

**MITSUBISHI
ELECTRIC**

UNINTERRUPTIBLE POWER SUPPLY SYSTEM

MODEL

9700 SERIES

OWNERS / TECHNICAL MANUAL

Preface

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INTRODUCTION

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

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS

This manual contains important instructions for the 9700 SERIES Uninterruptible Power Supply Systems that should be followed during installation and maintenance of the UPS and batteries.

WARNING 1

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

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.

SAFETY PRECAUTIONS**APPLICATION**

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

This UPS shall NOT be applied to support equipment (*) that could affect the human lives, such as:

- *
 - 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:

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 5 and 95%. There must be no condensation due to temperature changes.	
4	Altitude	This equipment must not be applied at altitude that exceeds 1520m(5000ft) 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 0.003 PPM
		Sulfurous acid gas (SO ₂)	No more than 0.01 PPM
		Chlorine gas (Cl ₂)	No more than 0.0005 PPM
		Ammonia gas (NH ₃)	No more than 1 PPM
		Hydrogen fluoride (HF)	No more than 0.001 PPM
		Nitrous oxides (NO _x)	No more than 0.05 PPM
		Ozone (O ₃)	No more than 0.002 PPM

WARNING 4

This UPS does not include a Bypass Input circuit breaker (MCCB). The Bypass Input contactor (CB3) does not protect against load induced short circuits. The bypass input circuit breaker (MCCB) is field supplied and installed. Breaker(MCCB)'s Specifications are as follows:

Capacity (kVA)	Bypass Voltage (VAC)	Maximum Bypass Rating (AAC)	Recommended Breaker (A)
100	208	278	350
150	208	416	500
225	208	625	700

1.0 GENERAL

The Mitsubishi 9700 Series UPS is designed to provide continuous, clean electrical power to your critical load and to monitor power conditions affecting that 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, back up 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 9700 Series UPS is available in three kVA sizes-100, 150, 225kVA. Specifications for each kVA model appear in Section 1.3. The principles of operation described herein are applicable to all models.

This manual provides an overview of the 9700 Series components and their functions. It describes the appearance and purpose of operator controls and indicators. It contains procedures for operation, start-up, shutdown, and basic maintenance.

1.1 Definitions

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

UPS MODULE CABINET - The metal enclosure which contains the Converter / Charger, the Inverter, the Static Transfer Switch, the Internal Bypass line, the operator controls, and the internal control system required to provide specified AC power to a load.

UPS MODULE - The Converter / Charger and Inverter assemblies which, under the direction of the internal control system and operator controls, provide specified AC power to a load.

CONVERTER / CHARGER - The UPS components which contain 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 components 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.

STATIC TRANSFER SWITCH - The device which connects the critical load to the bypass line when the UPS module cannot supply continuous power.

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

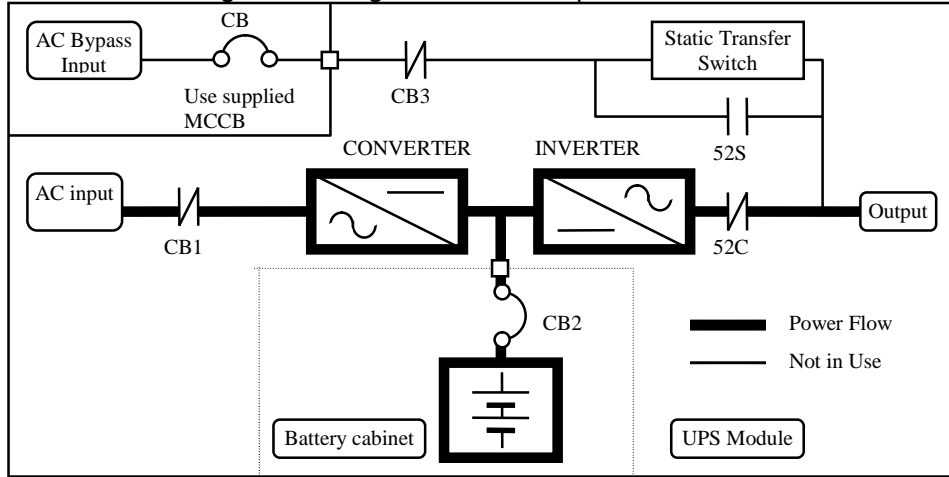
INPUT POWER - Power provided by the electrical utility company, or auxiliary generator, which is connected to the UPS for supplying the critical load.

1.2 Overview

The UPS provides two power paths between the utility source and the critical load as shown in figures 1.1 and 1.2.

A) Through the UPS Module (FIGURE 1.1)

FIGURE 1.1 Single Line Diagram - Normal Operation



When the load is on the Inverter, the internal control system determines which of the two paths supplies power to the load. During normal operation, the path through the UPS module is used.

Input AC power flows through the UPS where it is converted to DC by the Converter / Charger. This 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.

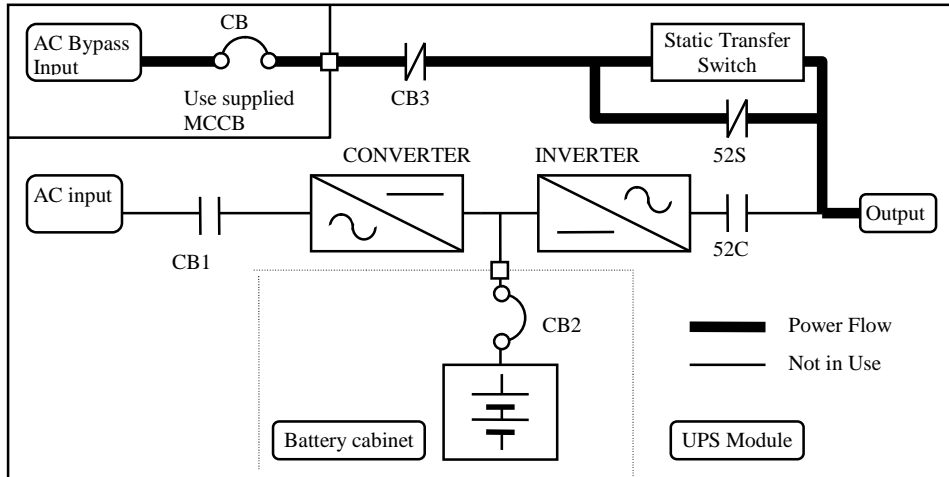
The conversion - inversion process eliminates any voltage transients or fluctuations existing in the input power before it reaches the critical load.

* The Bypass Input circuit breaker (MCCB) for protection of the UPS and cables is field supplied and field installed. (See WARNING 4 on page vii)

B) Internal Static Bypass Line (FIGURE 1.2)

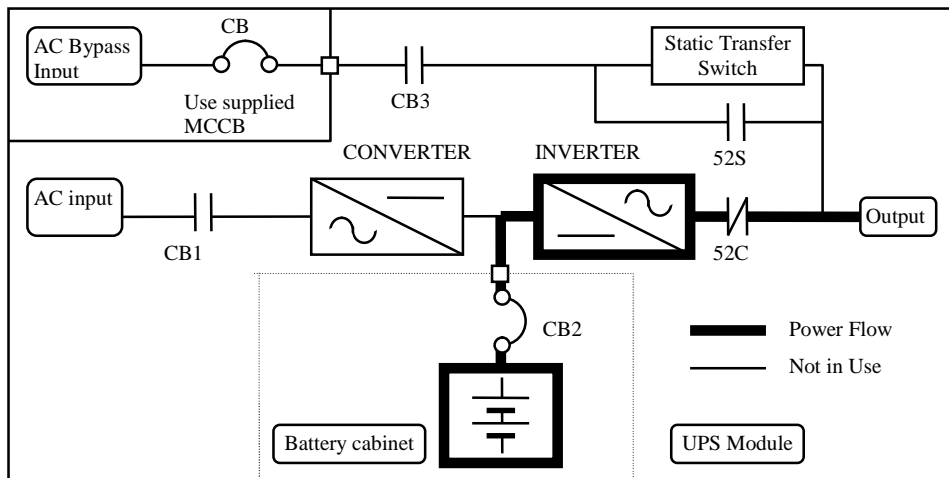
The Internal Static Bypass line is a Hard wired line through CB3, contactor 52S which supplies the critical load with unconditioned input power. The purpose of this line is to route power to the critical load while the UPS module is de-energized during Start-up before the system is fully operational.

FIGURE 1.2 Single Line Diagram- Bypass Operation



C) Inverter supply at battery operation (FIGURE 1.3)

FIGURE 1.3 Single Line Diagram - Battery Operation



If the input power is interrupted, the battery will immediately supply the DC power required by the Inverter to maintain continuous AC power to the load. A fully charged battery will provide power for the specified time at the rated load, or longer, at a 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 rectifier will de-energize and the batteries will discharge into the inverter and maintain power to the critical until a) the battery capacity expires and the inverter turns off, or b) input power is restored after which the converter will power the critical load and simultaneously recharge the batteries. Figure 1.3 illustrates the flow diagram during battery operation.

FIGURE 1.4-a UPS Parts Location (100kVA)

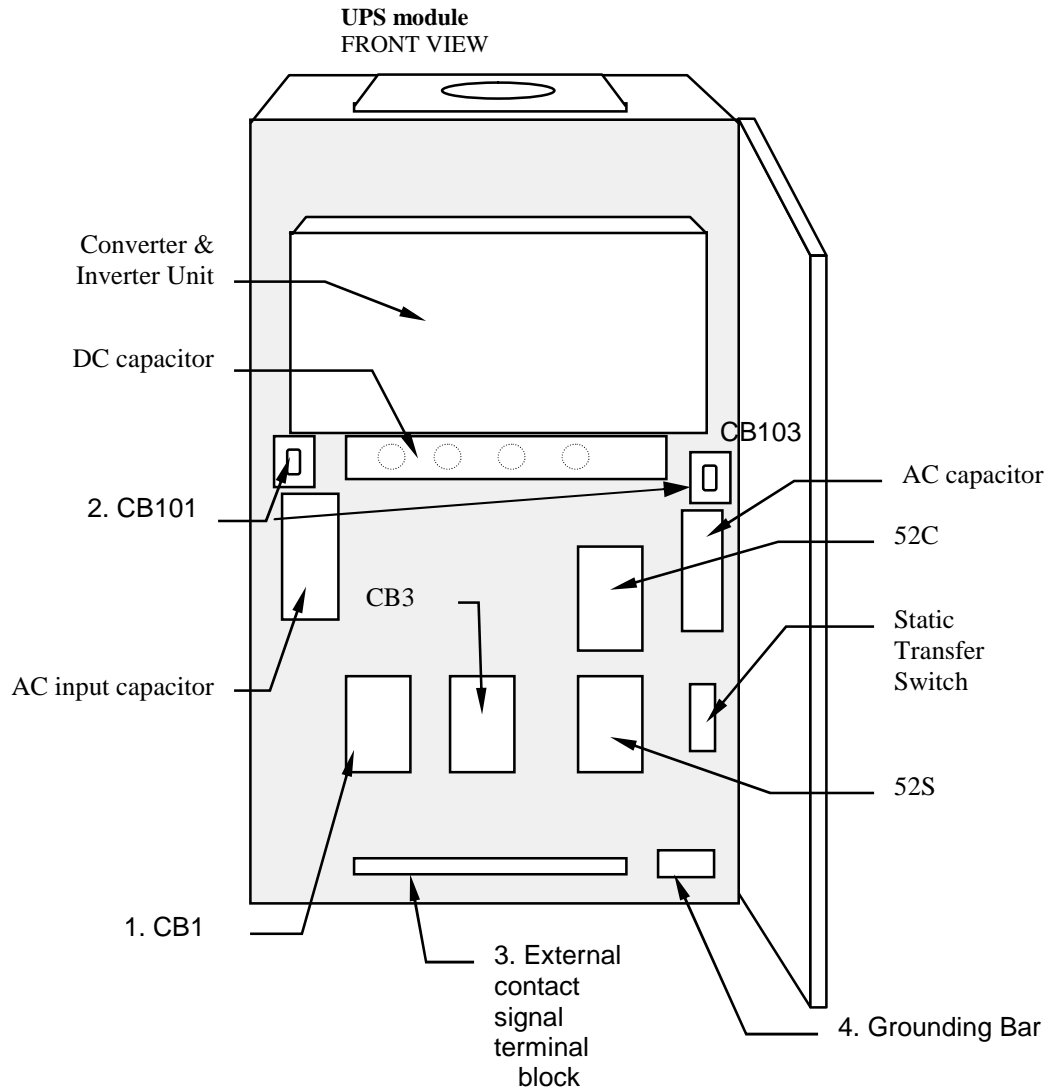
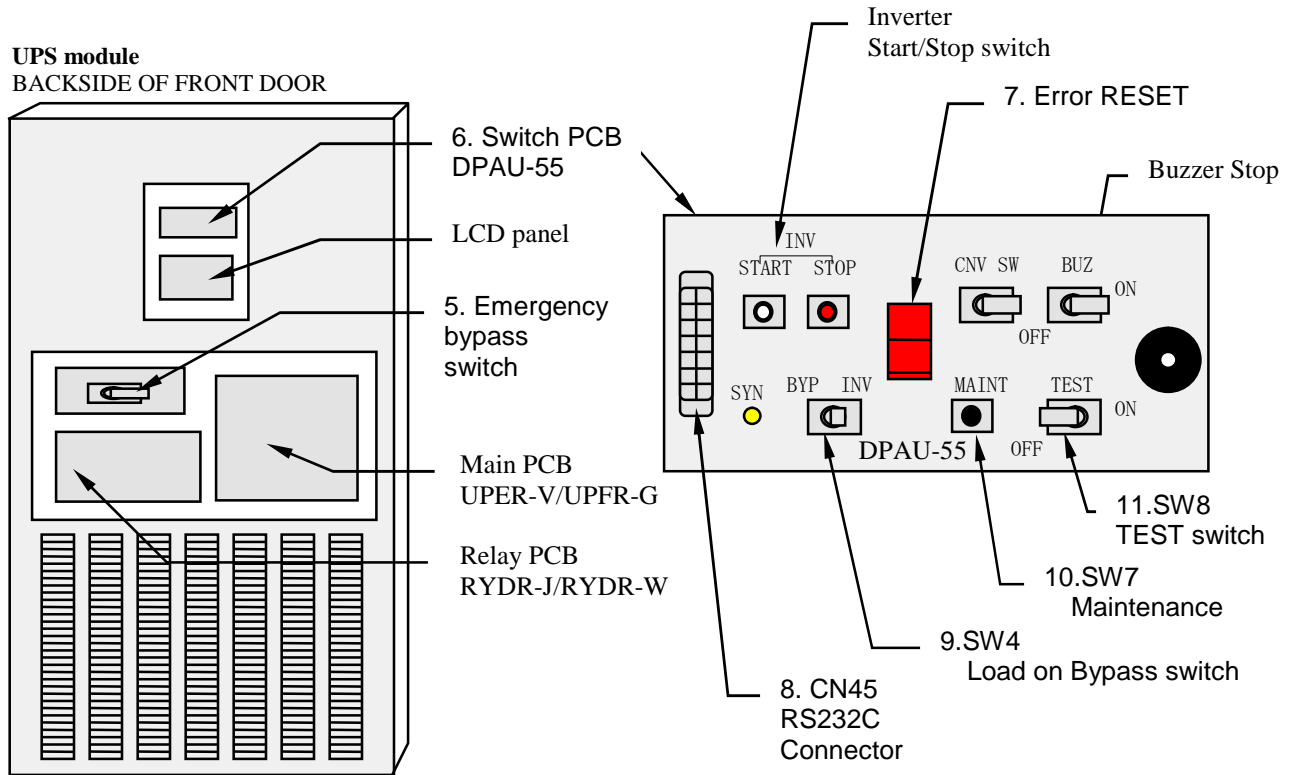


FIGURE 1.4-b UPS Parts Location (Continued)



Description of Figure 1.4:

1. **AC Input circuit breaker (CB1)** Circuit breaker for converter input power .
2. **Control Power circuit breaker (CB101, CB103)**
3. **External contact signal terminal block** Terminal block to connect contact signal input/output lines to and from the external devices. Refer to FIGURE 2.15 for details.
4. **Grounding bar (E)**
5. **Emergency bypass switch.** This switch activates bypass power supply for emergency reasons if the UPS is turned off. Normal position is "TRANSFER is PERFORMED"
6. **Switches on the DPAU-54(PCB) (FOR SERVICE PERSONNEL ONLY)**
Normally the customers do not have to operate those switches.
 - SW4 (Load on Bypass switch) (9)
 - SW3 (Maintenance Set button) (10)
 - SW5 (TEST Switch): Normal = "Off" side. ()
 - SW6 (Error RESET) (11)
7. **"Error reset" switch** This switch resets errors resulting from alarm conditions.
(Do not operate this switch while inverter and converter are in operation.)
8. **RS232C connector (CN45)**
9. **Bypass manual change-over button (FOR SERVICE PERSONNEL ONLY)**
This switch is used to transfer the UPS from inverter to static bypass for maintenance purposes. Do not operate it under normal operation. Transfers will be lock-out if the bypass voltage is more than +10%,-10% of nominal.
 - 1) Uninterrupted switching is made at the time of synchronous operation. Switching is impossible at the time of asynchronous operation.
 - 2) Return to "Normal" after use.
10. **Maintenance (Set) button** This switch sets the UPS menu parameters.
11. **"Test mode" switch** This switch should be operated by Authorized Service Personnel only.

1.3 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 1.1 Power Specifications

Rated output Power	Input voltage 3 Φ / 3 wire	Output voltage 3 Φ /3 or 4 wire
100kVA / 80kW	208V	208V
150kVA / 120kW	208V	208V
225kVA / 180kW	208V	208V

TABLE 1.2 UPS Module Information

UPS [kVA]	CABLE ENTRY	WIDTH [in / mm]	DEPTH [in / mm]	HEIGHT [in / mm]	WEIGHT [lb./ kg]	HEATING [kBTU/h]
100	BOTTOM	35.4 / 900	30.5 / 774	79.7 / 2025	1900 / 860	31.0
150	BOTTOM	47.2 / 1200	30.5 / 774	79.7 / 2025	2350 / 1065	45.3
225	BOTTOM	55.1 / 1400	30.5 / 774	79.7 / 2025	3300 / 1495	63.0

TABLE 1.3 Detail of Specifications

Rated Output kVA	100	150	225
Rated Output kW	80	120	180
AC INPUT CHARACTERISTICS			
Configuration	3 phase, 3 wire		
Voltage	208 V +10% ~ -15%		
Input Power Factor	0.98 Typical		
Frequency	60 Hz \pm 5%		
Reflected Current THD	3% max. at 100% load; 5% max. at 50% load		
STATIC BYPASS INPUT			
Configuration	3 phase, 3 or 4 wire		
Voltage	120/208 V \pm 10%		
Frequency	60 Hz (\pm 3% Tracking window)		
BATTERY			
Type	VRLA, Flooded Lead Acid, Nickel Cadmium		
Ride Through	Application Specific		
Nominal Voltage	360 VDC		
Minimum Voltage	290 VDC		
Number of Cells	176 ~ 185		
AC OUTPUT			
Configuration	3 phase, 3 or 4 wire		
Voltage	120/208 V		
Voltage Stability	\pm 1%		
Frequency	60 Hz		
Frequency Stability	\pm 0.01% in free running mode		
Power Factor	0.8 nominal		
Power Factor range	0.8 ~ 1.0 lagging (within output kW rating)		
Voltage THD	2% maximum THD at 100% Linear Load 5% maximum THD at 100% non-linear load		
Transient Response	\pm 2% maximum at 100% load step \pm 1% maximum at loss or return of AC power \pm 5% maximum at load transfer to/from static bypass		
Transient Recovery	Less than 1 line cycle		
Voltage Unbalance	1% maximum at 100% unbalanced load		
Phase Displacement	1% maximum at 100% unbalanced load		
Inverter Overload	125% for 10 minutes; 150% for 1 sec		
System Overload	500% for 2 cycle (with bypass available)		
Bypass Overload	125% for 10 minutes		
Withstand Rating	65kA*		*:with optional fuses
ENVIRONMENTAL			
Cooling	Forced Air		
Operating Temperature	2° F ~ 104° F (0° C ~ 40° C). Recommended 68° F ~ 86° F (20° C ~ 30° C)		
Relative Humidity	5% ~ 95% Non Condensing		
Altitude	3300 Feet (1000 meters); 5000 feet @ 0.99 derating		
Location	Indoor (free from corrosive gases and dust)		
Paint Color	Munsell 5Y7/1 (Beige)		



TABLE 1.4 Rating of Contactors / Circuit Breakers and Fuses

Parts No.	APPLICATION	OUTPUT CAPACITY OF EQUIPMENT		
		100kVA	150kVA	225kVA
CB1	AC input contactor	300A	420A	680A
CB2	Battery disconnect circuit breaker	400A	600A	800A
CB3	Bypass input contactor	300A	420A	680A
52S	Bypass contactor	300A	420A	680A
52C	AC output contactor	300A	420A	680A
CB101, 103	Control circuit protector	15A		
88C, 88R, 88RC	Control circuit contactor	20A		
FCU, FCV, FCW, FCX, FCY, FCZ	Converter circuit fuse	AC690V 450A	AC690V 630A	AC550V 900A
(OPTION) FSU, FSV, FSW	Bypass circuit fuse	AC690V 450A	AC690V 630A	AC550V 900A
FUD1, 2	Control power fuse	DC500V 10A		
FZS1, 2, 3	Bypass input ZNR fuse	AC600V 30A		

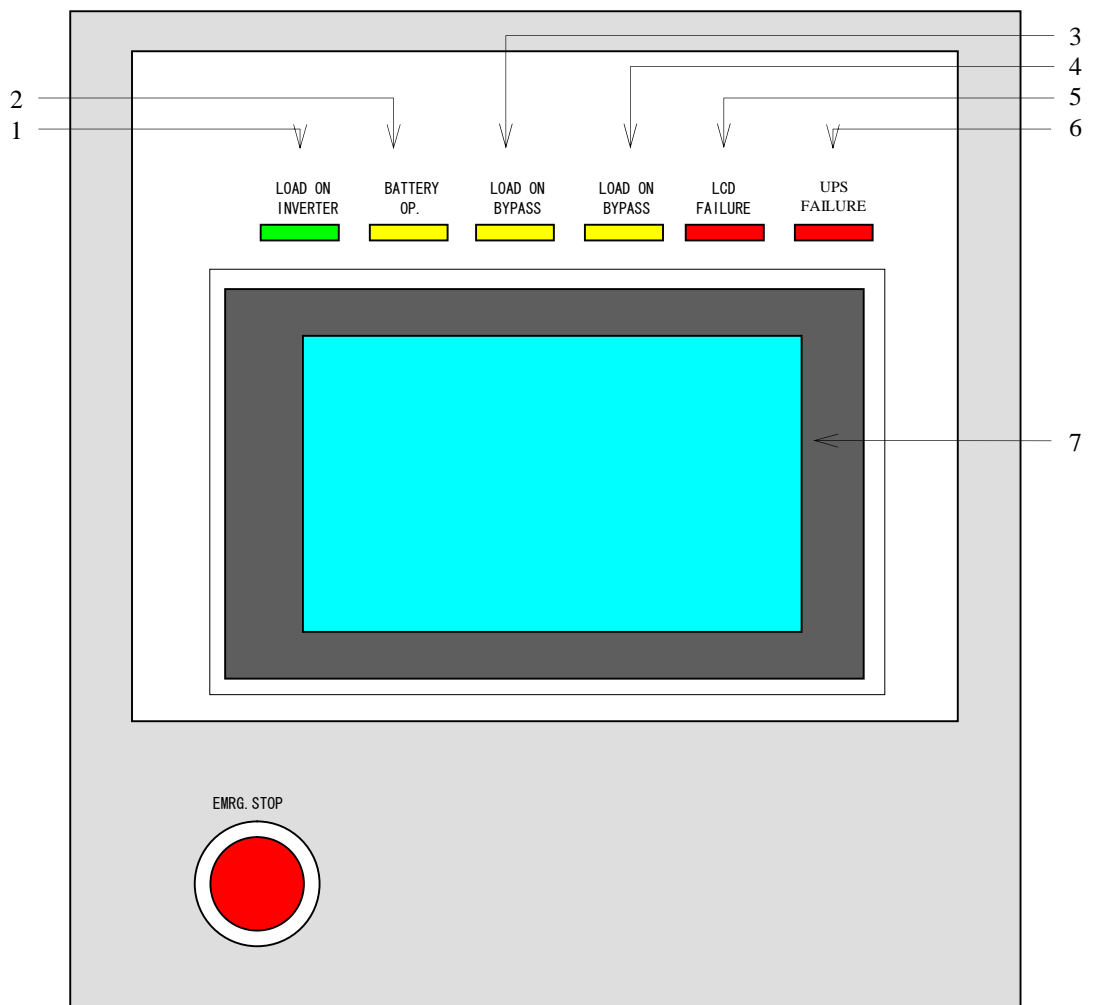
2.0 OPERATOR CONTROLS AND INDICATORS

The 9700 Series operator controls and indicators are located as follows:

Circuit breakers and contactors : Inside the module

UPS status indicators : Outside of door

FIGURE 2.1 Operation/Display Panel (Front panel)



2.1 LED Display

1) **Load on inverter (green)**

Turned on when power is supplied from inverter to the critical load.
(Indicates the state of transfer switch "52C" of inverter.)

2) **Battery operation (orange)**

Turned on when the battery is operating following an AC power failure..

3) **Load on bypass (orange)**

Turned on when power is supplied through bypass to load devices.
(Indicates the state of transfer switch "52S" of bypass.)

4) **Overload(orange)**

Turned on when an overload has occurred to the system.

5) **LCD failure [LCD FAIL](red)**

Turned on when an error occurs on the LCD.

6) **UPS failure [UPS FAIL](red) [Annunciator: intermittent or constant tones]**

Turned on when an error occurs on the system. In this case, the details of error are indicated on the display panel.

2.2 Liquid Crystal Display (7)

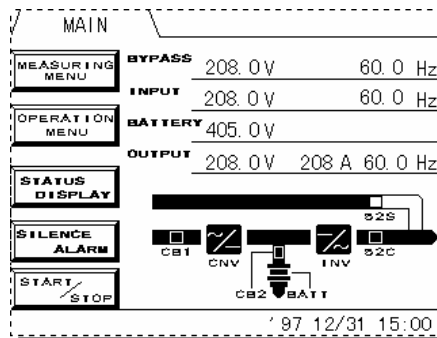
The Liquid Crystal Display (LCD) panel indicates the power flow, measured values, operational guidance, data record and error messages. The LCD panel is back-lit to facilitate viewing in different ambient lighting conditions. The LCD will automatically clear if the keyboard is not activated for 3 minutes. The ERROR indicator is cleared after 24 hours and can be reproduced by pressing any key on the panel.

2.2.1 Menu's

A) MAIN MENU (FIGURE 2.2)

The LCD panel indicates the power flow, measured values and remote operation mode. The LCD panel shows the power flow. This allows the user to verify the status of the UPS Module.

FIGURE 2.2 Main screen

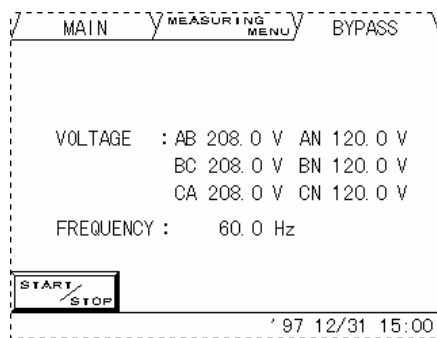


The following will be displayed when the measuring point button on LCD panel is pressed.

1) Bypass Voltage (FIGURE 2.3)

The voltages displayed are the Bypass input voltages (line-to-line) between phases A-B, B-C, C-A and frequency of the Bypass line. Line to neutral voltages A-N, B-N, C-N are measured on 4 wire systems only.

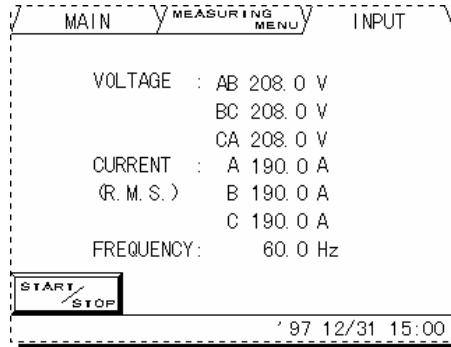
FIGURE 2.3 Bypass screen



2) Input Voltage and Current (FIGURE 2.4)

The voltages displayed are the RMS AC input voltages (line-to-line) between phases A-B, B-C C-A and frequency of the AC input line. The RMS values of Phases A, B and C currents are also displayed.

FIGURE 2.4 Input screen



3) Output Voltage, Output Current and Trend Graph

The voltages displayed on the LCD include the inverter output voltages A-B, B-C, C-A. Line to neutral voltages A-N, B-N, C-N are displayed on 4 wire systems only. Inverter output frequency is also displayed. (FIGURE 2.5)

The current displayed and the RMS values and Peak Values of Phases A, B, C, N-current (Neutral) is display on a 4 wire system only. (FIGURE 2.6)

The Trend Graph displays the Effective power values and the Reactive power values. (FIGURE 2.7)

FIGURE 2.5 Output voltage screen

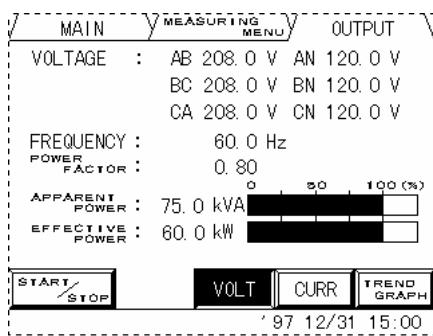


FIGURE 2.6 Output current screen

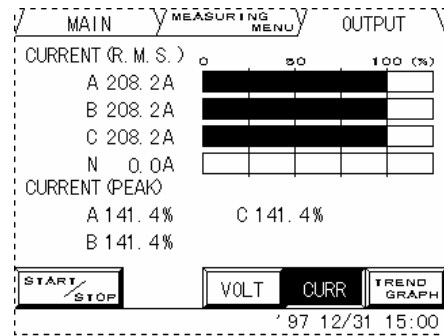
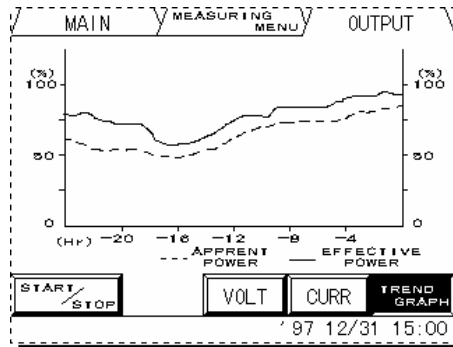


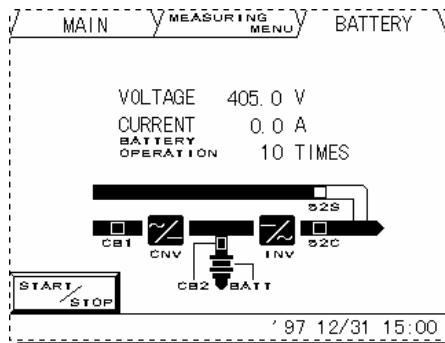
FIGURE 2.7 Trend graph screen



4) Battery (FIGURE 2.8)

This displays the charging, discharging or float mode of the battery, battery current and battery voltage.

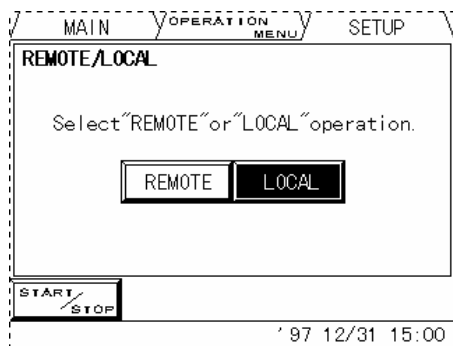
FIGURE 2.8 Battery screen



5) Remote / Local Selection (FIGURE 2.9)

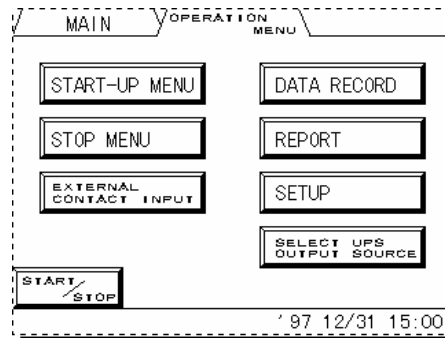
The system asks user to select whether the start & stop operation will be performed by a local or remote operation.

FIGURE 2.9 Remote / Local selection



B) OPERATION MENU (FIGURE 2.10)

The following will be displayed when the OPERATION MENU button is pressed on the LCD

FIGURE 2.10 Operation menu screen**1) START-UP MENU**

The display indicates the operation from closing circuit breakers to starting the inverter. When the inverter is started, the display shows the MAIN MENU. When the display changes, the annunciator sounds 3 times requesting user to perform next procedure.

2) STOP MENU

The display indicates the operation of how to stop the inverter and to shutdown the UPS system.

3) EXTERNAL CONTACT INPUT

The input of external contacts is indicated by closed or open contacts.

4) DATA RECORD

Operation data and events is indicated.

5) REPORT

Record data is indicated.

6) SETUP

Time, Remote/Local selection and Equalizing charge are set.

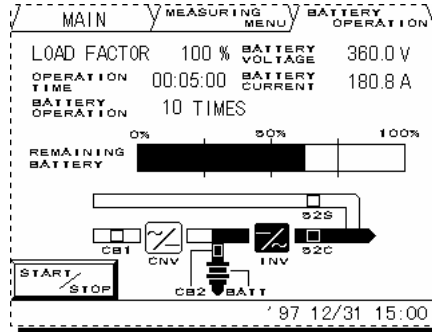
7) SELECT UPS OUTPUT SOURCE

This display is used to transfer the UPS from inverter to static bypass for maintenance purposes.

2.2.2 INPUT POWER FAILURE

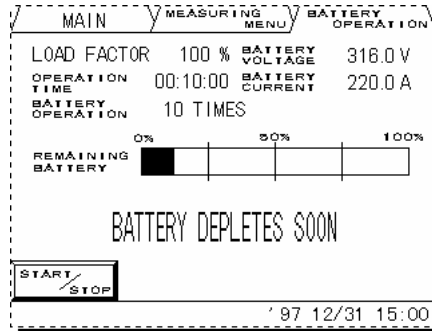
During an Input Power Failure the UPS will run on the Batteries. The following will be displayed. The indication of battery operation, load factor, and bar graph.

FIGURE 2.11 Battery Operation Screen



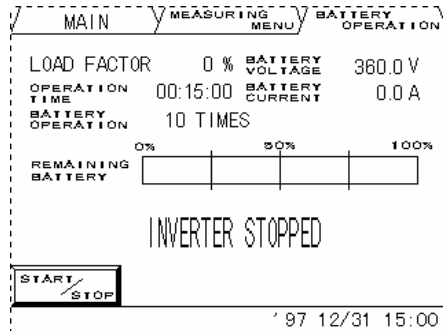
The LCD will display a battery low voltage announcement when battery capacity is near depletion.

FIGURE 2.12 Battery Low Voltage Screen



The End of Battery Discharge announcement is displayed when the battery end voltage is reached. At that time, the inverter will perform an electronic shutdown to prevent battery loss of life typical of extreme deep discharge conditions. The inverter will automatically restart to power the load and the batteries will be simultaneously recharged after input power is restored. Details of the End of Battery announcement is shown in Figure 2.13.

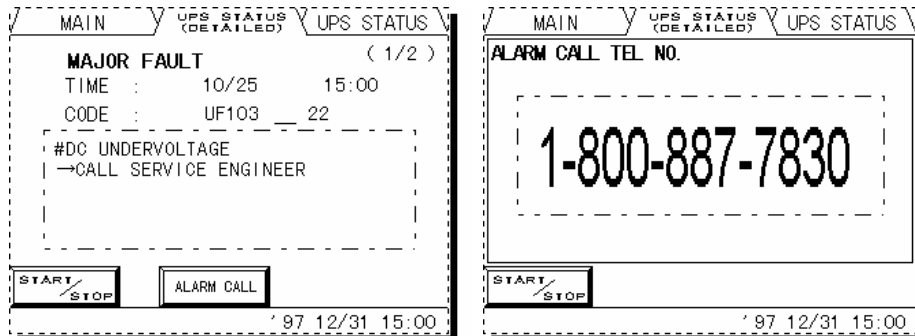
FIGURE 2.13 Discharge Termination Screen



2.2.3 FAULT INDICATION (FIGURE 2.14)

The display shows a fault code, description of fault and a guidance of what action is to take place by the user. A maximum of 10 faults are displayed at the same time. When an input power failure occurs during the fault indication, the fault indication and input power failure are alternatively displayed at 5 second intervals.

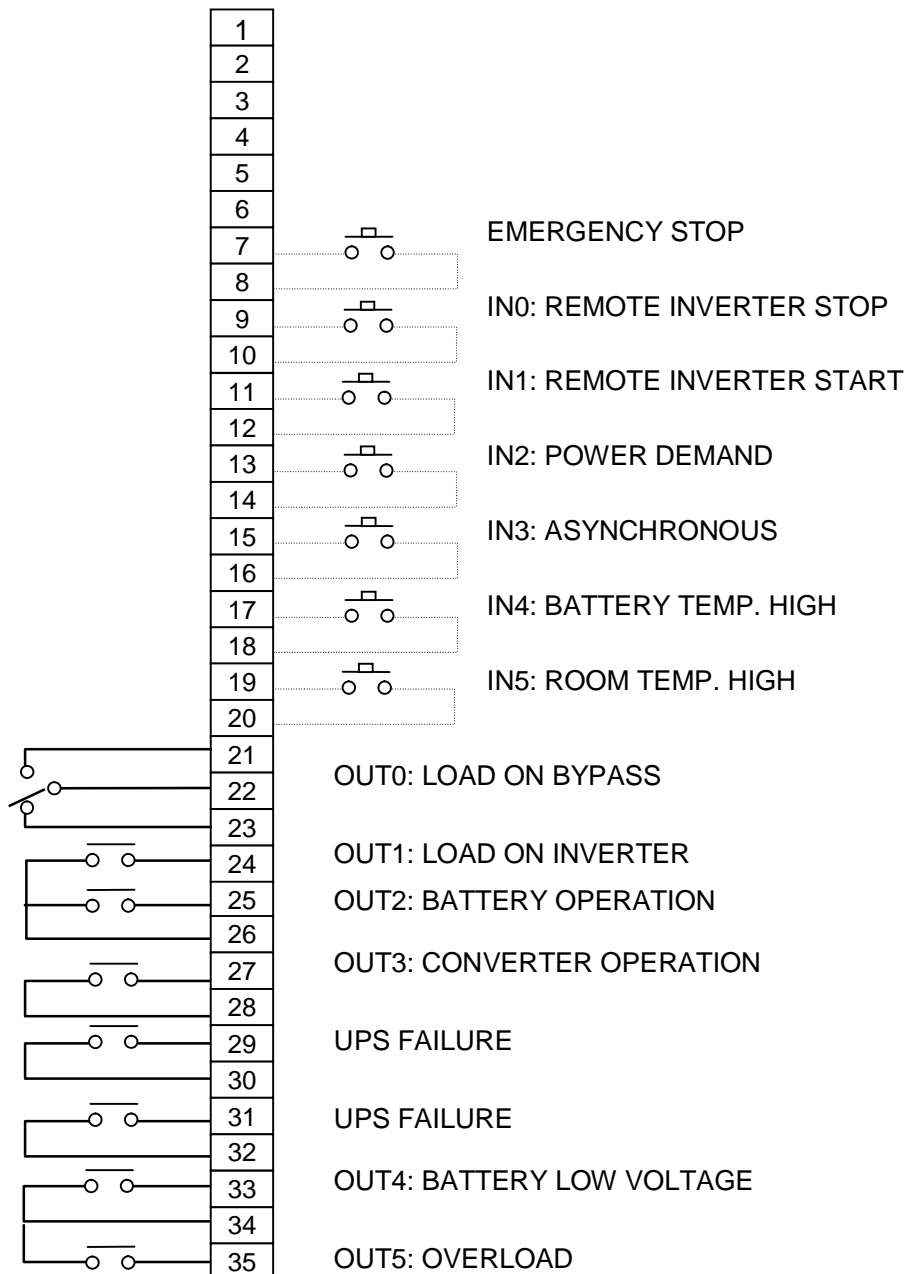
FIGURE 2.14 Failure indication screen



2.3 External Signal Terminal Block

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 2.15

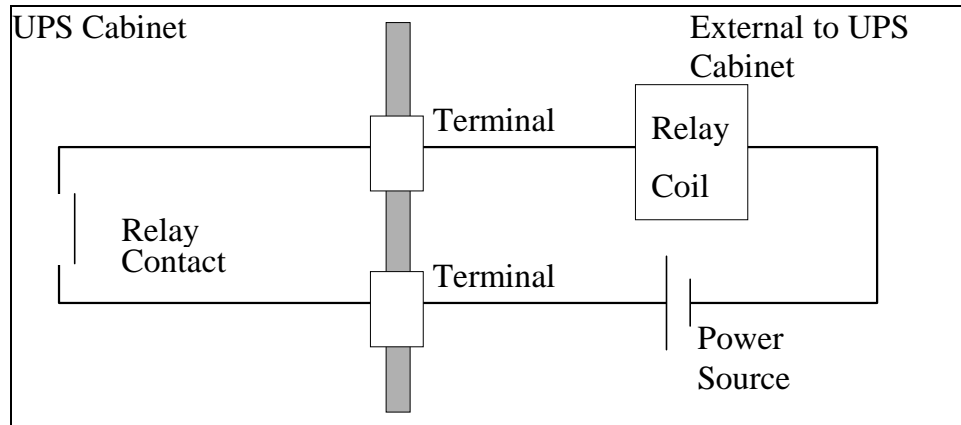
FIGURE 2.15 External Signal Terminal Block



A) Output Contacts(for external alarm annunciation)

Output contacts consist of form "A" dry type contacts. Rated value of all output contacts is 120Vac/0.5Aac or 30Vdc/1Adc. Operate all dry contacts at their rated values or lower. Figure 2.16 illustrates typical installation. The external relay can also be a lamp, LED, computer, etc.

FIGURE 2.16 Control Wiring for External Contacts



Details of output alarm contacts :

Terminals 22 to 21 "**Load on Bypass**" contact (OUT0)

Activated when the power is supplied from the static bypass input.

Terminals 24 to 26 "**Load on Inverter**" contact (OUT1)

Activated when the power is supplied by the inverter.

Terminals 25 to 26 "**Battery Operation**" contact (OUT2)

Activated when the battery is operating following an AC power failure.

Terminals 27 to 28 "**Converter Operation**" contact (OUT3)

Activated when the converter is operating.

Terminals 29 to 30 "**UPS failure**" contact

Activated when a major fault has occurred to the system.

Terminals 31 to 32 "**UPS failure**" contact

Activated when a major fault has occurred to the system.

Terminals 34 to 33 "**Battery Low Voltage**" contact (OUT4)

Activated when DC voltage dropped below discharge end during inverter operation.

Terminals 35 to 34 "**Overload**" contact (OUT5)

Activated when an overload has occurred to the system.

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 set-up information.*

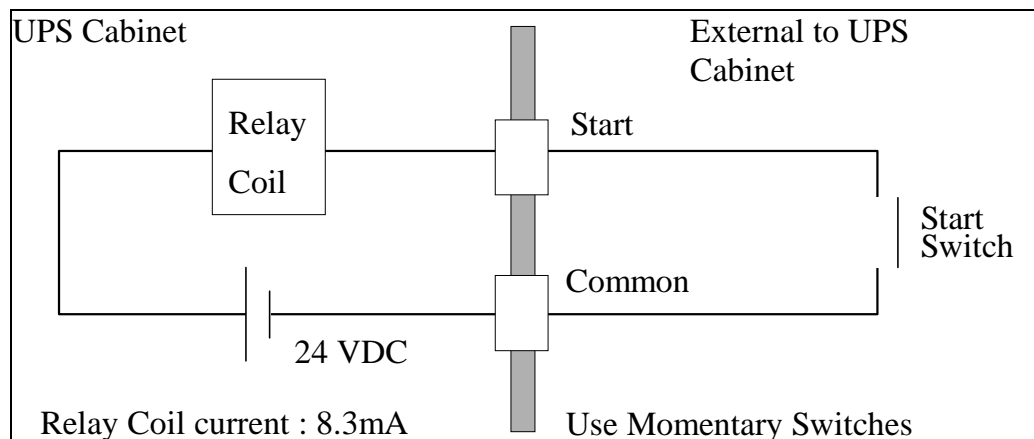
B) Input Contacts(for remote access of UPS)

External contacts are provided by the user of the UPS system. Terminal voltage at the UPS is 24Vdc. Provide external dry contact accordingly.

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

Refer to Figure 2.17 for typical wiring configuration. Although this figure applies to the remote start/stop terminals, the same wiring arrangement is used for emergency stop; asynchronous command; power demand; battery temperature high.

FIGURE 2.17 Remote "Start" Contact Connections



Details of input contacts for remote access :

Terminals 7 to 8 **"Emergency Stop" contact input**

Used to perform a remote UPS emergency power off (EPO).

The load will be dropped.

Terminals 9 to 10 **Remote "Inverter Stop" input terminal (IN0)**

Used to stop inverter from a remote location. UPS must be programmed for remote operation. Refer to Operations Menu for procedure.

Terminals 11 to 12 **Remote "Inverter Start" input terminal (IN1)**

Used to start inverter from a remote location. UPS must be programmed for remote operation. Refer to Operations Menu for procedure.

Terminals 13 to 14 **"Power Demand Command" contact input (IN2)**

Used to control the input current limit to the UPS converter (usually during

generator operation). Power demand is turned ON when the contact is closed. Power demand is turned OFF when the contact is open.

Terminals 15 to 16 "Asynchronous Command" contact input (IN3)

Used to create an asynchronous condition between the static bypass source and the inverter. Asynchronous condition is enabled when the switch is closed. Asynchronous condition is disabled when the switch is opened.

Terminals 17 to 18 "BATTERY TEMP. HIGH" contact input (IN4)

Input fed by a thermocouple that monitors battery temperature. The converter float voltage level is reduced for battery over-temperature conditions. Use battery manufacture recommended thermocouple.

Terminals 19 to 20 "ROOM TEMP. HIGH" contact input (IN5)

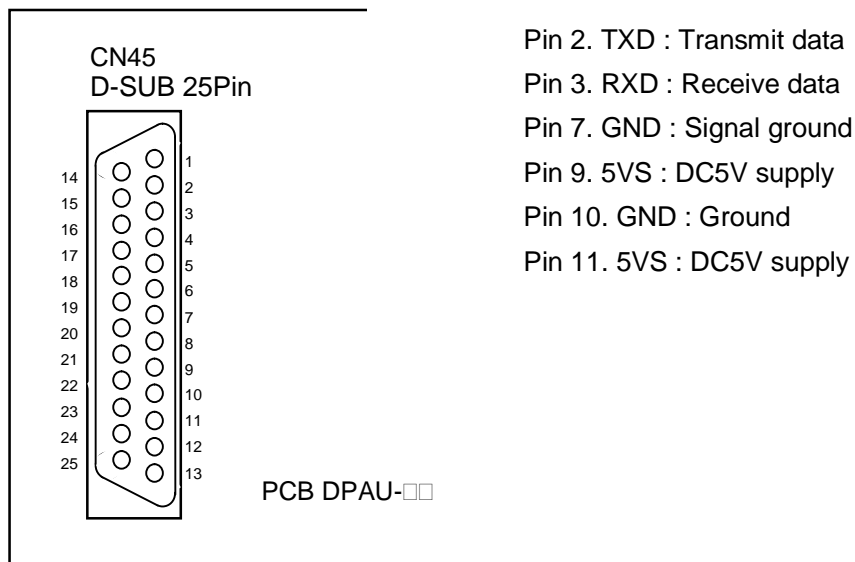
Input fed by a thermocouple that monitors room temperature. External thermocouple is user supplied.

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

2.4 External communication connector

This is a RS232C port for "DiamondLink". Layout of connector is shown in Figure 2.18.

FIGURE 2.18 External communication connector



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. Use eye bolts (not supplied) to carry with overhead crane.	Using the holes (4 - 24) pre drilled into the UPS channel base, anchor the unit using appropriate hardware.

Note : *Do not transport in a horizontal position. Cabinets should be maintained upright within +/- 15° during handling.*

3.2 Installation Procedure

A) Note the load tolerance of the floor

Refer to Table 3.2 for list of weights of UPS's.

TABLE 3.2 List of UPS weights

UPS Capacity (kVA)	100	150	225
Weight (lb.)	1900	2350	3300

B) Minimum clearance required for ventilation

Right side 1.0" (25 mm) (not required when sidecars are used)

Left side 1.0" (25 mm) (not required when sidecars are used)

Back side 0.0" (0.0 mm)

Top side 23.6" (600 mm) (for air flow)

C) Space requirement for routine maintenance

Allow the following space at the time of installation.

Front 39.4" (1000 mm)

Sides 0.0" (0.0 mm)

Rear 0.0" (0.0 mm)

D) External Battery Supply

Please refer to the following when installing batteries:

1. The customer shall make reference to the battery manufacturer's installation manual for battery installation and maintenance instructions.
2. The maximum permitted fault current from the remote battery supply and the DC voltage rating of the battery supply over-current protective device are shown in Table 3.3.

TABLE 3.3 Maximum Permitted Fault Current

UPS CAPACITY (kVA)	DC VOLTAGE RATING (V)	MAXIMUM PERMITTED FAULT CURRENT (A)
100	360	35000
150	360	25000
225	360	25000

3.3 Procedure for Cable Connections

- A) Required metric tools – 19mm wrench, 19mm socket.
- B) Confirm the capacity of the UPS being installed. Identify the input/output power terminal blocks as shown in the appropriate Figure 3.1 through Figures 3.2-a~c.
- C) Connect the internal control wire and power wire.
 - i) Control wire Inter-connect
DC breaker cabinet or battery cabinet
 - (1) CB2-UVR to terminal 5, 6 (100, 150, 225kVA) in bypass cabinet section.
 - (2) CB2 Alarm to terminal 1, 2 (100, 150, 225kVA) in bypass cabinet section.
 - (3) CB2 Auxiliary to terminal 3, 4 (100, 150, 225kVA) in bypass cabinet section.
 - ii) Power wire Inter-connect
 - a) From user's distribution cabinet
 - (1) X1 (A-phase) to A10 bus bar in UPS converter section.
 - (2) X2 (B-phase) to B10 bus bar in UPS converter section.
 - (3) X3 (C-phase) to C10 bus bar in UPS converter section.
 - b) DC Input to UPS
 - (1) Positive cable to BP bus bar in UPS converter section.
 - (2) Negative cable to NP bus bar in UPS converter section.

- D) Connect the grounding conductor from the input service entrance to the UPS ground bar.
- E) Two (2) sources feeding the UPS:
- i) Connect the converter input power cables from the input service entrance to the converter input power terminals identified as A10, B10, C10 in Figures 3.2-a~c. Input cables must be sized for an ampacity larger than the maximum input drawn by the converter. Refer to Table 3.4 for recommended cable sizes.
 - ii) Confirm that an external bypass input circuit breaker (MCCB) is installed (refer to WARNING 4). Connect the bypass input power cables from the input service entrance to the bypass input power terminals identified as A40, B40, C40 and N60 in Figures 3.2-a~c. Bypass input cables must be sized for an ampacity larger than the maximum output current capacity of the UPS. Refer to Table 3.4 for recommended cable sizes.
- F) One (1) source feeding the UPS:
- i) Confirm that an external input circuit breaker sized to protect both the converter input and the bypass lines is installed. Consult equipment nameplate for current ratings. Connect the bypass input power cables from the input service entrance to the bypass input power terminals identified as A40, B40, C40 and N60 in Figures 3.2-a~c. Input cables must be sized for an ampacity larger than the maximum current capacity of the UPS. Refer to Table 3.4 for recommended cable sizes.
 - ii) Using adequately sized conductors per Table 3.4 and referring to the appropriate figure identified in Figures 3.2-a~c, jumper bypass terminals A40, B40, C40 to converter input power A10, B10, C10 identified Figures 3.2-a~c.
- G) Referring to Figures 3.2-a~c, connect UPS load terminals A50, B50, C50 and N60 to load distribution panel. Refer to Table 3.4 for cable sizes.
- H) Connect external signal terminal block as needed. Refer to section 2.4 and Figure 2.15 for functional description. 12 AWG, or less, shielded conductor is recommended.

- NOTES:** 1. *Confirm that all UPS internal contactors(breakers) "CB1", "CB2", and "CB3" are open before energizing UPS.*
2. *UPS power terminals are supplied with bus bar and hardware (12mm diameter Nut/Bolt assembly). It is recommended that compression lugs be used to fasten all input/output power cables. Refer to Table 3.5 for recommended compression lugs and appropriate crimping tool.*
3. *If three wire source for input and bypass input is utilized, the neutral conductor in the UPS must be banded to ground.*



Table 3.4 Recommended cable size and torque requirements

kVA Capacity	Input Voltage	Output Voltage	Input Side * 1, 2		Output Side * 1, 2		Bypass Side * 1, 2		DC Input Side * 1, 2	
			Cable Size	Torque in. lbs.	Cable Size	Torque in. lbs.	Cable Size	Torque in. lbs.	Cable Size	Torque in. lbs.
100kVA	208V	208V	300 MCM or larger	347 - 469 in. lbs.	300 MCM or larger	347 - 469 in. lbs.	300 MCM or larger	347 - 469 in. lbs.	250 MCM or larger	347 - 469 in. lbs.
150kVA	208V	208V	600 MCM or larger	347 - 469 in. lbs.	600 MCM or larger	347 - 469 in. lbs.	600 MCM or larger	347 - 469 in. lbs.	500 MCM or larger	347 - 469 in. lbs.
225kVA	208V	208V	3x250 MCM or larger	347 - 469 in. lbs.	3x250 MCM or larger	347 - 469 in. lbs.	3x250 MCM or larger	347 - 469 in. lbs.	2x300 MCM or larger	347 - 469 in. lbs.

*1 - Voltage drop across power cables not to exceed 2% of nominal source voltage

*2 - Allowable ampacities based on 90 degree C insulation at an ambient temperature of 30 degree C

Not more than 3 conductors in a raceway without derating.

TABLE 3.5 Crimp Type Compression Lug

WIRE SIZE (CODE)	WIRE STRAND CLASS	RECOMMENDATION		CRIMP TOOL REQUIRED BURNDY TYPE Y35 OR Y46	
		VENDOR	CAT. NO.	COLOR KEY	DIE INDEX
2	B	BURNDY	YA2C	BROWN	10
	I	ILSCO	CRB-2L	BROWN	10
1	B	BURNDY	YA1C-LB	GREEN	11 / 375
	I	ILSCO	YA1C	GREEN	11 / 375
1/0	B	BURNDY	CRA-1L	GREEN	11 / 375
	I	BURNDY	YA25-LB	PINK	12 / 348
2/0	B	BURNDY	YA25	PINK	12 / 348
	I	ILSCO	CRA-1/OL	PINK	12 / 348
3/0	B	BURNDY	YA25-LB	BLACK	13
	I	ILSCO	YA26	BLACK	13
4/0	B	BURNDY	CRA-2/OL	BLACK	13
	I	BURNDY	YA27-LB	ORANGE	14 / 101
250 MCM	B	BURNDY	YA27	ORANGE	14 / 101
	I	ILSCO	CRB-3/OL	ORANGE	14 / 101
300 MCM	B	BURNDY	YA28-LB	PURPLE	15
	I	ILSCO	YA28	PURPLE	15
350 MCM	B	BURNDY	CRB-4/OL	PURPLE	15
	I	ILSCO	YA29-LB	PURPLE	15
400 MCM	B	BURNDY	YA29	YELLOW	16
	I	ILSCO	CRA-250L	YELLOW	16
500 MCM	B	BURNDY	YA30-LB	WHITE	17 / 298
	I	ILSCO	YA30	WHITE	17 / 298
600 MCM	B	BURNDY	CRA-300L	WHITE	17 / 298
	I	BURNDY	YA32-LB	RED	18 / 324
750 MCM	B	BURNDY	YA31	RED	18 / 324
	I	ILSCO	CRA-350L	RED	18 / 324
1000 MCM	B	BURNDY	YA34-LB	BLUE	19 / 470
	I	ILSCO	YA31	RED	18 / 324
1000 MCM	B	BURNDY	YA32	BLUE	19 / 470
	I	ILSCO	CRA-400L	BLUE	19 / 470
1000 MCM	B	BURNDY	YA34-LB	BROWN	20 / 299
	I	ILSCO	YA32	BLUE	19 / 470
1000 MCM	B	BURNDY	CRA-500L	BROWN	20 / 299
	I	BURNDY	YA38-LB	BROWN	20 / 299
1000 MCM	B	BURNDY	YA34	BROWN	20 / 299
	I	ILSCO	CRA-500L	BROWN	20 / 299
1000 MCM	B	BURNDY	YA36	GREEN	22 / 472
	I	ILSCO	-----	-----	-----
1000 MCM	B	BURNDY	YA39-LB	PINK	300
	I	BURNDY	YA39	PINK	300
1000 MCM	B	BURNDY	YA39	BLACK	24 / 473
	I	ILSCO	CRA-750L	BLACK	24 / 473
1000 MCM	B	BURNDY	YA44-LB	WHITE	27
	I	BURNDY	YA44	WHITE	27
1000 MCM	B	BURNDY	CRA-1000L	WHITE	27
	I	ILSCO	-----	-----	-----

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.*

Fig.3.1 UPS Terminal Designation (100, 150, 225kVA)

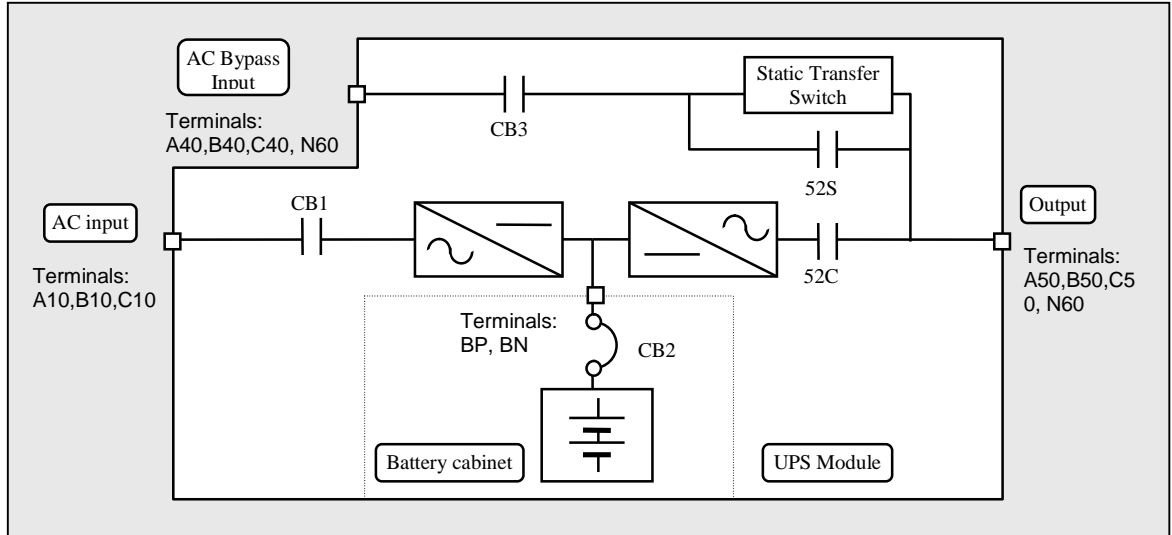




Fig. 3.2-a-1 Diagram of input/output bus bars and terminal blocks (100kVA UPS, Input voltage 208VAC)

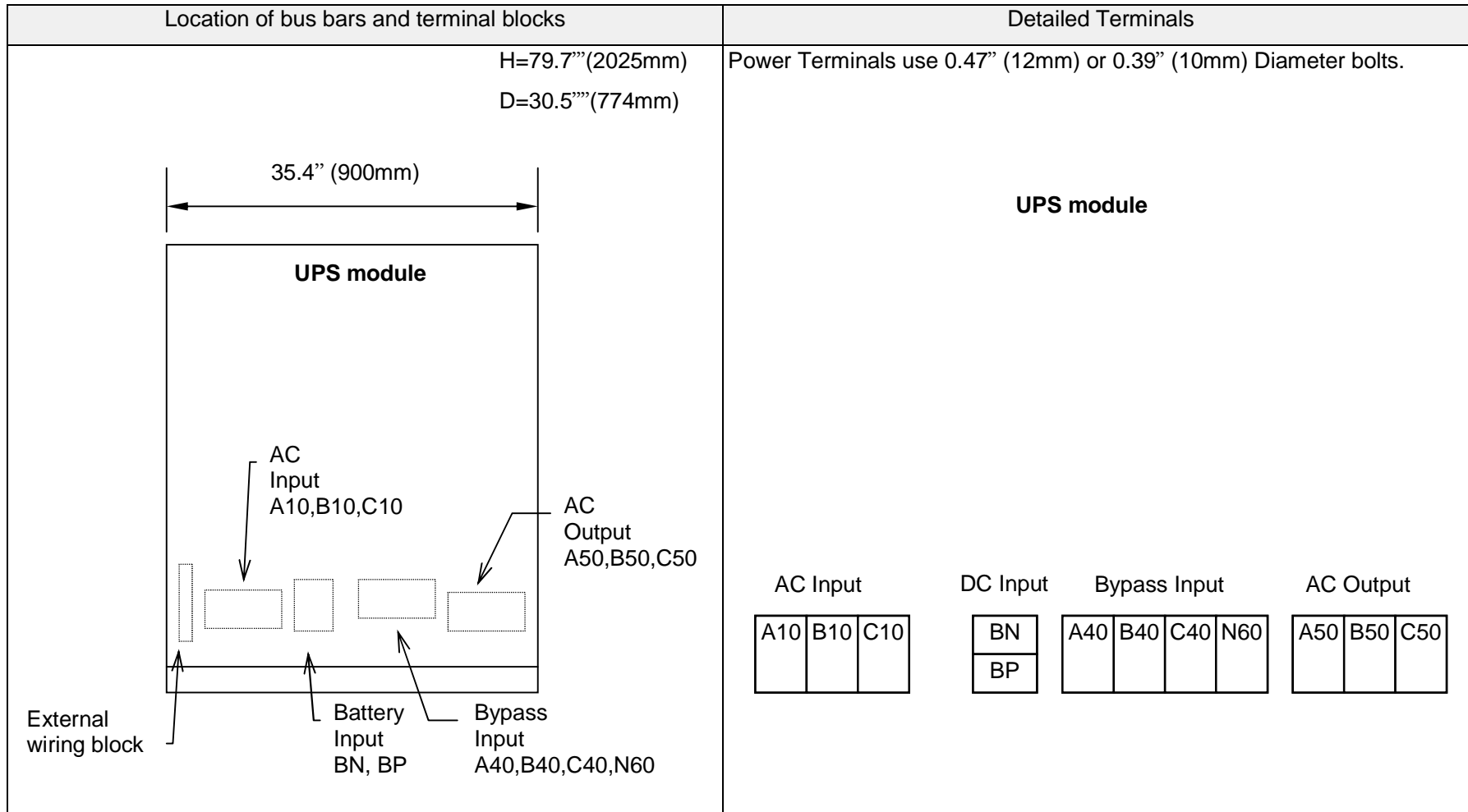




Fig. 3.2-a-2 Diagram of Power Wire & Control Wire Inter-Connect (100kVA UPS, Input voltage 208VAC)

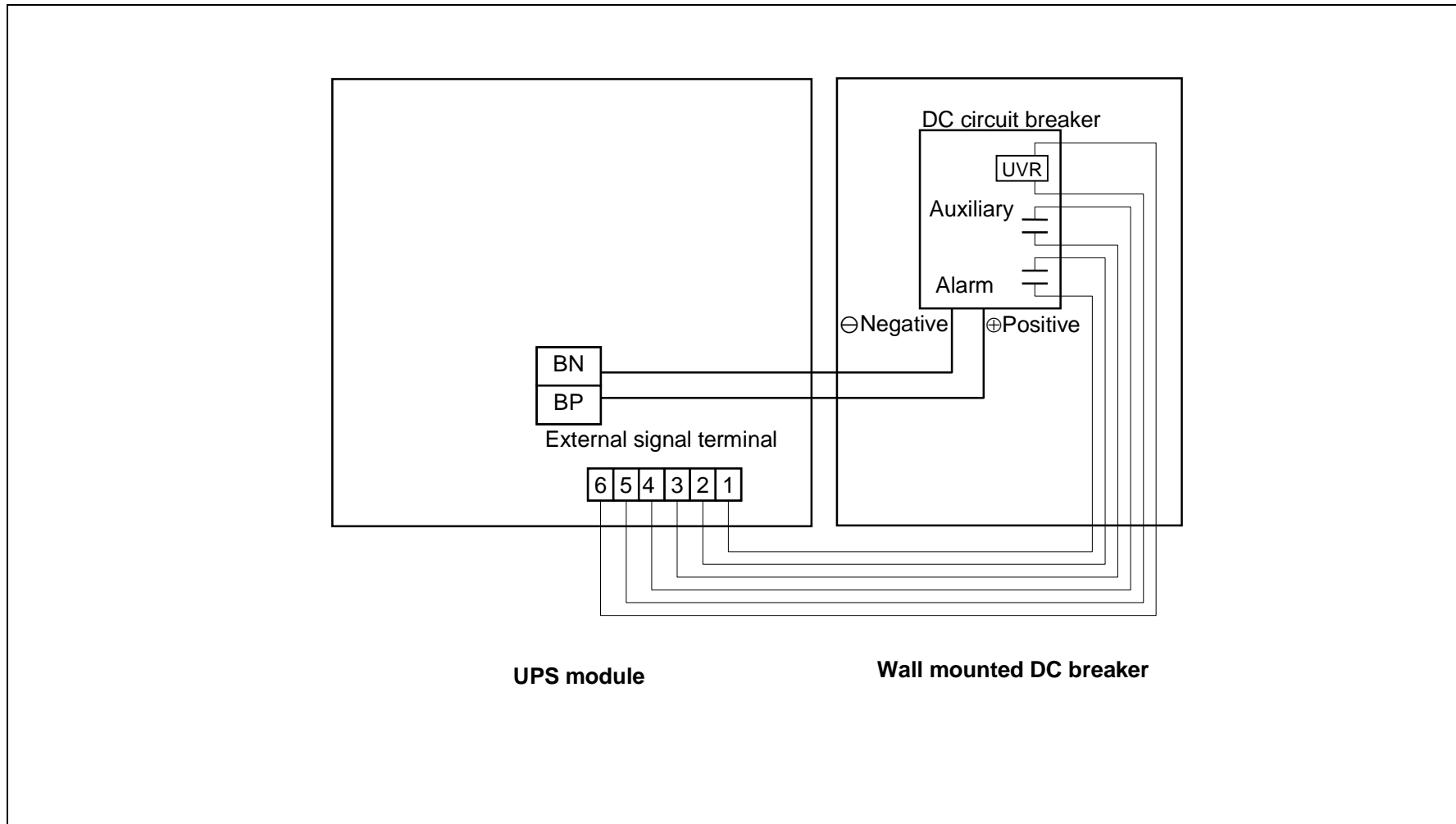




Fig. 3.2-b-1 Diagram of input/output bus bars and terminal blocks (150kVA UPS, Input voltage 208VAC)

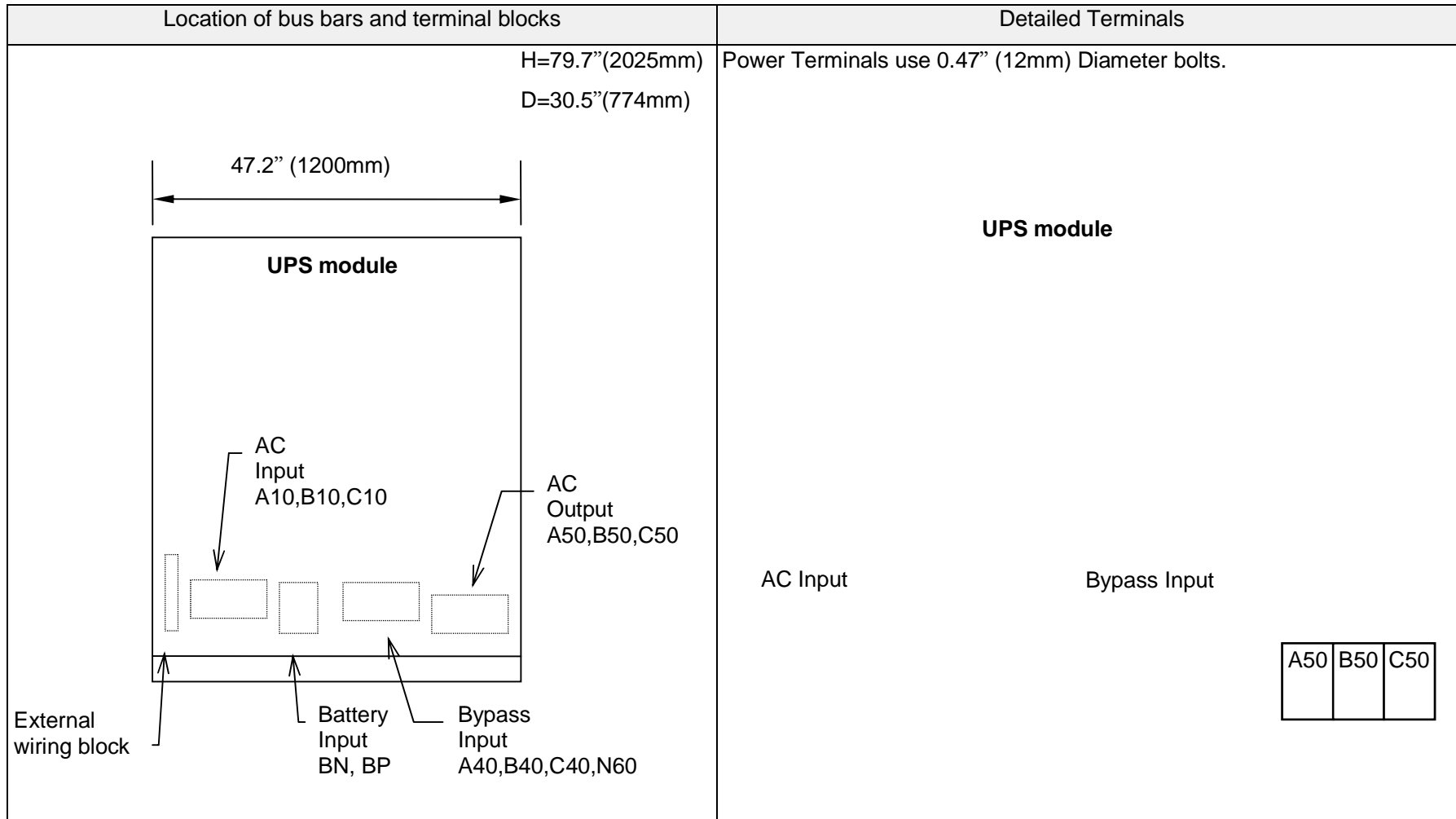




Fig. 3.2-b-2 Diagram of Power Wire & Control Wire Inter-Connect (150kVA UPS, Input voltage 208VAC)

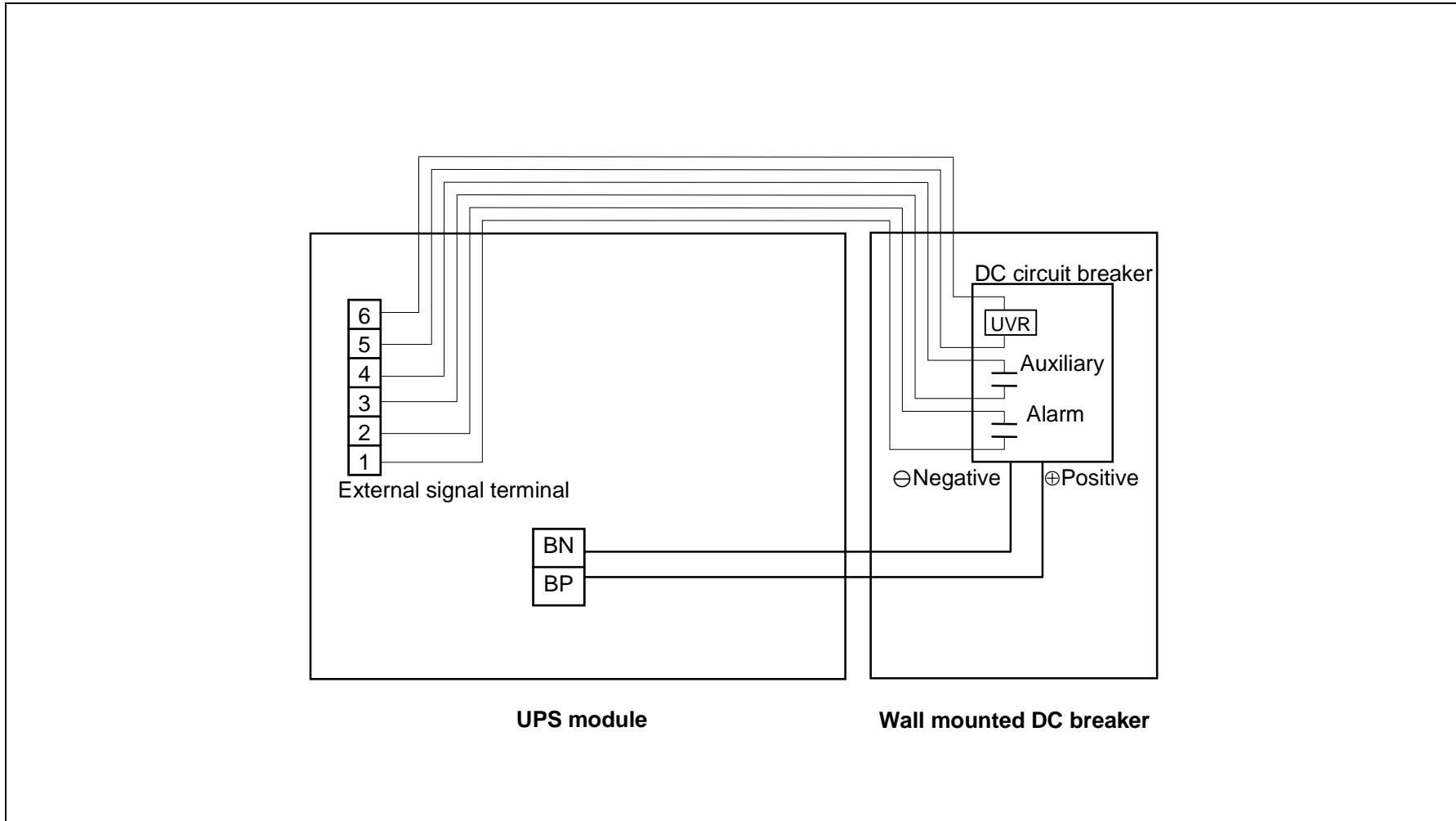




Fig. 3.2-c-1 Diagram of input/output bus bars and terminal blocks (225kVA UPS, Input voltage 208VAC)

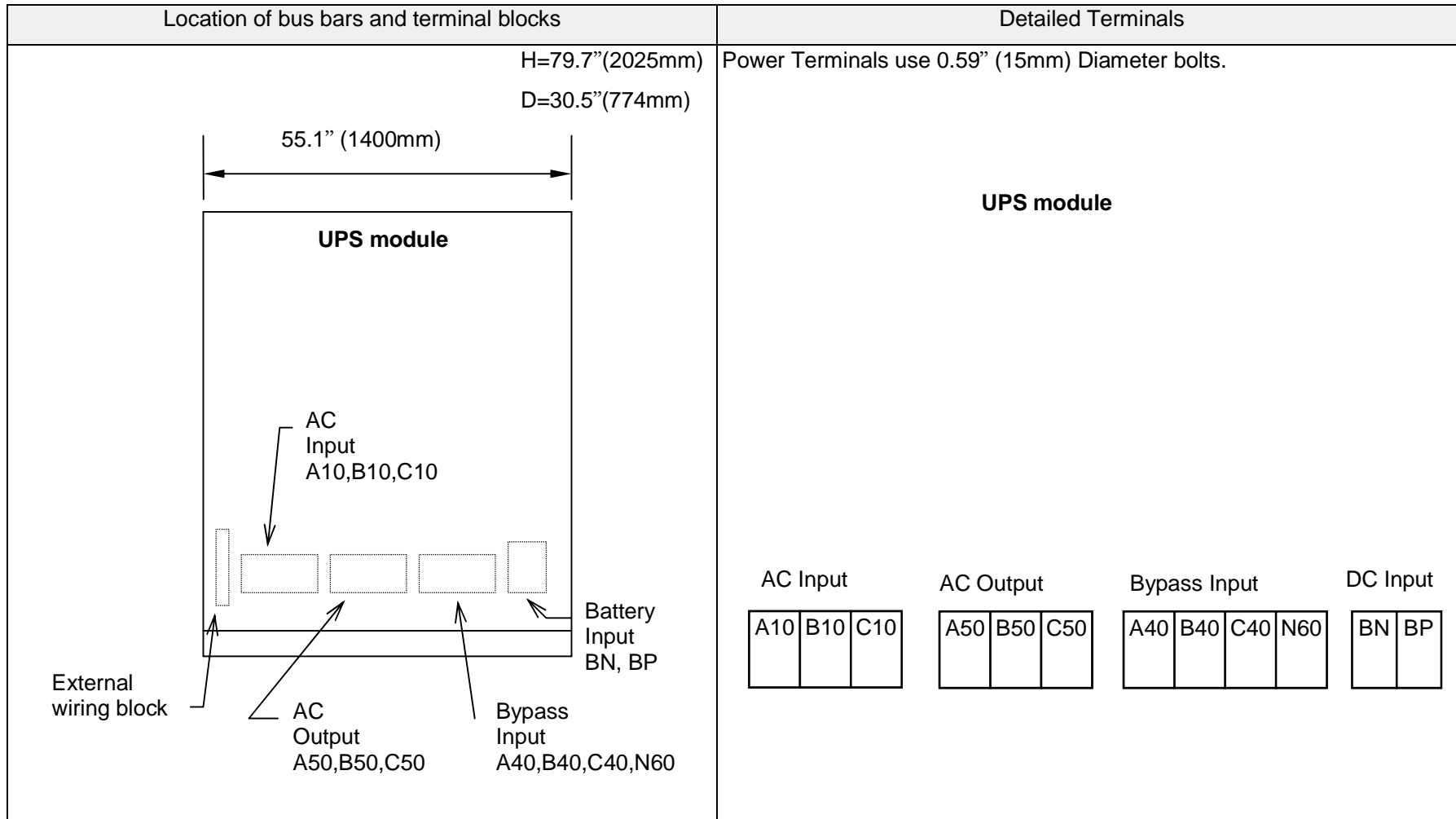
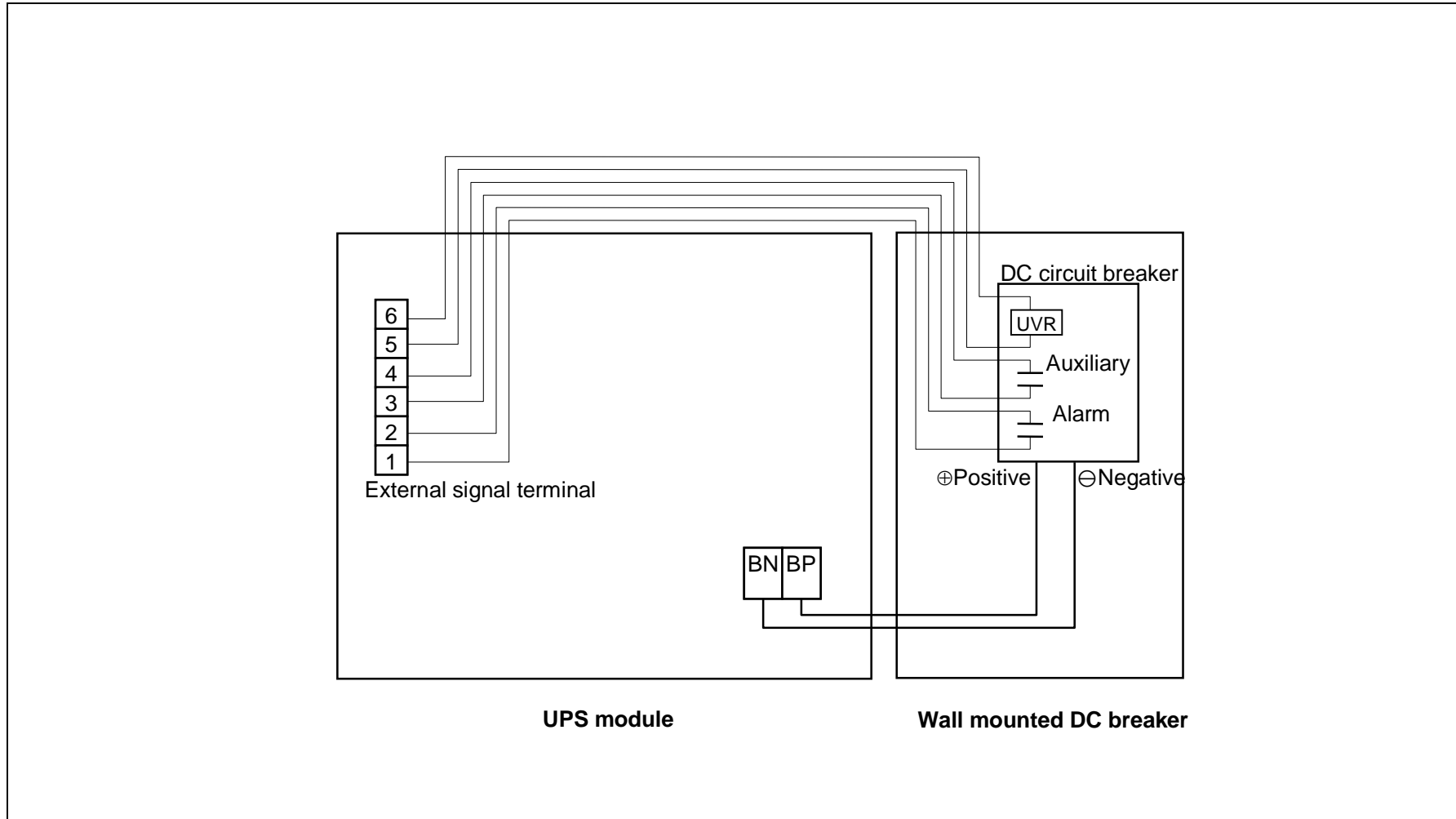




Fig. 3.2-c-2 Diagram of Power Wire & Control Wire Inter-Connect (225kVA UPS, Input voltage 208VAC)



3.4 Operating Procedures

A) UPS Start-up Procedure

1. Verify that the External Bypass input Circuit Breaker (user supplied. Refer to warning 4) is closed.
2. Close Control Circuit Breaker (CB103).
3. Close Control Circuit Breaker (CB101).
4. After a few seconds, an audible annunciator will sound and the AC Input Circuit Contactor (CB1) will automatically close.
5. The audible annunciator will sound and the instruction "RESET CB2" will be displayed on the Liquid Crystal Display (LCD) panel.
6. Reset the Battery Disconnect Circuit Breaker (CB2). To reset CB2, press the handle down until the handle stays in the off position.
7. Close the Battery Disconnect Circuit Breaker (CB2).
8. The audible annunciator will sound and the instruction "PRESS START / STOP KEY" will be displayed on the LCD panel. (Figure 3.3)
9. Press the "Start" key in the inverter START/STOP menu on the LCD panel. (Figure 3.4)

FIGURE 3.3 START-UP MENU

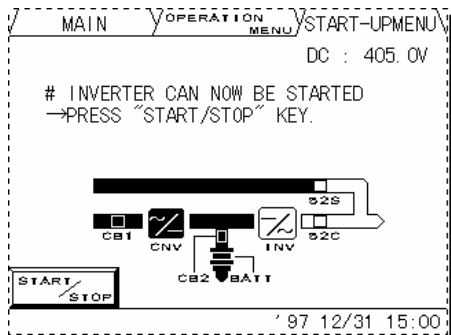
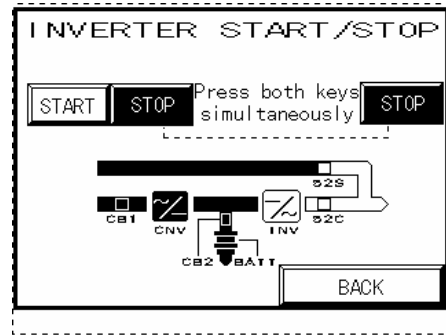


FIGURE 3.4 INVERTER START/STOP



10. When the message "LOCAL" is displayed on the LCD panel, the inverter start operation can only be performed locally at the UPS front panel. When the message "REMOTE" is displayed on the LCD pane, the inverter start operation can be started by remote operation only. Lock-out of one inverter start mode is inherent and cannot be.
11. If a local inverter start operation is required (at the UPS), select "Local" in "Remote/Local" function via the Operation menu. Select "LOCAL" mode.
12. Within five (5) seconds, the Inverter will start-up and begin supplying power to the critical load.
13. If power is not supplied to the load, follow the instructions on the LCD panel.

B) UPS Shutdown Procedure

1. If a total UPS shutdown is required, verify that the critical load is OFF.
2. Select "STOP MENU" from the Operations menu.
3. Press the "INVERTER STOP" key in the START/STOP menu on the LCD panel. The UPS will transfer the load to the static bypass line.
4. When the "LOCAL" is displayed on the LCD panel, the operation can be performed at the UPS front panel. When the "REMOTE" is displayed on the LCD panel, the Inverter can be stopped by remote operation only. If the inverter stop operation is required locally (at the UPS), select to "LOCAL" from the "Remote/Local" selection in the Operations menu. Select "Local" mode.
5. Generally, the Inverter alone will be stopped and the Converter will remain energized to float-charge the batteries.
6. If stopping the Converter is required, The operation instruction "TURN OFF CB2" will be displayed on the LCD panel.
7. Open the Battery Disconnect circuit breaker (CB2) manually. The operation instruction "TURN OFF CB101" will be displayed on the LCD panel.

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

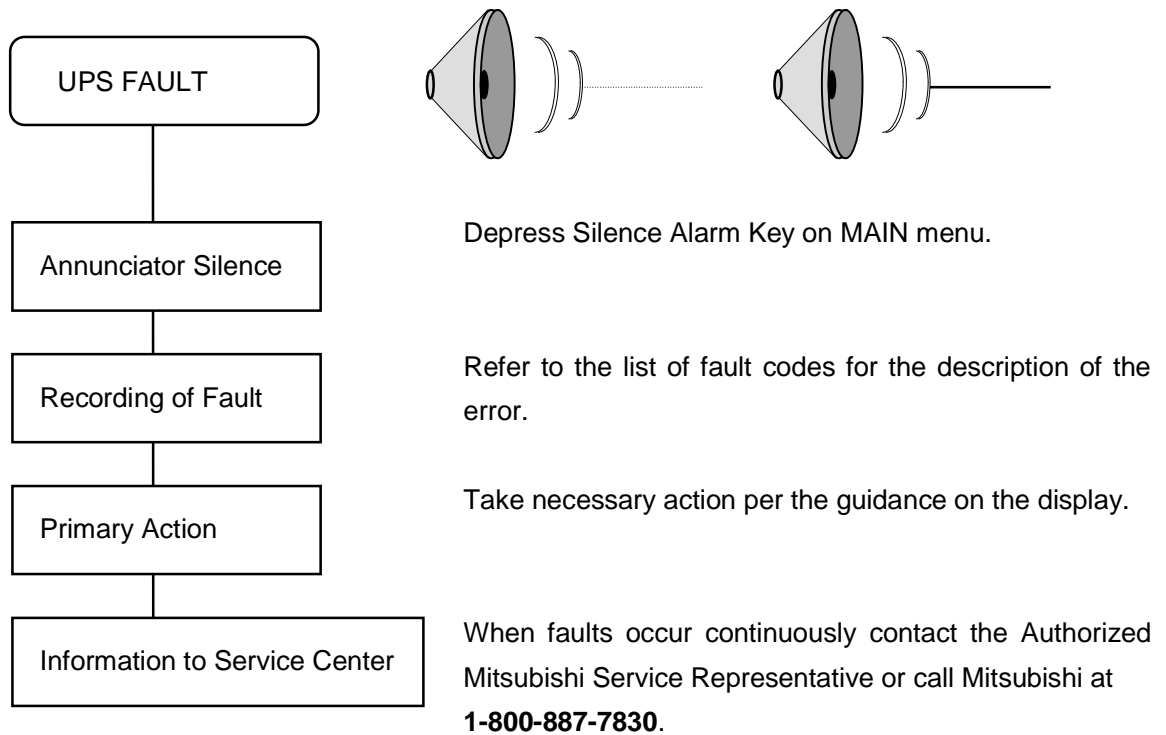
8. Open the control circuit breaker (CB101).
9. Open the AC Input circuit contactor (CB1) automatically.

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

10. If turning off all power to critical load is desired, open the control circuit breaker (CB103), then open the Bypass input Circuit Breaker(MCCB inside the user's cabinet) manually.
11. Contactor CB3 will open automatically.

CAUTION : *All UPS power terminals are still live. Lethal voltages present. De-energize all external sources of AC and DC voltages before handling UPS.*

4.0 RESPONSE TO UPS FAILURE



Note

The error code indicated on the LCD display panel at the time of UPS alarm condition is very important. In order to reduce 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 or its Authorized Service Center 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. Battery end of 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 capacity is within this percentage.

B) UPS Component Parts

Contact Mitsubishi or its Authorized Service Center for a complete parts replacement schedule. Recommended replacement time interval varies with operating environment. Contact Mitsubishi or its Authorized Service Center 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 details of alarm message on the LCD display panel.

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

- B) If a circuit breaker (MCCB) is in the trip state, depress the toggle to reset the breaker before closing it again.

Fault Code List

Note 11. Code indication	Status message	Contents	Note 1 Guidance	Note 2 Buzzer	Note 3 External send-out contact	Note 4 Failure lamp	Code No.
UF003	CONVERTER ABNORMAL	Preliminary charge impossible	1	[2]	Major	Lit up	64
UF007	SENSOR ABNORMAL	Converter input current sensor circuit abnormality	1	[2]	Major	Lit up	1
UF052	CB1 TRIPPED	Input circuit breaker CB1 has tripped	1	[1]	Minor	Flicker	97
UF053	CB1 ABNORMAL	Input circuit breaker CB1 abnormal	1	[1]	Minor	Flicker	96
UF056	CONVERTER OVERLOAD	Converter input overcurrent	1	[1]	Minor	Flicker	192
UF057	CONVERTER OVERTEMPERATURE	Overheating of converter circuit parts	1	[1]	Minor	Flicker	194
UF058	COOLING FAN ABNORMAL	Abnormality of cooling fan (converter circuit)	1	[1]	Minor	Flicker	193
UF059	CONVERTER ABNORMAL	Converter control circuit abnormality	1	[1]	Minor	Flicker	198
UF102	DC OVERVOLTAGE	Overvoltage of DC voltage	1	[2]	Major	Lit up	5
UF103	DC UNDERVOLTAGE	Low voltage of DC voltage	1	[2]	Major	Lit up	6
UF105	SENSOR ABNORMAL	DC voltage sensor circuit abnormality	1	[2]	Major	Lit up	2
UF106	DC CAPACITANCE ABNORMAL	Electrolytic capacitor abnormality	1	[2]	Major	Lit up	77
UF107	CB2 ABNORMAL	Battery disconnect circuit breaker CB2 abnormal	1	[2]	Major	Lit up	66
UF151	DC VOLTAGE ABNORMAL	Does not return to float voltage after power supply is resumed (24 hours)	2	[1]	Minor	Flicker	116
UF152	DC VOLTAGE ABNORMAL	Does not return to equalizing voltage after power supply is resumed	2	[1]	Minor	Flicker	117
UF153	CB2 TRIPPED	Battery disconnect circuit breaker CB2 has tripped.	1	[1]	Minor	Flicker	100
UF156	CB2 TRIPPED (BATTERY OVERTEMPERATURE)	Battery temperature abnormality (UF157) lasted a long time (Note 6)	1	[1]	Minor Note 5	Flicker	107
UF157	BATTERY OVERTEMPERATURE	Battery temperature abnormality	2	[1]	Minor Note 5	Flicker	106
UF158 (Note10)	BATTERY LIQUID LEVEL LOW	Battery solution level drop (Note 7)	2	[1]	Minor Note 5	Flicker	105
UF159	DC GROUND FAULT	Grounding of DC circuit	1	[1]	Minor	Flicker	112
UF160	SENSOR ABNORMAL	Sensor abnormality of battery circuit	1	[1]	Minor	Flicker	114
UF161	CB2 TRIPPED (DC VOLTAGE ABNORMAL)	Does not return to float voltage after power supply is resumed (48 hours) (Note 6)	2	[1]	Minor	Flicker	196
UF162	BATTERY ABNORMAL	Battery abnormal detected by battery self test.					
UF201	INVERTER OVERVOLTAGE	Output overvoltage during inverter power supply (+ 15%)	1	[2]	Major	Lit up	12
UF202	INVERTER UNDERVOLTAGE	Output low voltage during inverter supply (-15%)	1	[2]	Major	Lit up	13
UF203	INVERTER OVERCURRENT	Inverter output overcurrent	1	[2]	Major	Lit up	26
UF209	52C ABNORMAL	52C not turned ON	1	[2]	Major	Lit up	75
UF210	52C ABNORMAL	52C not turned OFF	1	[2]	Major	Lit up	76
UF212	FAN ABNORMAL	Fan power source abnormality during operation	1	[2]	Major	Lit up	65
UF213	INVERTER OR CONVERTER OVERTEMPERATURE	Overheating of main circuit parts	1	[2]	Major	Lit up	69



UF214	COOLING FAN ABNORMAL	Abnormality of cooling fan inside panel	1	[2]	Major	Lit up	67
UF215	FREQUENT OVERLOAD!	Load switching was made frequently during overload	4	[2]	Major Note5	Lit up	86
UF216	SENSOR ABNORMAL	Inverter output current sensor abnormality	1	[2]	Major	Lit up	11
UF254	88C ABNORMAL	Fan power source abnormality during operation	1	[1]	Minor	Flicker	197
UF255	52C ABNORMAL	52C turned OFF during inverter power supply	1	[1]	Minor	Flicker	128
UF256	OUTPUT VOLTAGE ABNORMAL	Inverter output voltage fell out of +/- 5%	1	[1]	Minor	Flicker	109
UF257	52C ABNORMAL	52C not turned OFF when manual transfer	1	[1]	Minor	Flicker	98
UF301	UPS CONTROL CIRCUIT ERROR	Control microcomputer abnormality	1	[2]	Major	Lit up	19
UF302	UPS CONTROL CIRCUIT ERROR	Control microcomputer abnormality	1	[2]	Major	Lit up	28
UF303	UPS CONTROL CIRCUIT ERROR	Control microcomputer abnormality	1	[2]	Major	Lit up	29
UF304	UPS CONTROL CIRCUIT ERROR	Control microcomputer abnormality	1	[2]	Major	Lit up	31
UF305	UPS CONTROL CIRCUIT ERROR	Control circuit abnormality	1	[2]	Major	Lit up	21
UF306	UPS CONTROL CIRCUIT ERROR	Control power source circuit abnormality	1	[2]	Major	Lit up	16
UF309	INVERTER VOLTAGE ABNORMAL	Inverter output voltage abnormality before inverter power supply	1	[2]	Major	Lit up	83
UF351	CONTROL FUSE BLOWN	Battery circuit's fuse burnt	1	[1]	Minor	Flicker	115
UF352	SUPPLY OF CONTROL CIRCUIT ABNORMAL	Control circuit abnormality	1	[1]	Minor	Flicker	111
UF355 (Note10)	UPS CONTROL CIRCUIT ERROR	Control circuit abnormality	1	[1]	Minor	Flicker	130
UF356	UPS CONTROL CIRCUIT ERROR	Control circuit abnormality	1	[1]	Minor	Flicker	123
UF357	"INVERTER START " BUTTON ABNORMAL	"INVERTER START" button is abnormal (Local)	1	[1]	Minor	Flicker	124
UF358	"INVERTER STOP " BUTTON ABNORMAL	"INVERTER STOP" button is abnormal (Local)	1	[1]	Minor	Flicker	125
UF359	"INVERTER SUPPLY" BUTTON ABNORMAL	"INVERTER SUPPLY" button is abnormal	1	[1]	Minor	Flicker	126
UF360	"BYPASS SUPPLY" BUTTON ABNORMAL	"BYPASS SUPPLY" button is abnormal	1	[1]	Minor	Flicker	127
UF362	UPS CONTROL CIRCUIT ERROR	52S control circuit abnormality (Note 8)	1	[1]	Minor	Flicker	195
UF401	52S ABNORMAL	52S not turned ON, or 52S turned ON without any command	1	[2]	Major	Lit up	84
UF402	52S ABNORMAL	52S not turned OFF, or 52S turned OFF without any command	1	[2]	Major	Lit up	85
UF451	52S ABNORMAL	52S not turned ON, or 52S turned ON without any command when manual transfer	1	[1]	Minor	Flicker	99
UA801	AC INPUT VOLTAGE OUT OF RANGE	AC input voltage fell out of +/- 18% range	3	[1]	Note 5		239
UA802	AC INPUT FREQUENCY OUT OF RANGE	Ac input frequency fell out of converter synchronization follow-up range	3	[1]	Note 5		161
UA803	AC INPUT PHASE ROTATION ERROR	Phase rotation is inverted when input voltage is normal	3	[1]	Note 5		236
UA804 (Note10)	BATTERY ABNORMAL	Battery abnormal (External input)	1	[1]	Note 5		238
UA805 (Note10)	AMBIENT TEMPERATURE ABNORMAL	Temp. abnormality in room where installed	11	[1]			237
UA806	INVERTER OVERLOAD > 100%	Overload exceeded 105% (Note 9)	4	[1]	Over	Flicker	216



UA807	INVERTER OVERLOAD > 110%	Overload exceeded 110% (Note 9)	4	[1]	Over	Flicker	217
UA808	INVERTER OVERLOAD > 125%	Overload exceeded 125% (Note 9)	4	[1]	Over	Flicker	218
UA809	INVERTER OVERLOAD > 150%	Overload exceeded 150% (Note 9)	4	[1]	Over	Flicker	219
UA810	OVERLOAD	Momentary over-current during Inverter power.	4	[1]	Over	Flicker	220
UA811	BYPASS VOLTAGE OUT OF RANGE	Bypass voltage fell out of +/- 15% range at manual transfer	5	[1]	Note 5		240
UA812	BYPASS VOLTAGE OUT OF RANGE	Bypass voltage fell out of +/- 20% range	5	[1]	Note 5		231
UA813	BYPASS PHASE ROTATION ERROR	Phase rotation is inverted when bypass voltage is normal	5	[1]			242
UA814	BYPASS FREQUENCY OUT OF RANGE	Bypass frequency fell out of inverter synchronization follow-up range	5	[1]	Minor Note 5		243
UA816	EXTENDED BYPASS OPERATION	Bypass power supply continued for many hours		[1]			244
UA817	EMERGENCY STOP ACTIVATED	Emergency stop applied	13	[2]	Minor	Flicker	232
UA819	REMOTE SWITCH ON(START)	There is an error with the remote start switch.	12	[1]			229
UA820	REMOTE SWITCH ON(STOP)	There is an error with the remote stop switch.	12	[1]			230
UA821	UPS STOPPED (TRANSFER INHIBITED - INVERTER AND BYPASS ASYNCHRONOUS)	Transfer cannot be permitted because Bypass voltage abnormal	5	[1]			249
UA822	GENERATOR OPERATION , INHIBITED BYPASS OPERATION	Transfer cannot be permitted because Generator operation contact is ON		[1]			246
UA823	CB1 OFF	AC input circuit breaker CB1 turned OFF	6	[1]			224
UA824	CB2 OFF	Battery disconnect circuit breaker CB2 turned OFF	7	[1]			225
UA826	CB101 OFF	Control power source breaker CB101 turned OFF during inverter operation	8	[1]			226
UA827	52C NOT PERMITTED	"52C PERMISSION" switch turned to OFF	9	[1]			233
UA830	AC INPUT UNDERVOLTAGE	AC input voltage fell out of - 10% range	3	[1]			234
UA831	EMERGENCY BYPASS SWITCH ON	Emergency bypass switch turned to <Emergency>	10	[1]			245
UA832	INTERRUPTED TRANSFER OCCURRED WHEN TRANSFERRING TO BYPASS SOURCE	When transfer to the bypass supply, occurs interrupted transfer.	5	[1]			248
UA834	BATTERY DEPLETED	DC voltage dropped below discharge end during inverter operation	10	[2]	Note 5		255
UA835	UPS STOPPED (TRANSFER INHIBITED - BYPASS INPUT ABNORMAL)	Transfer cannot be permitted because Bypass voltage is abnormal		[1]			250

(Note 1) Numbered guidance:

- 1: Contact Mitsubishi. 1-800-887-7830
- 2: Verify battery is operating within recommended voltage and temperature ranges.
- 3: Verify input power source is properly connected.
- 4: Reduce load.
- 5: Verify bypass power source is within amplitude and frequency.
- 6: Close CB1.
- 7: Close CB2.
- 8: Close CB101.
- 9: Reduce load, and restart.
- 10: Press the reset button.
- 11: Reduce room temperature to within specified UPS operating limits
- 12: Verify remote switch is properly connected and/or functional.
- 13: Place switch in OFF position.

(Note 2)

Audible annunciator: [1] intermittent sound, [2] continuous sound.

(Note 3)

- "Major" is defined as major failure. Inverter transferred to the static bypass line;
- "Minor" is defined as a minor failure. UPS continues to operate normally, but cause of alarm must be identified;
- "Over" is defined as an overload condition. UPS will transfer to the static bypass line and may or may not return to the inverter. Return to inverter will occur only if overload corrects itself and output load is within rating of UPS.

(Note 4)

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

(Note 5)

External send-out possible by option setting.

(Note 6)

Trips the battery breaker CB2.

(Note 7)

For other than sealed-type battery.

(Note 8)

Place UPS Emergency Bypass switch in the BYPASS position. Contact Mitsubishi.

(Note 9)

If the specified time passes, will transfer to the bypass power supply.

(Note 10)

Shows only when corresponding option settings are made.

(Note 11)

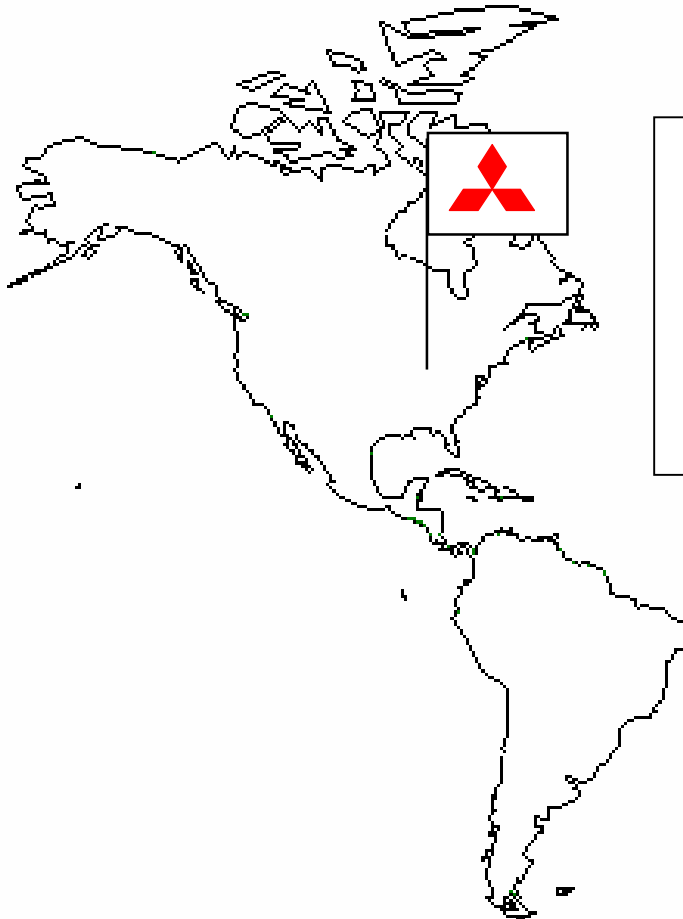
Code indication means:

UA□□□	-----	Alarm
UF□□□	-----	Failure
U□0□□	-----	Converter circuit failure
U□1□□	-----	DC circuit failure
U□2□□	-----	Inverter circuit failure
U□3□□	-----	Control circuit failure
U□4□□	-----	Bypass system failure
U□8□□	-----	Alarm
U□□00 - U□□49	-----	Major failure
U□□50 - U□□99	-----	Minor failure

7.0 WARRANTY & OUT OF WARRANTY SERVICE

The Mitsubishi Electric UPS Division Service Department has many Authorized Service Centers place 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?
Number of Employees at This Location is:
{Energy Producer}

-
- Utility
-
-
- Alternate Energy

 Education/Univ. Service

-
- {Service}**
-
-
- Consulting

 1 - 19

 20 - 49

 50 - 99

 100 - 249

 250 - 499

 500 - 999

 1000 or more

{Manufacturing Co.}

-
- OEM
-
-
- Process

 Engineering

 Outsourcing

Overall how was Start-Up performed:
 Unsatisfactory

 Satisfactory

 Exceeded

 Consumer Goods

 Electronics

 Power Quality Equipment

{Government}
 Military

 Municipals

 Federal/State/Local

Would you like to receive future product updates and news?
 Yes

 No

 Commercial Business
 Electrical Contractor
 Healthcare
 Internet
 Communications
 Distributors/Reps
 Other _____

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