M220 Series

Multi-Output Access Control
Power Supply/Chargers

Models Include:

AL300M220
- 2.5A @ 12VDC or 24VDC

AL400M220
- 4A @ 12VDC or 3A @ 24VDC

AL600M220
- 6A @ 12VDC or 24VDC

AL1012M220
- 10A @ 12VDC

AL1024M220
- 10A @ 24VDC

For a red enclosure add an "R" suffix to the part #, e.g. AL300MR220

Installation Guide

CE

Altronix®

Rev. 111103

More than just power.™

Installing Company: _____ Service Rep. Name: _____

Address: _____ Phone #: _____

Overview:

Altronix M220 Series multi-output access control power supply/chargers are specifically designed for use with access control systems and accessories. These units convert a 220VAC (working range 198VAC - 256VAC), 50/60Hz input into five (5) individually protected 12VDC or 24VDC outputs (see specifications). Each output will route power to a variety of access control hardware devices including Mag Locks, Electric Strikes, Magnetic Door Holders, etc. These outputs will operate in both Fail-Safe and Fail-Secure modes. Controlled trigger input is achieved through normally open [NO] or normally closed [NC] supervised input or the polarity reversal from an FACP (Fire Alarm Control Panel). A form "C" dry output relay enables HVAC Shutdown, Elevator Recall or may be used to trigger auxiliary devices.

M220 Series Power Supply Configuration Reference Chart:

Altronix Model Number	12VDC Total Output Current (A)	24VDC Total Output Current (A)	PTC Protected Outputs (auto-resettable)	220VAC 50/60Hz Input Current Draw (A)	Power Supply Board Input Fuse Rating
AL300M220	2.5	2.5	5	1A	5A/250V
AL400M220	4	3		1.2A	
AL600M220	6	6		1.5A	
AL1012M220	10	–		2.2A	
AL1024M220	–	10		3A	

Specifications:

Input:

- Power input 220VAC (working range 198VAC - 256VAC), 50/60Hz.
  See reference chart above.
- Fire Alarm Panel or Access Control System trigger inputs. [NO] or [NC] supervised trigger input and polarity reversal trigger input (4mA draw from FACP).

Output:

- Five (5) individual PTC protected auto-resettable power outputs.
- Current limit is 2A @ 12VDC or 24VDC per output (12VDC only for AL1012M220 and 24VDC only for AL1024M220).
- Filtered and electronically regulated outputs.
- Thermal and short circuit protection with auto reset.
- Overload protection.
- Output relay energizes when unit is triggered (form "C" contact rated 1A @ 28VDC).

Supervision:

- AC fail supervision (form "C" contact).
- Low battery supervision (form "C" contact).
- Battery presence supervision (form "C" contact).
- Power fail supervision relay (form "C" contact rated 1A @ 28VDC).
- Power supply is complete with enclosure, cam lock, and battery leads.

Battery Backup:

- Built-in charger for sealed lead acid or gel type batteries.
- Automatic switch over to stand-by battery when AC fails.
- AL300XB220, AL400XB220, AL600XB220, and AL1012XB220 (Power Supply Board) maximum charge current 0.7A.
  AL1024XB220 (Power Supply Board) maximum charge current 3.6A.
- Zero voltage drop when switching over to battery backup.
- AL300M220, AL400M220, and AL600M220 enclosures accommodate up to two (2) 12VDC/7AH batteries.
- AL1012M220 should be fitted with one (1) 12VDC/12AH battery.
- AL1024M220 enclosure accommodates up to two (2) 12VDC/12AH batteries.

Visual Indicators:

- DC output LED indicator.
- LEDs indicate condition of power outputs.
- Power and input trigger LEDs.

Installation Instructions:

Wiring methods shall be in accordance with the National Electrical Code/NFPA 70/NFPA 72/ANSI, and with all local codes and authorities having jurisdiction. Product is intended for indoor use only.

1. Mount unit in the 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 three 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. 15, 16)*. Secure enclosure to earth ground.
   It is recommended to first review the following tables for screw terminals, switch selection and LED status indications. This will greatly facilitate installation hook-up.
   Carefully review:

Output Voltage & Stand-by Specifications	**(pg. 5)**	**Terminal Identification Table**	**(pg. 10)**
LED Diagnostics	**(pg. 4)**	**Typical Application Diagrams**	**(pgs. 11 & 12)**

2. **Set output voltage:**
   AL300M220, AL400M220 *(Fig. 1c, pg. 5)* and AL600M220 *(Fig. 2c, pg. 6):* set desired DC output voltage by setting switch SW1 to the appropriate position on the power supply board.
   AL1012M220 is 12VDC only. AL1024M220 is 24VDC only.
   (Output Voltage and Stand-by Specification Charts, pg. 5).
3. Secure green lead (earth ground) to ground lug. Connect AC power (220VAC, 60Hz) to the terminals marked [L, G, N] on power supply board *(Figs. 1 - 4, pgs. 6 - 9)*.
   Use 18 AWG or larger for all power connections (Battery, DC output, AC input).
   Use 22 AWG to 18 AWG for power-limited circuits (AC Fail/Low Battery reporting).
4. Measure output voltage before connecting devices. This helps avoiding potential damage.
   Keep power-limited wiring separate from non power-limited wiring (220VAC, 50/60Hz 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.
5. Connect Fail-Secure type locking hardware (e.g. door strikes and electronic dead bolts) positive leads to terminals marked [1] through [5] [POS. (+) DC OUTPUT (ALARM)] on MOM5 board and the negative leads to terminals marked [NEG 1] through [NEG 5] on MOM5 board *(Figs. 1 - 4, pgs. 6 - 9)*.
6. Connect Fail-Safe type locking hardware (e.g. mag locks, door strikes and door holders) positive leads to terminals marked [6] through [10] [POS. (+) DC OUTPUT (STAND-BY)] on MOM5 board and negative leads to terminals marked [NEG 1] through [NEG 5] on MOM5 board *(Figs. 1 - 4, pgs. 6 - 9)*.
7. To trigger the unit from a FACP connect signaling circuit of FACP to terminals marked [– INPUT +] on MOM5 board *(Figs. 1 - 4, pgs. 6 - 9)*. Polarity is shown in alarm condition.
   For latching fire alarm interface see *Fig. 7, pg. 11; Figs. 8 & 9, pg. 12.*
   Note: A 2.2K EOL must be installed across terminals marked [TRIGGER] on MOM5 board or the unit will remain in an alarm condition.
8. To trigger the unit using a supervised dry contact connect the 2.2K resistor in series for a [NC] trigger input and in parallel for [NO] trigger input *(Fig. 5, pg. 11)*.
9. Connect auxiliary devices triggered by the unit to the terminals marked [DRY OUTPUT NO & C] on MOM5 board for normally open output or terminals marked [DRY OUTPUT NC & C] on MOM5 board for normally closed output *(Figs. 1 - 4, pgs. 6 - 9)*.
   Note: This relay will energize when the unit is triggered.
10. For Access Control applications batteries are optional. When batteries are not used, a loss of AC will result in the loss of output voltage. Batteries must be lead acid or gel type if used. Connect one (1) 12VDC battery to terminals marked [+ BAT –] on power supply board for 12VDC operation *(Figs. 1 - 4, pgs. 6 - 9)*.
    Use two (2) 12VDC batteries connected in series for 24VDC operation. (Battery leads included).
11. Connect supervisory trouble reporting devices to outputs marked [AC FAIL, LOW BAT] and [Power Fail] supervisory relay outputs marked [NO, C, NC] on power supply board *(Figs. 1a - 4a, pgs. 6 - 9)*.
    Use 22 AWG to 18 AWG for AC Fail & Low Battery reporting.
    Note: When used in fire alarm, burglar alarm or access control applications, "AC Fail" relay should be utilized to visually indicate that AC power is on.
    To delay report for 6 hours cut "AC Delay" jumper *(Figs. 1b - 4b, pgs. 6 - 9)*.
12. Please ensure that the cover is secured with the provided Key Lock.

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 (**Output Voltage and Stand-by Specification Charts**, *pg. 4*).

Battery Test: Under normal load conditions check that the battery is fully charged, check specified voltage at the battery terminals and at the board terminals marked [– BAT +] to ensure that there is no break in the battery connection wires.

Note: AL300XB2V, AL400XB2V, AL600XB220 and AL1012XB220 (Power Supply Board) maximum charge current is 0.7A.

AL1024XB2V (Power Supply Board) maximum charge current is 3.6A.

Expected battery life is 5 years; however, it is recommended to change batteries within 4 years or less if necessary.

LED Diagnostics:

Power Supply Board

LED		Power Supply Status
Red (DC)	Green (AC)	
ON	ON	Normal operating condition.
ON	OFF	Loss of AC. Stand-by battery supplying power.
OFF	ON	No DC output. Short circuit or thermal overload condition.
OFF	OFF	No DC output. Loss of AC. Discharged battery.

Red (Bat)	Battery Status
ON	Normal operating condition.
OFF	Battery fail/low battery.

MOM5 - Output Module

LED	ON	OFF
Power (Green)	Normal operating condition.	Power failure.
Trigger (Green)	Input is triggered (alarm condition).	No input trigger (non-alarm condition).
Outputs (Red)	Output tripped due to a short circuit or overload condition.	Normal operation.

Output Voltage and Stand-by Specification Charts:

AL300M220

Output	Switch Position	4 hr. of Stand-by & 5 Minutes of Alarm	24 hr. of Stand-by & 5 Minutes of Alarm	60 hr. of Stand-by & 5 Minutes of Alarm
12VDC/40AH Battery	ON	Stand-by = 2.5A Alarm = 2.5A	Stand-by = 1.0A Alarm = 2.5A	Stand-by = 300mA Alarm = 2.5A
24VDC/12AH Battery	OFF	–	Stand-by = 200mA Alarm = 2.5A	–
24VDC/40AH Battery	OFF	Stand-by = 2.5A Alarm = 2.5A	Stand-by = 1.0A Alarm = 2.5A	Stand-by = 300mA Alarm = 2.5A

AL400M220

Output	Switch Position	4 hr. of Stand-by & 5 Minutes of Alarm	24 hr. of Stand-by & 5 Minutes of Alarm	60 hr. of Stand-by & 5 Minutes of Alarm
12VDC/40AH Battery	ON	Stand-by = 4.0A Alarm = 4.0A	Stand-by = 1.0A Alarm = 4.0A	Stand-by = 300mA Alarm = 4.0A
24VDC/12AH Battery	OFF	–	Stand-by = 200mA Alarm = 3.0A	–
24VDC/40AH Battery	OFF	Stand-by = 3.0A Alarm = 3.0A	Stand-by = 1.0A Alarm = 3.0A	Stand-by = 300mA Alarm = 3.0A

AL600M220

Output	Switch Position	4 hr. of Stand-by & 5 Minutes of Alarm	24 hr. of Stand-by & 5 Minutes of Alarm	60 hr. of Stand-by & 5 Minutes of Alarm
12VDC/40AH Battery	ON	Stand-by = 6.0A Alarm = 6.0A	Stand-by = 1.0A Alarm = 6.0A	Stand-by = 300mA Alarm = 6.0A
24VDC/12AH Battery	OFF	–	Stand-by = 200mA Alarm = 3.0A	–
24VDC/40AH Battery	OFF	Stand-by = 6.0A Alarm = 6.0A	Stand-by = 1.0A Alarm = 6.0A	Stand-by = 300mA Alarm = 6.0A

AL1012M220

Output	
12VDC/12AH Battery	15 Minutes of Stand-by @ 10A

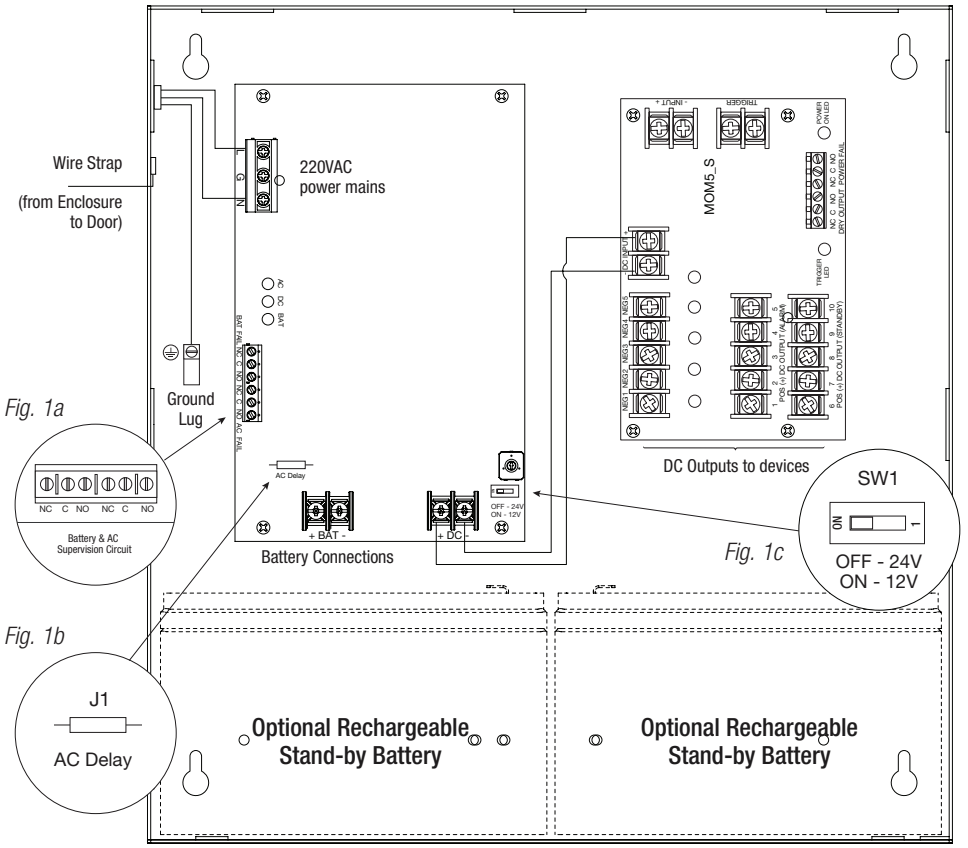
AL1024M220

Output	15 min. of Stand-by & 5 min. of Alarm	4 hr. of Stand-by & 5 min. of Alarm	24 hr. of Stand-by & 5 min. of Alarm	60 hr. of Stand-by & 5 min. of Alarm
24VDC / 12AH Battery	Stand-By = 8A Alarm = 10A	Stand-By = 1.5A Alarm = 10A	Stand-By = 130mA Alarm = 10A	Stand-By = 30mA Alarm = 10A
Output	**15 min. of Stand-by & 5 min. of Alarm**	**4 hr. of Stand-by & 5 min. of Alarm**	**24 hr. of Stand-by & 15 min. of Alarm**	**60 hr. of Stand-by & 15 min. of Alarm**
24VDC / 65AH Battery	–	Stand-By = 7.9A Alarm = 10A	Stand-By = 1.4A Alarm = 10A	Stand-By = 430mA Alarm = 10A

For Access Control use: 24V, 8A [including 0.07A MOM5_S module current draw and 0.05A AL1024XB2V power supply module current draw].

Fig. 1 - **AL300M220 and AL400M220**

CAUTION: De-energize unit prior to servicing. For continued protection against risk of electric shock and fire hazard replace fuses with the same type and rating (see marking on the board). Do not expose to rain or moisture.

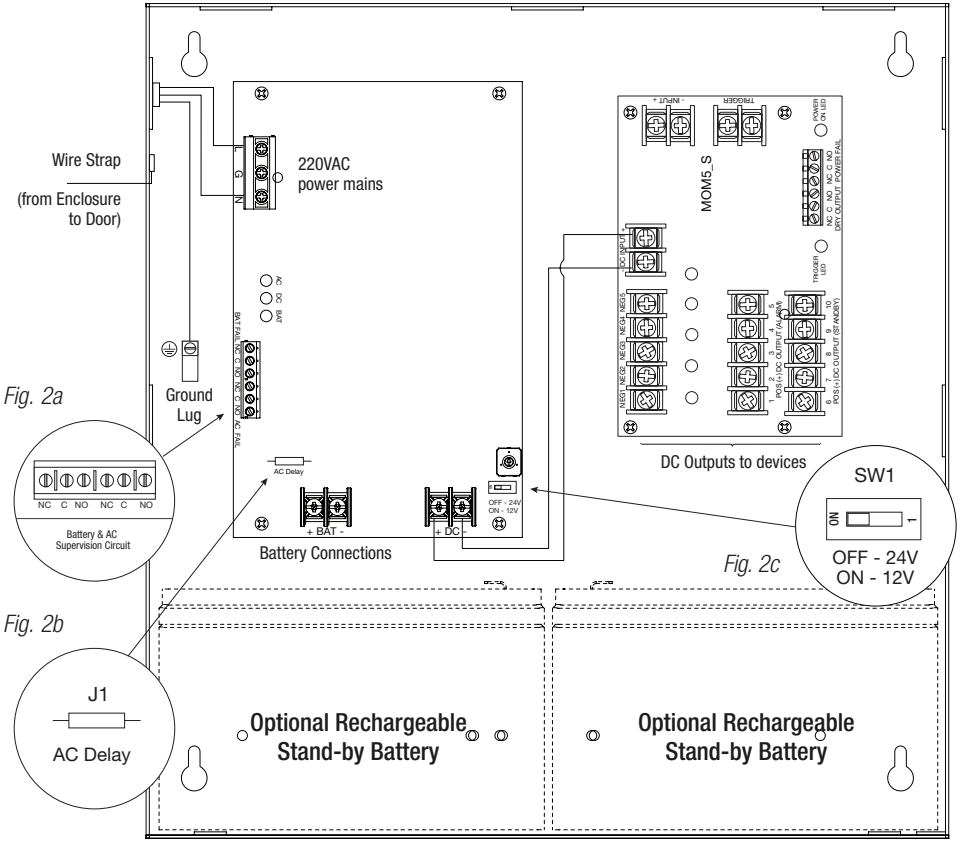


Keep power-limited wiring separate from non power-limited. Use minimum 0.25" spacing.

CAUTION: Optional rechargeable stand-by batteries must match the power supply output voltage setting.

Fig. 2 - **AL600M220**

CAUTION: De-energize unit prior to servicing. For continued protection against risk of electric shock and fire hazard replace fuses with the same type and rating (see marking on the board). Do not expose to rain or moisture.

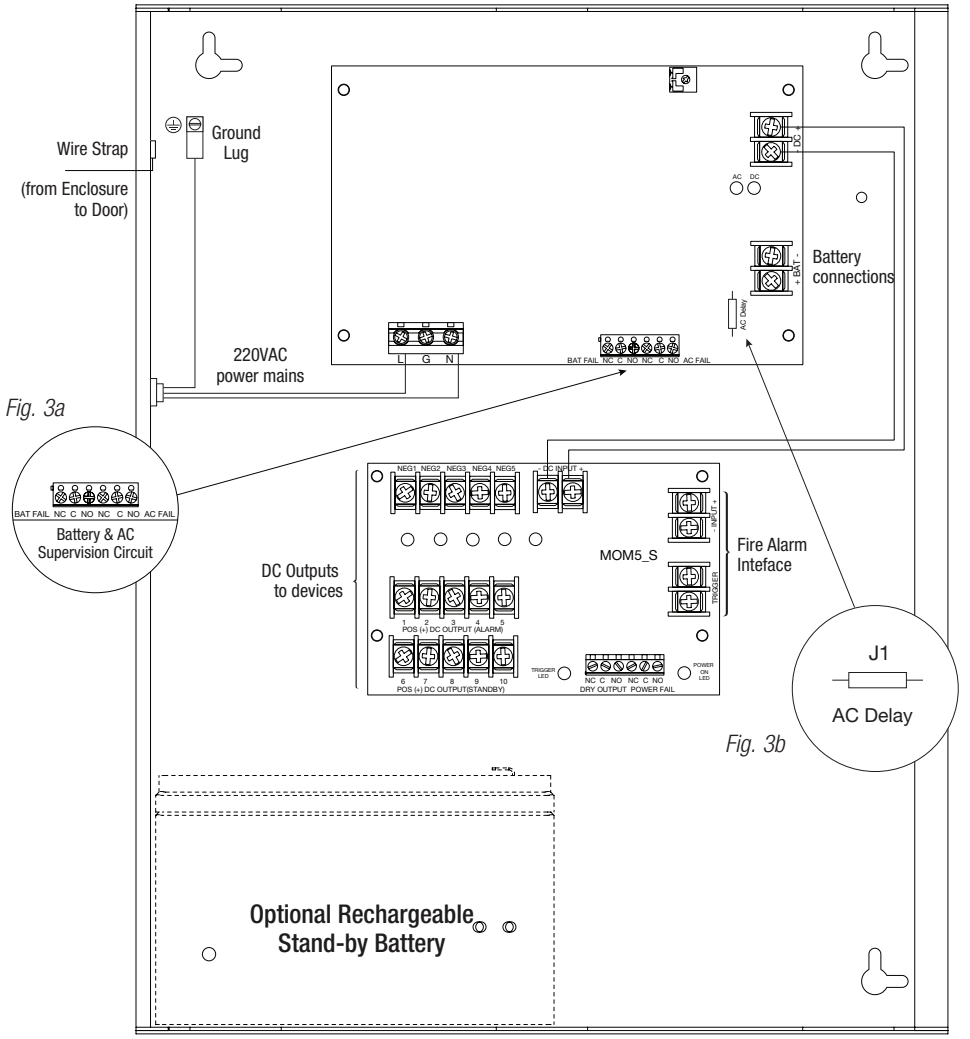


Keep power-limited wiring separate from non power-limited. Use minimum 0.25" spacing.

CAUTION: Optional rechargeable stand-by batteries must match the power supply output voltage setting.

Fig. 3 - **AL1012M220**

CAUTION: De-energize unit prior to servicing. For continued protection against risk of electric shock and fire hazard replace fuses with the same type and rating. Do not expose to rain or moisture.

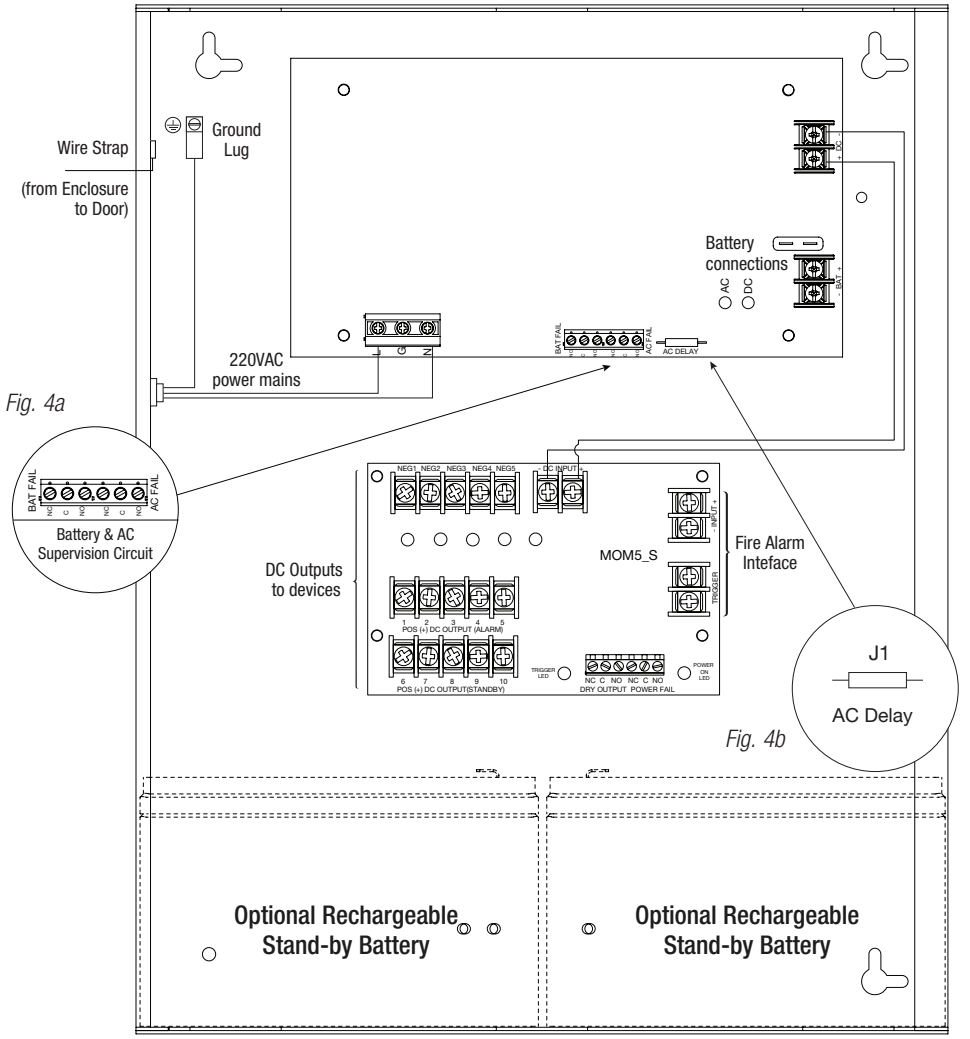


Keep power-limited wiring separate from non power-limited. Use minimum 0.25" spacing.

CAUTION: Optional rechargeable stand-by batteries must match the power supply output voltage setting.

Fig. 4 - **AL1024M220**

CAUTION: De-energize unit prior to servicing. For continued protection against risk of electric shock and fire hazard replace fuses with the same type and rating (see marking on the board). Do not expose to rain or moisture.



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

CAUTION: Optional rechargeable stand-by batteries must match the power supply output voltage setting.

Terminal Identification Tables:

Power Supply Board

Terminal Legend	Function/Description
L, G, N	Connect 220VAC, 50/60Hz to these terminals: L to hot, N to neutral.
+ DC –	AL300M220 - 12VDC/24VDC @ 2.5A to MOM5 board. AL400M220 - 12VDC @ 4A or 24VDC @ 3A to MOM5 board. AL600M220 - 12VDC/24VDC @ 6A to MOM5 board. AL1012M220 - 12VDC @ 10A to MOM5 board. AL1024M220 - 24VDC @ 10A to MOM5 board.
AC FAIL NC, C, NO	Indicates 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 the unit.
BAT FAIL NC, C, NO	Indicates 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 5 minutes. Battery reconnection is reported within 1 minute. Low battery threshold: 12VDC output threshold set @ approximately 10.5VDC. 24VDC output threshold set @ approximately 21VDC.
– BAT +	Stand-by battery connections. AL300XB2V, AL400XB2V, AL600XB220 and AL1012XB220 (Power Supply Board) maximum charge current is 0.7A. AL1024XB2V (Power Supply Board) maximum charge current is 3.6A.

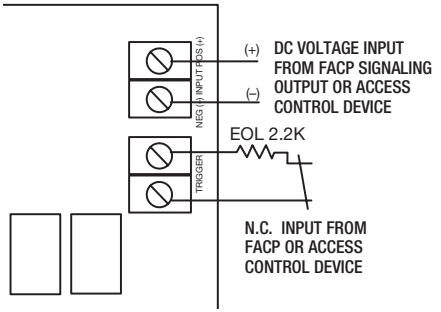
MOM5 - Output Module

Terminal Legend	Function/Description
– DC INPUT +	12VDC or 24VDC from power supply.
TRIGGER	Dry normally open [NO] or normally closed [NC] supervised (2.2K EOL resistor) input trigger. A short or open circuit will transfer power from terminals marked [POS. (+) DC OUTPUT (STAND-BY)] to terminals marked [POS (+) DC OUTPUT (ALARM)].
– INPUT +	Wet (5-30VDC) input trigger. Applying voltage to these terminals in the polarity shown will transfer power from terminals marked [POS. (+) DC OUTPUT (STAND-BY)] to terminals marked [POS. (+) DC OUTPUT (ALARM)] (e.g. fire alarm control panel indications circuit).
NEG. 1 through NEG. 5	Supplies constant negative (–) voltage.
POS. (+) DC OUTPUT (ALARM) 1-5	Supplies positive (+) voltage when dry trigger input or fire alarm wet trigger input is applied.
POS. (+) DC OUTPUT (STAND-BY) 6-10	Supplies positive (+) voltage in normal condition. Power is removed when dry trigger input or fire alarm wet trigger input is applied.
NC, C, NO DRY OUTPUT	When the MOM5 is triggered the terminals marked [C and NO] will open and the terminals marked [C and NC] will close. This output is used to trigger auxiliary devices. (e.g. HVAC Shutdown, Elevator Recall etc.). Contact rating 1A @ 28VDC.
NC, C, NO POWER FAIL	Form “C” contacts used for reporting no voltage is present at [– DC INPUT +] terminals. Under normal conditions, terminals marked [NO and C] are open, [NC and C] are closed. A loss of power causes terminals marked [NO and C] to close and [NC and C] to open. Contact rating 1A @ 28VDC.

Typical Application Diagrams:

Fig. 5

MOM5 module shown with wet and/or dry normally closed trigger inputs **(Non-Latching)**:



MOM5 module shown with wet and/or dry normally open trigger inputs **(Non-Latching)**:

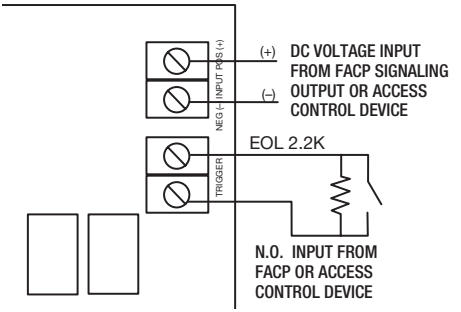


Fig. 6 - Two (2) or more MOM5 modules shown with wet and/or dry normally closed trigger inputs **(Non-Latching)**:

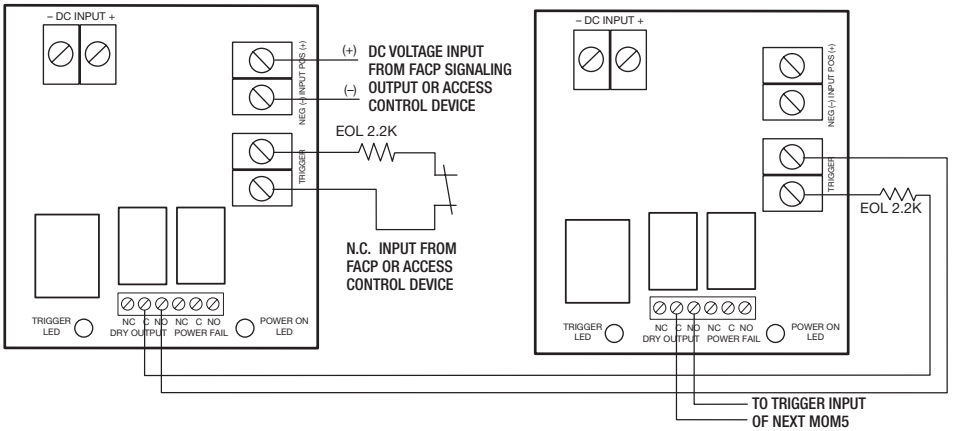
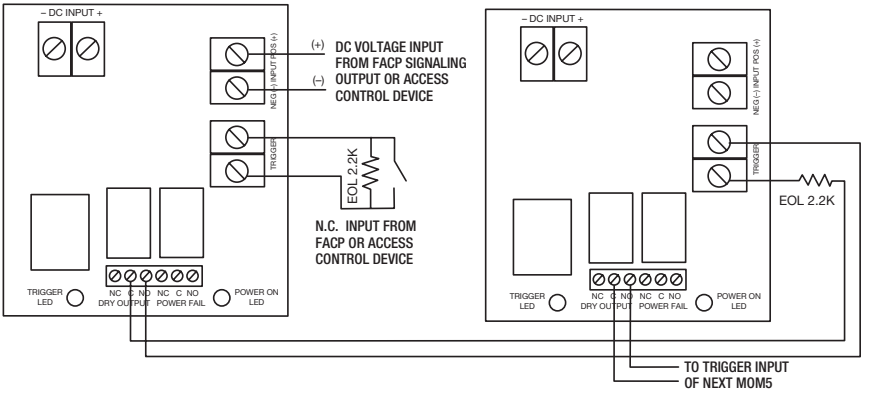


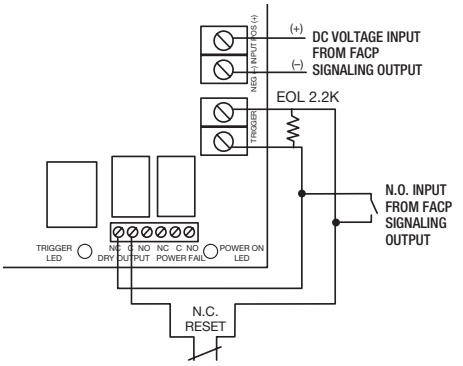
Fig. 7 - Two (2) or more MOM5 modules shown with wet and/or dry normally open trigger inputs **(Non-Latching)**:



Typical Application Diagrams (cont'd)**:**

Fig. 8

MOM5 module shown with with wet and/or dry normally open fire alarm trigger inputs **(Latching with Manual Reset)**:



MOM5 module shown with with wet and/or dry normally closed fire alarm trigger inputs **(Latching with Manual Reset)**:

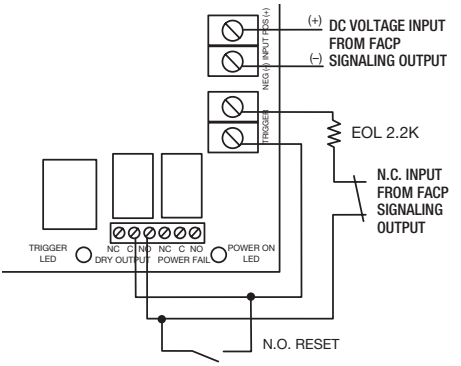


Fig. 9 - Two (2) MOM5 modules shown with wet and/or dry normally closed fire alarm trigger inputs **(Latching with Manual Reset)**:

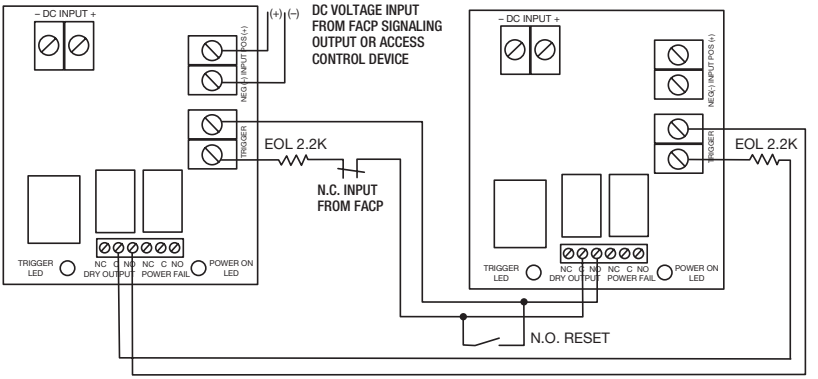
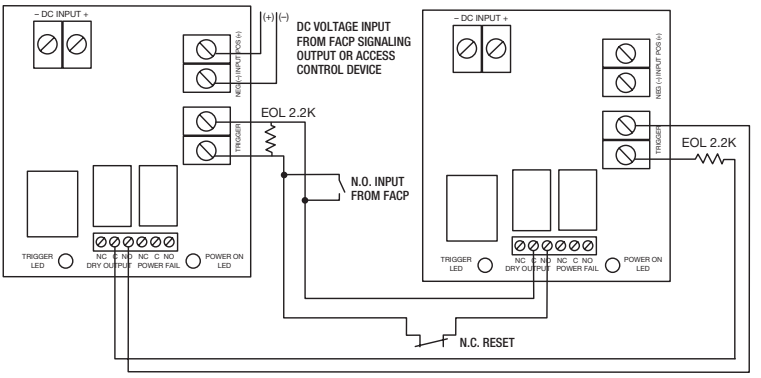


Fig. 10 - Two (2) MOM5 modules shown with wet and/or dry normally open fire alarm trigger inputs **(Latching with Manual Reset)**:



AL1024M220 Battery Size Calculation Worksheet.

A.	AL1024M220 internal current consumption	(stand-by)	_____	0.13A
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.	AL1024M220 internal power consumption	(Alarm)	_____	0.13A
F.	Load current consumption	(Alarm)	_____	A
G.	Alarm duration (Hours, example: 15 Min = 0.25 Hour)	(Alarm)	_____	H
H.	Battery capacity required for Alarm	(E+F)*G	_____	AH0
I.	Total calculated battery capacity	D+H	_____	AH
J.	Battery capacity required	I*1.8 (safety factor)	_____	AH

Note: AL1024M220 power supply is designed to work with batteries up to 65AH. Please note, line [I] must not exceeds 36AH. You have to reduce either standby current consumption or standby time in order to comply with requirement.

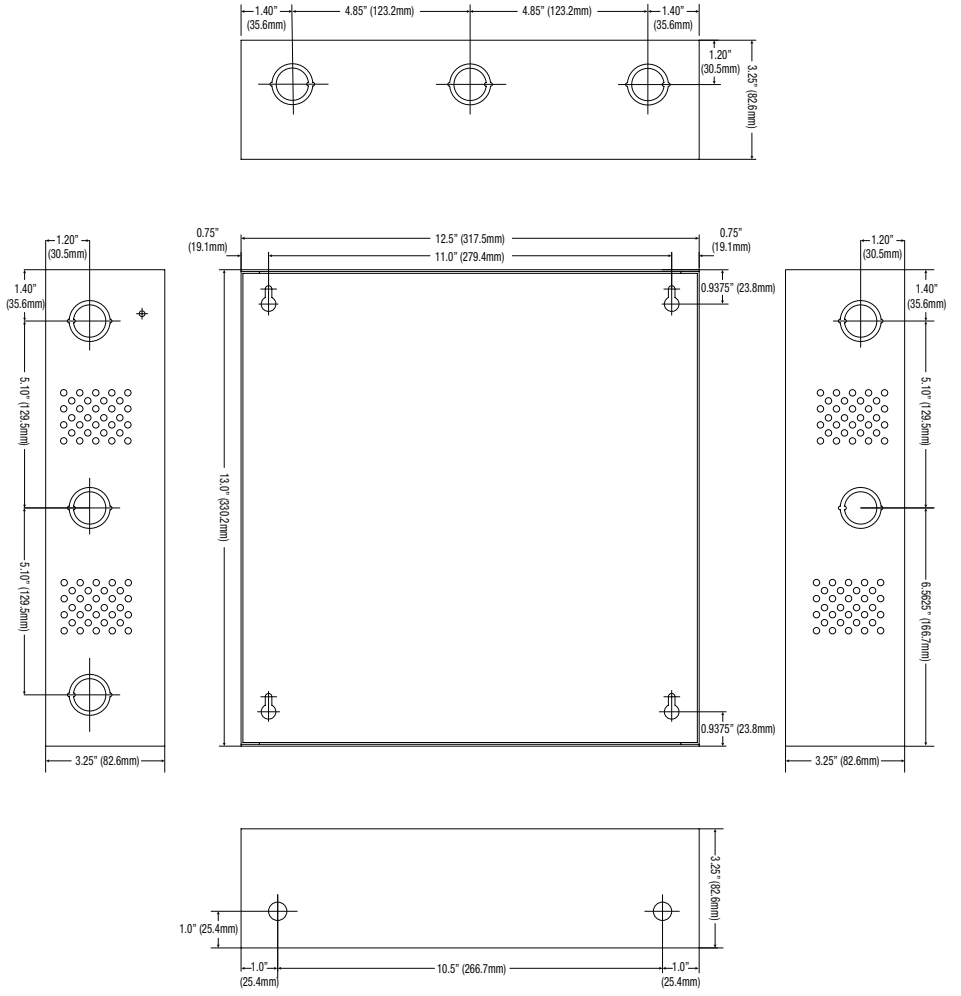
To determine actual battery size please round line [J] to the nearest larger standard battery size.

Notes:

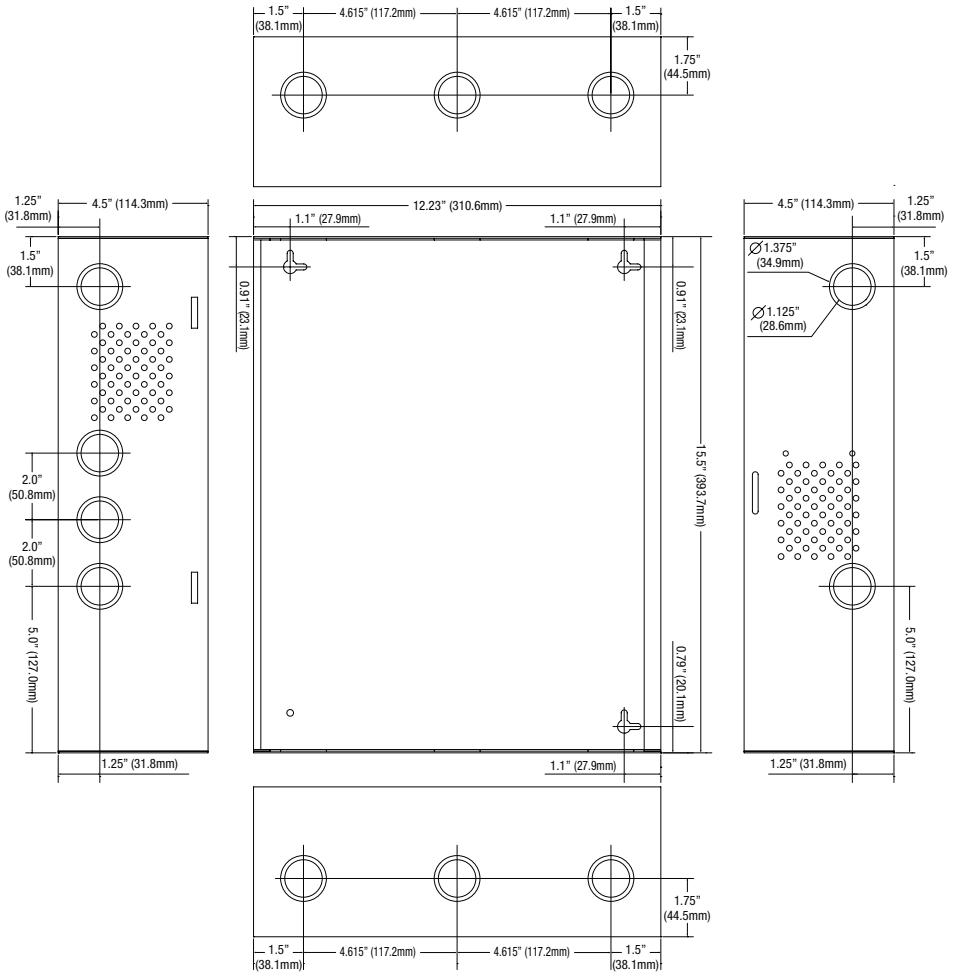
Enclosure Dimensions (H x W x D) **for:**

AL300M220 • AL400M220 • AL600M220

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



Enclosure Dimensions (H x W x D) **for:**

AL1012M220 • AL1024M220

15.5" x 12.23" x 4.5" (393.7mm x 310.6mm x 114.3mm)