



UNINTERRUPTIBLE POWER SUPPLY SYSTEM

MODEL

7011B SERIES

OWNERS / TECHNICAL MANUAL

UNINTERRUPTED Peace of Mind®

Preface

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HOW TO USE THIS MANUAL

This manual is designed for ease of use, giving the user easy and quick reference to information. This manual uses notice icons to draw attention to important user information regarding the safe operation and installation of the UPS. The notice icons used in this manual are explained below, and should be taken into account and adhered to whenever they appear in the text of this manual.



WARNING: A warning notice icon conveys information provided to protect the user and service personnel against hazards and/or possible equipment damage.



CAUTION: A caution notice icon conveys information provided to protect the user and service personnel against possible equipment damage.



NOTE: A Note notice icon indicates when the user should make a reference of information regarding the UPS operation, load status and display status. Such information is essential if Mitsubishi field service group assistance and correspondence is required.

Safety Recommendations: If any problems are encountered while following this manual, Mitsubishi field service group assistance and correspondence is recommended.

SAFETY PRECAUTIONS

The safety precautions are categorized as **DANGER** and **CAUTION** in this instruction manual.

DANGER: A dangerous situation may occur if improperly handled, leading to severe or fatal injuries.

CAUTION: A dangerous situation may occur if improperly handled, leading to serious injuries.

Note that some items described as **CAUTION** may lead to severe results depending on the situation. Nonetheless, important information outlined in this section must be observed at all times.

DANGER

- Do not dispose of the batteries in a fire as they may explode.
- Do not open or break the batteries. Released electrolyte is toxic and harmful to the eyes and skin.
- A battery can present a risk of electrical shock and high short circuit current. Observe the following minimum Safety Precautions when working on the batteries.
 - 1) Verify that the UPS is off and that the input power plug or wires are disconnected.
 - 2) Remove watches, rings or other metal objects.
 - 3) Use tools with insulated handles to prevent inadvertent shorts.
 - 4) Wear rubber gloves and boots.
 - 5) Do not lay tools or metal parts on top of the batteries.
 - 6) Determine if the battery is inadvertently grounded. If so, remove source of ground. Contact with any part of a grounded battery can result in electrical shock. The likelihood of such shock will be reduced if grounds are removed during installation and maintenance.

CAUTION

PRECAUTIONS FOR INSTALLATION

- **Do not block the intake/exhaust ports. Install the UPS at least 8" (20cm) away from walls, etc.**
 - If the intake/exhaust ports are blocked, the internal temperature of the UPS will rise and could lead to fires from battery electrolyte leakage, fire ignition or part deterioration.
- **Follow the UPS instruction manual carefully when installing the unit.**
 - Improper installation could lead to injury such as the UPS falling over, etc.

PRECAUTIONS FOR WIRING

- **The power supply for this unit must be single phase rated in accordance with the equipment data plate. It must be suitably grounded.**
 - Failure to ground the unit could lead to electrical shocks.

PRECAUTIONS FOR USE

- **If a unit fault, abnormal odor or noise occurs, turn off the UPS input switch.**
 - Failure to do so could lead to fires.
- **Do not insert blunt objects or fingers, etc., in the fan.**
 - Failure to observe this could lead to injuries.
- **Do not insert blunt objects or fingers, etc., into the unit's input/output section.**
 - Failure to observe this could lead to electrical shocks.
- **Ventilate the UPS surroundings.**
 - Failure to do so could lead to container rupture or to explosions from the gas generated from the battery system.
- **Prohibit smoking and the use of fire around the unit.**
 - Failure to do so could lead to injuries, damage or fires from explosions.
- **Do not place containers that have water or any liquids on the UPS.**
 - If the container tips over and the water or liquids spills, this could lead to electrical shocks and to fires in the UPS.
- **Do not sit on, step on or lean on the UPS.**
 - Failure to observe this could lead to injuries if the UPS tips over.

CAUTION

PRECAUTIONS FOR MAINTENANCE AND INSPECTION

- **The inside of the UPS must be inspected or repaired only by qualified personnel.**
 - Failure to observe this could lead to electrical shocks, injuries, burns, smoke generation or fires.
- **Periodically replace the batteries (every 5 years).**
 - Batteries that have exceeded the replacement life could lead to fires from electrolyte leakage or fire ignition.
- **Contact the dealer or service company for unit maintenance and repairs, and for the replacement of defective parts.**
 - Opening the cover could lead to electrical shocks or burns.

PRECAUTIONS FOR BATTERY

- **If the battery ignites, do not use water to extinguish the fire. Instead, use a powder (ABC) fire extinguisher.**
 - Use of water could cause the fire to grow.
- **Toxic diluted sulfuric acid in the battery.**
 - If electrolyte leaks from the unit, avoid contact with the skin or clothes.
If electrolyte makes contact with the skin or clothes, wash it off thoroughly with clean water.
If electrolyte makes contact with the eyes, rinse immediately and thoroughly with clean water, and then see a doctor. The presence of sulfuric acid in the eyes could lead to blindness, and adherence to skin could lead to burns.

OTHER PRECAUTIONS

- **Never use or store the unit in the following types of environment:**
 - a) A location having a low or high temperature, or high humidity deviating from the ambient environment conditions described in the brochure or instruction manual.
 - b) A location submerged in water or where the unit could become wet from dripping water.
 - c) At an altitude higher than 3300 feet (1000 meters).
 - d) In direct sunlight.
 - e) Where organic solvents (gasoline, paint thinner, etc.) are stored.
 - f) A location that is dusty.
 - g) A location containing combustible gas, corrosive gas, salt or oil mist.
 - h) A location subject to vibration or impacts.
 - i) A location near devices that generate sparks or near heating elements.

1.0 INTRODUCTION

The Mitsubishi Uninterruptible Power Supply (UPS) is designed to provide many years of reliable power supply and protection from power failure, brown-outs, line noise, and voltage transients. To ensure optimum performance of the equipment, follow the manufacturer's instructions accordingly. This manual contains descriptions for the installation and operation procedures of the UPS. Please read this manual carefully and retain it for future reference.

**IMPORTANT SAFETY INSTRUCTIONS
RETAIN THESE INSTRUCTIONS**



This manual contains important instructions for the 7011B Series Uninterruptible Power Supply System that should be adhered to during installation, operation and maintenance of the UPS and batteries.

WARNING 1



**Lethal voltages exist within the equipment during operation.
Observe all warnings and cautions in this manual.
Failure to comply may result in serious injury or death.
Obtain qualified service for this equipment as per instructions.**

WARNING 2

In no event will MITSUBISHI be responsible or liable for either indirect or consequential damage or injury that may come from the use of this equipment.

Any modifications without authorization by MITSUBISHI could result in personal injuries, death or destruction of the UPS.

APPLICATION

This UPS shall NOT be applied to support equipment (*) that could affect human lives.

Special considerations are required when applying this UPS to equipment () that affects human safety and/or maintains public services.**

Be sure to contact/inform MITSUBISHI if this is the case. These applications, without special consideration may cause serious accidents.

- ***
 - Medical operation room equipment
 - Life support equipment (artificial dialysis, incubators, etc.)
 - Toxic gas or smoke eliminators
 - Equipment that must be provided under fire laws, construction standards or other ordinances
 - Equipment equivalent to the above

- ****
 - Equipment to supervise or control airways, railways, roads, sea-lanes or other transportation.
 - Equipment in nuclear power plants.
 - Equipment to control communications.
 - Equipment equivalent/similar to the above mentioned.

WARNING 3


The UPS is to be installed in a controlled environment.

Improper storage and installation environment may deteriorate insulation, shorten component life and cause malfunctions.

Keep the installation environment per standard described as follows:

TABLE 1.1 UPS Installation Environment

| No. | Item | Environment standard | |
|-----|-----------------------|--|------------------------------------|
| 1 | Installation location | Indoors | |
| 2 | Ambient temperature | Minimum temperature: 32°F(0°C), Maximum temperature: 104°F(40°C) The average temperature over any 24-hour period must be in the range 41°F (5°C) to 95°F (35°C). | |
| 3 | Relative humidity | The relative humidity must be held between 30 and 90%. There must be no condensation due to temperature changes. | |
| 4 | Altitude | This equipment must not be applied at an altitude that exceeds 3300ft (1000m) above seal level. | |
| 5 | Dust | Dust in the room where the UPS is installed must not exceed normal atmospheric dust levels. In particular, that dust should not include iron particles, oils or fats, or organic materials such as silicone. | |
| 6 | Inflammable gas | There should be no inflammable/explosive gas. | |
| | | Hydrogen sulfide (H ₂ S) | No more than 0.0001 PPM |
| | | Sulfurous acid gas (SO ₂) | No more than 0.05 PPM |
| | | Chlorine gas (Cl ₂) | No more than 0.002 PPM |
| | | Ammonia gas (NH ₃) | No more than 0.1 PPM |
| | | Nitrous acid gas (NO ₂) | No more than 0.02 PPM |
| | | Nitrous oxides (NO _x) | No more than 0.02 PPM |
| | | Ozone (O ₃) | No more than 0.002 PPM |
| | | Hydrochloric acid mist (HCl) | No more than 0.1 mg/m ³ |

WARNING 4

This UPS does not include an AC input circuit breaker (MCCB) to protect the bypass and main input circuit. The AC input circuit breaker (MCCB) is to be field supplied and installed. Circuit breaker (MCCB) specifications are as follows:

TABLE 1.2 Rating of AC input Circuit breaker

| Capacity (kVA) | AC input Voltage (Vac) | AC input Rating (Aac) | Recommended Breaker (A) |
|-------------------|---------------------------|--------------------------|----------------------------|
| 6 | 208 | 26.4 | 35 |
| 8 | 208 | 35.2 | 45 |
| 10 | 208 | 44.0 | 60 |
| 12 | 208 | 52.8 | 70 |

AC output and DC input overcurrent protection and disconnection devices shall be field supplied and installed.

1.1 GENERAL

The Mitsubishi 7011B Series UPS is designed to provide continuous and clean electrical power to a critical load. In the event of an input power failure, the UPS will supply power to the critical load for the specified battery time.

If the input power is not restored promptly, backup power from the UPS battery permits the orderly shutdown of equipment supported by the UPS. The UPS is simple to start up, operate and maintain.

The 7011B Series UPS is available in four (4) kVA sizes: 6, 8, 10 and 12kVA. Specifications for each kVA model appear in Section 1.4. All models have batteries included in the UPS module cabinet. The principles of operation described herein are applicable to all models.

This manual provides an overview of the 7011B Series components and their functions. The appearance and purpose of operator controls and indicators is described with procedures for operation, start-up, shutdown and basic maintenance included.

1.2 DEFINITIONS

UNINTERRUPTIBLE POWER SUPPLY SYSTEM (UPS) - All components within the UPS Cabinet and associated batteries which function as a system to provide continuous, conditioned AC power to a load. This is sometimes referred to as the "System".

UPS CABINET - The metal enclosure which contains Converter & Inverter Module, I/O Module, Bypass Module, batteries, and operator controls required to provide specified AC power to a load.

CONVERTER & INVERTER MODULE - The Converter / Charger, and Inverter assembly which, under the direction of the I/O Module and operator controls, provide specified AC power to a load.

CONVERTER / CHARGER - The UPS component which contains the equipment and controls necessary to convert input AC power to regulated DC power required for battery charging and for supplying power to the Inverter.

INVERTER – The UPS component which contain the equipment and controls necessary to convert DC power from the Converter / Charger, or the battery, to AC power required by the critical load.

BYPASS MODULE - The metal enclosure which contains the Bypass Line, the Static Transfer Switch, UPS operator controls, and internal control systems.

BYPASS LINE - The line which conducts electricity directly from the input power source to the critical load whenever the UPS is not completely operational.

STATIC TRANSFER SWITCH - Device which connects critical load to the bypass line when the Inverter cannot supply continuous power.

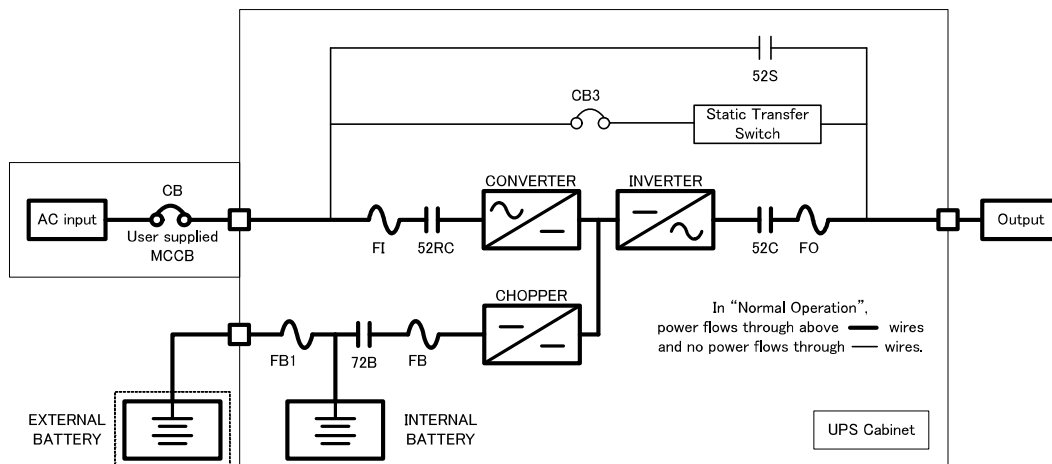
AC INPUT POWER - Power provided by the electrical utility company, or auxiliary generator, which is connected to the UPS for supplying critical load and recharging the batteries.

BATTERY - Rechargeable battery strings which supply DC power to the inverter to maintain continuous AC power to the load during AC input power failure conditions.

1.3 OVERVIEW

The UPS provides two power paths between the utility source and the critical load. Figure 1.1 shows the path for normal operation, with the load powered from the inverter. Figure 1.2 shows the path for bypass operation, with the load supplied through the bypass line.

FIGURE 1.1 Single Line Diagram - Normal Operation. Load Powered by Inverter.



During normal operation, the path through the inverter is used to power the load.

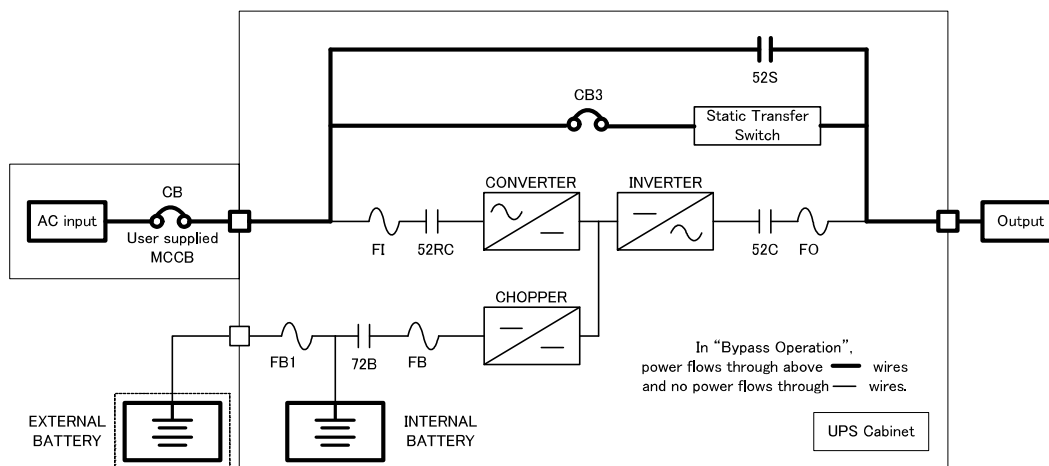
Referring to Figure 1.1: Input AC power is converted to DC by the Converter. DC power is utilized to charge the UPS battery and to provide power to the Inverter. The Inverter converts the DC power to clean AC power to supply the critical load.

The conversion - inversion process eliminates any voltage transients or fluctuations existing in the input power before it reaches the critical load.



*** The Input circuit breaker(MCCB) for protection of the UPS and cables are field supplied and field installed. (See WARNING 4 in section 1.0).**

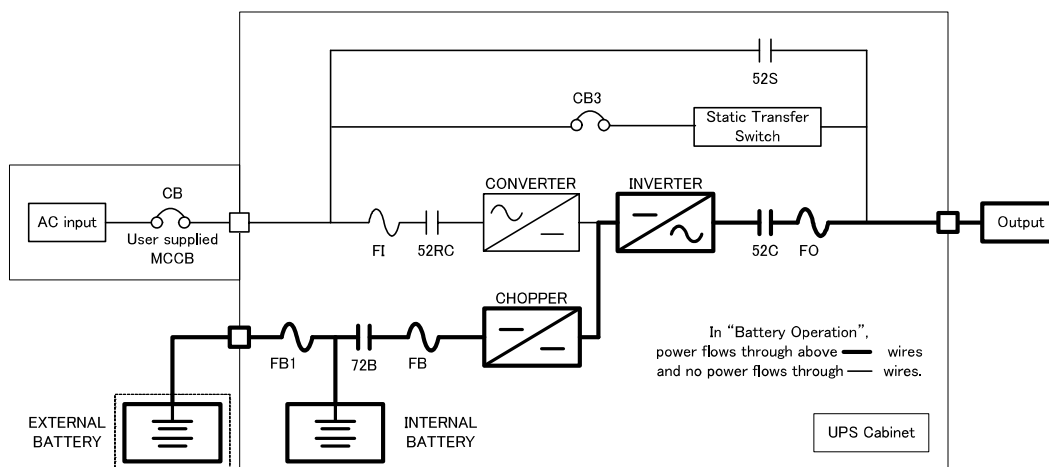
FIGURE 1.2 Single Line Diagram - Bypass Operation. Load Fed Through the Bypass Line.



Referring to Figure 1.2, the internal bypass line is a hard-wired line through 52S which supplies the critical load with unconditioned input power. Upon switching to the internal bypass line, the static transfer switch line through CB3 supplies the power immediately, and then the internal bypass line through 52S supplies the power. In the event the unit must switch to the internal bypass line, the power to the critical load will be uninterrupted. The purpose of this line is to route power to the critical load while the UPS module is de-energized (converter and inverter), and during Start-up before the system is fully operational.

The internal control system determines the operation of the two paths, with the load powered from the inverter being the normal operation.

FIGURE 1.3 Single Line Diagram - Battery Operation



Referring to Figure 1.3, if the input power is interrupted, the batteries will immediately supply the DC power required by the Inverter to maintain continuous AC power to the load. Fully charged batteries will provide power for the specified time at the rated load, or longer at reduced load.

When power is restored after a low battery shutdown, the Converter automatically restarts operation, recharges the batteries and the Inverter is automatically restarted without operator intervention. The load is assumed by the inverter automatically without operator intervention.

In the event of a power failure, the Converter will de-energize and the batteries will discharge into the Inverter and maintain power to the critical load until a) the battery capacity expires and the inverter turns off, or b) input power is restored after which the converter will power the inverter and simultaneously recharge the batteries. Figure 1.3 illustrates the flow diagram during battery operation.

FIGURE 1.4 UPS Parts Location Front View (6kVA)

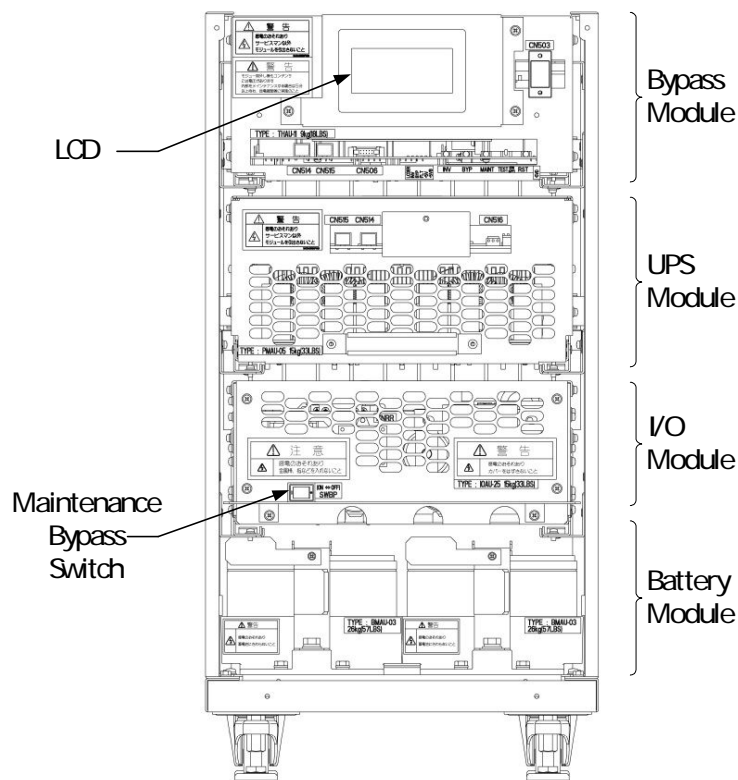


FIGURE 1.5 UPS Parts Location Front View (8,10, and 12kVA)

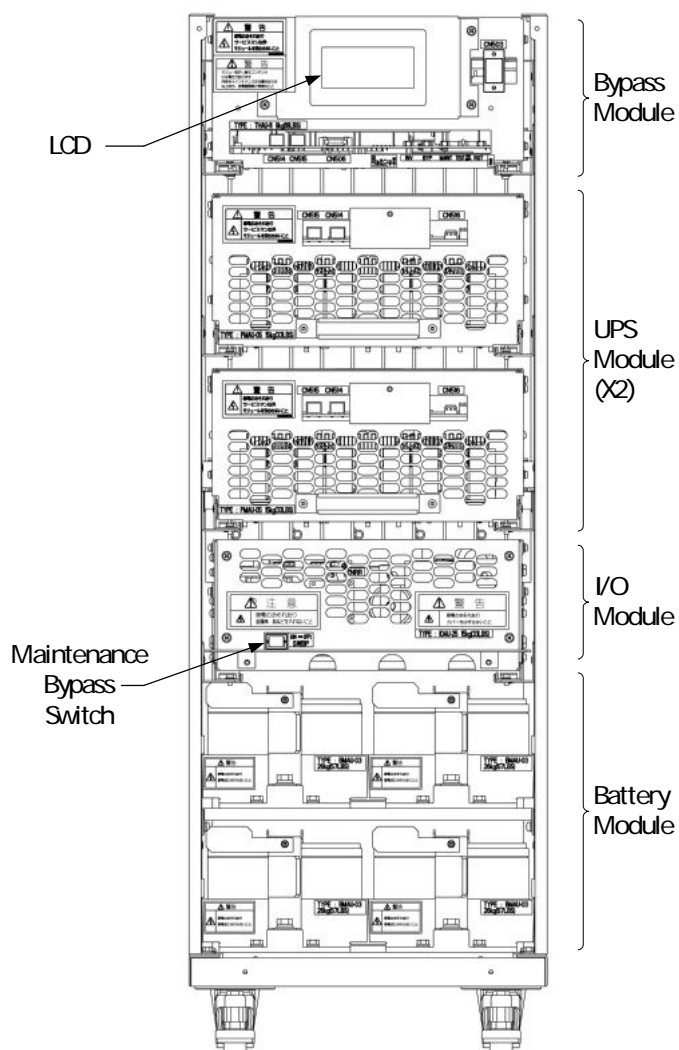
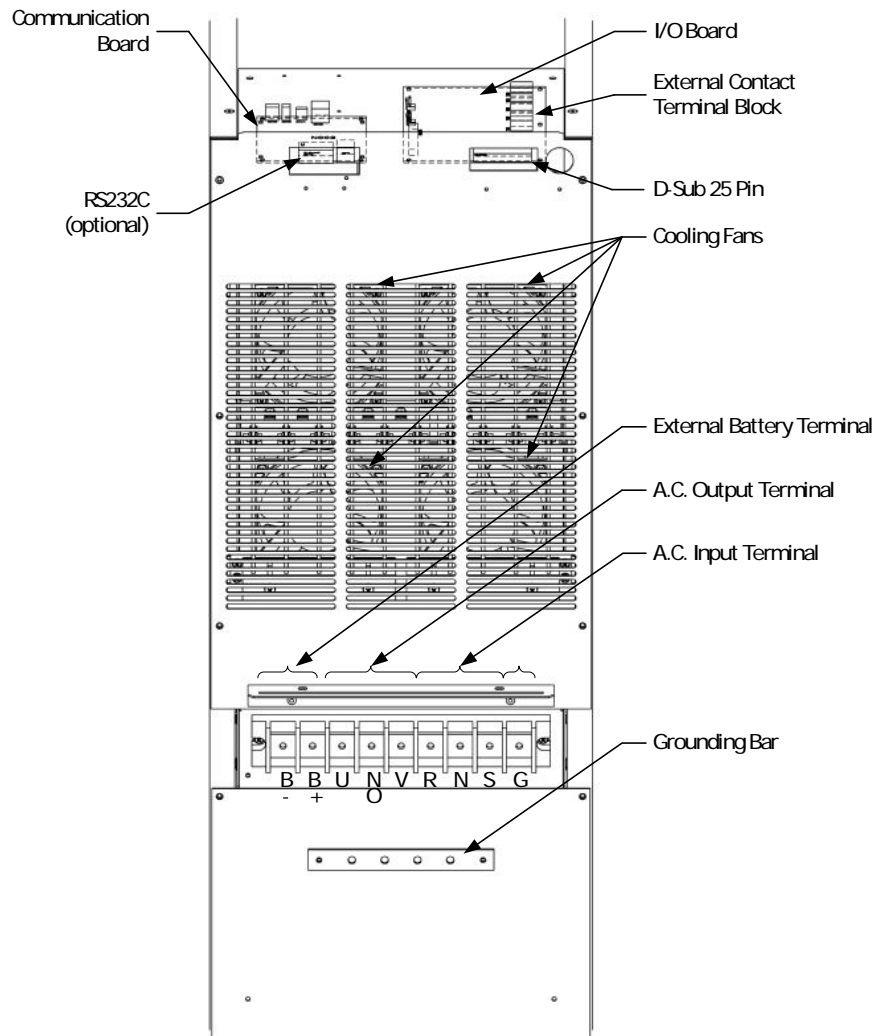


FIGURE 1.6 UPS Parts Location Rear View



Description of UPS parts, referred to in Figure 1.4 to Figure 1.6:**1. Maintenance Bypass Switch (FOR SERVICE PERSONNEL ONLY)**

This switch is used to force the load to transfer from inverter power to the bypass line. Do not operate it under normal operation.

2. External Battery terminal (FOR SERVICE PERSONNEL ONLY)

Terminal block to connect the external battery cabinet.

3. Field Wire Terminal Block (FOR SERVICE PERSONNEL ONLY)

Refer to Figure 3.3 and Figure 3.4 for details

4. Grounding Bar**5. RS232C connector**

Refer to Figure 2.17 for detail.

6. D-Sub 25 Pin connector

Refer to Table 2.1 and Figure 2.18 for detail.

7. External Contact Signal Terminal Block

Terminal block to connect contact signal input/output lines to and from external dry contacts. Refer to Figure 2.19 for details.

1.4 SPECIFICATIONS

The UPS name plate displays the rated kVA as well as nominal voltages and currents.
The name plate is located on the interior side of the UPS front door.

TABLE 1.3 Power Specifications

| Rated output Power | Input voltage 1 phase 3 wire or 2 phase 3 wire | Output voltage 1 phase 3 wire or 2 phase 3 wire |
|-----------------------|---|--|
| 6kVA / 4.2kW | 240/120, 208/120 | 240/120, 208/120 |
| 8kVA / 5.6kW | 240/120, 208/120 | 240/120, 208/120 |
| 10kVA / 7.0kW | 240/120, 208/120 | 240/120, 208/120 |
| 12kVA / 8.4kW | 240/120, 208/120 | 240/120, 208/120 |

TABLE 1.4 UPS Information

| UPS (kVA) | CABLE ENTRY | WIDTH (in/mm) | DEPTH (in/mm) | HEIGHT (in/mm) | WEIGHT* (lb./kg) | HEAT LOSS @ 208V (kBTU/h) |
|--------------|----------------|------------------|------------------|-------------------|---------------------|---------------------------------|
| 6 | REAR | 13.8 / 350 | 29.9 / 760 | 27.8 / 705 | 298/135 | 1.5 |
| 8 | REAR | 13.8 / 350 | 29.9 / 760 | 40.6 / 1030 | 496/225 | 1.9 |
| 10 | REAR | 13.8 / 350 | 29.9 / 760 | 40.6 / 1030 | 496/225 | 2.4 |
| 12 | REAR | 13.8 / 350 | 29.9 / 760 | 40.6 / 1030 | 496/225 | 2.9 |

* Including batteries

TABLE 1.5 Rating of Contactors and Fuses

| Component(s) | Description | Component Rating @ 208V,3 phase, 60 Hz | | | |
|--------------|----------------------|--|------------|------------|------------|
| | UPS Rating | 6 kVA | 8 kVA | 10 kVA | 12 kVA |
| 52RC | Relay | 31A | 31A | 31A | 31A |
| 52C | Relay | 31A | 31A | 31A | 31A |
| 72B | DC Input Contactor | 60A | 60A | 60A | 60A |
| FIR, FIS | AC Input Fuse | 60A/660V | 60A/660V | 60A/660V | 60A/660V |
| FOU, FOV | Inverter Output Fuse | 60A/660V | 60A/660V | 60A/660V | 60A/660V |
| FDP, FDN | Fuse | 60A/660V | 60A/660V | 60A/660V | 60A/660V |
| FBP, FBN | DC Input Fuse | 60A/660V | 60A/660V | 60A/660V | 60A/660V |
| FB1 | DC Input Fuse | 80A/500Vdc | 80A/500Vdc | 80A/500Vdc | 80A/500Vdc |
| CB3 | Contactor | 60A | 60A | 60A | 60A |
| 52S | Bypass Contactor | 60A | 100A | 100A | 100A |

TABLE 1.6 Detail of Specifications

| | | | | |
|------------------------------------|---|-----|-----|-----|
| TABLE 110 Detail of Specifications | | | | |
| Rated Output kVA | 6 | 8 | 10 | 12 |
| Rated Output kW | 4.2 | 5.6 | 7.0 | 8.4 |
| AC INPUT CHARACTERISTICS | | | | |
| Configuration | 1 phase 3 wire or 2 phase 3 wire | | | |
| Voltage | 240/120V (1 phase), 208/120V (2 phase) | | | |
| Frequency | 50 / 60 Hz +/-5% | | | |
| Reflected Current THD | 4% typ. at 100% load; 7% typ. at 50% load | | | |
| BATTERY | | | | |
| Type | VRLA | | | |
| Backup Time | 10 minutes | | | |
| Nominal Voltage | 216 Vdc | | | |
| Minimum Voltage | 173 Vdc | | | |
| Number of Cells | 108 | | | |
| AC OUTPUT | | | | |
| Configuration | 1 phase 3 wire or 2 phase 3 wire | | | |
| Voltage | 240/120V (1 phase), 208/120V (2 phase) | | | |
| Voltage Stability | +/-2% steady state | | | |
| Frequency | 50 / 60 Hz | | | |
| Frequency Stability | +/-0.05% in free running mode | | | |
| Power Factor | 0.7 nominal | | | |
| Power Factor range | 0.7 ~ 1.0 lagging (within output kW rating) | | | |
| Voltage THD | 2.5% typical THD at 100% Linear Load 5% typical THD at 100% non-linear load | | | |
| Transient Response | +/-5% typical at 100% load step +/-5% typical at loss/return of AC power +/-5% typical at load transfer to/from static bypass | | | |
| Transient Recovery | 50 ms | | | |
| Voltage Unbalance | 2% typical at 100% unbalanced load | | | |
| Phase Displacement | 1deg. typical at 100% load | | | |
| Inverter Overload | 150% for 1 minute | | | |
| System Overload | 150% for 1 minute, 1000% for 1 cycle | | | |
| Crest Factor Capabilities | 3:1 | | | |
| ENVIRONMENTAL | | | | |
| Cooling | Forced Air | | | |
| Operating Temperature | 32°F ~ 104°F (0°C ~ 40°C). Recommended 59°F ~ 77°F (15°C ~ 25°C) | | | |
| Relative Humidity | 30% ~ 90% Non Condensing | | | |
| Altitude | 0 ~ 3300 feet No Derating | | | |
| Location | Temperature-controlled, indoor area free of conductive contaminants | | | |

2.0 OPERATOR CONTROLS AND INDICATORS

The 7011B Series operator controls and indicators are located as follows:

| | |
|--|-------------------|
| Maintenance Bypass Switch and Contactors | : Inside the unit |
| Touch Panel (LCD) | : Door exterior |
| UPS Status Indicators (LED) | : Bypass Module |

FIGURE 2.1 Operation/Display Panel (Front Panel)

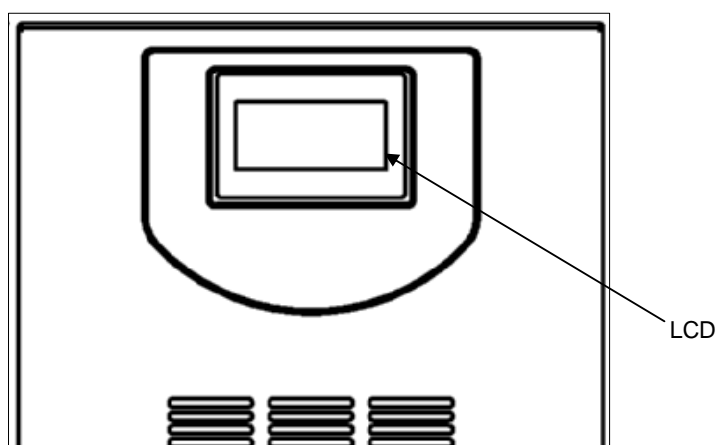
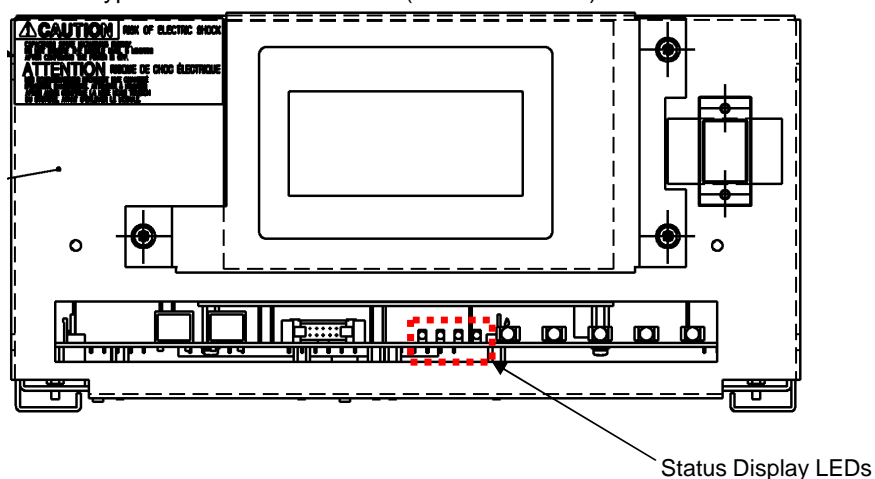


Figure 2.2 Bypass Module LED Section (Cover Removed)



2.1 STATUS INDICATORS

1) Load on inverter [INV] (green)

Illuminated when power is supplied from inverter to the critical load.

2) Load on bypass [BYP] (yellow)

Illuminated when power is supplied to load devices by the bypass line.

3) Fault (red)

Illuminated when UPS is in fault mode, input abnormal, or overload. Light flashes for minor failure, stays illuminated for major failure.

4) LCD Error (yellow)

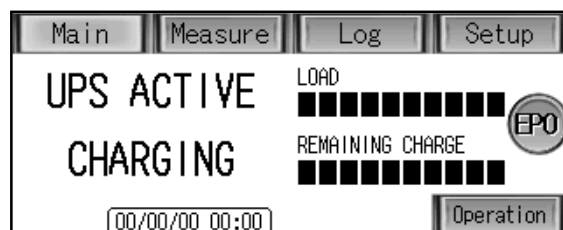
Flashes when there is a display communication error.

5) Conversion Module Error (red and green)

Illuminated when there is a communication error between conversion modules.

2.2 Liquid Crystal Display (LCD)

FIGURE 2.3 LCD Touch Panel Display During Normal Operation



The Liquid Crystal Display (LCD) touch panel indicates how the power is being supplied to the load, measured values, data records and error messages. The LCD panel has a back-light which facilitates viewing in different ambient lighting conditions. The LCD will automatically clear and turn off if the screen is not activated within a 3 minute period. The LCD is turned back on by touching the screen.

Main: Selecting "Main" will display the UPS system's power supply state.

Measure: Selecting "Measure" will display the measurements of internal electronics.

Log: Selecting "Log" will display the history of the UPS system's operations.

Setup: Selecting "Setup" will display the items which settings can be adjusted.

Operation: Selecting "Operation" will show the current operation and operation switching options.

Main Screen

Select "Main" and the following screens will appear. On these screens the UPS system's current status can be confirmed. The first item on the main screen shows the status of the power supply. When the main screen shows "UPS ACTIVE" the UPS is supplying power to the load through the inverter. When the main screen shows "LOAD ON BYP." the bypass line is supplying power to the load.

The second item shows the status of the batteries. The battery status can read BAT. FULL, DISCHARGE, CHARGING, or STOP. "BAT. FULL" and "STOP" show the level of the batteries charge at full capacity or out of charge, respectively. "DISCHARGING" and "CHARGING" indicate whether the batteries are supplying power to the inverter, or are being charged by the converter.

Figure 2.4 Main Screen UPS Inverter Supplying Power (AC Operation)

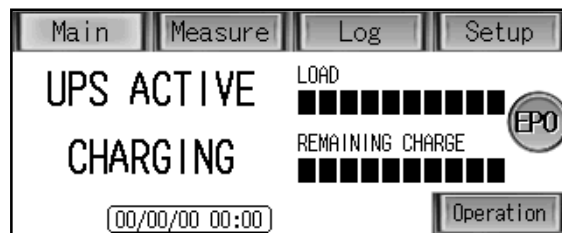


Figure 2.5 Main Screen Bypass Supplying Power

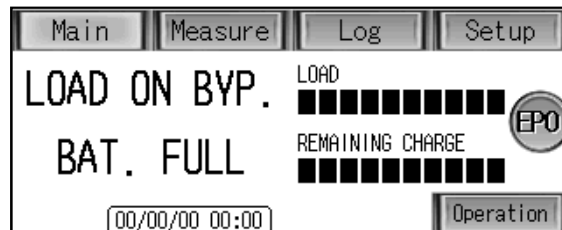
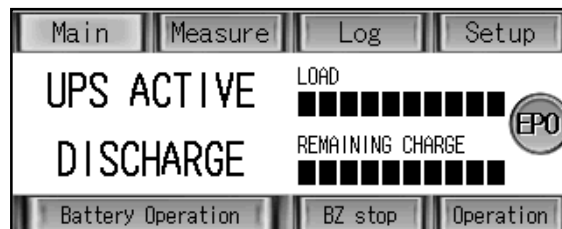


Figure 2.6 Main Screen UPS Batteries Supplying Power (DC Operation)

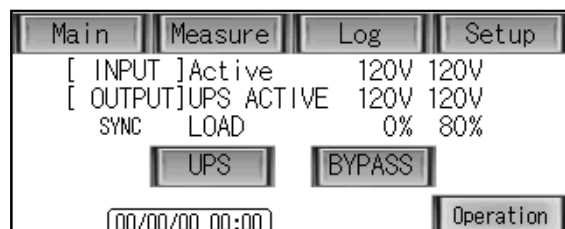


Operation Screen

Select "Operation" and the following screen will appear, which shows the summary of the UPS system's current operation. Select "BYPASS" while the UPS is supplying power, and the unit will switch to bypass mode and power will be supplied to the load

through the bypass line. Select "UPS" while the bypass line is supplying power, and the unit will switch to supplying power through the inverter.

Figure 2.7 Operation Screen UPS Supplying Power



The operation screen will show the input as "ACTIVE" or "UNDER VOLT." (under voltage). This indicates whether the AC input is supplying enough power to the UPS. When the input reads "UNDER VOLT." The UPS will use the batteries to continue supplying the necessary power to the load. If the batteries do not have enough charge, the UPS will switch to bypass mode.

The output will be shown as "UPS ACTIVE," "LOAD ON BYPASS" or "OUTPUT STOP" indicating whether the load is supplied through the inverter, the bypass line, or if no power is being supplied to the load.

Measurement Screen

Select "Measure" to view various measurements from the electrical equipment inside the UPS. On the measurement screen the operator can monitor input power, output power, battery charge, and the load percentage over the past twenty four hours.

Figure 2.8 Input Power Measurement Screen

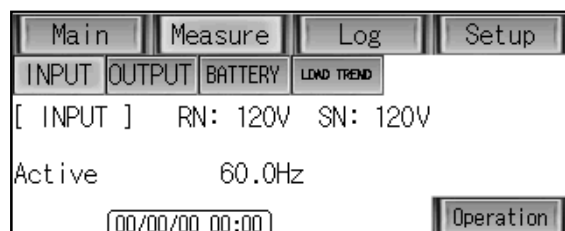


Figure 2.9 Output Power Measurement Screen

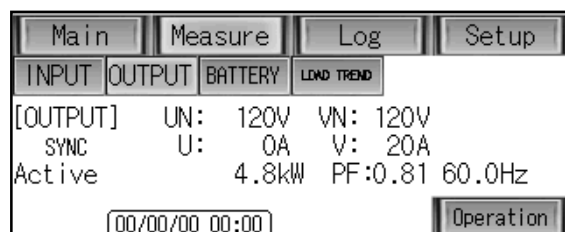


Figure 2.10 Battery Status Screen

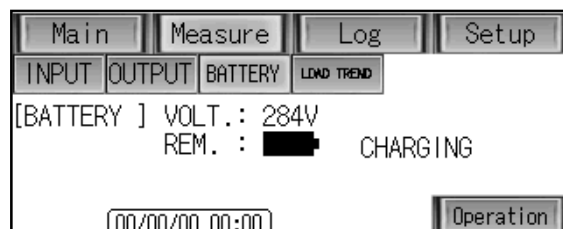
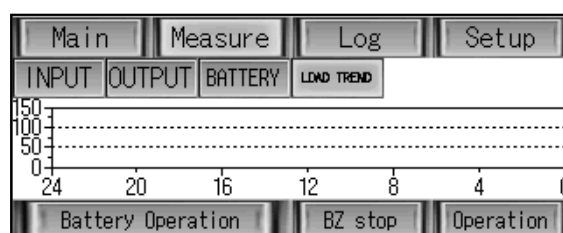


Figure 2.11 Load Trend Screen



Log Screen

Select "Log" to see the history of the last 100 changes in status of the UPS system. This screen also allows the operator to view the battery storage history.

Figure 2.12 Event Log Screen

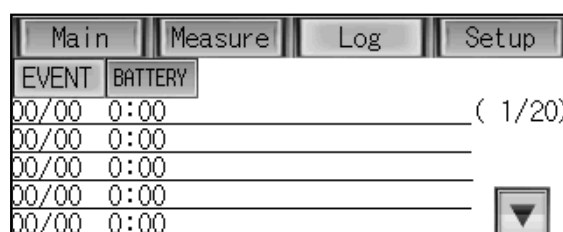


Figure 2.13 Battery Log Screen



Setup Screen

Select "Setup" to see the UPS system's configuration settings. On this screen you can adjust the date and time, the inverter output voltage, and the battery replacement date.

Figure 2.14 Time Setting Screen

The Time Setting Screen displays a menu bar at the top with 'Main', 'Measure', 'Log', and 'Setup'. Below the menu, there are sub-menus: 'CLOCK', 'INV.V.ADJ.', 'BAT. Rep.', and 'Operation'. The main display area shows the date and time format 'MM/DD/YY hh:mm' with the current values '00/00/00 00:00'. A 'SET' button is located to the right of the time values. At the bottom, there is a status bar showing '(00/00/00 00:00)' and the 'Operation' button.

Figure 2.15 Inverter Output Voltage Adjustment Screen

The Inverter Output Voltage Adjustment Screen displays a menu bar at the top with 'Main', 'Measure', 'Log', and 'Setup'. Below the menu, there are sub-menus: 'CLOCK', 'INV.V.ADJ.', 'BAT. Rep.', and 'Operation'. The main display area shows the current voltage 'VOLTAGE : 120.0V' and the adjustment range 'ADJ. (±2%): +0.2 ⇒ [0.0] %'. A 'SET' button is located to the right of the adjustment range. At the bottom, there is a status bar showing '(00/00/00 00:00)' and the 'Operation' button.

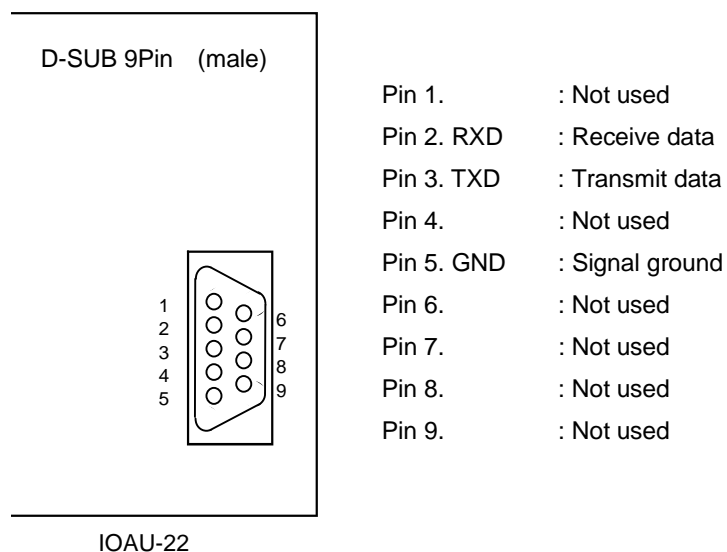
Figure 2.16 Battery Replacement Date Screen

The Battery Replacement Date Screen displays a menu bar at the top with 'Main', 'Measure', 'Log', and 'Setup'. Below the menu, there are sub-menus: 'CLOCK', 'INV.V.ADJ.', 'BAT. Rep.', and 'Operation'. The main display area shows the text 'Battery replace' and the date format 'DATE (MM/DD/YY) 00/00/00'. A 'SET' button is located to the right of the date values. At the bottom, there is a status bar showing '(00/00/00 00:00)' and the 'Operation' button.

2.3 RS232C CONNECTORS (External communication connector)

This is an RS232C port for the "Diamond-Link"* monitoring software. The layout of the connector is shown in Figure 2.17. Connections not to exceed NEC Class 2.

FIGURE 2.17 RS-232C Connectors



* Consult MITSUBISHI ELECTRIC POWER PRODUCTS, INC. for detail on "Diamond Link" monitoring software and its capabilities.

2.4 D-SUB 25 PIN CONNECTORS

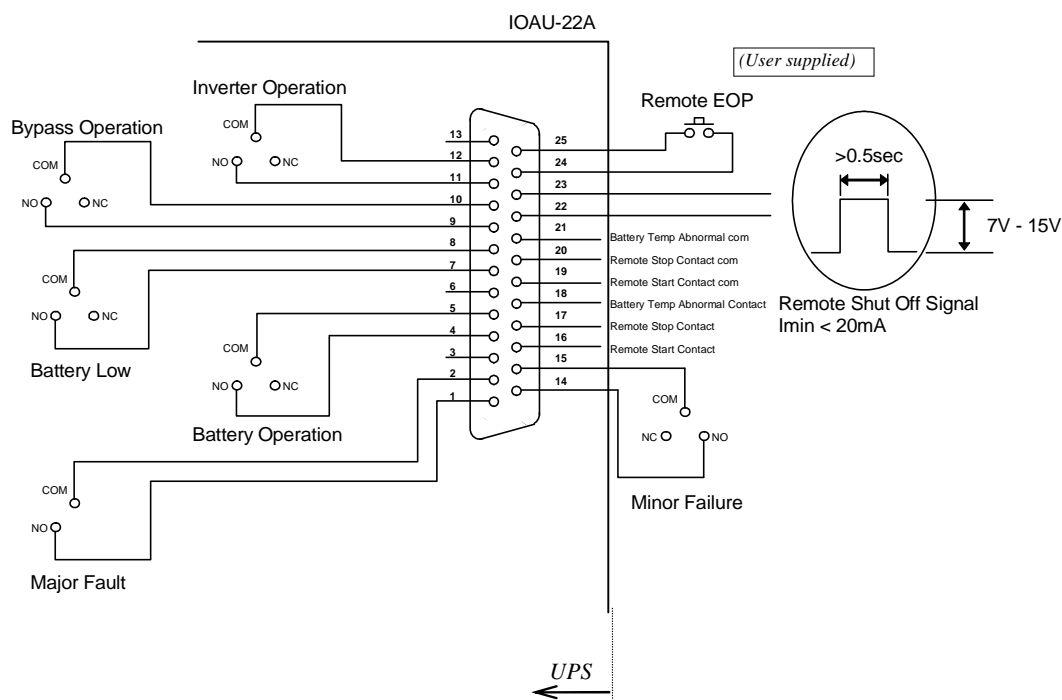
Uses dry contact on/off to express NORMAL, FAULT, ON BATTERY, BATTERY LOW, ON BYPASS, ON INVERTER status. Connections not to exceed NEC Class 2.

TABLE 2.1 D-Sub 25 Pin Connectors

| Pin No. | Signal | I/O |
|---------|-----------------------------------|--------|
| 1 | Failure A Contact | Output |
| 2 | Failure A Contact com | Output |
| 3 | - | - |
| 4 | Battery Operation A Contact | Output |
| 5 | Battery Operation com | Output |
| 6 | - | - |
| 7 | Battery Low Voltage A Contact | Output |
| 8 | Battery Low Voltage A Contact com | Output |
| 9 | Bypass Operation A Contact | Output |
| 10 | Bypass Operation A Contact com | Output |
| 11 | Inverter Operation A Contact | Output |
| 12 | Inverter Operation A Contact com | Output |
| 13 | - | - |

| Pin No. | Signal | I/O |
|---------|-------------------------------|--------|
| 14 | Minor Failure Contact | Output |
| 15 | Minor Failure Contact com | Output |
| 16 | Remote Start Contact | Input |
| 17 | Remote Stop Contact | Input |
| 18 | Battery Temp Abnormal Contact | Input |
| 19 | Remote Start Contact com | Input |
| 20 | Remote Stop Contact com | Input |
| 21 | Battery Temp Abnormal com | Input |
| 22 | Shut Off | Input |
| 23 | Shut Off common | Input |
| 24 | RE-EPO | Input |
| 25 | RE-EPO common | Input |

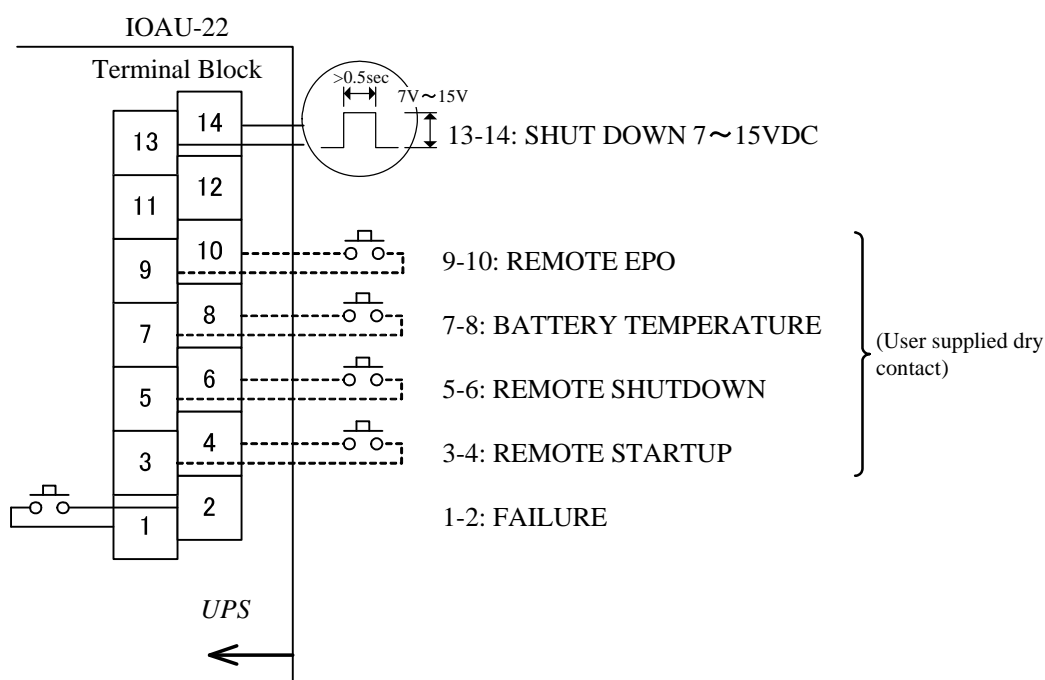
FIGURE 2.18 D-sub 25 Pin Connectors



2.5 EXTERNAL SIGNAL TERMINAL BLOCK (Option)

The UPS is equipped with a series of input/output terminals for the external annunciation of alarms and the remote access of certain UPS functions. A functional description of the input/output port is presented below. Layout of terminals is shown in Figure 2.19. Connections not to exceed NEC Class 2.

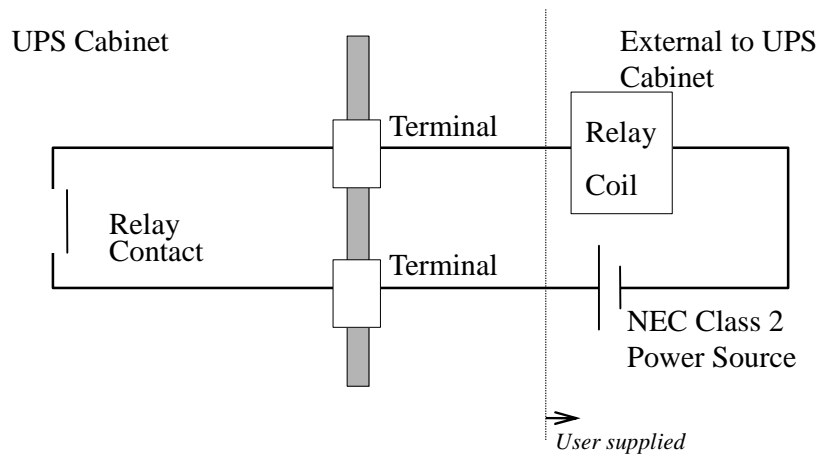
FIGURE 2.19 External Signal Terminal Block (NEC Class2)



A) Output Contacts(for external alarm annunciation)

Output contacts consist of form "A" dry type contacts. Rated capacity of all output contacts is 30Vdc/1Adc. Operate all dry contacts at their rated values or lower. Figure 2.20 illustrates typical installation. The external relay can also be a lamp, LED, computer, etc.

FIGURE 2.20 Control Wiring for External Contacts



NOTE: *The UPS is equipped with a selectable output contact feature. The above alarms are the default settings. Contact **MITSUBISHI ELECTRIC POWER PRODUCTS, INC.** for setup information.*

B) Input Contacts(for remote access of UPS)

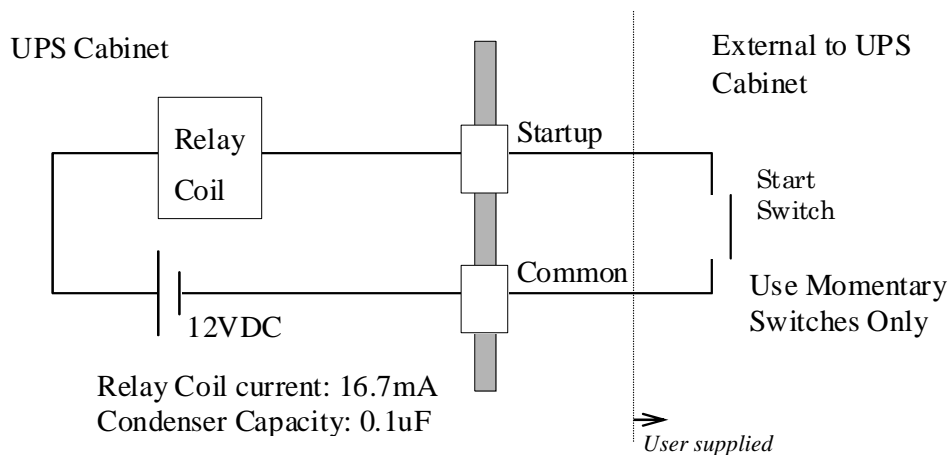
External contacts are provided by the user of the UPS system. Terminal voltage at the UPS is 12Vdc. Provide external dry contact accordingly.



CAUTION: *Do not apply voltage to remote access input terminals. Damage to UPS may result.*

Refer to Figure 2.21 for typical wiring configuration. Although this figure applies to the RE-STARTUP terminals, the same wiring arrangement is used for RE-EPO; RE-SHUTDOWN, Battery temperature.

FIGURE 2.21 Remote "Startup" Contact Connections



NOTE: *In all cases, a switch having a protective cover is recommended in order to reduce possibility of accidental operation.*

3.0 INSTALLATION AND OPERATION

3.1 TRANSPORTATION AND INSTALLATION

TABLE 3.1 How to Transport and Install the System

| Transportation | Installation |
|-------------------------------|--|
| Transport unit with forklift. | Pull out the UPS cabinet as shown in Figure 3.1 Fix the UPS unit in place using the four (4) leveling feet. |

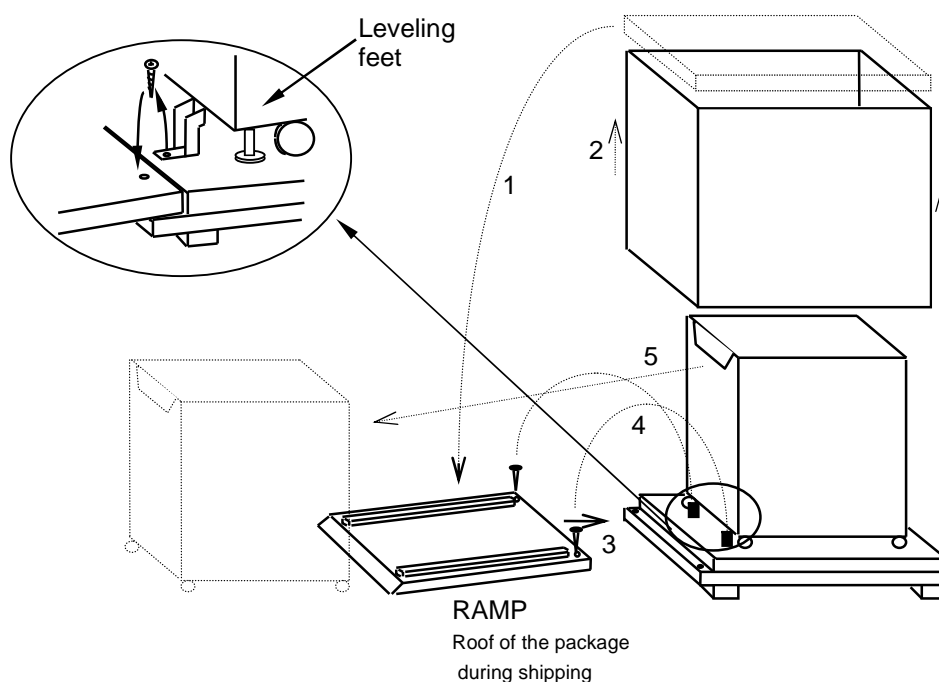


NOTE: Do not transport in a horizontal position. Cabinets should be maintained upright within $\pm 15^\circ$ of the vertical during handling.

3.2 HANDLING

The UPS is shipped in export packaging. Remove the UPS from the package only when it is ready for installation. Refer to Figure 3.1 for handling.

FIGURE 3.1 Handling



3.3 INSTALLATION PROCEDURE

A) Note the load tolerance of the floor

Refer to TABLE 3.2 for list of UPS weights:

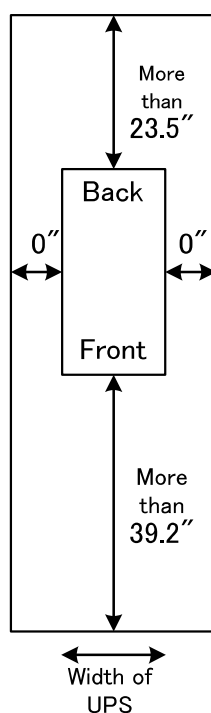
TABLE 3.2 List of UPS Weights (lb.)

| UPS Capacity (kVA) | 6 | 8 | 10 | 12 |
|--------------------|-----|-----|-----|-----|
| Weight (lb.) | 298 | 496 | 496 | 496 |

B) Minimum clearance required for ventilation and maintenance

The unit shall be installed with the ventilation and maintenance space shown in Figure 3.2. There shall also be 23.5" of clearance space above the top of the unit.

FIGURE 3.2 Clearance for Ventilation and Maintenance



When ambient temperature is 25 °C (77°F), expected battery life is 4.5~5.0 years. Expected battery life will be shorter if the ambient temperature is higher.

3.4 PROCEDURE FOR CABLE CONNECTION (Refer to Table 3.2 for cable sizes.)

- 1) Confirm the capacity of the UPS being installed. Identify the field terminal blocks as shown in Figure 3.3-Figure 3.6.
- 2) Referring to Figure 3.5-Figure 3.6., connect the grounding conductors from the input service entrance to the UPS ground bar.
- 3) Confirm that an external input circuit breaker sized to protect both the rectifier input and the bypass lines is installed. Consult equipment nameplate for current ratings.
- 4) Connect the AC power source cables from the input service entrance to the UPS INPUT power terminals identified as R, N, and S in Figure 3.3-Figure 3.6. Input cables must be sized for an ampere rating larger than the maximum current capacity of the UPS. Refer to Table 3.3 for recommended cable sizes.
- 5) Refer to Table 3.3 for recommended cable sizes. Referring to Figure 3.3-Figure 3.6, connect UPS OUTPUT load terminals U, NO, and V to load distribution panel.
- 6) UPS equipment does not employ AC output overcurrent protection or disconnection devices and must be provided at installation.
- 7) UPS equipment does not employ DC input overcurrent protection or disconnection devices and must be provided at installation.
- 8) Connect external signal terminal block as needed. Refer to section 2.5 and Figure 2.18 for functional description. 12 AWG or less, shielded conductor is recommended.
- 9) Connect internal battery connector(s).



CAUTION: *UPS power terminals are supplied with stud type fittings. It is recommended that compression lugs be used to fasten all input/output power cables. Refer to Table 3.4 for recommended compression lugs and appropriate crimping tool*

TABLE 3.3 Recommended Cable Size and Torque Requirements

| UPS Capacity (kVA) | Input Side *1 | | Output Side *1 | |
|-----------------------|------------------------------------|------------------|------------------------------------|------------------|
| | Cable Size | Torque (in. lbs) | Cable Size | Torque (in. lbs) |
| 6kVA (208V) | 10 AWG * ² or larger | 80 in. lbs | 10 AWG * ² or larger | 80 in. lbs |
| 8kVA (208V) | 8 AWG * ² or larger | 80 in. lbs | 8 AWG * ² or larger | 80 in. lbs |
| 10kVA (208V) | 6 AWG * ² or larger | 80 in. lbs | 6 AWG * ² or larger | 80 in. lbs |
| 12kVA (208V) | 6 AWG * ² or larger | 80 in. lbs | 6 AWG * ² or larger | 80 in. lbs |

*1 - Voltage drop across power cables not to exceed 3% of nominal source voltage.

*2 - Allowable ampere ratings based on 90 °C insulation at an ambient temperature of 40 °C.
No more than 3 conductors in a raceway without de-rating. Use copper conductors rated 90°C.

TABLE 3.4 Crimp Type Compression Lug

| Wire Size (Code) | Wire Strand Class | Recommendation | | Crimp tool required BUNRNDY type Y35 or Y46 | |
|------------------------|-------------------------|----------------|-------------|--|-----------|
| | | Vendor | Cat. No. | Color key | Die index |
| 10 | B | BURNDY | YAV10 T3BOX | - | - |
| 8 | B | BURNDY | YA8C-L1 BOX | RED | 49 |
| 6 | B | BURNDY | YA6C-L BOX | BLUE | 7 / 374 |



NOTE: When using crimp type lugs, the lugs should be crimped to the specifications given in the manufacturer's instructions for both crimp tool and lug.

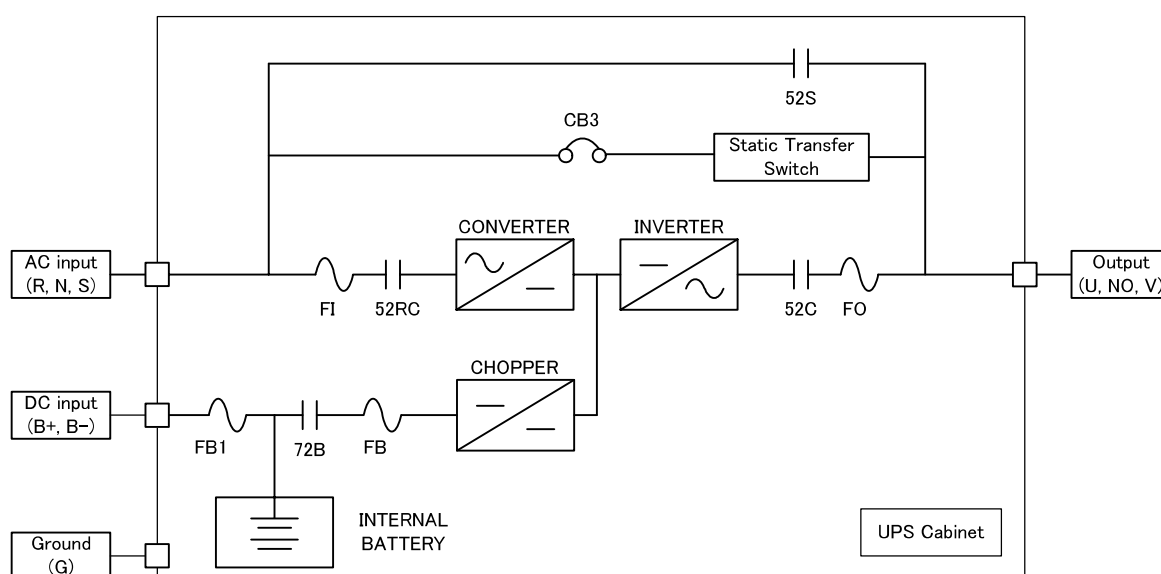
FIGURE 3.3 UPS Terminal Designation


FIGURE 3.4 Terminal Block

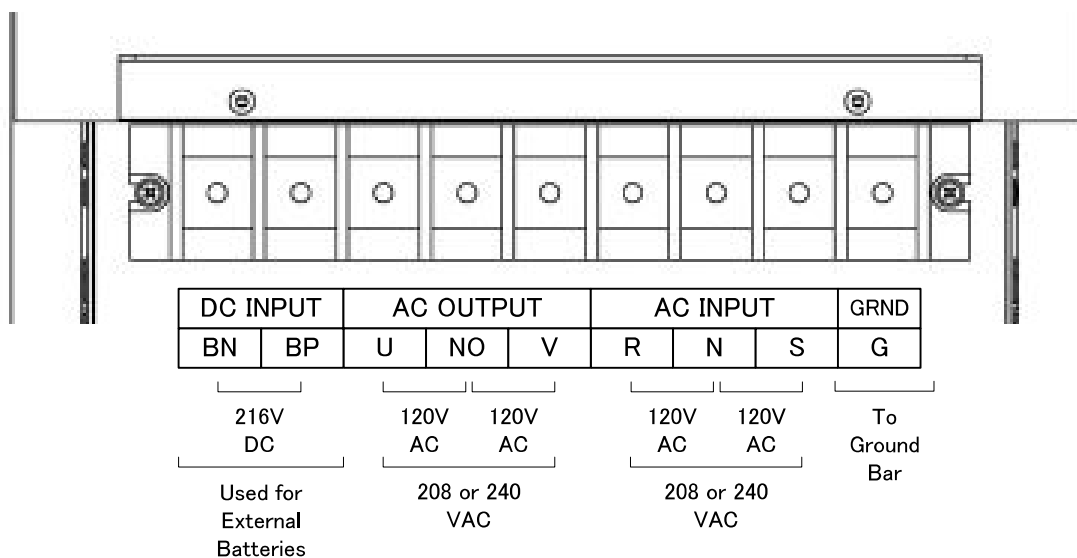


FIGURE 3.5 Input / Output Power Terminals (6kVA) (Rear View)

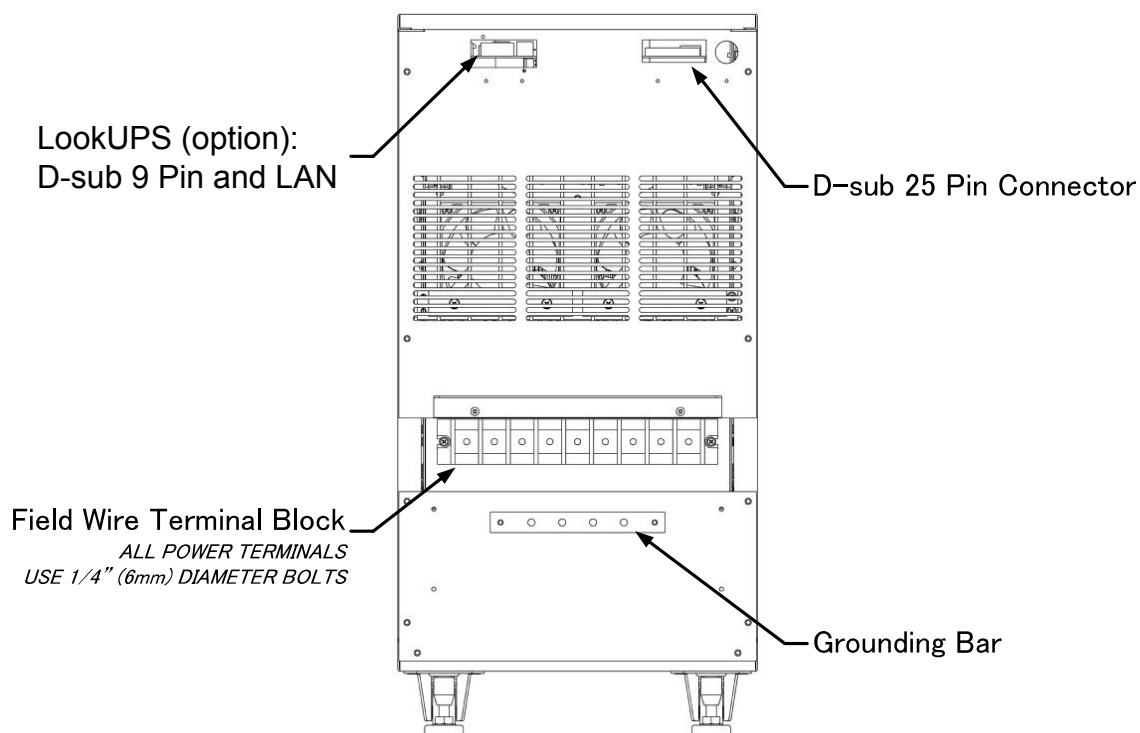


FIGURE 3.6 Input / Output Power Terminals (8,10 and 12kVA) (Rear View)

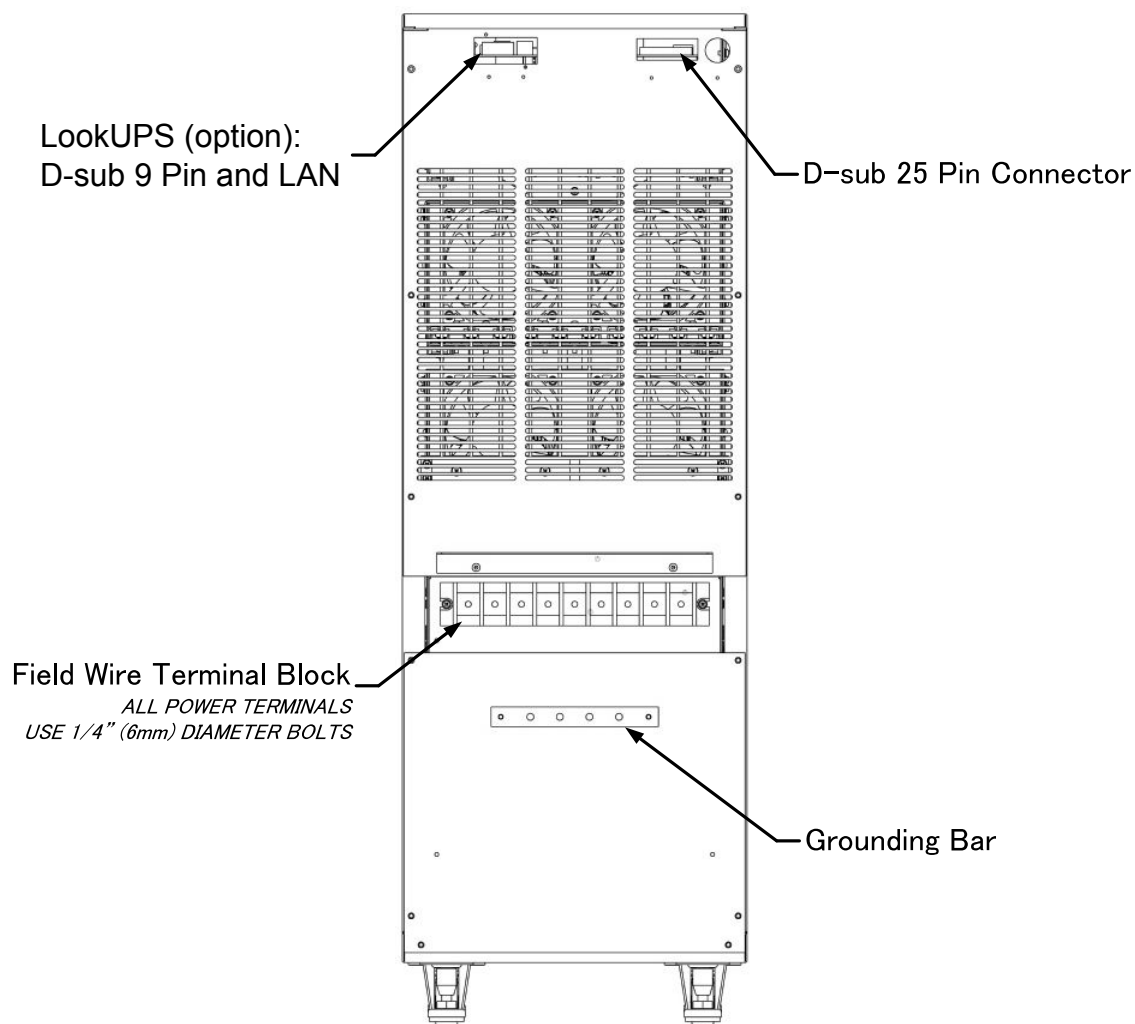




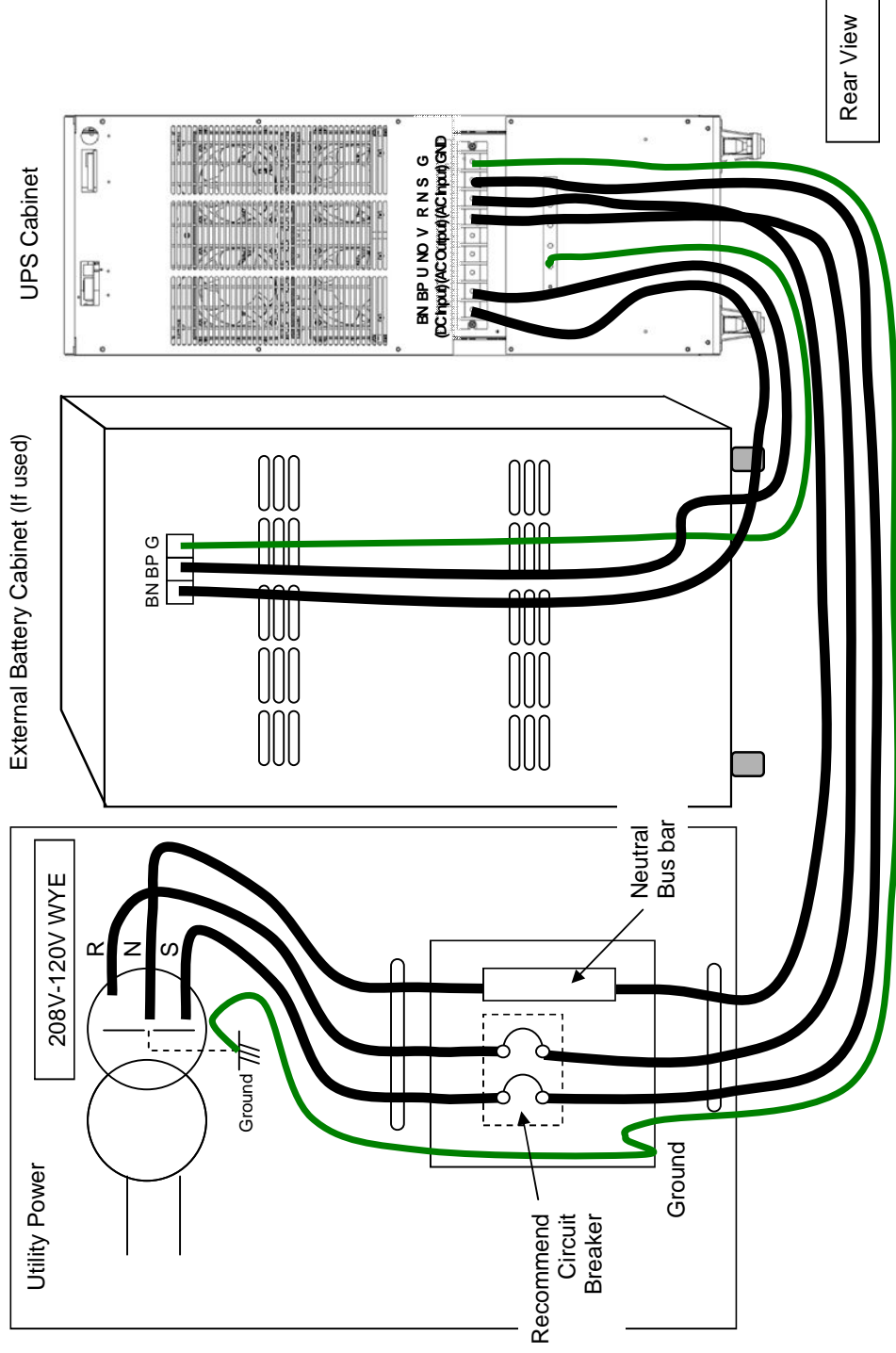
FIGURE 3.7 Field Wire Connection (208V – 120V WYE, 2 phase, 3wire)

NOTE: *Proper phase rotation must be observed when connecting input wires to R and S.*



If code 803 occurs
See next page.

*1



*1 : Please refer to the page Number 3-10

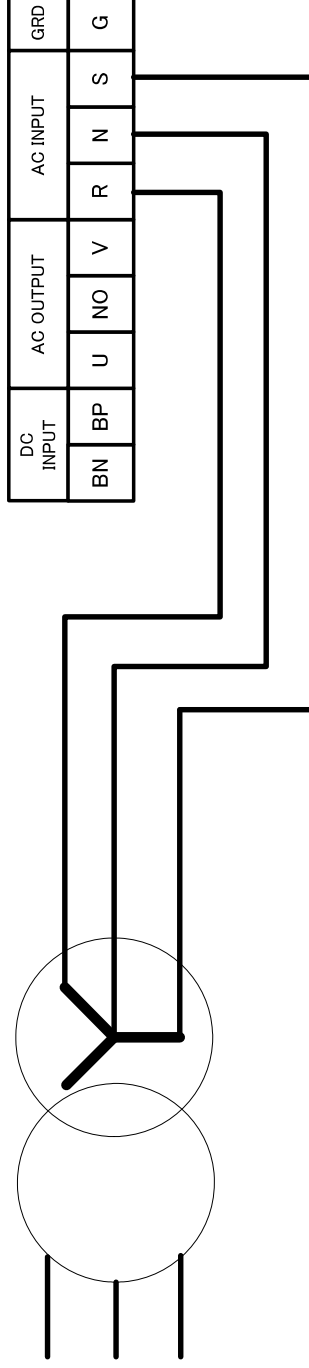


Wire Connection (208V – 120V WYE, 2 phase, 3wire)

UPS Must have Clockwise Phase Rotation if Error code 803 occurs, swap R and S. (see figure 3.8)

Figure 3.8 UPS Wire Connection Error Code 803

Correct connection



Incorrect connection

-> Code 803 Displayed on LCD when UPS powered up.

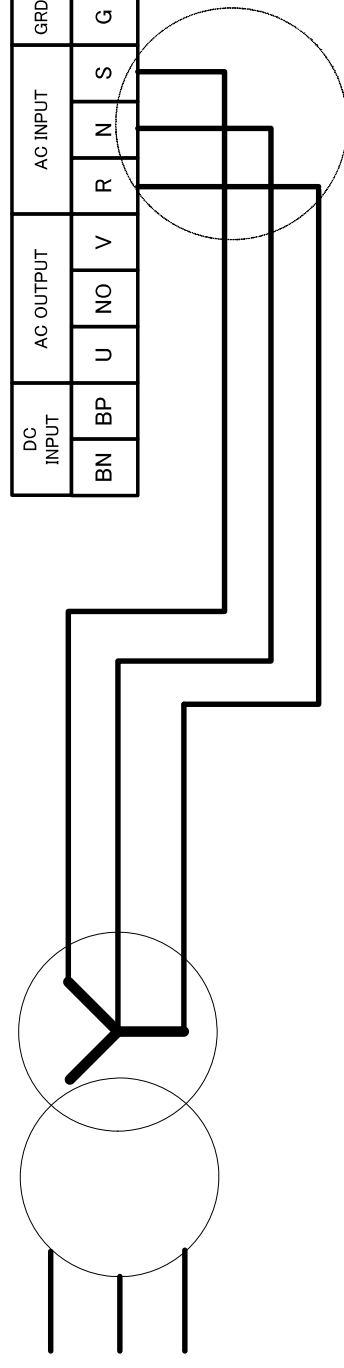
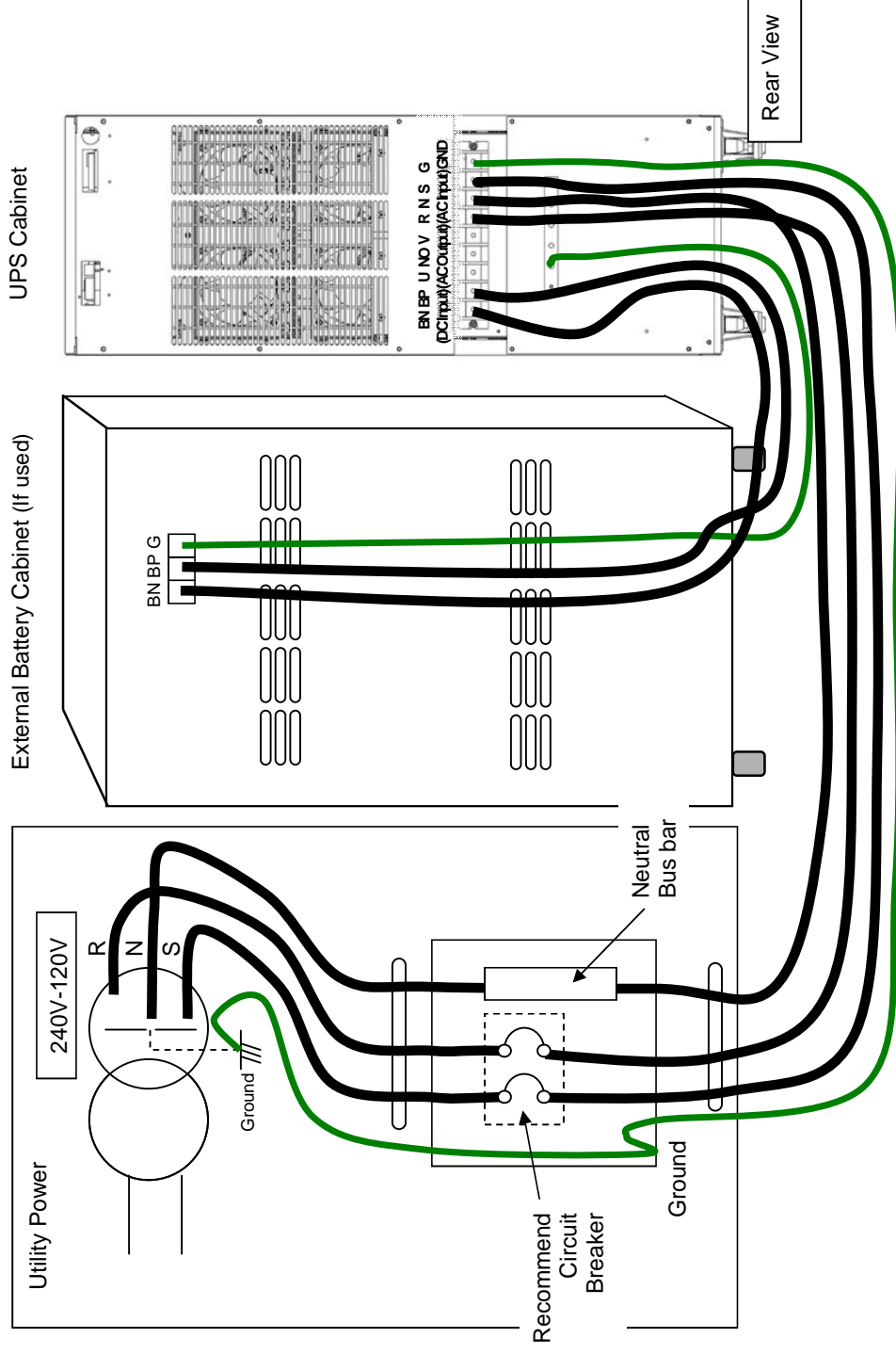


FIGURE 3.9 Field Wire Connection (240V – 120V, 1 phase, 3wire)



*1 : Please refer to the page 3-10

3.5 INSTALLATION PROCEDURE FOR BATTERY

Installation procedures of the batteries are shown on the next page.

Please refer to the following when installing and maintaining batteries:



1. Servicing of batteries should be performed or supervised by personnel knowledgeable of batteries and the required precautions. Keep unauthorized personnel away from batteries.
2. When installing or replacing batteries, install or replace with the same number and type per Table 3.5.

TABLE 3.5 Type and Number of Battery

| | Type | Manufacturer | Number |
|----------------|----------|------------------|--------|
| 6kVA | HF7-12 | Hitachi Chemical | 18 |
| 6kVA | HRL1234W | HCEN (Tentative) | 18 |
| 8,10 and 12kVA | HF7-12 | Hitachi Chemical | 36 |
| 8,10 and 12kVA | HRL1234W | HCEN (Tentative) | 36 |



CAUTION - Do not dispose of battery or batteries in a fire. The battery may explode.

CAUTION - Do not open or mutilate the battery or batteries. Released electrolyte is harmful to the skin and eyes and may be toxic.

CAUTION - A battery can present a risk of electrical shock and high short circuit current. The following precautions should be observed when working on batteries:

- Remove watches, rings, or other metal objects.
- Use tools with insulated handles.
- Wear rubber gloves and boots.
- Do not lay tools or metal parts on top of batteries.
- Disconnect charging source prior to connecting or disconnecting battery terminals.

3.5.1 PROCEDURE FOR EXTERNAL BATTERY CONNECTION (OPTIONAL)

1. Installation procedure

Please refer to **figures 3.4, 3.5, 3.6, 3.7 and 3.9** for connecting terminals.

Must connect external battery before internal battery is connected.

2. Set-up procedure

Please confirm the capacity “Ah (ampere hour) ” of the external battery cabinet.

3.5.2 PROCEDURE FOR INTERNAL BATTERY CONNECTION

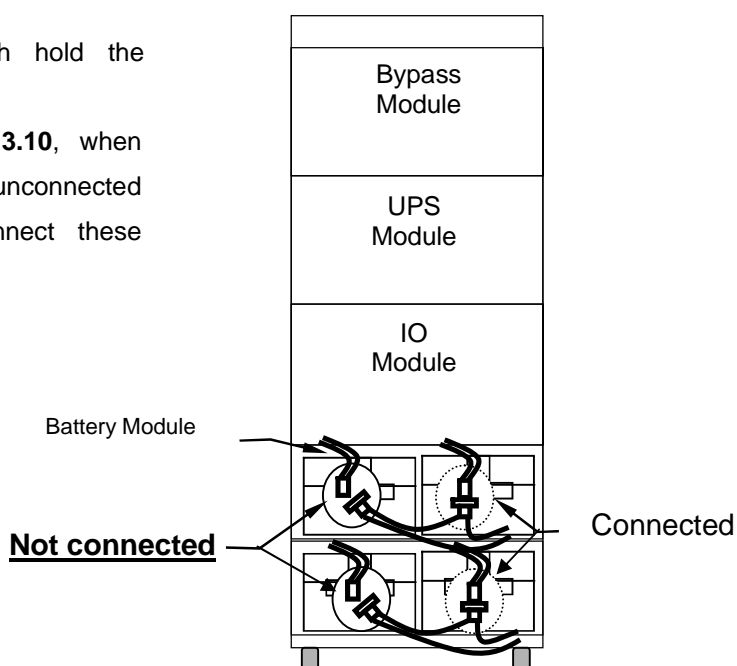
Procedures for battery connection are as follows.

Please note, these procedures **must be performed after** the external cables are connected.

For procedures for external cable connection, please refer to “**3.4 PROCEDURE FOR CABLE CONNECTIONS**”.

FIGURE 3.10 Battery Connection when shipped

1. Remove the straps, which hold the batteries.
2. As shown in the **Figure 3.10**, when shipped, there are unconnected connectors for safety. Connect these unconnected connectors.



For your safety, one side of the connectors is not connected when shipped. Connection of the battery module connectors may apply voltage to B+ / B- connectors on the Field Wire Terminal Block on the rear side of the UPS.

Please be sure to connect the external cables before connecting the battery connectors.

3.6 OPERATING PROCEDURES

A) UPS Startup Procedure

1. Confirm that the Load is turned off.
2. Confirm the batteries are connected in accordance with the battery connection procedures.
3. Confirm the AC Output and the Maintenance Bypass Breakers (both user supplied) are open (off).
4. Manually close the AC Input Breaker (user supplied).
5. Bypass contactor 52S will automatically close. (After an emergency stop the LCD will prompt the user to confirm closing 52S)
6. Manually close the AC Output Breaker (user supplied). UPS is supplying bypass power.
7. Input contactor 52RC will automatically close and the converter will start.
8. DC contactor 72B will automatically close and the batteries will begin pre-charging.
9. On the LCD select "Operation."
10. On the operation screen select "UPS."
11. The inverter will automatically start, output contactor 52C will automatically close and bypass contactor 52S will automatically open. The UPS is supplying power to the load.

B) Bypass Operation Procedure

1. In order to switch to bypass operation the bypass line must be in sync with the inverter.
2. Select "Operation" on the main screen of the LCD.
3. Select "Bypass" on the LCD's operation screen.
4. Bypass contactor 52S will automatically close, output contactor 52C will automatically open.
5. The inverter will automatically turn off. The bypass line is supplying the load.



WARNING: *Verify the load is OFF if the next step is to be performed .*

NOTE: *Power to the critical load is supplied through the static bypass line.
Power to the critical load will be lost after execution of the next step.
The load will drop.*

6. If turning off all power to the critical load is desired, open the AC Input Circuit Breaker (User supplied.).



CAUTION: *In bypass mode, all UPS power terminals are still alive. Lethal voltages are present. De-energize all external sources of AC and DC power before handling UPS.*

C) UPS Shutdown Procedure

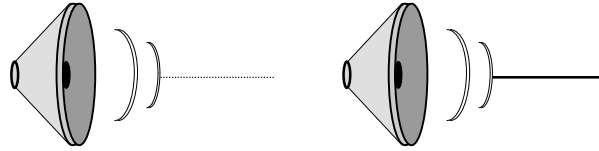
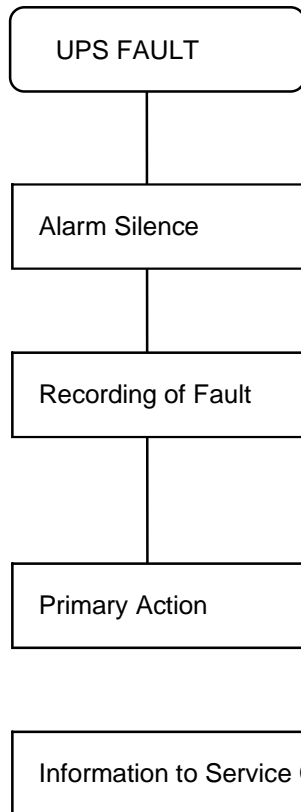
1. Confirm that the load is turned off.
2. Manually open the AC Output Breaker (user supplied).
3. Select "Operation" on the main screen of the UPS.
4. On the operation screen, select "Bypass."
5. Bypass contactor 52S will automatically close, output contactor 52C will automatically open.
6. The inverter will automatically turn off, the unit is now in normal stop. The converter continues to charge the batteries. For full shutdown follow the steps below.



WARNING: *With this operation, although all output power from the UPS is shutdown, it is necessary to manually open the input circuit breaker (user supplied), to remove the input power to the UPS*

7. Confirm that the AC Output and Maintenance Bypass Breakers (both user supplied) are open.
8. Manually open the AC Input Breaker (user supplied).
9. Input contactor 52RC will automatically open, the converter will automatically turn off, DC contactor 72B will automatically open.
10. Full stop operation complete.

4.0 RESPONSE TO UPS FAILURE



On the main screen of the LCD, select "BZstop" to silence the alarm.

Select "LOG" on the LCD. Record fault code on a piece of paper. Refer to the list of fault codes for a description of the error. See section 6 For fault codes

Take necessary action per the list of fault codes in section 6 of this manual.

If Service is needed contact the Authorized Mitsubishi Service Representative or call Mitsubishi at:

1-800-887-7830.



NOTE

The error code indicated on the LCD at the time of UPS alarm condition is very important. In order to minimize repair time, please include this information along with the operation status and load status, on all correspondence with Mitsubishi's field service group.

5.0 PARTS REPLACEMENT

Contact Mitsubishi Electric Power Products, Inc. or its authorized service representatives on all issues regarding the replacement of parts.

A) Battery

Battery lifetime may vary according to the frequency of use and the average ambient operating temperature. The end of battery life is defined as the state of charge resulting in an ampere-hour capacity less than, or equal to, 80% of nominal capacity.

Replace battery if its capacity is within this percentage.

B) UPS Component Parts

Contact Mitsubishi Electric Power Products, Inc. or its authorized service representatives for a complete parts replacement schedule. Recommended replacement time interval varies with operating environment.

Contact Mitsubishi Electric Power Products, Inc. or its authorized service representatives for application specific recommendations.

6.0 FAULT CODES

This section covers the fault codes, their description and required action.

At time of error :

- A) Verify and record the occurrence of the alarm. Note fault code on the LCD.



*Contact Mitsubishi Electric Power Products, Inc. at
1-800-887-7830.*

- B) If the External AC Input Circuit Breaker (MCCB) is in the trip state, depress the toggle to reset the breaker before re-closing.

TABLE 6.1 Failure Code List

| Failure Code | Status | Guidance | Note 1 Level | Note 2 Failure LED | Note 3 Buzzer | Note 4 Event Log |
|--------------|--|-----------------------|--------------|--------------------|---------------|------------------|
| 003 | Pre-charge abnormal | Call service engineer | Major | Lit On | [2] | [3] |
| 061 | Converter1 Control Abnormal | Call service engineer | Minor | Flicker | [1] | [3] |
| 062 | Converter2 Control Abnormal | Call service engineer | Minor | Flicker | [1] | [3] |
| 102 | DC Overvoltage | Call service engineer | Major | Lit On | [2] | [3] |
| 103 | DC Undervoltage | Call service engineer | Major | Lit On | [2] | [3] |
| 104 | Discharge Fault | Call service engineer | Minor | Flicker | [1] | [3] |
| 109 | DC Voltage Unbalance | Call service engineer | Major | Lit On | [2] | [3] |
| 112 | DC Voltage Sudden Change | Call service engineer | Major | Lit On | [2] | [3] |
| 151 | Battery Float Voltage Abnormal | Call service engineer | Minor | Flicker | [1] | [4] |
| 154 | 72B Abnormal | Call service engineer | Minor | Flicker | [1] | [3] |
| 156 | Battery Temperture Abnormal (72B OFF) | Call service engineer | Minor | Flicker | [1] | [3] |
| 157 | Battery Temperture Abnormal | Check battery | Minor | Flicker | [1] | [4] |
| 161 | Float Voltage Abnormal (72B OFF) | Check battery | Minor | Flicker | [1] | [3] |
| 162 | Battery Circuit Abnormal | Call service engineer | Minor | Flicker | [1] | [3] |
| 163 | Battery Voltage Abnormal | Call service engineer | Minor | Flicker | [1] | [3] |
| 171 | Battery Lifespan Notice | Information | Minor | Flicker | [1] | – |
| 172 | Battery End of Life | Information | Minor | Flicker | [1] | – |
| 173 | Disconnect Batteries End of Life | Information | Minor | Flicker | [1] | – |
| 181 | Module 1 Chopper Control Abnormal | Call service engineer | Minor | Flicker | [1] | – |
| 182 | Module 2 Chopper Control Abnormal | Call service engineer | Minor | Flicker | [1] | – |
| 191 | Module 1 DC Overvoltage | Call service engineer | Minor | Flicker | [1] | – |
| 192 | Module 2 DC Overvoltage | Call service engineer | Minor | Flicker | [1] | – |
| 201 | Output Overvoltage | Call service engineer | Major | Lit On | [2] | [3] |
| 202 | Output Undervoltage | Call service engineer | Major | Lit On | [2] | [3] |
| 218 | Inverter Voltage DC Component Increase | Call service engineer | Major | Lit On | [2] | [3] |
| 230 | Load Current Connector Abnormal | Call service engineer | Major | Lit On | [2] | – |
| 254 | Bypass Voltage Alignment Abnormal | Call service engineer | Minor | Flicker | [1] | – |
| 256 | Inverter Output Voltage Abnormal | Call service engineer | Minor | Flicker | [1] | [3] |
| 258 | Load Abnormal (overload switching) | Call service engineer | Minor | Flicker | [1] | [3] |
| 261 | Inverter1 Control Abnormal | Call service engineer | Minor | Flicker | [1] | [3] |
| 262 | Inverter2 Control Abnormal | Call service engineer | Minor | Flicker | [1] | [3] |
| 271 | Inverter1 Overcurrent | Call service engineer | Minor | Flicker | [1] | [3] |
| 272 | Inverter2 Overcurrent | Call service engineer | Minor | Flicker | [1] | [3] |
| 281 | Unit1 Heat Sink Temperature Abnormal | Call service engineer | Minor | Flicker | [1] | [3] |
| 282 | Unit2 Heat Sink Temperature Abnormal | Call service engineer | Minor | Flicker | [1] | [3] |
| 301 | Control Circuit Error | Call service engineer | Major | Lit On | [2] | [3] |
| 302 | Control Circuit Error | Call service engineer | Major | Lit On | [2] | [3] |
| 303 | Control Circuit Error | Call service engineer | Major | Lit On | [2] | [3] |
| 305 | Control Circuit Error (clock) | Call service engineer | Major | Lit On | [2] | [3] |

| Failure Code | Status | Guidance | Note 1 Level | Note 2 Failure LED | Note 3 Buzzer | Note 4 Event Log |
|--------------|---|--------------------------|--------------|--------------------|---------------|------------------|
| 306 | Control Circuit Power Supply Abnormal | Call service engineer | Major | Lit On | [2] | [4] |
| 323 | Conversion Module Serial Communication Error | Call service engineer | Major | Lit On | [2] | [3] |
| 349 | Major Fault in All Conversion Modules | Call service engineer | Major | Lit On | [2] | — |
| 351 | Equipment Lifespan Notice | Information | Minor | Flicker | [1] | — |
| 352 | Bypass Switching Power Supply Abnormal | Call service engineer | Minor | Flicker | [1] | — |
| 371 | Conversion Module Serial Communication Error | Call service engineer | Minor | Flicker | [1] | [3] |
| 372 | Control Circuit Error | Call service engineer | Minor | Flicker | [1] | [3] |
| 401 | 52S Abnormal | Call service engineer | Major | Lit On | [2] | [3] |
| 402 | 52S Abnormal | Call service engineer | Major | Lit On | [2] | [3] |
| 451 | 52S Abnormal | Call service engineer | Minor | Flicker | [1] | [3] |
| 455 | Bypass Circuit Abnormal | Call service engineer | Minor | Flicker | [1] | [3] |
| 552 | Simulated Failure | — | Major | Lit On | [2] | — |
| 801 | AC Input Voltage Out of Range | Check Input Power Source | Alarm | Flicker | [1] | [4] |
| 802 | AC Input Frequency Out of Range | Check Input Power Source | Alarm | — | [1] | [4] |
| 803 | AC Input Phase Rotation Error | Swap R and S | Alarm | Lit On | [2] | [3] |
| 806 | Inverter Overload | Warning: Decrease Load | Alarm | Flicker | [1] | [4] |
| 807 | Inverter Overload | Warning: Decrease Load | Alarm | Flicker | [1] | [4] |
| 808 | Overload Warning | Warning: Decrease Load | Alarm | Flicker | [1] | [4] |
| 809 | OverKW Warning | Warning: Decrease Load | Alarm | Flicker | [1] | [4] |
| 810 | Instant Overload | Warning: Decrease Load | Alarm | — | [1] | [3] |
| 812 | Input Voltage Abnormal | Check Bypass Input | Alarm | — | [1] | — |
| 814 | Input Frequency Abnormal | Check Bypass Input | Alarm | Flicker | [1] | [4] |
| 817 | Emergency Stop Activated | — | Alarm | Flicker | [2] | [3] |
| 831 | Emergency Bypass Switch Activated | Call service engineer | Alarm | — | [1] | — |
| 834 | Battery Depleted | — | Alarm | Flicker | — | [3] |
| 835 | Battery Depletion Warning | Reduce load | Alarm | Flicker | — | — |
| 840 | Shutdown Complete (Battery charging - terminal block) | — | Alarm | — | — | — |
| 841 | Shutdown Complete (Battery charging - RS-232C) | — | Alarm | — | — | — |
| 845 | Serial Communication Path Abnormal | Call service engineer | Alarm | — | [1] | — |
| 860 | Remote Start/Stop Abnormal | Call service engineer | Alarm | — | [1] | — |
| 861 | INV/BYP SEN1 abnormal | Call service engineer | Alarm | — | [1] | — |
| | | | | | | |
| | | | | | | |

Note 1) Level

"Major" is defined as a major failure. Load transferred from inverter to the static bypass line.

"Minor" is defined as a minor failure. UPS continues to operate normally, but cause of alarm must be identified.

Note 2) Failure LED

Indicates one of two possible LED illumination patterns - continuously on (lit) or intermittent (flicker).

Note 3) Buzzer (Audible annunciator)

[1]:Intermittent Sound [2]:Continuous Sound

Note 4) Event log: In case of major failures, log 10 items after the failure.

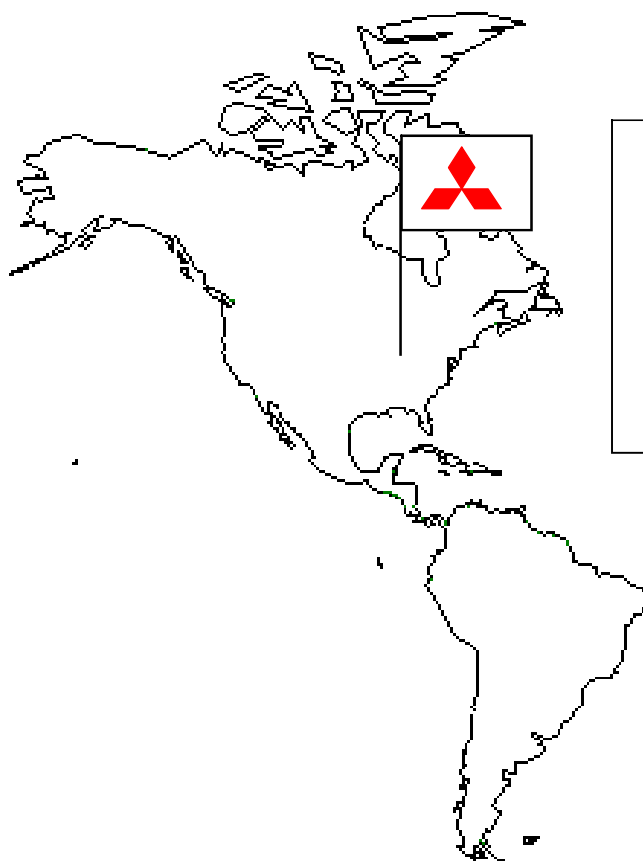
[3]: Log time and item name at time of fault. In some cases, it isn't logged.

[4]: Log time and item name at time of fault and clear.

7.0 WARRANTY & OUT OF WARRANTY SERVICE

The Mitsubishi Electric UPS Division Service Department has many Authorized Service Centers placed strategically throughout the US, Canada and Latin America. For both in warranty and out of warranty service, please contact Mitsubishi Electric Power Products, Inc. at (724) 772-2555. To register your UPS for warranty purposes, please complete the warranty registration form and fax it to the Mitsubishi Electric UPS Division Service Department fax line shown on the registration form. (Next page)

For warranty purposes, it is essential that any and all service work that may be required on your Mitsubishi brand UPS equipment is performed by a Mitsubishi Electric Authorized Service Center. The use of non-authorized service providers may void your warranty.



Mitsubishi Electric Power Products, Inc
UPS Division Service Department

530 Keystone Drive,
Warrendale, PA 15086, USA
Phone: (724) 772-2555
Fax: (724) 778-3146

**Mitsubishi Electric Power Products,
Inc.****UNINTERRUPTIBLE POWER SUPPLIES**

530 Keystone Drive, Warrendale, PA 15086 Phone: (724) 772-2555, Fax: (724) 778-3146

UPS Warranty Registration

☐ Register UPS for Warranty☐ Address Change

To validate the Warranty on your UPS this form must be filled out completely by
Customer and returned.

| CUSTOMER INFORMATION | | | |
|-------------------------------|--|---|----------------------|
| Your Name: | | Job Title: | |
| Company Name: | | | |
| Division / Department: | | | |
| Address: | | | |
| City: | | State: | Zip Code: |
| Country: | | Province: | |
| Business Phone: | | Ext: | Fax: |
| E-Mail: _____@_____ | | Internet Address: | |
| UPS Model #: | | Capacity (kVA): | UPS Serial #: |
| Start-Up Date: ____/____/____ | | Authorized Mitsubishi Service Company (if known): | |
| Signature: _____ | | | Date: ____/____/____ |

Which **ONE** of These Best Describes Your Organization's
Primary Business Classification?

{Energy Producer}

- ☐ Utility
☐ Alternate Energy

{Manufacturing Co.}

- ☐ OEM
☐ Process
☐ Consumer Goods
☐ Electronics
☐ Power Quality Equipment

Commercial Business

- ☐ Electrical Contractor
☐ Healthcare
☐ Internet
☐ Education/Univ. Service

{Service}

- ☐ Consulting
☐ Engineering
☐ Outsourcing
☐ Financial/Legal/Insurance

{Government}

- ☐ Military
☐ Municipals
☐ Federal/State/Local

Communications

- ☐ Distributors/Reps
☐ Other _____

Number of Employees at This Location is:

- ☐ 1 - 19 ☐ 100 - 249 ☐ 1000 or more
☐ 20 - 49 ☐ 250 - 499
☐ 50 - 99 ☐ 500 - 999

Overall how was Start-Up performed:

- ☐ Unsatisfactory ☐ Satisfactory ☐ Exceeded Expectations

Would you like to receive future product updates and news?

- ☐ Yes ☐ No

**After Start-Up has been done Fax completed Form to:
(724) 778-3146**