



laMARCHÉ
ISO 9001:2015 CERTIFIED

A31 22U Series

Ferro DC-AC Inverter



A31 shown w/ 22U
Made in U.S.A



The La Marche A31 Inverter is designed based on robust ferro technology. This DC-AC pure sine wave inverter utilizes IGBT Switching to assure reliable performance.

The 22U Series provides a wide range of features such as static transfer switch and a 4-line LCD display for monitoring. It incorporates a DC input breaker and an automatic under/over-voltage shutdown circuit to protect the inverter and battery. The A31 has a polarity indicator to tell you if the battery is connected incorrectly.

The La Marche A31 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.

Standard Features

Highly Reliable Ferroresonant Transformer Design

Robust IGBT Power Block Technology

Pure Sine Wave Output

Digital Static Transfer Switch (DSTS)

Alarm LEDs

4 - Line LCD Display

Adjustable DC Under/Over Voltage Shutdown

Digital DC Volt metering

DC to AC Isolation

Inverter On/Off Switch

Output AC Circuit Breaker

Input DC Circuit Breaker

Overload/Current Limit

UL 1012 Listed, UL 1481 Listed (selected models)
and C-UL Listed

5-Year Limited Warranty

Optional Accessories

09A UL 1481 (Consult Factory)

22A Discrete Alarm Relays (May not combine with
21Q/21P on units 5kVa or smaller)

21P DNP3 Communication (RS232/RS485/Ethernet)

21Q Modbus Communication (RS232/RS485/Ethernet)

06C DC Current Metering

Specifications subject to change without notice

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Inverter Specifications

Input Specifications

- **Battery Ranges**
24 volt nominal 21-30VDC
48 volt nominal 42-60VDC
120 volt nominal 105-147 VDC
- **Input Protection**
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
- **Frequency**
60Hz (50Hz Optional, Not UL Listed)
- **Output Power**
Rated VA continuous for unity to .8
lagging power factor
- **Line Regulation**
 $\pm 3\%$ Over DC Battery Range

- **Load Regulation**
 $\pm 4\%$ from no load to full load
- **Frequency Regulation**
 $\pm 0.5\%$ (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 (Consult Factory)
- 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

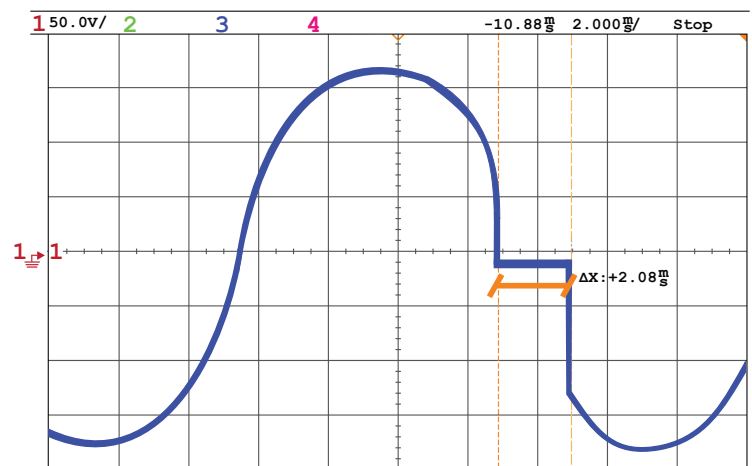
Digital Static Transfer Switch

Digital Static Switch for La Marche A31 DC to AC Inverter

The La Marche Digital Static Transfer Switch (DSTS) connects primary or alternate sources to the load via the corresponding SCR switches. In case of interruption from the primary source, the DSTS instantaneously switches without power interruption.

A customer calibration mode is incorporated into the Static Switch Menu to allow for on site changes that are best suited for the intended application.

Users will have the capability to select prime or standby from the calibration menu. The Digital Display will allow the operator to view Load Voltage, Load Current, VA (Volt-Amps), Utility Voltage, Utility Frequency, Inverter Voltage, Inverter Frequency and Input DC Voltage readings.



Scope photo shown above of typical Static Switch Transfer from Inverter Prime Source to Alternate Source upon loss of Inverter Output
Frequency 60.0Hz, 50.0V/DIV, 2.0ms/DIV
ΔX = 2.08ms Dead Time

LCD Display Monitoring



Digital Display to indicate the following:

- Load Voltage
- Load Current
- VA (Volt -Amps)
- Bypass Voltage
- Bypass Frequency
- Inverter Voltage
- Inverter Frequency
- Load on Inverter/Bypass
- Preferred Source
- Input DC Volts

Alarm Contacts

Alarm Relay Board consisting of (2) sets of Form “C” Contacts for each of the following:

- Phase Lock
- Bypass Available
- Inverter Available
- Load on Preferred Source
- Load on Bypass Source
- Low DC Alarm
- Low DC Shutdown Alarm
- High DC Shutdown Alarm

Status Display

A Status Display consisting of (8) LED indicator lights and (9) switches are provided on the front of the unit.

- | | |
|--------------------------|--|
| ☒ Phase Lock | ▶▶ Indicates when the Preferred and Bypass sources are in synchronization |
| ☒ Bypass Available | ▶▶ Indicates the Bypass source is connected and operating within its proper range |
| ☒ Inverter Available | ▶▶ Indicates the Inverter is operating within its proper range |
| ☒ Preferred Source | ▶▶ Indicates the AC load is operating on the Preferred source |
| ☒ Bypass Source | ▶▶ Indicates the AC load is operating on the Secondary source |
| ☒ Auto/Manual Retransfer | ▶▶ Indicates retransfer (from Bypass to Prime source) mode setting: Auto (solid), Manual (flash) |
| ☒ Low DC Shutdown/Low DC | ▶▶ Indicates Low DC Shutdown alarm (solid) or Low DC alarm (flash) is present |
| ☒ High DC Shutdown | ▶▶ Indicates High DC Shutdown alarm is present |

	Model Number	DC Input Amps		AC Output			BTU Hour**	Case No.	Approx. Weight	
		No Load	Full Load**	VA	Volts	Amps			lbs	kgs
24V (12L or 20N)	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
48V (24L, 37N or 38N)	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
120V (58L or 60L, 92N, 94N or 96N)	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

Case No.	Case Type		RU	Height		Width***		Depth	
	Floor	Relay Rack 23"		in	mm	in	mm	in	mm
9D	N/A	✓	10	17.50	445	20.88	530	18.00	457
9E	N/A	✓	10	17.50	445	20.88	530	23.00	584
72	✓	N/A	N/A	44.50	1130	27.00	686	23.50	597
44	✓	N/A	N/A	71.00	1803	38.00	965	47.00	1194

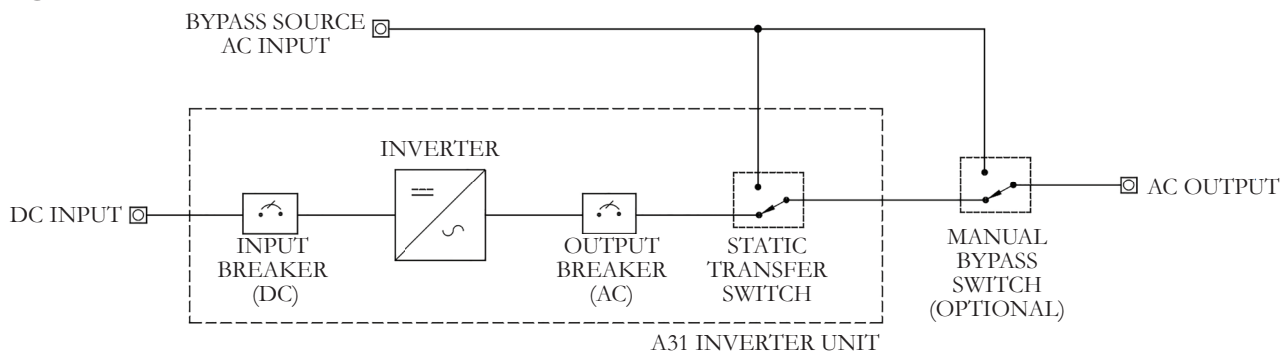
* Requires a heat baffle when 2 or more units are used.

(1) UL 1481 Listing Available

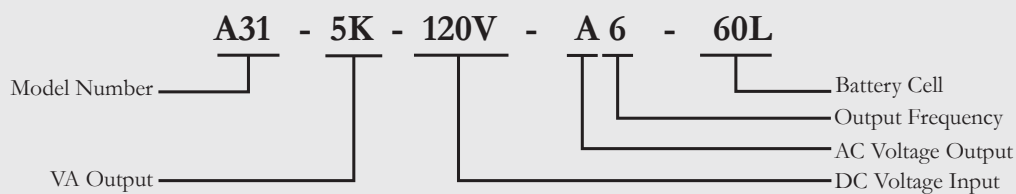
** Typical at full load and minimum input voltage.

*** Main body width of case on relay rack units. Side mounting angles located 7.50" from front of relay rack.

Block Diagram



Model Number Nomenclature



AC Voltage Code

A - 120V

DC Voltage Input

24Vdc
48Vdc
120Vdc

Output Frequency Code

6 - 60Hz
5 - 50Hz

Battery Cell Type Code

12L, 24L, 58L, 60L
20N, 37N, 38N,
92N, 94N, 96N.

Manual Bypass Switch

For AC Applications



*Back Cover Not Shown

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.

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

Optional Accessories

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

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

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

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

Model Number Nomenclature

Mounting

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

MB 19 - 20A - MB4B

Model Number Mounting Amps

MB4B - Make Before Break
BB4M - Break Before Make

Amps

20A
45A
75A
200A