TG-000213TE6

Uninterruptible Power Supply

*mini*UPS ALS-RM-*Series*

User's Manual

IMPOTANT SAFTY INSTRUCTION

Thank you for selecting our "ALS-RM Series".
Please read "Safety precautions" carefully before using the product,
and keep this manual in a convenient location for future reference.

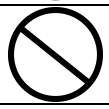
Symbols

Save the indication of symbols on this user manual to use the product properly and to prevent to inflict harm or damage on your assets.

Below explain about the level of harm and damage when you ignore indications and use the product inappropriately.

⚠WARNING	This symbol means near death or serious injury.
⚠CAUTION	This symbol means possibility of death or serious injury.
⚠NOTE	This symbol means possibility of injury or property damage.

The icons indicate the level of saving.

	This symbol means warning.
	This symbol means prohibition.
	This symbol means obligation.

SAFTY PRECAUTIONS

Observe safety precautions.

⚠WARNING
Do not use for medical equipment or Public transportation system  Do not use this product for the following. *Medical equipment that involves human lives. *Public transportation system with possibility of having important influence.

⚠CAUTION
Observe the general notes of this manual.  Observe the contents of this manual such as the using conditions and environments.
Prohibition from reconstructing, dismounting and arranging  Do not disassemble, repair, or modify the product. Doing so may cause injury or fire.
Prohibition from using in-vehicle.  This item isn't for using in-vehicle that a vibration is always added. It may cause a fire, and dangerous due to the vibration.

⚠NOTE
A guarantee is only in Japan.  We do not have any responsibility for the matter occurred on overseas.

SAFTY PRECAUTIONS

Not saving the following, it may cause fire or the product trouble.

THIS DEVICE

⚠CAUTION	
	Special knowledge and technology are necessary required for maintenance. Don't remove a cover. There is a part where a high voltage occurs in the device, that's highly dangerous. Even if an input cable isn't connected, electricity is supplied to UPS by a battery.
	Don't use to a hair drier, an electric heater and the laser printer.
	Be away from fire. Avoid putting UPS under high temperature place. Don't use it except for a plug to conform. Please keep unobstructed air in the exhaust holes of UPS. Power socket should be close to the UPS. Don't put any liquid or object in the inside of the UPS.

We recommend you regular maintenance to use this product effectively

BATTERY

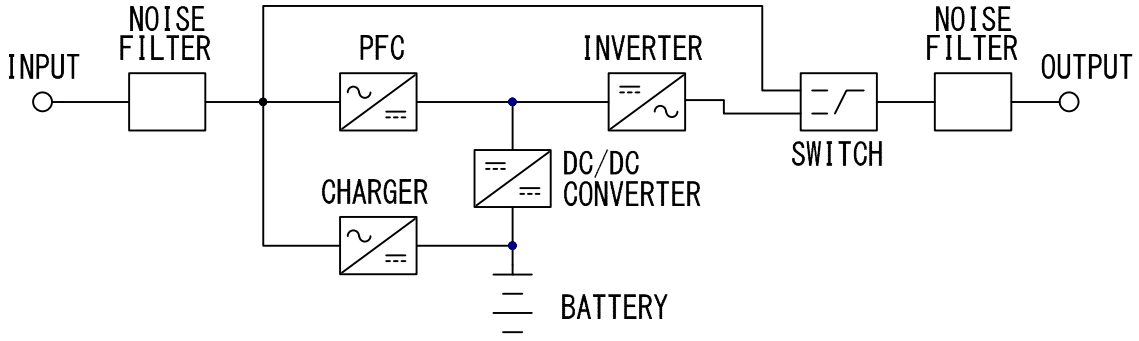
⚠CAUTION	
	Battery has the danger of high voltage and current. Don't try to open or damage battery casing. It might hurt human eyes or skin by slopping electrolyte of battery because it is a kind of strongly toxicity. To change or maintain the battery set are very serious matters that need to be done by technicians. Anyone can't be allowed to change or maintain the batteries of the UPS
	Replace the battery within 5 years.

CONTENTS

GENERAL DESCRIPTION

Feature

This hardware device is an uninterruptible power supply that provides a backup power source in case of a power outage (blackout).
Even if input power voltage and input frequency have changed the UPS can provide stable power because of online power system.



ALS-RM series block diagram

PACKAGE CONTENTS

■ Package contents

Please check package contents.

Model	Main unit	Battery module (another Box)	Mounting feet	Rack mount	Power cord	User Manual	Fuse
ALS-1.5KRM	1	—	1	1	1	1	1
ALS-1.5KHRM	1	—	1	1	1	1	1
ALS-2KRM	1	1	1	1	—	1	1
ALS-2KHRM	1	1	1	1	1	1	1
ALS-3KRM	1	1	1	1	—	1	—
ALS-3KHRM	1	1	1	1	1	1	1

Model	Mounting feet	Rack mount	Battery cable	Blank panel
ALS-B	1	1	1	1

Mounting feet is in pairs, Rack mount too.

Main unit

Battery module

Mounting feet

Rack mount

User's Manual

Fuse

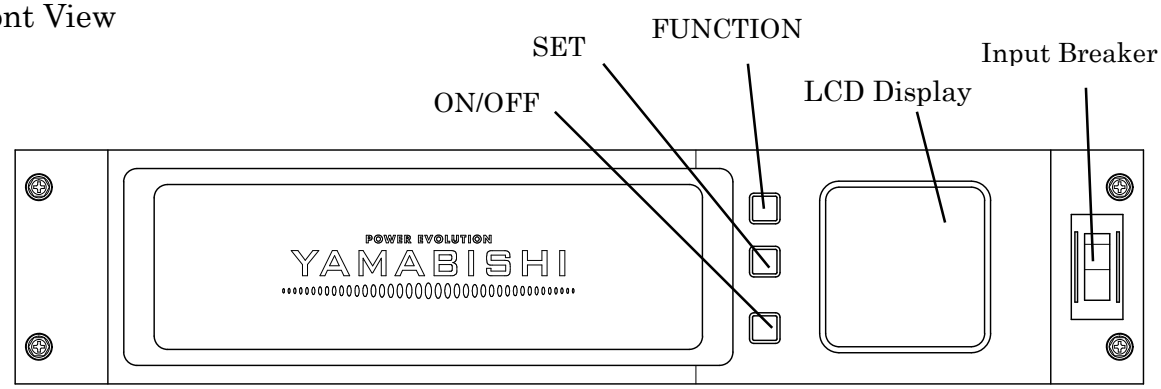
Power cord

Battery cable

Blank panel

EACH PART

① Front View



Input Breaker

This switch disconnects the input power to the UPS.

LCD Display

The LCD display indicates a variety of UPS operational conditions.

FUNCTION

The FUNCTION button is used for battery self test.

See page20 for more particular information.

SET

The SET button is used to change indications of LCD display.

See page16 for more particular information.

*FUNCTION button and SET button are also used when you set output voltage and green mode. See page18～19.

ON/OFF

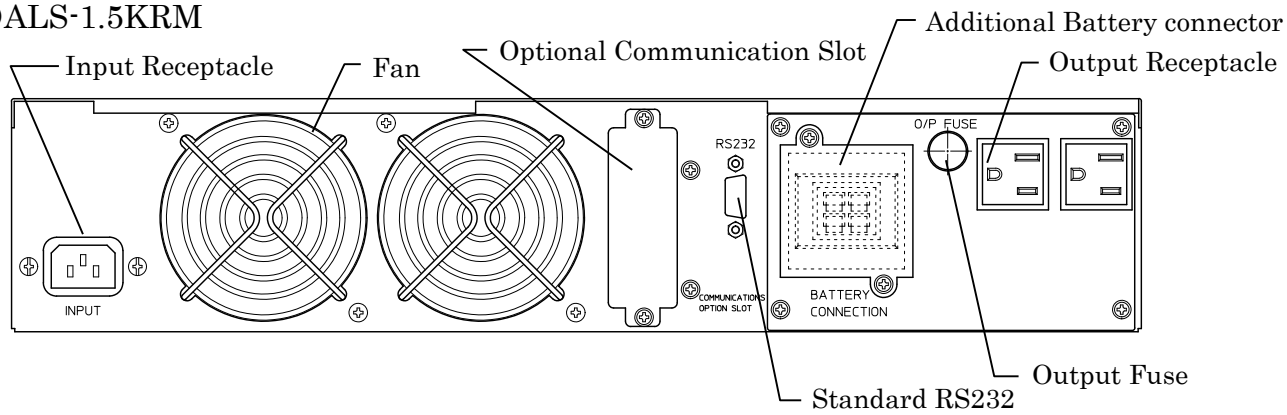
The ON/OFF button switches between normal mode and bypass mode.
If you push the ON/OFF button without tapping utility power, the product starts battery driving mode.

See page14 for more particular information.

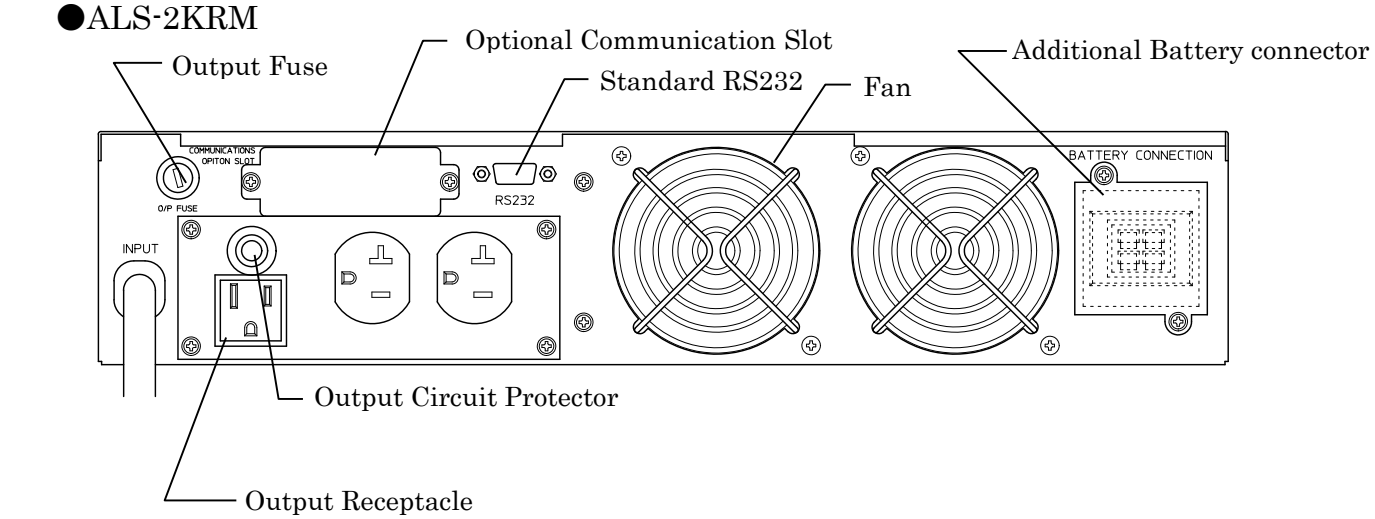
EACH PART

②Rear panel

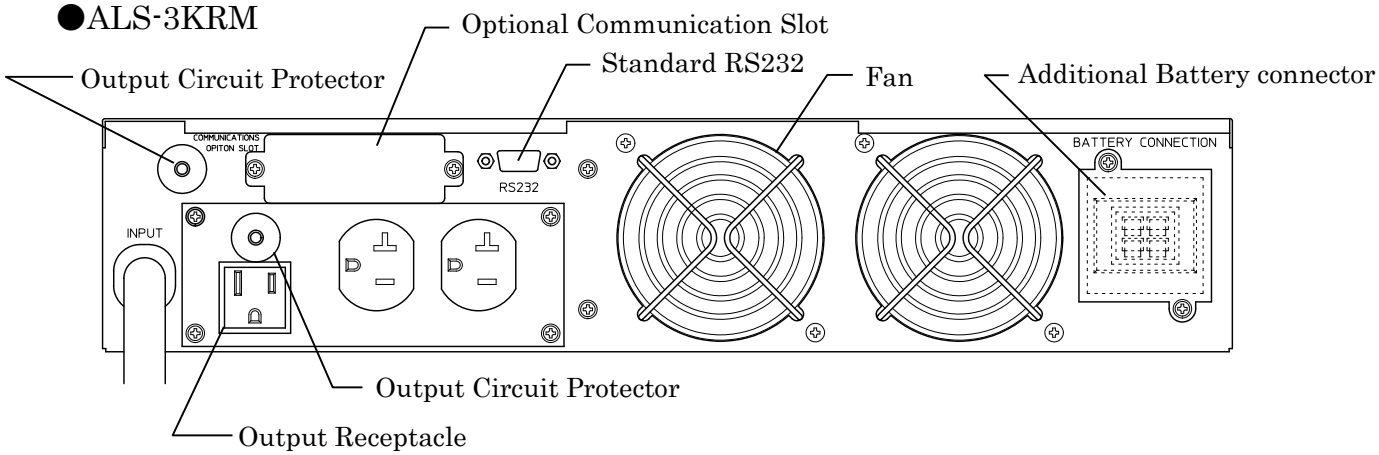
●ALS-1.5KRM



●ALS-2KRM

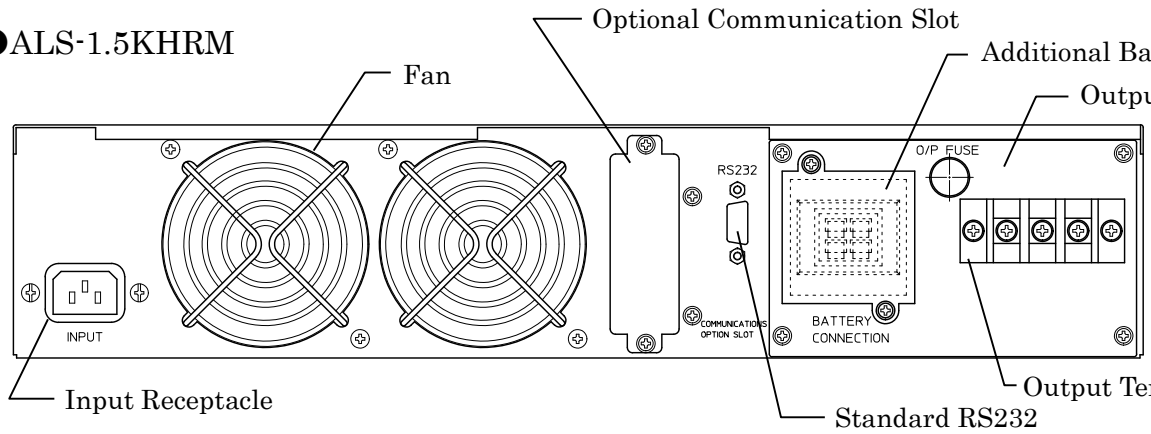


●ALS-3KRM

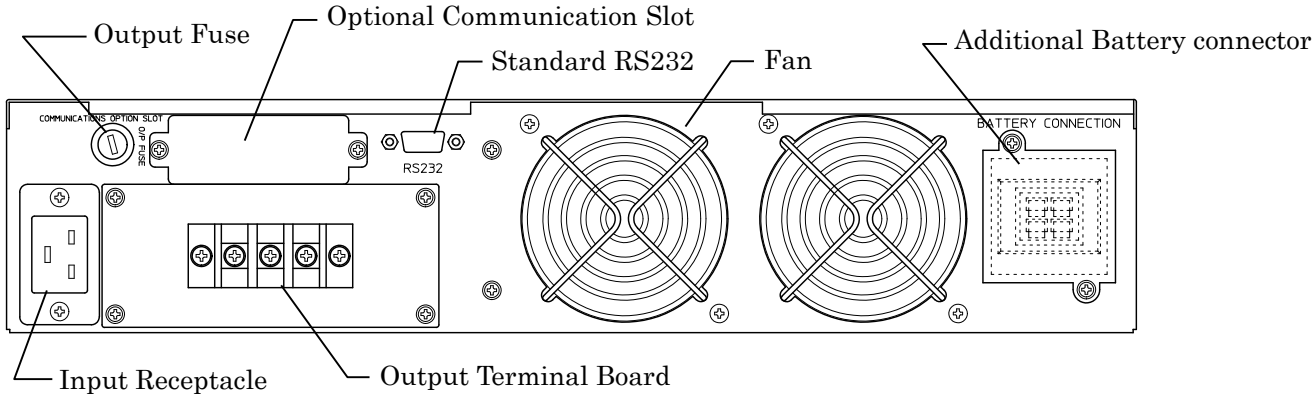


EACH PART

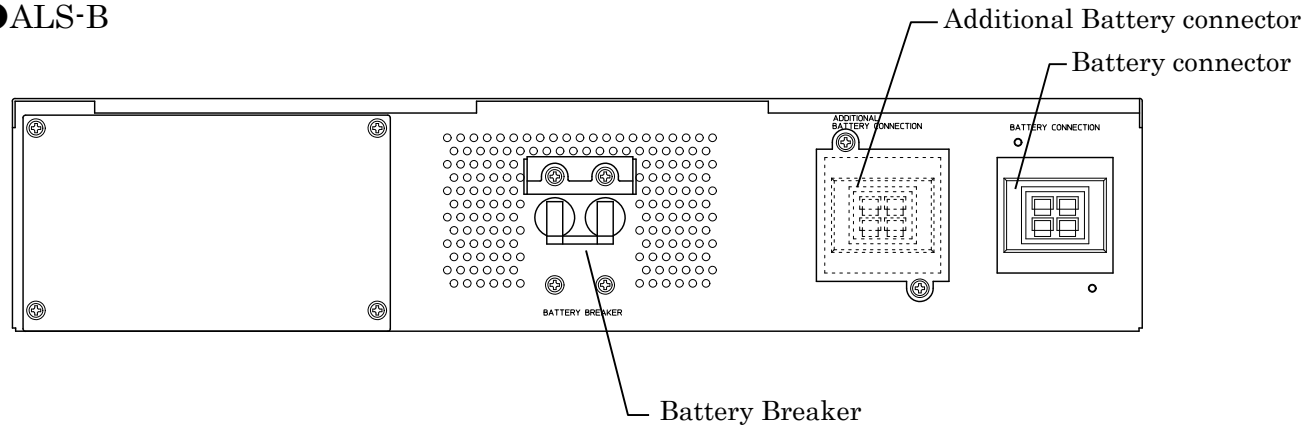
●ALS-1.5KHRM



●ALS-2KHRM / 3KHRM



●ALS-B



INSTALLATION

■ environment

Installation under the following condition causes the trouble in this device.

⚠NOTE
place of high-temperature and humidity (over 0～40degC over 0～95%RH) ●However, Installation to place of a surrounding Temperature 10-25degC is recommended to keep a battery life longer. Near the machine like display which a magnetic influence is often taken. place to have salt and corrosion gas. place to have a vibration, shock. place where powdered dust is abundant.

■ installation place

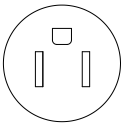
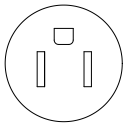
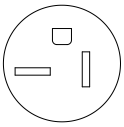
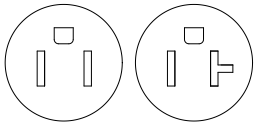
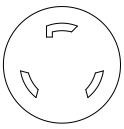
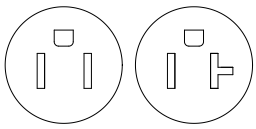
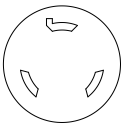
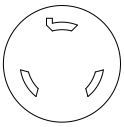
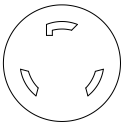
Keep the following strictly for your safety.

⚠NOTE
Secure the space “the front 10cm or more, the rear 20cm or more” because this product is cooled by blower.

⚠NOTE
The rack-mount ears will not support the products weight. Support it by using shelf or support rails.

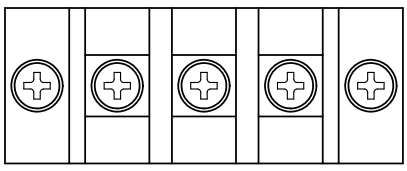
CONNECTION

Every product models have different plugs and outlets. Refer to below table.

Model	Input	Output
ALS-1.5KRM （NEMA5-15P） Cable 1.31 mm² (13A)(1.7m)	plug 	Outlet （NEMA5-15R 2 pieces） 
ALS-2KRM （NEMA5-20P） Cable 3.31 mm² (20A)(1.7m)	plug 	Outlet （NEMA5-15R 1 piece） （NEMA5-20R 2 pieces） 
ALS-3KRM （NEMAL5-30P） Cable 5.26 mm² (13A)(1.7m)	plug 	Outlet （NEMA5-15R 1 piece） （NEMA5-20R 2 pieces） 
ALS-1.5KHRM （NEMAL6-15P） Cable 1.31 mm² (13A)(1.7m)	plug 	3P Terminal board （Terminal M4）
ALS-2KHRM （NEMAL6-15P） Cable 2.08 mm² (15A)(1.7m)	plug 	3P Terminal board （Terminal M4）
ALS-3KHRM （NEMAL6-20P） Cable 2.08mm² (15A)(1.7m)	plug 	3P Terminal board （Terminal M4）

Wire up refer to below.

ALS-1.5KHRM / -2KHRM / -3KHRM

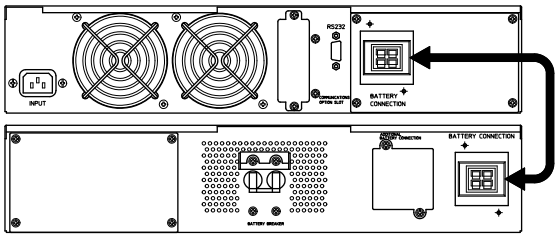
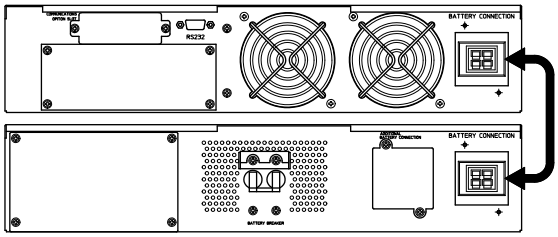
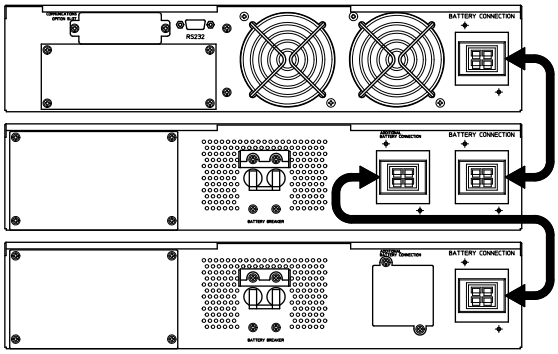


u v E

Terminal board

CONNECTION

Connect the battery module to UPS as below.（ALS-B）

	ALS-1.5K/1.5KH Additional battery connection
	ALS-2K/2KH ALS-3K/3KH Battery connection
	ALS-2K/2KH ALS-3K/3KH Additional battery connection

＊ Battery connection cable, please connect reliably.
Also, please on the switch surely to the battery breaker.
If the above has not been to reliably, are not backed up.

OPERATION

1. Starting up/shutting down the UPS

Starting up

Plug the UPS into an AC power source.
Turn on battery breaker (2K, 2KH, 3K, 3KH, 5KH and additional battery)
Turn on the Input breaker switch.
The UPS will begin its start-up process by first going into Bypass Mode and then into Normal Mode. After entering the Normal Mode, the UPS is ready for operation.

Shutting down

Press ON/OFF key for one second. The UPS will switch to Bypass Mode.
Turn off the Input breaker switch. Display will turn off.
During shutdown, do not press any buttons. Pressing a button may cause the UPS to re-energize and deliver output power.

2. Operating Modes

Normal Mode

During normal mode, utility power provides energy to the UPS.
The UPS converts the utility power to computer-grade power for the connected loads.
The UPS will also maintain the batteries at a fully charged state.

Bypass Mode

In the event of a UPS overload or internal failure, an audible alarm will sound and the UPS will switch to Bypass Mode where utility power is powering directly to the connected loads.
However, Battery Mode won't occurs availably when the UPS is overheating.

- Has an overload condition of 101 to 110% for more than 120 seconds.
- Has an overload condition of 111 to 150% for more than 20 seconds.
- Has an overload condition greater than 150%.
- Detects a fault in the battery or UPS electronics.

OPERATION

Battery Mode

Battery Mode occurs in the event of a utility power failure or an extreme input voltage condition. The batteries will supply power to the connected load through the DC/DC converter and the DC/AC inverter.

When utility power is restored, the UPS switches to Normal Mode operation and recharges the batteries.

While in Battery Mode, an alarm will beep.

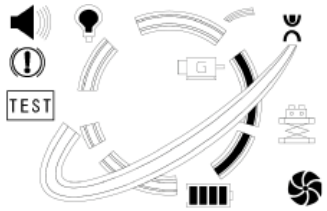
The beeping frequency will continue to increase as an indication that the batteries are running low and that the UPS is about to shut down.

If the UPS shuts down, then it will automatically restart when utility power is restored.

OPERATION

3.LCD display

3-1 Operating Modes

		
Normal Mode	Bypass Mode	Battery Mode

3-2 Display and Controles

Alarm : When the UPS fails, the symbol will flash.

Green Mode : When UPS is in Green Mode, the symbol will flash.

Fault : When the UPS has failed and must be repaired, the symbol will flash.

Test : When UPS is conducting Battery Self-Test under Normal Mode, the symbol will flash.

Load : The higher the load, the more bars will illuminate.

Inverter : When Inverter is normal, the symbol will illuminate.

Power factor corrector(PFC) : When PFC is normal, the symbol will illuminate.

Input Power : When utility power is normal, the symbol will illuminate.

Charger : When charger is in normal operation, the symbol will illuminate.

Booster : When UPS starts Battery Booster, the symbol will illuminate.

Battery : Ther bars indicate an approximate amount of battery cahrger remaining.

High-speed Fan : UPS is in Battery Mode.

Medium-speed Fan : UPS is in Normal Mode.

Low-speed Fan : UPS is in Bypass Mode.

3-3 Indication of LCD display

Every time you push SET button, you can monitor UPS condition.

Input Voltage

Output Voltage

Output Frequency

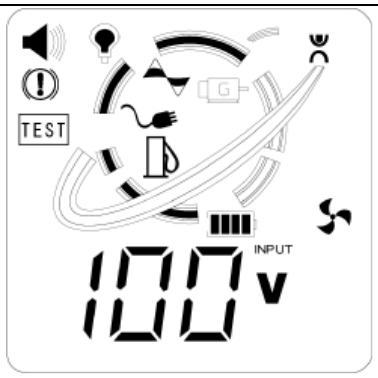
Battery Voltage

Load Rate

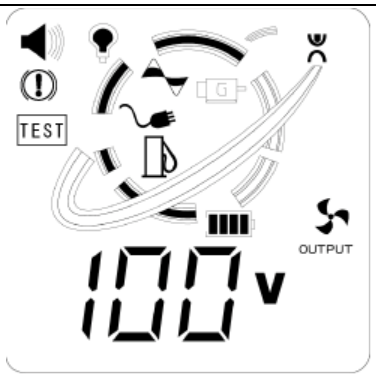
Input Current

Temperature

Output Current



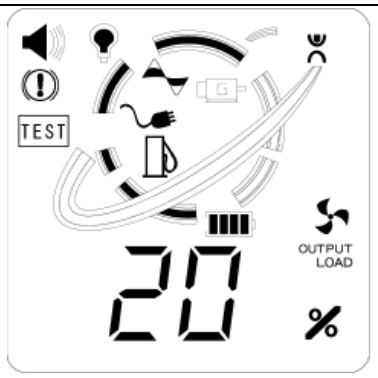
Input Voltage



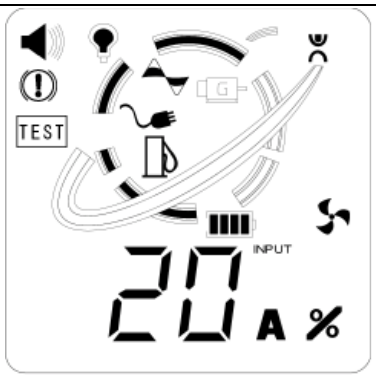
Output Voltage

Output Frequency

Battery Voltage

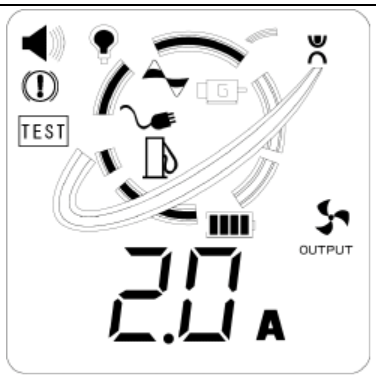


Load Rate



Input Current

Temperature



Output Current

OPERATION

4. Configuration

You can choice the inverter output voltage or switch to green mode.

4－1 Inverter output voltage

You can choice the output voltage from the following.

See page18 for setting.

ALS－△△KHRM	200V	220V	230V	240V
ALS－△△KRM	100V	110V	115V	120V

4－2 Green mode

The green mode is an energy saving mode.

The product has switch to bypass mode when load is low.

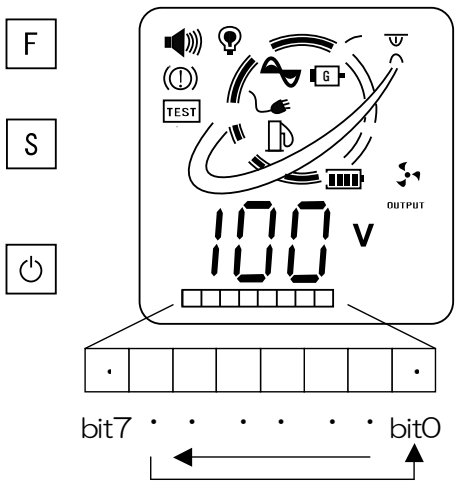
as a result, the product holds down the electricity consumption.

See page19 for setting green mode.

ALS-1.5KRM / -1.5KHRM	ALS-2KRM / -2KHRM	ALS-3KRM / -3KHRM
30W or less	60W or less	90W or less

⚠ Having blackout when the product drives in green mode, the battery backup system doesn't work.

Switch to configuration mode when you set inverter output voltage or green mode.



■ Push FUNCTION button and SET button at one time for 1 second to switch to configuration mode.

- Every time you push FUNCTION button, bit0～6 will illuminate by turns.
- Every time you push SET button, bit7 dot repeats to appear and disappear.
- you can check the setting of inverter output voltage and green mode by the indication of bit line.

OPERATION

5. Configuration settings

Bit0~7 appear or disappear by pushing FUNCTION button or SET button. You can set and check inverter output voltage and green mode by changing the combination of bit.

5－1 Inverter output voltage settings

Never change the inverter output voltage when your device is connected with UPS.

① Keep pushing FUNCTION button and SET button at one time until you hear beep. The product switches to configuration mode. A bit line will appear the bottom of LCD display.
② Bit0 will appear as below.

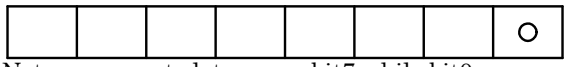
figure-1

③ Refer to figure2, let appear bit7 by pushing SET button if necessary to set voltage you need.
④ Push FUNCTION button once. Only bit1 will appear.
⑤ Refer to figure2, let appear bit7 by pushing SET button if necessary.
⑥ Keep pushing FUNCTION button and SET button at one time until you hear beep. Configuration mode will be canceled.
⑦ Restart the product.

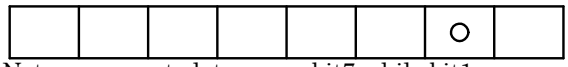
* You use only bit0, bit1 and bit7 for setting inverter output voltage.
* The product may need a few minutes to change the indication after you push FUNCTION button or SET button.

figure-2

200/100V

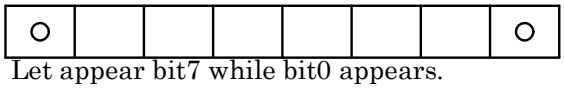


Not necessary to let appear bit7 while bit0 appears.

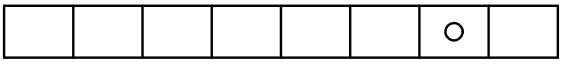


Not necessary to let appear bit7 while bit1 appears.

220/110V

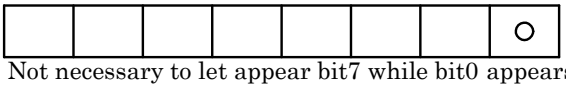


Let appear bit7 while bit0 appears.

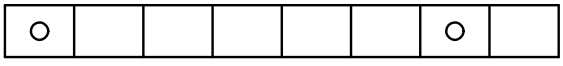


Not necessary to Let appear bit7 while bit1 appears.

230/115V

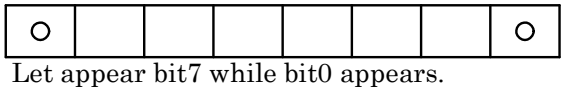


Not necessary to let appear bit7 while bit0 appears.

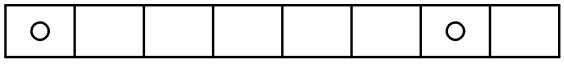


Let appear bit7 while bit1 appears.

240/120V



Let appear bit7 while bit0 appears.



Let appear bit7 while bit1 appears.

See page14 for how to restart the product.
The product reflects the setting after restarting.

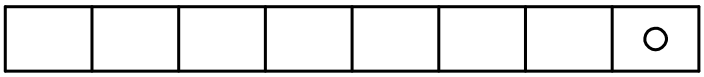
OPERATION

5－2 Green mode settings

① Keep pushing FUNCTION button and SET button at one time
until you hear beep. The product switches to Configuration mode.
A bit line will appear the bottom of LCD display.

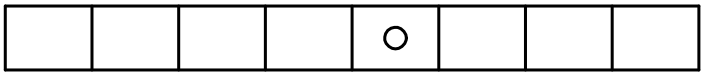
② Bit0 will illuminate as figure-3.

figure-3



③ Push FUNCTION button three times, then bit3 will illuminate as figure-4.

figure-4



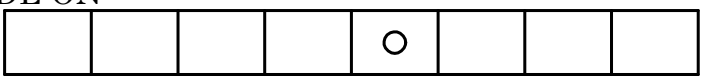
③ Refer to figure5, let appear or disappear bit7 by pushing SET button.

④ Keep pushing FUNCTION button and SET button at one time
until you hear beep. The Configuration mode will be canceled.

* You don't need to restart the product.
* You use only bit3 and bit7 to set the green mode.
* The product needs a few minutes to change the indication
after you push FUNCTION button or SET button.

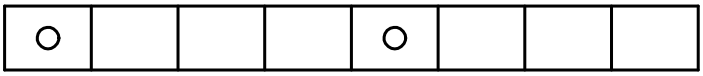
figure-5

GREEN MODE ON



Let disappear bit7 while bit3 appears.

GREEN MODE OFF



Let appear bit7 while bit3 appears.

OPERATION

6.Various functions

6-1 Battery self test

Please push FUNCTION button for 2second in normal mode.
The product switches to battery mode and begins the battery self test.
If the battery is normal, the product will return to normal mode
in about 10seconds. If the battery is low, the alarm will sound
and return to the normal mode.

6-2 Interface connection

The product has the communication interface "RS232C" that let computer shut down when blackout occurs.

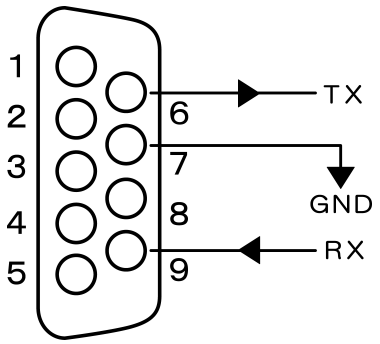
* You need UPSilon2000 and cable of the attachment.
  OS compatibilities: Widows7/8/10
* The product doesn't react the UPS service from Windows

① Please set RS232C as below.

Baud Rates	2400bps
Data Length	8bits
Stop Bit	1 bit
Parity	None

② Arrangement of DB9connecter and RS232Cpin

Pin No.	Function	I／O
9	RS232RX	Input
6	RS232TX	Output
7	GROUND	



TROUBLE SHOOTING

Problem	Possible Causes	Action
UPS doesn't work though the utility power plugs properly. Battery supply mode begins when you push ON/OFF button.	Input fuse will blow or input circuit protector will trip. *1	Replace the fuse or push back the circuit protector. *2
	No AC input	Check AC power
UPS doesn't work though utility power plugs properly. Battery supply mode doesn't begin when you push ON/OFF button.	UPS fault	Call for service
	Battery damaged	Call service to replace batteries
UPS will not provide power to load.	Input fuse will blow or input circuit protector will trip. *1	Replace the fuse or push back the circuit protector. *2
UPS switches to battery supply mode on normal driving however the product plugs to utility power properly.	AC voltage abnormal	Make sure that the utility power is properly.
	AC frequency abnormal	Make sure that the utility power is properly.
	utility power detection circuit abnormal	Call for service
UPS remains bypass supply mode though you cancel the green mode. UPS doesn't switch to inverter supply mode.	The product is set in the forced bypass supply mode.	Please push ON/OFF button. The alarm will sound once and the product will return to normal mode
Button on front panel does not work.	UPS will be in start-up.	Please wait for start-up completing.
	Button damaged	Call for service
UPS returns to inverter supply mode to 10seconds though you push FNCTION button on inverter supply mode.	Battery damaged	Call service to replace batteries

TROUBLE SHOOTING

Problem	Possible Causes	Action
Fault LED lit *3	Your device have an excessive rushing current	Suppress the rushing in electric current.
	Output load abnormal or short circuited	Check your device.
	UPS abnormal	Call for service.
UPS doesn't backup of the rating in blackout.	Batteries not available	Replace batteries.
	Batteries not fully charged	Charge batteries.
	The battery charger abnormal	Call for service.
Five short beeps	UPS internal overheating.	Make sure that there is no stops in front of vents
		Check the surrounding temperature.
	Fan failure.	Replace the fan
Six short beeps	Protection against the input over current may work because load factor is high and the utility power voltage is low.	Check the utility power. Lower the load factor.

*1 Over current causes that fuse melts and breaks or circuit protector trips.
Check your device.

*2 About ALS-1.5K、1.5KH、2KH、3KH, input fuses are inside the product cover.

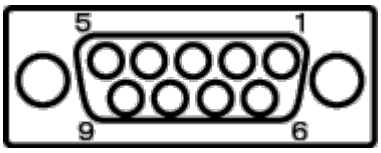
*3 If the fault sign flashes and the product switches to bypass supply mode,
please make the product restart. The product may go back to normal condition.

SPECIFICATION

Model / Specification			1.5KRM	1.5KHRM	2KRM	2KHRM	3KRM	3KHRM
Output	UPS Type		On-Line Type					
	Capacity		1.5kVA/1050W		2kVA/1400W		3kVA/2100W	
	Phase		Single Phase 2 Wire					
	Voltage (V)		100	200	100	200	100	200
			110	220	110	220	110	220
			115	230	115	230	115	230
			120	240	120	240	120	240
	Voltage Accuracy		Within 3%					
	Transient Response		Within 8% (0 ⇔ 100% Load Step)					
	Wave Form		Pure Sine Wave					
	Crest Factor		3 : 1					
	Wave Distortion		Within 3.5% (Linear Load)					
	Frequency		50/60Hz Auto Tracking					
	Frequency Accuracy		Within ± 0.3%					
	Transfer Time		ZERO for Line Fails or Reverse : 4mSec. Transfer to Bypass or Reverse					
	Green Mode		30W or less		60W or less		90W or less	
	Power factor		0.7					
	Backup time		6min.		8min.		6min.	
	Recharge Time (90%)		8hours					
	Battery		Sealed Lead-Acid battery					
Input	Phase		Single Phase 2 Wire					
	Voltage (V)		85～132	170～265	85～132	170～265	85～132	
	Frequency		50/60Hz					
Efficiency			87%TYP		90%TYP			
Interface			RS-232C (Standard)					
Option			Alarm Signal Card etc.					
Condition	Heating Value (Kcal/H)		118.8	126	132.2	144	194.4	
	Ambient Temperature		0～40 degrees C					
	Ambient Humidity		0～95%RH					
	Audible Noise		45dB					
Mechanical	Dimension (mm)	W	426					
		D	502					
		H	88 (2U)		176 (4U)			
	Weight (kg)		23.2		44.4		44.6	

OPTION

ALS series have "AC CARD" optional interface card.
AC CARD reports you alarm signal during emergency such as blackout or product trouble.
You can input signal on AC CARD. (Refer to 1－2)
the signal pulls out by D sub9 pin connector.



1．Alarm signal

1－1 Alarm signal Output

①blackout detection　Close (or Open) when the utility power stops

② battery low　Close (or open) the signal when the battery capacity leaves 25% or less in battery back-up mode.

③trouble　Close (or open) during the product trouble

1—2 Alarm signal Input

④remote UPS control　Stop UPS by turning this signal on if battery backup system doesn't need during blackout. The product prevents the needless battery loss.

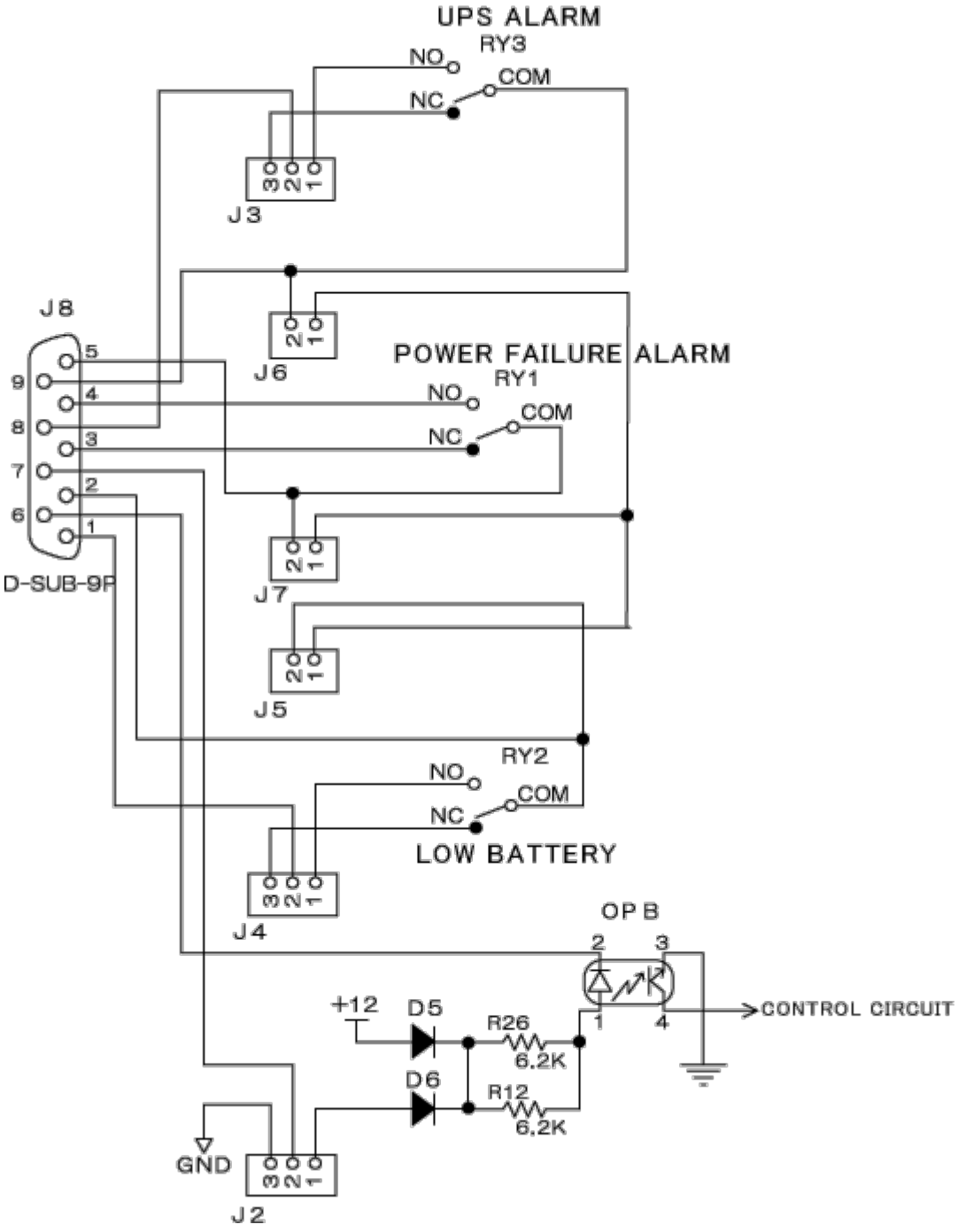
2．Dsub 9 pin connector　pin assign

UPS condition	jumper settings *factory settings	Signal	D sub connector pin No.
①blackout		Open	pin 4-5
		Close	pin 3-5
②battery low	*J4 pin1-2	Close	pin 1-2
	J4 pin 2-3	Open	
③trouble	*J3 pin 1-2	Close	pin 8-9
	J3 pin 2-3	Open	
④remote UPS stop	J2 pin 1-2	add 12VDC for 1second or more (external power used)	pin 6-7 *2
	*J2 pin 2-3	Short circuit for 1second or more (internal power used)　*1	
If you need a common ground against each points, short-circuit J5, J6 and J7.			

*1 Great care must be taken because the product generates about10VDC at Dsub pin6-7 while the internal power is used.

*2 Input minus into Dsub pin6 and plus into Dsub pin7 while the external power is used.

OPTION



AC CARD circuit block diagram

2－1 Electricity specifications

kind of the point：mechanical relay (mechanical dry contact)

point limits：50V DC/0.5A or l

If there are unknown point or maintenance required, please contact us below.

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