Ordering Number:

AL1024NK1

Dual Output Power Supply/Charger Kit

Fully assembled kit includes:

- (1) AL1024ULXB2 - Power Supply/Charger
- (1) VR6 - Voltage Regulator

Installation Guide

All components of this kit are UL Listed sub-assemblies

CE

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Rev. 1024NK1_022322

Installing Company: _____ Service Rep. Name: _____

Address: _____ Phone #: _____

Overview:

Altronix AL1024NK1 dual output power supply/charger kit converts a 115VAC, 60Hz input into one (1) 5VDC or 12VDC selectable output at up to 6A supply current and one (1) 24VDC output. It also offers a suite of features that includes overvoltage protection, AC fail supervision, low battery supervision and battery presence supervision (form "C" contacts).

Agency Listings:

AL1024ULX:

UL Listings for US Installations:

UL 294 - UL Listed for Access Control System Units.
UL 603 - UL Listed for Power Supplies for Use with Burglar-Alarms Systems.
UL 1481 - UL Listed for Power Supplies for Fire Protective Signaling Systems.

UL Listings for Canadian Installations:

CSA C22.2 No.205 - Signal Equipment.

VR6:

UL Listings for US Installations:

UL 294 6th Edition: Access Control System Units.

UL Listings for Canadian Installations:

ULC-S319: Electronic Access Control Systems.

Stand-by Specifications (total current shown):

Output	15 min. of Stand-by and 5 min. of Alarm	4 hr. of Stand-by and 5 min. of Alarm	24 hr. of Stand-by and 5 min. of Alarm	60 hr. of Stand-by and 5 min. of Alarm
24VDC/12AH Battery	Stand-By = 8A Alarm = 10A	Stand-By = 1.5A Alarm = 10A	Stand-By = 200mA Alarm = 10A	Stand-By = 100mA Alarm = 10A
Output	**15 min. of Stand-by and 5 min. of Alarm**	**4 hr. of Stand-by and 5 min. of Alarm**	**24 hr. of Stand-by and 15 min. of Alarm**	**60 hr. of Stand-by and 15 min. of Alarm**
24VDC/65AH Battery	–	Stand-By = 8.0A Alarm = 10A	Stand-By = 1.5A Alarm = 10A	Stand-By = 500mA Alarm = 10A

For Access Control applications, battery capacity for 10A supply current - 1 hr. for 24VDC/12AH battery, 6.5 hrs. for 24VDC/65AH battery.
See battery size calculation worksheet for other batteries *(Page 6)*.

Specifications:

Input:

- 115VAC, 60Hz, 4.2A.

Output:

- Two outputs:
  - Selectable 5VDC or 12VDC output;
  - 24VDC output.
- 5VDC @ 6A continuous and
  24VDC @ 8A continuous
  or
  12VDC @ 6A continuous and
  24VDC @ 6A continuous
- Overvoltage protection.

Battery Backup:

- Built-in charger for sealed lead acid or gel type batteries.
- Maximum charge current 3.6A.
- Automatic switch over to stand-by battery when AC fails.
  Transfer to stand-by battery power is instantaneous with no interruption.

Supervision:

- AC fail supervision (form "C" contacts).
- Low battery supervision (form "C" contacts).
- Battery presence supervision (form "C" contacts).

Visual Indicators:

AL1024ULXB:

- **Green AC LED:** Indicates 115VAC present.
- **Red DC LED:** Indicates DC output.

VR6:

- Input and output LEDs.

Additional Features:

- Short circuit and overload protection.
- Unit is complete with power supply, enclosure, battery leads, and cam lock.

Enclosure Dimensions (approximate H x W x D):

13" x 12.5" x 3.25"
(330.2mm x 317.5mm x 82.6mm).

Installation Instructions:

Wiring methods shall be in accordance with the National Electrical Code/NFPA 70/NFPA 72/ANSI, The Canadian Electrical Code, Part 1 and with all local codes and authorities having jurisdiction. The product must be located indoors within the protected premises.

1. Mount unit in desired location. Mark and predrill holes in the wall to line up with the top two keyholes in the enclosure. Install two upper fasteners and screws in the wall with the screw heads protruding. Place the enclosure's upper keyholes over the two upper screws, level and secure. Mark the position of the lower two holes. Remove the enclosure. Drill the lower holes and install the two fasteners. Place the enclosure's upper keyholes over the two upper screws. Install the two lower screws and make sure to tighten all screws *(Enclosure Dimensions, pg. 9)*. Secure enclosure to earth ground.
2. Connect unswitched AC power (115VAC, 60Hz) to terminals marked [L, N] *(Fig. 1a, pg. 4)*. Use 14 AWG or larger for all power connections. Secure green wire lead to earth ground.
   Keep power-limited wiring separate from non power-limited wiring (115VAC 60Hz Input, Battery Wires). Minimum 0.25" spacing must be provided.
   CAUTION: Do not touch exposed metal parts. Shut branch circuit power before installing or servicing equipment. There are no user serviceable parts inside. Refer installation and servicing to qualified service personnel.
3. Measure output voltage before connecting devices. This helps avoiding potential damage.
4. Select VR6's output voltage (5VDC or 12VDC) using switch [S1] *(Fig. 2a, pg. 5)*.
5. Connect devices to be powered:
   a. For 24VDC connect device(s) to terminals marked [+ DC –] on AL1024ULXB2 (power supply board) (*Fig. 1h, pg. 4, Fig. 2, pg. 5*).
   b. For 5VDC or 12VDC connect device(s) to terminals marked [+ OUT –] on VR6 *(Fig. 2b, pg. 5)*
   Carefully observe correct polarity.
6. For Access Control applications batteries are optional. When batteries are not used, a loss of AC will result in the loss of the output voltage. When the use of stand-by batteries is desired, they must be lead acid or gel type. Connect battery to terminals marked [– BAT +] *(Fig. 1g, pg. 5)*. Use two (2) 12VDC batteries connected in series for 24VDC operation (battery leads included) Use batteries - Casil CL1270 (12V/7AH), CL12120 (12V/12AH), CL12400 (12V/40AH), CL12650 (12V/65AH) batteries or UL recognized BAZR2 batteries of an appropriate rating.
7. Connect appropriate signaling notification devices to AC FAIL & BAT FAIL *(Fig. 1b, pg. 4)* supervisory relay outputs.
8. To delay reporting for up to 6 hrs., cut "AC Delay" jumper and reset power to unit *(Fig. 1f, pg. 4)*.
9. For Access Control Applications: mount UL Listed tamper switch (Altronix model TS112 or equivalent) at the top of the enclosure. Slide tamper switch bracket onto the edge or the enclosure approx. 2" from the right side *(Fig. 2, pg. 5)*. Connect tamper switch wiring to the Access Control Panel input or the appropriate UL Listed reporting device.

Wiring:

Use 18 AWG or larger for all low voltage power connections.
Note: Take care to keep power-limited circuits separate from non power-limited wiring (115VAC, Battery).

Maintenance:

Unit should be tested at least once a year for the proper operation as follows:
Output Voltage Test: Under normal load conditions, the DC output voltage should be checked for proper voltage level AL1024NK1: 24VDC nominal rated @ 10A max.
Battery Test: Under normal load conditions check that the battery is fully charged, check specified voltage (24VDC @ 26.4) both at battery terminal and at the board terminals marked [– BAT +] to ensure that there is no break in the battery connection wires.
Note: Maximum charging current under discharges is 3.6A.
Note: Expected battery life is 5 years, however it is recommended changing batteries in 4 years or less if needed.

LED Diagnostics:

AL1024ULXB2 - Power Supply/Charger

Red (DC)	Green (AC/AC1)	Power Supply Status
ON	ON	Normal operating condition.
ON	OFF	Loss of AC. Stand-by battery supplying power.
OFF	ON	No DC output.
OFF	OFF	Loss of AC. Discharged or no stand-by battery. No DC output.

Terminal Identification:

AL1024ULXB2 - Power Supply Board

Terminal Legend	Function/Description
L, N	Connect 115VAC to these terminals: L to hot, N to neutral *(Fig. 1a, pg. 4)*.
+ DC –	Factory connected to VR6 *(Fig. 1d, pg. 4)*.
AC Fail NC, C, NO	Used to notify loss of AC power, e.g.connect to audible device or alarm panel. Relay normally energized when AC power is present. Contact rating 1A @ 28VDC. AC or brownout fail is reported within 1 minute of event. To delay reporting for up to 6 hrs., cut "AC Delay" jumper and reset power to unit *(Fig. 1f, pg. 4)*.
Bat Fail NC, C, NO	Used to indicate low battery condition, e.g. connect to alarm panel. Relay normally energized when DC power is present. Contact rating 1A @ 28VDC. A removed battery is reported within 1 minute. Battery reconnection is reported within 1 minute. Low battery threshold: approximately 21VDC *(Fig. 1b, pg. 4)*.
– BAT +	Stand-by battery connections. Maximum charge current 3.6A *(Fig. 1c, pg. 4)*.

VR6 - Voltage Regulator

Terminal Legend	Function/Description
+ IN –	Power input from AL1024ULXB2, factory installed.
+ OUT –	5VDC @ 6A or 12VDC @ 6A, depending on SW1 setting.

Fig. 1 - **AL1024ULXB2 Board Configuration**

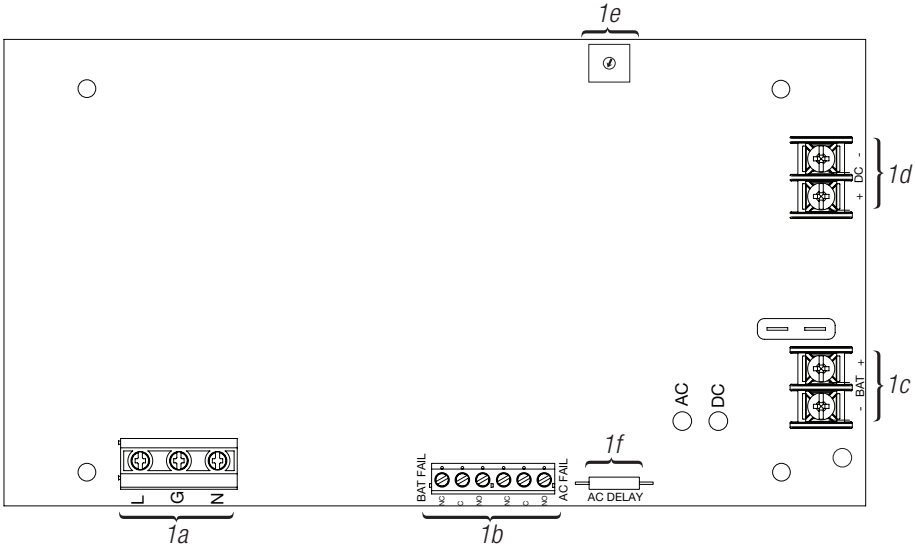
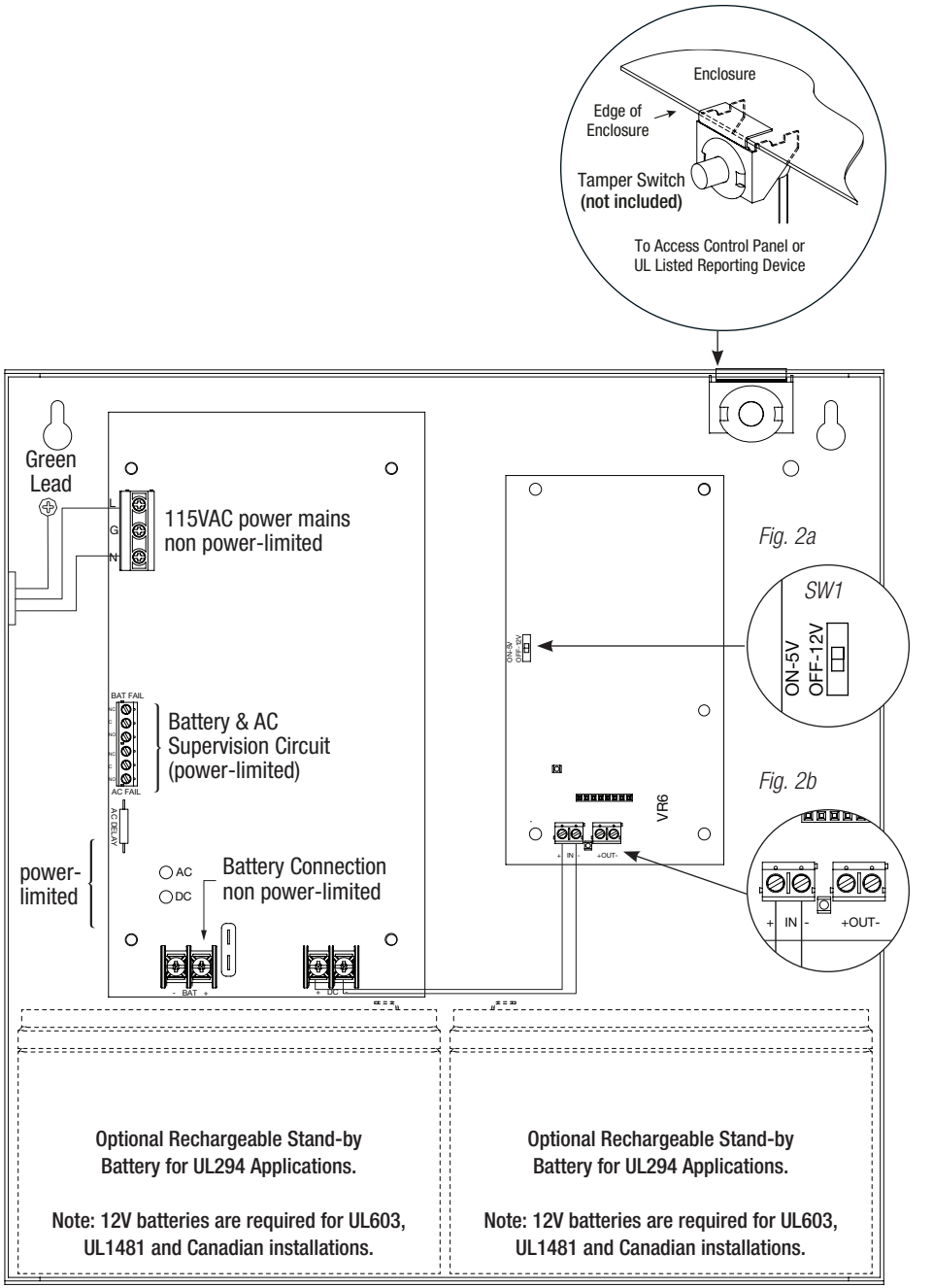


Fig. 2 - **AL1024NK1 Configuration**



CAUTION: Power supply board is factory set for 24VDC. Use two (2) 12VDC stand-by batteries.

Keep power-limited wiring separate from non power-limited. Use minimum 0.25" spacing.

7AH Rechargeable batteries are the largest batteries that can fit in this enclosure.
A UL Listed external battery enclosure must be used if using 12AH, 40AH or 65AH batteries.

Battery Size Calculation Worksheet:

A. AL1024NK1 internal current consumption	(stand-by)	_____	0.05 A
B. Load current consumption	(stand-by)	_____	A
C. Stand-by time required (hours)		_____	H
D. Battery capacity required for stand-by	(A+B)*C	_____	AH
E. AL1024NK1 internal power consumption	(Alarm)	_____	0.05 A
F. Load current consumption	(Alarm)	_____	A
G. Alarm duration (Hours; 15 Min. = 0.25 Hour)	(Alarm)	_____	H
H. Battery capacity required for Alarm	(E+F)*G	_____	AH
I. Total calculated battery capacity	D+H	_____	AH
J. Battery capacity required	I*1.8 (safety factor)	_____	AH

Note: AL1024NK1 power supply is designed to work with batteries up to 65AH.
Please note: line [I] must not exceeds 36AH.
You have to reduce either stand-by current consumption or stand-by time in order to comply with requirement.

To determine actual battery size please round line [J] to the nearest larger standard battery size (e.g. 3.5 AH = 4.0 AH).

NEC Power-Limited Wiring Requirements for AL1024NK1:

Power-limited and non power-limited circuit wiring must remain separated in the cabinet. All power-limited circuit wiring must remain at least 0.25" away from any non power-limited circuit wiring. Furthermore, all power-limited circuit wiring and non power-limited circuit wiring must enter and exit the cabinet through different conduits. One such example of this is shown below. Your specific application may require different conduit knockouts to be used. Any conduit knockouts may be used. For power-limited applications use of conduit is optional. All field wiring connections must be made employing suitable gauge CM or FPL jacketed wire (or equivalent substitute).

Optional UL Listed battery enclosure must be mounted adjacent to the power supply via Class 1 wiring methods. For Canadian installations use shielded wiring for all connections.

Note: Refer to wire handling drawing below for the proper way to install the CM or FPL jacketed wire *(Fig. 4a).*

Fig. 4

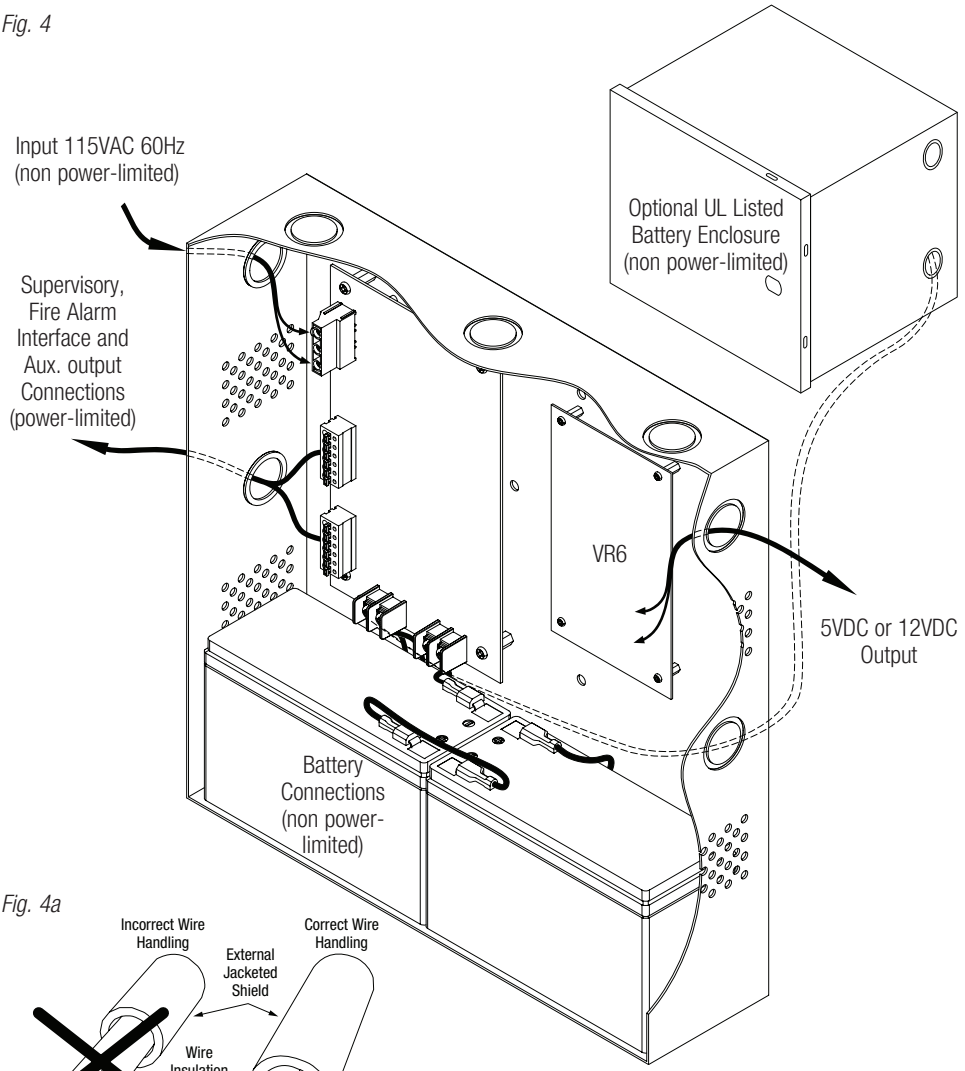
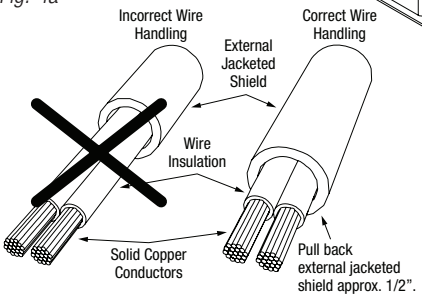
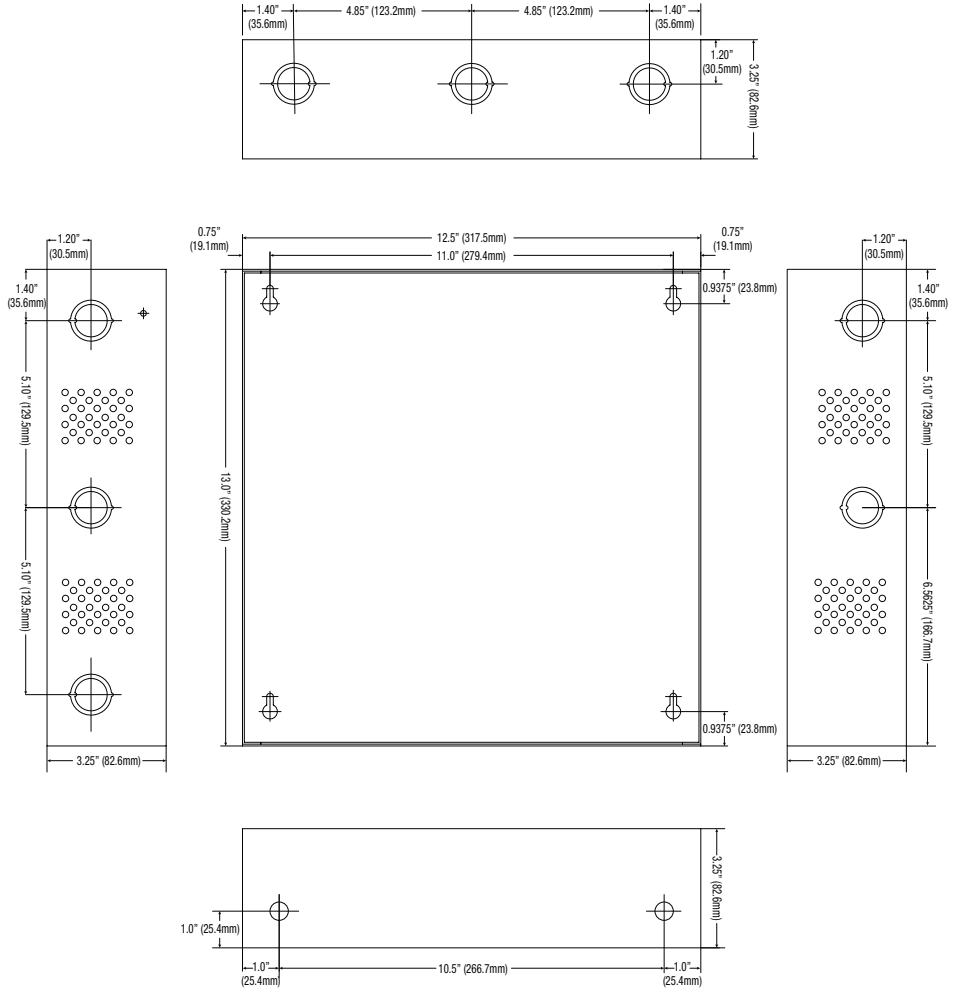


Fig. 4a



Enclosure Dimensions (BC300)**:**

13" x 12.5" x 3.25" (330.2mm x 317.5mm x 82.6mm)



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