IMPORTANT SAFETY INSTRUCTIONS
FOR THE
LA MARCHE POWER CONVERSION EQUIPMENT
SAVE THESE INSTRUCTIONS

This manual contains important safety and operating instructions for the La Marche Power Conversion Equipment.

Before using this equipment, read all instructions and cautionary markings on (1) unit, (2) battery, and (3) product using the battery.

CAUTION: To reduce risk of injury and/or damage to the batteries, use only the type of batteries specified on the charger.

- Do not expose equipment to rain or snow.
- Do not operate equipment if it has received a sharp blow, been dropped, or otherwise damaged in any way; take it to a qualified serviceman.
- Do not disassemble this unit; take it to a qualified serviceman when service or repair is required. Incorrect re-assembly may result in a risk of electric shock or fire.

To reduce risk of electric shock, disconnect this unit from the d.c. supply, or batteries and loads before attempting any maintenance or cleaning. Turning off controls will not reduce this risk.

WARNING – THERE IS A RISK OF EXPLOSIVE GASSES AND WORKING IN THE VICINITY OF A BATTERY IS DANGEROUS. SOME BATTERIES GENERATE EXPLOSIVE GASES DURING NORMAL BATTERY OPERATION. FOR THIS REASON, IT IS OF UTMOST IMPORTANCE THAT EACH TIME BEFORE USING THIS UNIT, YOU READ THIS MANUAL AND FOLLOW THE INSTRUCTIONS EXACTLY.

To reduce risk of battery explosion, follow these instructions and those published by the battery manufacturer and manufacturer of any equipment you intend to use in the vicinity of the battery.

Review cautionary marking on all products.

PERSONAL PRECAUTIONS:
- Someone should be within range of your voice or close enough to come to your aid when you work near a battery.
- Have plenty of fresh water and soap nearby in case the battery electrolyte contacts skin, clothing, or eyes.
- Wear complete eye protection and clothing protection. Avoid touching eyes while working near a battery.
- If the battery electrolyte contacts skin or clothing, wash immediately with soap and water. If the electrolyte enters the eye, immediately flood the eye with running cold water for at least ten (10) minutes and get medical attention immediately.
- Never smoke or allow a spark or flame in vicinity of a battery.
- Be extra cautious to reduce risk of dropping a metal tool onto a battery. It might spark or short-circuit the battery or other electric part that may cause an explosion.
- Remove personal metal items such as rings, bracelets, necklaces, and watches when working with a battery. A battery can produce a short-circuit current high enough to weld a ring or the like to metal, causing a severe burn.
- NEVER charge a frozen battery.
PREPARING TO CHARGE

♦ If necessary to remove the battery connections, always remove grounded terminal from the battery first. Make sure all loads are disconnected and unit is off, so as not to cause an arc.
♦ Be sure the area around the battery is well ventilated while the battery is being charged.
♦ When cleaning battery terminals, be careful to keep corrosion from coming in contact with eyes.
♦ Study all the battery manufacturer’s specific precautions such as removing or not removing cell caps while charging, recommended rates of charge, and maintenance procedures.

UNIT LOCATION

♦ Never place this unit directly above the battery. Gases from the battery will corrode and damage equipment. A sealed maintenance free or valve regulated lead acid (VRLA) may be placed below this equipment.
♦ Never allow the battery electrolyte to drip on this unit when reading the specific gravity or filling the battery.
♦ Do not operate this unit in a closed-in area or restrict ventilation in any way.
♦ Do not set a battery on top of this unit.

D.C. CONNECTION PRECAUTIONS

Connect and disconnect D.C. output cables only after setting all of this unit’s switches to off position.

GROUNDING INSTRUCTIONS

This battery charger should be connected to a grounded, metal, permanent wiring system; or an equipment grounding conductor should be run with circuit conductors and connected to equipment-grounding terminal or lead on battery charger. Connections to battery should comply with all local codes and ordinances.

CAUTION: DO NOT PULL ON OUTPUT CABLES WHEN DISCONNECTION CHARGER FROM BATTERY
CAUTION: To ensure safe installation and operation, the information given in the instruction manual should be read and understood before installing or using the equipment.

RECEIVING INSTRUCTIONS

Unpacking and Inspection: Examine the shipping crate upon arrival. If there is obvious damage, describe on the receiving documents. Within a few days after delivery, the equipment should be uncrated and carefully inspected for hidden damages. When removing packaging material, be careful not to discard any equipment, parts, or manuals. If any damage is detected you should:
1. File a claim with the carrier within five (5) days.
2. Send a copy of the claim to La Marche Mfg. Co.
3. Call La Marche Mfg. For a RETURN MATERIAL AUTHORIZATION NUMBER.

Failure to properly file a claim for shipping damages, or provide a copy of the claim to La Marche Mfg., may void warranty service for any physical damages reported for repair.

HANDLING

WARNING: Equipment can be very heavy, and top-heavy. Use adequate manpower or equipment for handling. Until the equipment is securely mounted, care must be used to prevent the equipment from being accidentally tipped over.

NOMENCLATURE PLATES

Each piece of La Marche Mfg. Equipment shipped is identified by part number on the nomenclature plate.

ADJUSTMENTS

All equipment is shipped from the factory fully checked and adjusted. Do not make any adjustments unless the equipment has been powered-up and the settings have been determined to be incorrect.

SPARE PARTS

To minimize downtime during installation or normal service, it is advisable to purchase spare fuses, circuit boards and other recommended components. Please refer to the list of recommended spare parts and their La Marche Mfg. Part numbers included with the instruction manual. It is recommended that spare fuses be ordered for all systems.

To order spare parts, please contact La Marche Mfg. (847)-299-1188 during business hours and ask for the Parts Department.
Description:

The PC63 Cage is intended to be installed in a protected environment. The cage can have several different combinations dependant as to what has been ordered. Either four A63s or two A63s and a TPCD, can be inserted in a PC63 cage. The TPCD distribution panel is always inserted in the third and fourth slot. The slots are numbered from 1 to 4 from left to right.

Although a PC63 cage can accept more than one A63 module, it does not need more than one to power the load.

All A63 rectifiers must be plugged into the proper voltage cage. (i.e. 24V A63 into 24V PC63)

At least 6 inches of room should be provided in front and the rear of the PC63 cage for ventilation.

The PC63 cage can be mounted either in a 19” or 23” rack using the standard brackets provided. It can be mounted flush to the rack or midway.

<table>
<thead>
<tr>
<th>Typical Model #</th>
<th>Slot 1</th>
<th>Slot 2</th>
<th>Slot 3</th>
<th>Slot 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC63-60-48V-130V</td>
<td>48V A63</td>
<td>48V A63</td>
<td>48V A63</td>
<td>48V A63</td>
</tr>
<tr>
<td>PC63-120-24V-130V</td>
<td>24V A63</td>
<td>24V A63</td>
<td>24V A63</td>
<td>24V A63</td>
</tr>
<tr>
<td>PC63-30-48V-130V</td>
<td>48V A63</td>
<td>48V A63</td>
<td>TPCD DISTRIBUTION CENTER</td>
<td></td>
</tr>
<tr>
<td>PC63-60-24V-130V</td>
<td>24V A63</td>
<td>24V A63</td>
<td>TPCD DISTRIBUTION CENTER</td>
<td></td>
</tr>
<tr>
<td>PC63-120-12V-130V</td>
<td>12V A63</td>
<td>12V A63</td>
<td>12V A63</td>
<td>12V A63</td>
</tr>
</tbody>
</table>

Input DC:
The A63 module has the input voltage range from 105Vdc to 150Vdc. No taps, jumpers, straps or circuit breakers need to be changed. The input d.c. voltage terminal block is located on the backside of the cage. (Each A63 converter has an input d.c. breaker.) Each converter draws approximately 10 amps.

Output DC with A63 Converters ONLY – no distribution center (TPCD):
All A63 outputs are paralleled and brought to the PC63 cabinet d.c. output terminals. When connecting the PC63 cage to the termination split buss, use both terminals located on the back of the PC63 cage. Each terminal block will provide 60A of current up to a total of 120A.

The rear panel of the PC63 does not have to be removed to connect to the d.c. output terminals. Remove the d.c. terminal cover to gain excess to the d.c. terminals. The d.c. cables can be passed thru the holes on the PC63 cage or ½” conduit can be attached to the PC63 cage at the Feed Thru holes. Remove the rear panel to access the rectifier failure alarm (RFA) terminals.
For wire distances exceeding 10 feet between the battery and unit or load and the unit refer to the Power Cabling Formulas in the back of manual to determine the wire size.

**Observe Proper Battery Polarity**

The negative wire from the battery must be connected to the terminal marked negative, (-) and the positive wire from the battery must be connected to the terminal marked positive (+) on the rear of the PC63 cage.

If the cage is set up to accept a TPCD, connect the negative wire from the battery must be connected to the terminal marked negative, (-) and the positive wire from the battery must be connected to the terminal marked positive (+) on the rear of the TPCD.

**Output DC with distribution center (TPCD):**

Connect positive and negative wires from TPCD to the back plane of the cage (OBserve proper Polarity). Connect load positive to common load positive buss bar. Connect negative to load negative terminal block.

**Rectifier Failure Alarm Terminal:**

The rectifier failure alarm terminals RFA1 and RFA2 are located on the rear of the PC63 cage. Each A63 has a separate rectifier failure dry form “C” contact labeled A, B, and C. A to B is the normally open contact and B to C is the normally closed contact. The maximum wire size for the alarm terminal blocks is 12 gauge. The contacts are rated at 0.4 amps @ 120Vac or 1.25 amps @ 24 Vdc.

The rectifier failure is alarmed, with a loss of d.c. input voltage, low d.c. output voltage, high output d.c. voltage, high temperature or improperly inserted A63 module.

**Power Cabling**

All electrical connections must conform to the National Electric Code and all local building and electrical codes.
INSTALLERS INFORMATION

The table below lists the a.c. and the d.c. minimum wire size requirements. At distances exceeding 10 feet, the d.c. wire size should be chosen to keep the voltage difference between the unit's terminals and the battery at less than 1/2 volt when the unit is fully loaded. If the distance between the unit and the battery exceeds 10 feet, use the Power Cabling Formulas to determine wire size.

**WIRE SIZE TABLE**

(Based upon unit fuse size)

<table>
<thead>
<tr>
<th>FUSE SIZE</th>
<th>WIRE SIZE REQUIREMENT</th>
<th>EQUIPMENT GROUNDING CONDUCTOR MINIMUM</th>
<th>FUSE SIZE</th>
<th>WIRE SIZE REQUIREMENT</th>
<th>EQUIPMENT GROUNDING CONDUCTOR MINIMUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>#14</td>
<td>#14</td>
<td>150</td>
<td>#1</td>
<td>#6</td>
</tr>
<tr>
<td>3</td>
<td>#14</td>
<td>#14</td>
<td>175</td>
<td>#1/0</td>
<td>#6</td>
</tr>
<tr>
<td>4</td>
<td>#14</td>
<td>#14</td>
<td>200</td>
<td>#2/0</td>
<td>#6</td>
</tr>
<tr>
<td>5</td>
<td>#14</td>
<td>#14</td>
<td>225</td>
<td>#2/0</td>
<td>#4</td>
</tr>
<tr>
<td>6</td>
<td>#14</td>
<td>#14</td>
<td>250</td>
<td>#4/0</td>
<td>#4</td>
</tr>
<tr>
<td>10</td>
<td>#14</td>
<td>#14</td>
<td>300</td>
<td>250-MCM</td>
<td>#4</td>
</tr>
<tr>
<td>15</td>
<td>#12</td>
<td>#12</td>
<td>350</td>
<td>350-MCM</td>
<td>#2</td>
</tr>
<tr>
<td>20</td>
<td>#12</td>
<td>#12</td>
<td>400</td>
<td>400-MCM</td>
<td>#2</td>
</tr>
<tr>
<td>25</td>
<td>#10</td>
<td>#12</td>
<td>450</td>
<td>500-MCM</td>
<td>#2</td>
</tr>
<tr>
<td>30</td>
<td>#10</td>
<td>#10</td>
<td>500</td>
<td>600-MCM</td>
<td>#2</td>
</tr>
<tr>
<td>35</td>
<td>#8</td>
<td>#10</td>
<td>600</td>
<td>900-MCM</td>
<td>#1</td>
</tr>
<tr>
<td>40</td>
<td>#8</td>
<td>#10</td>
<td>700</td>
<td>1500-MCM</td>
<td>1/0</td>
</tr>
<tr>
<td>45</td>
<td>#8</td>
<td>#10</td>
<td>800</td>
<td>2/500-MCM</td>
<td>1/0</td>
</tr>
<tr>
<td>50</td>
<td>#8</td>
<td>#10</td>
<td>1000</td>
<td>2/800-MCM</td>
<td>4/0</td>
</tr>
<tr>
<td>60</td>
<td>#6</td>
<td>#10</td>
<td>1200</td>
<td>2/1000-MCM</td>
<td>4/0</td>
</tr>
<tr>
<td>70</td>
<td>#6</td>
<td>#8</td>
<td>1600</td>
<td>2/2000-MCM</td>
<td>4/0</td>
</tr>
<tr>
<td>80</td>
<td>#4</td>
<td>#8</td>
<td>2000</td>
<td>250-MCM</td>
<td>250-MCM</td>
</tr>
<tr>
<td>90</td>
<td>#4</td>
<td>#8</td>
<td>2500</td>
<td>350-MCM</td>
<td>350-MCM</td>
</tr>
<tr>
<td>100</td>
<td>#4</td>
<td>#8</td>
<td>3000</td>
<td>400-MCM</td>
<td>400-MCM</td>
</tr>
<tr>
<td>110</td>
<td>#2</td>
<td>#6</td>
<td>4000</td>
<td>500-MCM</td>
<td>500-MCM</td>
</tr>
<tr>
<td>125</td>
<td>#2</td>
<td>#6</td>
<td>5000</td>
<td>700-MCM</td>
<td>700-MCM</td>
</tr>
<tr>
<td>130</td>
<td>#2</td>
<td>#6</td>
<td>6000</td>
<td>800-MCM</td>
<td>800-MCM</td>
</tr>
</tbody>
</table>

**NOTE:** These are recommended wire sizes. All National and Local Wiring Codes must be followed.
# Wire Gauge Table

<table>
<thead>
<tr>
<th>SIZE AWG</th>
<th>AREA CIR. MILS</th>
<th>SIZE MCM*</th>
<th>AREA CIR. MILS</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>1620</td>
<td>250</td>
<td>250000</td>
</tr>
<tr>
<td>16</td>
<td>2580</td>
<td>300</td>
<td>300000</td>
</tr>
<tr>
<td>14</td>
<td>4110</td>
<td>350</td>
<td>350000</td>
</tr>
<tr>
<td>12</td>
<td>6530</td>
<td>400</td>
<td>400000</td>
</tr>
<tr>
<td>10</td>
<td>10380</td>
<td>500</td>
<td>500000</td>
</tr>
<tr>
<td>8</td>
<td>16510</td>
<td>600</td>
<td>600000</td>
</tr>
<tr>
<td>6</td>
<td>26240</td>
<td>700</td>
<td>700000</td>
</tr>
<tr>
<td>4</td>
<td>41740</td>
<td>750</td>
<td>750000</td>
</tr>
<tr>
<td>3</td>
<td>52620</td>
<td>800</td>
<td>800000</td>
</tr>
<tr>
<td>2</td>
<td>66360</td>
<td>900</td>
<td>900000</td>
</tr>
<tr>
<td>1</td>
<td>83690</td>
<td>1000</td>
<td>1000000</td>
</tr>
<tr>
<td>0</td>
<td>105600</td>
<td>1250</td>
<td>1250000</td>
</tr>
<tr>
<td>00</td>
<td>133100</td>
<td>1500</td>
<td>1500000</td>
</tr>
<tr>
<td>000</td>
<td>167800</td>
<td>1750</td>
<td>1750000</td>
</tr>
<tr>
<td>0000</td>
<td>211600</td>
<td>2000</td>
<td>2000000</td>
</tr>
</tbody>
</table>

*Denotes all sizes larger than #0000 are expressed in MCM.

## Table of Conventions:

- **CMA** = Cross-section of wire in circular MIL area.
- **A** = Ultimate drain in amperes.
- **LF** = Conductor loop feet.
- **MAX AMP** = Maximum allowable amperes for given voltage drop.
- **CMA** = Cross section of wire in circulate MIL area.
- **AVD** = Allowable voltage drop.
- **LF** = Conductor loop feet.
- **K** = 11.1 Constant factor for commercial (TW Type) copper wire (KS5482-01).
  = 17.4 for aluminum (KS20189)

1. Calculating Wire Size Requirements..............................................\( \text{CMA} = \frac{A \times LF \times K}{\text{AVD}} \)

2. Calculating Current Carrying Capacity of Wire..............................\( \text{Max Amp} = \frac{\text{CMA} \times \text{AVD}}{\text{LF} \times K} \)

*Source: Handbook 100-National Bureau of Standards*

**Note:** All wire #6 and larger is stranded.
General Maintenance Procedure

**Yearly**

1. Blow out rectifier/inverter with a low-pressure air hose.
2. Make sure all connections are tight.
3. Perform a visual check on all internal components.
4. Check front panel meters and alarms for accuracy.

**4th Year**

*REPEAT ABOVE WITH THE ADDITION OF:*

1. Check relay contacts for pitting or corrosion.
2. Check capacitors for leakage.

**7th Year**

*REPEAT ALL, WITH THE ADDITION OF:*

1. Filter, resonating capacitors and control relays should be replaced.

**10th Year**

*REPEAT ALL WITH THE ADDITION OF: (except replacing capacitors and control relays, they should be replaced every 7 years)*

1. Check magnetics, components and wiring for signs of excessive heat.
MANUFACTURER’S WARRANTY

All La Marche Manufacturing Co. equipment has been thoroughly tested and found to be in proper operating condition upon shipment from the factory and is warranted to be free from any defect in workmanship and material that may develop within two (2) years from date of purchase under normal use.

If the equipment proves defective within a two year period, it shall be replaced without charge after examination at our factory, providing such defect in our opinion, is due to faulty material or workmanship and not caused by tampering, abuse, misapplication or improper installation.

Should the equipment require major replacement or repair, the equipment must be returned to the La Marche factory to have the inspections, parts, replacements and testing performed by factory personnel. Should it be necessary to return a piece of equipment to the factory, the customer or Sales representative must first obtain a RMA (Return Material Authorization) from the factory. If upon inspection at the factory, the defect was due to faulty material or workmanship, all repairs will be made at no cost to the customer during the warranty period.

All internal maintenance to be performed by La Marche. Warranty is void if seal is damaged.

La Marche reserves the right to honor the warranty with a replacement unit.

In accepting delivery of the equipment, the purchaser assumes full responsibility for proper installation, installation adjustments and service arrangements. Should minor adjustments be required, the local La Marche Sales Representative should be contacted to provide this service.

All sales are final. Only standard LaMarche units will be considered for return. A 25% restocking fee is charged when return is factory authorized. Special units are not returnable.

In no event shall La Marche Manufacturing Co. have any liability for consequential damages, or loss, damage or expense directly or indirectly arising from the use of the products, or any inability to use them either separately or in combination with other equipment or materials, or from any other cause. In addition, any alterations of equipment made by anyone other than La Marche Manufacturing Co. renders this warranty null and void.

La Marche Manufacturing Co. reserves the right to make revisions in current production of equipment, and assumes no obligation to incorporate these revisions in earlier models.

The failure of La Marche Manufacturing Co. to object to provisions contained in customers' purchase orders or other communications shall not be deemed a waiver of the terms or conditions hereof, nor acceptance of such provisions.

The above warranty is exclusive, supersedes and is in lieu of all other warranties, expressed or implied, including any implied warranty of merchantability or fitness. No person, agent or dealer is authorized to give any warranties on behalf of the Manufacturer, nor to assume for the Manufacturer any other liability in connection with any of its products unless made in writing and signed by an official of the manufacturer.