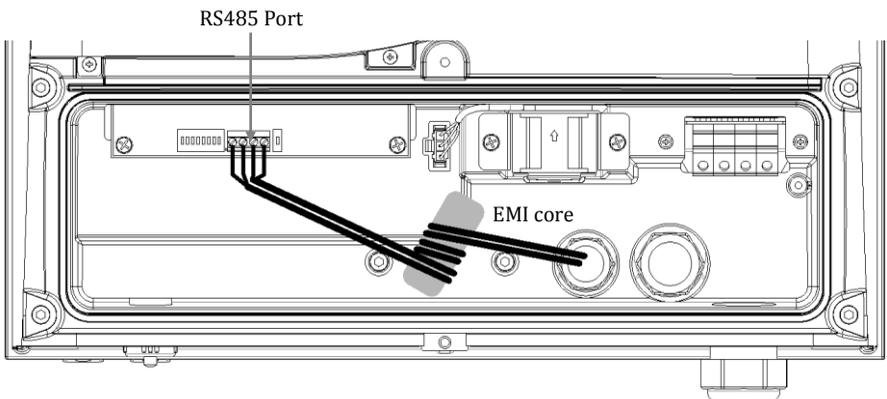
## ■ Ripple Control Receiver (RCR)/RS485 and RJ45 Connections

1. Remove sealing plug and twist off the cable gland (M25)
2. Insert wires from rear of guidance and holes of rubber sealing (M25)
3. Refer to Ch.8 on P.45 for proper RS485 connections
4. Refer to Ch.9 on P.48 for proper RCR connections
5. Connect RCR/RS485 and RJ45 wires as shown below
6. Make sure RCR/RS485 and RJ45 wires are both wound through a grey EMI core (from accessory kit), as for noise immunity
7. Tighten cable gland to secure cables firmly in position

### S-Series (RCR/RS485)

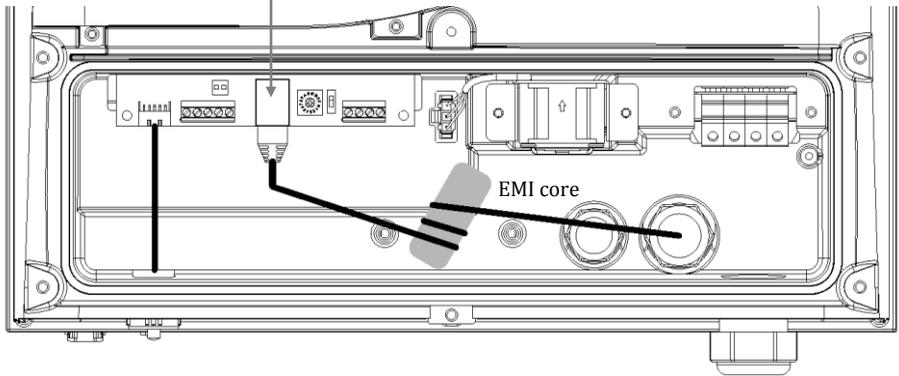


### E-Series (RS485)



## S-Series (RJ45)

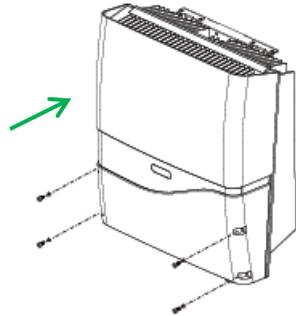
RJ45 Cable for Internet



### ■ Closing the Front Cover

After connecting all wires, please

1. Inspect all the connections again
2. Close front cover and tighten 4 screws gently
3. Check for any openings in between front cover and inverter



### ■ Applicable PV Modules

Only non-grounding PV panel is applicable, user is suggested to consult with a system installer for PV panel type selection.

## ■ DC (PV) Wiring

### 1. DC Input Ratings

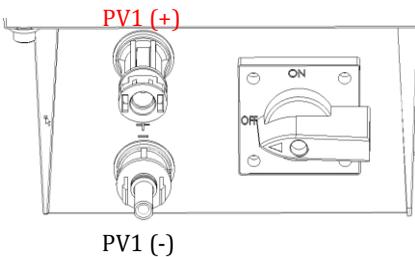
Model Rating	PV-5000T-U	PV-8000T-U	PV-10000T-U	PV-15000T-U	PV-20000T-U
Recommended Max. DC Power (W)	5500	8800	11000	16500	22000
Max. DC (V)	980	980	980	980	980
Max. Current (A)	10	10/String 20 in Total	10/String 20 in Total	20 for String 1 (Paralleled) 10 for String 2 30 in Total	20/String 40 in Total
String(s)	1	2	2	2 (3 Inputs)	2 (4 Inputs)

2. Use either connector
  - a. Wieland PST40i1C (Preferred)
  - b. Multi-Contact MC4
3. Connect to PV

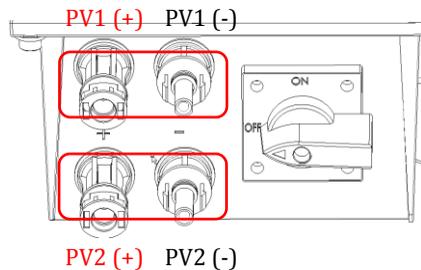
After all the associated cables and connectors have been prepared,

1. Remove sealing plugs as depicted on right
2. Plug in PV cables gently as depicted below

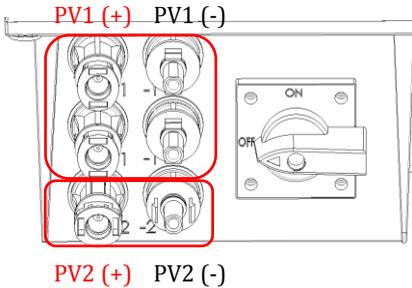
**PV-5000T-U**



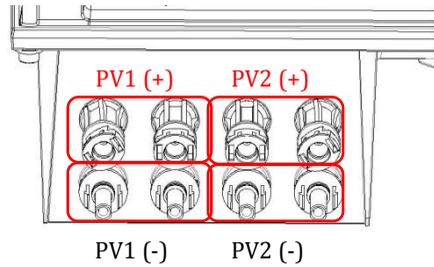
**PV-8000T-U & PV-10000T-U**



## PV-15000T-U



## PV-20000T-U



### *Danger of Electric Shock!*

While working on DC wiring, make sure DC is completely turned off.



### *Polarity & Voltage Check*

Before plugging in, make sure all polarities and voltages are correct. Incorrect connections could cause malfunction.



### *Warning*

1. Only non-grounding PV module is applicable, user is suggested to consult with system installer for PV module type selection.
2. Require PV modules that have IEC 61730 class A rating.



***Multiple PV Connections for PV-8000T-U/PV-10000T-U/PV-15000T-U/ PV-20000T-U***

Either two paralleled DC feeds from one common PV string or two independent DC strings can be set up for PV-8000T-U & PV-10000T-U. Two paralleled DC feeds from one common PV string and a single DC feed from another independent PV string **MUST BE** set up for PV-15000T-U in accordance with hardware specifications. The inverter will then adjust to optimal performance accordingly by itself.



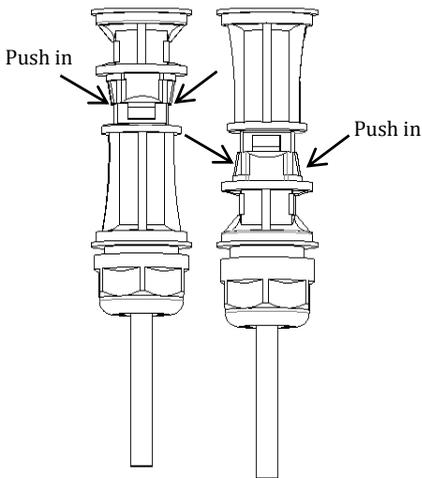
***Keep the Sealing Plugs***

Please keep those plugs in a safe place. You may need to use them again in case removal of DC connectors is needed.

## ■ Unplugging PV

In case you need to disconnect the PV, follow the steps below.

1. SWITCH OFF PV!
2. Use preferred Wieland assembling/disconnecting mounting tool PST (Art. No. 05.502.1753.0)
3. Push interlock to release plugs
4. Pull off plugs



### *Be Sure to SWITCH OFF PV*

Direct pull-off of DC plugs can lead to sparks. Be sure to switch off PV beforehand.

## 6.6 Ready to Start

### ■ Checklist

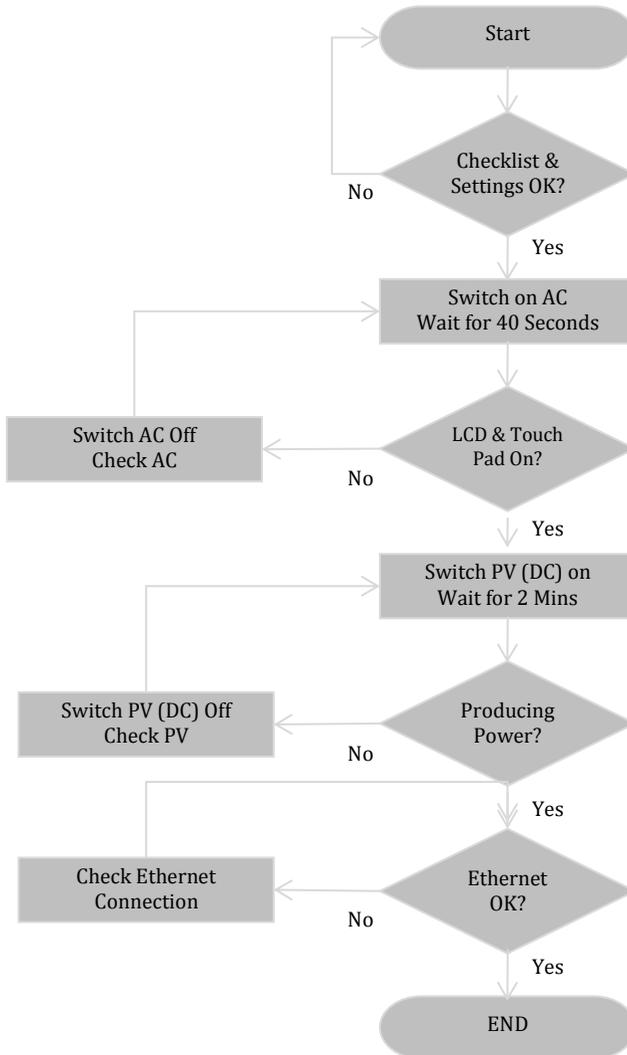
Before starting the inverter, please check the following items:

Item	Check Points	Checked?
Mounting	<ul style="list-style-type: none"><li>• Inverter is firmly mounted on bracket(s)</li><li>• The 2 lock caps are secured</li><li>• Locks are closed</li></ul>	
AC	<ul style="list-style-type: none"><li>• All cables are firmly fixed on terminal block</li><li>• Polarities are matched</li><li>• Protective Ground is available</li><li>• Cable gland is tightened firmly</li></ul>	
RS485 RJ45 Ripple Control Receiver	<ul style="list-style-type: none"><li>• All terminals are secured</li><li>• Polarities are matched</li><li>• Wires are tightened by cable gland</li><li>• If not used, sealing plugs are in position</li></ul>	
Front Cover	<ul style="list-style-type: none"><li>• Front cover is firmly attached</li><li>• All screws are secured</li></ul>	
DC	<ul style="list-style-type: none"><li>• All plugs are firmly connected</li><li>• Polarities are matched</li><li>• Strings are not mixed wired (for multiple MPPT models)</li></ul>	

### ■ Changing Grid Connection and Operation Parameters

If you need to change grid connection settings and/or operation parameters including voltages, frequency range, power factor and power limitation, please contact your local authorized service provider for an “USB key” to do so.

## ■ Start-up Procedure of Inverter



# 7. Operation (S-Series)

## 7.1 Overview

### ■ LCD



### ■ Icons on LCD

Icon	Description	Note
	USB. Appears when USB port in use	
	RS485. Appears when there is data transfer via RS485.	
	Wi-Fi. Appears when Wi-Fi dongle is connected. Refer to manual of Wi-Fi dongle.	
	Ethernet. Appears when Ethernet is connected.	
	Sun. Appears during daytime.	
	PV module. Appears when PV connected.	
	Utility. Appears when electrical grid is present.	
	Power feeding. Appears while inverter is feeding power to electrical grid.	

### ■ Button

Button is used to change frame displayed on LCD screen.



■ Icons on button

Icon	Function	Note
	Home. Returns to Home Screen.	
	Toggle. Toggles between frames for information.	
	Backward. Switches to previous daily (monthly) frame.	
	Forward. Switches to next daily (monthly) frame.	

## 7.2 Setting Clock

During the first installation of inverter where the internal clock has not been set, the system will automatically prompt user to set time and date.



The flashing characters are the fields to be set. Use touch pad for all entries. When completed, tap  to finish and confirm your new settings.



The following table depicts functions of button keys.

Icon	Function	Note
	Confirms settings.	
	Switches views among Year, Month, Day, Hour and Minute.	
	Decreases entry value.	
	Increases entry value.	



### *Incorrect Clock Settings?*

In case of incorrect settings, switch to “Information frame” to make adjustments afterwards.



### *Keeping the Clock Settings*

In cases where the AC has been disconnected for more than 3.5 hours, the internal clock of inverter will roll back to factory default settings.



### *Self-calibration of Clock*

If the inverter is connected to the Internet, the clock will synchronize with a local time server automatically. To do this, you will need to set the time zone and time server via internal web server. Please refer to later sections for details.

## 7.3 Status LED

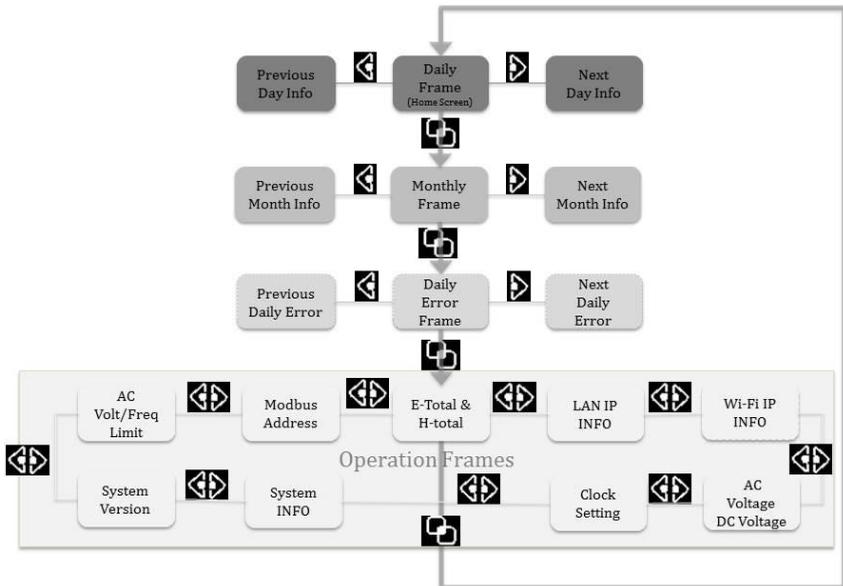
Both of S-serial and E-serial have this function.

The LED on the inverter right side will show the inverter operation status by different colors. In normal operation, the LED appears in green color; in error circumstance, it appears in red color.

Status	Indication
○	Inverter is not connected to AC.
●	Solid Green: Inverter is standing by/operating (day).
☀	Flashing Green: Inverter is standing by (evening/night).
●	Solid Red: Inverter is having a fault.

## 7.4 Frames

### ■ Operation Chart

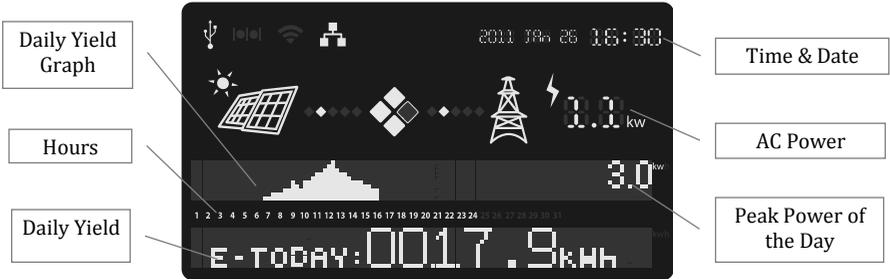


Note:

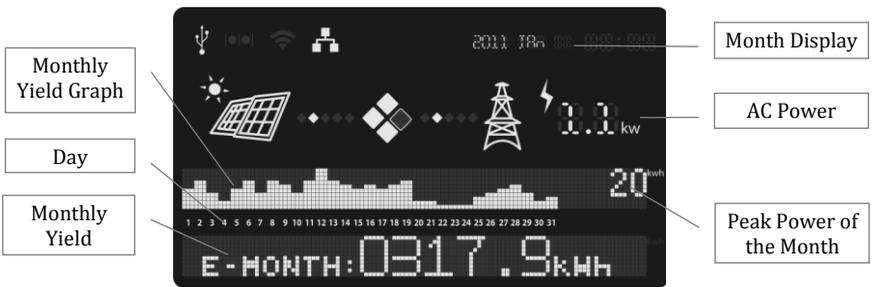
1. Tapping  will go back to Home (Daily) Frame.
2. Daily Error Frame will not pop up if there have been no errors occurred during the day.
3. LAN IP and/or Wi-Fi IP will not show on screen if no Ethernet and/or Wi-Fi connected.

■ Home Screen & Daily Frame

The Home Screen (Daily Frame) shows the operation data of a day. The user can switch to different daily data by tapping FORWARD or BACKWORD. The date on the upper right side will change accordingly as well.



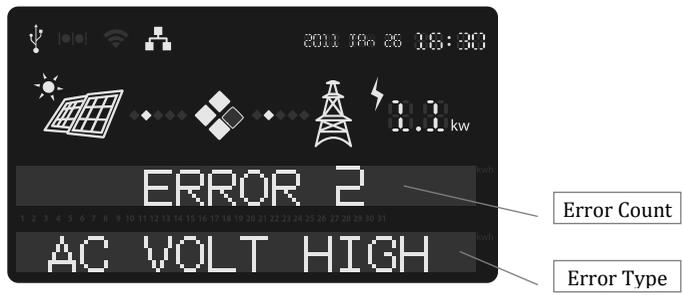
■ Monthly Frame



The monthly Frame shows operation data of a month. The user can view data of a different month by tapping FORWARD or BACKWORD. The month (shown on upper-right side) will change accordingly.

■ Daily Error Frame

This frame exists when there have been operation errors during the day.



## ■ Operation Frame

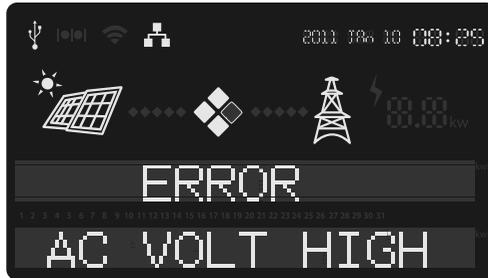
This frame shows operational information of inverter. There are ten sub-frames as described here.



1. E-Total & H-Total: E-Total (total accumulated energy) in kWh and H-Total (total operating time of inverter) in hours
2. LAN and Wi-Fi IP addresses: IP address information of inverter
3. Clock: To set clock, refer to Ch.7.2 Setting Clock on P.38
4. Language: Language displayed on LCD screen
5. Parameters: Grid safety regulation (VDE0126-1-1/A1, VDE-AR-N 4105, or EN50438), 70% power limit (ON/OFF), and power factor PF (-0.8 ~ +0.8)
6. System Info: F/W version currently installed on inverter
7. Idc & Pdc: The total instantaneous input DC current (unit: A) and total instantaneous input DC power (unit: kW) from your solar panel(s).
8. Power Limit: The restraint in terms of percentage of rated AC output power of inverter currently posted by Ripple Control Receiver (RCR).
9. Modbus Address: Designated address of inverter for all communication purposes in the monitoring network.
10. AC Nominal Frequency: GF: 59.5 ~ 60.3Hz; AC Voltage Range: GF: 198.0 ~ 248.0V.

## ■ Error Frame

An error implicates abnormal activity of the solar system. The frame pops up automatically after detection of an error. The second text line indicates error type. Error types are defined in the table below.



System error

<b>Error</b>	<b>Implication</b>
<i>AC VOLT HIGH</i>	Grid (AC) voltage is higher than preset
<i>AC VOLT LOW</i>	Grid (AC) voltage is lower than preset
<i>AC FREQ HIGH</i>	Grid frequency is higher than preset
<i>AC FREQ LOW</i>	Grid frequency is lower than preset
<i>PV VOLT HIGH</i>	PV voltage is higher than allowed
<i>PV ISUL LOW</i>	The insulation resistance between either PV (+) or PV (-) to earth is lower than 2.0 MΩ
<i>GFCI HIGH</i>	Ground Fault Current is higher than specified

## Inverter internal error

<b>Error</b>	<b>Implication</b>
<i>KEEP PV OFF</i>	Internal capacitor(s) short User must switch off PV immediately
C1	High DC current detected
C2	Relay failed
C3	DC current sensor failed
C4	Internal temperature of inverter high
C5	GFCI detection failed
C7	Anti-islanding (or AFD) failed
FAN FAILS	Internal or external cooling fan failed to work



### *Note on “KEEP PV OFF”*

If this message shows up on screen, please turn off the DC switch of PV immediately. DO NOT turn on again for any reason. Call for service immediately.

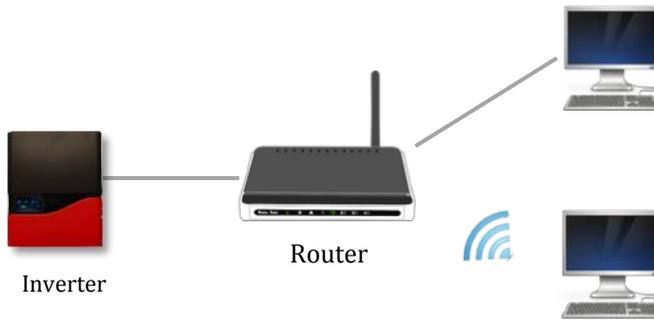


### *Ground Fault Alarm*

In addition to showing “GFCI HIGH” on display, inverter will activate audible alarm of the optional buzzer and show message on web page while using a computer to monitor.

## 7.5 Network and Internet (S-Serial)

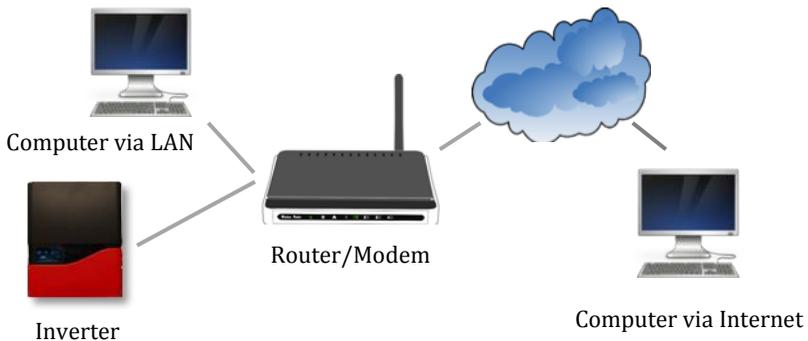
### ■ Accessing Inverter via LAN (Local Area Network)



The illustration above is a typical LAN connection. The inverter and devices are connected to a router by Ethernet cable or Wi-Fi. Computers and other devices in the LAN can access inverter's data if its IP address is known.

The router, acting as a DHCP server, usually assigns an IP to the inverter automatically. You can also manually assign an IP to the inverter with the router as well. Use touch pad to go to "Operation Frame" for IP confirmation.

### ■ Accessing Inverter via Internet



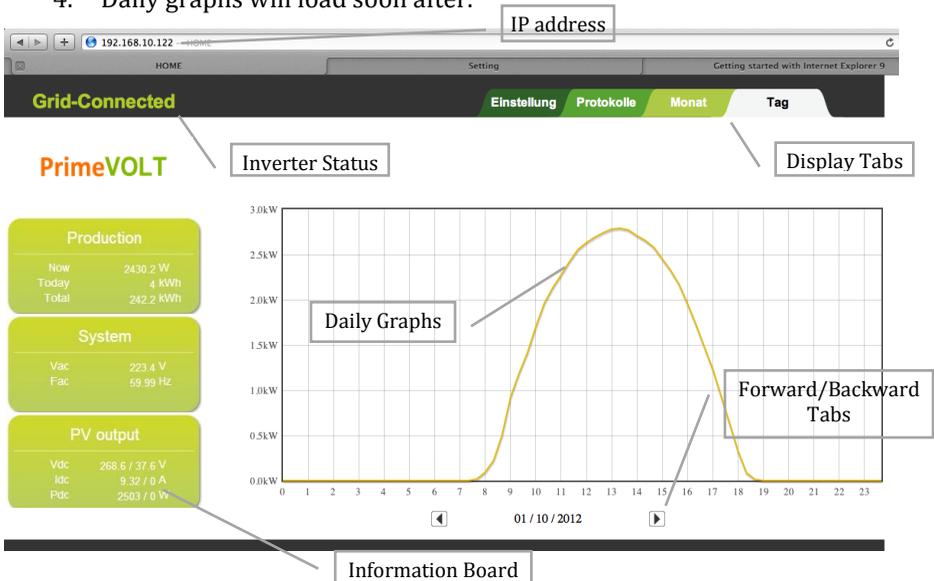
The illustration above demonstrates how to access the inverter via Internet. Similar to LAN, the inverter can be accessed by web browser. However, there is usually a firewall that would block direct access of the LAN from the Internet. In order to overcome this, you will need to set up NAT (Network Address Translation) or Port Forwarding of the router. For detailed information, please refer to the manual provided by your router supplier.

## 7.6 Browsing Inverter Web Page (S-Serial)

### ■ Basics

Inverter has a built-in and multi-functional web page that user can access via LAN/WLAN. The recommended web browsers are Internet Explorer, Firefox and Safari. Follow the steps below to explore the inverter web page.

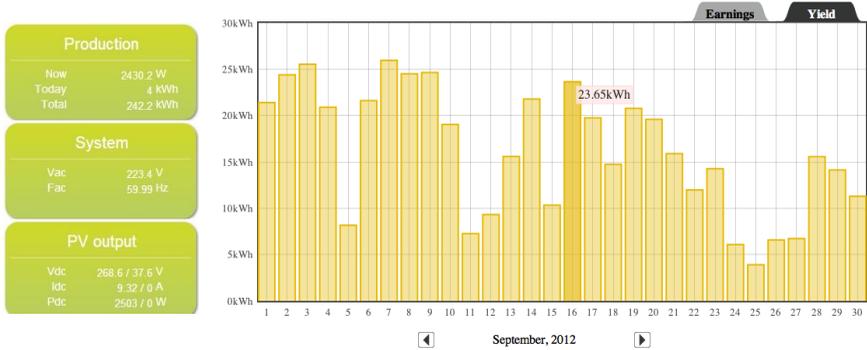
1. Make sure you have successfully connected inverter to a LAN by either Ethernet or Wi-Fi.
2. Tap touch pad to switch to “Operation Frame” to read off the inverter’s IP address.
3. Open a web browser on your desktop/laptop, key in the IP address you have read previously at the address bar (Refer to figure below. The example IP address here is 192.168.10.122).
4. Daily graphs will load soon after.



### ■ Overview

1. Display Tabs: There are 4 selections available.
  - a. Day: Yield graphs of the day
  - b. Month: Bar Graphs of a month. When pointing cursor to a specific day, the corresponding yield of that day will highlight automatically. See picture below for illustration

PrimeVOLT



c. Logs: Event records of inverter. Events include activities and errors of inverter. See picture below for demonstration

Uhrzeit	Status	Meldung
2012/10/01 13:01:00	Information	F/W Download
2012/09/30 13:01:00	Information	F/W Download
2012/09/29 13:01:00	Information	F/W Download
2012/09/28 21:35:49	Information	System Started
2012/09/28 13:35:00	Information	AutoUpdate Firmware!
2012/09/28 13:01:00	Information	Check Firmware!
2012/09/27 15:10:17	Information	System reboot.

d. Settings: Information and set-up of inverter

2. Inverter Status: Showing current operation status. During the night and/or when inverter is not working, the area is black. When an error or failure happens, a message will pop up.
3. Information Board: Displays power generation and relevant system parameters. During the night, while inverter is not working, the "system" data will not be viewable.
4. Forward/Backward Tabs: Move current display forward or backward.

## ■ Settings

When in Settings, you will see the table below.

<b>Inverter Info.</b>	PV-10000T-U	<b>Date &amp; Time</b>	Oct/1/2013 11:02:00
<b>Voltage Range</b>	194.0 ~ 264.0 V	<b>Frequency Range</b>	47.50 ~ 51.50 Hz
<b>Grid Regulation</b>	VDE-AR-N 4105	<b>PF</b>	1.00
<b>70% Limit</b>	No	<b>RCR Info.</b>	<a href="#">(Show)</a>
<b>IP Address</b>	192.168.1.121	<b>Wi-Fi</b>	<a href="#">(Edit)</a>
<b>Auto FW Update</b>	ON	<b>Language</b>	English
<b>Feed-in Rate</b>	\$0.32	<b>Administration</b>	Admin

For any item you wish to change, move the cursor and click on it. You will be prompted to enter user name and password before proceeding.

1. Inverter Info. : Name, serial number and F/W version.
 

Name :   
 Password :   
  
[Forget Password](#)
2. Time & Date: Clock of inverter. You can set the time zone and synchronize with time server automatically.
3. Voltage Range: Operation voltage range of inverter.
4. Frequency Range: Frequency range of inverter operation.
5. Grid Regulation: The safety regulation the inverter is currently complying with.
6. PF: Power factor. Ranging from -0.8 ~ +0.8.
7. 70% Limit: On or Off. Limits AC output power of inverter to 70% of the original rating.
8. RCR Info: Settings of the **R**ipple **C**ontrol **R**eceiver. Refer to “RCR Setting Information” for details.
9. IP address: The assigned IP address of inverter.
10. Wi-Fi: Settings of Wi-Fi connection, including
  - a. Wi-Fi SSID.
  - b. WI-FI Password: The key or password of your WLAN.
 

Wi-Fi SSID :   
 Wi-Fi Password :
11. Language: Language selection.

12. Feed-in Rate: The feed-in rate. There are graphs displaying your earnings in accordance to the rates you entered.
13. Administration: User name and password. The default name is “admin”; the default password is “admin”.
14. Cloud Monitoring : Go to <http://mypowermanager.net> to download the user manual of cloud and register your user account to set up your inverters for cloud monitoring.



#### ■ RCR Information

By clicking on “Show” on the right of “RCR Info,” the current settings of RCR will show up like the table in next page.

K1	K2	K3	K4	Active	Power
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	100%
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	0%
<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	30%
<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	75%
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	60%
<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	70%
<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	10%
<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	50%
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	100%
<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	20%
<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	100%
<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	0%
<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	60%
<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	70%
<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	20%
<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	90%

<b>Signal Length</b>	2 Sec
<b>Fallback Active</b>	Yes
<b>Fallback Time</b>	10 Min
<b>Fallback Power</b>	100%

1. K1 ~ K4: The relays on RCR.
2. Active: When selected, relays K1 ~ K4 will be active.
3. Power: The corresponding limit on AC output power of inverter.
4. Signal Length: The minimum time required to activate a power limit.
5. Fallback: A fallback is an operation state which the inverter can enter if relays K1~K4 is not active in the table.
6. Fallback Active: When selected, fallback will take place.
7. Fallback Time: The time required if the input status is not valid.
8. Fallback Power: The power limit for fallback.



***RCR Cannot Be Set via Web***

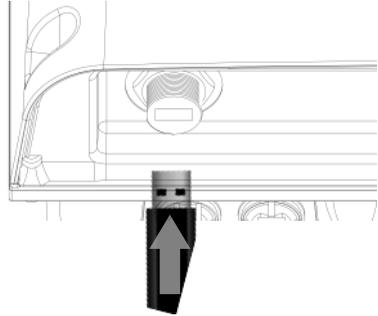
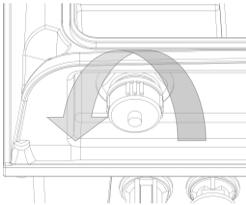
To change RCR settings, you may need request a setting tool from your inverter supplier. Users cannot do this via web.

## 7.7 Using USB

### ■ Plugging in USB Stick

To acquire inverter data, you can plug in a pre-formatted USB stick into the USB interface beneath inverter. *The stick must be FAT or FAT32 formatted.*

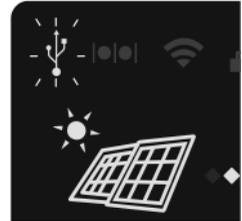
Remove the cap and plug in a USB stick. If inverter recognizes the device, the USB icon on LCD screen will light up.



### ■ Downloading Inverter Data

After plugging in the USB, all data stored in the inverter will be downloaded to the stick automatically. During the download, USB icon will be blinking.

After downloading, while USB icon stays solid, you can then safely unplug the stick. The inverter data has been saved in the USB stick.



#### *Data Format*

There will be two data files downloaded. One is for SQLite; the other is a CSV (Common Separation Value).



#### *Note on Firmware Upgrade*

If the USB stick contains an update of firmware, the inverter will not download data into USB stick but perform firmware upgrade instead.

## ■ Firmware Upgrade

The inverter can be a U upgraded to the latest firmware version via USB. To do this, you will need to have either the firmware update in USB stick.

## ■ Setting PF and 70% Power Limit

These parameters can only be done by an authorized agent. Please contact your local service provider if assistance is needed.

## ■ Capacity of Memory

The internal memory of inverter can store up to 3-year length of data. Data older than 3 year will be overwritten automatically.



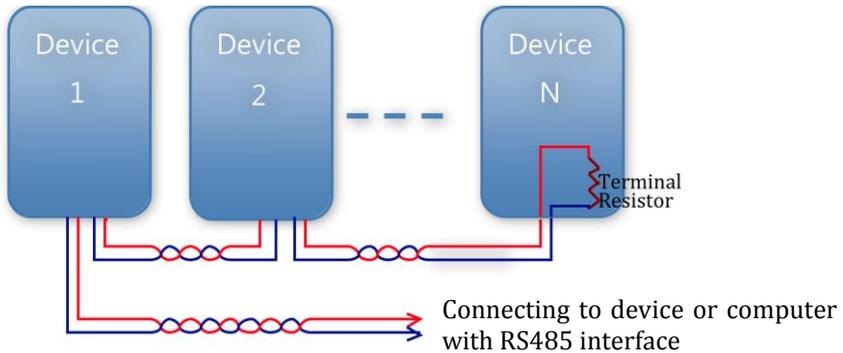
### ***Back Up Inverter Data Periodically***

Once the data stored in logger has been deleted, it cannot be retrieved. It is highly recommended to back up your inverter data periodically if you wish to retain all recordings.

# 8. RS485

## 8.1 About RS485

A typical RS485 connection is as below.

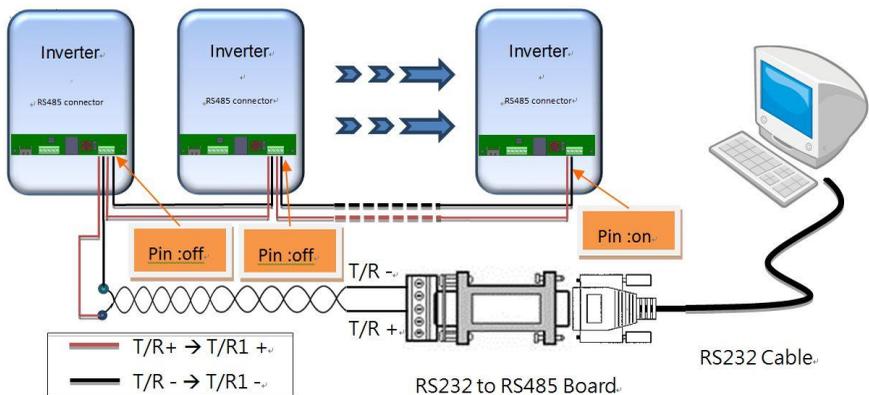


Some Noteworthy Points:

1. Wires between devices and computer shall be twisted.
2. Maximum allowable wire length is 1000 meters.
3. The terminal-end device should have a terminal resistor.
4. Due to multiple connections, each individual device should be assigned an IP address as to send/receive.

## 8.2 Connecting RS485

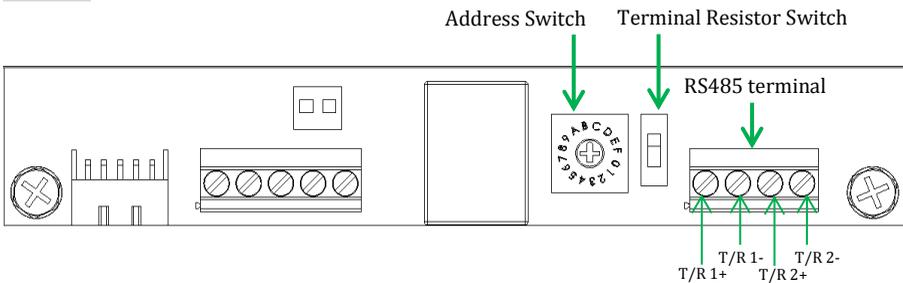
### ■ Wiring Diagram



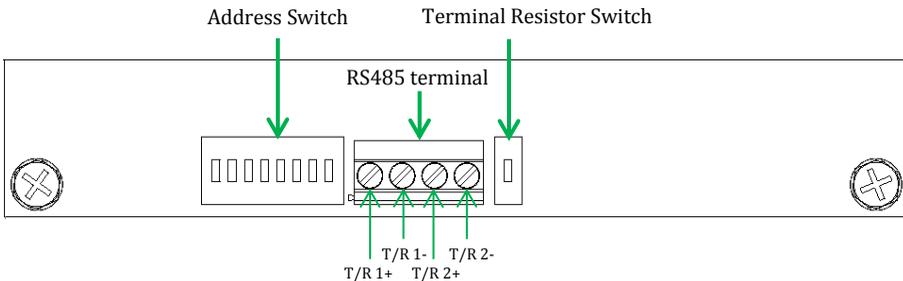
1. Connect T/R+ and T/R- of RS485 converter to the T/R1+ and T/R1- of an inverter respectively.
2. Between two inverters, match T/R2+ and T/R2- of this inverter to T/R1+ and T/R1- of the next inverter.
3. Set terminal resistor switch “ON” of the terminal-end inverter (last inverter of the row) only. The others’ should be set as “OFF.”

## ■ Inverter hardware interface

### S-Series



### E-Series



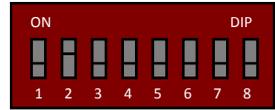
## ■ Address Setup(S-Series)

To do this setting, use the address rotary switch shown on right. For a single inverter, set the position to “1”; for multiple inverters, please assign them different positions with no duplications. Since only 15 positions (1~F) are available, the maximum number of inverters that can be grouped at a time in a RS485 bus is 15. Position “0” is reserved for broadcast purposes when multiple inverters are employed. Please do not use in all circumstances.



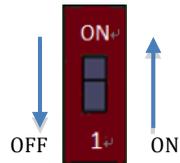
### ■ Address Setup(E-Series)

To do this setting, use the address dip switch shown on right. For a single inverter, set the position to “1”; for multiple inverters, please assign them different positions with no duplications. The maximum number of inverters that can be grouped at a time in a RS485 bus is 255. Position “0” is reserved for broadcast purposes when multiple inverters are employed. Please do not use in all circumstances.



### ■ Setting the Terminal Resistor

As shown on right, “ON” indicates a resistor is added. ONLY the terminal-end inverter (last inverter of the row) should have this switch set to “ON”. Switches of the other inverters should be set as “OFF.”

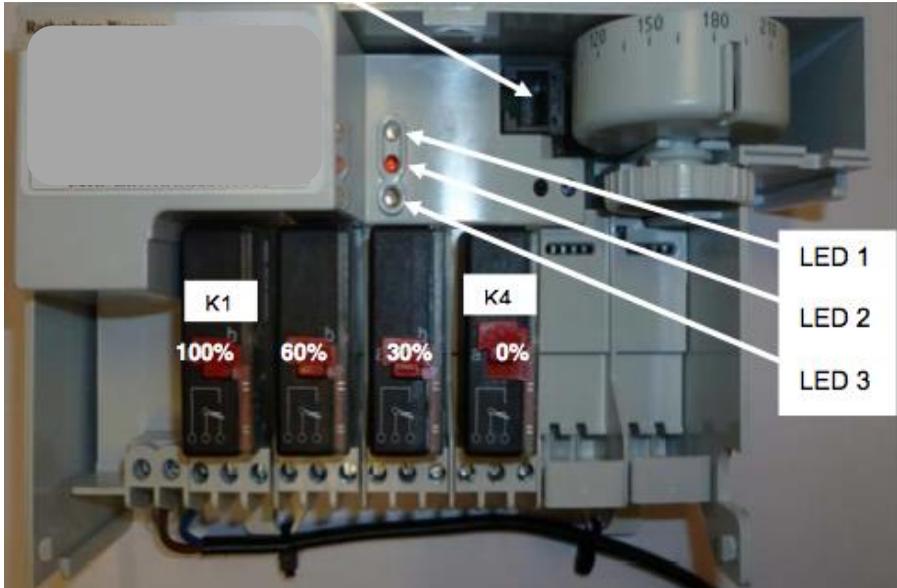


#### ***Attention!***

Incorrect settings could cause communication failure.

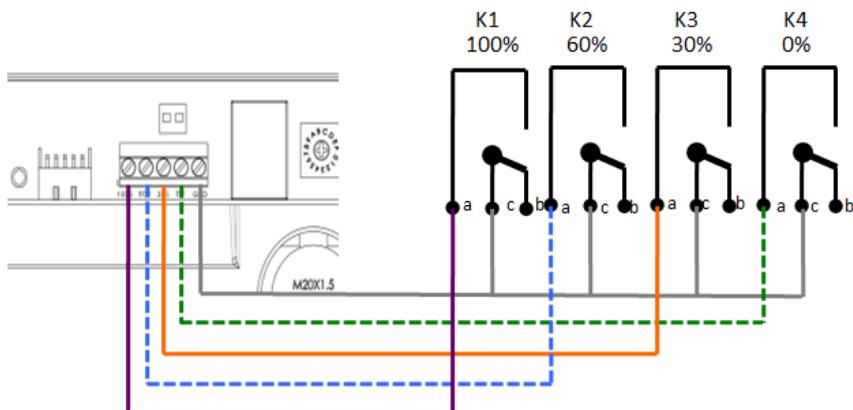
## 9. Connecting to Ripple Control Receiver (RCR)

RCR receives control signals from your power company. PV series inverters can be connected to RCR directly. Inverters will be able to receive command from RCR and adjust their AC output powers to the corresponding level. A typical RCR installation is illustrated below.

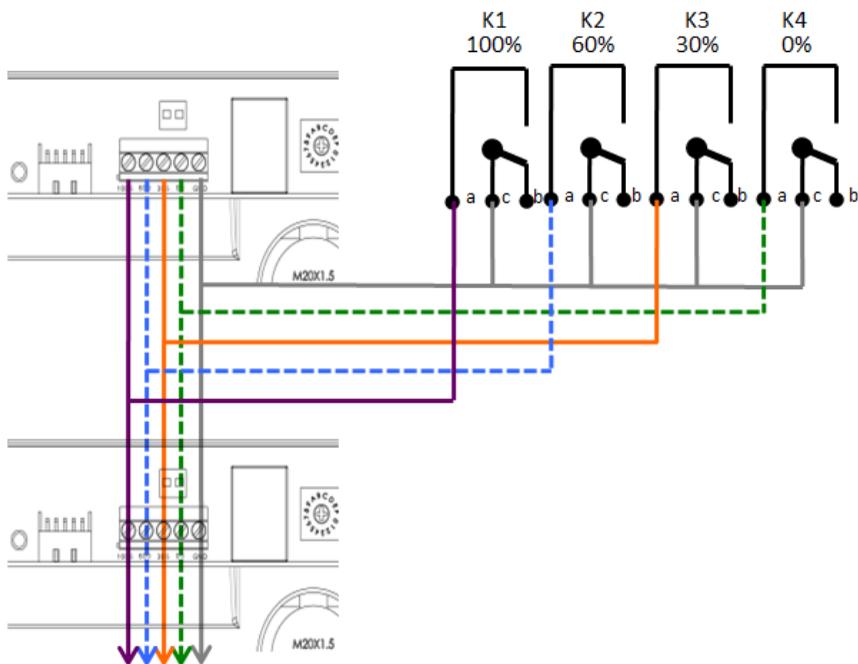


## ■ Connections with Single Inverter

When connecting a single inverter only, refer to the figures below.



## ■ 9.2 Connections with Multiple Inverters



To Other Inverters

## 10. Operation (E-Series)

E-Series stands for Economic Series. It offers three solutions for customers who are seeking only basic logger functionalities and wishing to save a bit upon their own interests. The display screen of inverter is either not equipped or of some simple form.

This is the simplest of E-Series. There is no screen of any kind. The LED panel has three LED lights and one button. When a fault occurs, one or two or three LED lights will be blinking in response.



### ■ Button icon

Icon	Description	Note
	LED A · Reference LED fault table A	
	LED B · Reference LED fault table B	
	LED C · Reference LED fault table C	
	Button	

### ■ LED fault LED indication

LED fault table

LED A	LED B	LED C	Error Message
OFF	OFF	OFF	All Normal
ON	OFF	OFF	DC Current Injection High
OFF	ON	OFF	Relay(s) Failed
OFF	OFF	ON	DC Current Sensor(s) Failed

LED A	LED B	LED C	Error Message
ON	ON	OFF	High Internal Temperature
ON	OFF	ON	GFCI Detection Failed
OFF	ON	ON	Bus Failed
Blink	Blink	Blink	Arcing Fault Detected (AFD)
Blink	OFF	OFF	Isolation Fault (< 2.0MΩ)
OFF	Blink	OFF	Leakage Current High
OFF	OFF	Blink	Cooling Fan(s) Failed

Note : Blinking means LEDs on for 0.5 seconds and off for 0.5 seconds.

## ■ LCD window structure

When inverter has connected to electrical grid and started generating power, of the LCM screen enters regular mode. The starting on-screen information by default contains Pac that is the instantaneous solar power being generated at the moment (unit: W), and Etoday that is the cumulative solar power that has been generated today (unit: kWh). Push the button on LED panel gently to change inverter information frame on LCM screen. Please refer to flow chart on next page for sequence of on-screen inverter information frames.



## ■ Error message

When inverter encounters an error, LCM screen enter error mode and an error message will be displayed on LCM screen continuously.

**AC VOLT HIGH**  
Vac 271/262/261V

This error message will remain on-screen until user presses the button on LED panel to unlock and exit error mode. When exited, the LCM screen returns to regular mode and goes to the information frame displaying the solar power being generated at the moment (unit: W) and cumulative solar power that has been generated today (unit: kWh). The error message mentioned above will be recorded in history error information frame. Refer to the table below for interpretation of all inverter error messages.

### System error

<b>Error Message</b>	<b>Indication</b>
AC VOLT HIGH Vac xxx/xxx/xxx V	Grid voltage over range Measured voltage displayed
AC VOLT LOW Vac xxx/xxx/xxx V	Grid voltage below range Measured voltage displayed
AC FREQ HIGH fac xx.x Hz	Grid frequency over range Measured frequency displayed
AC FREQ LOW fac xx.x Hz	Grid frequency below range Measured frequency displayed
PV VOLT HIGH Vdc xxx/xxx V	Solar panel voltage over range Measured voltage displayed
PV ISUL LOW	Check for insulation of solar panels failed
Ground I high I <sub>g</sub> xxx mA	Leakage current high Measured current displayed

### Inverter internal error (1)

<b>Error Message</b>	<b>Indication</b>
KEEP PV OFF	Internal fault detected Please keep DC breaker of solar panels off
C1	High DC current detected
C2	Relay failed
C3	DC current sensor failed
C4	Internal temperature high
C5	GFCI detection failed
C7	Anti-islanding detection failed
FAN FAILS	Fan not working properly

### Inverter internal error (2)

<b>Error Message</b>	<b>Indication</b>
F1	Bus voltage low
F2	Bus voltage high
F3	CPU communication abnormal
F4	Mismatch of firmware version between CPUs
F5	EEPROM memory faulty
F6	Error on system consistency
F7	Over-current in inverter detected
F8	Slow start-up on Bus

#### ■ History error Information Frame

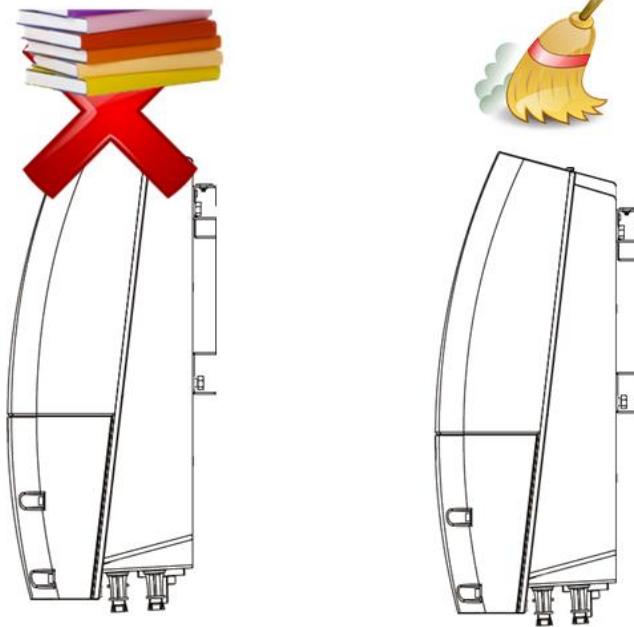
The inverter error that has occurred most recently is generally recorded by the history error.

**History Error  
Message Record**

# 11. Maintenance

Conventionally, an inverter does not require any special care throughout its life. However, to keep the inverter in best performance, it's recommended to do the following on a regular basis.

1. Make sure no object is placed on the top of inverter.
2. Dust off the inverter, especially the heat sink located on the top of inverter.
3. Monitor power production figures of inverter.
4. Inspect all wires and cables.



## 11.1 Replacing Fans

For years of operation, the fans of the inverter may be worn out. When the fans are very noisy or stopped, please replace the fan.

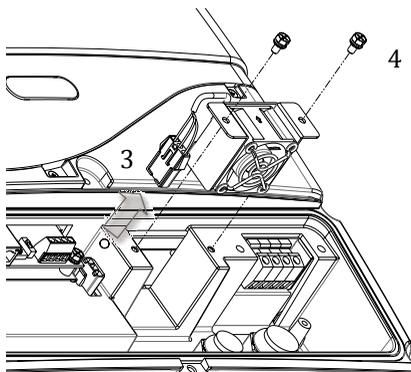


*Be sure to SWITCH off PV and AC*

Before replacing fan, please turn both AC and DC off.

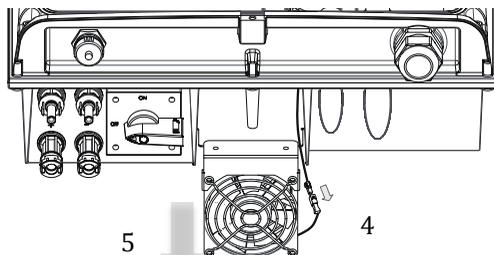
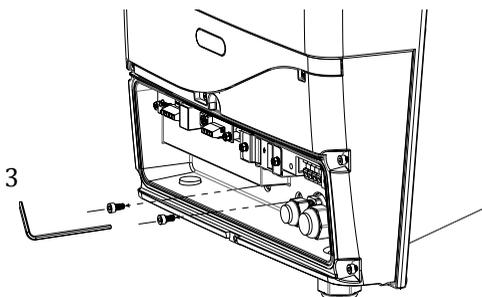
### ■ Replacing Internal Fan

1. Switch both DC and AC off
2. Open front cover
3. Unplug fan connector
4. Remove screws of the fan
5. Take fan off
6. Replace new fan supplied by authorized dealer



### ■ Replacing External Fan

1. Switch both DC and AC off
2. Open front cover
3. Remove screws as figure
4. Take fan off
5. Unplug fan connector
6. Replace new fan supplied by authorized dealer



## 12. Troubleshooting

In cases where an inverter detects a problem, an error message may be conveyed by the system. Use the table below to resolve accordingly. If the problem persists, contact your local service provider for further assistance.

<b>Trouble</b>	<b>Suggestions</b>
<i>No display or incorrect display</i>	<ol style="list-style-type: none"> <li>1. Check AC connection segments such as fuses, breakers and wires. Be sure AC is connected to inverter properly.</li> <li>2. Switch AC off and on again.</li> </ol>
<i>No generation (No Error)</i>	<ol style="list-style-type: none"> <li>1. Check PV wiring.</li> <li>2. Check PV polarities.</li> <li>3. Check PV voltages.</li> <li>4. Wait for stronger sunlight.</li> </ol>
<i>Error on display</i>	<p>Refer to error table in Error Frame section.</p> <ol style="list-style-type: none"> <li>1. Error other than “C#”: Check the error message and take suitable action.</li> <li>2. “C#” Error: Switch off the AC breaker then the DC breaker. Switch on the DC breaker then the AC breaker again.</li> <li>3. If “C#” error persists, call your local service provider for assistance.</li> </ol>
<i>Generated power less than expected</i>	<ol style="list-style-type: none"> <li>1. Check module installation.</li> <li>2. Check the PV module is damaged or sheltered.</li> <li>3. Ensure inverter is not in direct sun light.</li> <li>4. Remove all objects on inverter.</li> <li>5. Check the setting space of each inverter.</li> <li>6. Check inverter’s ambient temperature.</li> </ol>

## 13. Specifications

### PV-5000T-U/PV-8000T-U/PV-10000T-U

	Unit	PV-5000T-U	PV-8000T-U	PV-10000T-U
<b>Input (DC)</b>				
Recommended Max. Power	W	5500	8800	11000
MPPT Range (full load)	V	550 ~ 850	550 ~ 850	550 ~ 850
Working Range	V	180 ~ 980	180 ~ 980	180 ~ 980
Max. DC Voltage	V	980	980	980
Max. DC Current	A	10	10 x 2	10 x 2
No. of MPP Trackers		1	2	2
I <sub>sc</sub> PV	A	14	14 x 2	14 x 2
Max. backfeed current to array	mA	1.0	1.0	1.0
<b>Output (AC)</b>				
Nom. Power	W	5000	8000	10000
Max. Power	W	5000	8000	10000
Power @ 55°C	W	4000	8000	8000
Nominal Voltage	V	220/380 ; 230/400 ; 240/415		
Voltage Range	V	184 ~ 264.5 <sup>1</sup>		
Nominal Frequency	Hz	50/60		
Power Factor		-0.8 ~ +0.8		
Maximum Current	A	8.0	12.8	16.0
Max. O/P Over-Current Protection	A	15	30	30
<b>Efficiencies</b>				
Max. Efficiency	%	97.5	97.7	97.9
Euro- Eta	%	96.2	97.0	97.2
<b>General</b>				
Temp. Range	°C	-20 ~ 55		
Temp. (Full Power)	°C	-20 ~ 45		

<sup>1</sup> Voltage Range: 184~264.5 for VDE-AR-N 4105

	Unit	PV-5000T-U	PV-8000T-U	PV-10000T-U
Topology		Transformerless		
Protection		IP65		
Humidity	%	0 ~ 100%		
Cooling		Convection		
Protection Class		I		
Overvoltage Cat.		Pollution Degree III		
Environment Cat.		DC Input: II, AC Output: III		
Amplitude	M	< 2,000		
<b>Features</b>				
LCD		Icon Graphic Display		
RS485		Standard, half-duplex		
Power Reduction		Yes, via USB with authorized software		
Wi-Fi		Optional		
Data Logging		Yes, 3 years		
Web Server		Yes		
Clock Sync		Automatically sync with time server		
<b>Mechanical</b>				
W x H x D	mm	418x485x190	418x485x196	418x485x196
Weight	kg	23	24	24
Input Pairs		1	2	2
DC Switch		Optional		
<b>Compliances</b>				
Grid Monitoring		VDE-AR-N 4105, VDE0126-1-1/A1, AS/NZS 4777.2, AS/NZS 4777.3, PEA, MEA		
Safety		IEC 62109-1, 62109-2		
EMC Emission		EN61000-3-2, EN61000-3-3, EN61000-6-3/-4, AS/NZS 61000.6.3		
EMC Immunity		EN61000-6-2		

*Note: Specifications are subject to change without prior notice.*

**PV-15000T-U**

	Unit	PV-15000T-U
<b>Input (DC)</b>		
Recommended Max. Power	W	16500
MPPT Range (full load)	V	550 ~ 850
Working Range	V	180 ~ 980
Max. DC Voltage	V	980
Max. DC Current	A	10 x 2 (Paralleled DC Feeds) & 10 x 1
No. of MPP Trackers		2
I <sub>SC</sub> PV	A	14 x 2 (Paralleled DC Feeds) & 14 x 1
Max. backfeed current to array	mA	1.0
<b>Output (AC)</b>		
Nom. Power	W	15000
Max. Power	W	15000
Power @ 55°C	W	12000
Nominal Voltage	V	220/380 ; 230/400 ; 240/415
Voltage Range	V	184 ~ 264.5 <sup>2</sup>
Nominal Frequency	Hz	50/60
Power Factor		-0.8 ~ +0.8
Maximum Current	A	24.0
Max. O/P Over-Current Protection	A	45.0
<b>Efficiencies</b>		
Max. Efficiency	%	98.1
Euro- Eta	%	97.7
<b>General</b>		
Temp. Range	°C	-20 ~ 55
Temp. (Full Power)	°C	-20 ~ 45
Topology		Transformerless

<sup>2</sup> Voltage Range: 184~264.5 for VDE-AR-N 4105

	Unit	PV-15000T-U
Protection		IP65
Humidity	%	0 ~ 100
Cooling		Convection
Protection Class		I
Overvoltage Cat.		Pollution Degree III
Environment Cat.		DC Input: II, AC Output: III
Amplitude	M	< 2,000
<b>Features</b>		
LCD		Icon Graphic Display
RS485		Standard, half-duplex
Power Reduction		Yes, via USB with authorized software
Wi-Fi		Optional
Data Logging		Yes, 3 years
Web Server		Yes
Clock Sync		Automatically sync with time server
<b>Mechanical</b>		
W x H x D	mm	418x485x196
Weight	kg	27
Input Pairs		3
DC Switch		Optional
<b>Compliances</b>		
Grid Monitoring		VDE-AR-N 4105/IEEE 1547, VDE0126-1-1/A1, AS/NZS 4777.2, AS/NZS 4777.3, PEA, MEA
Safety		IEC 62109-1, 62109-2
EMC Emission		IEC EN61000-6-3/-4, EN61000-3-11, EN61000-3-12, AS/NZS 61000.6.3
EMC Immunity		EN61000-6-2

*Note: Specifications are subject to change without prior notice.*

**PV-20000T-U**

	Unit	PV-20000T-U
<b>Input (DC)</b>		
Recommended Max. Power	W	22000
MPPT Range (full load)	V	550 ~ 780
Working Range	V	180 ~ 980
Max. DC Voltage	V	980
Max. DC Current	A	10 x 2 (Paralleled DC Feeds) & 10 x 2
No. of MPP Trackers		2
I <sub>SC</sub> PV	A	14 x 2 (Paralleled DC Feeds) & 14 x 2
Max. backfeed current to array	mA	1.0
<b>Output (AC)</b>		
Nom. Power	W	20000
Max. Power	W	20000
Power @ 60°C	W	12kW@780Vdc Min.
Nominal Voltage	V	220/380 ; 230/400 ; 240/415
Voltage Range	V	184 ~ 264.5 <sup>3</sup>
Nominal Frequency	Hz	50/60
Power Factor		-0.8 ~ +0.8
Maximum Current	A	32.0
Max. O/P Over-Current Protection	A	66.0
<b>Efficiencies</b>		
Max. Efficiency	%	98.2
Euro- Eta	%	98.0
<b>General</b>		
Temp. Range	°C	-25 ~ 60
Temp. (Full Power)	°C	-20 ~ 45

<sup>3</sup> Voltage Range: 184~264.5 for VDE-AR-N 4105

	Unit	PV-20000T-U
Topology		Transformerless
Protection		IP65
Humidity	%	0 ~ 100
Cooling		Convection
Protection Class		I
Overvoltage Cat.		Pollution Degree III
Environment Cat.		DC Input: II, AC Output: III
Amplitude	M	< 2,000
<b>Features(S-Series)</b>		
LCD		Icon Graphic Display
RS485		Standard, half-duplex
Power Reduction		Yes, via USB with authorized software
Wi-Fi		Optional
Data Logging		Yes, 3 years
Web Server		Yes
Clock Sync		Automatically sync with time server
<b>Features(E-Series)</b>		
LCD		1602 character type
RS485		Standard, half-duplex
Power Reduction		Yes, via RS485 with authorized software
Wi-Fi		N/A
Data Logging		N/A
Web Server		N/A
Clock Sync		N/A
<b>Mechanical</b>		
W x H x D	mm	467x485x306
Weight	kg	42
Input Pairs		4
DC Switch		Optional
<b>Compliances</b>		
Grid Monitoring		VDE-AR-N 4105/IEEE 1547, VDE0126-1-1/A1, AS/NZS 4777.2, AS/NZS 4777.3, PEA, MEA

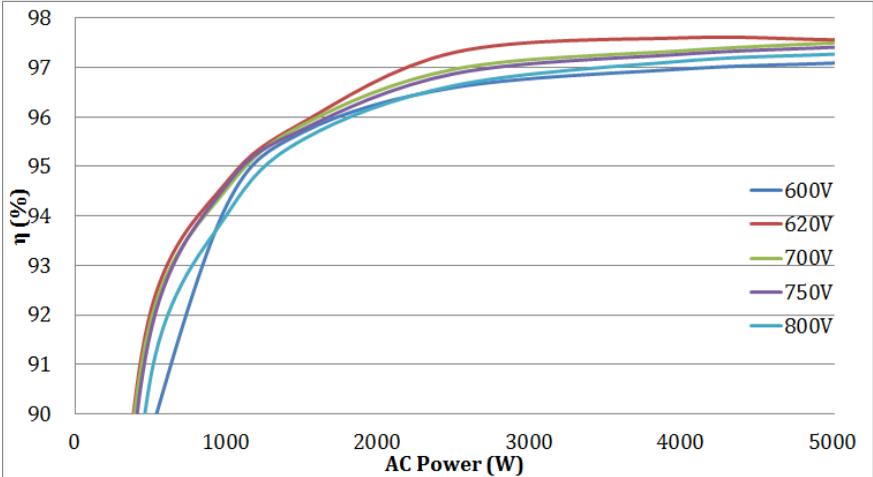
	Unit	PV-20000T-U
Safety		IEC 62109-1, 62109-2
EMC Emission		IEC EN61000-6-4, EN61000-3-11, EN61000-3-12, AS/NZS 61000.6.4
EMC Immunity		EN61000-6-2

*Note: Specifications are subject to change without prior notice.*

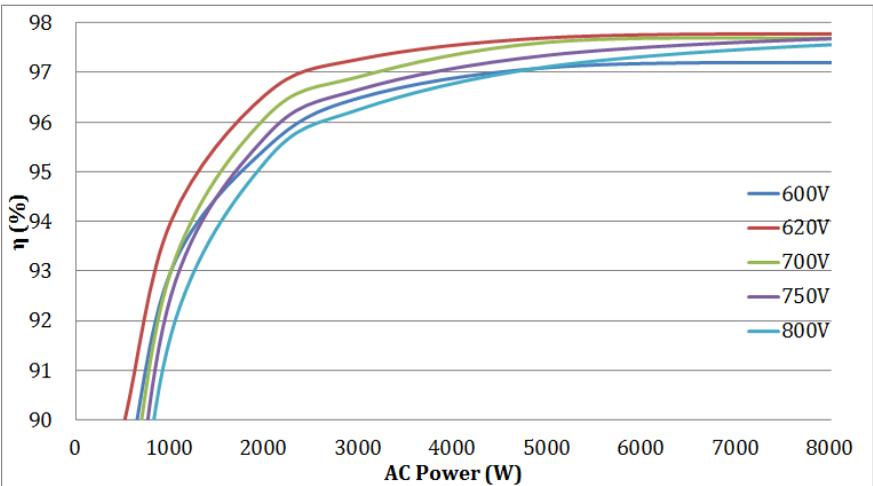
# 14. Addendum

## Efficiency Charts

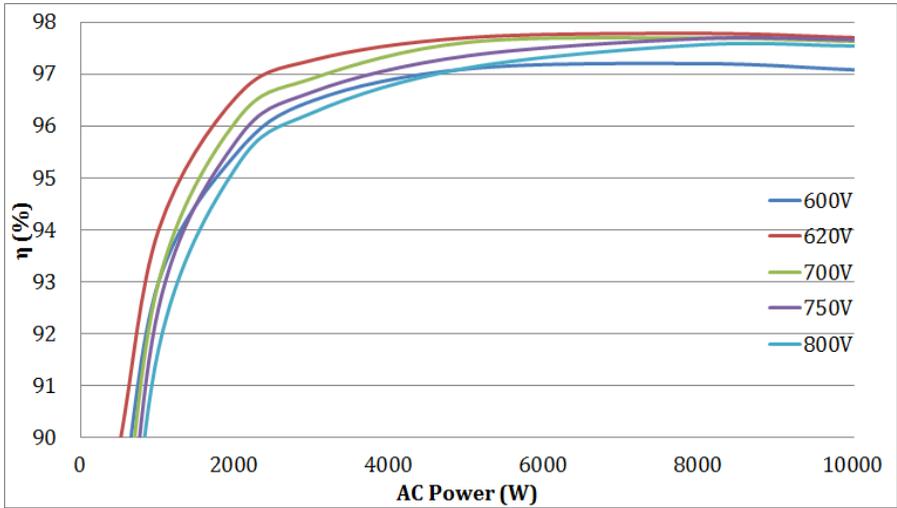
### PV-5000T-U



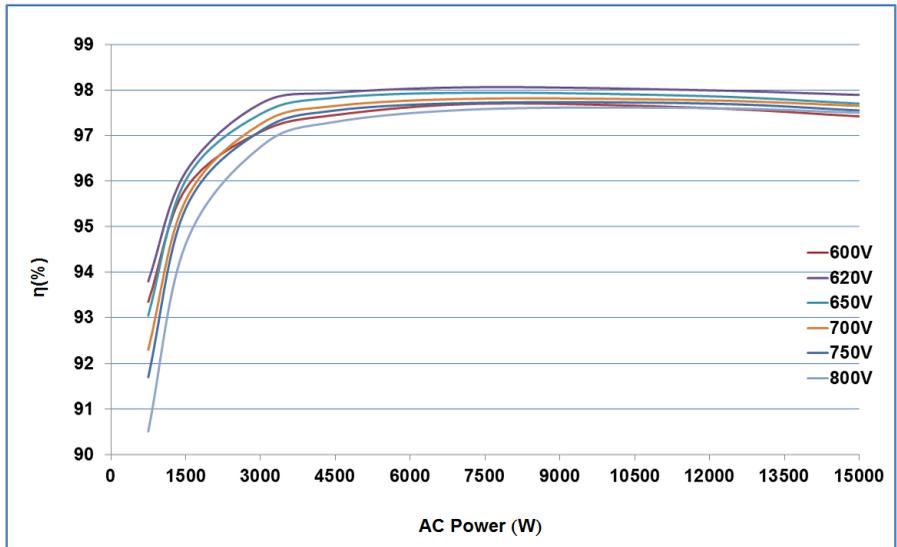
### PV-8000T-U



### PV-10000T-U



### PV-15000T-U



## PV-20000T-U

