Aeon Battery

A48-40

Inverter & Charge Controller Settings

Generic 2 or 3-stage charger settings
Victron Multiplus-II / Multiplus-II GX / Quattro / EasySolar / EasySolar II
Victron SmartSolar MPPT / BlueSolar MPPT
MPP PIP 5048MK / 5048GK / MPI 5K / 5.5K / 10k / Hybrid V2-5048
Schneider XW Pro / XW+ / SW / Conext MPPT
Selectronic SP Pro 2i
Sungrow SH3K6 / SH4K6 / SH5K-20 / SH5K+
SMA Sunny Island 4.4M / 6.0H / 8.0H

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- Information within this guide is accurate at the time of publication and is subject to change without notice.
- While Zenaji has tested many settings and provides these settings as recommendations, not all settings have been field tested and each installation may require specific settings to suit the system. Untested inverters have been noted.
- Illustrations and images are only for the purpose of assisting with installation and system configuration and for illustration purposes only.

Contents

1 Battery Technical Specifications

Specification	A48-40	
Nominal Capacity (25°C ± 5°C) (Useable Capacity)	1.93KWh (40Ah)	
Chemistry	Lithium Titanate (LTO)	
Dimensions (Height x Width x Depth)	1635 x 155 x 145 mm	
Nominal Voltage	48.0V	
Bulk Stage Voltage / Current	53.8V / 20A	If only one Bulk/Absorption stage available, use Absorption settings *round down* to closest number when inverter setting isn't as precise
Absorption Stage Voltage / Current	55.4V / 8A	
Float Voltage	53.8V / 4A	
High Cut-off Voltage	56.0V	
Discharge Cut-off Voltage (Low Cut-off Voltage)	42.5V	*round up* to closest number when inverter setting isn't as precise
Low Restart Voltage (Reconnect Voltage)	45.6V	
Mass	36kg	
Rated DC Charge/Discharge Current (25°C ± 5°C)	50A (1.25C) continuous DC, 38A (0.95C) pulsed DC	
Rated DC Charge/Discharge Power (25°C ± 5°C)	2415W continuous DC, 1835W pulsed DC	
Max DC Charge/Discharge Current (10s, 25°C ± 5°C)	120A (3C)	
Max DC Charge/Discharge Power (10s, 25°C ± 5°C)	5796W	
Battery Management System	Internal cell balancing, failure detection and trip. Under-Voltage, Over-Voltage, Over-Current, Over-Temp, Under-Temp protection and trip	
Isolation & Distribution Block Requirement	50A per battery connected in parallel	
Battery Short Circuit Current	1700A	
Operating Temperature	-40°C to 60°C (recommended 5°C to 35°C)	
Storage Temperature	-5°C to 35°C	
Cycle Life (1C, 25°C ± 5°C)	22,000	
Depth of Discharge	100%	
Round Trip Efficiency (1C, 25°C ± 5°C)	96%	
Ingress Rating	IP65	
Installation	Indoors or outdoors	
Connections	6mm² (10 AWG) (Ø2.8mm) wire per pole	
Warranty	20 Years or 22,000 cycles, whichever comes first, see warranty document for details	

2 Generic Settings

2.1 Charge and Discharge Settings

Standard three stage battery chargers with the common settings below should work with the Aeon Battery.

Setting	Value	Notes
Bulk Stage Voltage / Current	53.8V / 20A per battery	If only one Bulk/Absorption stage available, use Absorption settings *round down* to closest number when inverter setting isn't as precise Current is A x # batteries connected in parallel
Absorption Stage Voltage / Current	55.4V / 8A per battery	
Float Stage Voltage / Current	53.8V / 4A per battery	
High Cut-off Voltage	56.3V	
Low Cut-off Voltage	42.5V	*round up* to closest number when inverter setting isn't as precise
Low Restart (Reconnect) Voltage	45.6V	
Max Charge/Discharge Current	38A per battery	38A x # batteries connected in parallel*

*lower than rated current of 50A as most inverters receive current in high pulsed cycles not continuous current. For Inverters that use unswitching DC current 50A per battery may be used.

2.2 Battery Maintenance

Every 100 charge/discharge cycles or every 2 weeks, whichever occurs first, the battery must be fully charge. To maintain cell balance within the Aeon battery, the battery needs periodic maintenance, by charging the battery to 100% SOC. Where possible, this should be automated with the inverter used, commonly known as Equalisation. If the Equalisation cannot automated periodically it must be performed manually.

Every 100 partial charge/discharge cycles
A partial charge/discharge cycle occurs when the battery has been charged and discharged to any SOC. i.e., the battery is discharged from 80% SOC to 40% SOC then charged up to 80% SOC is one charge/discharge cycle 100 times. Charge the battery to 100% SOC, or an Equalisation charge must be completed.

Every two weeks
If no full 100% SOC is reached within a two week period the battery must be charged to 100% SOC, or an Equalisation charge must be completed.

Setting	Value	Notes
Equalisation Voltage	55.5V	the same as the high cutoff voltage
Equalisation Current	4A per battery	4A x # batteries connected in parrallel or the closest current setting available
Equalisation Time	10min	either 10min or the minimum time available on the charger

3 Victron

3.1 Multiplus-II / Multiplus-II GX / Quattro / EasySolar / EasySolar II

Software: VE Configure III

Zenaji does not provide a VE Settings file a this affects more than just the Inverter and Charger settings.

Inverter Tab

Setting	Value	Notes
DC input low shut-down	42.5	Do not allow the battery to be discharged below 42V
Shut-down on SOC	unchecked	Zenaji recommends you use the battery Voltage for SOC
DC input low restart	45.6	At this voltage the battery is at ~12.5% SOC
Low DC pre-alarm	42.5	-
Do not restart after short-circuit (VDE 4105-2 safety)	unchecked	-

Charger Tab

Setting	Value	Notes
Enable charger	checked	-
Weak AC input	Install dependant	-
Stop after excessive bulk	unchecked	-
Lithium batteries	unchecked	-
Storage mode	unchecked	-
Use equalization	unchecked	-
Charge curve	Adaptive + Battery Safe	-
Absorption voltage	55.4	-
Float voltage	53.8	-
Charge current	38 per battery	38A x # batteries connected in parallel*
Repeated absorption time	0.5	-
Repeated absorption interval	14	-
Maximum absorption time	1	-
Temperature Compensation	Install dependant	suggest default setting used

*38A per battery specified as inverters of this type receive current in high pulsed cycles not continuous current

3.2 SmartSolar MPPT / BlueSolar MPPT

Development and testing for the Victron SmartSolar MPPT and BlueSolar MPPT is still underway, this document will be updated once this is completed. Please visit www.zenaji.com for the most up to date documentation.

Please use the generic charging settings until more detail is provided.

4 MPP

4.1 MPP PIP 5048MK / 5048GK / MPI 5K / 5.5K / 10k / Hybrid V2-5048

Software: MPP "SolarPower" Software

Zenaji does not provide a Settings file as this affects more than just the Parameter settings. Settings for MPP inverters are untested and require verification from MPP.

Note: These settings untested as of 15 December 2021

Parameter Settings

Setting	Value	Notes
Max. battery discharge current in	38 per battery	38A x # batteries connected in parallel**
Battery Type	User Defined	
Bulk charging voltage (C.V. voltage)	53.8	-
Floating charge voltage	53.8	-
Low DC cut-off voltage	42.5	-
Battery equalization	Enable	
Battery equalization voltage	55.4	
Battery equalized time	10	minutes
Battery equalized timeout	20	minutes
Equalization interval	14	days
Equalization Activated Immediately	Enable	
Battery re-discharing voltage when grid is available	min 45.6	installation dependant*
Battery cut-off discharging voltage when Grid is unavailable	42.5	-
Battery re-discharging voltage when Grid is unavailable	min 45.6	installation dependant*
Activate Li-Fe battery while commissioning	no	-
X: (float charging current threshold)	4 x # batteries	installation dependant, up to installer discretion
T: (time under float charge current threshold)	10	installation dependant, up to installer discretion
Y: (when battery voltage is less than Y, then charger turns on again)	55	installation dependant, up to installer discretion

* up to installer discretion, this is understood to be the "Low Restart Voltage"
**38A per battery specified as inverters of this type receive current in high pulsed cycles not continuous current

5 Schneider

5.1 Schneider XW Pro / XW+ / Connext MPPT

Software: InverterCharge Controller Interface
Note: These settings untested as of 15 September 2021

Inverter Menu

Setting	Value	Notes
Low Batt Cut Out	42.5V	-
LBCO Delay	5s	installation dependent, default setting
LBCO Hysteresis	2.1V	-
High Batt Cut Out	56.0V	-
Search Watts	50W	installation dependent, default setting
Search Delay	2s	installation dependent, default setting

Charger Menu

Batt Type	Value	Notes
Batt Type	LithiumIon	Custom to be used when Equalisation required
Batt Capacity	40Ah x # batteries	40Ah per battery installed
Max Chg Rate	(38A x # batteries) / (Inverter Max Current) x 100	38A per battery divided by the Inverters Maximum DC output in percentage, maximum 100%*
Charge Cycle	3-Stage	-
Default Batt Temp	Cool, Warm, Hot	installation dependent
Absorb Time	10min	-

*38A per battery specified as inverters of this type receive current in high pulsed cycles not continuous current

Lithium-ion Settings Menu

Batt Type	Value	Notes
Control	3-Stage	-
Bulk Voltage	53.0V	-
MaxBulkCurrent	20A x # batteries	20A per battery connected in parallel
Absorb Voltage	56.3V	-
MaxAbsCurrent	8A x # batteries	8A per battery connected in parallel
Float Voltage	53.8A	-
MaxFloatCurrent	4A x # batteries	4A per battery connected in parallel
DisChglmax	(38A x # batteries) / (Inverter Max Current) x 100	38A per battery divided by the Inverters Maximum DC output in percentage, maximum 100%*
DisChglmax Timer	(38A x # batteries) / (Inverter Max Current) x 100	38A per battery divided by the Inverters Maximum DC output in percentage, maximum 100%*

*38A per battery specified as inverters of this type receive current in high pulsed cycles not continuous current

Custom Settings Menu - for use when performing Equalisation

Batt Type	Value	Notes
Eqlz Support	Enabled	-
Eqlz voltage	55.5V	-
Bulk Voltage	53.8V	20A per battery connected in parallel
Absorb Voltage	55.4V	8A per battery connected in parallel
Float Voltage	53.8V	4A per battery connected in parallel
Batt Temp Comp	100mV	-

6 Selectronic

6.1 Selectronic SP Pro 2i

Software: SP Link Software

Quick Start (Above tabs)

Setting	Value	Notes
Battery Typew	Custom	-
Battery Capacity	40 x # batteries	40Ah per battery connected in parallel

Inverter Tab

Section	Setting	Value	Notes
DC Shutdown	Battery 0% Load	42.5	20% Charge
DC Shutdown	Battery 100% Load	41.0	A bit less than 20% charge
DC Shutdown	Recovery Voltage	45.6	-
DC Shutdown	SoC Shutdown	Disabled	not applicable as we use the voltage to determine shutdown

Battery Tab

Section	Setting	Value	Notes
Limits	Max Charge Voltage	56.0	-
Limits	Hi Battery Alert	58.0	-
Limits	Hi Battery Alert Clear	57.5	-
AC Coupled Trip	AC Coupled Trip	64.0	should be greyed out
AC Coupled Trip	Over Target Charge Voltage Trip	2.0	-
AC Coupled Trip	Over Target Charge Current Trip	2.0	-
AC Coupled Trip	Trip Delay	1.0	seconds
BMS Charger Adjustment	Float Voltage Adjust	0	-
BMS Charger Adjustment	Current Target Scale	100	installation dependent
Battery	Periodic Equalize	Enabled	-
Battery	Equalise period	14	
Battery	Periodic Recharge	Disabled	-
Battery	Soft Battery	Disabled	-
Mid Point	Monitoring	Disabled	-
Mid Point	Equalize Request	Enabled	-
SOC Setting	Peukert's Exponent	1	not critical, changes automatically
Over Temp. Protection	Limit Charge above	50	Max value 60°C, 50°C recommended
Over Temp. Protection	Limit Rate	20	-

Charger Tab

Section	Setting	Value	Notes
Charge Settings	Max. Charge Current	100	%, 40A per battery connected in parallel
	Initial Return Voltage	52.4	-
	Initial return SOC	90	90% SOC matched with 52.4V
Initial Stage	Voltage	53.3	-
	Current	100	-
	Time	1	-
Bulk Stage	Voltage	53.8	-
	Current	50	%, 20A per battery connected in parallel
	Time	1	-
Absorption Stage	Voltage	55.4	-
	Current	20	%, 8A per battery connected in parallel
Absorb-Float Transition	Net Change	1.0	-
	Change Time	30	-
	Max time	50	-
Float Stage	Voltage	53.8	-
	Current	10	%, 4A per battery connected in parallel
	Long Term Voltage	53.8	-
Equalise Stage	Voltage	55.5	-
	Current	10	%, 4A per battery connected in parallel
	Time	2	-
Battery Temperature Compsation	Reference Temp. A	25	-
	Reference Temp. B	25	-
	Min. Comp. Temp.	0	-
	Max. Comp. Temp.	45	-
	Ref. A Temp. Co.	0	-
	Ref. B Temp. Co.	0	-

7 Sungrow

7.1 Sungrow SH3K6 / SH4K6 / SH5K-20 / SH5K+

Software: Inverter LCD Menu
Note: These settings untested as of 15 September 2021

Battery Type

Setting	Value	Notes
Battery Type	Other Lead-acid	-

Battery Settings

Setting	Value	Notes
Max. SOC	100	%
Min. SOC	0	%
rate Vtg	48.0	-
Capacity	40 x # batteries	40Ah per battery connected in parallel
Over Vtg	56.0	-
Low Vtg	42.5	-
Over Temp	50	Max value 60°C, 50°C recommended
Low Temp	-20	Min value -30°C, -20°C recommended
Max. Chrg	0.95 x # batteries	0.95 C-rate, 38A per battery connected in parallel*
Max. DChrg	0.95 x # batteries	0.95 C-rate, 38A per battery connected in parallel*
CSTVtgChar	53.8	-
DChrgEndVtg	42.8	Helps prevent overdischarge below 42.5V with Sungrow Inverters

*38A per battery specified as inverters of this type receive current in high pulsed cycles not continuous current

8 SMA

8.1 Sunny Island 4.4M / 6.0H / 8.0H

Software: Inverter LCD Menu
Notes:

These settings untested as of 15 September 2021

Minimum of 3 Aeon batteries required to meet the minimum 100Ah battery capacity requirement of SMA inverters when using the FLA/VRLA charge profile, this is a restriction by SMA.

Charge Settings

Setting	Value	Notes
Maximum charging current	38A per battery	38A x # batteries connected in parallel*
Time for boost charge	10 min	-
Time for equalization charge	1 h	-
Time for full charge	Install Dependent, 6h as default	6 hours only a recommendation to allow the PV enough time to charge
Cell charge nominal voltage for boost charge	2.24 V	*Measured cell voltage would be 2.56V. SMA assumes 24 cells, not 21 as in the Aeon battery*
Cell charge nominal voltage for full charging	2.31 V	*Measured cell voltage would be 2.64V. SMA assumes 24 cells, not 21 as in the Aeon battery*
Cell charge nominal voltage for equalization charge	2.31 V	
Cell charge nominal voltage for float charge	2.24 V	*Measured cell voltage would be 2.56V. SMA assumes 24 cells, not 21 as in the Aeon battery*
Cycle time full charge	14 d	-
Temperature Compensation	0.004 V/°C	-
Automatic equalization charge	off	-

*38A per battery specified as inverters of this type receive current in high pulsed cycles not continuous current

Battery Setting

Setting	Value	Notes
Rated Capacity	1930 Wh x # batteries	1930Wh per battery connected in parallel.
Nominal Capacity	40 x # batteries	40Ah per battery connected in parallel. Minimum 3 batteries (120Ah) as the minimum Ah rating for using FLA/VRLA batteries with SMA is 100Ah
Type	VRLA	-
Nominal Voltage	48.0	-
Current sensor type	installer to provide	-
Current sensor gain	installer to provide	-
maximum temperature	50 °C	-
Switch-on limit after overtemperature shutdown	45 °C	-
Output resistance DC connection	0.000 Ohm	-

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