Front panel configuration

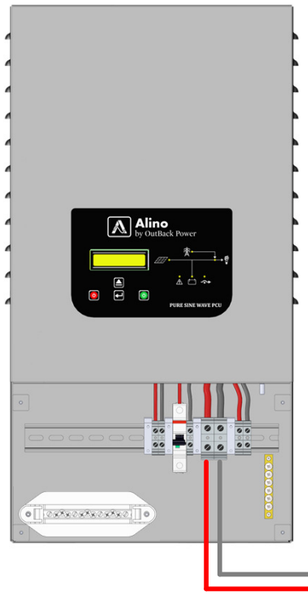
Quick Start Guide

Alino solar Power Conditioning Unit (PCU)

CAUTION: Equipment damage

These procedures should be done by a qualified installer who is trained on configuring inverter power systems. Failure to set accurate parameters for the system could potentially cause equipment damage.

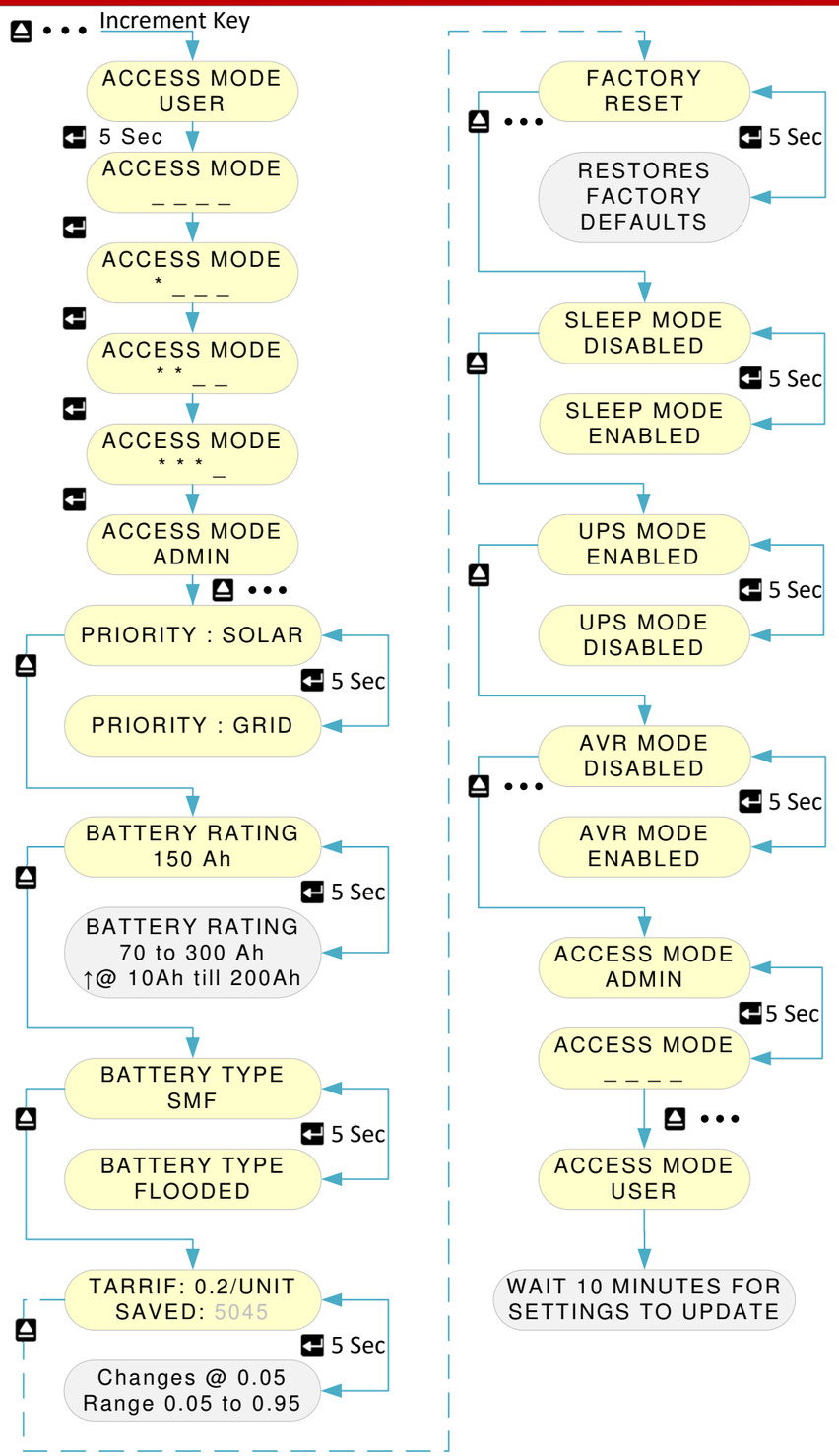
Configuration setting



	Increment key
	Enter key
	ON key
	OFF key

See detailed wiring diagram in the quick start guide

1. Connect the battery bank terminals to the Alino Power Conditioning Unit (PCU). Front panel battery LED indicator should glow in green.
2. PCU default mode is 'USER' mode. Changing the configuration of the PCU can only be done in ADMIN mode.
3. Scroll up using the increment key (• • •) until the front panel LCD screen displays 'ACCESS MODE'
4. Once the screen displays 'ACCESS MODE', then press and hold 'ENTER' key for five (5 Sec) seconds to enter the password for changing over to ADMIN mode.
5. Pressing 'ENTER' key four (4) times will change the access mode from USER to ADMIN.
6. Grid/Solar priority, battery type, capacity, AC power tariff, sleep mode (power save mode) and Automatic Voltage Regulator (AVR) mode are the configurable parameters.
7. After configuring all the parameters wait for ten minutes for new settings to get updated.
   DO NOT DISCONNECT BATTERY POWER DURING THIS TIME.



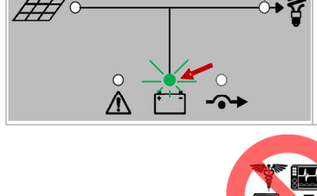
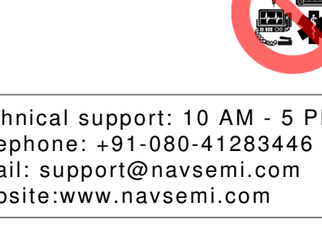
Refer www.outbackpower.com for latest documents & other reference materials.

Package contents

Alino PCU package contents
Alino Power Conditioning Unit
Mounting bracket
Self drilling screws with anchors 12-14mm x 3 PT#3
Isolated neutral busbar
Comb fuse/circuit breaker busbar - 18mm pitch
Quick start guide

LED indications

(See manual for further instructions)

	AC input LED is ON when grid is available and within limits. AC output LED is ON when output is available in bypass mode. Flashing LED indicates inverter mode.
	PV LED is ON when solar input is available and is within limits.
	Alert LED is ON when there is any system fault. This includes overload, short circuit, battery related faults, PV related faults or thermal sensor faults.
	Bypass LED is ON in grid mode when there is thermal sensor faults or overload faults. Note that fault LED would also be ON at this time.
	Battery LED is ON when proper battery is connected. Battery faults are indicated by a flashing battery LED. Refer to LCD for more information.

IMPORTANT:
Not intended for use with life support equipment.

Technical support: 10 AM - 5 PM IST
Telephone: +91-080-41283446
Email: support@navsemi.com
Website:www.navsemi.com

8 AM - 5 PM CST
T: + 52 55-5543-1114
T: + 52 55-5543-1115
Sin Costo: 01-800-0082-886

Mounting Procedure

WARNING: Fire/ Explosion Hazard

Do not place combustible or flammable materials within 12 feet (3.7m) of the equipment to avoid fire hazard.

WARNING: Personal Injury

Use safe lifting techniques and standard safety equipment when working with this equipment.

WARNING: Personal Injury

Disconnect all possible sources of energy. Ensure ALL power sources (solar, battery, and AC) are disconnected before performing any installation or maintenance on PCU equipment. Confirm that the terminals are de-energized using a voltmeter (rated for a minimum 600 Vac and 600 Vdc) to verify the de-energized condition.

IMPORTANT:

Clearance and access requirements may vary by location. Maintaining a 36" (90 cm) clear space in front of the system for access is recommended. Make sure wall is strong enough to support the Alino PCUs weight.

Alino PCU Dimensions:
26"(67cm) tall X 14"(35cm) wide
Drill Size: 5/16" (8 mm) Drill Depth ~3.4" (85 mm)

Open the desired knockouts prior to wall mounting

To install the mounting bracket:

1. Place the mounting bracket on the wall / plywood at the desired height for the ease of operation of the unit

2. Secure the mounting bracket to the Wall/Plywood surface. Minimum thickness of the plywood is ¼ inch (6.35mm)

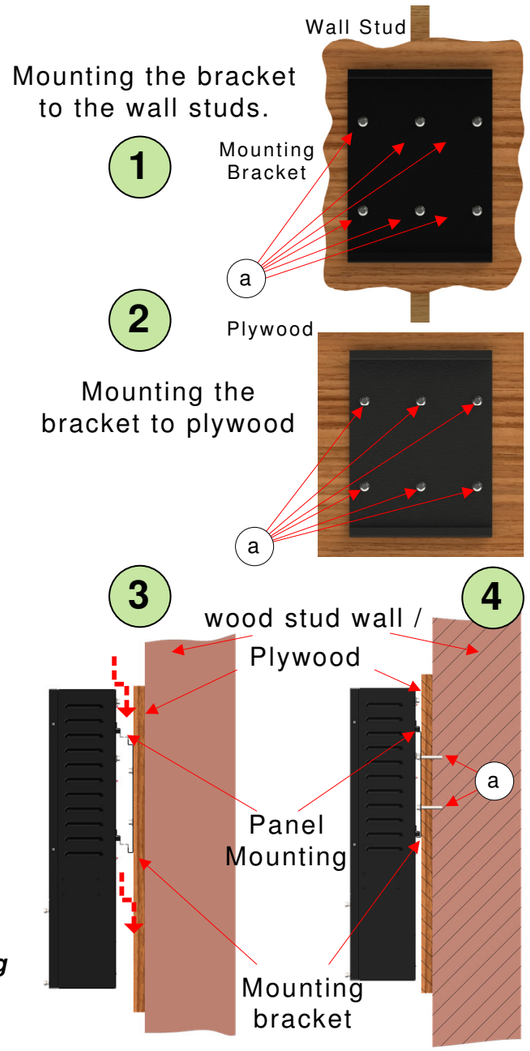
a  Use the Self Drilling Screws on all six mounting slots provided on the bracket.

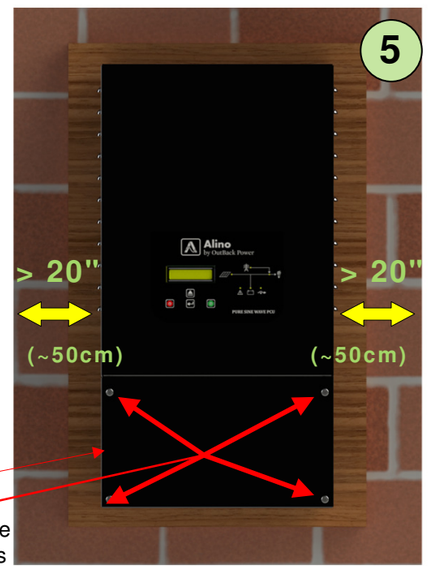
To mount the panel on the bracket:

3. Lift the PCU above the mounting bracket

4. Insert the top of the PCU mounting panel over the bent-lip of the mounting bracket.

5. Maintain a clearance of 20"(50.2cm) around the unit

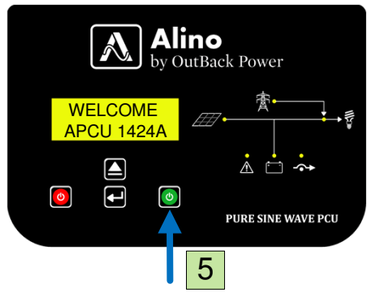


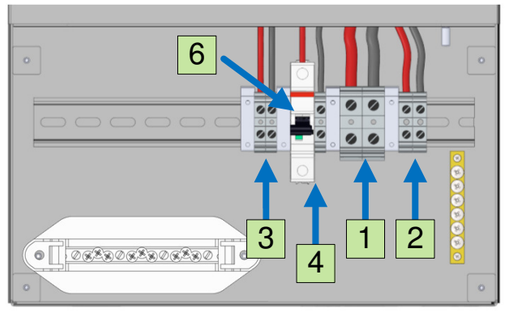


Energize/ De-energize Procedures

Alino Solar APCU

ENERGIZE / STARTUP





1. Remove the Balance Of Systems (BOS) box cover by loosening 4 captive screws on the front.

2. Using a digital voltmeter, verify battery voltage, solar PV voltage. and grid AC voltage are appropriate for the PCU model to be installed.

3. Connect one end of both battery cables to APCU battery terminals. Do not connect batteries yet! 1

4. Connect the positive and negative photovoltaic terminals from the PV combiner box and input breaker to the APCU photovoltaic terminals. 2

5. Connect the AC output cables to the APCU AC output terminals. 3

6. Connect the AC input cables to the APCU AC input terminals. 4

7. Connect the battery cables to the battery terminals and turn on the battery breaker or fuse (not shown.)

8. Turn ON the APCU by pressing & holding 5 sec the ON key on the front panel. 5

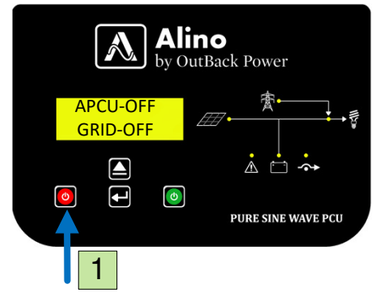
9. Turn ON the AC input breaker in APCU. 6

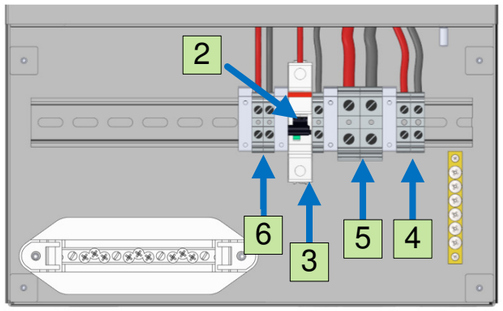
10. Turn ON the AC input breaker on service panel (not shown.)

11.Turn ON the DC input breaker in the PV combiner box (not shown.)

12. Close the BOS box and fasten the screws.

DE-ENERGIZE / SHUTDOWN





1. Press and hold the OFF key on front panel for 5 seconds to turn off APCU. 1

   LCD and LED indicators will continue to be active and show status.

2. Turn OFF the solar DC input breaker (not shown.)

3. Turn OFF the AC input breaker on service panel (not shown.)

4. Turn OFF battery breaker or remove inline fuse (not shown.)

5. Remove the BOS box cover by loosening 4 captive thumb on the front.

6. Turn OFF the AC input breaker. 2

7. Disconnect the AC input cable from APCU. 3

8. Disconnect the photovoltaic positive and negative cables. 4

9. Disconnect the battery positive and negative cables. 5

   LCD and LED indications will shutdown.

10. Disconnect the AC output cable from APCU 6

11. Close the BOS box and fasten the screws.

General Wiring

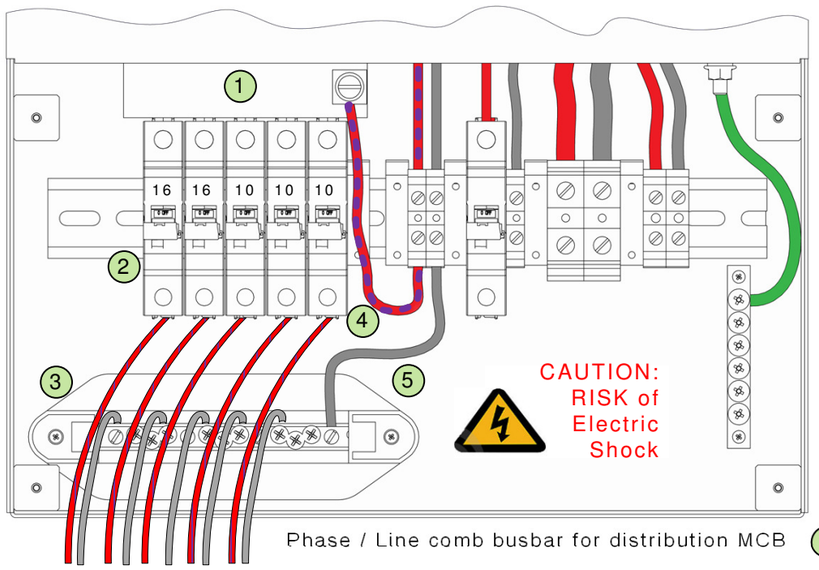
Quick Start Guide

Alino solar Power Conditioning Unit (PCU)

IMPORTANT:
Example only; actual wiring may vary

NOTE: Refer local codes for appropriate cable gauges to avoid voltage drop.

Load center assembly — See manual for further instructions



PCU AC output branches for distribution

1. Phase / Line comb busbar for distribution MCB
2. Distribution MCB
3. Isolated Neutral link bar
4. Connection from AC line output to busbar
5. Connection from AC neutral output to neutral busbar

Connection to ground terminal is not shown for simplicity. Follow local wiring practices and codes.

Use DIN mount Miniature Circuit Breaker (MCB) or fuse holders. Numbers shown on distribution MCB's are for illustration only. Use appropriate breakers as per wire and load requirement.

Use ferrules or terminal lugs for connecting wires to connectors.

Tools required for installation

1. Screw driver (flathead #5/16(8mm), 10 inch (254mm)
2. Drill bit set (5/16"(8 mm)
3. Measuring tape
4. Socket set
5. Spirit level
6. Hammer
7. Marker

Terminal		Torque (N-m)
AC	6U	0.8
Solar	10U	1.2
Battery	35U	2.5
MCB	25U	3.5

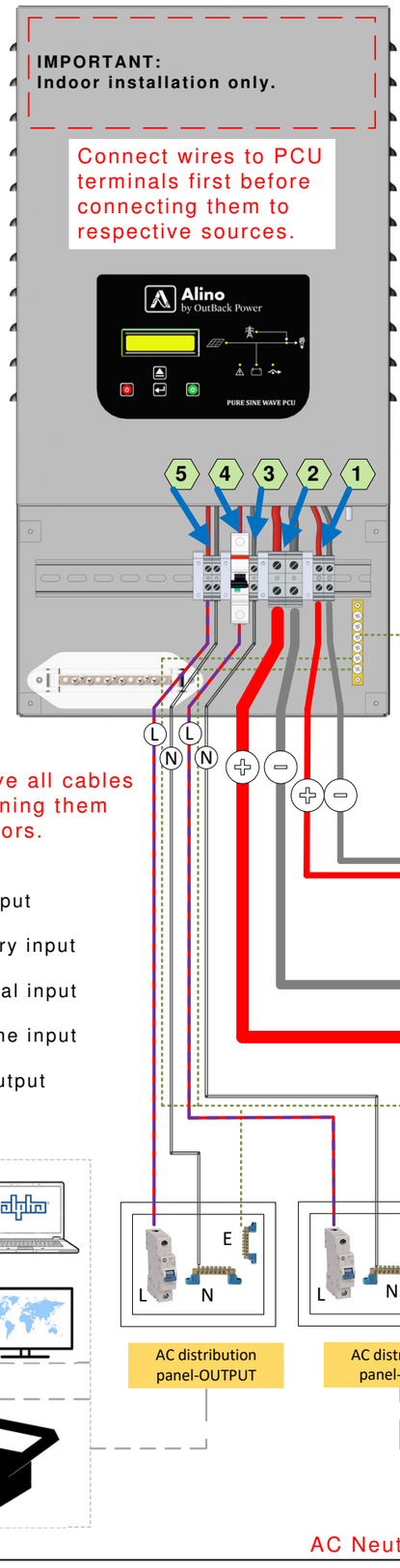
Battery Ah capacity vs charging current limit	
≥ 190 Ah	≥ 40 ADC
≥ 100 Ah and < 190 Ah	≥20 to ≤36 ADC linear
> 70 Ah and ≤ 100 Ah	≥10 to ≤20 ADC linear
≤70 Ah	≤10 ADC

Protection & Minimum wiring guide

	APCU1424	APCU2648	APCU3348	APCU1424A	APCU1424B	APCU2648A	APCU2648B
PV MCB	50 ADC	50 ADC	50 ADC	50 ADC	50 ADC	50 ADC	50 ADC
Battery MCB	63 ADC	63 ADC	63 ADC	63 ADC	63 ADC	63 ADC	63 ADC
AC INPUT MCB	16 AAC	32 AAC	32 AAC	32 AAC	16 AAC	50 AAC	32 AAC
AC OUTPUT MCB	10 AAC	16 AAC	25 AAC	16 AAC	10 AAC	32 AAC	16 AAC
AC INPUT cable	2.5 mm^2 14 AWG	4 mm^2 12 AWG	6 mm^2 10 AWG	2.5 mm^2 14 AWG	2.5 mm^2 14 AWG	6 mm^2 10 AWG	4 mm^2 12 AWG
AC OUTPUT cable	2.5 mm^2 14 AWG	4 mm^2 12 AWG	6 mm^2 10 AWG	2.5 mm^2 14 AWG	2.5 mm^2 14 AWG	6 mm^2 10 AWG	4 mm^2 12 AWG
PV cable	10 mm^2 / 8 AWG						
Battery cable	35 mm^2 / 2 AWG						

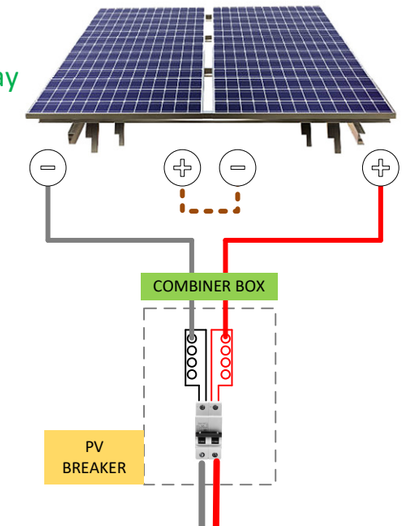
IMPORTANT:
Indoor installation only.

Connect wires to PCU terminals first before connecting them to respective sources.



DC LEGEND

- BATTERY POSITIVE (+)
- BATTERY NEGATIVE (−)
- PHOTOVOLTAIC POSITIVE (+)
- PHOTOVOLTAIC NEGATIVE (−)



AC LEGEND

- AC LINE (Hot) — L
- AC NEUTRAL — N
- EARTH — E

AC Neutrals: Input and Output are internally bonded together.

Parameter \ Models	50 Hz			60 Hz			
	APCU1424	APCU2648	APCU3348	APCU1424A	APCU2648A	APCU1424B	APCU2648B
Nominal output	230 VAC	230 VAC	230 VAC	120 VAC	120 VAC	220 VAC	220 VAC
Typical frequency	50 Hz ± 0.5	50 Hz ± 0.5	50 Hz ± 0.5	60 Hz ± 0.5	60 Hz ± 0.5	60 Hz ± 0.5	60 Hz ± 0.5
Nominal battery voltage	24 VDC	48 VDC	48 VDC	24 VDC	48 VDC	24 VDC	48 VDC
Nominal power rating (25 ° C)	1400 VA	2600 VA	3300 VA	1400 VA	2600 VA	1400 VA	2600 VA
Power rating (UPF, 25 ° C)	1100 W	2000 W	2600 W	1100 W	2000 W	1100 W	2000 W
Electrical - Solar							
Charger rating	1 kWp	2 kWp	2.5 kWp	1 kWp	1 kWp	2 kWp	2 kWp
Battery input range	18 VDC to 32 VDC	36 VDC to 64 VDC	36 VDC to 64 VDC	18 VDC to 32 VDC	36 VDC to 64 VDC	18 VDC to 32 VDC	36 VDC to 64 VDC
Absolute maximum Voc	55 VDC	100 VDC	100 VDC	55 VDC	100 VDC	55 VDC	100 VDC
MPPT range	26 VDC to 40 VDC	48 VDC to 72 VDC	48 VDC to 72 VDC	26 VDC to 40 VDC	48 VDC to 72 VDC	26 VDC to 40 VDC	48 VDC to 72 VDC
Panel high voltage cutoff	> 50 VDC	> 90 VDC	> 90 VDC	> 50 VDC	> 90 VDC	> 50 VDC	> 90 VDC
Solar charger voltage drop	< 1 VDC (PCU solar input to battery terminals)						
Recommended solar panel configuration for 72 cell modules [5]	4 modules in parallel	2 modules in series per string, 4 string in parallel	2 modules in series per string, 5 string in parallel	4 modules in parallel	2 modules in series per string, 4 string in parallel	4 modules in parallel	2 modules in series per string, 4 string in parallel
Battery types supported	Default setting : flooded lead acid type Sealed maintenance free type (common for VRLA/GEL/AGM) selectable through front panel)						
Battery high cutoff	> 32 VDC	> 64 VDC	> 64 VDC	> 32 VDC	> 64 VDC	> 32 VDC	> 64 VDC
Electrical - Grid							
Input voltage range	145 VAC to 275 VAC	145 VAC to 275 VAC	145 VAC to 275 VAC	75 VAC to 143 VAC	75 VAC to 143 VAC	145 VAC to 265 VAC	145 VAC to 265 VAC
Frequency range	42 Hz to 58 Hz	42 Hz to 58 Hz	42 Hz to 58 Hz	55Hz to 65 Hz	55Hz to 65 Hz	55Hz to 65 Hz	55Hz to 65 Hz
AVR input range[1]	165 VAC to 275 VAC	165 VAC to 275 VAC	165 VAC to 275 VAC	85 VAC to 143 VAC	85 VAC to 143 VAC	165 VAC to 265 VAC	165 VAC to 265 VAC
AVR output range	230 VAC ± 10%	230 VAC ± 10%	230 VAC ± 10%	120 VAC ± 10%	120 VAC ± 10%	220 VAC ± 10%	220 VAC ± 10%

Weight	**kgs**	22	32	32	22	32	22	32
	lbs	49	71	71	49	49	71	71

[1] Beyond this input range Automatic Voltage Regulation (AVR) output voltage regulation is 20 %. Factory default setting is AVR disabled. See user manual for more details.

[2,3] Sleep mode is power save mode. When enabled, the Alino will only support load above the percentage of rated value given in [3].

[4] Auto triggered after every low voltage load disconnect event or 60 day PV cycle. Can manually force through front panel. Only applicable when battery is set to flooded type.

[5] Ensure solar panel Voc does not exceed the absolute maximum rating at coldest regional temperature. Refer user manual for more details.

Parameter \ Models	50 Hz			60 Hz			
	APCU1424	APCU2648	APCU3348	APCU1424A	APCU2648A	APCU1424B	APCU2648B
Electrical - Inverter							
Instantaneous power (100 mS)	3600 VA	7200 VA	9000 VA	3600 VA	7200 VA	3600 VA	7200 VA
Surge power (0.5 S)	2400 VA	4800 VA	6000 VA	2400 VA	4800 VA	2400 VA	4800 VA
Peak efficiency	> 88 %	> 90 %	> 90 %	> 90 %	> 90 %	> 90 %	> 90 %
Battery low alarm & indication	21.9 VDC	43.8 VDC	43.8 VDC	21.9 VDC	43.8 VDC	21.9 VDC	43.8 VDC
Low battery load cutoff	21.5 VDC	43 VDC	43 VDC	21.5 VDC	43 VDC	21.5 VDC	43 VDC
Load reconnect voltage	> 25 VDC	> 50 VDC	> 50 VDC	> 25 VDC	> 50 VDC	> 25 VDC	> 50 VDC
Nominal Self consumption	< 26 W	< 45 W	< 45 W	< 26 W	< 45 W	< 26 W	< 45 W
Sleep mode threshold w.r.t power rating[2]	< 3 %	< 2 %	< 2 %	< 3 %	< 2 %	< 3 %	< 2 %

Common specification

PV charger Technology	MPPT	**Output waveform**	Pure sine wave
Recommended PV panel	36 & 72 cell types	**Load regulation**	± 2%
MPPT efficiency	> 99 %	**THD (Linear load)**	< 3 %
Solar PV charger efficiency	> 95 %	**Output power factor**	0.8
Operating temperature	0 to 50 ° C	**Crest factor**	3 : 1
Maximum PV charging current	40 ADC	**Transfer time (Utility/ generator to inverter)**	< 12 mS
AC input battery charging current	Up to 20 ADC	**AC wiring**	Single phase 2 wire system (Hot/Line and Neutral)
Self consumption : Sleep mode [3]	< 10 W	**Mode of operation**	Solar or Grid Priority selectable via front panel
Relative humidity (Non – condensing)	5 % to 95 %	**Acoustic noise**	< 56 dB
Sleep to normal mode recovery time	4 seconds	**Charging modes**	Four modes (Bulk, Absorption, Float, Equalization[4])

Short circuit protection	0.1 Second ON and 10 Seconds OFF. One automatic retry followed by shutdown.
Over load rating	110 to 125 % rating for 60 seconds 125 to 150 % rating fro 10 seconds 150 to 200 % rating for 3 seconds 200 to 300 % for 0.5 second > 300% for 0.1 second Automatic retry after 10 seconds. Continuous 3 overloads on retry results in shutdown.
Type of cooling	Forced cooling, 2 nos. 92 X 92 X 25 mm, DC brushless, 24 VDC
Dimension	670 mm (H) X 350 mm (W) X150 mm (D) 26.4" (H) X 13.8" (W) X 5.9" (D)

Bottom Knockouts	Solar PV	A; x2 or C; x1	**Cable gland trade size**	A	½"
	Battery	B; x2 or D; x1		B	¾"
	AC input	B; x1 or C; x1		C	1"
	AC output	B; x1 or C; x1		D	1½"