



COMMANDER

700VA ~ 3000VA

IMPORTANT SAFETY INSTRUCTIONS

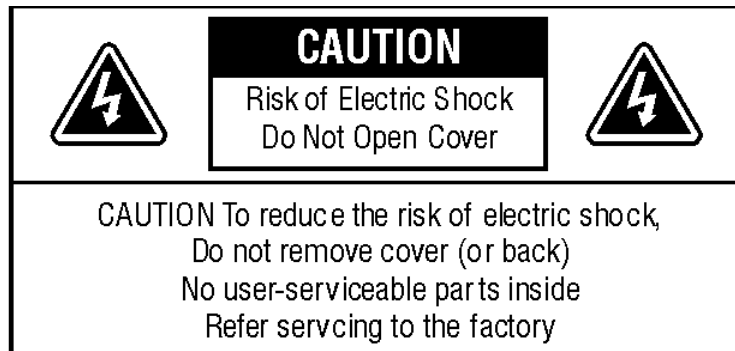
- When replacing the batteries, use the same number and the same type of batteries.
- Do not dispose of batteries in a fire; the battery may explode.
- Do not open or mutilate the battery or batteries, released electrolyte is harmful to the skin and eyes.
- A battery can present a risk of electric shock and high short circuit current. The following precaution should be observed when working on batteries.
 - * Remove watches, rings or other metal objects.
 - * Use tools with insulated handles.
- To prevent an overbalance of this unit, with the installation the additional stabilizer are to mount at the bottom side.
- This unit should be installed by service personnel.
- The equipment can be operated by any individuals with no previous experience.
- "The socket-outlet shall be installed near the equipment and easily accessible."
- "With the installation of this equipment it should be prevented, that the sum of the leakage current of the UPS at the connected consumer does not exceed 3.5mA."
- **Attention:** hazardous through electric shock. Also, with disconnection of this unit from the main, hazardous voltage still may be accessible through supply of battery.
- The battery supply should be therefore disconnected in the plus and minus pole through or from the outer enclosure accessible battery fuses when maintenance or service work inside the UPS is considered.
- The lead acid battery may cause chemical hazard.
- The battery presents a risk of electric shock and energy hazard.
- Batteries will be disposed by the manufacturer or importer. Customers need to send them back with no charge for disposal.

CAUTION:

- The UPS connection instructions and operation described in the manual must be followed in the indicated order.
- UPS must be connected to a near by wall outlet that is easily accessible. The UPS can be disconnected from the AC-power source by removing the power cord.
- Check that the indications on the rating plate correspond to your AC-power system and to the actual electrical consumption of all the equipment to be connected to the UPS.
- Never install the UPS near liquids or in an excessively damp environment.
- Never let a foreign body penetrate inside the UPS.
- Never block the ventilation grates of the UPS.
- Never expose the UPS to direct sunlight or source of heat.
- If the UPS must be stored prior to installation, storage must be in a dry place.
- The admissible storage temperature range is -15°C to $+55^{\circ}\text{C}$.
- All handling operations will require at least two people (unpacking, installation in rack systems).
- Once installed and connected to the AC power source for the first time, the battery will start to charge. Full charging to obtain the rated battery backup time requires at least 8 hours.
- Before and after the installation, if the UPS remains de-energized for a long period, the UPS must be energized for a period of 24 hours, at least once every 6 months (for a normal storage temperature less than 25°C). This charges the battery, thus avoiding possible irreversible damage. During the replacement of the battery module, it is imperative to use the same type and number of element previously mounted in the UPS, in order to maintain an identical level of performance and safety. In case of doubt, don't hesitate to contact our after sales department.

Special Symbols

The following are examples of symbols used on the UPS to alert you the important information.



RISK OF ELECTRIC SHOCK -

Indicates that a risk of electric shock is present and the associated warning should be observed



CAUTION; REFER TO OPERATOR'S MANUAL -

Refer to your operator's manual for additional information, such as important operating and maintenance.



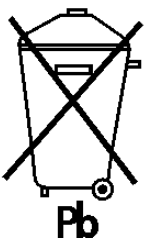
SAFETY EARTHING TERMINAL -

Indicates the primary safety ground.



RJ-45 RECEPTACLE -

For 230V units only; this receptacle provides network interface connections. Do not plug telephone or telecommunications equipment into this receptacle.



This symbol indicates that you should not discard the UPS or the UPS batteries in the trash. The UPS may contain sealed, lead-acid batteries. Batteries must be recycled.

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1. OVER VIEW AND FEATURES

The PowerShield Commander Series UPS is an advanced Line-Interactive Uninterruptible Power System which produces pure sine wave power to your equipment; unlike the traditional off-line UPS, the series provides very short transference when blackouts happen, and zero transference from AC mode to battery mode and vice versa. The voltage regulation of the series is similar to an On-line UPS; however, the series provides efficiency over 96% under normal power condition. Two charge modes, quick charge and trickle charge, are provided to maintain the batteries in the best condition

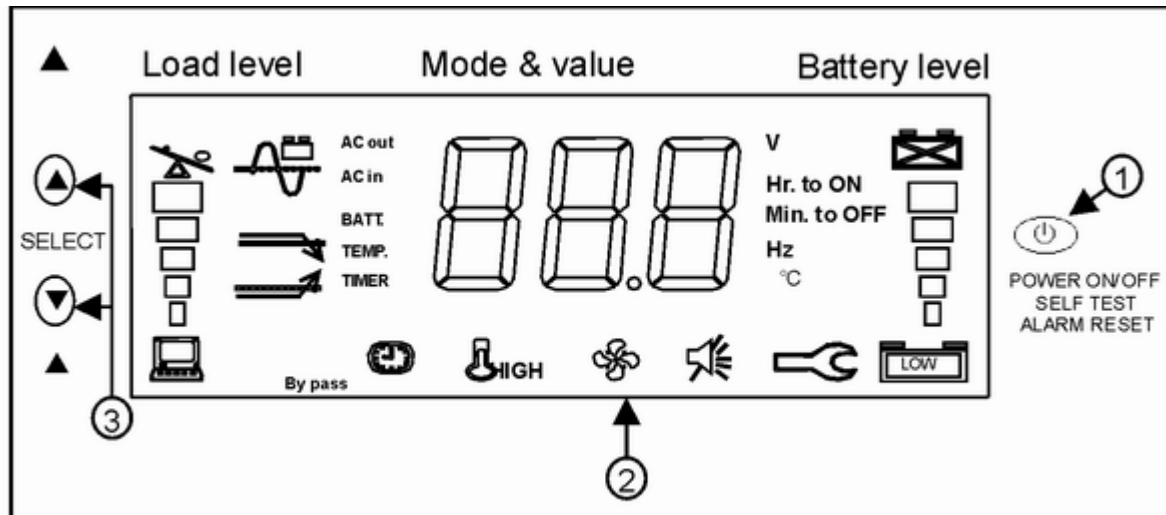
With outstanding performance and reliability, the unique benefits of the UPS include the following:

- * Pure sine wave output.
- * Microprocessor based design with true Line-Interactive structure.
- * Adjustable voltage sensitivity, charging voltage, & voltage-transfer points.
- * Remaining Estimated Backup Time indication (EBT system on LCD version).
- * Smart battery management with intelligent double stages of charging control.
- * Real time auto-detection for battery condition.
- * Automatic restart of load after UPS shutdown.
- * Smart AVR function (Two buck / boost modes).
- * Zero Transference.
- * Generator compatible.
- * “Green Power” design with auto on/off function & adjustable level.
- * Hot-swappable batteries (Rack version/optional).
- * Network manageable (SNMP optional).
- * RS-232 interface for communication, compatible with all major O.S., including Windows, Linux, SCO UNIX, & DOS.
- * Protection for overload, short circuit, & over heat.

2. PRESENTATION

2.1 LCD display models

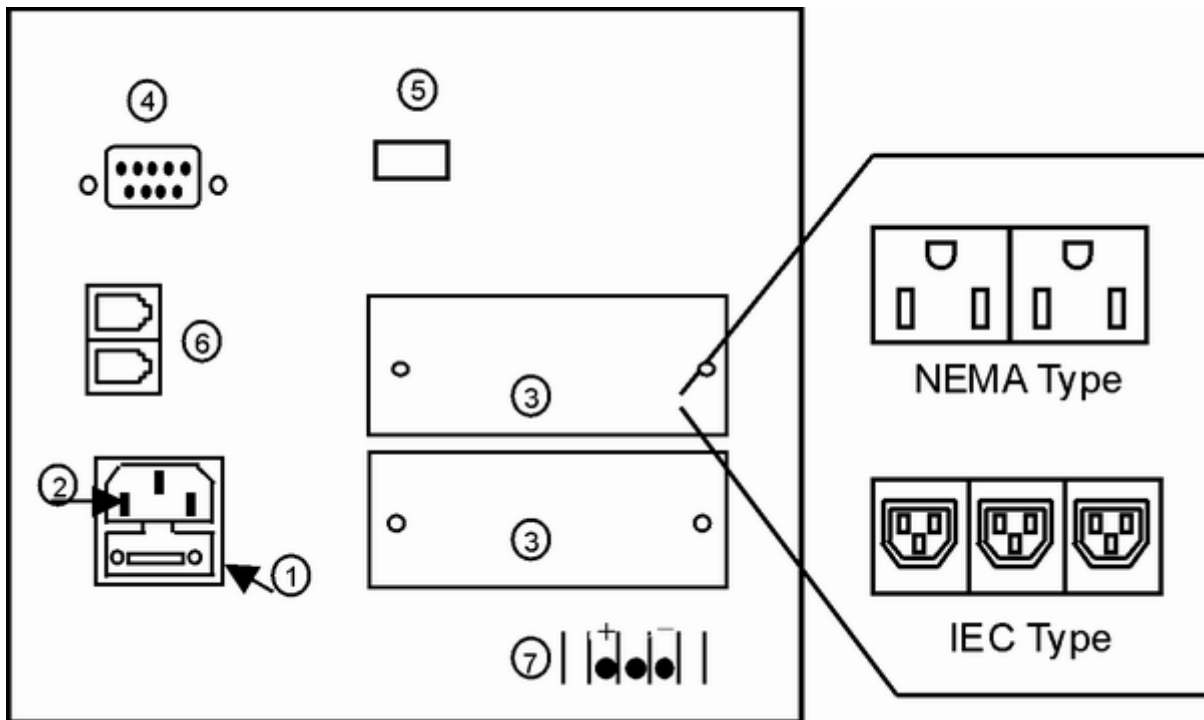
The following is one example of LCD display; the location of control buttons could be different for some models; however, the functions of buttons are the same.



- ① Main control button.
- ② LCD screen.
- ③ Selection button for mode & value.

2.2 Rear Panels

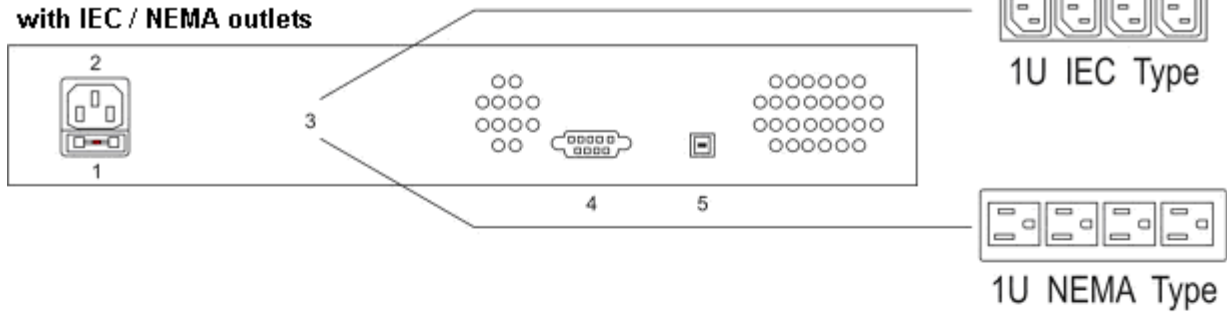
A. Tower models



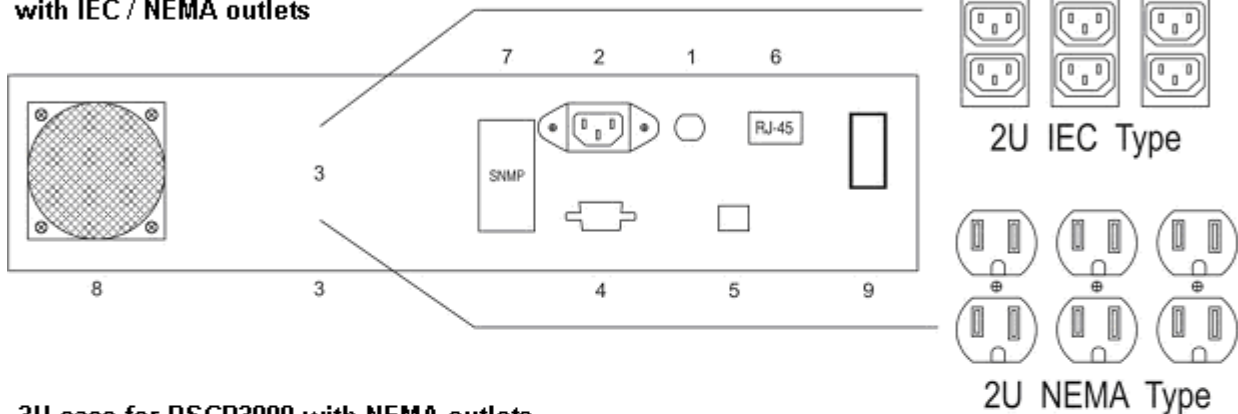
- ① Fuse (some models apply circuit breaker).
- ② Inlet of city power.
- ③ Outlet(s) (NEMA or IEC).
- ④ RS-232 Interface port.
- ⑤ USB port included.
- ⑥ Data-line protection.
- ⑦ Battery connector (for Long-run models only, optional for Anderson's type).

B. Rack models

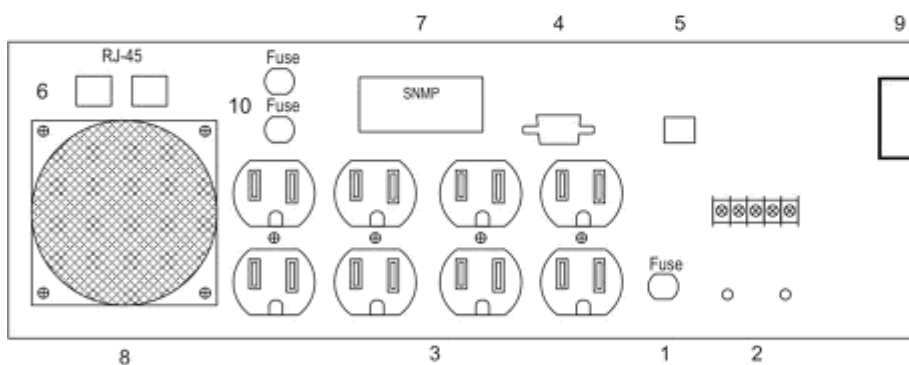
1U case for PSCR700 with IEC / NEMA outlets



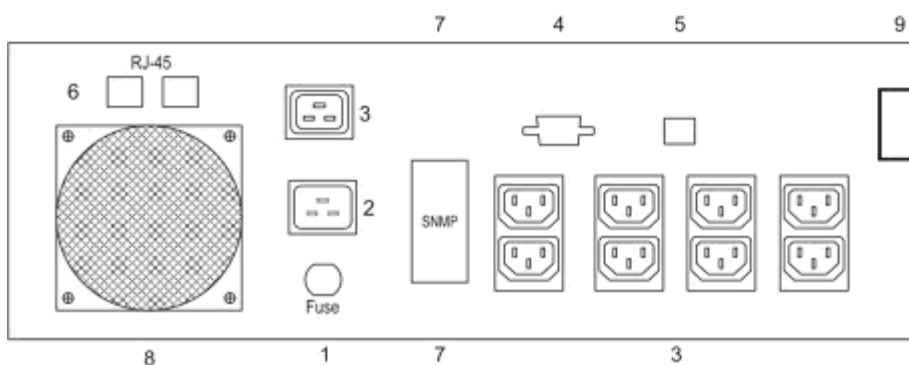
2U case for PSCR1000, PSCR1500, & PSCR2000 with IEC / NEMA outlets



3U case for PSCR3000 with NEMA outlets



3U case for PSCR3000 with IEC outlets



1. Input fuse
2. Inlet or input terminal
3. Outlets
4. RS-232 port
5. USB port
6. Data-line protection
7. SNMP slot
8. Cooling fan (optional)
9. External battery terminal (optional)
10. Output fuses

3. INSTALLATION

3.1 Inspecting the packing carton for damage that may have occurred while in transit. Immediately notify the carrier and place of purchase if any damage is found. Retain the package for future use.

3.2 Plugging the power cord to a 3-wire grounding receptacle. If an extension cord must be used between the UPS and the nearest wall outlet, use a 3-wire grounding type with rating, at least, for full load of input current as stated in item 8, Specifications.

3.3 Connecting your equipment to the UPS. To ensure that your computer equipment will be protected during a utility failure, it is important to make sure that the maximum power needed by the equipment is not over the rated capacity of the UPS. Red LED will light up (LED version), or the "Over load" symbol will show up (LCD version), and alarm will beep if the load is over the rated value. Meantime, if the overload is severe, the UPS will shut down immediately for protecting UPS itself.

3.4 If you are going to use the setting software (e.g. UPS Wizard), connect your computer to the communication port of UPS (RS-232) with the supplied communication cable.

3.5 After installation with normal city power, the UPS will charge the battery automatically; please keep the UPS in charging for 5 hours, at least.

3.6 Important Safety Instruction

SAVE THESE INSTRUCTIONS. This manual is important instructions that you should follow during installation and maintenance of the UPS and batteries. Please read all instructions before operating the equipment and save this manual for future reference.

4. OPERATION

4.1 Once it's connected with normal city power, the UPS will charge the battery automatically, when UPS is off, the status LED (in LED version) blinks green every 2 seconds; or in LCD version, the battery symbol and battery level will blink every second during charging. If AC auto turn-on function is enabled, the UPS will turn on automatically when city power is normal. If auto turn-on is disabled, please push the button for about one second on the front panel; then the UPS will give power to the outlets after a short-time of beeping.

4.2 Pushing the button for 4 seconds, the UPS will turn off the power on the outlets. But, the UPS will keep charging if city power is normal. To stop the charging, please pull out the power cord to shut down the UPS completely.

4.3 **DC start:** During a blackout, push the button one second for entering "OFF" mode (LCD showing "OFF" or LED blinking orange); then push again for one second, and the UPS will be turned on and enter into backup mode. To turn off the power from UPS; please push the button for 4 seconds; then the status LED (in LED version) will blink orange every 2 seconds; or LCD display will show "OFF" (in LCD version); then, wait for 10 seconds, and UPS will turn off the power automatically.

4.4 In "OFF" mode, UPS will turn off power completely in 10 seconds during a utility failure; while UPS will keep charging the batteries if the utility power is normal. When utility power is normal, please pull out the power cord if you want to turn off the UPS completely.

4.5 To test the battery and inverter of UPS, you can unplug the I/P cord, but it is more convenient to push the main control button for one second, the UPS will simulate a 10 seconds blackout and transfer to battery mode for discharging test. To cancel self-test, please push the control button for 2 seconds.

4.6 Under battery mode, when battery voltage is too low or too high, the UPS will emit alarm, if the under voltage or over voltage is too much, the UPS will turn off the UPS automatically.

4.7 When a blackout happens, the buzzer will emit two beeps every 8 seconds for alarm. You can disable the alarm by setting silence mode; to push the main control button will disable the alarm, and to push it again will enable the alarm, the setting can be shown on LCD display.

Note: The main control button will provide test function at normal mode, but will become with alarm-reset function at battery mode.

4.8 Battery charging mode: The UPS provides two charging modes for the battery, quick charging and trickle charging. The quick charging provides higher charging current when battery is empty and reduces the charging current when battery voltage increases. Trickle charging will begin automatically after battery is 90% fully charged.

4.9 Green mode setting (by UPS wizard software or through LCD display)

When "Green Power" function is enabled, the UPS will turn off the power within 60 seconds after blackout occurs with the power consumption lower than the pre-set level (adjustable from 1% to 14% of full load). The default value of green mode setting is zero (disabled). Please use the UPS wizard software to adjust this level.

4.10 Battery capacity balance discharging

In the structure, the battery is composed with many 2VDC cells in series connection. When UPS is installed, the batteries are charged and discharged by the same current. In theory, all battery cells have the same charging capacity; but in fact, each cell has a small difference of self-discharge rate in a long term, in which, the small difference of self-discharge rate will cause big difference among all the charged batteries. This phenomenon may not only shorten the battery life, but also cause wrong detection of "Replace battery". To prevent the wrong detection and to keep UPS batteries in the best condition, the battery needs capacity-balance discharge every 12 months; which is to discharge the UPS batteries to low battery alarm by disconnecting the AC input with the UPS and use a table lamp as the load. Do not use PC as the load when doing capacity-balance discharge to prevent from data loss at low battery shut-down. The lower the load, the better the balancing effect.

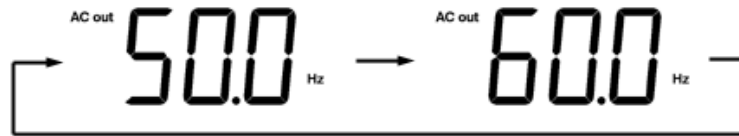
Note: If an UPS is stored in stock, please recharge the battery set every 6 months, at least; or the battery life will be shortened.

4.11 There are two ways to change the setting of UPS. The 1st way is to use the UPS Wizard software, please contact your service people for detailed information. The 2nd way is to make it through the LCD display, by the following procedures:

4.11.1 To push the two selection buttons, \triangle and ∇ , at the same time for 3 seconds until the LCD display begins to blink.

4.11.2 To change the UPS O/P frequency at DC start

When the frequency value is blinking, push any selection button, \triangle or ∇ , for 1 second to change the frequency setting! The setting will keep changing every 2 seconds if you keep pushing the button. Push two selection buttons at the same time for next setting, or leave the LCD blinking without pushing any button for 30 seconds to end the setting.



4.11.3 To change the UPS rated voltage

When the voltage value is blinking, push any selection button for 1 second to change the rated voltage. Keep pushing the button until the required voltage blinking. Then, push two selection buttons at the same time for next setting, or leave the LCD blinking for 30 seconds to end the setting.



4.11.4 To change the Auto-turn-on setting at the recovery of utility power

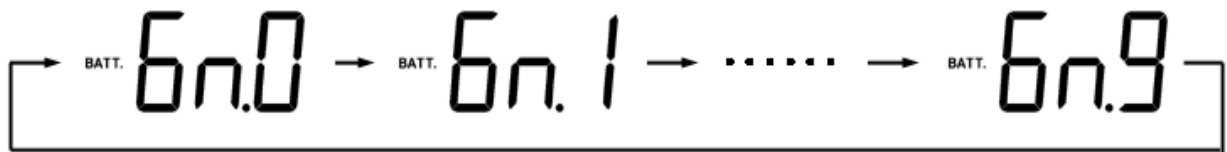
The method of changing the setting is similar to that of voltage setting. If you don't need Auto-turn-on function, please select "oFF". To select "On" is for immediate auto turning on at the recovery of utility power. While the "On.S" means auto turning on with safety mode. Sometimes, when battery is empty after blackout, the auto turn-on function will have very short backup time if blackout happened again following with a short time recovery. To select "On.S" will provide Auto-turn-on only when the battery is charged for, at least, 30% of its capacity.



4.11.5 To change the green mode level at battery mode

When the “Gn.0” is blinking, it means the green mode level is off. The UPS will not turn off the power automatically if there’s no any load connected to UPS. When the “Gn.1” is blinking, it means the green mode level is 1% of full load level. The UPS will turn off the power automatically if blackout happened when load level is less than 1% of full load.

Push the selection button “△” for 2 seconds at least, to increase the green mode level or push “▽” to decrease the level. Push two selection buttons at the same time to end the setting.

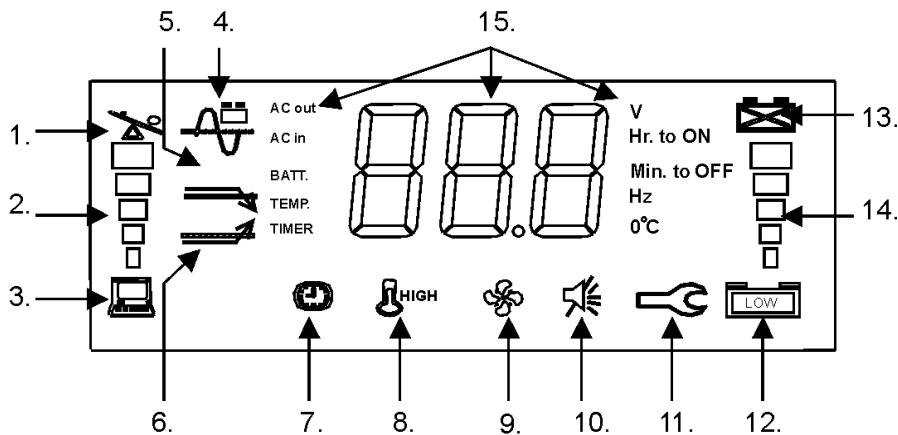


5. INDICATION & CONTROL









5.1 LCD Display

5.1.1 Main control button: Please refer to point 4 & 5 (4.1~4.7 & 5.3~5.4).

5.1.2 LCD screen



No.	Symbol	Indication	Description
1.		Over load	The loading exceeds the rating of UPS.
2.		Load level	The higher the loading, the more bars will illuminate.
3.		UPS is loaded	When "Green Mode" is enabled, this symbol will display if the loading is over 30W (default, but adjustable), and disappears when it's under 25W (default, but adjustable). Please refer to User's Manual 4.9. If "Green Mode" is disabled, the symbol will always display.
4.		Normal mode	1) The sine wave symbol will display steadily without battery symbol when UPS is in the normal mode.
		Battery mode	2) The sine wave symbol and battery symbol will blink when the UPS is in back-up (inverter) mode.
		Test mode	3) The sine wave symbol will display steadily with blinking battery symbol when the UPS is in testing mode.
5.		Buck mode	The AVR (Auto Voltage Regulator) is reducing the output voltage of the UPS (when the input voltage is too high), and the sine wave symbol, as mentioned in item 4, will also display steadily to indicate that the output is in the normal mode.
6.		Boost mode	The AVR is increasing the output voltage of the UPS (when the input voltage is too low), and the sine wave symbol, as mentioned in item 4, will display to indicate it's in the normal mode
7.		Timer is enabled	This symbol will show up in the following situations: 1) A turn-on / turn-off schedule has been set using the monitoring software. Refer to User's Manual 5.5 and the "Readme" file or "Help" function of the monitoring software. 2) The Green Mode is enabled and the loading is under 25W (default, but adjustable). The UPS will turn itself off automatically in 60 seconds. Refer to 4.9 of User's Manual.

8.		Thermal alarm	The temperature inside the UPS is over 55°C. If the user does not reduce the load, the temperature will continue to rise and the UPS will shut down automatically at 60°C.
9.		Fan is in "High speed"	This symbol is used mainly for long run series and the 5000VA model. The symbol will display whenever the cooling fan is running (or high speed), and will disappear when it is off (or low speed).
10.		Silence mode	The audible alarm has been silenced. To reset the alarm in Back-up mode, push the control button (not available during low battery level or abnormal condition).
11.		UPS fault	The UPS has failed and must be repaired. Contact a qualified service person.
12.		Battery normal	1) In normal operation, this symbol indicates a charged battery.
		Battery low	2) When the battery charge level is low, the word "LOW" will be added to the symbol.
13.		Battery replacement	The battery has failed and must be replaced. The battery is checked each time the Test Function is executed.
14.		Battery voltage level	1) The higher the battery voltage, the more bars will illuminate. 2) When the UPS is charging the battery, the battery symbol and the level indicator will blink together.
15.	Mode	Value	Description
	AC out	V	AC output voltage.
	AC in	V	AC input voltage.
	AC out	Hz	AC output frequency.
	BATT.	V	DC battery voltage.
	TEMP.	°C	UPS internal temperature.
	TIMER	Min. to off	The UPS will turn off when the displayed value reaches zero. For example, if the timer shows 0.5 Min to off, the UPS will shut down in 30 seconds.
	TIMER	Hr. to on	The UPS will turn on when the displayed value reaches zero. For example, if the timer shows 48 Hr to on, the UPS will turn on in 2 days.
	BATT.	Min. to off	The estimated remaining run time in Back-up mode. The accuracy of the value is influenced by the loading type, ambient temperature and battery condition (old or new).
Selection Button for mode & value All the operation data will be displayed on LCD screen. By selecting the required mode (upward or downward), the related value will be displayed.			

5.2 Audible alarm

During a utility failure or fault operation, the UPS emits beep for warning. In back-up mode, the alarm can be silenced by pushing the button. However, the warning of low battery will still sound for urging user to leave computer without any data loss.

Basic Indication Table:

	STATUS	ALARM	REMARK (LED)
Idle mode	Utility Good	No Beep	Green (flash)
	Utility outage	No Beep	Orange (flash)
	Timer on, (refer to Item 5.5)	No Beep	Red (flash)
Normal / Back-up mode	Normal (Utility good)	No Beep	Green
	Back-up (No load)	One beep every 4 sec (alarm can be silenced).	Orange (flash)
	Back-up (Loaded)	2 beeps every 8 sec. (alarm can be silenced).	
	Battery Low	4 beeps per sec (alarm can Not be silenced).	Orange (flash)
Abnormal Condition	Over load	Continuous alarm (alarm can Not be silenced).	Red
	UPS fault	Every other 2 sec., 32 beeps in 2 sec (alarm can Not be silenced).	Red (flash)
	Thermal alarm	Every other 2 sec., 32 beeps in 2 sec (alarm can Not be silenced).	Red (flash)

5.3 Auto Self-test Function

In normal mode of UPS, turn on your computer and push the button on the front panel for self-test. The UPS will simulate a power outage and transfer to battery mode. If low battery warning sounds during the test, it means that the battery set is weak and requires extended recharge.

5.4 Remote Control

The UPS can be set for daily shutdown/wake up. This command must be set through the RS-232 interface. When this function is set, the timer inside the UPS will begin to run, and the load will be turned off by the shutdown / wake-up schedule. For LCD version, the time period to next turn-on will be shown on LCD panel by hour (Ref. item 15 of LCD description).

5.5 Reset the UPS

If any abnormal condition occurs, and the item 4.1 ~ 4.7 can not be executed, please unplug the line cord and push the button for at least 15 sec., which will reset the UPS.

6. COMMUNICATION INTERFACE

The UPS provides two computer interfaces, smart software (RS-232) and USB (optional). The RS-232 also includes dry contact (DB-9, optional) for different monitoring application. The models with USB interface are applying the same control port for both USB & RS-232 so that the only interface can be used at the same time.

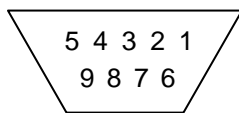
6.1 The definition and setup for RS-232 is shown as follows:

Baud Rate : 2400 dps

Data Length : 8 bits

Stop Bit : 1 bit

Parity : None



Pin #6 : RS-232 data Tx out.

Pin #7 : Common of Pin #6 and Pin #9

Pin #9 : RS-232 data Rx In

6.2 The definition and setup for DB9 (optional) is shown as follows:

Pin #2 : AC Power Failure

Pin #4 : Common GND of Pin #2 & Pin #5

Pin #5 : UPS Battery Low

Pin #6 : Turn off UPS

Pin #7 : GND of Pin6

The interface with computer is diagramed as above for your reference. Use Pin #4 as the common of Pin #2 and Pin #5, Pin #2 and Pin #4 will become close loop from open when the utility fails, Pin #5 and Pin #4 will become close loop from open when the battery level is low.

The UPS will shut down itself when the high level from RS-232, sustained for 3 seconds, which is applied between Pin #6 and Pin #7.

7. TROUBLE SHOOTING

Problem	Possible Cause	Action to Take
UPS no reaction while AC is connected	<ol style="list-style-type: none"> 1. Line cord plug is loose 2. Fuse on rear panel blown (Inside the drawer of inlet) 3. Dead wall socket 	<ol style="list-style-type: none"> 1. Check the line cord plug 2. Replace fuse 3. Check wall socket with a table lamp.
Power output is normal, UPS emits continuous beep, status LCD shows "overload".	UPS is over loaded	Turn off UPS and unplug excessive loads from UPS.
No power on outlets, UPS emits continuous beep, LCD shows "over load".	UPS has shut down due to severe overload.	Unplug excessive loads from UPS, press button to reset the buzzer, and turn on the UPS again.
UPS does not provide expected run time	<ol style="list-style-type: none"> 1. Excessive loads connected at UPS's outlets. 2. Battery is weak and cannot provide enough capacity. 	Do not operate the UPS, and leave the UPS plugged in for 10 hours. Then, test it again, if UPS still cannot provide expected run time, battery should be replaced.
Button on front panel doesn't work	<ol style="list-style-type: none"> 1. The CPU inside UPS is not running correctly. 2. Button damaged. 	<ol style="list-style-type: none"> 1. Unplug the line cord & push the button for 15 seconds to reset the UPS. 2. Unplug all loads and line cord from the UPS to let it shut down automatically, and call for service.
To push button for testing under AC mode, UPS emits urgent beep and LCD display shows "battery replacement" at the same time.	Battery is weak and should be replaced	Replace batteries.
UPS cannot be turned on.	<ol style="list-style-type: none"> 1. Battery polarity wrong 2. UPS fault 	<ol style="list-style-type: none"> 1. Check battery connection. 2. Call for service.

8. SPECIFICATIONS

8.1 PowerShield Commander Series (Tower) PSC1000, PSC1500, PSC2000 & PSC3000

General Features:

- Smart backup time estimation
- Adjustable voltage sensitivity, voltage-transfer points, & charging voltage.
- Generator compatible
- Automatic restart of load after UPS shutdown
- Smart AVR function (Two buck / boost modes)
- Cold-start capable
- Audible alarm
- Hot-swappable batteries for rack models
- Network manageable (SNMP optional)
- Full function of LCD display (LED display optional)
- Smart battery management
- Intelligent double stages of charging control

Output

	115V Models	240V Models
Power Levels crated at nominal inputs	1000VA / 700W, 1500VA / 1050W, 2000VA / 1400W, 3000VA / 2100W,	
Output Voltage	100V/110V/115V/120V Selectable	200V/220V/230V/240V Selectable
Voltage Waveform	Sine wave	
Crest Factor	3 : 1	
Output Frequency (Synchronized to Mains)	Auto Select for 50/60Hz 47Hz ~ 55Hz for 50Hz nominal; 56Hz ~ 65Hz for 60Hz nominal	
Regulation (Nominal)	±5% typical of nominal voltage (optional at ±8% AVR for wide I/P up to ±35%)	
Regulation (Batt. mode)	±3% of selected output voltage (adjustable with the remote set-up software)	
Transfer time	Blackout 3ms typical; Brownout 1ms; Battery mode to Normal mode : 1ms typical	
Over current protection	Over load alarm level 100% ~ 120%, Over load shutdown level 120% ~ 190% (Adjustable with the remote set-up software)	

Input

	115V Models	230V Models
Nominal Voltage	100V/110V/115V/120V Selectable	200V/220V/230V/240V Selectable
Input Frequency	47Hz ~ 65Hz, 50/60Hz auto-sensing	
Efficiency	97% (Normal mode)	
Noise Filtering	Full time EMI/RFI filtering	

Over current protection	800VA~1000VA : by AC fuse 1500VA ~ 4000VA : by re-settable over current protector	1000VA ~ 2000VA : by AC fuse 3000VA: by re-settable over current protector
Voltage Range	-20% ~ +24% for selected nominal voltage. -29% ~ +33% adjustable with the remote set-up software	
AVR Range (2 Bucks, 2 Boosts)	Enhanced Buck: +15% of selected nominal voltage Buck mode: +5% of selected nominal voltage Boost mode: -5% of selected nominal voltage Enhanced Boost: -12.5% of selected nominal voltage	
Surge Protection	1000VA ~ 1500VA : 216 Joules 2000VA ~ 3000VA : 324 Joules	1000VA ~ 1500VA : 220 Joules 2000VA ~ 3000VA : 440 Joules

Battery

Battery type	Maintenance-free sealed, valve-regulated, Lead-Acid 1000VA ~ 3000VA : 12V, 7Ah	
Voltage	1000VA : 24Vdc, 1500VA : 36Vdc 2000VA : 48Vdc, 3000VA : 72Vdc	
Typical backup time at half-load	1000VA ~ 3000VA : 14 minutes	
Typical backup time at full load	1000VA ~ 3000VA : 4.5 minutes	
Charging method	Smart pulse charging with two charging modes. Quick charging when battery is not fully charged, trickle charging when battery is 90% fully charged.	
Charging time	Less than 3 hours to 90% at normal line and normal temperature.	
Charging current	2.5A (Average)	
Average charging voltage for each battery	Quick charging mode : 14V maximum. Trickle charging mode : 13.2V ~13.9V adjustable with the remote set-up software.	
Protection	Over current protection & Over charging voltage protection (SCR control) Thermal protection (CPU control) When temperature inside UPS is over 45°C, charger will stop charging for 2.5 minutes followed by an 1.5 minutes charging. The cycle will be repeated until the temperature is lower than 44°C.	
Monitoring	Smart monitoring & warning for failed battery or open-circuit battery. Auto-detection each time when power on or every 6 days.	

☐ Communications & Management

Standard Interface port	PowerShield UPSilon2000. 1000VA ~ 1500VA : RS232, optional for RJ45, USB. 2000VA : RS232 + USB, optional for RJ45. 3000VA : RS232 + USB +RJ45 (Surge Protection)
Optional Interface port	DB9, SNMP (external type)
Control panel	LCD or LED Selectable
Audible alarm	Alarm on battery : Low battery & Battery over voltage Alarm on abnormal operation : Over load, Short-circuit, & Over heat
EBT (Estimation of Backup Time) system	Support for LCD display
Green mode function (Auto-shutdown during blackout)	1% to 14% of full load (adjustable with the remote set-up software) The default setting is OFF.

☐ Environmental and Safety

Operating Temp.	Up to 1500 meters : 0°C to 40°C (32°F to 104°F)	
Transit/storage Temp.	-15°C to 55°C (5°F to 131°F)	
Relative Humidity	5 - 95% non condensing	
Operating Altitude	0 ~ 3000 meters	
Audible noise	≤40 dBA (at 1M from surface of unit)	
Safety Markings	BSMI	CE
EMC	Class B, EN50091-2, FCC part15, IEC1000-2-2	
Quality control system	ISO 9001	

☐ Physical

Dimensions: (D×H×W)	1000VA : 38 x 20 x 18 (cm) / 48 x 33 x 30 (cm)	
Unit / Shipping	1500VA : 45 x 20 x 18 (cm) / 54 x 33 x 30 (cm) 2000VA ~ 3000VA : 51 x 20 x 18 (cm) / 61 x 33 x 30 (cm)	
Weight:	1000VA : 15 / 16 (kg), 1500VA : 21 / 22 (kg)	
Net / Gross (kg)	2000VA : 25 / 26 (kg), 3000VA : 36 / 37 (kg)	
Packing	Export carton for each unit, 16 - 30 units per pallet	

8.2 PowerShield Commander Long-Run Series (Tower) PSC2200L

General Features:

- ◆ Smart backup time estimation for any kind of battery
- ◆ Adjustable voltage sensitivity, voltage-transfer points, & charging voltage
- ◆ Generator compatible
- ◆ Automatic restart of load after UPS shutdown
- ◆ Smart AVR function (Two buck / boost modes)
- ◆ Cold-start capable
- ◆ Audible alarm
- ◆ Hot-swappable batteries for rack models
- ◆ Network manageable (SNMP optional)
- ◆ Full function of LCD display
- ◆ Smart battery management
- ◆ Intelligent double stages of charging control, Wet battery compatible
- ◆ Thermal control cooling fan

Output

	115V Models	230V Models
Power Levels crated at nominal inputs	2500VA, 1600W	
Output Voltage	100V/110V/115V/120V Selectable	200V/220V/230V/240V Selectable
Voltage Waveform	Sine wave	
Crest Factor	3 : 1	
Output Frequency (Synchronized to Mains)	Auto Select for 50/60Hz 47Hz ~ 55Hz for 50Hz nominal; 56Hz ~ 65Hz for 60Hz nominal	
Regulation (Nominal)	±5% typical of nominal voltage (optional at ±8% AVR for wide I/P up to ±35%)	
Regulation (Battery mode)	±3% of selected output voltage (adjustable with the remote set-up software)	
Transfer time	Blackout 3ms; Brownout 1ms; Battery mode to Normal mode : 1ms typical	
Over current protection	Over load alarm level 100% ~ 120%, Over load shutdown level 120% ~ 190% (Adjustable by using the remote set-up software)	

Input

	115V Models	240V Models
Nominal Voltage	100V/110V/115V/120V Selectable	200V/220V/230V/240V Selectable
Input Frequency	47Hz ~ 65Hz, 50/60Hz auto-sensing	

Efficiency	97% (Normal mode)	
Noise Filtering	Full time EMI/RFI filtering	
Over current protection	1100VA : by AC fuse 2200VA ~ 3000VA : by re-settable over current protector	2500VA : by re-settable over current protector
Voltage Range	-20% ~ +24% for selected nominal voltage. -29% ~ +33% adjustable by using the remote set-up software	
AVR Range (2 Bucks, 2 Boosts)	Enhanced Buck: +15% of selected nominal voltage Buck mode: +5% of selected nominal voltage Boost mode: -5% of selected nominal voltage Enhanced Boost: -12.5% of selected nominal voltage	
Surge Protection	2500VA : 324 Joules	2500VA : 660 Joules

Battery

Battery type	Lead-Acid 25Ah ~ 250Ah
Voltage	2500VA : 72Vdc
Typical backup time	No Limit
Charging method	Smart pulse charging with two charging modes. Quick charging when battery is not fully charged, trickle charging when battery is 90% fully charged.
Charging current	5A at normal line and normal temperature (Average)
Average charging voltage for each battery	Quick charging mode : 14V maximum. Trickle charging mode : 13.2V ~ 13.9V adjustable with the remote set-up software.
Protection	Over current protection & Over charging voltage protection (SCR control) Thermal protection (CPU control) When temperature inside UPS is over 45°C, charger will stop charging for 2.5 minutes followed by an 1.5 minutes charging. The cycle will be repeated until the temperature is lower than 44°C.
Monitoring	Smart monitoring & warning for failed battery or open-circuit battery. Auto-detection each time when power on or every 6 days.

☐ Communications & Management

Standard Interface port	PowerShield UPSilon2000. 2500VA : RS232 + USB
Optional Interface part	RJ45 (Surge protection), DB9, SNMP (external type)
Control panel	LCD or LED Selectable
Audible alarm	Alarm on battery : Low battery & Battery over voltage Alarm on abnormal operation : Over load, Short-circuit, & Over heat
EBT (Estimation of Backup Time) system	Support for LCD display
Green mode function (Auto-shutdown during blackout)	1% to 14% of full load (adjustable by using the remote set-up software) The default setting is OFF.
Cooling fan control	Auto on / off, controlled by temperature & operation mode

☐ Environmental and Safety

Operating Temperature	Up to 1500 meters : 0℃ to 40℃ (32°F to 104°F)	
Transit/storage Temperature	-15℃ to 55℃ (5°F to 131°F)	
Relative Humidity	5 - 95% non condensing	
Operating Altitude	0 ~ 3000 meters	
Audible noise at 1M from surface of unit	≤ 50 dBA	
Safety Markings	BSMI	CE
EMC	Class B, EN50091-2, FCC part15, IEC1000-2-2	
Isolation	3KVac for 1 minute between battery and AC side	
Quality control system	ISO 9001	

☐ Physical

Dimensions: (DxHxW) Unit / Shipping	2500VA : 54 x 33 x 30 (cm)
Weight: Net / Gross (kg)	2500VA : 23 / 24 (kg)
Packing	Export carton for each unit, 16 - 30 units per pallet

8.3 PowerShield Commander Rack Series (Rack) PSCR700, PSCR1000, PSCR2000 & PSCR3000

General Features:

- Smart backup time estimation
- Adjustable voltage sensitivity, voltage-transfer points, & charging voltage.
- Generator compatible
- Automatic restart of load after UPS shutdown
- Smart AVR function (Two buck / boost modes)
- Cold-start capable
- Audible alarm
- Hot-swappable batteries for rack models
- Network manageable (SNMP optional)
- Full function of LCD display (LED display optional)
- Smart battery management
- Intelligent double stages of charging control

Output

	115V Models	240V Models
Power Levels crated at nominal inputs	700VA / 480W, 1000VA / 700W, 1500VA / 1050W, 2000VA / 1400W, 3000VA / 2100W	
Output Voltage	100V/110V/115V/120V Selectable	200V/220V/230V/240V Selectable
Voltage Waveform	Sine wave	
Crest Factor	3 : 1	
Output Frequency (Synchronized to Mains)	Auto Select for 50/60Hz 47Hz ~ 55Hz for 50Hz nominal; 56Hz ~ 65Hz for 60Hz nominal	
Regulation (Nominal)	±5% typical of nominal voltage (optional at ±8% AVR for wide I/P up to ±35%)	
Regulation (Batt. mode)	±3% of selected output voltage (adjustable with the remote set-up software)	
Transfer time	Blackout 3ms; Brownout 1ms; Battery mode to Normal mode : 1ms typical	
Over current protection	Over load alarm level 100% ~ 120%; Over load shutdown level 120% ~ 190% (Adjustable with the remote set-up software)	

Input

	115V Models	240V Models
Nominal Voltage	100V/110V/115V/120V Selectable	200V/220V/230V/240V Selectable
Input Frequency	47Hz ~ 65Hz, 50/60Hz auto-sensing	
Efficiency (Normal mode)	97%	
Noise Filtering	Full time EMI/RFI filtering	

Over current protection	700VA~1000VA : by AC fuse 1500VA ~ 3000VA : by re-settable over current protector	700VA~1000VA : by AC fuse 1500VA ~ 3000VA : by re-settable over current protector
Voltage Range	-20% ~ +24% for selected nominal voltage. -29% ~ +33% adjustable by using the remote set-up software	
AVR Range (2 Bucks, 2 Boosts)	Enhanced Buck: +15% of selected nominal voltage Buck mode: +5% of selected nominal voltage Boost mode: -5% of selected nominal voltage Enhanced Boost: -12.5% of selected nominal voltage	
Surge Protection	700VA ~ 1500VA : 216 Joules 2000VA ~ 3000VA : 324 Joules	700VA ~ 1500VA : 220 Joules 2000VA ~ 3000VA : 440 Joules

Battery

Battery type	Maintenance-free sealed, valve-regulated, Lead-Acid 700VA : 6V, 9Ah, 1000VA ~ 3000VA : 12V, 7Ah
Voltage	700VA : 18Vdc, 1000VA : 24Vdc, 1500VA : 36Vdc 2000VA : 48Vdc, 3000VA/ : 72Vdc
Typical backup time at half-load	700VA : 12 minutes 1000VA ~ 3000VA : 14 minutes
Typical backup time at full load	700VA : 4 minutes 1000VA ~ 3000VA : 4.5 minutes
Charging method	Smart pulse charging with two charging modes. Quick charging when battery is not fully charged, trickle charging when battery is 90% fully charged.
Charging time	Less than 3 hours to 90% at normal line and normal temperature.
Charging current	2.5A (Average)
Average charging voltage for each battery	Quick charging mode : 14V maximum. Trickle charging mode : 13.2V ~13.9V adjustable with the remote set-up software.
Protection	Over current protection & Over charging voltage protection (SCR control) Thermal protection (CPU control) When temperature inside UPS is over 45°C, charger will stop charging for 2.5 minutes followed by an 1.5 minutes charging. The cycle will be repeated until the temperature is lower than 44°C.
Monitoring	Smart monitoring & warning for failed battery or open-circuit battery. Auto-detection each time when power on or every 6 days.

☐ Communications & Management

Standard Interface port	PowerShield UPSilon2000 compatible. 700VA : RS-232, SNMP (External) 1000VA ~ 3000VA : RS232, USB, SNMP, RJ45 (Surge Protection)
Optional Interface port	DB9
Control panel	LCD selectable
Audible alarm	Alarm on battery : Low battery & Battery over voltage Alarm on abnormal operation : Over load, Short-circuit, & Over heat
EBT (Estimation of Backup Time) system	Support for LCD display
Green mode function (Auto-shutdown during blackout)	1% to 14% of full load (adjustable with the remote set-up software) The default setting is OFF.

☐ Environmental and Safety

Operating Temp.	Up to 1500 meters : 0℃ to 40℃ (32℉ to 104℉)	
Transit/storage Temp.	-15℃ to 55℃ (5℉ to 131℉)	
Relative Humidity	5 - 95% non condensing	
Operating Altitude	0 ~ 3000 meters	
Audible noise	≤40 dBA (at 1M from surface of unit)	
Safety Markings	BSMI	CE
EMC	Class B, EN50091-2, FCC part15, IEC1000-2-2	
Quality control system	ISO 9001	

☐ Physical

Dimensions: (HxWxD)	700VA : 1u x 41cm / 18 x 59.5 x 55(cm)	
Unit / Shipping	1000VA ~ 2000VA : 2u x 47cm / 22.5 x 61 x 59(cm) 3000VA : 3u x 47cm / 27 x 62 x 58(cm)	
Weight:	700VA : 14 / 16 (kg)	1000VA : 21 / 23 (kg)
Net / Gross (kg)	1500VA : 23.5 / 25.5 (kg)	2000VA : 31 / 33 (kg)
	3000VA : 41 / 43 (kg)	
Packing	Export carton for each unit, 14~21 units per pallet	