A31 DC-AC Inverter

The La Marche A31 Inverter is the ideal choice when AC power requirements are critical. This inverter has a wide range of standard features such as a sine wave output, voltage regulation, protection from AC-DC shorts, under/over-voltage conditions, input filtering and overload protection. It incorporates a DC input breaker and an automatic under/over-voltage shutdown circuit to protect the inverter. The A31 has a polarity indicator to tell you if the battery is connected incorrectly. The unit is equipped with an input filter pre-charge circuit which includes an indicator to inform you that the inverter is ready for operation. Applications may include data centers, fire alarms, telecommunications, emergency lighting, security, oil exploration and utility substation systems.

Available in 50 or 60 Hz 120, 240, 208 or 220 AC Output.

Standard Features

- Highly Reliable Ferroresonant Transformer
- Available DC Inputs 24V or 48V or 120V
- DC to AC Isolation
- Pure Sine Wave Output
- Adjustable DC Under/Over Voltage Shutdown
- Analog AC Ammeter & Voltmeter (2%)
- Overload/Current Limit
- Inverter On/Off Switch
- AC Circuit Breaker
- DC Circuit Breaker
- IGBT Power Block Technology
- UL 1012 Listed, UL 1481 Listed (selected models) and C-UL Listed
- AC Ammeter
- AC Voltmeter
- 5-Year Limited Warranty

Options

22P 1ms Static Transfer Switch (Inverter Prime)

22S 1ms Static Transfer Switch (Inverter Standby)

22A Static Switch Alarm Package consisting of the following: 2 Form "C" Contacts for Phase Lock, Utility Available, Inverter Available, Load on Preferred, Load on Alternate, Requires 22P or 22S.

22D Digital Display (replaces AC analog meters). Used only with 1ms Static Switch. Requires 22P or 22S.

09A UL 1481

164 10-15ms Static Switch Transfer (Inverter Prime) (not available on 4KVA & above)

165 10-15ms Static Switch Transfer (Inverter Standby) (not available on 4KVA & above)

130 Inverter Failure Relay and Light (not available with option 22A)

132 Inverter Failure Relay (1 Form "C") (not available with option 22A)

133 Utility Available Relay (1 Form "C") (not available with option 22A)

123 Duplex Receptacles (not UL Listed)

06C DC Ammeter (2%)

06D DC Voltmeter (2%)

MADE IN U.S.A.
Specifications subject to change without notice
P25-DSA31-1
ECN 22130
04/19

La Marche Mfg. (A U.S. Company)
106 Bradrock Drive, Des Plaines, IL 60018
Tel: 847.299.1188 Fax: 847.299.3061
sales@lamarchemfg.com
www.lamarchemfg.com

Model Number	DC Input Amps		AC Output			BTU Hour***	Case No.	Approx. Weight	
	No Load	Full Load***	VA	Volts	Amps			lbs	kgs
A31-1K-24V-A6 [1]	11.0	59.0	1000	120	8.33	817	9D	105	48
A31-1.5K-24V-A6 [1]	12.0	87.0	1500	120	12.50	1118	9D	120	55
A31-2K-24V-A6 [1]	17.0	116.0	2000	120	16.67	1491	9E*	175	80

Model Number	DC Input Amps		AC Output			BTU Hour***	Case No.	Approx. Weight	
	No Load	Full Load***	VA	Volts	Amps			lbs	kgs
A31-1K-48V-A6 [1]	5.0	28.0	1000	120	8.33	602	9D	105	48
A31-1.5K-48V-A6 [1]	7.0	40.0	1500	120	12.50	616	9D	120	55
A31-2K-48V-A6 [1]	10.0	54.0	2000	120	16.67	917	9E*	175	80
A31-3K-48V-A6 [1]	13.0	81.0	3000	120	25.00	1375	9E*	270	123
A31-4K-48V-A6 [1]	15.0	106.0	4000	120	33.33	1546	9E*	310	141
A31-5K-48V-A6 [1]	16.0	132.0	5000	120	41.67	1860	9E*	340	155
A31-10K-48V-A6	29.0	278.0	10000	120	83.33	5732	44**	800	364

Model Number	DC Input Amps		AC Output			BTU Hour***	Case No.	Approx. Weight	
	No Load	Full Load***	VA	Volts	Amps			lbs	kgs
A31-1K-120V-A6	4.0	11.0	1000	120	8.33	730	9D	105	48
A31-1.5K-120V-A6	4.5	17.0	1500	120	12.50	975	9E*	120	55
A31-2K-120V-A6	5.0	22.0	2000	120	16.67	1060	9E*	175	80
A31-3K-120V-A6	6.0	32.0	3000	120	25.00	1231	9E*	270	123
A31-4K-120V-A6	8.0	42.0	4000	120	33.33	1402	9E*	310	141
A31-5K-120V-A6	9.0	52.0	5000	120	41.67	1573	9E*	340	155
A31-7.5K-120V-A6	10.0	79.0	7500	120	62.5	2719	72**	500	227
A31-10K-120V-A6	12.0	105.0	10000	120	83.33	3506	72**	800	364
A31-15K-120V-A6	25.0	162.0	15000	120	125.00	6874	44**	950	432
A31-20K-120V-A6 [2]	40.0	210.0	20000	120	166.67	8400	47B**	1900	861

Case No.	Case Type			RU	Height		Width****		Depth	
	Floor	Relay Rack								
		19”	23”		in	mm	in	mm	in	mm
39	N/A	√	√	4	7.0	178	16.75	425	16.25	413
33	N/A	N/A	√	6	10.50	267	21.00	533	16.25	413
9D	N/A	N/A	√	10	17.50	445	20.88	530	18.00	457
9E	N/A	N/A	√	10	17.50	445	20.88	530	23.00	584
70	√	N/A	N/A	N/A	41.00	1041	27.00	686	19.00	483
72	√	N/A	N/A	N/A	44.50	1130	27.00	686	23.50	597
44	√	N/A	N/A	N/A	72.10	1831	24.00	610	19.06	484
47B	√	N/A	N/A	N/A	71.00	1803	38.00	965	47.00	1194

* Requires a heat baffle when 2 or more units are used.
** Floor mount case only (all others are rack mounted).
*** Typical at full load and minimum input voltage.
**** Main body width of case on relay rack units. Side mounting angles located 7.50” from front of relay rack.
[1] UL 1481 Listing Available
[2] Not UL Listed

Input Specifications

- **Battery Ranges**
  24 volt nominal 21-30VDC
  48 volt nominal 42-60VDC
  120 volt nominal 105-150VDC
- **Input**
  Reverse Polarity Protection Indicator
  Filter Pre-charge Circuit; DC Breaker
- **DC Under Voltage Shutdown**
  Adjustable
- **DC Over Voltage Shutdown**
  Adjustable

Output Specifications

- **AC Output Voltage**
  120V Nominal (Standard)
  240V (Optional)
  208V and 220V (Optional, Not UL Listed)
- **Output Power**
  Rated VA continuous for unity to .8 lagging power factor
- **Line Regulation**
  ±3% Over DC Battery Range
- **Load Regulation**
  ±4% from no load to full load
- **Frequency Regulation**
  ±0.5% (Quartz Clock)
- **Current Limit**
  Approximately 150%. Protected by AC Output Breaker
- **Total Harmonic Distortion**
  Approximately 5% at nominal DC Input and Full Load. Less than 3% for any single harmonic.
- **Noise**
  Less than 32 dBrn “C” message weighted with a battery (24VDC and 48VDC only).
- **Audible Noise**
  65 dB @ 5 feet
- **Approximate Efficiency**
  24VDC models 70-75%
  48VDC models 85-90%
  120VDC models 85-90%
- **Load Crest Factor**
  Will operate with Load Crest Factors up to 2.8

Environmental

- **Operating Temperature**
  0 to 50°C
- **Storage Temperature**
  -20 to 60°C
- **Relative Humidity**
  0-95% (non-condensing)
  Convection Cooled (3KVA and larger units may be fan assisted)

Agency Approvals

- UL 1012
  UL 1481 (Available for selected models, refer to chart)
- C-UL

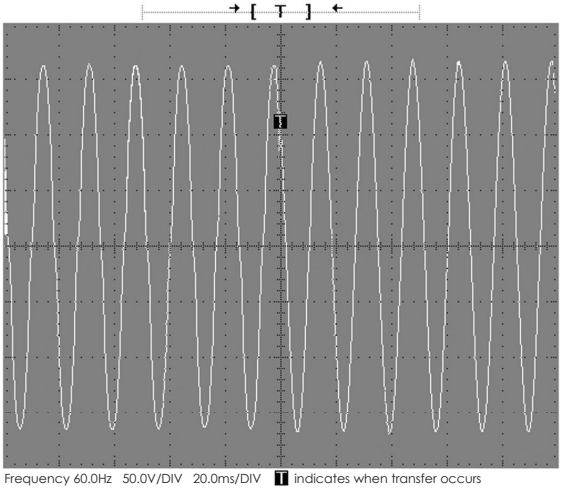
Ordering Information

When ordering, please specify:

- La Marche Model Number A31 Inverter
- Desired output power (VA)
- Battery type and number of cells
- Output voltage and frequency
- Description of load
- Optional Accessories

22P / 22S Static Switch

1MS Electronic Transfer Switch



Frequency 60.0Hz 50.0V/DIV 20.0ms/DIV T indicates when transfer occurs

Scope photo shown above of typical Static Switch Transfer from Inverter Prime Source to Alternate Source upon loss of Inverter Output

Fast Electronic Static Switch for La Marche A31 DC to AC Inverter

The La Marche Electronic Static Switch is an automatic device that will transfer an AC load to and from the Prime Source to an Alternate Source, if the Prime Source fails, in less than 4 millisecond. The Static Transfer Switch is intended for use on the La Marche A31 DC to AC Inverters ranging from 1kVA to 15kVA models (consult factory for other applications). A customer calibration mode is incorporated into the Static Switch Menu to allow for on site settings that are best suited for the intended application.

A Digital Display Panel, which replaces the unit's AC analog meters, is also offered as an option. The Digital Display will allow the operator to view Load Voltage, Load Current, VA (Volt-Amps), Utility Voltage, Utility Frequency, Inverter Voltage and Inverter Frequency readings.

Status Display

A Status Display panel consisting of (5) LED indicator lights and (2) switches are provided on the front of the unit.

⌘ Phase Lock	▶▶ Indicates when the Prime and Alternate sources are in synchronization
⌘ Utility Available	▶▶ Indicates the Alternate source is connected and operating within its proper range
⌘ Inverter Available	▶▶ Indicates the Inverter is operating within its proper range
⌘ Load on Preferred Source	▶▶ Indicates the AC load is operating on the Prime source
⌘ Load on Alternate Source	▶▶ Indicates the AC load is operating on the Secondary source
▶ Auto/Manual Switch	▶▶ Allows for an Automatic or Manual Transfer
▶ Test Transfer Pushbutton	▶▶ Allows an active check of the Static Switch operation

Customer Calibration Mode

The customer calibration mode allows the user to select the available parameters and to set per preferences.

SELECTIONS	▶▶ SETTINGS
1. Preferred Source	▶▶ May be selected to either Utility or Inverter
2. Load Voltage Window Upper Limit	▶▶ Maximum voltage allowed on the Load
3. Load Voltage Window Lower Limit	▶▶ Minimum voltage allowed on the Load
4. Utility Voltage Upper Limit	▶▶ Maximum voltage allowed for Utility to be considered good
5. Utility Voltage Lower Limit	▶▶ Minimum voltage allowed for Utility to be considered good
6. Inverter Voltage Upper Limit	▶▶ Maximum voltage allowed for Inverter to be considered good
7. Inverter Voltage Lower Limit	▶▶ Minimum voltage allowed for Inverter to be considered good
8. Inverter Sense Delay	▶▶ The amount of time the Inverter must be within the upper and lower limits before the Inverter is considered within tolerance
9. Utility Sense Delay	▶▶ The amount of time the Utility must be within the upper and lower limits before the Utility is considered within tolerance
10. Retransfer Delay	▶▶ Used to set the time the Static Switch will attempt retransfer from the Alternate Source to the Primary Source
11. Hit Counter	▶▶ Used to determine the maximum allowable load voltage deviations outside of the pre-defined envelope that will trigger a transfer

Static Switch Options

Option #22A Alarm Relay Board consisting of (2) sets of Form "C" Contacts for each of the following:

- Phase Lock
- Utility Available
- Inverter Available
- Load on Prime Source
- Load on Alternate Source

Option #22D Digital Display (replacing AC analog meters on unit) to indicate the following:

- Load Voltage
- Load Current
- VA (Volt -Amps)
- Utility Voltage
- Utility Frequency
- Inverter Voltage
- Inverter Frequency

Manual Bypass Switch

For AC Applications

*Back Cover Not Shown

Manual Bypass Switch

The Manual Bypass Switch (MBS) provides a mechanical means to transfer between power sources to your critical loads. Whether you are performing regular schedule maintenance on the system or in the event of an unexpected system malfunction, the power to the load can be safely transferred without being interrupted.

La Marche offers two types of MBS configurations, a Make-Before-Break (MB4B) and a Break-Before-Make (BB4M). The MB4B switch links both primary and secondary sources momentarily before completing the transfer. The MB4B is the preferred configuration for use with critical loads.

Rack Panel	Inverter Rating	Rack Units
20A	1k TO 1.5kVA	2
45A	2k to 4kVA	3
75A	5kVA	4
200A	7.5 to 15kVA	8

Wall Mount	Inverter Ratings	Case No.	Width		Depth		Height	
			in	mm	in	mm	in	mm
20A	1k TO 1.5kVA	1	10.375	264	7.875	200	16.250	413
45A	2k to 4kVA	1	10.375	264	7.875	200	16.250	413
75A	5kVA	2	12.812	326	10.000	254	17.125	435
200A	7.5 to 15kVA	3	15.375	391	11.000	279	23.750	603

Standard Features

- Input & Output Terminal Block
- Rotary CAM Type Switch
- 2- Position for Complete Isolation
- Rack or Wall Mount available
- UL Listed Bypass Switches
- 20 to 200 AMP Rating Switches

Option

- 06J - Frequency Meter (available for MB23 & MBW)

Model Number Nomenclature

MB 19 - 20A - MB4B

- Model Number
- Mounting
- Amps
- MB4B - Make Before Break
  BB4M - Break Before Make

Mounting

19 - Mounting for 19" Rack
23 - Mounting for 23" Rack
W - Wall Mount

Amps

20A
45A
75A
200A

Note: For use on 120 VAC Inverters. For other AC Voltages consult factory.