



LaMARCHE®

A76A

HIGH FREQUENCY FLOAT CHARGER

FOR

TELECOMMUNICATIONS POWER SYSTEMS

INSTRUCTION MANUAL

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INSTRUCTION PART NUMBER:

P25-**LA76A-1**

*****IMPORTANT SAFETY INSTRUCTIONS*****

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; return to La Marche factory for repair.
- Do not disassemble this unit; return to factory 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 a.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 these 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.

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 and removing a.c. input supply.

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 charger should comply with all local codes and ordinances.

CAUTION: DO NOT PULL ON OUTPUT CABLES WHEN DISCONNECTING CHARGER FROM BATTERY

RECEIVING INSTRUCTIONS AND GENERAL EQUIPMENT INFORMATION

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.

TABLE OF CONTENTS

1.0 GENERAL	6.2 STORAGE TEMPERATURE
2.0 OUTPUT RATINGS	6.3 HUMIDITY
2.1 D.C. VOLTAGE	6.4 SHOCK
2.2 D.C. VOLTAGE RANGE	6.5 VIBRATION
2.3 D.C. CURRENT RATINGS	6.6 ALTITUDE
2.4 REGULATION	6.7 VENTILATION
2.5 FILTERING	6.8 AUDIBLE NOISE
3.0 INPUT RATINGS	7.0 INSTALLATION INFORMATION
3.1 A.C. VOLTAGE	7.1 MINIMUM WIRE SIZES
3.2 INPUT FREQUENCY RANGE	7.2 NATIONAL CODES
3.3 INPUT CURRENT	8.0 ELECTRICAL CONNECTIONS & FIELD WIRING
3.4 POWER FACTOR	8.1 A.C. INPUT
4.0 TYPICAL ELECTRICAL SPECIFICATIONS	8.2 D.C. OUTPUT
5.0 STANDARD FEATURES	8.3 REMOTE SENSING
5.1 INPUT PROTECTION	9.0 OPERATION – START-UP
5.2 OUTPUT PROTECTION	10.0 DIGITAL ALARM STATUS PANEL
5.3 SELECTIVE HIGH VOLTAGE SHUTDOWN	11.0 ADJUSTMENTS
5.4 REMOTE SENSING	12.0 CIRCUIT DESCRIPTION
5.5 STATUS/ALARM INDICATORS	13.0 TROUBLESHOOTING
5.6 PARALLELING	INSTALLER INFORMATION
5.7 LOAD SHARING	POWER CABLE FORMULAS
5.8 CURRENT WALK IN	MANUFACTURERS WARRANTY
5.9 EMERGENCY RESTORATION	MOUNTING DIMENSION DIAGRAM
5.10 METERS	UNIT SCHEMATIC WIRING DIAGRAM
5.11 MOUNTING	UNIT PARTS LIST
5.12 "HOT" PLUG-IN	PIC-LIMS-01 LAYOUT DRAWING
6.0 ENVIRONMENTAL RATINGS	
6.1 OPERATION AMBIENT TEMPERATURE	

1.0 General

The La Marche Model A76A High Frequency Float Charger has many inherent advantages: Voltage Regulation, Current Limiting Circuitry, High Efficiency and High Power Factor. The Model A76A's compact size and lightweight (less than 40 lbs.) provides a small system footprint and ease of service.

These chargers provide separate adjustable voltages for floating or equalizing lead-acid or nickel cadmium cells. A float/equalize selector switch is located on the front of the charger.

The Model A76A was designed to be mounted in a cabinet, which will fit in a 23 inch relay rack. A 19 inch cabinet is also available and will hold up to (3) A76A chargers. The 23 inch cabinet will hold up to four (4) LaMARCHE Model A76A chargers with the same output voltage. The A76A in the cabinet was designed for a "Hot" plug in which allows addition or removal of units without requiring a system shutdown. Cover plates are provided for cabinet bays that are not used. Summary rectifier failure and low current alarm contacts are located at the rear of the cabinet.

Note: There are no serviceable parts within the A76A Cabinet. Should the A76A stop operating correctly, contact the La Marche Service Department for a Return Authorization Number.

2.0 Output Ratings

2.1 D.C. Voltage

The A76A series provide separate voltages for Floating or Equalizing lead or nickel cadmium cells. The float or equalize mode of operation is selected by a switch located on the front of the rectifier.

The factory settings are as follows:

<i>Float voltage</i>	<i>Equalize voltage</i>
2.25 volts/cell (Lead)	2.35 volts/cell (lead)
1.40 volts/cell (N.C.)	1.55 volts/cell (N.C.)

2.2 D.C. Voltage Range

Float

2.12-2.30 volts/cell +/- .1 volts (Lead) 1.39-1.45 volts/cell +/- .1 volts (N.C.)

Equalize

2.25-2.4 volts/cell +/- .1 volts (Lead) 1.5-1.6 volts/cell +/- .1 volts (N.C.)

2.3 D.C. Current Ratings

The A76A is available in 50 or 100A models. See Table 1.

2.4 Regulation

Steady state output voltage remains within +/- 1/2% of the setting from no load to full 100% load and for a.c. input voltage variations from 190Vac to 264Vac.

2.5 Filtering

A76A chargers are internally filtered to 32 DBRN ("C" Message Weighted) for all condition of rated input voltage at rated output with ripple voltage not exceeding 30 milli-volts RMS when connected to a battery whose capacity is four (4) times the rated output of the charger.

3.0 Input Ratings

3.1 A.C. Voltage

The A76A is designed for 190 - 264 v a.c..

3.2 Input Frequency Range

Range - 45 to 75 HZ

3.3 Input Current

Refer to Table 1

3.4 Power Factor

The A76A is provided with Power Factor correction circuitry, which corrects the a.c. input power factor to approximately.9.

4.0 Typical Electrical Specifications

MODEL #	AC INPUT	PROTECTION
A76A-50-48V-V1	18	25
A76A-100-24V-V1	18	25

TABLE 1

5.0 Standard Features

5.1 Input Protection

A two-pole circuit breaker opens both sides of the a.c. service. Refer to Table 1 for values.

5.2 Output Protection

Current limiting

A circuit adjustable from 90% to 105% of rated output limits the d.c. output current. This is factory set at 105%.

5.3 Selective High Voltage Shutdown

The a.c. circuit breaker trips if the output voltage exceeds a preset d.c. value. Blocking diodes provided in each unit prevents parallel units from being affected.

5.4 Remote Sensing

Sensing for each module is wired to a terminal strip in the cabinet with jumpers wiring the sensing to the d.c. buss at the bay. To remote sense at the load or battery, wire to the sensing terminals.

5.5 Status/Alarm Indicators

A.C. "ON" Indicator

A green LED illuminates to indicate a.c. voltage is present to the rectifier.

Equalize Indicator

A yellow LED illuminates to indicate that the rectifier is in the equalize mode of operation.

Rectifier Failure Alarm and Indicator

A red LED illuminates to indicate that a failure has occurred which may disable the rectifier. The conditions, which will produce a rectifier failure, include:

- Low Voltage
- High Voltage
- High Voltage Shutdown

Low Voltage Alarm (1)

A red LED illuminates to indicate that the rectifier output has dropped below a preset voltage point. The preset voltage point is as follows:

- 1.98 volts/cell (lead)
- 1.3 volts/cell (NC)

This setting will also trip the rectifier failure contacts.

Low Voltage Alarm (2)

A red LED illuminates to indicate that the rectifier output has dropped below a preset voltage point. The preset voltage point is as follows:

- 1.98 volts/cell (lead)
- 1.3 volts/cell (NC)

This setting will also trip the rectifier failure contacts.

High Voltage Alarm

A red LED illuminates to indicate the rectifier output has exceeded the preset high voltage set voltage. The preset voltage point is as follows:

- 2.4 volts/cell (lead)
- 1.6 volts/cell (NC)

This setting will also trip the rectifier failure contacts.

High Voltage Shutdown Alarm

A red LED illuminates to indicate the rectifier output has exceeded a preset set point and the unit has been shutdown by breaking the a.c. circuit breaker. The preset voltage point is as follows:

- 2.5 volts/cell (lead)
- 1.65 volts/cell(NC)

To reset the unit after a High Voltage Shutdown the unit must be removed from the cabinet for a minimum of 10 seconds, then reinserted, and the a.c. breaker reset.

This setting will also trip the rectifier failure contacts.

5.6 Paralleling

This rectifier will parallel with any other La Marche A76A charger with the same output voltage. Up to four A76A's are paralleled in the La Marche A76A Cabinet and multiple cabinets may be paralleled for additional output current.

5.7 Load Sharing

Forced load sharing is not provided on the model A76A charger.

Balanced operation may be obtained by :

1. Turn off all but one (1) charger.
2. Set the one charger for the required output voltage.
3. Turn on all other chargers and apply approximately 50% of the system load.
4. Adjust the output voltage of the chargers until the load is balanced between all chargers. (Do not adjust the first charger with the required voltage setting)

5.8 Current Walk In

Output current will gradually increase after the charger is initially turned on reducing d.c. current and voltage surges.

5.9 Emergency Restoration

This charger may be connected to a battery that has been heavily discharged and recharge it without clearing any protective devices while powering d.c. loads.

5.10 Meters

The A76A is equipped with a digital ammeter/voltmeter at +/- 1-% accuracy at full scale. The meter is selected via a switch on the front panel. The meter reads the individual unit output current and voltage.

5.11 Mounting

The A76A is designed to be mounted in the A76A Power Cabinet. Up to four (4) A76A chargers may be mounted in the 23" cabinet. A 19" cabinet is available which will mount up to (3) A76A chargers. Cover plates are provided for any unused bay. The Power Cabinet is designed to be mounted in a 23-inch wide relay rack with EIA standard mounting centers spaced 1-3/4 inches apart. Any number of Power Cabinets may be paralleled, provided they are all the same output voltage.

5.12 "Hot" Plug-In

The "hot" plug-in feature allows addition or removal of units without requiring a system shutdown.

The units should be plugged in with the a.c. breaker in the off position.

When the unit is plugged into the cabinet, the A76A will go through a lamp test where all the LED's will flash and the meter display will display numbers 0000 thru 9999. While going through the lamp test, the unit should be "locked" into place. When the lamp test is complete and the unit is "locked" into place, the a.c. breaker may be switched to the on position.

To remove the unit, switch the a.c. breaker to the off position, unlock the charger and remove from the system.

6.0 Environmental Ratings

6.1 Operation Ambient Temperature

0 to 50 degrees C (32 to 104 degrees F)

6.2 Storage Temperature

-40 to +85 degrees C (-40 to +185 degrees F)

6.3 Humidity

0 to 95% relative humidity, non-condensing.

6.4 Shock

The charger in its shipping container, withstands shock developed when one edge of the container is dropped from six (6) inches while the opposite edge is resting on the ground, or its dropped two (2) inches on any surface without any physical damage or degradation of the electrical performance.

6.5 Vibration

The charger in its shipping container, withstands vibration encountered in shipping without physical damage or degradation of the electrical performance.

6.6 Altitude

This rectifier is capable of operation at altitudes to 10,000 feet at an ambient temperature of up to +40 degrees C.

6.7 Ventilation

The chargers are fan cooled, the relay rack should be mounted so that the ventilating openings are not blocked and air entering the cabinet does not exceed +50 degrees C.

6.8 Audible Noise

Less than 55 dBA at any point 3 feet from any vertical surface of the charger.

7.0 Installation Information

The A76A was designed to be mounted in a cabinet provided by LaMarche. Up to four (4) units are mounted in the 23" cabinet.

7.1 Minimum Wire Sizes

All wire sizes and cabling should be sized for four (4) chargers. (SEE CHART ON PAGE 15)

7.2 National Codes

All wiring should be done following the National Electric Code and all local building and electrical codes.

8.0 Electrical Connections & Field Wiring

8.1 A.C. Input

Terminals are provided in the back of the cabinet for all a.c. connections. Each charger has its own set of a.c. terminals.

8.2 D.C. Output

All charger outputs are paralleled and brought to the cabinet d.c. buss.

8.3 Remote Sensing

Remote sensing is provided by removing the jumper bars between terminals 2&3 and 4&5 of the remote sensing terminal strip and connecting leads between terminal 2 to the battery or load positive and connecting terminal 5 to the battery or load negative.

9.0 Operation

START UP

When all connections have been made to the cabinet, plug all chargers into the cabinet and turn the locking screws. **Be sure the a.c. breakers are off until all lamp tests are complete.** Place all a.c. breakers to the "on" positions.

10.0 Digital Alarm Status Panel

DESCRIPTION

- ◆ Digital display, selectable for d.c. voltage, d.c. current (amps), timer mode, and equalize time remaining (hours)
- ◆ Electronic Equalize timer with equalize light
- ◆ Summary Alarm Light / Alarm relay - will indicate when breaker trips or charger fails
- ◆ Low Voltage Alarm 1 w/ Light
- ◆ Low Voltage Alarm 2 w/ Light
- ◆ Low d.c. current light with alarm relay

- ◆ High d.c. voltage w/ Light
- ◆ High Voltage Shutdown w/ Light
- ◆ Reset push-button – **NOTE:** To perform the reset operation, the reset button **MUST BE HELD DOWN** for an **ENTIRE 5 SECONDS**, then released.
- ◆ Equalize / select mode switch

The low d.c. volts, high d.c. volts, low current, high d.c. voltage shutdown alarms, the equalize timer mode and equalize time are all adjustable from the front door panel.

OPERATION

Once the proper a.c. input and battery are connected to the system, the digital display will indicate the unit output voltage, the DCV "LED" will light. Toggle the equalize/select switch down to the select position and the display will indicate system output amps and its "LED" will light. A second toggle and the time mode will indicate on the display and its "LED" will light. A third toggle and the equalize time remaining will indicate on the display. A fourth toggle and d.c. volts will again indicate.

To check or re-set the alarm settings, hold the equalize/select switch in equalize for approximately five (5) seconds and the display will indicate cal. in a few seconds, the low voltage "LED-1" will blink and the display will read the low voltage setting for approximately five (5) seconds, the "LED" will turn off and the low voltage "LED-2" will blink for approximately 5 seconds it will turn off and the timer mode "LED" will turn on, the display will indicate the timer mode setting. The display and "LED" will change every five seconds. The remaining "LED's" are equalize time, high voltage shutdown, high voltage and low current. After going through one cycle, the display will return to the normal mode. The alarm settings, timer mode, or equalize time can be reset while their function is active (i.e. "LED" is blinking) by using the equalize select mode switch. Pushing the switch to up will raise the setting, while pushing the equalize select mode switch down will lower the setting. **NOTE:** The cycle must be allowed to be completed in order to save any new settings.

There are dry form "C" contacts located on the rear of the cabinet for low d.c. current and summary rectifier failure. The summary contacts are rated 60 Va @ 120V, a.c. or d.c.. These contacts will change in approximately five (5) seconds after any alarm light turns on. The low current alarm can be turned off with the select mode switch. This alarm package is shipped with the following factory settings unless otherwise specified.

Note: *Some cabinets have the optional La Marche Intelligent Monitoring System (LIMS), input and output jacks are located on the rear of the cabinet. To see physical location of LIMS input and output jacks, refer to PIC-LIMS-01 drawing included with this manual. (Drawing also shows location of contacts referred to in above paragraph.)*

TIMER MODES - **NOTE: IN ALL MODES, THE UNIT WILL RETURN TO FLOAT IF THE EQUALIZE SWITCH IS PUSHED.**

Low D.C.voltage (1): 1.98Vpc L.A.
Low D.C. voltage (2): 1.98Vpc L.A.
High D.C. voltage : 2.45 Vpc L.A.
High D.C. voltage shutdown: 2.5 Vpc L.A.
Low D.C. current: .5 A
Timer mode: Mode 0
Equalize Time: 8 Hours

MODE 0

DISPLAY indicates P00

This is the standard timer mode. If the "EQUALIZE" switch is pushed the timer will switch the charger into the equalize mode and the equalize "LED" will indicate. The timer will automatically return the charger to the float mode when the equalize cycle is complete.

MODE 1

DISPLAY indicates P01

This mode of operation automatically starts an equalize cycle every 7 days after. The length of this cycle is again determined by the timer setting. After the equalize period the timer will wait for another 7 days and then restart.

MODE 2

DISPLAY indicates P02

This mode of operation automatically starts an equalize cycle every 14 days. The length of this cycle is again determined by the timer setting. After the equalize period the timer will wait for another 14 days and then restart.

MODE 3

DISPLAY indicates P03

This mode of operation automatically starts an equalize cycle every 30 days. The length of this cycle is again determined by the timer setting. After the equalize period the timer will wait for another 30 days and then restart.

MODE 4

DISPLAY indicates P04

This mode of operation automatically starts an equalize cycle when the d.c. voltage drops below the low voltage setting for 30 seconds or longer. The battery voltage must rise approximately 8% above the low voltage set point.

11.0 Adjustments

Float and Equalize voltage adjustments are provided on the front of each unit along with a current limit output current adjustment. Adjusting the potentiometers in the clockwise direction will increase the setting and counter clockwise will decrease the setting.

There are no other user adjustments that can be made.

12.0 Circuit Description

The A76A float charger is a high frequency off line switch mode battery charger that is designed in the asymmetrical half bridge forward converter topology.

The a.c. input voltage is rectified to a d.c. level, filtered, regulated, and switched creating a square wave into the primary of the power transformer. The power transformer steps down the voltage to the required a.c. voltage, which in turn is rectified to a d.c. level, regulated, and filtered to provide the d.c. output.

The A76A is controlled by a current mode controller that is constantly monitoring the current into the switching MOS-FETS, this provides instantaneous current limit protection and improved transient response to large load changes.

All alarms and charger status is monitored and controlled by a microprocessor. This circuit is monitoring the d.c. voltage and current and displaying it as the ammeter and voltmeter display. It is also comparing the unit input and output against preset values

which cause high and low voltage indication, low current indication, high voltage shut down, over temperature (fan failure) indication and current cutback.

All wiring internal to the A76A is very critical and because of this most of the internal wiring is done via circuit boards. It is not recommended that the charger case be opened for any reason.

13.0 Troubleshooting

Be sure all connections to the cabinet are correct. Check polarities. Check for loose connections. Be sure all units are locked into place. Check for correct a.c. input and d.c. output voltages.

If the a.c. breaker trips and the high voltage shutdown (HVSD) LED is on, unplug the charger, lower the float & equalize settings by adjusting their respective potentiometers counter clockwise, plug the unit back into the cabinet (unplugging and then plugging the charger back into the cabinet resets the charger), Lock the screws, and switch the a.c. breaker on. If the a.c. breaker trips again, return the unit.

There are no user serviceable parts internal to the A76A. Should the A76A stop operating correctly, contact the LaMarche service department for a Returned Material Authorization (RMA) number and return the charger for repair.

To avoid damage caused by shipping the units must be returned in their original shipping container with the original packing material if available. La Marche will not be responsible for damage when returned to factory.

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)

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

NOTE: These are recommended wire sizes. All National and Local Wiring Codes must be followed.

POWER CABLING FORMULAS

WIRE GAUGE TABLE

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

*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.....
$$CMA = \frac{A \times LF \times K}{AVD}$$

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

SOURCE: HANDBOOK 100-NATIONAL BUREAU OF STANDARDS

NOTE: ALL WIRE #6 AND LARGER IS STRANDED.

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 one (1) year from date of purchase under normal use.

If the equipment proves defective within a one 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.

INSERT DRAWING – PIC-LIMS-01