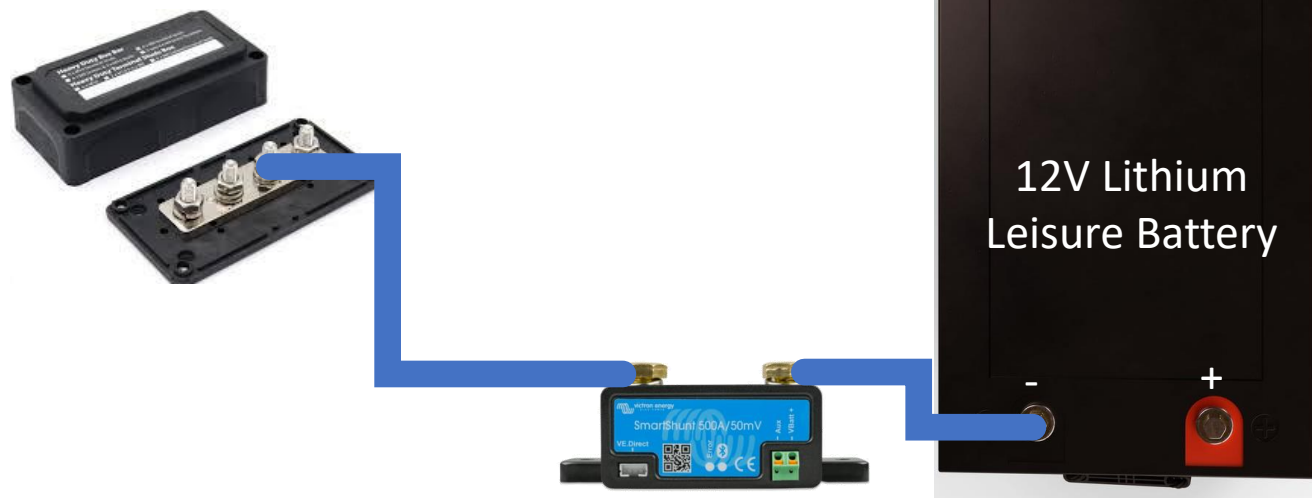


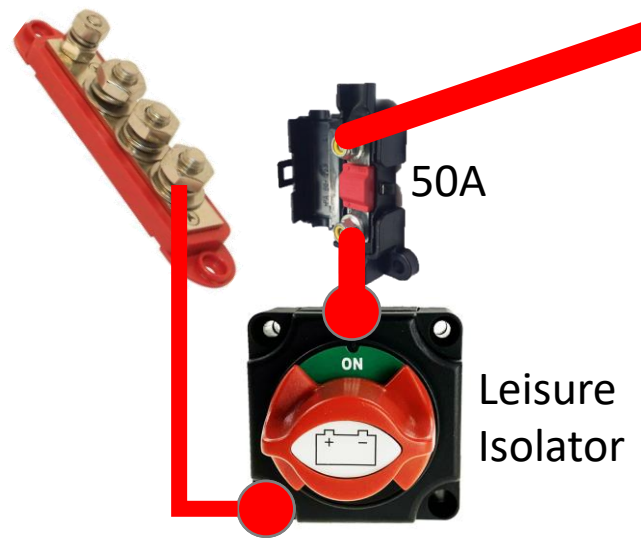
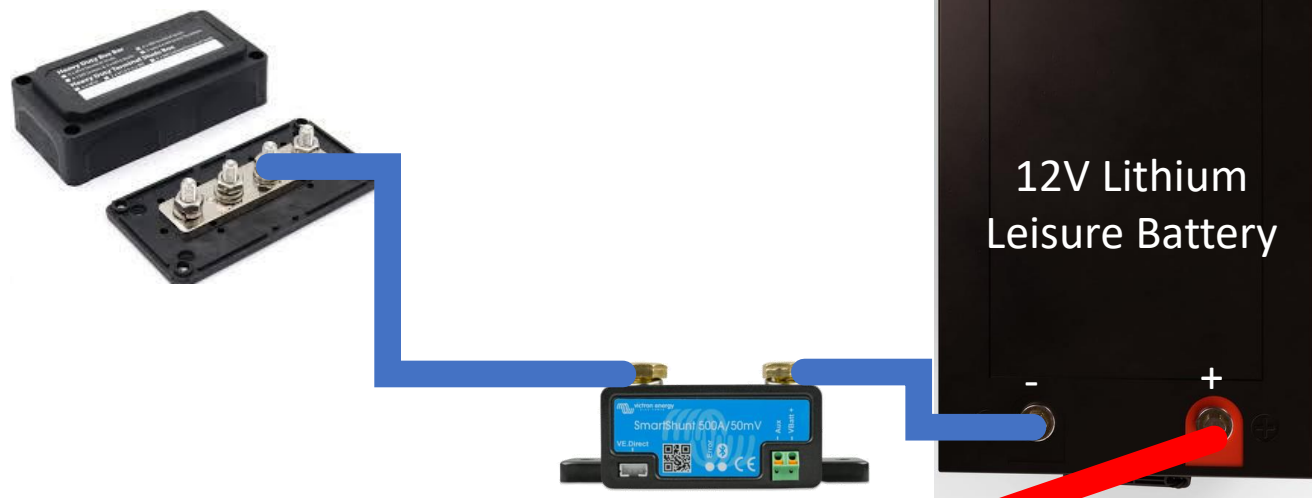


12V Lithium  
Leisure Battery

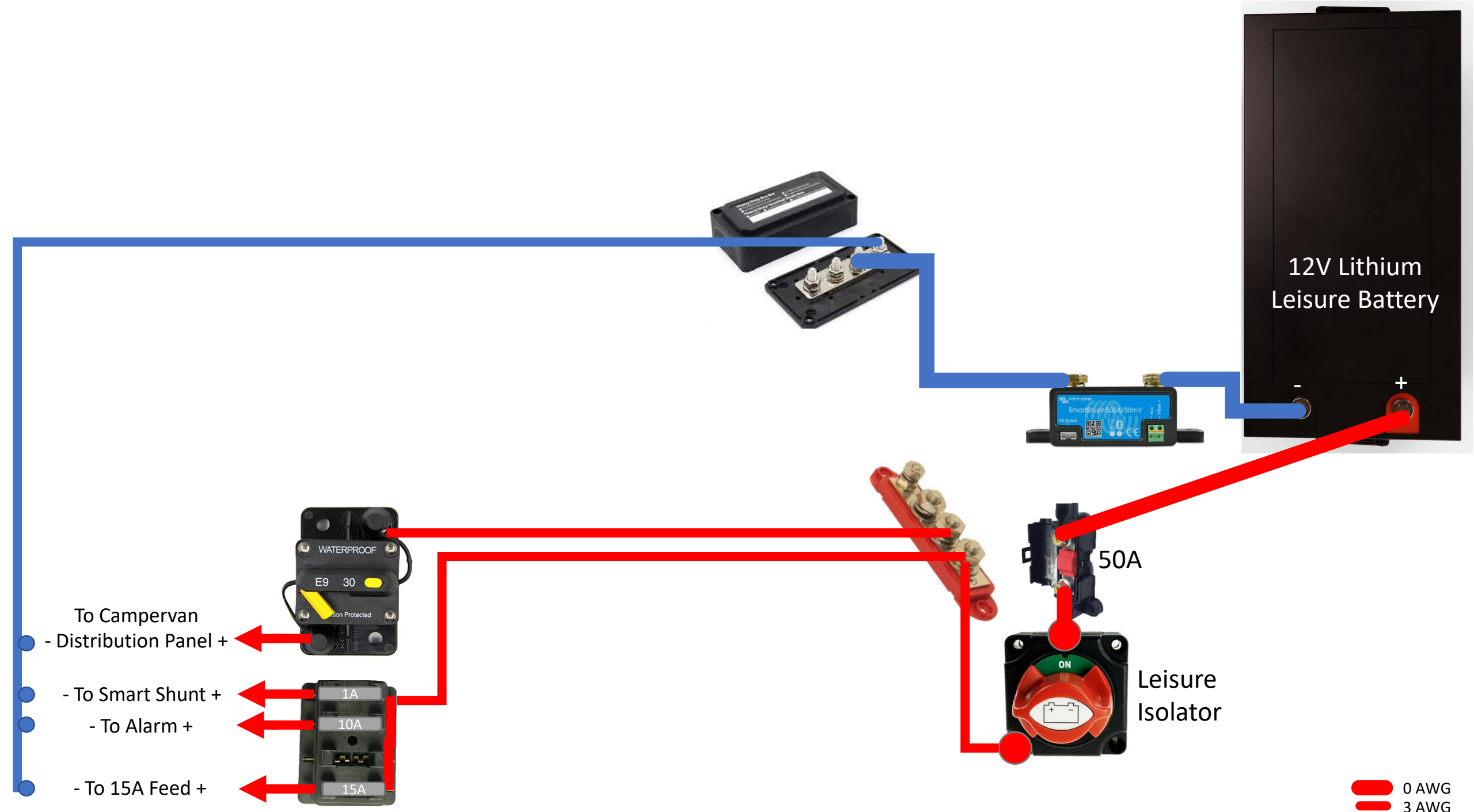


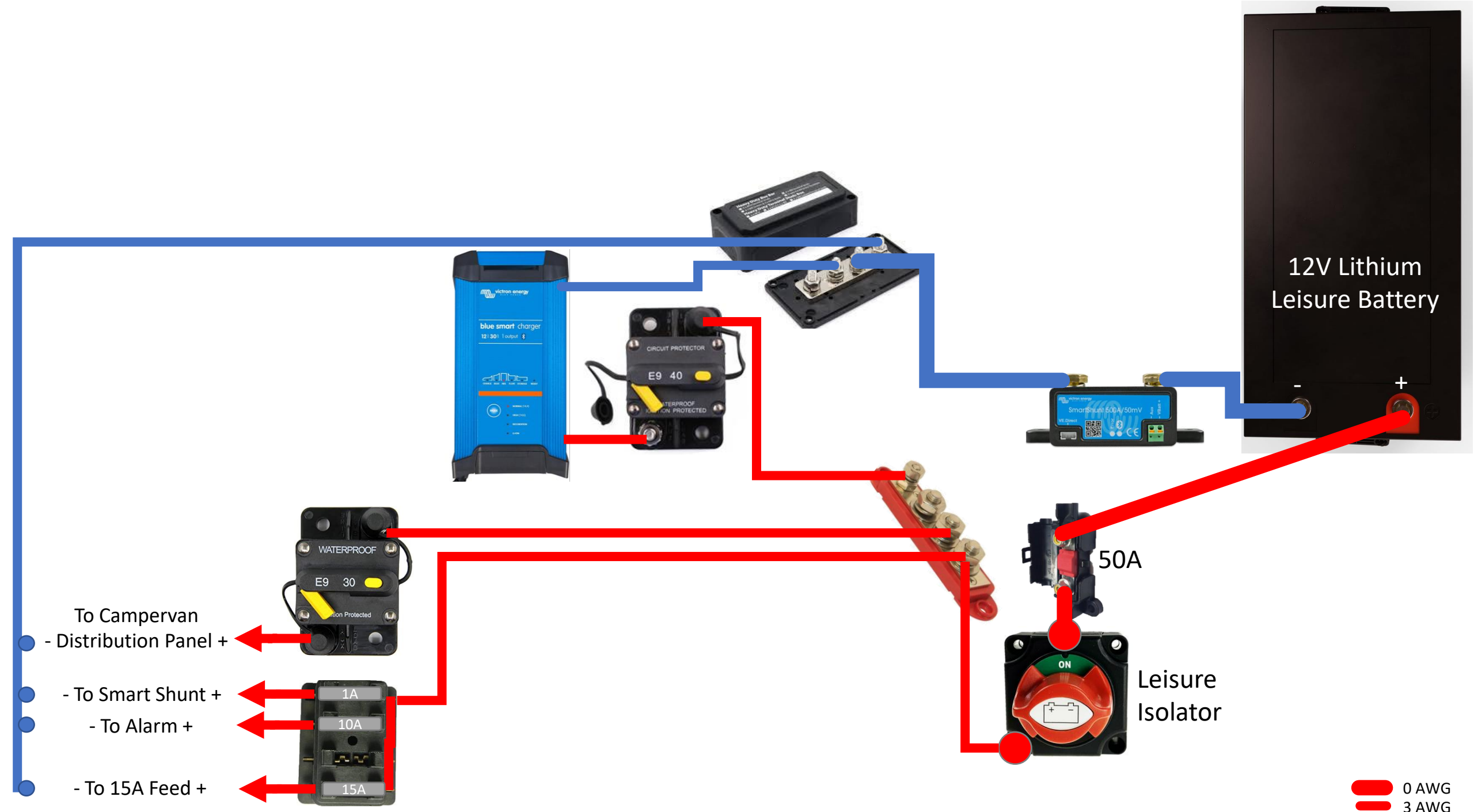


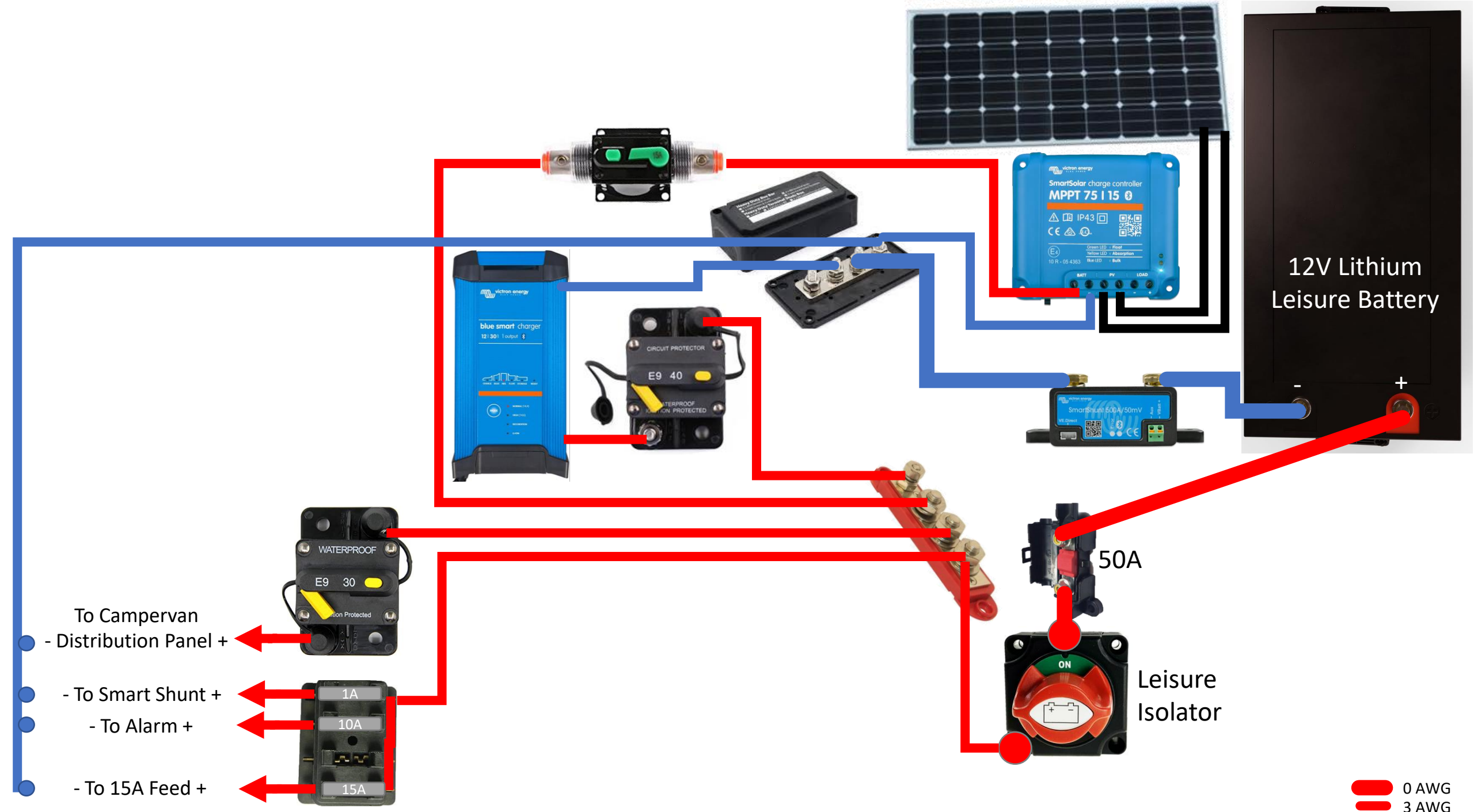
0 AWG  
3 AWG



0 AWG  
3 AWG









12V Vehicle

Battery

12V Lithium  
Leisure Battery

victron energy  
SmartSolar charge controller  
MPPT 75 I 15

victron energy  
blue smart charger

CIRCUIT PROTECTOR  
E9 40

50A

Leisure  
Isolator

Existing Wiring

To Campervan  
- Distribution Panel +

- To Smart Shunt +  
- To Alarm +

- To 15A Feed +

0 AWG  
3 AWG





12V Vehicle

Battery

12V Lithium Leisure Battery

SmartSolar charge controller  
MPPT 75 I 15

blue smart charger

CIRCUIT PROTECTOR  
E9 40

SmartShunt 50A/50mV

50A

125A

125A

Leisure Isolator

Inverter Isolator

Existing Wiring

Sterling Power Products

To Campervan - Distribution Panel +

- To Smart Shunt +

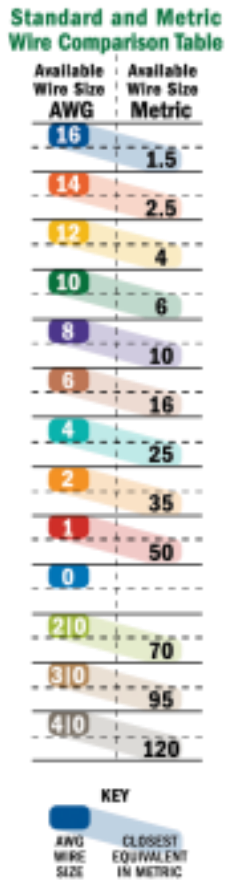
- To Alarm +

- To 15A Feed +

WATERPROOF  
E9 30

1A  
10A  
15A

0 AWG  
3 AWG



CIRCUIT TYPE			CURRENT FLOW IN AMPS															
CIRCUIT LENGTH	Non-Critical 10% VOLTAGE DROP	Critical 3% VOLTAGE DROP	5A	10A	15A	20A	25A	30A	40A	50A	60A	70A	80A	90A	100A	120A	150A	200A
	0 to 20 ft	0 to 6 ft		16 AWG	16 AWG	14 AWG	14 AWG	12 AWG	10 AWG	8 AWG	6 AWG	6 AWG	6 AWG	4 AWG	4 AWG	4 AWG	2 AWG	1 AWG
30 ft	10 ft		16 AWG	14 AWG	12 AWG	12 AWG	10 AWG	10 AWG	8 AWG	6 AWG	6 AWG	4 AWG	4 AWG	4 AWG	2 AWG	2 AWG	1 AWG	2 0 AWG
50 ft	15 ft		14 AWG	12 AWG	10 AWG	10 AWG	8 AWG	8 AWG	6 AWG	6 AWG	4 AWG	4 AWG	4 AWG	2 AWG	2 AWG	1 AWG	0 AWG	2 0 AWG
65 ft	20 ft		12 AWG	10 AWG	8 AWG	8 AWG	6 AWG	6 AWG	4 AWG	4 AWG	2 AWG	2 AWG	2 AWG	1 AWG	1 AWG	0 AWG	0 AWG	2 0 AWG
80 ft	25 ft		10 AWG	8 AWG	6 AWG	6 AWG	4 AWG	4 AWG	2 AWG	2 AWG	1 AWG	1 AWG	1 AWG	0 AWG	0 AWG	2 0 AWG	2 0 AWG	3 0 AWG
100 ft	30 ft		8 AWG	6 AWG	4 AWG	4 AWG	4 AWG	2 AWG	2 AWG	1 AWG	1 AWG	0 AWG	0 AWG	2 0 AWG	2 0 AWG	3 0 AWG	3 0 AWG	4 0 AWG
130 ft	40 ft		6 AWG	4 AWG	4 AWG	4 AWG	2 AWG	2 AWG	1 AWG	0 AWG	0 AWG	2 0 AWG	2 0 AWG	3 0 AWG	3 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG
165 ft	50 ft		4 AWG	2 AWG	2 AWG	2 AWG	1 AWG	1 AWG	0 AWG	0 AWG	2 0 AWG	2 0 AWG	3 0 AWG	3 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG
200 ft	60 ft		2 AWG	1 AWG	1 AWG	1 AWG	0 AWG	0 AWG	2 0 AWG	2 0 AWG	3 0 AWG	3 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG
	70 ft		1 AWG	0 AWG	0 AWG	0 AWG	2 0 AWG	2 0 AWG	3 0 AWG	3 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG
	80 ft		0 AWG	0 AWG	0 AWG	0 AWG	2 0 AWG	2 0 AWG	3 0 AWG	3 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG
	90 ft		0 AWG	0 AWG	0 AWG	0 AWG	2 0 AWG	2 0 AWG	3 0 AWG	3 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG
	100 ft		0 AWG	0 AWG	0 AWG	0 AWG	2 0 AWG	2 0 AWG	3 0 AWG	3 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG
	110 ft		0 AWG	0 AWG	0 AWG	0 AWG	2 0 AWG	2 0 AWG	3 0 AWG	3 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG
	120 ft		0 AWG	0 AWG	0 AWG	0 AWG	2 0 AWG	2 0 AWG	3 0 AWG	3 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG
	130 ft		0 AWG	0 AWG	0 AWG	0 AWG	2 0 AWG	2 0 AWG	3 0 AWG	3 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG	4 0 AWG

**Cables used in the setup:**

- 0AWG x 2 for Inverter circuits
- 0AWG x 2 for Negative
- 4AWG for 30A/40A circuits
- 3AWG for 50A Circuits

*Note: You should always check the cable size is suitable for your specific application.*

**AWG WIRE SIZE CHART**



# The Principal Kit used:



Roamer 460AH Lithium (LIFEPO4) Battery with 250A BMS



Sterling Power Battery Maintainer 12V / 3A



Negative Bus Bar 300A+



Victron Energy SmartShunt



2 x Midi Fuse Holders & 2 x 125A Midi Fuses



Positive Bus Bar 100A+



Victron Energy MPPT SmartSolar Charge Controller



1 x Midi Fuse Holder & 1 x 50A Midi Fuse



Victron Energy BlueSmart Charger (12V / 30A)



2 x Battery Isolator Switches



Small fuse box  
1 x 1A Fuse  
1 x 10A Fuse  
1 x 15A Fuse



Giandel Pure Sine Wave Inverter 3000W



1 x 40A DC Circuit Protector  
1 x 30A DC Circuit Protector



Cables and terminals  
0 AWG  
3 AWG  
4 AWG



1 x 15A In-line DC Circuit Breaker

# Principal Kit Approximate Cost (April 2022)



Roamer 460AH Lithium (LIFEPO4) Battery with 250A BMS

~£1,950



Sterling Power Battery Maintainer 12V / 3A

~£60



Negative Bus Bar 300A+

~£34



Victron Energy SmartShunt

~£110



2 x Midi Fuse Holders & 2 x 125A Midi Fuses

~£10



Positive Bus Bar 100A+

~£15



Victron Energy MPPT SmartSolar Charge Controller

~£115



1 x Midi Fuse Holder & 1 x 50A Midi Fuse

~£5



Small fuse box  
1 x 1A Fuse  
1 x 10A Fuse  
1 x 15A Fuse

~£10



Victron Energy BlueSmart Charger (12V / 30A)

~£170



2 x Battery Isolator Switches

~£25



1 x 40A DC Circuit Protector  
1 x 30A DC Circuit Protector

~£24



Cables and terminals  
0 AWG  
3 AWG  
4 AWG

~£50



Giandel Pure Sine Wave Inverter 3000W

~£390



1 x 15A In-line DC Circuit Breaker

~£12

# Principal Kit Approximate Cost (April 2022)



Roamer 460AH Lithium (LIFEPO4) Battery with 250A BMS

~£1,950



Sterling Power Battery Maintainer 12V / 3A

~£60



Negative Bus Bar 300A+

~£34

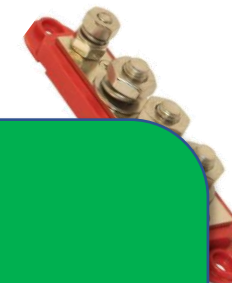


Victron Energy SmartShunt

~



2 x Midi Fuse Holders & 2 x 125A Midi Fuses



Positive Bus Bar 100A+

~£15



Victron Energy SmartSolar Charge Controller

~

**Total Cost:**  
**£2,980**  
Excluding Solar Panel & B2B Charger



Victron Energy BlueSmart Charger (12V / 30A)

~£170



1 x 40A DC Circuit Protector  
1 x 30A DC Circuit Protector

~£24



1 x 15A In-line DC Circuit Breaker

~£12



Cables and terminals  
0 AWG  
3 AWG  
4 AWG

~£50



Giandel Pure Sine Wave Inverter 3000W

~£390

# Variants: 460AH vs 200AH and with and without inverter:



460AH Lithium Battery  
With Inverter (Full Setup)  
  
~£3,000

200AH Lithium Battery  
With Inverter (Full Setup)  
  
~£2,000

460AH Lithium Battery  
**without** Inverter  
  
~£2,500

200AH Lithium Battery  
**without** Inverter  
  
~£1,500

# Variants: 460AH vs 200AH and with and without inverter:



460AH Lithium Battery  
With Inverter (Full Setup)

Battery  
65%  
of cost

~£3,000

Cost  
£6.52  
Per Amp  
Hour

200AH Lithium Battery  
With Inverter (Full Setup)

Battery  
53%  
of cost

~£2,000

Cost  
£10  
Per Amp  
Hour

460AH Lithium Battery  
**without** Inverter

Battery  
78%  
of cost

~£2,500

Cost  
£5.43  
Per Amp  
Hour

200AH Lithium Battery  
**without** Inverter

Battery  
70%  
of cost

~£1,500

Cost  
£7.50  
Per Amp  
Hour

# Comparing to AGM Battery:



VARTA PROFESSIONAL DUAL PURPOSE 95Ah 850A(EN)

[Visit the VARTA Store](#)

★★★★★ 209 ratings

£219<sup>45</sup>

- Nominal Capacity: 85ah
- Regular Usable Capacity: ~45ah (50%)
- Life of 400 cycles to 50% depth of discharge
- Weight: 18kg
- Approx Size (cm): 35L x 17.5w x 19h
- Guarantee: 3 years



**12V 200AH LIFEP04**

£1,050.00

- Nominal Capacity: 200ah
- Regular Usable Capacity: ~160ah (80%)
- Life of 6,500 cycles to 50% depth of discharge
- Life of 3,500 cycles to 80% depth of discharge
- Life of 2,000 cycles to 100% depth of discharge
- Weight: 21kg
- Approx Size (cm): 49L x 17.3w x 24h
- Guarantee: 10 years



**12V 460AH LIFEP04**

£1,950.00

- Nominal Capacity: 460ah
- Regular Usable Capacity: ~370ah (80%)
- Life of 6,500 cycles to 50% depth of discharge
- Life of 3,500 cycles to 80% depth of discharge
- Life of 2,000 cycles to 100% depth of discharge
- Weight: 38kg
- Approx Size (cm): 52.5L x 27w x 22h
- Guarantee: 10 years



# Comparing to AGM Battery:



VARTA PROFESSIONAL DUAL PURPOSE 95Ah 850A(EN)

Visit the VARTA Store

★★★★★ 209 ratings

£219<sup>45</sup>

- Nominal Capacity: 85ah
- Regular Usable Capacity: 50%
- Life of 400 cycles to 50% depth of discharge
- Weight: 18kg
- Approx Size (cm): 35L x 17.5w x 19h
- Guarantee: 3 years

400 cycles x 50% 85Ah (42.5Ah) =  
17,000Ah life  
= 1.29p/ Ah



**12V 200AH LIFEP04**

£1,050.00

- Nominal Capacity: 200ah
- Life of 6,500 cycles to 50% depth of discharge
- Life of 3,500 cycles to 80% depth of discharge
- Life of 2,000 cycles to 100% depth of discharge
- Weight: 21kg
- Approx Size (cm): 49L x 17.3w x 24h
- Guarantee: 10 years

6,500 cycles x 50% 200Ah (100Ah)  
= 650,000Ah life  
= 0.162p / Ah



**12V 460AH LIFEP04**

£1,950.00

- Nominal Capacity: 460ah
- Life of 6,500 cycles to 50% depth of discharge
- Life of 3,500 cycles to 80% depth of discharge
- Life of 2,000 cycles to 100% depth of discharge
- Weight: 38kg
- Approx Size (cm): 52.5L x 27w x 22h
- Guarantee: 10 years

6,500 cycles x 50% 460Ah (230Ah)  
= 1,495,000Ah life  
= 0.13p / Ah

# Comparing to AGM Battery:



VARTA PROFESSIONAL DUAL PURPOSE 95Ah 850A(EN)

Visit the VARTA Store

★★★★★ 209 ratings

£219<sup>45</sup>

+£0

Factory Spec

- Nominal Capacity: **85ah AGM**
- Regular Usable Capacity: 50%
- Life of 400 cycles to 50% depth of discharge
- Weight: 18kg
- Approx Size (cm): 35L x 17.5w x 19h
- Guarantee: 3 years

400 cycles x 50% 85Ah (42.5Ah) =  
17,000Ah life  
= 1.29p/ Ah



**12V 200AH LIFEP04**

£1,050.00

+£1,000

Full Setup

- Nominal Capacity: **200Ah LIFEP04**
- Life of 6,500 cycles to 50% depth of discharge
- Life of 3,500 cycles to 80% depth of discharge
- Life of 2,000 cycles to 100% depth of discharge
- Weight: 21kg
- Approx Size (cm): 49L x 17.3w x 24h
- Guarantee: 10 years

6,500 cycles x 50% 200Ah (100Ah)  
= 650,000Ah life  
= 0.32p / Ah



**12V 460AH LIFEP04**

£1,950.00

+£1,000

Full Setup

- Nominal Capacity: **460Ah LIFEP04**
- Life of 6,500 cycles to 50% depth of discharge
- Life of 3,500 cycles to 80% depth of discharge
- Life of 2,000 cycles to 100% depth of discharge
- Weight: 38kg
- Approx Size (cm): 52.5L x 27w x 22h
- Guarantee: 10 years

6,500 cycles x 50% 460Ah (230Ah)  
= 1,495,000Ah life  
= 0.20p / Ah

# Comparing to AGM Battery:



VARTA PROFESSIONAL DUAL PURPOSE 95Ah 850A(EN)

Visit the VARTA Store

★★★★★ 209 ratings

£219<sup>45</sup>

+£0

Factory Spec

- Nominal Capacity: **85ah AGM**
- Regular Usable Capacity: 50%
- Life of 400 cycles to 50% depth of discharge
- Weight: 18kg
- Approx Size (cm): 35L x 17.5w x 19h
- Guarantee: 3 years

1.29p/ Ah

Most expensive over lifetime



**12V 200AH LIFEP04**

£1,050.00

+£1,000

Full Setup

- Nominal Capacity: **200Ah LIFEP04**
- Life of 6,500 cycles to 50% depth of discharge
- Life of 3,500 cycles to 80% depth of discharge
- Life of 2,000 cycles to 100% depth of discharge
- Weight: 21kg
- Approx Size (cm): 49L x 17.3w x 24h
- Guarantee: 10 years

0.32p / Ah

Over 4 x less expensive than AGM over lifetime



**12V 460AH LIFEP04**

£1,950.00

+£1,000

Full Setup

- Nominal Capacity: **460Ah LIFEP04**
- Life of 6,500 cycles to 50% depth of discharge
- Life of 3,500 cycles to 80% depth of discharge
- Life of 2,000 cycles to 100% depth of discharge
- Weight: 38kg
- Approx Size (cm): 52.5L x 27w x 22h
- Guarantee: 10 years

0.20p / Ah

Over 6 x less expensive than AGM over lifetime

# Original vs Lithium Setup Summary



## 85Ah AGM

### Pros:

- Usually comes with the van
- Replacement cost around 1/3 of Lithium equivalent.
- Doesn't require specialist kit to maintain.

### Cons:

- Easily damaged with deep discharge.
- Lifetime only 6% that of Lithium if used to 50% depth of discharge.



## 460Ah LiFePO4

### Pros:

- Lifespan more than and guarantee for 10 years
- A week + "Off-Grid" (subject to usage)
- Over 5 times the usable capacity of 85Ah AGM
- 6 times less expensive per Ah over lifetime
- Bluetooth Battery Management System (250A)
- 3 x the capacity but only twice the weight.
- Battery management system protection.

### Cons:

- Cost – more expensive initially
- Requires specialist chargers and management

MPPT 75 115 0

460S+

The first in a series on installation of a lithium battery in our campervan

**Lithium Battery Intro**  
in our Fiat Ducato based Elddis CV20 Campervan

Upgrading from PWM to Lithium comparable MPPT Solar Controller...

Allow 30-60 mins

**Upgrading Solar Controller**  
in our Fiat Ducato based Elddis CV20 Campervan

Removing the original battery and box in prep for Lithium Battery install...

Allow 30-60 mins

To

**Prepping for Lithium**  
Removing the original battery and box

Keeping the vehicle battery topped up using any excess power from the leisure battery, solar or charger.

Allow 30-60 mins

**Installing a Leisure to Vehicle battery maintainer**  
in our Fiat Ducato based Elddis CV20 Campervan

More power, lithium compatible and an app to check status and manage settings ...

Allow 30-60 mins

To

**Upgrading the charger**  
to a Lithium compatible in our campervan

Upgrading from AGM to Lithium battery to enable longer off-grid...

Allow 3-4 hours

**Fitting a Lithium Battery**  
To our Elddis CV20 Campervan

Run all the mod-cons off-grid with auto changeover!

Allow 3-4 hours

**Fitting a 3000w inverter**  
To our Elddis CV20 Campervan

Upgrading to Lithium batteries in the campervan  
LeisureBit - Camping & Tech in our CV20 Campervan - 1/7

- Introduction to upgrading to a Lithium Battery in the campervan / motorhome...  
LeisureBit - Camping & Tech in our CV20 Cam...  
16:32
- Upgrading Solar Controller to an MPPT Lithium compatible with Bluetooth...  
LeisureBit - Camping & Tech in our CV20 Cam...  
9:03
- Preparing for Lithium install - removing the old battery and box from our Elddi...  
LeisureBit - Camping & Tech in our CV20 Cam...  
8:36
- Installing Leisure to Vehicle Battery Maintainer in our Elddis CV20  
LeisureBit - Camping & Tech in our CV20 Cam...  
8:37
- Installing Lithium compatible Victron upgraded charger in our campervan  
LeisureBit - Camping & Tech in our CV20 Cam...  
17:04
- Lithium Battery Install and fitting in our Elddis CV20 Campervan  
LeisureBit - Camping & Tech in our CV20 Cam...  
17:54
- Fitting a 3kW inverter to our Elddis CV20 campervan with auto changeover  
LeisureBit - Camping & Tech in our CV20 Cam...  
22:28

