USER'S MANUAL

Uninterruptible Power System
GX 100 Series

Model M-UPS050AD1S/M-UPS050AD2S
M-UPS075AD1S/M-UPS075AD2S
M-UPS100AD1S/M-UPS100AD2S

Fuji Electric Co., Ltd.

INR-HG5685

For safe use

● Handling of this manual

This document contains important information for safe use of the product. You are kindly requested to carefully read this instruction manual before use of the product. Read "Precautions for safety and precautions for use" described in this document with particular attention, and fully understand the product before use. Furthermore, it is requested that this document be kept with caution.

High-safety uses

This product is designed and produced assuming general uses such as general office use and personal use, and it is not what was designed and produced for uses (hereinafter called "high-safety uses") that require safety of extremely higher degree and that accompany direct serious dangerousness to human lives and human bodies if required safety is not maintained, such as atomic nucleus control, aircraft flight control, aviation traffic control, pass transport control, life supporting devices and nuclear weapon launching control. The customer is kindly requested not to use this product without taking measures required for such high-safety uses. In case the customer intends to use this product for any high-safety uses, please contact our in-charge sales staff for consultation in advance.

Prevention of radio disturbance

CAUTION
This product is equivalent to Class A information technology device based on standards of Voluntary Control Council for Interference by Information Technology Product (VCCI). There is a possibility where radio disturbance arises if the product is used in a home environment. The user may be requested to take appropriate measures in such a case.

Prevention of higher harmonics current disturbance

The product conforms to IEC61000-3-12.

Foreword

An uninterruptible power system is what supplies stable electric power to OA devices, FA devices, computer devices or the like.

This document describes installation, running, daily management, troubleshooting and maintenance of an uninterruptible power system. You are kindly requested to properly use the uninterruptible power system in accordance with instructions given in this document.

The uninterruptible power system is referred to as “the Product” in this document.

● Contents and composition of this document

The composition of this document is shown below.

Precautions for safety and precautions for use

Precautions for safety are described. It is requested that the one who uses the Product surely reads these precautions before use.

1 Unpacking

Describes the precautions for taking the Product out of its case.

2 Overview

Describes components and setup of the Product.

3 Installation

Describes installation and cable connection of the Product.

4 Running

Describes the method for start/stop of the Product.

5 Inspection

Describes daily inspection and precautions for planned interruption of power supply.

6 LCD Display

Describes the method for operation of LCD panel.

7 Troubleshooting

Describes actions to be taken on occurrence of troubles.

8 Maintenance

Describes method for replacement of batteries and of cooling fans and also describes the method for storage of the Product.

9 Appendix

Describes the rated specification for the Product and additional explanation of UL-type products.

Those chapters requiring particular reference depending on the purpose of use of this document are indicated below.

- For the one to execute installation:
  Precautions for safety, Precautions for use, 1, 2, 3, 4
- For a user: Precautions for safety, Precautions for use, 2, 4, 5, 6, 7
- For the one to execute maintenance:
  Precautions for safety, Precautions for use, 2, 4, 5, 7, 8

Warning indication

This document contains warning indications shown below, in order not to cause damage to bodies and properties of the user and of the people around the user.

⚠ WARNING	A “WARNING” sign indicates a potentially hazardous situation that could result in death or serious injury if the user does not follow instructions.
⚠ CAUTION	A “CAUTION” sign indicates a potentially hazardous situation, which if not avoided, may result in minor injury, moderate injury or property damage.
IMPORTANT	An “IMPORTANT” sign indicates matters that require attention in the use of the procuct.

Symbols appearing in the text

Symbols appearing in the text of this document are of the meanings indicated below.

	Describes the status of the Product.
	Reference to be read, if necessary. How to take actions and what to be referred to are described.

LED display

Indicates the LED status by any of the symbols indicated below.

	: Lit
	: Blinking
	: Out

Notice

- The description in this document is subject to change without notice.

● List of important warning matters

The important warning matters described in this document are as follows.

⚠ WARNING	A "WARNING" sign indicates a potentially hazardous situation that could result in death or serious injury if the user does not follow instructions.
Electric shock	Do not remove the cover from the Product. There are sections of high voltage in the Product, and electric shock may arise.

⚠ CAUTION	A "CAUTION" sign indicates a potentially hazardous situation, which if not avoided, may result in minor injury, moderate injury or property damage.
Electric shock Personal injury	Do not stick a bar or finger into a cooling fan or ventilation hole. Electric shock and personal injury may result.
Electric shock	It is requested that maintenance (such as replacement of batteries and replacement of cooling fans) other than daily inspection is executed by professional engineers. Electric shock may result otherwise. The Product requires grounding (of Class D as the minimum requirement). At the occasion of connection of the Product to an input power supply line, connect a grounding conductor to the AC input protective grounding terminal of the Product. Electric shock may result otherwise.

Electric shock Failure	At the occasion of connection of the Product to an input power supply line, connect the conductor on the live side of the Product to an AC input L/R terminal and connect the conductor on the non-live side of the Product to an N/S terminal. Furthermore, connect a grounding conductor to the AC input protective grounding terminal. Also at the occasion of connection of the Product to an output equipment, connect the conductor on the live side of the Product to an I1/U1 terminal and L3/V1 terminal in case of AC (100V) output. In case of AC (200V) output, connect the conductor on the live side of the Product to an I1/U2 terminal and I2/V2 terminal, and connect the grounding line to a grounding terminal. Malfunction caused by noise, failure and electric shock may arise, if an error is committed in the wiring connection. At the occasion of inspection and maintenance of connected equipment (equipment connected to the Product) and/or the Product, turn OFF the power for the connected equipment and also stop running of the Product. With M-UPS050AD1S/2S, M-UPS075AD1S/2S or M-UPS100AD1S/2S, turn OFF the circuit breaker on the cabinet panel and disconnect the AC input terminals. Electric shock may result otherwise.
Personal injury	Do not step on the Product, and do not locate any article on the Product. Personal injury and falling may result.
Personal injury Damage	The Product is a heavy article. Be cautious in the handling of the Product. To take the Product out, select a level and flat place for work execution. If it is attempted to lift or carry the Product by one-person alone, damage to his arms, feet and lower back may arise, and the Product may fall and causes damage to other equipment. It is requested that multiple persons of an appropriate number are allocated to the work. Furthermore, full attention is required so as not to allow occurrence of falling and dropping. The mass of the Product is as follows. • M-UPS050AD1S/2S: 180 kg (125 kg without batteries) • M-UPS075AD1S/2S: 235 kg (160 kg without batteries) • M-UPS100AD1S/2S: 300 kg (190 kg without batteries)

Damage	Do not use the Product for any application that may exert major influence over human bodies and/or over social and public affairs. • Medical equipment that is directly related to human lives • Devices that may cause damage to human bodies • Socially and publicly important computer systems Do not locate any article (such as CRT display and floppy disc), which is easily affected by magnetism, in the vicinity of the Product. Such articles may be adversely affected. Replace the batteries periodically. Electrolyte leakage, smoke emission and ignition may arise, if use of batteries is continued in the state where the battery lifetime has matured. For replacement, use batteries we nominate and use new batteries. Electrolyte leakage, smoke emission, ignition and failure/malfunction to the Product may arise, if batteries other than what we nominate or used or if old and new batteries of different types are used in mixture. At the occasion of planned interruption of power supply or of OFF of the input circuit breaker on the back side of the Product, assure that the [RUN] LED (green) is slowly blinking (in about 1.6-second period). If the circuit breaker on the cabinet panel is turned OFF, or the input circuit breaker on the back side of the Product is OFF in the state where the [RUN] LED is lit, conditions that are identical to those in the state of interruption of power supply arise, and therefore, discharge from batteries located in the Product begins. Damage to batteries and shortening of battery replacement period may arise otherwise.

● Warning label

A warning label is attached to the Product.

- Never remove this warning label from the Product.
- This warning label is targeted to the person who uses the Product.

Precautions for use

Pay attention to the following matters in the use of the Product.

IMPORTANT	An “IMPORTANT” sign indicates matters that require attention in the use of the Product.

Do not install and store the Product in any of the places indicated below.

- Outdoors
- Place exposed to rain and wind
- Place of excessively high humidity and dust
- Place with corrosive gases and salt
- Place directly exposed to sunlight
- Place located close to sparks or heating elements
- Place of extremely high or low temperature or place of excessive temperature changes
- Place to which vibration and impact is applied

Do not continuously execute battery check.

The battery voltage is checked while discharge is occurring from batteries located in the Product in practice during battery check.

If battery check is continuously executed, therefore, damage to batteries and shortening of battery replacement period may result.

Charge batteries once every two (2) months, if the Product is not used for a long time.

Run the Product for 12 hours or longer to charge batteries once every two (2) months, and check batteries on termination of their charge.

If the Product is shelved for a long time without being run, batteries may reach over-discharged state due to natural discharge, and may become unusable.

Disposal treatment of used batteries, which have become unnecessary, is legally controlled.

Request a professional industrial-waste disposal business or contact your dealer or the maintenance in-charge company.

Do not close cooling fans and ventilation holes of the Product, and do not use the Product in a place of inferior ventilation.

The cooling fans and ventilation holes of the Product are provided for cooling the Product interior.

If they are closed, the Product internal temperature and surrounding temperature may rise to a level that is outside of the rated specification range.

Replace the cooling fans periodically.

If use of cooling fans is continued after their lifetime has matured, the Product internal temperature may rise to a level that is outside of the rated specification range.

The allowable voltage between the input line and grounding terminal of the Product is 250V AC.

The filter circuit in the input unit may be damaged, if a voltage that is higher than 250V AC is impressed.

The input surge voltage capacity of the Product is 5 kV peak (1.2 × 50 μsec).

The filter circuit in the input unit may be damaged, if a surge voltage that is higher than 5 kV peak is impressed.

The input voltage to the Product is rated voltage ±15%.

If the input voltage is different from the rated specification, provide a transformer for voltage conversion outside of the Product. The Product may be damaged, if a voltage outside of the input voltage range is impressed.

The input voltage to the Product should not exceed the rated input voltage range of connected equipment.

During bypass running, the input voltage to the Product is output as it is as the output voltage. The connected equipment may be damaged, if a voltage that exceeds the rated input voltage range of connected equipment is impressed.

In case a generator is used temporarily for planned interruption of power supply, use a generator that satisfies the following specification.

If a generator that does not satisfy the following specification is connected to the input unit of the Product, malfunction and damage to the Product may result.

- Voltage variation: within ±15% of rated voltage
- Frequency variation: within ±5% of rated frequency (1Hz per second)
- Voltage waveform distortion: 5% or less
- Voltage zero-cross condition: No multiple zero-cross during a cycle

Contents

1 Unpacking

1.1 Open the package

● Open the package

⚠ CAUTION	
Personal injury Damage	The Product is a heavy article. Be cautious in the handling of the Product. To take the Product out, select a level and flat place for work execution. If it is attempted to lift or carry the Product by one-person alone, damage to his arms, feet and lower back may arise, and the Product may fall and causes damage to other equipment. It is requested that multiple persons of an appropriate number are allocated to the work. Furthermore, full attention is required so as not to allow occurrence of falling and dropping. The mass of the Product is as follows. • M-UPS050AD1S/2S: 180 kg (125 kg without batteries) • M-UPS075AD1S/2S: 235 kg (160 kg without batteries) • M-UPS100AD1S/2S: 300 kg (190 kg without batteries)

1. Open the case and take the Product out of the case.

● Check what are contained in the case

2. Assure that external appearances of the Product are free of damage.
3. Assure that accessories are fully provided.

Product type	Accessory	Quantity
M-UPS050AD1S/2S (5 kVA)	• Instruction manual (this document) • Fixture (with 4 lock screws)	1 volume 1 set
M-UPS075AD1S/2S (7.5 kVA)	• Instruction manual (this document) • Fixture (with 4 lock screws)	1 volume 1 set
M-UPS100AD1S/2S (10 kVA)	• Instruction manual (this document) • Fixture (with 4 lock screws)	1 volume 1 set

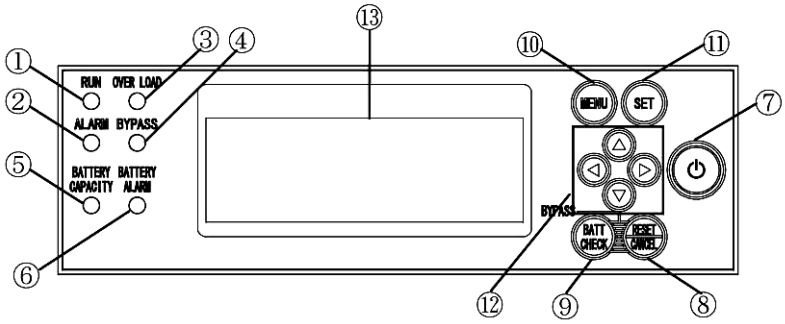
☞ If damaged, or any of accessories is missing:
Please contact your sales representative.

2 Overview

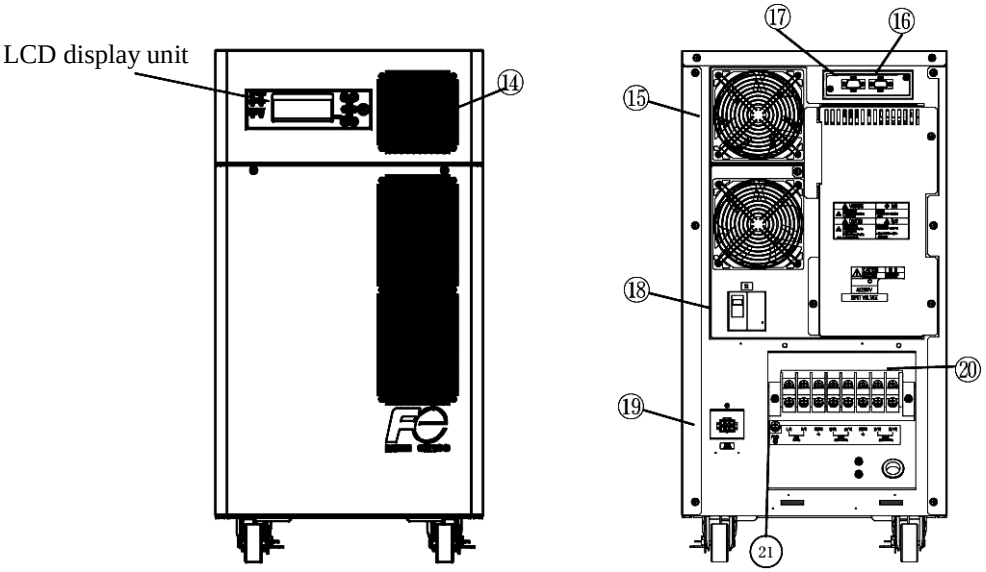
2.1 Names and principal functions of components

The names and principal functions of components of the Product are described below.

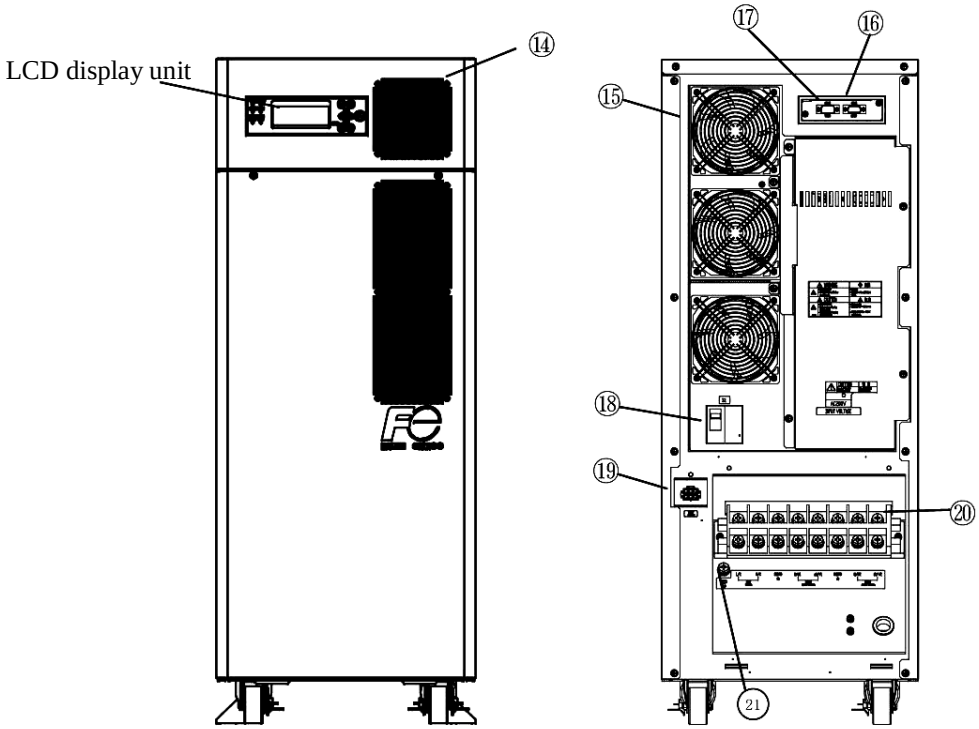
<LCD display unit>



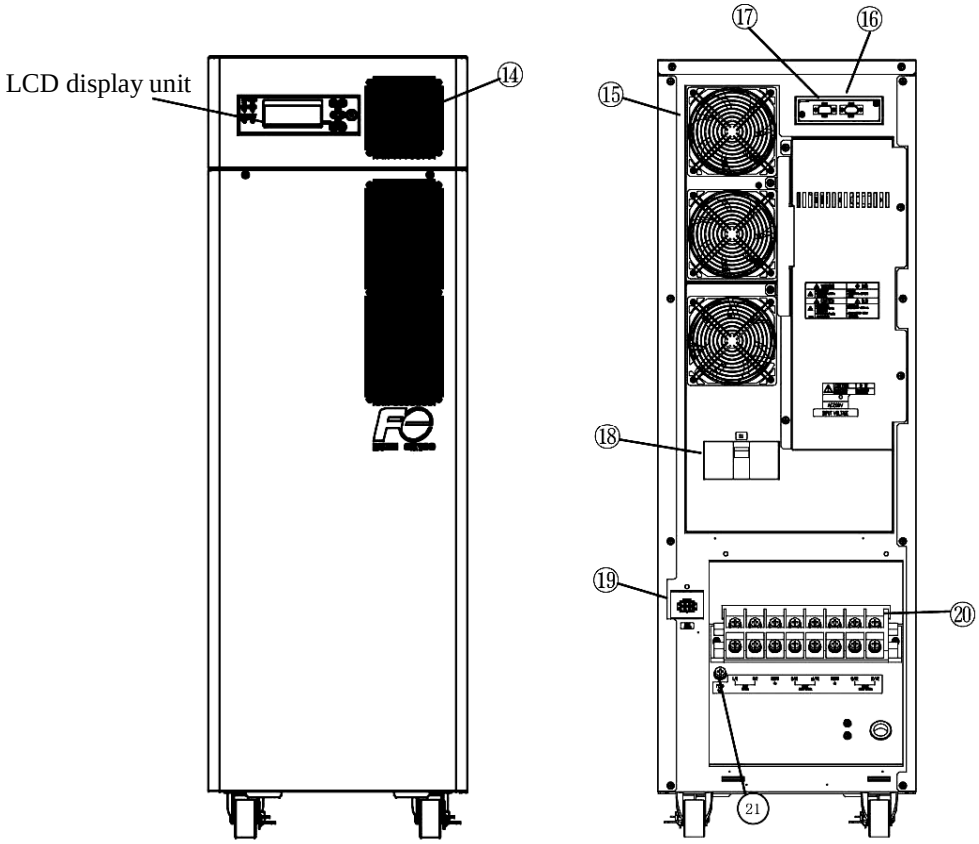
<M-UPS050AD1S/M-UPS050AD2S>



<M-UPS075AD1S/M-UPS075AD2S>



<M-UPS100AD1S/M-UPS100AD2S>



	Name		Principal function
①	LED	RUN	Lit (in green) while the Product is running normally.
②		ALARM	Lights up (in orange) when any failure arises in the Product.
③		OVER LOAD	Lights up (in orange) when the load capacity of the connected equipment exceeds the rated specification.
④		BYPASS	Lit (in orange) while the Product is in bypass running.
⑤		BATTERY CAPACITY	Indicates the extent of battery charge by the lighting type (in green). (Out: 0 to 50%, Blinking: 50 to 80%, Lit: 80 to 100%)
⑥		BATTERY ALARM	Lights up (in orange) when any battery error arises.
⑦	Switch	ON/OFF	Switch for ON/OFF of the Product. Switching between ON and OFF occurs each time when this switch is pressed for about 1 second.
⑧		RESET/CANCEL	Press this switch for stopping the warning beep. Furthermore, the [ALARM] LED goes out when this switch is kept pressed for 3 seconds upon recovery from failure. Switch for canceling the item selected in the LCD screen. Use this switch when it is wanted to display the screen of the hierarchical level that is just above what is being displayed, for instance.
⑨		BATT CHECK	Switch for execution of battery check in the manual mode. Press this switch for about 2 seconds to start battery check.
		BYPASS	Press switches ⑧ and ⑨ simultaneously for about 3 seconds, to forcibly (manually) changing the running status to bypass running while the Product is running in the normal running status. Return to the normal running status occurs when switches ⑧ and ⑨ are pressed again simultaneously for about 3 seconds.
⑩		MENU	Switch for having the LCD menu displayed.
⑪		SET	Switch for finalizing the item selected on the LCD screen. Use this switch when it is wanted to display a sub menu selected out of the main menu.
⑫		▲ Switch	Switch for moving the cursor displayed on the LCD screen upward or for scrolling the screen upward.
		▼ Switch	Switch for moving the cursor displayed on the LCD screen downward or for scrolling the screen downward.
		▶ Switch	Switch for moving the cursor displayed on the LCD screen rightward.
		◀ Switch	Switch for moving the cursor displayed on the LCD screen leftward.
⑬	LCD panel		Panel for display of status and warning of the Product and for display of various operations.
⑭	Ventilation hole (Air suction)		Used for ventilation and cooling of the Product interior. The wind direction is suction (in).
⑮	Cooling fan		Used for cooling of the Product interior. The wind direction is exhaust (out).
⑯	Standard monitoring interface (CN1)		Outputs a no-voltage contact signal.
⑰	PC interface (CN2)		This is the interface for a PC.
⑱	Input circuit breaker		Circuit breaker for protection of the input circuit.

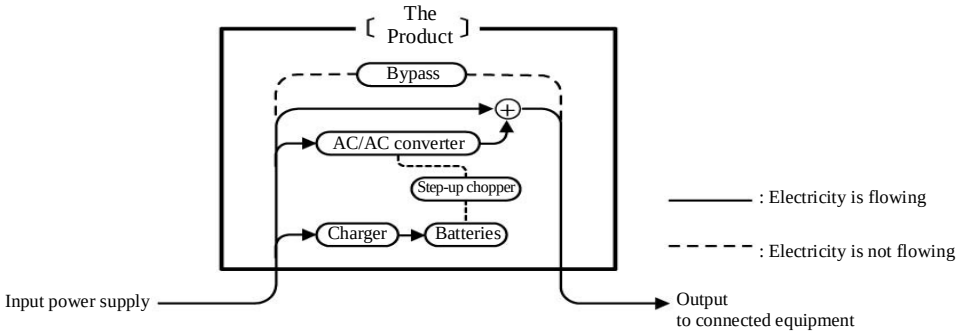
	Name	Principal function
⑲	Connector for connection of optional battery box	Use this connector for connection of batteries for long-time backup.
⑳	Input/output terminal block	Connect this terminal block to the input power supply. Make connection to input power supply. L/R: Non-grounded side pole N/S: Grounded side pole Make connection to load equipment. l1/U1 – l3/V1: 100V AC is output. l1/U2 – l2/V2: 200V AC is output. GND (FG): Grounding terminal
㉑	AC input protective grounding terminal	Connect a grounding conductor to this terminal.

2.2 Setup of the Product

● During normal running

The Product runs using AC power supply as the input during normal running, and feeds a constant voltage output to the connected equipment. At the same time, the Product charges batteries located in the Product, in preparation for battery running.

The output frequency is synchronized with the input frequency.

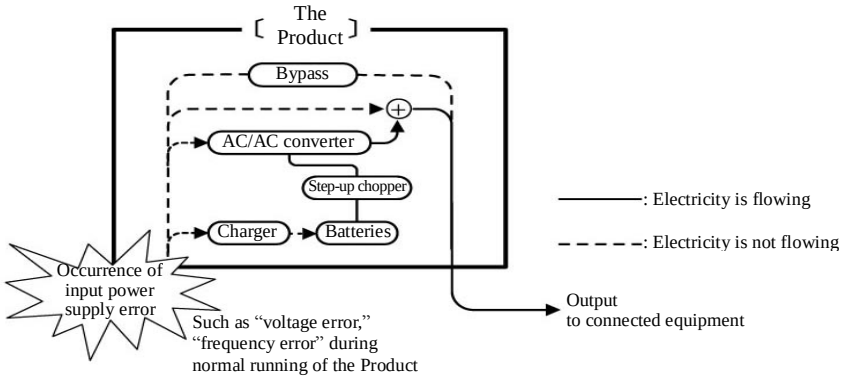


Flow of electricity during normal running

● During battery running (case of input power supply error)

If any input power supply error such as interruption of input power supply and voltage or frequency error arises while the Product is running, discharge from batteries begins and stable power is kept supplied to the load. Switching to battery running occurs uninterruptibly.

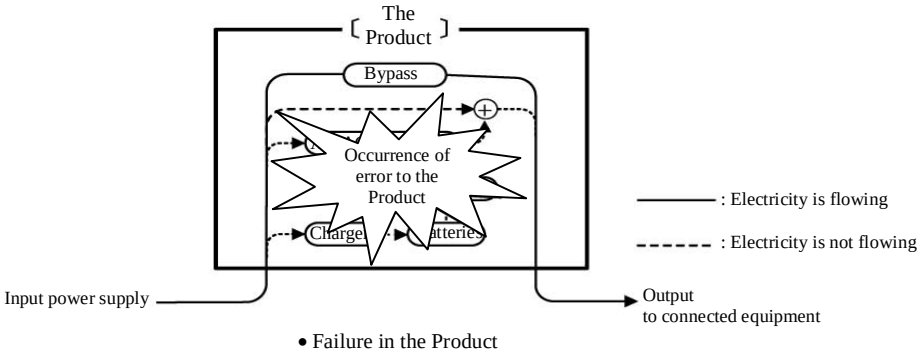
Return to running described in "● During normal running" stated above occurs automatically upon recovery of the AC input power supply (the voltage of input power supply returns to the rated specification).



Flow of electricity during battery running

● Automatic bypass running

If any error occurs to the Product during normal running, switching to bypass running occurs automatically. During bypass running, input voltage is directly fed and power is supplied to the connected equipment. If interruption of power supply arises in this running status, switching to battery running will not occur and interruption of power supply will affect the connected equipment.

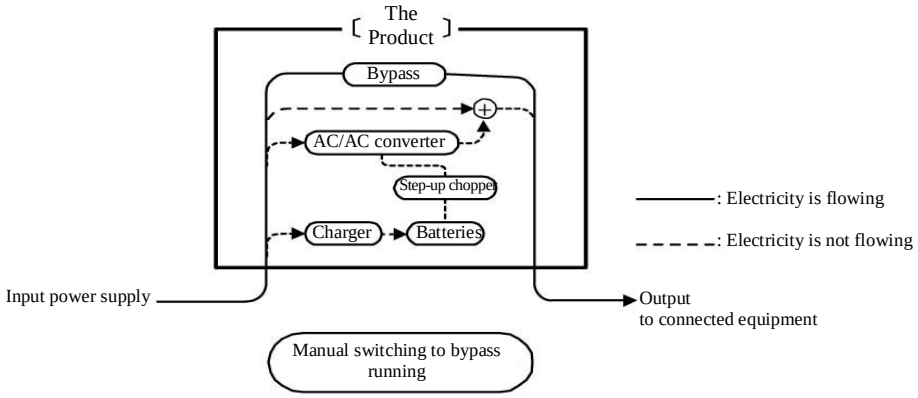


Flow of electricity during automatic bypass running

● Manual bypass running

Switching to bypass running can be executed manually during normal running.

For this operation, press the [RESET/CANCEL] switch and [BYPASS] switch simultaneously for about 3 seconds. Return to normal running occurs when both of these switches are pressed simultaneously for about 3 seconds. If interruption of power supply arises in this running status, switching to battery running will not occur and interruption of power supply will affect the connected equipment.



Flow of electricity during manual bypass running

3 Installation

3.1 Installation of the Product

- **Precautions for installation**

⚠ CAUTION	
Personal injury	Do not step on the Product, and do not locate any article on the Product. Personal injury and falling may result.
Damage	Do not locate any article (such as CRT display and floppy disc), which is easily affected by magnetism, in the vicinity of the Product. Such articles may be adversely affected.

- **Determine the place of installation**

IMPORTANT

Do not install the Product in any of the places indicated below.

- Outdoors
- Place exposed to rain and wind
- Place of excessively high humidity and dust
- Place with corrosive gases and salt
- Place directly exposed to sunlight
- Place located close to sparks or heating elements
- Place of extremely high or low temperature or place of excessive temperature changes
- Place to which vibration and impact is applied

Do not use the Product in a residential area or its neighborhood.

This product is equivalent to Class A information technology device based on standards of Voluntary Control Council for Interference by Information Technology Product (VCCI). There is a possibility where radio disturbance arises if the product is used in a home environment. The user may be requested to take appropriate measures in such a case.

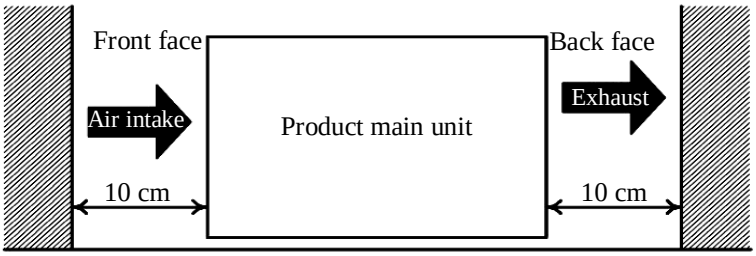
Do not close cooling fans and ventilation holes of the Product, and do not use the Product in a place of inferior ventilation.

The cooling fans and ventilation holes of the Product are provided for cooling the Product interior.

If they are closed, the Product internal temperature and surrounding temperature may rise to a level that is outside of the rated specification range.

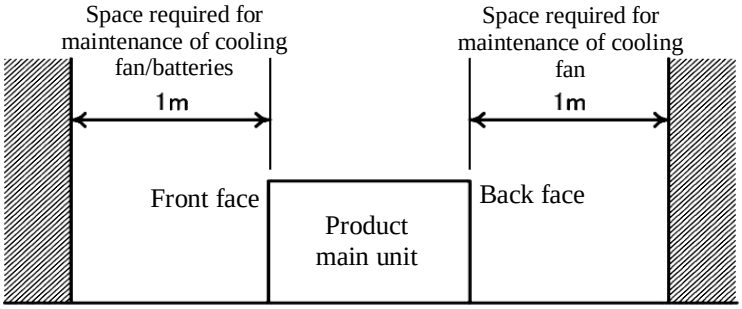
The place for installation of the Product requires spaces indicated below.

- The Product intakes cooling air through the ventilation hole located on its front face and exhaust the cooling air by means of the cooling fan located on the back face. Therefore, provide a space of 10 cm at minimum on each of the front side and back side of the Product.



☞ For maintenance and inspection:

A space of about 1 m is required on each of the front side and back side of the Product as indicated below.



Check the environment of the place of installation. The recommended environment that takes battery lifetime and other factor into account is as follows.

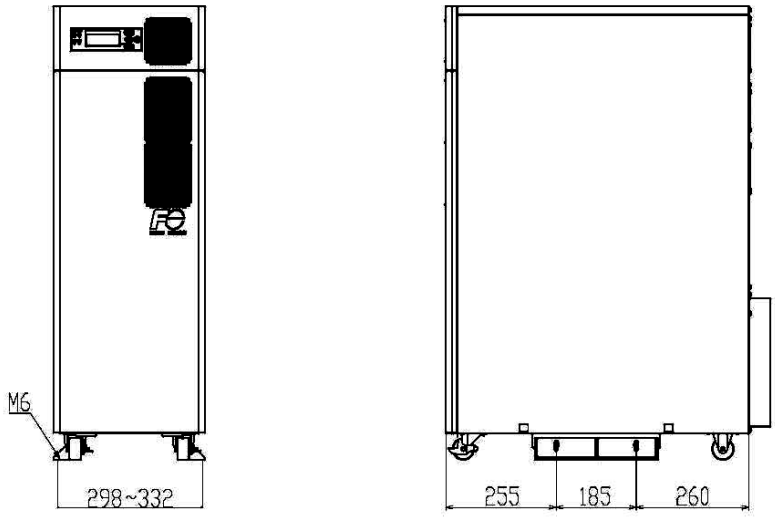
Item	Recommended environment
Temperature	15 to 25°C
Humidity	30 to 70% (No condensation)

● Method for installation

⚠ CAUTION	
Personal injury Damage	The Product is a heavy article. Be cautious in the handling of the Product. To take the Product out, select a level and flat place for work execution. If it is attempted to lift or carry the Product by one-person alone, damage to his arms, feet and lower back may arise, and the Product may fall and causes damage to other equipment. It is requested that multiple persons of an appropriate number are allocated to the work. Furthermore, full attention is required so as not to allow occurrence of falling and dropping. The mass of the Product is as follows. • M-UPS050AD1S/2S: 180 kg (125 kg without batteries) • M-UPS075AD1S/2S: 235 kg (160 kg without batteries) • M-UPS100AD1S/2S: 300 kg (190kg without batteries)

The Product may be used in a "vertical position" only. Use of the Product in a tilted position is not permitted. After installation, make sure to lock casters for preventing displacement of the Product. Both of right and left casters on the front face side are provided with locks.

In case the L-fixture (part appended as standard) is used for fixing the Product main unit to the floor, fix the fixture to the floor first of all, and then fix the Product to the fixture. This L-fixture functions to prevent falling of the Product.



3.2 Connection of cables

● Precautions for cable connection

⚠ CAUTION	
Electric shock	The Product requires grounding (of Class D as the minimum requirement). At the occasion of connection of the Product to an input power supply line, connect a grounding conductor to the AC input protective grounding terminal of the Product. Electric shock may result otherwise.

IMPORTANT

The allowable voltage between the input line and grounding terminal of the Product is 250V AC.

The filter circuit in the input unit may be damaged, if a voltage that is higher than 250V AC is impressed.

The input surge voltage capacity of the Product is 5 kV peak (1.2 × 50 μsec).

The filter circuit in the input unit may be damaged, if a surge voltage that is higher than 5 kV peak is impressed.

The input voltage to the Product is rated voltage ±15%.

If the input voltage is different from the rated specification, provide a transformer for voltage conversion outside of the Product. The Product may be damaged, if a voltage outside of the input voltage range is impressed.

The input voltage to the Product should not exceed the rated input voltage range of connected equipment.

During bypass running, the input voltage to the Product is output as it is as the output voltage. The connected equipment may be damaged, if a voltage that exceeds the rated input voltage range of connected equipment is impressed.

● Preparation before connection

IMPORTANT

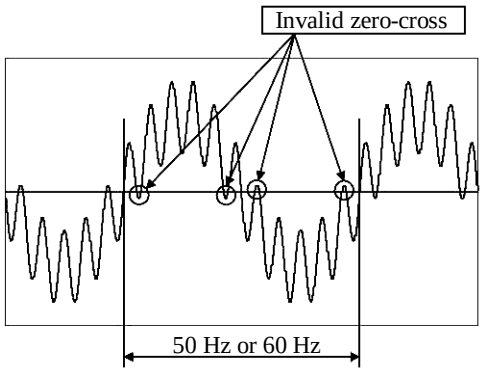
In case of connection of the Product to a 3-phase power supply system, make sure to connect the grounding phase of the 3-phase power supply system to the AC input grounding side terminal of the Product.

Malfunction may arise, if connection is made to non-grounded power supply.

In case a generator is used temporarily for planned interruption of power supply, use a generator that satisfies the following specification.

If a generator that does not satisfy the following specification is connected to the input unit of the Product, malfunction and damage to the Product may result.

- Voltage variation: within ±15% of rated voltage
- Frequency variation: within ±5% of rated frequency (1Hz per second)
- Voltage waveform distortion: 5% or less
- Voltage zero-cross condition: No multiple zero-cross during a cycle



1. Check the input power supply. The input power supply that may be connected to the Product is as follows.

Product type	Circuit breaker capacity	Input capacity	Input voltage	Input frequency	Number of phases
M-UPS050 AD1S	70 A or greater	5.5 kV or greater	100 V AC ±15%	50/60 Hz ±5% (See note.)	Single phase, 2-wire system
M-UPS050 AD2S	35 A or greater	5.5 kV or greater	200 V AC ±15%		
M-UPS075 AD1S	100 A or greater	8.3 kV or greater	100 V AC ±15%		
M-UPS075 AD2S	50 A or greater	8.3 kV or greater	200 V AC ±15%		
M-UPS100 AD1S	125 A or greater	11 kV or greater	100 V AC ±15%		
M-UPS100 AD2S	70 A or greater	11 kV or greater	200 V AC ±15%		

Remarks: The Product may reach the state described below or failure may arise to the Product, if the input voltage or frequency is deviated out of this range.

☞ When the power for the Product is ON:
"input error at start-up" arises. The Product cannot be started in this state.

☞ While the Product is running:
"Input voltage error" is detected, and the running status changes to battery running. If the Product is connected to input power supply that frequently deviates from this range, charge/discharge of batteries is repeated, and battery "empty" state arises or deterioration of batteries may result. Be cautious.

Note: An input frequency is automatically chosen according to the area in which the Product is used.

2. Select the input/output cable size and length (one way) with reference to the following table.

Product type	Cable type		Wire size	Length
M-UPS050AD1S	Input	100 V	14 mm^2	10 m or less
			22 mm^2	20 m or less
	Output	100 V	14 mm^2	10 m or less
			22 mm^2	20 m or less
		200 V	14 mm^2	20 m or less
M-UPS050AD2S	Input	200 V	14 mm^2	20 m or less
	Output	100 V	14 mm^2	10 m or less
			22 mm^2	20 m or less
		200 V	14 mm^2	20 m or less
M-UPS075AD1S	Input	100 V	38 mm^2	20 m or less
	Output	100 V	22 mm^2	10 m or less
			38 mm^2	20 m or less
		200 V	22 mm^2	20 m or less
M-UPS075AD2S	Input	200 V	22 mm^2	20 m or less
	Output	100 V	22 mm^2	10 m or less
			38 mm^2	20 m or less
		200 V	22 mm^2	20 m or less
M-UPS100AD1S	Input	100 V	60 mm^2	20 m or less
	Output	100 V	38 mm^2	10 m or less
			60 mm^2	20 m or less
		200 V	38 mm^2	20 m or less
M-UPS100AD2S	Input	200 V	38 mm^2	20 m or less
	Output	100 V	38 mm^2	10 m or less
			60 mm^2	20 m or less
		200 V	38 mm^2	20 m or less

3. The terminal block specification is as follows. Select conforming crimp-style terminals.

<table>
<tr><th>Product side</th><th colspan="3">Specification</th><th>Object of connection</th></tr>
<tr><td rowspan="9">Input/output terminal block</td><td>Terminal symbol</td><td>Connection to</td><td>Form</td><td rowspan="9">Input power supply and output system</td></tr>
<tr><td>L/R</td><td>AC input (non-grounded side terminal)</td><td rowspan="8">8P screw terminal
(M6)
M-UPS050AD1S
M-UPS050AD2S
(M8)
M-UPS075AD1S
M-UPS075AD2S
M-UPS100AD1S
M-UPS100AD2S</td></tr>
<tr><td>N/S</td><td>AC input (Grounded side terminal)</td></tr>
<tr><td>GND (FG)</td><td>Ground</td></tr>
<tr><td>l1/U1</td><td>AC output (non-grounded side terminal)</td></tr>
<tr><td>l3/V1</td><td>AC output (non-grounded side terminal)</td></tr>
<tr><td>GND (FG)</td><td>Ground</td></tr>
<tr><td>l1/U2</td><td>AC output (non-grounded side terminal)</td></tr>
<tr><td>l2/V2</td><td>AC output (non-grounded side terminal)</td></tr>
<tr><td>Protective grounding terminal</td><td>PE (G)</td><td>Ground (protective grounding)</td><td>(M6 screw)
M-UPS050AD1S
M-UPS050AD2S
(M8 screw)
M-UPS075AD1S
M-UPS075AD2S
M-UPS100AD1S
M-UPS100AD2S</td><td>Grounding conductor</td></tr>
</table>

Insulation of input/output

The transformer located in the Product insulates the input and output of the Product. Take into account that input/output is insulated, at the occasion of wiring of input/output lines and for provision of ground-fault circuit interrupter or the like.

- **Connect the output cable**

  Remove the AC input/output terminal block cover from the back face of the Product, and connect the AC output cable to the AC output terminal block. Assure that the grounding terminal is connected to the ground.

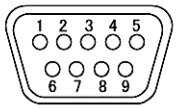
- **Connect the input cable**

  Remove the AC input/output terminal block cover from the back face of the Product, and connect the AC input cable to the AC input terminal block. Assure that the grounding terminal is connected to the ground.

3.3 Interface port

The Product is provided with a D-sub 9-pin interface port on its back face, and this interface port permits take-out of signals indicated below. Use these signals as required.

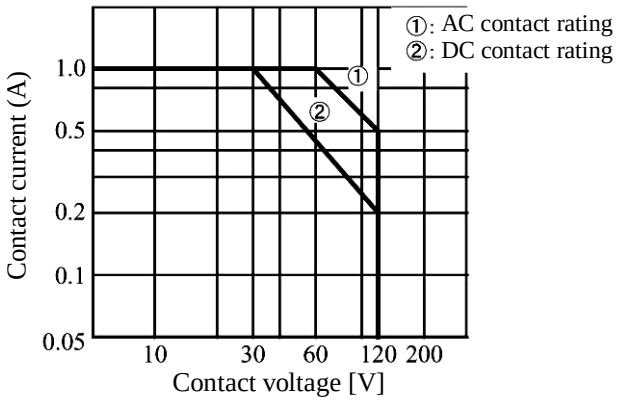
● CN1 (standard monitoring interface)



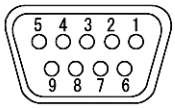
D-sub 9-pin male port
(3 mm threads)

Pin No.	Signal type	Signal name	Description
1-4	"Opens" on action	Product failure signal	No-voltage contact signal that is output when any failure arises in the Product, and any error arises to batteries or when the battery replacement recommended time comes.
1-6	"Closes" on action		
2-5	"Opens" on action	Input power supply error signal	No-voltage contact signal that is output when any voltage error arises to the input power supply due to interruption of power supply or the like. (No action will occur, if the power supply error is of up to 1.5 seconds.)
2-7	"Closes" on action		
3-9	"Opens" on action	Low battery voltage signal	No-voltage contact signal that is output about 2 minutes (during rated load) before termination of battery discharge during battery running.
3-8	"Closes" on action		

Use the contact output in the voltage and current ranges indicated below.



● CN2 (PC interface)



D-sub 9-pin female port
(#4-40 inch threads)

Pin No.	Signal type	Signal name	Description
2-3	"Closes" on action	Input power supply error signal (See Note 1.)	No-voltage contact signal that is output when any voltage error arises to the input power supply due to interruption of power supply or the like. (No action will occur, if the power supply error is of up to 1.5 seconds.)
1-3	"Closes" on action	Low battery voltage signal (See Note 1.)	No-voltage contact signal that is output about 2 minutes (during rated load) before termination of battery discharge during battery running.
8-7	AC output stops upon receipt of "H" signal	UPS automatic shutdown signal (See Note 2.)	Signal input to the Product for stopping AC output from the Product. (1) AC output may be stopped only during battery running. (2) This signal (5 to 25 V DC) should be input for about 0.6 second or longer.
6-7	RS-232C serial signal (See Note 3.)	Serial data input (RX)	<Communication method> • Baud rate: 2400 bps • Data length: 8 bits • Stop bit: 1 bit • Parity: non • Character type: ASCII type
9-7		Serial data output (TX)	
7		Signal ground (SG)	

Note 1: See the graph on the previous page for contact capacity. In case the UPS monitor function (using contact signals stated above) that is mounted as default in the following OS is used, a dedicated contact signal cable that corresponds to the OS is required elsewhere. Therefore, please contact the in-charge maintenance staff. For details of the UPS monitor function that is mounted as default in each OS, see the instruction manual and online manual for the OS.
- Windows NT/2000/XP: FiFH/WS9 (dedicated contact signal cable)

Note 2: Windows 2000 and XP permit shutdown of the OS on occurrence of interruption of power supply, and UPS automatic shutdown thereafter is not feasible.

Note 3: Dedicated RS-232C communication cable is required elsewhere for execution of RS-232C serial communication. Please contact the in-charge maintenance staff.
- FiFA/WS9 (dedicated RS-232C communication cable)

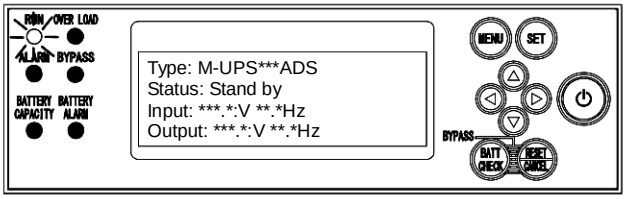
4 Running

4.1 Power ON

● Check cable connection

1. Assure that the Product is connected to the input power supply and connected equipment.

   When the input circuit breaker on the back face of the Product is ON, the [RUN] LED (green) begins slow blinking (in about 1.6-second period). Furthermore, the LCD screen displays various information upon acquisition of Product information.

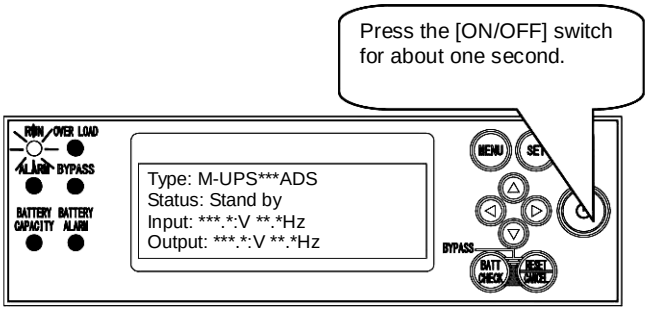


☞ If the cable is not connected:
See “3.2 Connection of cables”.

● Turn ON the power for the Product

2. Press the [ON/OFF] switch on the front face of the Product for about one second.

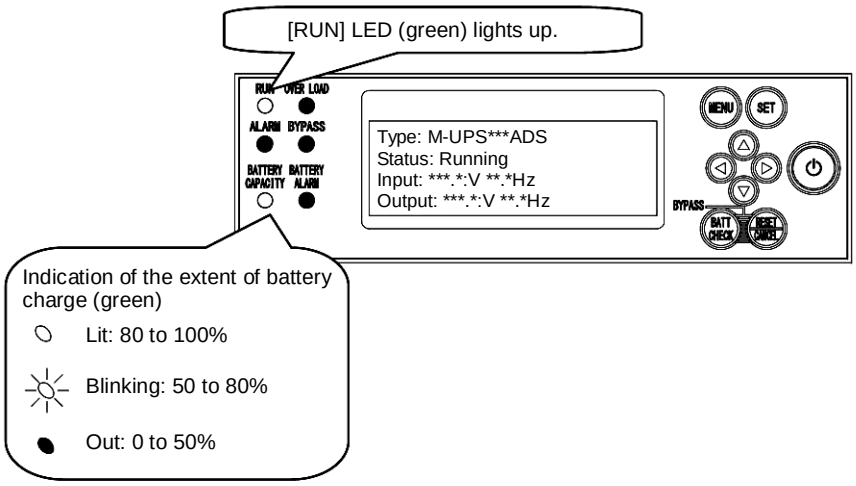
   The buzzer begins to beep upon acceptance of the switch.



3. AC voltage is output from the output terminal block.

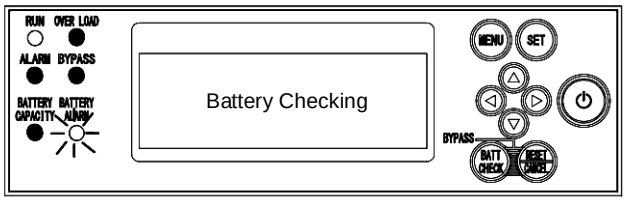
   The [RUN] LED (green) on the front face of the Product lights up.

   The [BATTERY CAPACITY] LED (green) on the front face of the Product indicates the extent of battery charge by the lighting type.



4. Battery check is executed automatically.

   The [BATTERY ALARM] LED (orange) on the front face of the Product blinks slowly (in about 1.6-second period).



5. If no error was found in batteries during battery check for about 5 seconds, and [BATTERY CAPACITY] LED on the front face of the Product shows the extent of battery charge (green) again, and return to the normal running status arises.

   ☞ If normal running is not started:
   See “Chapter 7 Troubleshooting”.

- **Turn ON the power for connected equipment**

6. Upon normal start-up of normal running, turn ON the power for the connected equipment.

4.2 Power OFF

Make sure to perform the operation described below also in case of implementation of planned interruption of power supply. (See "5.2 Precautions and measures for planned interruption of power supply" for details.)

⚠ CAUTION	
Damage	At the occasion of OFF of the input circuit breaker on the back side of the Product, assure that the [RUN] LED (green) is slowly blinking (in about 1.6-second period). If the circuit breaker on the cabinet panel is turned OFF, or the input circuit breaker on the back side of the Product is OFF without execution of the operation described in "● Turn OFF the power for the Product" below, conditions that are identical to those in the state of interruption of power supply arise, and therefore, discharge from batteries located in the Product begins. Damage to batteries and shortening of battery replacement period may arise otherwise.

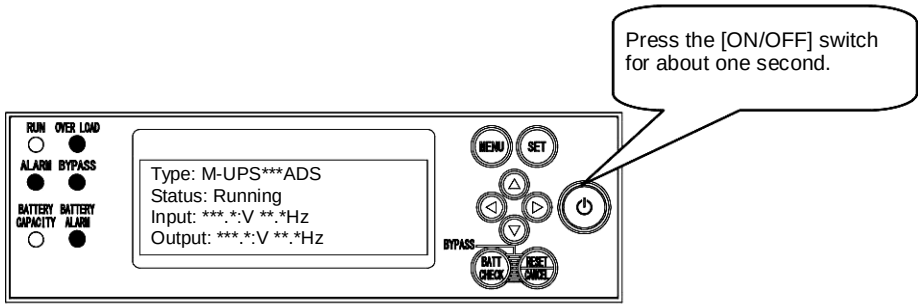
● Turn OFF the power for the connected equipment

1. Turn OFF the power for the connected equipment

● Turn OFF the power for the Product

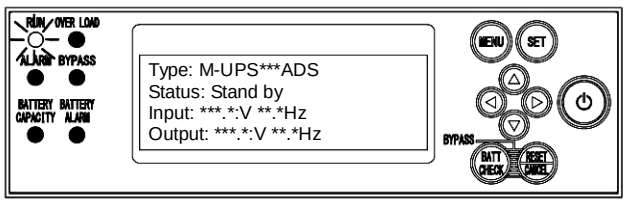
2. Press the [ON/OFF] switch on the front face of the Product for about one second.

   The buzzer begins to beep upon acceptance of the switch.



3. The output stops.

   The [RUN] LED (green) on the front face of the Product beings to blink slowly (in about 1.6-second period).



☞ If the output fails to stop normally:
See "Chapter 7 Troubleshooting".

4. Turn OFF the input circuit breaker on the back face of the Product.

5 Inspection

5.1 Care and daily inspection

It is essential to implement care and inspection described below, to keep using the Product without anxiety over an extended period of time,

⚠ WARNING	
Electric shock	Do not remove the cover from the Product. There are sections of high voltage in the Product, and electric shock may arise.

⚠ CAUTION	
Electric shock	At the occasion of inspection and maintenance of the Product, turn OFF the power for the connected equipment and the Product, turn OFF the input circuit breaker on the back side of the Product, and disconnect cables from AC input terminals (L1/R, N/S). Electric shock may result otherwise. It is requested that maintenance (such as replacement of batteries and replacement of cooling fans) other than daily inspection is executed by professional engineers. Electric shock may result otherwise.
Damage	At the occasion of OFF of the input circuit breaker on the back side of the Product, assure that the [RUN] LED (green) is slowly blinking (in about 1.6-second period). If the circuit breaker on the cabinet panel is turned OFF, or the input circuit breaker on the back side of the Product is OFF without execution of the operation described in “4.2 Power OFF”, conditions that are identical to those in the state of interruption of power supply arise, and therefore, discharge from batteries located in the Product begins. Damage to batteries and shortening of battery replacement period may arise otherwise.

● Care

1. Turn OFF the power for the connected equipment and then turn OFF the power for the Product. Then remove dust from ventilation holes and cooling fans of the Product with a vacuum cleaner or the like.
2. Rub surfaces of the Product with a soft dry cloth.

● Daily inspection

- Assure that ventilation holes and cooling fans are free of dust attachment.

  ☞ If dust is attached:

  See "● Care".

- Assure that the Product surfaces, cables and power outlet are not abnormally heated.

  ☞ If abnormally heated:

  Check the situation and contact your dealer or the maintenance in-charge company.

- Assure that major abnormal noise and abnormal odor are not produced during running.

  ☞ If any abnormality is arising:

  Check the situation and contact your dealer or the maintenance in-charge company.

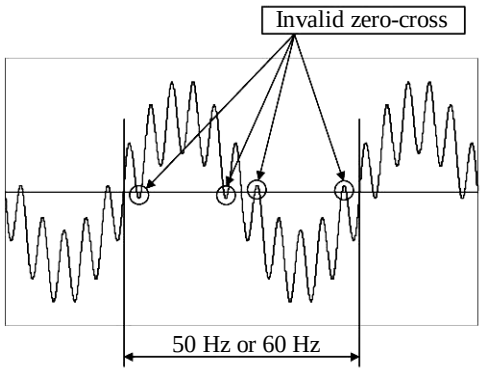
5.2 Precautions and measures for planned interruption of power supply

IMPORTANT

In case a generator is used temporarily for planned interruption of power supply, use a generator that satisfies the following specification.

If a generator that does not satisfy the following specification is connected to the input unit of the Product, malfunction and damage to the Product may result.

- Voltage variation: within ±15% of rated voltage
- Frequency variation: within ±5% of rated frequency (1Hz per second)
- Voltage waveform distortion: 5% or less
- Voltage zero-cross condition: No multiple zero-cross during a cycle



● Operation before implementation of planned interruption of power supply

Turn OFF the power for the connected equipment and the Product before implementation of planned interruption of power supply (see note).

1. Turn OFF the power for the connected equipment.
2. Press the [ON/OFF] switch on the front face of the Product for about one second.

   The buzzer begins to beep upon acceptance of the switch.
3. The output stops.

   The [RUN] LED (green) on the front face of the Product begins to blink slowly (in about 1.6-second period).

In case planned interruption of power supply was implemented without turning OFF the power for the Product, conditions that are identical to those in the state of interruption of power supply arise, and power is fed to the connected equipment from batteries in the Product until power recovery (termination of planned interruption of power supply). On termination of discharge, therefore, power feed to the connected equipment will not be implemented until power recovery arises.

Note: Planned interruption of power supply means interruption of power supply, the date and hour of occurrence of which is known in advance for electricity safety checkup or the like.

● Operation after planned interruption of power supply

1. Assure that the Product is connected to the input power supply and connected equipment.

   The [RUN] LED (green) on the front face of the Product begins slowly blinking (in about 1.6-second period).

2. Press the [ON/OFF] switch on the front face of the Product for about one second.

   The buzzer begins to beep upon acceptance of the switch.

3. AC voltage is output from the output terminal block, and the [RUN] LED (green) on the front face of the Product lights up.

4. Turn ON the power for the connected equipment upon normal start-up of normal running.

   ☞ See “4.1 Power ON” for details.

   ☞ If warning beep is issued:

   See “7.1 When warning beep was issued”.

5.3 Battery inspection (battery check)

Inspection of batteries is implemented with battery check functions. Two battery check functions, that is, automatic battery check function and manual battery check function, are available.

Manual battery check is not required in an ordinary state, because automatic battery check is executed while the Product is running.

Automatic battery check is executed in any of the following cases.

- When running of the Product begins.
- Once every 2 weeks while running of the Product is continued.
- When switching from bypass running to normal running arises.

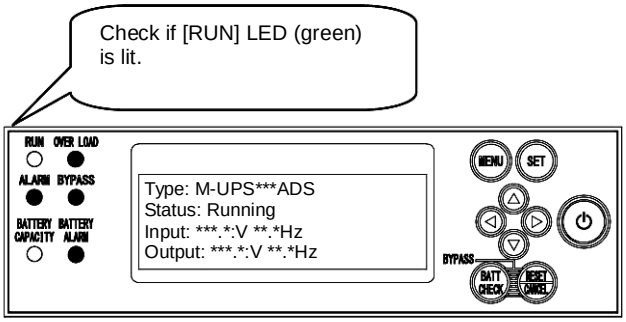
Execute manual battery check in any of the following cases.

- When warning beep is issued.
- When it is wanted to execute battery check at an occasion other than automatic battery check.

IMPORTANT
Do not continuously execute battery check. The battery voltage is checked while discharge is occurring from batteries located in the Product in practice during battery check. If battery check is continuously executed, therefore, damage to batteries and shortening of battery replacement period may result

● Check conditions of the Product

1. Check if the Product is in the normal running status.

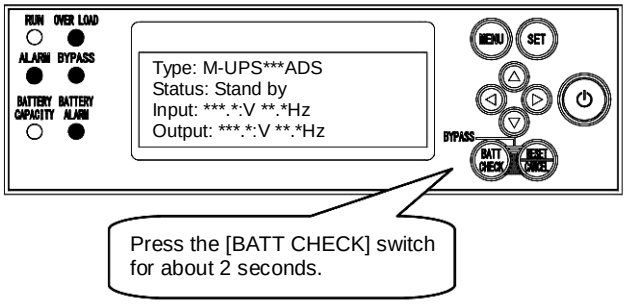


☞ If the Product is in the pause status (all the LED's on the front face of the Product are out):
Turn ON the power for the Product, and proceed to Step 2.
See "4.1 Power ON" for details.

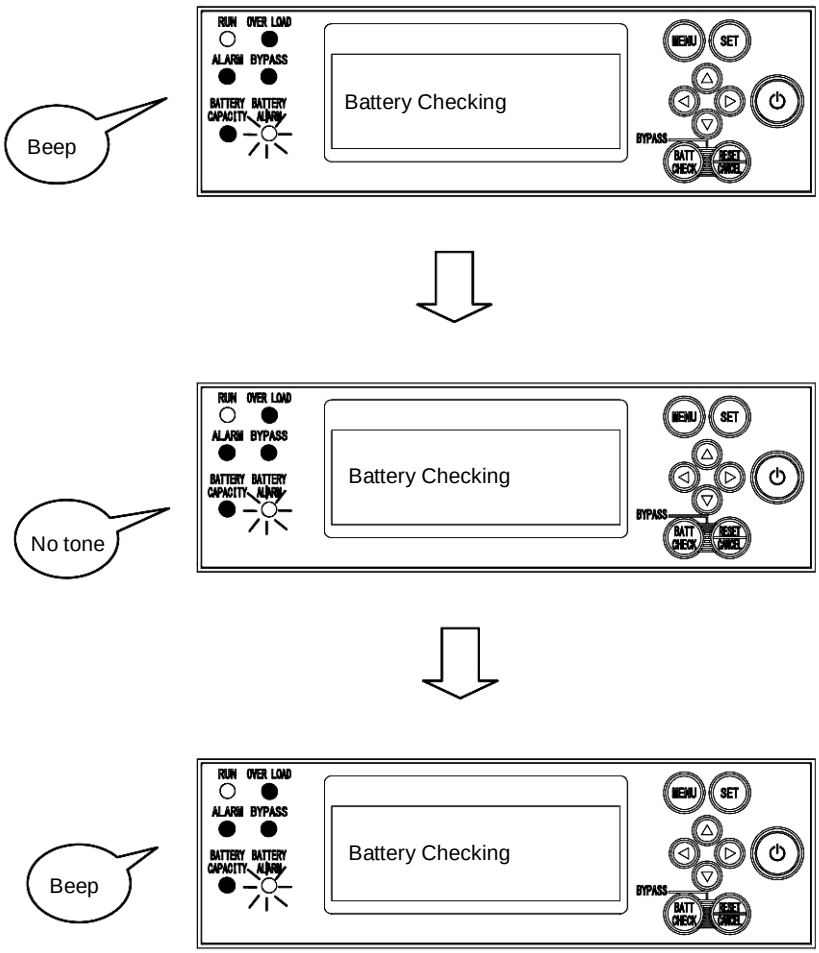
☞ If it cannot be identified that the Product is in normal running in a status other than pause:
See "Chapter 7 Troubleshooting". Take troubleshooting actions, and then proceed to Step 2.

- **Use the manual battery check function**

2. Press the [BATT CHECK] switch on the front face of the Product for about 2 seconds.



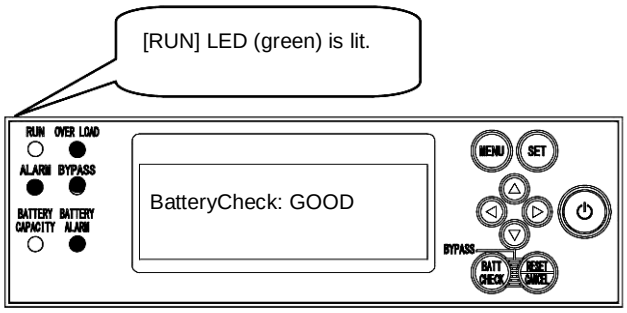
The buzzer beeps, and the [BATTERY CAPACITY] LED (orange) begins blink slowly (in about 1.6-second period).
The buzzer beeps again about 5 seconds later, and battery check terminates.



3. The Product reaches the following status as a result of battery check.

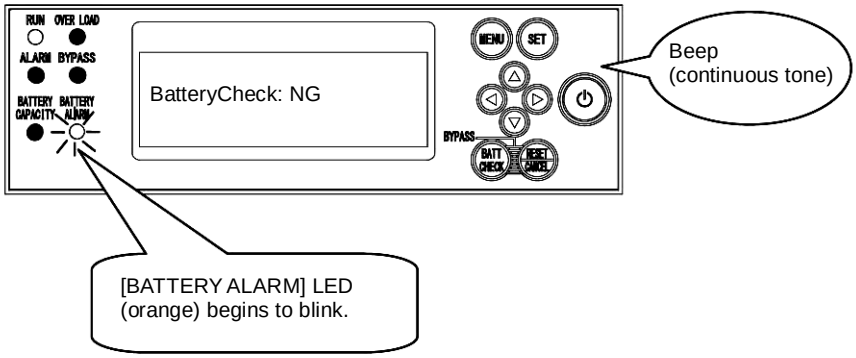
☞ In case batteries are fully charged:

The [RUN] LED (green) on the front face of the Product lights up, and return to normal running occurs.
The LCD panel displays the following indication for 5 seconds, and then returns to the screen before execution of automatic battery check.



☞ In case charge of batteries is insufficient:

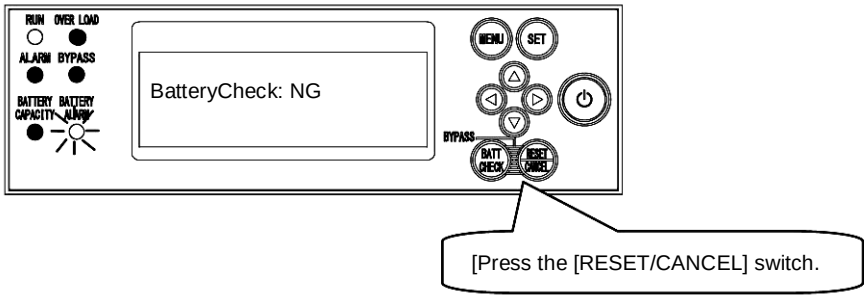
- Warning beep is issued and the [BATTERY ALARM] LED (orange) on the front face of the Product begins to blink.
  Proceed to Step 4.



● Charge batteries

4. Press the [RESET/CANCEL] switch on the front face of the Product for about 3 seconds. Blinking of the [BATTERY ALARM] LED (orange) terminates. Charge batteries by running the Product in this state for 12 hours or longer.

   The LCD panel returns to the screen before execution of automatic battery check.



Remarks: In this status, there is a possibility where battery running does not occur even if interruption of power supply arises.

5. Return to Step 2, and execute manual battery check again.

   ☞ If the state of "In case charge of batteries is insufficient:" in Step 3 arises again:

   The batteries have failed (maturity of lifetime). Replace batteries.

   See "8.1 Battery replacement" for details.

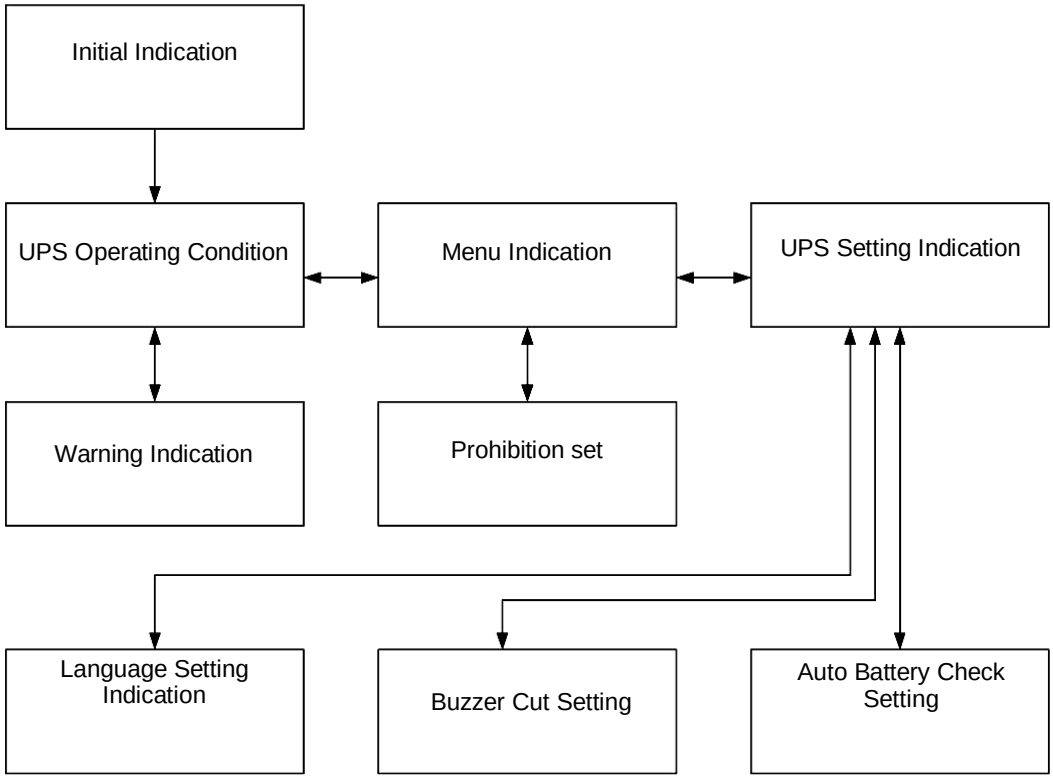
6 LCD Display

The Product mounts an LCD panel for browsing detail information of various kinds and for setting and operation.

This chapter describes contents displayed on the LCD as well as methods for operation and setting.

6.1 Overview of LCD

- **Transition of LCD display screen**



● Contents of LCD display

The LCD panel displays the [UPS Operating Condition] screen or [Warning Indication] screen indicated below, unless the [MENU] button is pressed.

The [UPS Operating Condition] screen is displayed while the Product is in the normal state, and the [Warning Indication] screen appears on occurrence of an error or warning to the Product.

Screen name		Contents of display on LCD screen English (default)	Remarks
UPS Operating Condition		Type: M-UPS***ADS Status: Running Input: 201.4 V / 60.0 Hz Output: 200.0 V / 60.0 Hz Battery Vol: 243.5 V Battery Life: 48 months Battery Temp: 21.5°C Load: 040% Input Power: 02.4 kW Backup Times: 0007	Indicates the Product conditions and measured values. Those items located below the dotted line can be seen when the screen is scrolled.
Warning Indication	[1]	- WARNING - Not Access	This screen appears on occurrence of communication error between LCD panel and control circuit.
	[2]	Data Reading	This screen is displayed during initialization executed at the time of ON of commercial power supply. It is also displayed during data communication between LCD panel and control circuit.
	[3]	- FAULT - Transformer Temp Output Turn off	This screen appears when the output stops as a means of protection upon occurrence of temperature error to the Product internal transformer.
	[4]	- FAULT - Thyristor Temp Output Turn Off	This screen appears when the output stops as a means of protection upon occurrence of temperature error to the power module internal thyristor.
	[5]	- WARNING - Manual Bypass Input: ***.* V **.* Hz	This screen is displayed during bypass running by manual operation.
	[6]	- OVERLOAD - Input Failure Cannot Bypass Output: Turn Off	This screen appears when the output stops as a means of protection upon occurrence of overload to the Product during backup running.
	[7]	- FAULT - Input Failure Cannot Bypass Output Turn Off	This screen appears when the Product fails during backup running.
	[8]	- OVERLOAD - Bypass Load: ***%	This screen appears when the Product is switched to bypass running due to overload.
	[9]	- INPUT FAILURE - Backup Battery Low	This screen appears when the battery voltage drops to the specified level due to backup running and the remaining length of time that permits continuation of backup running has become short.
	[10]	- FAULT - Bypass @@@@@@@@@@ Input: ***.* V **.* Hz	This screen appears when the Product is switched to bypass running due to failure. The contents of failure are also displayed in @@@@@@@@@@.

Warning Indication	[11]	- OVERLOAD - Backup Load: ***%	This screen appears when the Product is overloaded during backup running.
	[12]	- WARNING - Booting Failure	This screen appears, if the input power supply is of voltage or frequency outside of the rated range of the Product at start-up of running of the Product
	[13]	- INPUT FAILURE - Backup	This screen is displayed while the Product is in backup running.
	[14]	- WARNING - Battery Life	This screen appears when the battery lifetime (anticipated value) has matured.
	[15]	Change to Inverter	This screen appears at the time of return to normal running from bypass running.
	[16]	Battery Checking	This screen is displayed while battery check is in progress.
	[17]	BatteryCheck: NG	This screen is displayed, if the result of battery check is abnormal.
	[18]	BatteryCheck: GOOD	This screen is displayed when the result of battery check is satisfactory.

Note 1: In the state where multiple [Warning Indication] screens are overlapped, the items of smaller numbers are displayed with priority.

Note 2: What are indicated below are displayed as contents of the failure of [10]. In the state where multiple failures are overlapped, the items of smaller numbers are displayed with priority.

Failure contents	1	UPS Temp
	2	Output Failure
	3	BattCharge Failure
	4	DC Voltage Failure
	5	FAN Failure
	6	Feedback Failure
	7	Battery Temp

Pressing the [MENU] button permits transition from the [Menu indication] screen to the [UPS Setting Indication] screen or to a screen for browsing and implementing various settings.

Screen name	Contents of display on LCD screen English (default)	Remarks
Menu Indication	- Menu - > Operating Condition Settings Prohibition set	Screen for displaying the menu of Product setting and operation.
UPS Setting Indication	- Settings - > Language Buzzer cut Auto Battery Check	Screen for implementation of various settings.

6.2 Details of display screens

● [UPS Operating Condition] screen

This screen is displayed while the Product is in normal running.

Type:M-UPS***ADS Status:Running Input:201. 4V／60. 0Hz Output:200. 0V／60. 0Hz	カタシキ:M-UPS***ADS ジョウタイ:セイジョウウンテン ニュウリョク:201. 4V／60. 0Hz シュツリョク:200. 0V／60. 0Hz

The screen scrolls when a direction button (▼ button or ▲ button) is pressed, and permits reading of measurement information of various kinds.

①→	Type:M-UPS***ADS	カタシキ:M-UPS***ADS
②→	Status:Running	ジョウタイ:セイジョウウンテン
③→	Input:201. 4V／60. 0Hz	ニュウリョク:201. 4V／60. 0Hz
④→	Output:200. 0V／60. 0Hz	シュツリョク:200. 0V／60. 0Hz
⑤→	Battery Vol:243. 5V	バッテリデンアツ:243. 5V
⑥→	Battery Life:48month	バッテリジュミョウ:48カゲツ
⑦→	Battery Temp:21. 5℃	バッテリオンド:21. 5℃
⑧→	Load:040%	フカリツ:040%
⑨→	Input Power:02. 4kW	ニュウリョクデンリョク:02. 4kW
⑩→	Backup Times:0007	バックアップカイスウ:0007

These items can be observed when the screen is scrolled.

① “Type”
Indicates the Product type.

② “Status”
One is selected out of the following depending on the Product conditions.

[1] Running
[2] Stand by
[3] Backup
[4] Bypass
[5] UPS Booting
[6] Data Reading

③ “Input”
Indicates the Product input voltage measured value and frequency measured value.

④ “Output”
Indicates the Product output voltage measured value and frequency measured value.

⑤ Battery Vol”
Indicates the Product battery voltage measured value.

⑥ Battery Life”
Indicates the estimated residual battery lifetime in month units.
“99” is indicated, if indication of the estimated residual battery lifetime is invalidated.

⑦ “Battery Temp”
Indicates the battery ambient temperature measured value. This measured value is used for calculation of estimated residual battery lifetime.

⑧ “Load”
Indicates the present loading dose to the allowable loading dose of the Product.
(Backup running is disabled, if the loading dose exceeds 100%.)

⑨ “Input Power”
Indicates the input power measured value of the Product.

⑩ “Backup Times”
Indicates the total count of backup running since the Product was introduced or since batteries were replaced.

● [Warning Indication] screen

On occurrence of status change or error to the Product, transition to the [Warning Indication] screen occurs automatically from the [UPS Operating Condition] screen. See the description of [Warning Indication] screen in Section 6.1 for types of display contents. Furthermore, the buzzer begins to beep as linked to transition to the [Warning Indication] screen.

Buzzer stops when the [RESET/CANCEL] switch is pressed for one second. Furthermore, transition to the [UPS Operating Condition] screen occurs automatically when the [RESET/CANCEL] switch is pressed for 3 seconds in the state where the factor that is responsible for issue of warning was dissolved.

Note: Regarding buzzer beeping, there are cases where buzzer cut has been set for each factor. (See "Buzzer cut setting".) The buzzer will not beep, if buzzer cut setting has been made.

[Example 1] Case where overload occurs in the state where input power supply is normal

− OVER LOAD −	− カフカ −
Bypass Load:106%	バイパスウンテン フカリツ:106%

The example shown above indicates that the load factor is 106% of the rated load and that bypass running is in progress. Transition to the [UPS Operating Condition] screen occurs when the load is reduced to the rated load or less.

[Example 2] Case where interruption of input power supply occurred

− INPUT FAILUR −	−ニュウリョクイジョウ−
Backup	バックアップウンテン

The example shown above indicates that the Product is in backup running because of interruption of input power supply. Return to the [UPS Operating Condition] screen occurs upon recovery of input power supply.

In the state where multiple warning indications are overlapped, the items of higher display priority are displayed.

See the description of [Warning Indication] screen in Section 6.1 for the display priority. [1] to [18] indicated here represent the display priority.

<High display priority> [1], [2]……[17], [18] <Low display priority>

[Example] Indication on LCD screen in case where voltage drop (advance notice of termination of discharge) occurred during backup running

− INPUT FAILUR −	−ニュウリョクイジョウ−
Backup	バックアップウンテン

The priority of the backup running warning screen is [13].

−INPUT FAILURE−	−ニュウリョクイジョウ−
Backup Battery Low	バックアップウンテン バッテリデンアツテイカ

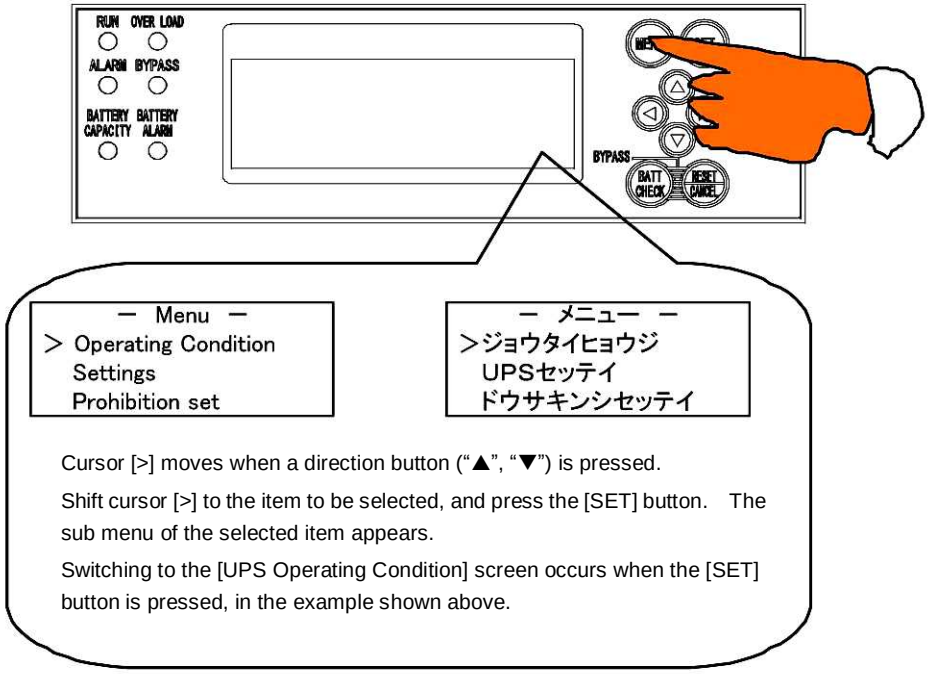
The priority of the battery voltage drop warning screen is [9].

Because of the relation of priority stated above, the battery voltage drop warning screen is displayed.

6.3 Screen operation

● How to display [Menu Indication] screen

Press the [MENU] button to display the [Menu Indication] screen.



Cursor [>] moves when a direction button ("▲", "▼") is pressed.

Shift cursor [>] to the item to be selected, and press the [SET] button. The sub menu of the selected item appears.

Switching to the [UPS Operating Condition] screen occurs when the [SET] button is pressed, in the example shown above.

● [Menu Indication] screen

(1) "Operating Condition"
The UPS operating condition screen permits reading of measurement information of various kinds. See Section 6.2.

(2) "Settings"
The [UPS setting Indication] screen permits setting of the following items.

- Setup of language
- Setup of buzzer cut
- Setup of automatic battery check

(3) "Prohibition set"
The [Prohibition set] screen permits setting of the following items.

- Setup of battery lifetime calculation
- Setup of automatic start-up of UPS upon power recovery

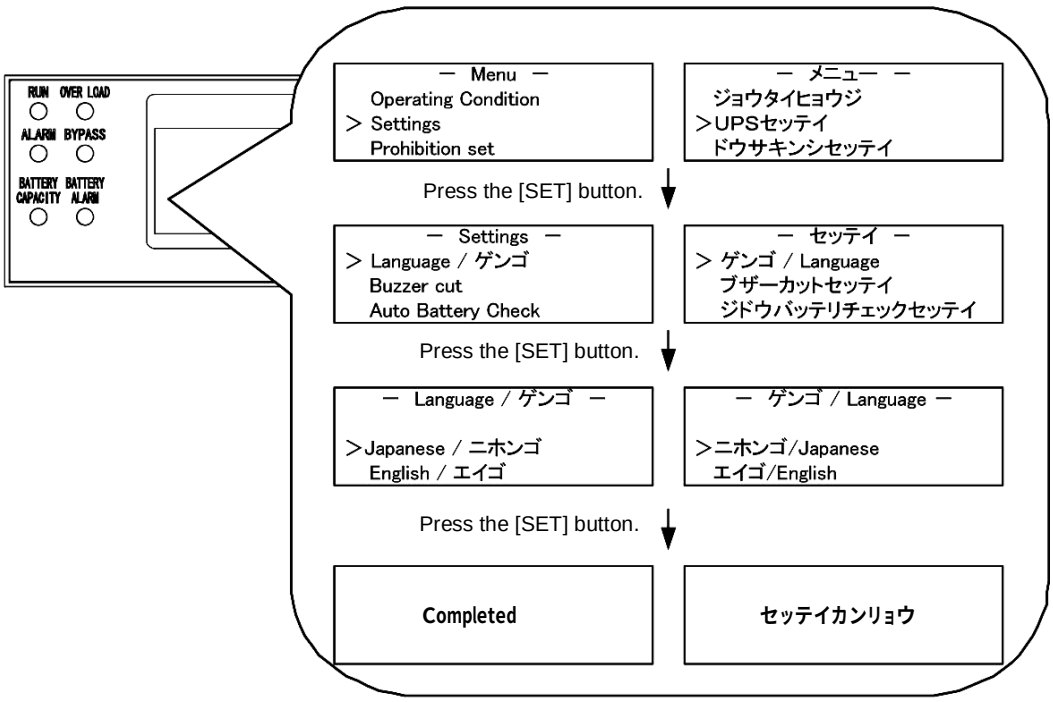
1) [Language Setting Indication] screen

(1) Display the [Menu Indication] screen by pressing the [MENU] button. Shift cursor [>] to [Settings] using a direction button (▼ button or ▲ button), and then press the [SET] button.

(2) Transition to the [UPS setting Indication] screen occurs.

(3) Shift cursor [>] to [Language] using a direction button (▼ button or ▲ button) again, and press the [SET] button.

(4) Transition to the [Language Setting Indication] screen occurs. Either [English] or [Japanese] may be selected.



(5) Select a target item using a direction button (▼ button or ▲ button). For selecting display in Japanese, shift cursor [>] to [Japanese (**ニホンゴ**)], and then press the [SET] button.

(6) The setting becomes valid upon indication on the screen of completion of setting.

(7) Transition to the [UPS Operating Condition] screen occurs on completion of setting.

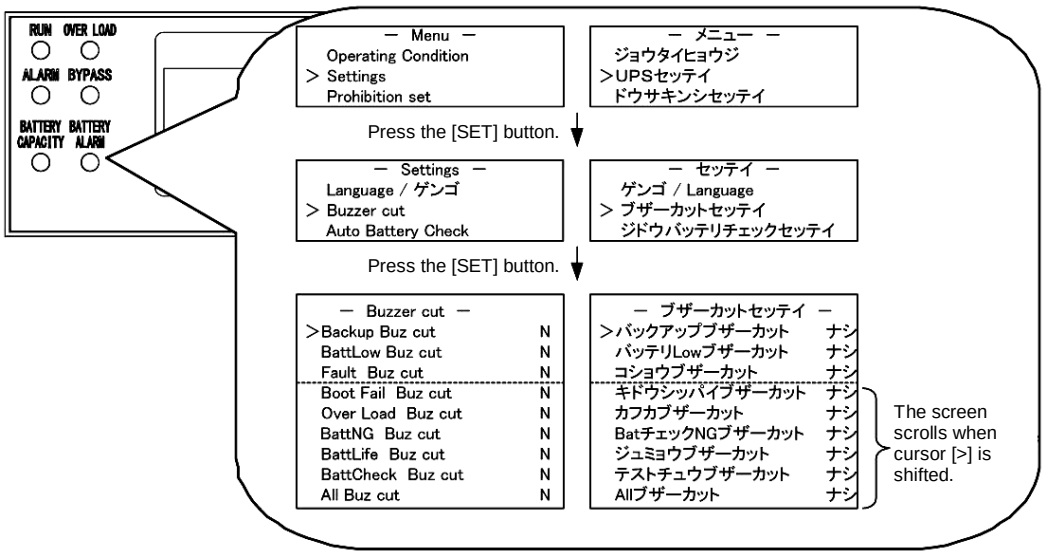
*1 “Display in English” is set as default.

2) [Buzzer Cut Setting] screen

(1) Display the [Menu Indication] screen by pressing the [MENU] button. Shift cursor [>] to [Settings] using a direction button (▼ button or ▲ button), and then press the [SET] button.
(2) Transition to the UPS setting indication screen occurs.
(3) Shift cursor [>] to [Buzzer cut] using a direction button (▼ button or ▲ button) again, and press the [SET] button.
(4) Transition to the [Buzzer Cut Setting] screen occurs.

Buzzer cut, that is, banning of buzzer beeping, is permitted for each action mode of the Product.
The modes for which buzzer cut may be set are as follows.

- [Backup Buz cut]
  Setup to ban buzzer beeping during backup running.
- [BattLow Buz cut]
  Setup to ban buzzer beeping on occurrence of battery voltage drop during backup running.
- [Fault Buz cut]
  Setup to ban buzzer beeping on occurrence of failure.
- [Boot Fail Buz cut]
  Setup to ban buzzer beeping on occurrence of input error during Product start-up.
- [Over Load Buz cut]
  Setup to ban buzzer beeping on occurrence of overload.
- [BattNG Buz cut]
  Setup to ban buzzer beeping in case battery check result is NG.
- [BattLife Buz cut]
  Setup to ban buzzer beeping on maturity of battery lifetime.
- [BattCheck Buz cut]
  Setup to ban buzzer beeping at start of battery check.
- [All Buz cut]
  Setup to ban buzzer beeping in all the modes.



(5) Select a target item using a direction button (▼ button or▲ button). To apply buzzer cut, change the indication to [Y (Yes)] by pressing the ▶ button. To cancel buzzer cut, change the indication to [N (No)] by pressing the ◀ button. Select [Y (Yes)] or [N (No)] for each one of all the items, and then press the [SET] button.
Buzzer cut setting becomes valid as a result of this operation.

*1 The letters of the selected item are blinking.
*2 The preset setting for each item is displayed at the time of transition to the [Buzzer Cut Setting] screen. Do not change the setting of [Y (Yes)] or [N (No)] for an item, if it is not wanted to change the status of the subject item.

(6) Transition to the [UPS Operating Condition] screen occurs automatically after completion of the setting.

*3 The default is entirely [N (No)].

3) [Auto Battery Check Setting] screen

The Product mounts the battery check function. Two different methods are available for battery check; automatic check and manual check. The method for mode change in automatic check is described in this section.
The modes that can be set are as follows.

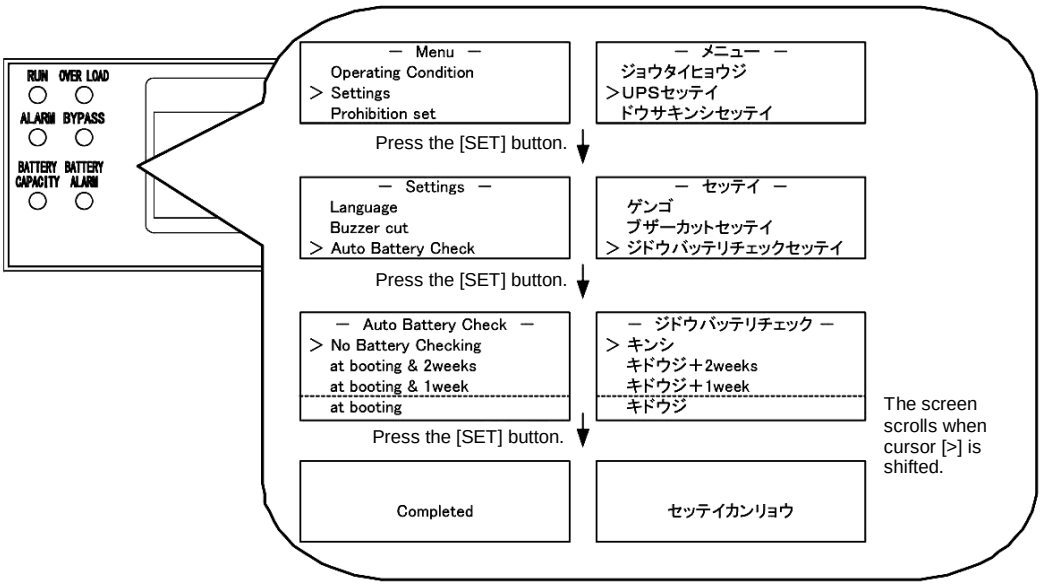
- [No Battery Checking]
  Automatic battery check is not executed.
- [at booting & 2 weeks]
  Battery check is executed automatically at the time of Product start-up (from the stop status) by ON/OFF switch or the like and also once every two (2) weeks thereafter in case the Product is run continuously.
- [at booting & 1 week]
  Battery check is executed automatically at the time of Product start-up (from the stop status) by ON/OFF switch or the like and also once every week thereafter in case the Product is run continuously.
- [at booting]
  Battery check is executed only at the time of Product start-up (from the stop status) by ON/OFF switch or the like.

(1) In the [Menu Indication] screen, shift cursor [>] to [Settings] using direction buttons, and then press the [SET] button.
(2) Transition to the UPS setting indication screen occurs.
(3) Shift cursor [>] to [Auto Battery Check] using direction buttons again, and press the [SET] button.
(4) Transition to the [Auto Battery Check Setting] screen occurs.
(5) Shift cursor [>] to the item to be set, using the ▲ button or ▼ button, and then press the [SET] button.

The automatic battery check setting is changed as a result of this operation.

*1 At the time of transition to the automatic battery check setting screen, the indicated contents are currently set contents.
If it is wanted not to change the status, press the [CANCEL] switch, without pressing the ▲ button or ▼ button. Transition to the setting screen will occur.
Change to and check of contents of automatic battery check setting can also be executed on the web.
Details of the method for operation on the web are described in the Web/SNMP card user's guide (separate volume).

(6) Transition to the [UPS Operating Condition] screen occurs automatically after completion of the setting.


RUN
OVER LOAD
ALARM
BYPASS
BATTERY CAPACITY
BATTERY ALARM
－ Menu －
Operating Condition
＞ Settings
Prohibition set
－ メニュー －
ジョウタイヒョウジ
＞UPSセッテイ
ドウサキンシセッテイ
Press the [SET] button.
－ Settings －
Language
Buzzer cut
＞ Auto Battery Check
－ セッテイ －
ゲンゴ
ブザーカットセッテイ
＞ ジドウバッテリチェックセッテイ
Press the [SET] button.
－ Auto Battery Check －
＞ No Battery Checking
at booting & 2weeks
at booting & 1week
at booting
－ ジドウバッテリチェック －
＞ キンシ
キドウジ＋2weeks
キドウジ＋1week
キドウジ
Press the [SET] button.
The screen scrolls when cursor [>] is shifted.
Completed
セッテイカンリョウ

4) [Prohibition set] screen

(1) Display the [Menu Indication] screen by pressing the [MENU] button. Shift cursor [>] to [Prohibition set] using a direction button (▼ button or ▲ button), and then press the [SET] button.
(2) Transition to the [Prohibition set] screen occurs.

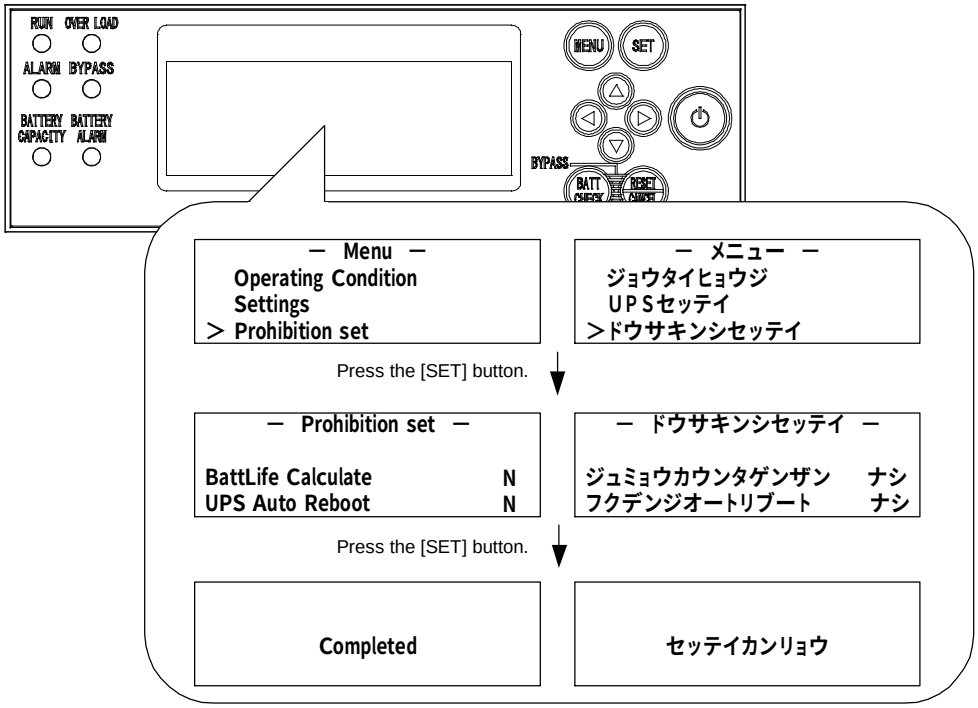
- [BattLife Calculate]
  Use this setting for determining whether to validate or invalidate battery lifetime decrement processing for batteries in the Product. The default setting is [N (No)] (warning processing is executed upon maturity of the battery lifetime). Change the setting to [Y (Yes], if the user executes accurate management such as battery replacement in sufficiently marginal cycles against battery lifetime.
  * If [Y (Yes)] is set, the UPS is not permitted to detect the battery lifetime. Furthermore, if this setting is changed to [Y (Yes)] after detection of the lifetime, the lifetime indication is not cleared. Replace batteries early in such a case.
- [UPS Auto Reboot]
  Use this setting for determining whether to automatically execute the processing to restart Product output upon recovery of input power supply or not, in case input power failure has continued for a long time and backup running was continued until Product halt occurred. The default setting is [N (No)]. Change the setting to [Y (Yes)], if any problem may arise to the connected equipment in use upon automatic recovery of power supply.

(3) Select a target item using a direction button (▼ button or ▲ button). To apply prohibition, change the indication to [Y (Yes)] by pressing the ▶ button. To allow the action, change the indication to [N (No)] by pressing the ◀ button. Select [Y (Yes)] or [N (No)] for each one of all the items, and then press the [SET] button.
Prohibition setting becomes valid as a result of this operation.

*1 The letters of the selected item are blinking.
*2 The preset setting for each item is displayed at the time of transition to the [Prohibition set] screen. Do not change the setting of [Y (Yes)] or [N (No)] for an item, if it is not wanted to change the status of the subject item.

(4) Transition to the [UPS Operating Condition] screen occurs automatically after completion of the setting.

*3 The default is entirely [N (No)].


RUN
OVER LOAD
ALARM
BYPASS
BATTERY CAPACITY
BATTERY ALARM
MENU
SET
BYPASS
BATT CHECK
RESET CANCEL
－ Menu －
Operating Condition
Settings
＞ Prohibition set
－ メニュー －
ジョウタイヒョウジ
ＵＰＳセッテイ
＞ドウサキンシセッテイ
Press the [SET] button.
－ Prohibition set －
BattLife Calculate N
UPS Auto Reboot N
－ ドウサキンシセッテイ －
ジュミョウカウンタゲンザン ナシ
フクデンジオートリブート ナシ
Press the [SET] button.
Completed
セッテイカンリョウ

7 Troubleshooting

7.1 When warning beep was issued

1. Check the LED status on the front face of the Product and identify the warning beep type.
2. See "● List of motion modes" and take actions in accordance with instructions given in said section.

If the Product is not connected to input power supply, connect the Product to input power supply. See "3.2 Connection of cables" for details.

☞ How to stop warning beep

Warning beep will stop when the [RESET/CANCEL] switch on the front face of the Product is pressed for about one second.

If warning beep fails to stop even if the [RESET/CANCEL] switch was pressed, stop the warning beep by observing the procedures described below. See "4.2 Power OFF" for details.

(1) Turn OFF the power for the connected equipment.

(2) Press the [ON/OFF] switch on the front face of the Product for about one second.
The buzzer begins to beep when the switch is accepted.

(3) The output stops.
The [RUN] LED (green) on the front face of the Product begins to blink slowly (in about 1.6-second period).

(4) Turn OFF the input circuit breaker on the back face of the Product.

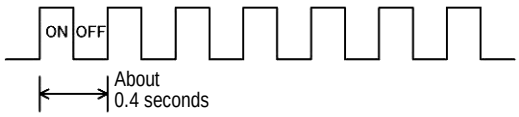
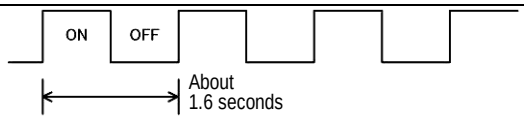
Note: The warning beep will not stop, in the state of output load, even if the [RESET/CANCEL] switch is pressed. Reduce the capacity of the connected equipment to a level that is no higher than the rated value of the Product.

7.2 List of motion modes

If the Product is out of order or the connected equipment has stopped, check the LED status on the front face of the Product and identify the warning beep type. Then take actions in accordance with description in the "Remarks" column with reference made to "● List of motion modes".

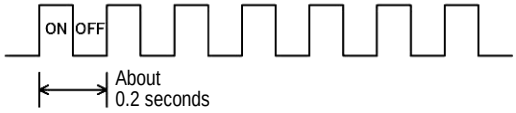
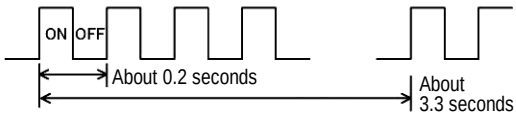
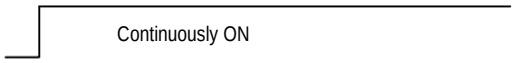
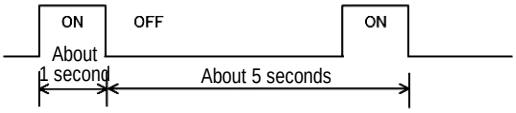
● Types of LED blinking

(Symbols correspond to symbols indicated in "● List of motion modes".)

Symbol	ON/OFF pattern	
(a)	Quick blinking (about 0.4-second period)	
(b)	Slow blinking (about 1.6-second period)	

● Types of warning beeps

(Symbols correspond to symbols indicated in "● List of motion modes".)

Symbol	Warning beep	
(i)	Beep beep beep beep (continuous tone)	
(ii)	Beep beep (suspension for about 2 seconds) Beep beep (7 times each, once every about 3.3 seconds)	
(iii)	Beep (continuous tone)	
(iv)	Beep (suspension for about 4 seconds)	

● List of motion modes

- LED symbol: □ ... Lit, ■ ... Out, ☼ ... Blinking
- The [BATTERY CAPACITY] LED (green) indicates the extent of battery charge by the lighting type as follows.

■	(Out)… 0 to 50%	Charge is insufficient. There is a possibility where backup is not feasible on occurrence of interruption of power supply.
☼	(Blinking)… 50 to 80%	The batteries were charged to a certain extent. But sufficient backup time cannot be expected.
□	(Lit)… 80 to 100%	The batteries were almost fully charged. They provide sufficient backup time.

No.	LED						Warning beep	Running status	Remarks
	RUN (green)	ALARM (orange)	OVER LOAD (orange)	BYPASS (orange)	BATTERY CAPACITY (green)	BATTERY ALARM (orange)			
1	Lit □	■	■	■	Amount of charge indication	■	—	Normal running	The Product is in normal running.
2	■	■	■	■	■	■	—	Suspension of running (without input power supply)	Output from the Product is suspended. Suspension of running (No. 3) arises upon recovery of input power supply. If suspension of running (No. 3) failed to arise upon recovery of input power supply, check the input circuit breaker for trip. If tripped, reset it. If suspension of running (No. 3) still failed to arise, then please contact your dealer or the maintenance in-charge company. In case of occurrence of suspension due to termination of battery discharge in the state where interruption of input power supply, return to normal running (No. 1) occurs automatically upon power recovery.
3	(b) Slow blinking ☼	■	■	■	■	■	—	Suspension of running (with input power supply)	Output from the Product is suspended. Return to normal running (No. 1) occurs when the [ON/OFF] switch is pressed for about one second.

No.	LED						Warning beep	Running status	Remarks
	RUN (green)	ALARM (orange)	OVER LOAD (orange)	BYPASS (orange)	BATTERY CAPACITY (green)	BATTERY ALARM (orange)			
4	■	Lit □	■	Lit □	■	■	(i)	Failure bypass running	The Product has reached failure status and switching to bypass running occurred. Evacuate important connected equipment from the Product. No battery running is permitted in this status even on occurrence of interruption of input power supply. Check the ambient temperature and ventilation. After elapse of about 10 minutes, press the [RESET] switch on the front face of the Product for about 3 seconds. Return to normal running (No. 1) occurs if there is no problem. If the [ALARM] LED does not go out or if it lights up again after the operation stated above, please contact your dealer or the maintenance in-charge company.
5	■	■	■	(b) Slow blinking ☼	■	■	—	Manual bypass running	Manual switching to bypass running was made. No battery running is permitted in this status even on occurrence of interruption of input power supply.

No.	LED						Warning beep	Running status	Remarks
	RUN (green)	ALARM (orange)	OVER LOAD (orange)	BYPASS (orange)	BATTERY CAPACITY (green)	BATTERY ALARM (orange)			
6	(b) Slow blinking ☼	(a) Quick blinking ☼	■	■	■	■	(i)	Input error at start-up	The Product cannot be started due to error in the input power supply. Once stop the Product, assure that the input power supply satisfies the following conditions, and then start the Product again. Input voltage: 85 V to 115 V AC or 170 V to 230 V AC Input frequency: 47.5 Hz to 52.5 Hz or 57 Hz to 63 Hz
7	Lit □	■	Lit □	Lit □	■	■	(i)	Bypass feed due to output overload occurred during normal running	Switching to bypass running occurred automatically because the load capacity exceeded the rated value and overload status has occurred. Reduce the capacity of connected equipment to the rated value of the Product or less. Return to normal running (No. 1) occurs if the load capacity drops to the rated value of the Product or less. In the state where overload status continues, buzzer will not stop even when the [RESET] switch is pressed. There are cases where overload occurs temporarily due to rush current at the time of load ON.

No.	LED						Warning beep	Running status	Remarks
	RUN (green)	ALARM (orange)	OVER LOAD (orange)	BYPASS (orange)	BATTERY CAPACITY (green)	BATTERY ALARM (orange)			
8	■	■	Lit □	(b) Slow blinking ☼	■	■	(i)	Output overload during bypass running	The capacity of connected equipment exceeded the rated value during bypass running. Reduce the capacity of connected equipment to the rated value of the Product or less. Return to normal running (No. 1) will not occur, even if bypass switching (by simultaneously pressing [RESET] switch and [BATT CHECK] switch for about 3 seconds) is attempted in this state.
9	Lit □	■	Lit □	■	Amount of charge indication	■	(i)	Output overload during battery running	The capacity of connected equipment exceeded the rated value in the battery running status. Reduce the capacity of connected equipment to the rated value of the Product or less. Suspension of running occurs, if this status continues for 100 seconds. Evacuate important connected equipment from the Product.
10	■	Lit □	Lit □	■	■	■	(i)	Suspension of running caused by output overload	Running of the Product was suspended due or major excess of the capacity of connected equipment beyond the rated value of the Product. Reduce the capacity of connected equipment to the rated value of the Product or less, and then attempt re-start.
11	Lit □	■	■	■	Amount of charge indication	■	(ii)	Battery running	Power feed to connected equipment from batteries occurred due to occurrence of error in input power supply. No measures are required in particular. Return to normal running (No. 1) occurs automatically upon recovery of the input power supply.

No.	LED						Warning beep	Running status	Remarks
	RUN (green)	ALARM (orange)	OVER LOAD (orange)	BYPASS (orange)	BATTERY CAPACITY (green)	BATTERY ALARM (orange)			
12	Lit ☐	■	■	■	Amount of charge indication	■	(i)	Drop in battery voltage during battery running	The battery voltage dropped due to continuation of battery running. Power feed from batteries will be suspended about 2 minutes later in case of rated load. Evacuate important connected equipment from the Product. Return to normal running (No. 1) occurs automatically upon recovery of the input power supply.
13	Lit ☐	■	■	■	■	(b) Slow blinking ☼	(iv) (During manual check)	Battery check in progress	Battery check is in progress. A warning beep is issued at start and termination of manual battery check. After execution of battery check for about 5 seconds, return to normal running (No. 1) occurs, if there is no problem.
14	Lit ☐	■	■	■	■	(a) Quick blinking ☼	(i)	Error found during battery check	There is a possibility where battery charge is insufficient. For charging batteries, continue running in the then state for over 12 hours, and then execute battery check in the manual mode. Evacuate important connected equipment from the Product, because sufficient backup time cannot be secured. If such a state occurs again, it is necessary to replace batteries. Please contact your dealer or the maintenance in-charge company.

No.	LED						Warning beep	Running status	Remarks
	RUN (green)	ALARM (orange)	OVER LOAD (orange)	BYPASS (orange)	BATTERY CAPACITY (green)	BATTERY ALARM (orange)			
15	Lit □	■	■	■	■	Lit (orange) □	(i)	Maturity of battery lifetime	The time for replacement of batteries has come. It is necessary to replace batteries. Please contact your dealer or the maintenance in-charge company. Although alarming (indication and warning beep) stops, if the [RESET] switch is pressed for 3 seconds, an alarm (warning beep) is issued again 24 hours later or at the time of re-start. If the warning beep only is stopped by pressing the [RESET] switch for one second or longer, a battery lifetime alarm (warning beep) is issued again at the occasion of automatic battery check implemented once every 2 weeks.
16	(b) Slow blinking ☼	■	■	■	(b) Slow blinking ☼	■	—	Waiting for re-start	Output from the Product is suspended by the setup using RS-232C connector on the back face of the Product. The Product starts up automatically and returns to normal running (No. 1) after elapse of the length of time set at the time of setting. Furthermore, it is also possible to start the Product by the [ON/OFF] switch.

8 Maintenance

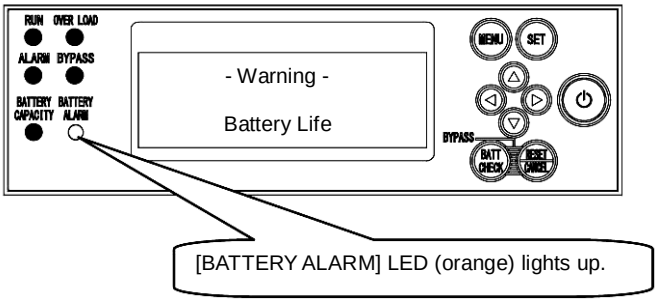
8.1 Battery replacement

● Time of battery replacement

⚠ CAUTION	
Damage	Replace the batteries periodically. Electrolyte leakage, smoke emission and ignition may arise, if use of batteries is continued in the state where the battery lifetime has matured.

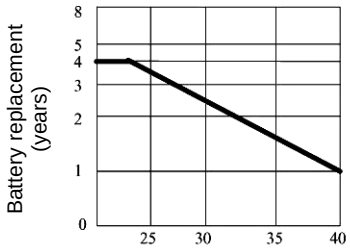
The battery lifetime has matured, if any of the following cases arises.

- The [BATTERY ALARM] LED (orange) on the front face of the Product lights up and warning beep was issued.



- Battery holding time was reduced to 3 minutes or less (in case of rated load).

  The battery lifetime is largely affected by the ambient temperature and conditions of connected equipment. In case the Product is used in a standard environment and under standard conditions (ambient temperature 25°C, rated load), a period of about three (3) years is the time of replacement with new batteries.



Relation between ambient temperature and time of battery replacement

● Method for battery replacement

⚠ CAUTION	
Electric shock	It is requested that replacement of batteries is executed by professional engineers. Electric shock may result otherwise.
Damage	For replacement, use batteries we nominate and use new batteries. Electrolyte leakage, smoke emission, ignition and failure/malfunction to the Product may arise, if batteries other than what we nominate or used or if old and new batteries of different types are used in mixture.

IMPORTANT
Disposal treatment of used batteries, which have become unnecessary, is legally controlled. Request a professional industrial-waste disposal business or contact your dealer or the maintenance in-charge company.

The batteries of the Product can be replaced in the live state (parts are replaced in the state where the power is kept ON for the Product and connected equipment) (see note). Please contact your dealer or the maintenance in-charge company for details.

Note: The Product is in bypass running during battery replacement in the live state. During bypass running, switching to battery running will not occur even if any input power supply error such as interruption of power supply arises.

Use batteries shown below. Please contact your dealer or the maintenance in-charge company for the method for purchase of battery units.

UPS model	Arrange-ment Model	Type of battery unit	Number of units (Note) (per UPS)	Battery unit	
				Mass (a unit)	Battery capacity
M-UPS050 AD1S/2S (5 kVA)	Battery for M-UPS 050ADS	BRABU-J4	6 units	About 9 kg	12 V, 9Ah × 3
M-UPS075 AD1S/2S (7.5 kVA)	Battery for M-UPS 075ADS	BRABU-J5	4 units	About 10 kg	12 V, 5Ah × 5
		BRABU-J6	4 units	About 8 kg	12 V, 5Ah × 4
M-UPS100 AD1S/2S (10 kVA)	Battery for M-UPS 100ADS	BRABU-J4	12 units	About 9 kg	12 V, 9Ah × 3

Note) It is necessary to replace the battery by the unit.

● Battery treatment and storage

- Pay full attention to treatment and storage of batteries. When batteries were taken out of the Product for disposal, take short-circuit preventing measures such as adhesion of adhesive tapes to terminals. Do not mix these batteries with ordinary batteries such as dry cell batteries.
- This Product uses small-size control valve type lead storage batteries. Small-size control valve type lead storage batteries use expensive rare resources of limited reserve, and such resources can be recycled for reuse. You are kindly requested to give your cooperation for recycling of used batteries. Please contact your dealer or the company in charge of maintenance, if you have any question regarding battery recycling.

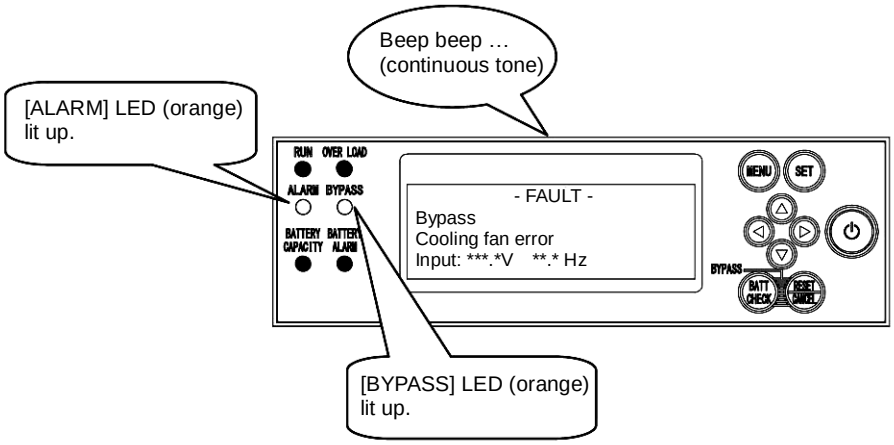
This mark is a small-size control valve type lead storage battery recycling mark.

8.2 Cooling fan replacement

● Time of cooling fan replacement

IMPORTANT
Replace the cooling fans periodically. If use of cooling fans is continued after their lifetime has matured, the Product internal temperature may rise to a level that is outside of the rated specification range.

The cooling fan lifetime has matured, if any of the following phenomenon arises.



- The time for second replacement of batteries has come.

  The cooling fans involve lifetime due to wear to bearings, and it is essential that cooling fans are periodically replaced with new ones. However, there are cases where the lifetime is shortened in correspondence to the working environment. It is recommended that cooling fans are replaced early.

● Method for cooling fan replacement

⚠ CAUTION	
Electric shock Personal injury	Do not stick a bar or finger into a cooling fan or ventilation hole. Electric shock and personal injury may result.
Electric shock	It is requested that replacement of cooling fans is executed by professional engineers. Electric shock may result otherwise.

The cooling fans of the Product can be replaced in the live state (parts are replaced in the state where the power is kept ON for the Product and connected equipment) (see note). Please contact your dealer or the maintenance in-charge company for details.

Note: It is requested that replacement of cooling fans in the live state is executed in a short length of time. The Product is in bypass running during cooling fan replacement in the live state. During bypass running, switching to battery running will not occur even if any input power supply error such as interruption of power supply arises.

Use cooling fans shown below. Please contact your dealer or the maintenance in-charge company for the method for purchase of cooling fans.

Cooling fan type for replacement:

Fan for M-UPS050ADS (RRAF-R1×1 / RRAF-GX12×2)

Fan for M-UPS075ADS (RRAF-R1×2 / RRAF-GX12×3)

Fan for M-UPS100ADS (RRAF-R1×2 / RRAF-GX12×3)

8.3 Storage of the Product

● Operations before storage

IMPORTANT
Do not store the Product in any of the places indicated below. • Outdoors • Place exposed to rain and wind • Place of excessively high humidity and dust • Place with corrosive gases and salt • Place directly exposed to sunlight • Place located close to sparks or heating elements • Place of extremely high or low temperature or place of excessive temperature changes • Place to which vibration and impact is applied

1. Charge batteries by running the Product for 12 hours or longer. Check batteries by the battery check function (manual) after the batteries were charged. See "5.3 Battery inspection (battery check)" for details.
   The storable period of batteries used in the Product is about two (2) months from the fully charged state.
2. Turn OFF the power for the connected equipment, turn OFF the power for the Product, and turn OFF the input circuit breaker on the back face of the Product. See "4.2 Power OFF" for details.
3. Place the Product in a case (such as the case used for shipping of the Product).

● Case where storage period exceeds 2 months

IMPORTANT
Charge batteries once every two (2) months, if the Product is not used for a long time. Run the Product for 12 hours or longer to charge batteries once every two (2) months, and check batteries on termination of their charge. If the Product is shelved for a long time without being run, batteries may reach over-discharged state due to natural discharge, and may become unusable.

Charge batteries by running the Product for 12 hours or longer once every two (2) months. Check batteries by the battery check function (manual) after the batteries were charged.

See "5.3 Battery inspection (battery check)" for details.

The batteries discharge naturally in the Product even while the Product is not in use. If the batteries are shelved for over two (2) months, batteries may reach over-discharged state due to natural discharge, and may become unusable.

9 Appendix

9.1 Rated specification

Type		M-UPS050AD1S	M-UPS050AD2S
AC output	Rated capacity	5000 VA / 4000 W	
	Voltage	100 V ±2%	200 V ±2%
	Frequency	50 Hz or 60 Hz (automatic switching in the Product)	
	Frequency accuracy	During normal running: Varies by input frequency	
		During backup running: ±0.1% or better	
	Number of phases	Single phase, 2-wire system (with grounding terminal)	
	Load condition	Linear load or rectifying load of peak-to-rms ratio up to 3	
	Voltage waveform distortion factor	Under load resistance: 4% or less Under rectifying load: 6% or less	
	Overcurrent protection	RMS value: 100% or greater Peak value: 300% or greater of rated RMS value (Shall withstand the load of crest factor = 3.)	
	Grounding method	Non-grounding or neutral point grounding	
	Commercial electric power switching method	Thyristor switching (switching time: uninterruptible) Switching is not permitted during interruption of power supply.	
AC input	Voltage	100 V ±15%	200 V ±15%
	Frequency	50 Hz or 60 Hz ±5%	
	Number of phases	Single phase, 2-wire system (with grounding terminal)	
	Capacity	5000 VA or less	
	Grounding method	Single-line grounding	
	Power factor	0.97 or greater (during rated running)	
	Input higher harmonics current	Conforms to IEC61000-3-12.	
Storage battery	Type	Small-size control valve type lead storage battery (long-life battery)	
	Backup time *1 [initial value]	About 10 minutes [4000 W]	
	Nominal voltage	216 V	
Others	Ambient temperature	0 to 40°C	
	Relative humidity	20 to 95% (no condensation)	
	Noise	50 dB (A) or less (at 1 m from on the front face of the Product)	
	Cooling method	Forced air cooling	
External dimensions (W × D × H)		350 × 700 × 675mm	
Mass		180 kg (without batteries: 125 kg)	
Applicable standard		Conforms to VCCI CLASS A, UL1778-4th, IEC62040	
External connection	Input	Input/output terminal block (L/R, N/S: M6 screw)	
	Grounding terminal	Input/output terminal block (PE (G): M6 screw)	
	Output	Input/output terminal block (l1/U1, l3/V1: M6 screw)	Input/output terminal block (l1/U2, l2/V2: M6 screw)

Type		M-UPS075AD1S	M-UPS075AD2S
AC output	Rated capacity	7500 VA / 6000 W	
	Voltage	100 V ±2%	200 V ±2%
	Frequency	50 Hz or 60 Hz (automatic switching in the Product)	
	Frequency accuracy	During normal running: Varies by input frequency	
		During backup running: ±0.1% or better	
	Number of phases	Single phase, 2-wire system (with grounding terminal)	
	Load condition	Linear load or rectifying load of peak-to-rms ratio up to 3	
	Voltage waveform distortion factor	Under load resistance: 4% or less Under rectifying load: 6% or less	
	Overcurrent protection	RMS value: 100% or greater Peak value: 300% or greater of rated RMS value (Shall withstand the load of crest factor = 3.)	
	Grounding method	Non-grounding or neutral point grounding	
	Commercial electric power switching method	Thyristor switching (switching time: uninterruptible) Switching is not permitted during interruption of power supply.	
AC input	Voltage	100 V ±15%	200 V ±15%
	Frequency	50 Hz or 60 Hz ±5%	
	Number of phases	Single phase, 2-wire system (with grounding terminal)	
	Capacity	7500 VA or less	
	Grounding method	Single-line grounding	
	Power factor	0.97 or greater (during rated running)	
	Input higher harmonics current	Conforms to IEC61000-3-12.	
Storage battery	Type	Small-size control valve type lead storage battery (long-life battery)	
	Backup time *1 [initial value]	About 10 minutes [6000 W]	
	Nominal voltage	216 V	
Others	Ambient temperature	0 to 40°C	
	Relative humidity	20 to 95% (no condensation)	
	Noise	55 dB (A) or less (at 1 m from on the front face of the Product)	
	Cooling method	Forced air cooling	
External dimensions (W × D × H)		350 × 700 × 900mm	
Mass		235 kg (without batteries: 160 kg)	
Applicable standard		Conforms to VCCI CLASS A, UL1778-4th, IEC62040	
External connection	Input	Input/output terminal block (L/R, N/S: M8 screw)	
	Grounding terminal	Input/output terminal block (PE (G): M8 screw)	
	Output	Input/output terminal block (l1/U1, l3/V1: M8 screw)	Input/output terminal block (l1/U2, l2/V2: M8 screw)

Type		M-UPS100AD1S	M-UPS100AD2S
AC output	Rated capacity	10000 VA / 8000 W	
	Voltage	100 V ±2%	200 V ±2%
	Frequency	50 Hz or 60 Hz (automatic switching in the Product)	
	Frequency accuracy	During normal running: Varies by input frequency	
		During backup running: ±0.1% or better	
	Number of phases	Single phase, 2-wire system (with grounding terminal)	
	Load condition	Linear load or rectifying load of peak-to-rms ratio up to 3	
	Voltage waveform distortion factor	Under load resistance: 4% or less Under rectifying load: 6% or less	
	Overcurrent protection	RMS value: 100% or greater Peak value: 300% or greater of rated RMS value (Shall withstand the load of crest factor = 3.)	
	Grounding method	Non-grounding or neutral point grounding	
	Commercial electric power switching method	Thyristor switching (switching time: uninterruptible) Switching is not permitted during interruption of power supply.	
AC input	Voltage	100 V ±15%	200 V ±15%
	Frequency	50 Hz or 60 Hz ±5%	
	Number of phases	Single phase, 2-wire system (with grounding terminal)	
	Capacity	10000 VA or less	
	Grounding method	Single-line grounding	
	Power factor	0.97 or greater (during rated running)	
	Input higher harmonics current	Conforms to IEC61000-3-12.	
Storage battery	Type	Small-size control valve type lead storage battery (long-life battery)	
	Backup time *1 [initial value]	About 10 minutes [8000 W]	
	Nominal voltage	216 V	
Others	Ambient temperature	0 to 40°C	
	Relative humidity	20 to 95% (no condensation)	
	Noise	55 dB (A) or less (at 1 m from on the front face of the Product)	
	Cooling method	Forced air cooling	
External dimensions (W × D × H)		350 × 700 × 1050mm	
Mass		300 kg (without batteries: 190 kg)	
Applicable standard		Conforms to VCCI CLASS A, UL1778-4th, IEC62040	
External connection	Input	Input/output terminal block (L/R, N/S: M8 screw)	
	Grounding terminal	Input/output terminal block (PE (G): M8 screw)	
	Output	Input/output terminal block (l1/U1, l3/V1: M8 screw)	Input/output terminal block (l1/U2, l2/V2: M8 screw)

(*1) The backup time is an ability value, and is not a guaranteed value.

9.2 Additional Description for UL Type

IMPORTANT SAFETY INSTRUCTIONS
SAVE THESE INSTRUCTIONS

This manual contains important instructions for UPS GX100 series Models that should be followed during installation and maintenance of the UPS and batteries.

- Internal battery voltage is 216 V DC.

  Models M-UPS050AD*S-# with suffix

  Models M-UPS075AD*S-# with suffix

  Models M-UPS100AD*S-# with suffix

  *: 1 or 2, #: U or W
- This unit intended for installation in a controlled environment and maximum ambient temperature is 25°C
  (temperature controlled, indoor area free of conductive contaminants).
- This UPS must be fasten down the floor by branckets attached this UPS.
- This UPS is intended for use in Japan-domestic.
- For All Models, Need to provide External Disconnect ／Overcurrent Protective Device for the AC input and the AC output. -for example ,an UL Listed branch circuit breaker with suitable ratings could provide both functions (disconnect and overcurrent protection).
  - A readily accessible disconnect device shall be incorporated in the building installation wiring.
  - Circuit Breaker (UL Listed Inverse-time Circuit Breaker) is not provided on the UPS at input side as shipped without M-UPSXXXAD*S-#. All Moedls must connect Circuit Breakers for use with the UPS. The rated tripping current of the Circuit Breaker (2 pole type) are shown in Table1 , Table2 and Table3.
  - Field wiring connection must be made by a UL and CSA Listed closed-loop terminal connector sized for the wire gauge involved and fully insulated up to terminals. Connector must be fixed using the crimp tool specified by the connector manufacturer. Cloosed-loop terminal is shown in Table1 , Table2 and Table3 (made by Japan Solderless Terminal). If can not get these terminals , use the similer terminal.
  - Use 75°C Copper conductors.
- Wire size and tightening torque are shown in Table1 , Table2 and Table3.
- Circuit diagrams are shown by figure 1.
- UPS must be set up with flexible conduit.

Table 1. Input rating, wire size, torque, external input circuit breaker size

MODEL	INPUT & GROUND				TIGHTENING TORQUE (N·m)	2 POLE CIRCUIT BREAKER	
	Vin (V)	Iin (A)	WIRE SIZE AWG	Type of Closed-loop Terminal		V	A
M-UPS050AD1S-U	100	50	4	R22-6	4.1	240 AC	70
M-UPS050AD2S-U	200	25	8	R8-6			35
M-UPS075AD1S-U	100	75	2	R38-8	9.8	240 AC	100
M-UPS075AD2S-U	200	37.5	6	R14-8			50
M-UPS100AD1S-U	100	100	1/0	R60-8	9.8	240 AC	125
M-UPS100AD2S-U	200	50	4	R22-8			70

Table 2. M-UPSXXXAD1S/2S-W(provided UL489 breaker)
Input rating, wire size and torque

MODEL	INPUT & GROUND				TIGHTENING TORQUE (N·m)
	Vin (V)	Iin (A)	WIRE SIZE AWG	Type of Closed-loop Terminal	
M-UPS050AD1S-W M-UPS050AD2S-W	100 200	50	4	R22-6	4.1
M-UPS075AD1S-W M-UPS075AD2S-W	100 200	75	2	R38-6	9.8
M-UPS100AD1S-W M-UPS100AD2S-W	100 200	100	1/0	R60-8	9.8

Table 3. Output rating, wire size, torque, external output circuit breaker size

MODEL	INPUT & GROUND				TIGHTENING TORQUE (N·m)	2 POLE CIRCUIT BREAKER	
	Vout (V)	Iout (A)	WIRE SIZE AWG	Type of Closed-loop Terminal		V	A
M-UPS050AD1S-U	100	50	4	R22-6	4.1	240 AC	70
M-UPS050AD2S-U	200	25	8	R8-6			35
M-UPS075AD1S-U	100	75	2	R38-8	9.8	240 AC	100
M-UPS075AD2S-U	200	37.5	6	R14-8			50
M-UPS100AD1S-U	100	100	1/0	R60-8	9.8	240 AC	125
M-UPS100AD2S-U	200	50	4	R22-8			70

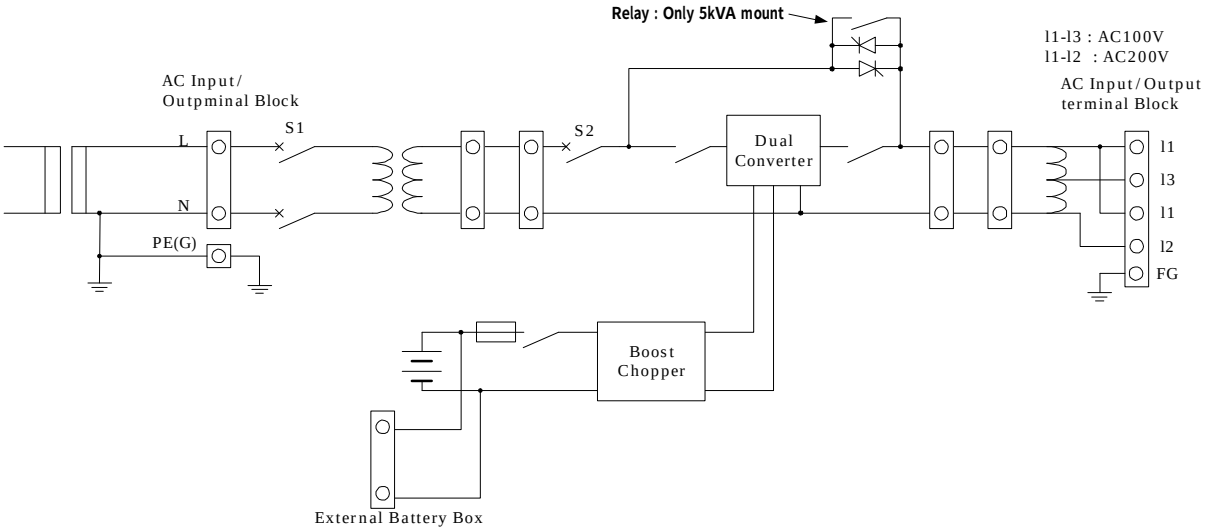


Figure 1. Circuit diagram of All Models

DANGER

- Risk of electric shock
- Do not touch uninsulated battery terminal.

WARNING

- Risk of electric shock
- Do not remove the cover for any reason. There are no user-serviceable parts inside the UPS. Refer servicing to qualified service personnel.

CAUTION

- Don't use this equipment in life support applications where failure of this equipment can reasonably be expected to cause the failure of the life support equipment or to significantly effect its safety or effectiveness.
- Risk of explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions.
- Replace batteries are only the one designated by our company.
- Risk of electric shock
- Battery and cooling fan servicing should be performed by only authorized servicing personnel who were qualified technically. Keep unauthorized personnel away from batteries and cooling fan.
- The UPS has an internal energy source (the battery). The output may be energized when the unit is not connected to an AC power line.
- Terminal marked "PE(G)" is intended for connection of the Protective Earthing (Grounding) conductor(s). This earth connection is essential before connecting supply conductors. Also ensure the reliability of this connection during any servicing, including connection of protective earthing (grounding) conductors to the output (load).
- Capacitor stores hazardous energy. Do not remove cover until 7 minutes after disconnecting all sources of supply.
- If this UPS installs, removes or does any services, for disconnecting all sources of supply, be off the external input circuit breaker.

⚠ CAUTION

- Do not dispose of batteries in a fire. The batteries may explode.
- Do not open or mutilate batteries. Released electrolyte is harmful to the skin and eyes. It may be toxic.
- A battery can present a risk of electrical shock and high short-circuit current. The following precautions should be observed when working on batteries:
  a) Remove watches, rings, or other metal objects.
  b) Use tools with insulated handles.
  c) Wear rubber gloves and boots.
  d) Do not lay tools or metal parts on top of batteries.
  e) Disconnect charging source prior to connecting or disconnection battery terminals.
  f) Determine if battery is inadvertently grounded.
  If inadvertently grounded, remove source from ground.
  Contact with any part of a grounded battery can result in electrical shock. The likelihood of such shock can be reduced if such grounds are removed during installation and maintenance (applicable to equipment and remote battery supplies not having a grounded supply circuit)