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AERL LiFe² 5120S

Battery Modules, Cabinets and Inverters



LiFe²-5120S · LiFe² battery cabinets

System Sizing Guide

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Document

Revision **1.0.0**	Effective **11 / 2026**	Audience **System designers and installers**	Battery **AERL LiFe² 5120S, 5.12 kWh / 100 Ah**
Cabinets **CAB6 · CAB10 · CAB4-OUTD · CAB6-OUTD · CAB10-OUTD**	Format **A4 · 15 pages**		

About This Guide

This guide shows how to size a LiFe² 5120S battery bank: how many modules, which cabinet, and the checks on current, temperature and cabling. It brings together values from the LiFe² 5120S datasheet, the Installation and Operation Manual, the PCE Integration Guide and the Managed Battery Integration Guide. Where they set a rule, this guide restates it; for installation, wiring and settings, use those documents.

The system design is the designer's responsibility. Check every design against the inverter manufacturer's requirements and the local standards, including AS/NZS 5139 and AS/NZS 3000.

Building Blocks

01

The LiFe² 5120S module, usable energy, battery cabinets

1.1 The LiFe² 5120S Module

Parameter	Value
Nominal voltage	**51.2 V DC**
Operational voltage range	**40.8 V DC to 58.4 V DC**
Capacity	**5.12 kWh / 100 Ah**
Depth of discharge	**Up to 100%**
Maximum continuous discharge current	**100 A (1C at 25 °C)**
Peak discharge current	**200 A (10.24 kW, 5 s)**
Maximum continuous charge current	**100 A (1C at 25 °C)**
Peak charge current	**200 A (at 25 °C)**
Integrated circuit breaker	**2-pole, 125 A, 80 V DC**
Short-circuit current	**2000 A**
Scalability	**Up to 64 modules in parallel (327.68 kWh)**
Series connection	**Not permitted**
Operating temperature, Managed	**Charge −10 to 55 °C, discharge −20 to 55 °C**
Operating temperature, Self-Managed	**Charge 0 to 55 °C, discharge −5 to 55 °C**

1.2 Usable Energy

Size the bank on usable energy: the module's 5.12 kWh multiplied by the depth of discharge (DoD) the inverter is set to.

Mode	Default depth of discharge	Usable energy per module
Managed (CAN bus)	80% (20% SOC low cut-off)	4.096 kWh
Self-Managed (no comms)	90% (recommended setting)	4.608 kWh

The battery can discharge to 100%; a shallower depth of discharge gives a longer cycle life (LiFe² 5120S Installation and Operation Manual, chapter 11).

1.3 Battery Cabinets

Cabinet	Modules	Energy	Busbar rating	Use
LiFe²-CAB6	Up to 6	30.72 kWh	625 A	Indoor, IP20
LiFe²-CAB10	Up to 10	51.20 kWh	1250 A	Indoor, IP20
LiFe²-CAB4-OUTD	Up to 4	20.48 kWh	250 A	Outdoor, IP55
LiFe²-CAB6-OUTD	Up to 6	30.72 kWh	400 A	Outdoor, IP55
LiFe²-CAB10-OUTD	Up to 10	51.20 kWh	600 A	Outdoor, IP55

The cabinets are pre-wired (quick connectors, 4 AWG UL cable) and have no DC circuit breaker: fit the DC isolation and protection between the cabinet and the inverter.

> **Cabinet current**
>
> A cabinet's continuous current is the lower of 100 A per installed module and its busbar rating. In the indoor cabinets the busbar carries every module at full current. In the outdoor cabinets the busbar rating is lower than the modules together (for example 250 A for four modules in the LiFe²-CAB4-OUTD), so the busbar sets the limit.

Sizing Method

Step 1: energy, step 2: minimum modules for the inverter

02

2.1 Step 1: Energy

1. Work out the energy the battery must supply between charges, in kWh: the daily load from the battery, multiplied by the days of autonomy the site needs.
2. Divide by the usable energy per module (4.096 kWh Managed, 4.608 kWh Self-Managed).
3. Round up to a whole number of modules.

2.2 Step 2: Minimum Modules for the Inverter

Look up the inverter in chapter 03 and use at least that number of modules. The minimum makes sure the battery can support the inverter's full output. In Managed mode the inverter stays within the battery's limits; in Self-Managed mode, fewer modules than the minimum may operate the battery outside its warranty conditions.

For an inverter that is not listed, check the discharge current: the inverter's maximum DC current must not exceed 100 A per module. Work out the DC current from the inverter's rated AC power, its efficiency and the lowest battery voltage it runs at:

$$I_{dc} = P_{ac} \div (\eta \times V_{dc})$$

Check the inverter's surge rating against the module's peak discharge of 200 A for 5 seconds.

2.3 Step 3: Charge Current

Add up the charge current of every source that can charge at the same time: the inverter's charger (from the grid or a generator) and any CoolMax SRX or other DC charge controllers.

- **Managed:** the bank accepts up to 100 A per module (1C at 25 °C), less at other temperatures (step 4). The inverter charges within the limits the battery sends; set every other charge source within them.
- **Self-Managed:** program a maximum charge current of no more than 70 A per module, across all charge sources together.

2.4 Step 4: Temperature

The battery allows its full 1C charge and discharge rates only between about 20 and 45 °C; outside that range the rates fall (LiFe² 5120S Installation and Operation Manual, chapter 12). Below 0 °C a managed battery charges at no more than 0.1C, and it does not charge below −10 °C. For a site that is cold in winter, size the bank so that it can accept the winter charge current at the reduced rate, or keep the battery warm.

2.5 Step 5: Cabinets

Choose cabinets for the module count and the site: indoor (IP20) or outdoor (IP55). Check that each cabinet's continuous current (the lower of 100 A per module and the busbar rating) covers its share of the inverter's DC current. Connect parallel cabinets through a DC bus or DC combiner box, with DC cables of the same length for every cabinet.

2.6 Step 6: Round Up and Check

- Use the largest of the module counts from steps 1 to 3.
- Size the PV array (or other charge source) to charge the bank to 100% regularly, even at the winter solstice: at least every 14 days in Self-Managed operation and every 30 days in Managed operation.
- Plan for expansion: modules of the same part number can be added later, at any SOC (LiFe² 5120S Installation and Operation Manual, chapter 8).

Minimum Modules by Inverter

AERL controllers, Selectronic, Victron, Deye, Noark, Solis, SMA

03

The minimum number of LiFe² 5120S modules for each AERL charge controller and each Selectronic, Victron, Deye, Noark, Solis and SMA inverter, from the LiFe² PCE Integration Guide and the LiFe² Managed Battery Integration Guide.

3.1 AERL Controllers

Charger	Battery modules
SRX 600/70-48	1
SRX-R 600/60-48	1

3.2 Selectronic

Inverter	Single phase	Three phase
SPMC480	2	6
SPMC481	2	6
SPMC482	3	9

3.3 Victron

Per inverter, from Victron's and ZYC's published tables.

Inverter	Single-phase on-grid	Single-phase off-grid	Three-phase on-grid	Three-phase off-grid
MultiPlus 48/500/6	1	1	1	1
MultiPlus 48/800/9	1	1	1	1
MultiPlus 48/1200/13	1	1	1	1
MultiPlus 48/1600/20	1	1	1	2
MultiPlus 48/2000/25	1	1	1	2
MultiPlus 48/3000/35	1	1	2	3
MultiPlus 48/5000/70	1	2	2	4
MultiPlus-II (GX) 48/3000/35-32	1	1	1	3
MultiPlus-II (GX) 48/5000/70-50	1	2	2	4
MultiPlus-II 48/3000/35-32	1	1	1	3
MultiPlus-II 48/5000/70-50	1	2	2	4
MultiPlus-II 48/8000/110-100	1	3	3	7
MultiPlus-II 48/10000/140-100	2	3	3	8
MultiPlus-II 48/15000/200-100	2	4	4	12
Quattro 48/5000/70-100/100	1	2	2	4
Quattro 48/8000/110-100/100	1	3	2	7
Quattro 48/10000/140-100/100	2	3	4	8
Quattro 48/15000/200-100/100	2	4	4	12
Quattro II 48/5000/70-50	1	2	2	4
RS Smart Solar 48/6000	1	2	2	4
Multi RS Solar 48/6000	1	2	2	4
Multi RS Solar 48/6000 Dual Tracker	1	2	2	4
EasySolar-II 48/3000/35-32 MPPT 250/70 GX	1	1	2	3
EasySolar-II 48/5000/70-50 MPPT 250/100 GX	1	2	2	4

3.4 Deye

Inverter	Battery modules
SUN-3.6K-SG01LP1-EU	2
SUN-5K-SG01LP1-EU	2
SUN-7.6K-SG01LP1-EU	3
SUN-8K-SG01LP1-EU	3
SUN-12K-SG01LP1-EU	4
SUN-14K-SG01LP1-EU	4
SUN-16K-SG01LP1-EU	5
SUN-3.6K-SG03LP1-EU	2
SUN-4.6K-SG03LP1-EU	2
SUN-5K-SG03LP1-EU	2
SUN-5.5K-SG03LP1-EU	2
SUN-6K-SG03LP1-EU	2
SUN-5K-SG04LP3-EU	2
SUN-6K-SG04LP3-EU	2
SUN-8K-SG04LP3-EU	3
SUN-10K-SG04LP3-EU	3
SUN-12K-SG04LP3-EU	4
SUN-3K-SG04LP1-EU	1
SUN-3.6K-SG04LP1-EU	2
SUN-5K-SG04LP1-EU	2
SUN-6K-SG04LP1-EU	2
SUN-3.6K-SG05LP1-EU	2
SUN-5K-SG05LP1-EU	2
SUN-6K-SG05LP1-EU	2
SUN-7K-SG05LP1-EU	2
SUN-7.6K-SG05LP1-EU	3
SUN-8K-SG05LP1-EU	3

3.5 Noark

Inverter	Battery modules
Ex9N-DH-3KS-AU	1
Ex9N-DH-3.6KS-AU	1
Ex9N-DH-5KS-AU	2
Ex9N-DH-6KS-AU	2
Ex9N-DH-7.6KS-AU	3
Ex9N-DH-8KS-AU	3
Ex9N-DH-5KT-AU	2
Ex9N-DH-6KT-AU	2
Ex9N-DH-8KT-AU	3
Ex9N-DH-10KT-AU	3
Ex9N-DH-12KT-AU	4

3.6 Solis

Inverter	Single phase	Three phase
RHI-3K-48ES-5G	1	—
RHI-3.6-48ES-5G	1	—
RHI-4.6K-48ES-5G	2	—
RHI-5K-48ES-5G	2	—
RHI-6K-48ES-5G	2	—
RAI-3K-48ES-5G	1	—
S5-EH1P3K-L	1	—
S5-EH1P3.6K-L	1	—
S5-EH1P4.6K-L	2	—
S5-EH1P5K-L	2	—
S5-EH1P6K-L	2	—
S5-EO1P4K-48	2	—
S5-EO1P4K-48-P	2	—
S5-EO1P5K-48	2	—
S5-EO1P5K-48-P	2	—
S6-EO1P4K-48	2	4
S6-EO1P5K-48	2	5
S6-EH1P3K-L-EU	1	3

Inverter	Single phase	Three phase
S6-EH1P3.6K-L-EU	2	4
S6-EH1P4.6K-L-EU	2	4
S6-EH1P5K-L-EU	2	5
S6-EH1P6K-L-EU	2	6
S6-EH1P3K-L-PRO	1	3
S6-EH1P3.6K-L-PRO	2	4
S6-EH1P5K-L-PRO	2	5
S6-EH1P6K-L-PRO	2	6
S6-EH1P8K-L-PRO	3	7

3.7 SMA

Sunny Island	Single phase	Three phase
SI 4.4M	2	6
SI 6.0H	2	6
SI 8.0H	3	9

Cabling and Protection 04

These are pointers to the rules in the LiFe² 5120S Installation and Operation Manual. Size every cable and protective device to AS/NZS 3008.1.1 and AS/NZS 5139 for the installed current, route length and conditions.

Item	Rule
DC cables to the inverter	Size for the current of the connected inverter or load. Keep the voltage drop small (AERL's example systems use 2% or less).
Cable terminals	LiFe²-CAB6: SCxxx-10. LiFe²-CAB10: SCxxx-12. Outdoor cabinets: contact AERL.
Parallel cabinets	Through a DC bus or DC combiner box. DC cables of the same length and size for every cabinet, so every module sees the same impedance.
Custom enclosures	Connect modules to the busbar with AERL pre-assembled cables (AERL-BATT-CABLE-2.5), all the same length and size. Fuses, cables and connections are the designer's to select.
DC isolation and protection	A 2-pole DC breaker or MCCB between the battery and the inverter, on both conductors. Rate it for the bank's prospective short-circuit current (2000 A per module). The cabinets have no DC breaker.
Protective earth	Cross-section at least 25 mm², with an SC35-6 terminal.
Communications	Shielded Cat 5 or better, no longer than 5 m (Managed mode).

Worked Examples

Example 1: off-grid home, Selectronic SP PRO, Managed

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The loads in these examples are illustrative. Use the site's own load data and the current inverter documentation.

5.1 Example 1: Off-Grid Home, Selectronic SP PRO, Managed

A single-phase off-grid home uses 15 kWh a day from the battery and needs 1.5 days of autonomy. The inverter is a Selectronic SP PRO SPMC482 (7500 W), running the LiFe² 5120S in Managed mode.

Step	Working
1. Energy	15 kWh × 1.5 days = 22.5 kWh. 22.5 ÷ 4.096 kWh (80% DoD) = 5.5, so **6 modules**.
2. Minimum for the inverter	SPMC482, single phase: 3 modules. 6 is more than 3.
3. Charge current	The SP PRO charges within the battery's limits: up to 600 A for 6 modules at 25 °C.
4. Temperature	Assumed between 20 and 45 °C, so the full rates apply. For a colder site, see step 4.
5. Cabinet	One LiFe²-CAB6: 6 modules, 30.72 kWh, 625 A busbar. The inverter's DC current at 7500 W and 48 V is about 160 A, well within it.
6. Result	**6 × LiFe² 5120S in one LiFe²-CAB6**: 24.6 kWh usable at 80% DoD.

5.2 Example 2: Outdoor Cabinet, Victron MultiPlus-II, Managed

A single-phase off-grid cabin uses 10 kWh a day and needs one day of autonomy. The inverter is a Victron MultiPlus-II 48/5000/70-50 with a GX device. The battery must be outdoors.

Step	Working
1. Energy	10 kWh ÷ 4.096 kWh = 2.4, so **3 modules**.
2. Minimum for the inverter	MultiPlus-II 48/5000/70-50, single-phase off-grid: 2 modules. 3 is more than 2.
3. Charge current	The MultiPlus-II charger (70 A) charges within the battery's limits.
4. Temperature	Assumed between 20 and 45 °C, so the full rates apply. For a colder site, see step 4.
5. Cabinet	One LiFe²-CAB4-OUTD: up to 4 modules, 250 A busbar. With 3 modules the busbar, not the modules (300 A), sets the cabinet's continuous current: 250 A. The inverter's DC current is about 100 A, within it.
6. Result	**3 × LiFe² 5120S in one LiFe²-CAB4-OUTD**: 12.3 kWh usable, with room for a fourth module.

5.3 Example 3: DC-Coupled Solar, Self-Managed

An off-grid site with an SMA Sunny Island SI 8.0H (single phase) uses 25 kWh a day, with one day of autonomy. Three CoolMax SRX 600/70-48 charge controllers (70 A each) charge the battery from PV. The battery runs Self-Managed.

Step	Working
1. Energy	25 kWh ÷ 4.608 kWh (90% DoD) = 5.4, so **6 modules**.
2. Minimum for the inverter	SI 8.0H, single phase: 3 modules.
3. Charge current	The three SRX controllers can deliver 210 A together. At 70 A per module this needs at least 3 modules. With 6 modules the limit for all charge sources together is 6 × 70 A = 420 A, so limit the Sunny Island's own charge current (from a generator) to 420 − 210 = 210 A.
4. Temperature	Assumed between 20 and 45 °C, so the full rates apply. For a colder site, see step 4.
5. Cabinet	One LiFe²-CAB6 (625 A busbar).
6. Result	**6 × LiFe² 5120S in one LiFe²-CAB6**: 27.6 kWh usable at 90% DoD.

For the PV array and the SRX settings, see the CoolMax SRX DC-Coupling Design Guide.

Support

Register the warranty, design support, change log

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6.1 Register the Warranty

The LiFe² 5120S warranty is 5 years. Register the battery within 60 days of installation to extend it to 10 years: register at **aerl.com.au/warranty-registration**. LiFe² cabinets carry a 2-year warranty. Conditions apply: see the LiFe² Warranty Statement, at aerl.com.au.

6.2 Design Support

For a design this guide does not cover, such as an unlisted inverter or a multi-cabinet bank, contact AERL support on 1800 950 865 or support@aerl.com.au with the inverter models, the load profile and the site conditions.

6.3 Change Log

Revision	Date	Change
1.0.0	11 / 2026	First issue.

Thank You for Choosing AERL

If you have any questions or need support, contact AERL.

Sincerely,

The AERL Team

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