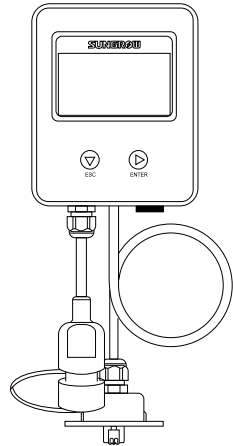

User Manual

eShow

LCD module



Contents

1	Installation and Connection	1
1.1	Connecting the eShow to the Inverter	1
1.2	Connecting the eShow to the DRED.....	3
2	Commissioning	6
2.1	Inspection before Commissioning	6
2.2	Commissioning Procedure	6
3	LCD Operation	8
3.1	Description of Button Function	8
3.2	Menu Tree	9
3.3	Main Screen	10
3.4	Contrast Adjustment.....	11
3.5	Checking Running Information	12
3.6	Setting the Country Code.....	13
3.7	Setting the Time	15
3.8	Starting/Stopping the Inverter	15
3.9	Advanced Settings	16
3.9.1	Password Entry	16
3.9.2	Setting Reactive Power Response.....	16
3.9.3	Setting Active Power Response	18
3.9.4	Setting Grid-tied Time	20
3.9.5	Setting Grid Protective Parameters.....	20
3.9.6	Setting Power Parameters	22
3.9.7	GND Detection	23
3.9.8	Factory Reset.....	23
3.9.9	Other Settings	23
3.10	Setting Communication Parameter	24
3.11	Viewing Fault Records	24

4	Appendix	25
4.1	Troubleshooting	25
4.2	Exclusion of Liability	29
4.3	About Us	30

1 Installation and Connection

1.1 Connecting the eShow to the Inverter

The eShow is installed onto the inverter by means of the bracket and the M4 screws in the packaging.

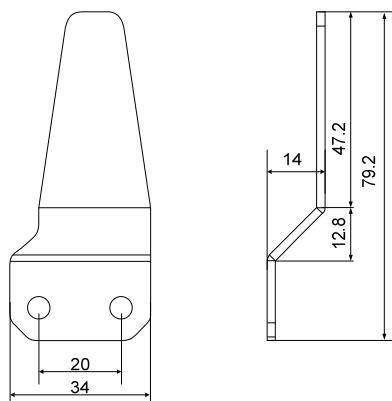


Fig. 1-1 Dimensions of the Bracket (unit: mm)

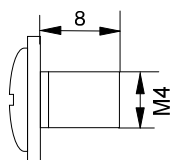
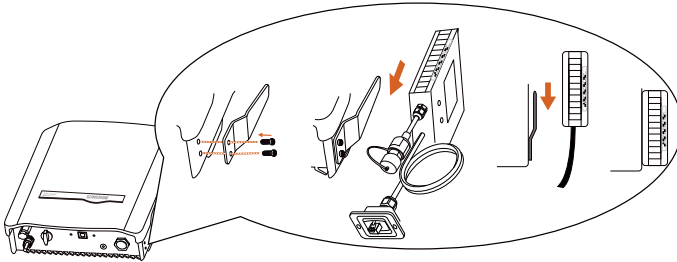


Fig. 1-2 Dimensions of the Fastener (unit: mm)

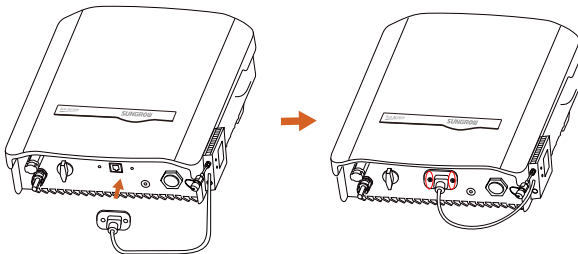
Procedure

Step 1 Secure the bracket to the inverter with the supplied screws and then hang the eShow onto the bracket.



The eShow can also be mounted to the wall next to the inverter. Make sure that the distance between the eShow and the inverter is proper for the cable connection.

Step 2 Connect the RJ45 plug to the RJ45 port on the bottom of the inverter. Fasten the screws to secure the RJ45 plug to the inverter.



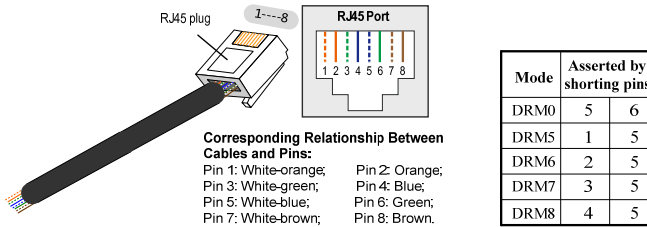
NOTICE

Do not extend the communication cable. The loss of any or all rights may follow if otherwise.

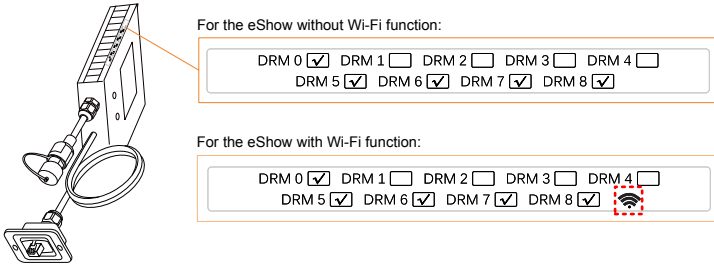
1.2 Connecting the eShow to the DRED

The eShow provides a DRM (Demand Response Mode) port for connecting to a demand response enabling device (DRED). The DRM port is a standard Ethernet port.

The following figure shows the DRM mode and the corresponding shorting pins of the RJ45 plug.



The modes supported by the inverter are ticked on the label located on the left side of the module.



For the eShow module supporting Wi-Fi function, a Wi-Fi icon will be added on the "AS4777:2015" sticker pasted on the packaging. Refer to the WiFi quick user manual to configure the Wi-Fi settings.

The DRM connector components are included in the delivery scope. The seal and the support are not closed. So, you can use the standard network cable with the RJ45 plug to assemble the DRM connector.

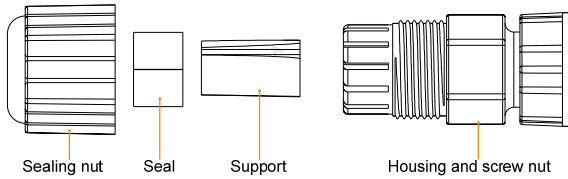
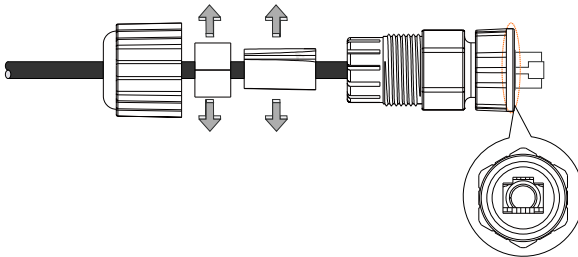


Fig. 1-3 DRM Connector Components

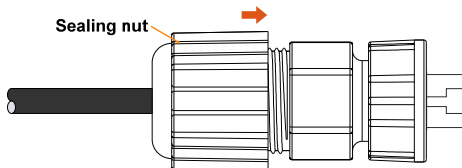
Procedure

Step 1 Lead the network cable through the components according to the following sequence. Align the RJ45 plug and the slot on the housing. The cable should be fully inserted until the RJ45 plug is positioned to the place.



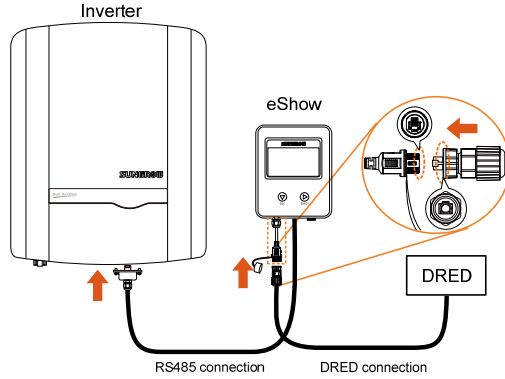
The seal and the support can be opened to place the cable body.

Step 2 Push the support and the seal into the housing. Then tighten the sealing nut to the housing.

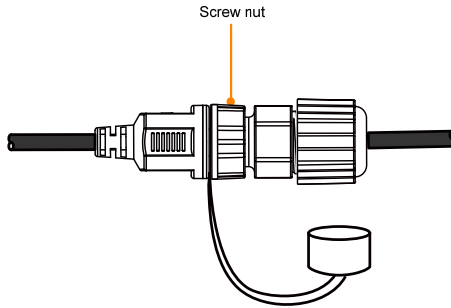


Step 3 Unscrew the dust-proof cap from the DRM terminal. Keep it hung on the terminal for later use.

Step 4 Align the DRM connector and the DRM terminal. Plug the connector and make them engage perfectly.



Step 5 Tighten the screw nut of the connector to the DRM terminal.



NOTICE

Reinstall and tighten the dust-proof cap onto the DRM terminal if the DRM connector is removed.

2 Commissioning

2.1 Inspection before Commissioning

Check the following items before starting up the eShow for the first time.

1. Check if the module is firmly secured and the site is convenient for operation, maintenance and service.
2. The room for ventilation is provided and nothing is left on top of the module.
3. The eShow and Inverter are correctly connected. Cables are routed in a safe place and protected against mechanical damage.
4. Warning signs and labels are suitably affixed and durable.

2.2 Commissioning Procedure

Refer to “3.1 Description of Button Function” for button operation. Proceed as follows to start up the eShow for the first time when all the above mentioned items are OK.

Step 1 Turn on the external AC circuit breaker.

Step 2 (Optional) Rotate the DC switch to “ON”.

If there is sufficient sunlight, PV array will initialize and supply DC energy to the inverter. When the DC voltage exceeds the inverter startup voltage, inverter will start automatically.

Step 3 Wait for approximately 15 seconds, the eShow will start automatically and the LCD will be activated.

* This power limit percentage is not indicated in some firmware versions.

P-ac	1380W
E-day	10.0kWh
E-tot	765kWh
Status	Run
100%	2015/01/03 10:39

Step 4 Check the country setting. Reset the country code if it is not correct.

Main screen (**Press** ▷) → Menu (**Touch** ▽×1) → Country setting (**press** ▷)

Touch ▾/▷ to choose and **press** ▷ to confirm.
 If the country selected is not in the list, please choose **Other** and set the parameters manually.
 Please refer to **Tab. 3-4** for the descriptions of country codes.

Country Setting	
○GB	○DE ○FR ○IT ○ES ○AT
●AU	○CZ ○BE ○NL ○CN ○SE
○TH	○Other

Step 5 Check the system time. It should be in accordance with the local time. Incorrect time may directly affect the data storage.

Main screen (**Press** ▷)→Menu (**Touch** ▾×2)→Set time (**Press** ▷)

Touch ▷ to move the cursor and **touch** ▾ to change value. **Press** ▷ to confirm setting.

Set-Time	
YY/MM/DD	
Date	16/01/21
Time	13:34:32

Step 6 Check the grid protective parameters.

Main screen (**Press** ▷)→Menu (**Touch** ▾×4)→Set-param (**Press** ▷)→input password 111 (**Press** ▷)→Set-param (**Touch** ▾×3) →Grid Prot. Param (**Press** ▷)

Touch ▾ to choose the item and **press** ▷ to check the details.



Grid Prot. Param	
▶ Single/Mul Prot.	
10 Min Over Vtg	

3 LCD Operation

3.1 Description of Button Function

Inverter offers two buttons for users to look up the running information and configure parameters. The two buttons have multiple functions. Please refer to **Tab. 3-1** before any operation of the inverter.

Tab. 3-1 Button function

Button	Operation	Description
	≤ 1.2 s	Move upwards or downwards or scroll among set values. Hereinafter, it is referred to as " Touch ▾".
	> 1.2 s	Return to a previous menu or cancel the settings. Hereinafter, it is referred to as " Press ▾".
	≤ 1.2 s	Move left or right, or turn pages. Hereinafter, it is referred to as " Touch ▷".
	> 1.2 s	Enter the sub-menu or confirm the settings. Hereinafter, it is referred to as " Press ▷".



If there is no button operation for:

- 1 minute, LCD backlight will be automatically deactivated;
- 2 minutes, system will return to the default menu (main screen).

3.3 Main Screen

The LCD display will enter the main screen after successful commissioning, as shown in **Fig. 3-2**.

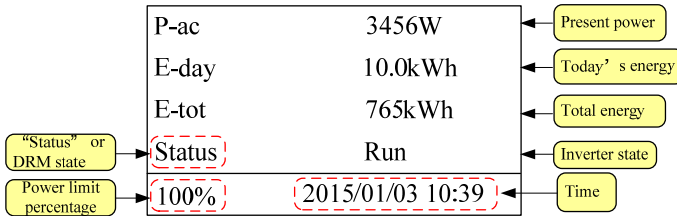


Fig. 3-2 Main screen

Power limit percentage = (Current maximum output power) / (Rated power)

The current maximum output power depends on the minimum value of *Pac Limit*, *Volt-watt* and *Frq-watt* response settings that can be set via LCD menu. Refer to sections **3.9.3** and **3.9.6** for details.

* This power limit percentage is not indicated in some firmware versions.

Tab. 3-2 Descriptions of Inverter Status

Status	Description
Run	After being energized, inverter tracks the PV arrays' maximum power point (MPP) and converts the DC power into AC power. This is the normal operation mode.
Standby	Inverter enters Standby mode when DC input is insufficient or with the DRM0 command from the DRED. In this mode inverter will wait within the Standby duration. (Refer to " 3.9.4 Setting Grid-tied Time ")
Key-stop	Inverter will stop running by manual "stop" via the LCD menu. In this way, inverter internal DSP stops. To restart the inverter, manually start via the LCD menu.
Startup	The inverter is initializing and synchronizing with the grid.
Dispatch	Inverter output power can be adjusted via the LCD menu. This state means that the Pac limit is set lower than 100%. (Refer to " 3.9.6 Setting Power Parameters ")
Fault xxx	If a fault occurs, inverter will automatically stop running, disconnect the AC relay, and display the fault information on the LCD display with the "FAULT" indicator on. "xxx" is the fault code, e.g. "010". Once the fault is removed in recovery time (refer to " 3.9.4 Setting Grid-tied Time "), inverter will automatically resume running.
Warn xxx	Warning information is detected. "xxx" is the warning code, e.g. "070".


If a DRED is connected to the eShow and the DRED activates a DRM command, the DRM state will be shown on the main screen, as shown in the figure.

P-ac	0W
E-day	7.0KWh
E-tot	100KWh
DRM0	Standby
100%	2015/01/03 10:39

Tab. 3-3 Demand Response Modes (DRMs)


Mode	Explanation
DRM0	The inverter is in the state of standby.
DRM5	The export power to the grid is 0.
DRM6	The export power to the grid is no more than 50% of the rated power.
DRM7	The export power to the grid is no more than 75% of the rated power.
DRM8	The export power to the grid is 100% of the rated power, but subject to the constraints from other active DRMs.

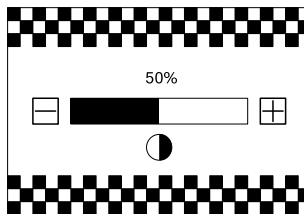
Viewing Current Fault



If inverter is in "Fault" state, touch  to view "Current fault" information. To know the meaning of the fault code, please refer to "4.1 Troubleshooting".


Current fault	
Fault Code	010

3.4 Contrast Adjustment

Step 1 Press/touch  on the main screen to enter the contrast adjustment screen.



Step 2 Touch  to increase the setting value and touch  to decrease the value.

Step 3 Press  to confirm the contrast setting.



Contrast adjustment range: 0–100%
Recommended value: 50% or 60%.

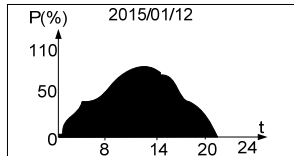
3.5 Checking Running Information

The main screen displays some basic information about the inverter. For more detailed information, please operate as follows:

Main Screen (Press \triangleright)→**Menu**→**Run-inform (Press \triangleright)**

Scroll pages by **touching \triangleright** .

The power curve shows the daily power output. Each point in the curve is the percentage of the present power to the nominal power.



If the inverter has two pairs of DC terminals, the DC information will be as shown in the figure.

Vdc[V]: DC voltage of each input.

Idc[A]: DC current of each input.

Pdc[W]: DC power of each input.

Indep mode/Paral mode:

The PV configuration mode of the two PV inputs.

DC	Paral mode	
	DC1	DC2
Vdc[V]	345.6	345.6
Idc[A]	6.2	6.3
Pdc[W]	2142	2177

If the inverter has a pair of DC terminals, the DC information will be as shown in the figure.

Vdc[V]: DC voltage.

Idc[A]: DC current.

Pdc[W]: DC power.

DC	
Vdc[V]	345.6
Idc[A]	6.2
Pdc[W]	2142

Vac[V]: AC output voltage.

Iac[A]: AC output current.

Pac[W]: AC output power.

F[Hz]: Frequency of AC output.

AC	
Vac[V]	221.7
Iac[A]	19.7
Pac[W]	4330
F[Hz]	50.0

Country: Country code.

Temp: The internal temperature of the inverter.

Country	AU
Temp	45.2°C

This interface shows the detailed device information.

* Image shown here is for your reference only. The actual version may be different.




* This interface is not available in some firmware versions.

Firmware version	
SN	A1610090001
Version	
Crystal-V21_FW_V014	
Device Type	
SG5KTL-D	

3.6 Setting the Country Code

To make the protection parameters setting convenient, inverter provides in-built protection parameters for certain countries.

Main Screen (Press )→**Menu (Touch  × 1)**→**Country setting (Press )**

Touch /  to choose countries and **press ** to confirm.

If the country selected is not in the list, please choose Other and then input the protection parameters manually.

Countries											
<input type="radio"/>	GB	<input type="radio"/>	ODE	<input type="radio"/>	FR	<input type="radio"/>	ITO	<input type="radio"/>	ES	<input type="radio"/>	OAT
<input checked="" type="radio"/>	AU	<input type="radio"/>	CZ	<input type="radio"/>	BE	<input type="radio"/>	NL	<input type="radio"/>	CN	<input type="radio"/>	OSE
<input type="radio"/>	OTH	<input type="radio"/>	KR	<input type="radio"/>	Other						



- After setting the country, please set other parameters in accordance with the specific requirements of the local grid. Check the parameters thoroughly before commissioning.
- SUNGROW assumes no liability for direct or indirect damage arising from the parameters exceeding the permissible range of the utility grid.

Tab. 3-4 Country code description

Country Code	Country	Language
GB	Great Britain	English
DE	Germany	
FR	France	
IT	Italy	
ES	Spain	
AT	Austria	
AU	Australia	
CZ	Czech	
BE	Belgium	

Country Code	Country	Language
NL	Netherlands	
CN	China	Chinese
SE	Sweden	
TH	Thailand	
KR	Korea	English
Other	Country not mentioned above	

If the country code is set to AU, the grid company setting will appear. **Touch** ▽/▷ to choose grid code and **press** ▷ to confirm. When the grid is set to "EE" or "EG", the reactive power regulation will be in PF mode with the power factor of +0.90 (0.90 lagging).

Grid Company Setting		
<input type="radio"/> AG	<input type="radio"/> EE	<input type="radio"/> PN
<input type="radio"/> PC	<input type="radio"/> WP	<input type="radio"/> EG
<input checked="" type="radio"/> Other		

Tab. 3-5 Grid Standard Description

Grid company Code	Company
AG	AusGrid, NSW
EE	Ergon Energy, QLD
PN	SA Power Networks, SA
PC	Powercor, VIC
WP	Western Power, WA
EG	Energex, QLD
Other	Company not mentioned above

Tab. 3-6 Parameters of Grid Standards

Parameter	Other (Default)	AG	EE	EG	PN	PC	WP
Over-voltage							
1-V _{max} (V)	260.0	260.0	260.0	260.0	257.0	260.0	260.0
1-Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
2-V _{max} (V)	265.0	265.0	265.0	265.0	265.0	265.0	265.0
2-Time (s)	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Under-voltage							
1-V _{min} (V)	180.0	200.0	210.0	210.0	200.0	195.0	180.0
1-Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
2-V _{min} (V)	180.0	200.0	210.0	210.0	200.0	195.0	180.0
2-Time (s)	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Over-frequency							
1-F _{max} (Hz)	52.00	52.00	52.00	52.00	52.00	51.50	51.50
1-Time (s)	0.20	0.20	0.20	0.20	0.20	0.20	0.20
2-F _{max} (Hz)	52.00	52.00	52.00	52.00	52.00	51.50	51.50
2-Time (s)	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Under-frequency							
1-F _{min} (Hz)	47.00	48.00	47.00	47.00	48.00	48.50	47.00

Parameter	Other (Default)	AG	EE	EG	PN	PC	WP
1-Time (s)	1.50	1.50	1.50	1.50	1.50	1.50	1.50
2-F _{min} (Hz)	47.00	48.00	47.00	47.00	48.00	48.50	47.00
2-Time (s)	1.50	1.50	1.50	1.50	1.50	1.50	1.50
10-min voltage							
1-V _{10-min} (V)	255.0	255.0	255.0	257.0	255.0	255.0	258.0
2-V _{10-min} (V)	255.0	255.0	255.0	257.0	255.0	255.0	258.0

* Refer to **Tab. 3-11** for the parameter explanations.

3.7 Setting the Time

The correct system time is very important. If there is deviation between the system time and the local time, the inverter will not operate normally. The clock is in 24-hour format. Proceed as follows to set the correct time.

Main Screen (Press \triangleright)→**Menu (Touch $\nabla \times 2$)**→**Set Time(Press \triangleright)**

Touch \triangleright to move the cursor and **touch ∇** to change value. **Press \triangleright** to confirm setting.

Set-Time
YY/MM/DD
Date 15/01/21
Time 13:34:32

3.8 Starting/Stopping the Inverter

Main Screen (Press \triangleright)→**Menu (Touch $\nabla \times 3$)**→**On/Off Control (Press \triangleright)**

Touch ∇ to choose and **press \triangleright** to confirm the choice.

On/Off Control	Start/Stop
▶ Start/Stop	▶ Start Stop

Press \triangleright to confirm.

Start/Stop	Start/Stop
Confirm start inverter?	Confirm stop inverter?

3.9 Advanced Settings

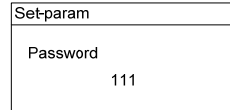
Main Screen (Press **▷**)→Menu (Touch **▽** ×4)→Set-param (Press **▷**)

3.9.1 Password Entry

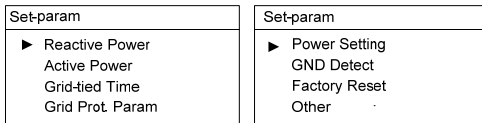
Set-parameter setting is password-protected. To set the parameters, you should input the correct password.

Step 1 A password confirmation screen will occur.

Touch **▷** to move cursor right and **touch** **▽** to input the password 111.



Step 2 Press **▷** to confirm the password and enter the “Set-param” submenu.

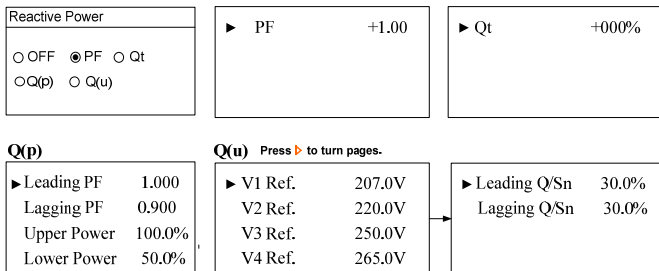


3.9.2 Setting Reactive Power Response

This item is to set the reactive power response mode. The default setting is OFF.

When the grid standard of country “AU” is set to “EE” or “EG”, the reactive power response will be in PF mode with the power factor of +0.90 (0.90 lagging).

Touch **▽/▷** to select the mode and **press** **▷** to enter the submenu.



Tab. 3-7 Description of Reactive Power Parameters

Parameter	Description	Default	Range
OFF	Disable the function of reactive power regulating.	-	-

Parameter	Description	Default	Range	
PF	Fixed power factor mode	+1.00	-1.00 to -0.80, +0.80 to +1.00	
Qt	The maximum ratio of reactive power to rated apparent power as %.	000%	-060% to +060%	
Q(p)	Leading PF	Power factor of point P1 in the Q(p) curve	1.000	0.900–1.000
	Lagging PF	Power factor of point P2 in the Q(p) curve	0.900	0.900–1.000
	Upper Power*	Output power of point P2 in the Q(p) curve (in %)	100.0%	50%–100%
	Lower Power*	Output power of point P1 in the Q(p) curve (in %)	50.0%	0%–50%
Q(u)	V1 Ref.	Grid voltage reference value 1	207.0 V	Not applicable
	V2 Ref.	Grid voltage reference value 2	220.0 V	216 V–230 V
	V3 Ref.	Grid voltage reference value 3	250.0 V	235 V–255 V
	V4 Ref.	Grid voltage reference value 4	265.0 V	244 V–265 V
	Leading Q/Sn	Q/Sn value of voltage V1	30.0%	0%–60%
Lagging Q/Sn	Q/Sn value of voltage V4	30.0%	0%–60%	

*Lower Power < Upper Power

"+": Lagging, the inverter is sinking reactive power from the grid.

"-": Leading, the inverter is sourcing reactive power to the grid.

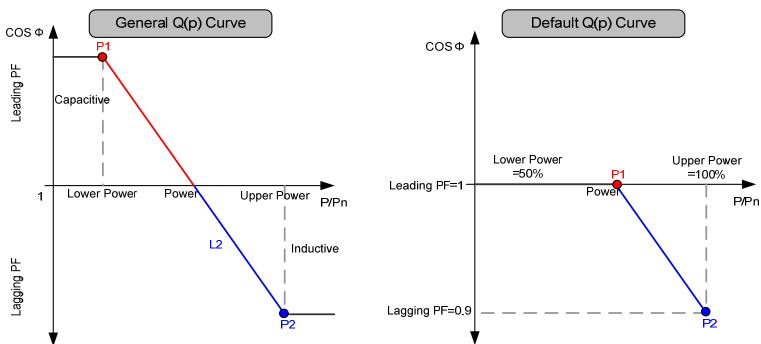


Fig. 3-3 Reactive Power Regulation Curve in Q(p) Mode

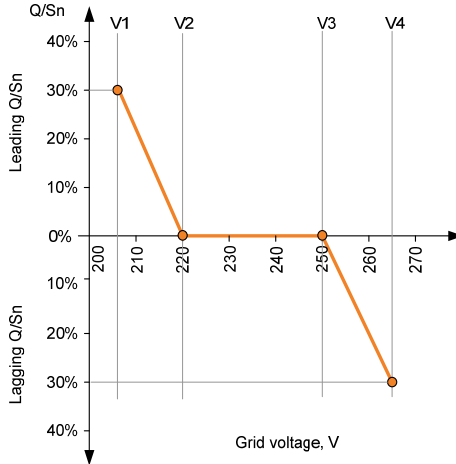


Fig. 3-4 Reactive Power Regulation Curve in Q(u) Mode

3.9.3 Setting Active Power Response

Touch ▾ to choose the active power response mode and **press** ▷ to confirm setting.

* The item “Volt-watt” is not indicated in some firmware versions.

Active Power
▶ Volt-watt
Frq-watt

Volt-watt Response

ON: enable the Volt-watt response mode. (By default)

OFF: disable the response mode.

Volt-watt
<input type="radio"/> OFF <input checked="" type="radio"/> ON

Define the response curve with four reference voltage values. The inverter power output will vary in response to the voltage curve.

Touch ▷ to move the cursor and **touch** ▾ to change value. **Press** ▷ to confirm setting.

▶ V1 Ref.	207.0V
V2 Ref.	220.0V
V3 Ref.	250.0V
V4 Ref.	265.0V

Tab. 3-8 Description of Volt-watt Parameters

Parameter	Description	Default	Range
V1 Ref.	Grid voltage reference value 1	207.0 V	Not applicable
V2 Ref.	Grid voltage reference value 2	220.0 V	216 V–230 V
V3 Ref.	Grid voltage reference value 3	250.0 V	235 V–255 V
V4 Ref.	Grid voltage reference value 4	265.0 V	244 V–265 V

* The default values are the factory settings.

The response curve is defined by the voltage reference values and corresponding power levels.

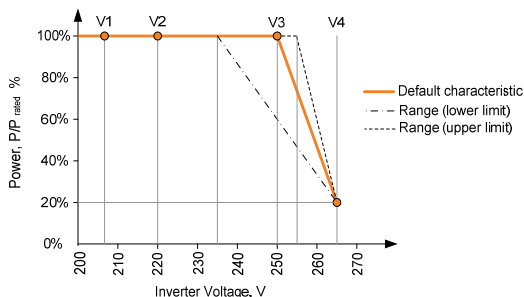


Fig. 3-5 Power Response Curve in Volt-watt Mode

Frq-watt Response

Define the response curve with a start frequency and an end frequency. The inverter power output will vary in response to the increase of grid frequency.

Touch ▷ to move the cursor and **touch** ▽ to change value. **Press** ▷ to confirm setting.

▶ Frq Stop	52.00Hz
Frq Start	50.25Hz

Tab. 3-9 Description of Frq-watt Parameters

Parameter	Description	Default	Range
Frq Stop	The stop frequency value for over-frequency response	52.00 Hz	51.00 Hz–52.00 Hz
Frq Start	The start frequency value for over-frequency response	50.25 Hz	50.25 Hz–52.00 Hz

* The default values are the factory settings.

When there is an increase in grid frequency which exceeds the *Frq Start* value (50.25 Hz), the inverter will reduce the power output linearly with an increase of frequency until the *Frq Stop* value (52.00 Hz) is reached. When the frequency exceeds the stop value, the inverter output will be ceased (i.e. 0 W).

The output power will remain at or below the lowest power level reached in response to an over-frequency event between 50.25 Hz and 52 Hz. This is to provide hysteresis in the control of the inverter.

When the grid frequency has decreased back to 50.15 Hz or less for at least 60 s, the power level will be increased at a rate no greater than the power ramp rate limit.

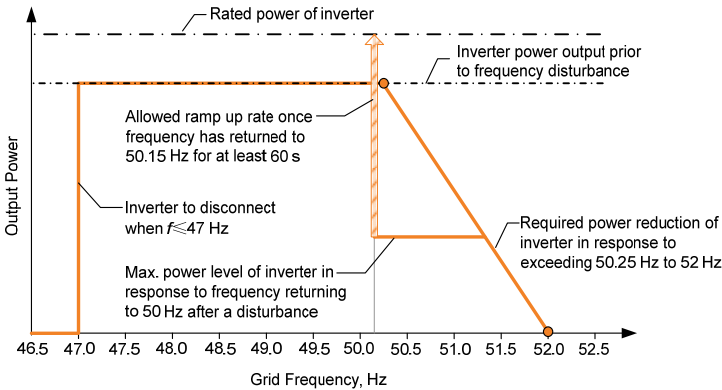


Fig. 3-6 Power Response Curve in Frq-Watt Mode

3.9.4 Setting Grid-tied Time

Touch ▾ to choose the item and press ▷ to enter the setting interface.

Grid-tied Time	▶ Standby time 010s	▶ Recovery time 030s
▶ Standby time Recovery time		

Tab. 3-10 Description of Grid-tied Time

Parameter	Description	Default	Range
Standby time	The time needed for the inverter from standby to startup	10 s	10 s–255 s
Recovery time	The time needed for inverter recovery from fault to standby	30 s (IT: 300 s)	0–900 s

3.9.5 Setting Grid Protective Parameters

Protective parameters are designed for the threshold values that can trigger the protective function of the inverter.

Touch ▾ to choose the item and press ▷ to enter the setting interface.

Grid Prot. Param
▶ Single/Mul Prot. 10 Min Over Vtg

Single/Multiple Stage Protection

Touch \blacktriangleright to choose single stage or multi. stage and **press** \blacktriangleright to enter the setting interface.

Prot. Stage	
\blacktriangleright Single stage	
Multi. stage	

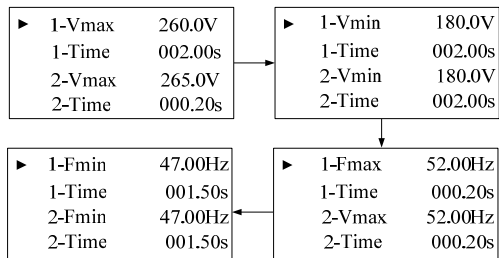
Single stage protective parameter setting:

Touch ∇ to select parameter, **touch** \blacktriangleright to move the cursor and **touch** ∇ to set the appropriate value. Confirm settings by **pressing** \blacktriangleright .

\blacktriangleright Vmax	260.0V
Vmin	180.0V
Fmax	52.00Hz
Fmin	47.00Hz

Multi. stage protective parameter setting:

Touch ∇ to select parameter, **touch** \blacktriangleright to move cursor and **touch** ∇ to set the appropriate value. Confirm settings by **pressing** \blacktriangleright .



Tab. 3-11 Description of Multi. Stage Protective Parameters

Parameter	Explanation
Max-V prot.	Over-voltage protection
1-V _{max}	Grid over-voltage 1 (V>)
1-Time	Grid over-voltage 1 (V>) tripping time
2-V _{max}	Grid over-voltage 2 (V>>)
2-Time	Grid over-voltage 2 (V>>) tripping time
Min-V prot.	Under-voltage protection
1-V _{min}	Grid under-voltage 1 (V<)
1-Time	Grid under-voltage 1 (V<) tripping time
2-V _{min}	Grid under-voltage 2 (V<<)
2-Time	Grid under-voltage 2 (V<<) tripping time
Max-F prot.	Over-frequency protection
1-F _{max}	Grid over-frequency 1 (F>)
1-Time	Grid over-frequency 1 (F>) tripping time
2-F _{max}	Grid over-frequency 2 (F>>)
2-Time	Grid over-frequency 2 (F>>) tripping time
Min-F prot.	Under-frequency protection
1-F _{min}	Grid under-frequency 1 (F<)
1-Time	Grid under-frequency 1 (F<) tripping time
2-F _{min}	Grid under-frequency 2 (F<<)
2-Time	Grid under-frequency 2 (F<<) tripping time

10 Min Over Voltage Protection

The inverter will automatically disconnect from the grid within 3 s when the average voltage for a 10 min period exceeds the set-point of *10 min Vtg*.

ON: enable the function. (By default)

OFF: disable the function.

* This interface is not available in some firmware versions.

The *10 min Vtg* lies in the range 244 V–258 V and the default set-point is 255.0 V.

10 Min Over Vtg	
<input type="radio"/> OFF	<input checked="" type="radio"/> ON

▶ 10 min Vtg	255.0V
--------------	--------

3.9.6 Setting Power Parameters

Touch ▽ to choose and **Press** ▷ to confirm the setting.

* The item “Max Output Power” is only indicated for SG5KTL-D in some firmware versions.

Default setting: 4990 W.

After you change the maximum output power setting, disconnect the inverter from DC sources and re-power the inverter to bring the setting into effect.

Power Setting	
▶ Max Output Power	
Pac Limit	
Power Ramp Rate	

Max Output Power	
<input checked="" type="radio"/> 4990W	<input type="radio"/> 4600W

Pac limit:

The inverter active power limitation.

The inverter state will be “Dispatch” if this limit value is set to 0–99%.

▶ Pac limit	100 %
-------------	-------

Power Ramp Rate:

The ramp up/down rate of power variation.

ON: enable the power rate limit mode. (By default)

OFF: disable the power rate limit mode.

* This interface is not available in some firmware versions.

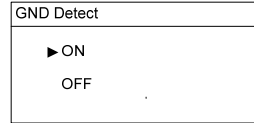
Power Ramp Rate	
<input type="radio"/> OFF	<input checked="" type="radio"/> ON

The default set-point is 16.67% of rated power per minute and the range lies in 5%–100%.

▶ PRampRate	16.67%
-------------	--------

3.9.7 GND Detection

Select **ON** to enable the GND Detection. If the enclosure of the inverter is not grounded, the fault code 106 will be shown on the main screen. The buzzer inside will sound at the same time.



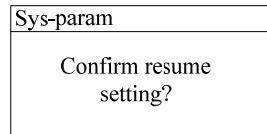
3.9.8 Factory Reset

NOTICE

All history information will be unrecoverable and all parameters will return to the default value except the protective parameters and time once the "Factory Reset" operation is performed.

Press ▶ to confirm the operation.

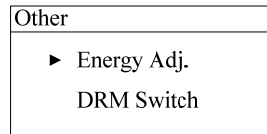
Press ▼ to discard the operation.



3.9.9 Other Settings

Touch ▼ to choose the item and **press** ▶ to confirm setting.

* The item "DRM Switch" is not indicated in some firmware versions.



Energy Deviation Adjustment

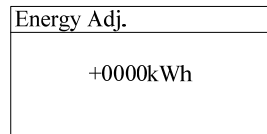
If the accumulative value "E-tot" in the inverter is different from the value in the external metering device, you should adjust energy by this setting.

(Energy Adj. value) = (Real measured value) - (E-tot reading value).

Touch ▶ to move the cursor and **touch** ▼ to change the value. **Press** ▶ to confirm the setting.

The "+" can be changed to "-".

The adjustment ranges from -9999 to +9999 kWh.



DRM Switch Setting

Touch ▾/▷ to choose the item and **press** ▷ to confirm the setting.

ON: enable the DRM function. (By default)

OFF: disable the DRM function.

DRM Switch	
<input type="radio"/> OFF	<input checked="" type="radio"/> ON

3.10 Setting Communication Parameter

Main Screen (Press ▷)→Menu (Touch ▾×5)→Com-param (Press ▷)

Touch ▷ to move the cursor and **touch** ▾ to set the appropriate value. Confirm settings by **pressing** ▷.
Device address range: 1-247.

Com-param
▶ Modbus param 031

3.11 Viewing Fault Records

Main Screen (Press ▷)→Menu (Touch ▾×6)→Flt-record (Press ▷)

Inverter shows fault record pages.

Scroll pages by **touching** ▾.

The inverter can only store at most 20 latest fault records.

Flt-record	P1/2
1 15/01/21 09:10:12	[010]
2 15/01/21 09:10:08	[004]
3 15/01/21 09:10:00	[009]
4 15/01/20 15:13:18	[010]

4 Appendix

4.1 Troubleshooting

When the data on the screen of eShow cannot be refreshed on time, please follow the procedure below for a solution.

Step 1 Disconnect the external AC circuit breaker.

Step 2 Turn off the upstream DC circuit breaker or pull off the MC4 terminals.

Step 3 Check whether the communication cable of the eShow is firmly connected.

Step 4 If the fault still exists, contact Sungrow Service Dept.

When faults occur, the "Fault" state will be shown on the main screen.

Fault Code	Description	Troubleshooting
002	The grid voltage exceeds the inverter allowable upper limit.	<ol style="list-style-type: none">1. Check the voltage of the grid.2. If the grid voltage exceeds the permissible range of inverter protection parameters, ask the local utility grid authority for solution.3. If the grid voltage is within the permissible range, contact Sungrow Service Dept.
003	Grid transient voltage exceeds the permissible range.	<ol style="list-style-type: none">1. This is a short-term fault due to grid condition. Wait a moment for inverter recovery.2. If the fault still exists, please contact Sungrow Service Dept.
004	The grid voltage is below inverter's allowable lower limit.	<ol style="list-style-type: none">1. Check the grid voltage.2. If the grid voltage exceeds the permissible range of inverter protection parameters, ask utility grid company for solution.3. If the grid voltage is within the permissible range, contact Sungrow Service Dept.
005	The grid voltage is too low.	<ol style="list-style-type: none">1. This is a short-term fault due to grid condition. Wait a moment for inverter recovery.2. If the fault still exists, please contact Sungrow Service Dept.
006	The AC output current exceeds inverter allowable upper limit.	<ol style="list-style-type: none">1. The inverter will resume if the output current falls below the protection value.2. If the fault still exists, please contact Sungrow Service Dept.

Fault Code	Description	Troubleshooting
007	Transient over-current. AC	<ol style="list-style-type: none"> 1. The inverter will self-recover after several seconds. 2. If the fault still exists, please contact Sungrow Service Dept.
008	The grid frequency exceeds inverter allowable upper limit.	<ol style="list-style-type: none"> 1. Check the grid frequency. 2. If the grid frequency exceeds the permissible range of inverter protection parameters, ask utility grid company for solution.
009	The grid frequency is below the inverter allowable lower limit.	<ol style="list-style-type: none"> 3. If the grid frequency is within the permissible range, contact Sungrow Service Dept.
010	Islanding.	<ol style="list-style-type: none"> 1. Check whether AC circuit breaker is triggered. 2. Check whether AC cables are all firmly connected. 3. Check whether grid is not in service. 4. If all conditions are OK and this fault still occurs in the LCD screen, contact Sungrow Service Dept.
011	The DC component of AC current exceeds inverter limit.	<ol style="list-style-type: none"> 1. Wait a moment for inverter recovery. 2. If the fault occurs repeatedly, contact Sungrow Service Dept.
012	The leakage current exceeds the upper limit.	<ol style="list-style-type: none"> 1. Check the PV strings for ground fault. 2. If the fault occurs repeatedly, contact Sungrow Service Dept.
014	The average grid voltage exceeds the permissible range for over 10 minutes.	<ol style="list-style-type: none"> 1. Check whether the inverter selected country code is the country you are in. 2. Wait a moment for inverter recovery. 3. Check the voltage of the grid. If the grid voltage exceeds the permissible range of inverter protection parameters, ask utility grid company for solution. 4. If the fault occurs repeatedly, contact Sungrow Service Dept..
015	The grid voltage exceeds the permissible range.	<ol style="list-style-type: none"> 1. Check the model of the AC cables. 2. Wait a moment for inverter recovery. 3. If the grid voltage exceeds the permissible range, ask utility grid company for solution. 4. If the fault occurs repeatedly, contact Sungrow Service Dept.
016	The bus voltage is high after grid-connection.	<ol style="list-style-type: none"> 1. Wait a moment for inverter recovery. 2. If the fault occurs repeatedly, contact Sungrow Service Dept.
019	The transient bus voltage is high.	<ol style="list-style-type: none"> 1. Wait a moment for inverter recovery. 2. If the fault occurs repeatedly, contact Sungrow Service Dept.

Fault Code	Description	Troubleshooting
020	The bus average voltage is high.	1. Wait a moment for inverter recovery. 2. If the fault occurs repeatedly, contact Sungrow Service Dept.
021	PV1 input over-current is detected.	Check the layout and the wiring of PV1 input.
022	PV2 input over-current is detected.	Check the layout and the wiring of PV2 input.
028	Reverse polarity of the PV1 connection.	1. Disconnect the DC switch. 2. Check the polarity of the PV inputs.
029	Reverse polarity of the PV2 connection.	3. Reconnect the PV strings if the polarity is incorrect.
036	The temperature of radiator is too high.	1. Check whether the placement of inverter is correctly. 2. Check whether the inverter operating ambient temperature is more than the range indicated in the specification.
037	The internal temperature of inverter is too high.	3. Check whether AC output power exceeds the nominal power. 4. If the fault still exists, please contact Sungrow.
038	Relay fault is detected.	1. Wait a moment for inverter recovery. 2. If the fault occurs repeatedly, contact Sungrow Service Dept.
039	The insulation resistance is low. (ISO-fault)	1. Check whether there is a reliable inverter grounding line. 2. Check whether the positive and negative of PV panels is short-circuited with ground lead. 3. Wait a moment for inverter recovery. 4. If the fault occurs repeatedly, contact Sungrow Service Dept.
041	Leakage current sensor fault.	1. Wait a moment for inverter recovery. 2. If the fault occurs repeatedly, contact Sungrow Service Dept.
043	Ambient under-temperature protection.	1. Stop the inverter. 2. Wait a moment for the temperature recovery. Restart the inverter when the temperature is in the permissible range. 3. If the fault occurs repeatedly, contact Sungrow Service Dept.
044	Open-loop inverter self-test fault.	1. 1. Check the drive circuit.
045	Boost 1 self-test fault.	2. If the fault occurs repeatedly, contact Sungrow Service Dept.
046	Boost 2 self-test fault.	

Fault Code	Description	Troubleshooting
048	AC current sampling channel fault.	<ol style="list-style-type: none"> 1. Wait a moment for inverter recovery. 2. If the fault occurs repeatedly, contact Sungrow Service Dept.
053	Slave DSP detects that the grid voltage exceeds the protection range.	<ol style="list-style-type: none"> 1. Check the grid voltage. 2. If the grid voltage exceeds the permissible range of inverter protection parameters, ask utility grid company for solution. 3. If the grid voltage is within the permissible range, contact Sungrow Service Dept.
054	Slave DSP detects that the grid frequency exceeds the protection range.	<ol style="list-style-type: none"> 1. Check the grid frequency. 2. If the grid frequency exceeds the permissible range of inverter protection parameters, ask utility grid company for solution. 3. If the grid frequency is within the permissible range, contact Sungrow Service Dept.
056	Slave DSP detects that the leakage current exceeds the protection range.	<ol style="list-style-type: none"> 1. Check whether there is a grounded fault of the PV string. 2. If the fault occurs repeatedly, contact Sungrow Service Dept.
059	Master DSP and slave DSP communication fault.	<ol style="list-style-type: none"> 1. Wait a moment for inverter recovery. 2. If the fault occurs repeatedly, contact Sungrow Service Dept.
061	The inverter type is not set.	Contact Sungrow Service Dept.
070	Fan warning.	Stop the inverter and disconnect the AC & DC cables. Check whether the fan duct has been blocked. If not, replace fans.
074	Communication fault between the LCD and DSP.	<ol style="list-style-type: none"> 1. Check whether communication cable of the eShow is firmly connected. 2. If the communication cable is firmly connected, a fault has occurred in the internal communication of the inverter. However, the inverter continues feeding into the grid. Contact Sungrow Service Dept.
100	The AC output current exceeds inverter protection limit.	<ol style="list-style-type: none"> 1. The inverter will resume if the output current falls below the protection value. 2. If the fault still exists, please contact Sungrow Service Dept.
106	The inverter is not grounded. Neither the PE terminal on the AC connection block nor the second PE terminal on the enclosure is reliably connected.	<p>Check whether there is a reliable inverter grounding line.</p> <p>If there is access to the ground, and the fault still exists, please contact Sungrow Service Dept.</p>

Fault Code	Description	Troubleshooting
200	The bus voltage is high.	<ol style="list-style-type: none"> 1. Wait for inverter recovery after bus voltage lower. 2. If the fault occurs repeatedly, contact Sungrow Service Dept.
201	The bus voltage is too low.	<ol style="list-style-type: none"> 1. Wait a moment for inverter recovery. 2. If the fault occurs repeatedly, contact Sungrow Service Dept.
202	PV hardware over-current.	<ol style="list-style-type: none"> 1. Wait for inverter recovery after DC current is reduced. 2. If the fault occurs repeatedly, contact Sungrow Service Dept.
203	The PV input voltage exceeds the bus voltage.	Check the functionality of the PV connection terminals.
205	AC output relay abnormal.	<ol style="list-style-type: none"> 1. Wait a moment for inverter recovery. 2. If the fault occurs repeatedly, contact Sungrow Service Dept.
306	Mismatch of input and output power.	Contact Sungrow Service Dept.
315	Faults detected in the PV1 current sampling channel.	Restart the system.
316	Faults detected in the PV2 current sampling channel.	
409, 503-506	Temperature sensor warnings.	<ol style="list-style-type: none"> 1. Inverter can normally be connected to the grid. 2. Restart the system.

4.2 Exclusion of Liability

The content of the document is periodically checked and revised when necessary. Discrepancies therefore may exist. Readers are cautioned that Sungrow reserves the right to make changes without notice. Please call us or visit our website at www.sungrowpower.com for the latest information. No guarantee is made for the completeness of the document. Please contact our company or distributors to get the latest version.

Guarantee or liability claims for damage of any kind are excluded if they are caused by one or more of the followings:

- improper or inappropriate use or install of the product;
- installing or operating the product in unintended environment;

- installing or operating the product without observing relevant safety regulations in the deployment location;
- ignoring the safety warnings or instructions contained in all documents relevant to the products;
- installing or operating the products under incorrect safety or protection conditions;
- altering the products or supplied software without authority;
- the product malfunctions due to operating attached or neighboring devices running out of the allowed limit values; and
- damage caused by the natural environment beyond the rated operating range of the inverter.

The use of supplied software produced by Sungrow Power Supply Co., Ltd. is subject to the following conditions:

- Sungrow Power Supply Co., Ltd. assumes no liability for direct or indirect damage arising from the use of SolarInfo software. This also applies to the provision or non-provision of support activities.
- SolarInfo software used for commercial purposes is prohibited.
- Decompiling, decoding or destroying the original program, including SolarInfo software and the embedded software, is prohibited.

4.3 About Us

SUNGROW is a China-leading manufacturer of various power electronic products for renewable energy generation systems. Our products include converters, inverters, battery chargers and other power supplies for distributable generation systems in both grid-connected and stand-alone applications. The power rating of SUNGROW products covers from hundred watt to mega-watt systems.

The vision of SUNGROW is to help our customers acquire stable and clean power with minimum cost, maximum reliability and enhanced safety.

Contact Information

Should you have any problems, please contact us through the following information. We will be more than happy to assist you!

Company:	Sungrow Power Supply Co., Ltd.
Website:	en.www.sungrowpower.com
Email:	service@sungrowpower.com(China), service@sungrow.cn(Overseas)
Add:	No.1699 Xiyou Rd., New & High Technology Industrial Development Zone, Hefei, P. R. China.
Post Zip:	230088
Service line:	400 880 5578 (China), +86 551 65327834(Overseas)
Fax:	+86 551 65323478

SUNGROW

Green and Effective

Sungrow Power Supply Co., Ltd.

Add: No.1699 Xiyou Rd., New & High Technology Industrial Development Zone, 230088, Hefei, P. R. China.

Post Zip: 230088

Web: www.sungrowpower.com

E-mail: info@sungrow.cn

Tel: +86 551 6532 7834/6532 7845

Fax: +86 551 6532 7856

Specifications are subject to changes without advance notice.

UEN M-H-000580