BMPRO

OWNER'S MANUAL

BATTERYPLUS35-II

BATTERYPLUS35-II-HA
BATTERYPLUS35-II-SI
BATTERYPLUS35-II-SR

TEAMBMPRO.COM

BMPRO

POWERING YOUR ADVENTURES

With over 50 years' experience in power solutions combined with manufacturing and design facilities in Melbourne, Australia, BMPRO are the leading experts in RV power management.

Inspired by the great outdoors, we have created a range of rugged, smart and reliable products to power your adventures.

Our range of battery, power and RV management and control systems gives you peace of mind when you are on the road, so that you can relax in even the most far-flung destinations, knowing you have control over your power needs.

To learn more about the BMPRO range of products, please visit our website **teambmpro.com**

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SAFETY PRECAUTIONS

Please read the Safety Precautions before installing or using the BatteryPlus35-II. Be sure to observe all precautions without fail. Failure to observe these instructions properly may result in personal damage, or personal injury which depending on the circumstances may be serious and cause loss of life.

⚠ WARNING
⚠ Ensure that there is a good ventilation from the battery area.
⚠ Correct installation is the most critical factor in ensuring the safe use of the BatteryPlus35-II. If every consideration of these instructions has been satisfied, the BatteryPlus35-II will be safe to operate.
⚠ This product is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instructions concerning the use of the appliance by a person responsible for their safety.
⚠ Children shall not play with this product. Cleaning and user maintenance should not be performed by unsupervised children.
⚠ Ensure that the product is well ventilated and that if the product has a fan, the fan is not covered or obstructed.
⚠ Metal conducts electricity. Take care not to drop or touch metal objects onto the battery terminals, which if contacts the battery terminals, could cause short circuits and may lead to serious personal injury. Take care and remove unwanted metal objects from the vicinity of battery and BatteryPlus35-II. Remove any personal metal adornment such as chain, watch or ring before handling the battery and BatteryPlus35-II.
⚠ Do not attempt to charge non-rechargeable batteries. Charging a non-rechargeable battery may result in the battery catching fire or possible explosion
⚠ Do not replace a damaged mains power cord. If the power cord is damaged, the product must be discarded.
⚠ Batteries are always electrically live and must be treated with extreme caution. They can supply high short circuit currents, even if they appear damaged or undamaged.
⚠ Before servicing a battery, disconnect the power supply from all power sources.
⚠ Only charge battery types which are supported by this charger (see “Compatible Battery Types”)
⚠ Do not allow water or other liquids to enter the power supply area.
⚠ Do not drop or vigorously shake the product as this may cause damage. Do not shock the product, its accessories or batteries as this may cause the product or battery to fail, catch fire or explode.
⚠ Stay away from magnetic equipment. Radiation may erase the information stored on this product causing it to become inoperative.
⚠ Please note that your battery can only reach top performance level only after it has been fully charged and discharged two or three times.

⚠ WARNING

CAUTION: Risk of fire.

Do not replace any vehicle fuse with a rating higher than recommended by the vehicle manufacturer.

⚠ This product is rated to draw between 20 and 30 amperes from a 12V vehicle outlet, depending on your model of BatteryPlus35-II. Ensure that the electrical system in your vehicle can supply this product without causing the vehicle fusing to open. This can be determined by making sure the fuse in the vehicle which protects the outlet is rated higher than the maximum ampere drawing current for your BatteryPlus35-II. Information on the vehicle fuse rating are typically found in the vehicle operator's manual.

If a vehicle fuse opens repeatedly, do not keep on replacing it. The cause of the overload must be found. On no account should fuses be patched up with tin foil or wire as this may cause serious damage elsewhere in the electrical circuit or cause fire.

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS - This manual contains important instructions for Models BatteryPlus35-II-SR, BatteryPlus35-II-SI, BatteryPlus35-II-HA that shall be followed during the installation and maintenance.

The nominal voltage of the BatteryPlus35-II is 12V. All models of the BatteryPlus35-II series are rated to charge lead acid batteries, and the BatteryPlus35-II-HA is also rated to charge LiFePO4 batteries.

The maximum ambient temperature rating for the BatteryPlus35-II is 50 °C (122 °F).

For 0-10A current, use 18 AWG, 90 °C (194 °F) copper wire.

For 10-20A current, use 14 AWG, 90 °C (194 °F) copper wire.

For 20-30A current, use 10 AWG, 90°C (194 °F) copper wire.

Overcurrent protection for the battery circuit is to be provided by the installer or the user, whichever is applicable.

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MANUAL PART **036164**
REV **6.0**

Designed by BMPRO, one of Australia's leading power solution experts, the BMPRO range of products are proudly Australian-Made in Melbourne, Victoria and represent a high-quality product that will provide years of service.

ABOUT THE BATTERYPLUS35-II

BMPRO's BatteryPlus35-II is a battery management system designed specifically for use in recreational vehicles. The BatteryPlus35-II operates from 100 to 240V AC mains power supply, towing vehicle auxiliary and solar panel to provide 35A of current to simultaneously power caravan loads and charge the caravan battery.

The BatteryPlus35-II is available in a range of models to suite any RV and battery management needs.

FEATURE	BP35-II-SI	BP35-II-SR	BP35-II-HA
In-built Solar	20A - PWM	30A - MPPT	30A - MPPT
Solar Connection	Direct to BatteryPlus35-II		
Lithium (LiFePO4) Charging	No	No	Yes
Maximum AC Charging Current	20A	20A	30A

Table 1: Comparison of features for the models of the BatteryPlus35-II range

OPTIONAL ADD-ONS

To get the most of your BatteryPlus35-II it may be used with the following products (sold separately) from the BMPRO range:

BC300 + CommLink

External Shunt for integration of additional accessories and high current loads such as inverters.

RVView Battery Monitor

To monitor battery parameters and charge sources.

Trek Battery Monitor

To gain greater insights into battery usage, the ability to monitor water tank levels and control water pumps.

Odyssey + OdysseyLink

To monitor battery usage and caravan features (tanks and temperature) and control caravan loads from an in-built monitor.

MiniBoost

DC-to-DC charge-booster for RV applications.

COMPATIBLE BATTERY TYPES

The BatteryPlus35-II is rated to charge battery banks of up to 600Ah in capacity and of the following battery types:

	BATTERY	SI	SR	HA*
Lead Acid	Valve-Regulated (VRLA)	Yes	Yes	Yes
	Absorbed Glass Mat (AGM)	Yes	Yes	Yes
	Gel	Yes	Yes	Yes
Lithium	LiFePO4	No	No	Yes

Table 2: Batteries compatible for use with the BatteryPlus35-II

* By default, the BP35-II-HA is configured to charge lead acid batteries.

⚠ WARNING

The BP35-II-HA is designed for use with Lead Acid and LiFePO4 Lithium batteries only. Do not connect other types of Lithium batteries to the BP35-II-HA. BMPRO Invicta batteries are recommended.

DESCRIPTION OF PARTS

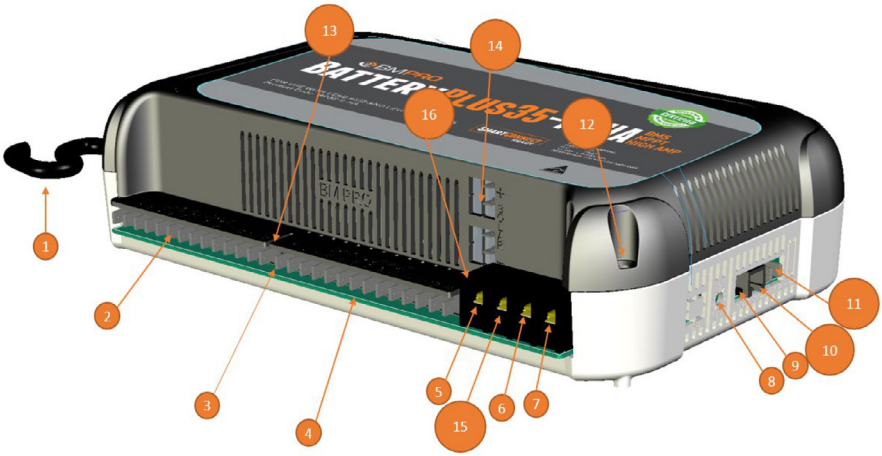


Figure 1: BatteryPlus35-II. Compatible for all models

1. MAINS CABLE

The BatteryPlus35-II is pre-cabled with a permanent mains power supply cord for use with 240V or 110V input power.

⚠ WARNING

Do not replace a damaged power supply cord. If the power cord is damaged, the BatteryPlus35-II must be discarded. Ensure that the AC mains source always has an earth terminal.

2. LOAD TERMINAL BLOCK – COMMON NEGATIVE CONNECTION

Negative wire connection return point for the caravan's 12V loads.

3. LOAD OUTPUTS – 15A X 2 POSITIVE CONNECTIONS

Used for connecting the positive wire of the 12V loads, outputs 1 & 2

4. LOAD OUTPUTS – 10A X 12 POSITVE CONNECTIONS

Used for connecting the positive wire of the 12V loads, outputs 3 – 14

Terminals are labelled according to their designated load output

TERMINAL OUTPUTS		LOAD RATING
1	Tablet / Spare	15A
2	Spare	15A
3-9	Spare	10A
10	Light 1	10A
11	Light 2	10A
12	Light 3	10A
13	Pump 1	10A
14	Pump 2	10A

Table 3: Designated terminal-load outputs

5. AUX+

   Connection point for external DC input positive.

6. BATT+

   Connection point for battery positive terminal. Attach fuse to Batt+ wiring.

7. BATT-

   Connection point for battery negative terminal.

8. NOT USED

9. RESET (MASTER RESET BUTTON)

   Press the Master Reset Button if any part of the system is unresponsive or not operating correctly during or after installation

10. CAN BUS COMMUNICATION CONNECTOR

    To connect to and power BMPRO accessories (BC300 + CommLink External Shunt or OdysseyLink) or monitors (RVView or Trek).

11. REMOTE SWITCH TERMINAL BLOCK (RSW)

    Terminal block for connecting an optional remote switch. This switch is used to disconnect the loads from all power.

12. MOUNTING HOLE (X4)

13. LOAD OUTPUT STATUS INDICATORS

LED COLOUR	LOAD OPERATIONAL STATUS
GREEN	Loads operating normally
FLASHING RED	Fault with load
OFF	Load is off

Table 4: LED Status Indicators

14. SOLAR PANEL CONNECTION

Connection used for solar panel input.

15. +BRK BATTERY OUTPUT (40A MATCH RATED)

⚠ WARNING

Loads connected to +BRK output will not turn off even during ECO mode or Storage mode. To maintain good health of the battery during low voltage, manually turn these loads off. Exceeding 40A total load current may turn off some of the load outputs 1-14. All loads connected on this output must be individually fused.

This output is an uncontrolled 15th output with a maximum current rating of 40A. This is specifically designed for loads which do not need to be isolated or have a current rating higher than the inbuilt circuit protection of the individual outputs and have a current rating less than 40A. This may include, but not be limited to:

- BMPRO SwayControl
- BMPRO Trailsafe (+)
- Heaters
- Stereo memory

⚠ WARNING

If braking systems are already connected to the +BRK output, non-braking loads must use a separate output.

16. SYSTEM STATUS INDICATOR

Indicates the operational status of the BatteryPlus35-II.

INSTALLATION INSTRUCTIONS

PERSONNEL

Installation is to be carried out only by suitably qualified personnel.

EARTHING

As the BatteryPlus35-II is positive sensing for current monitoring, this allows for chassis earthing of both the battery and the negative of DC 12V appliances.

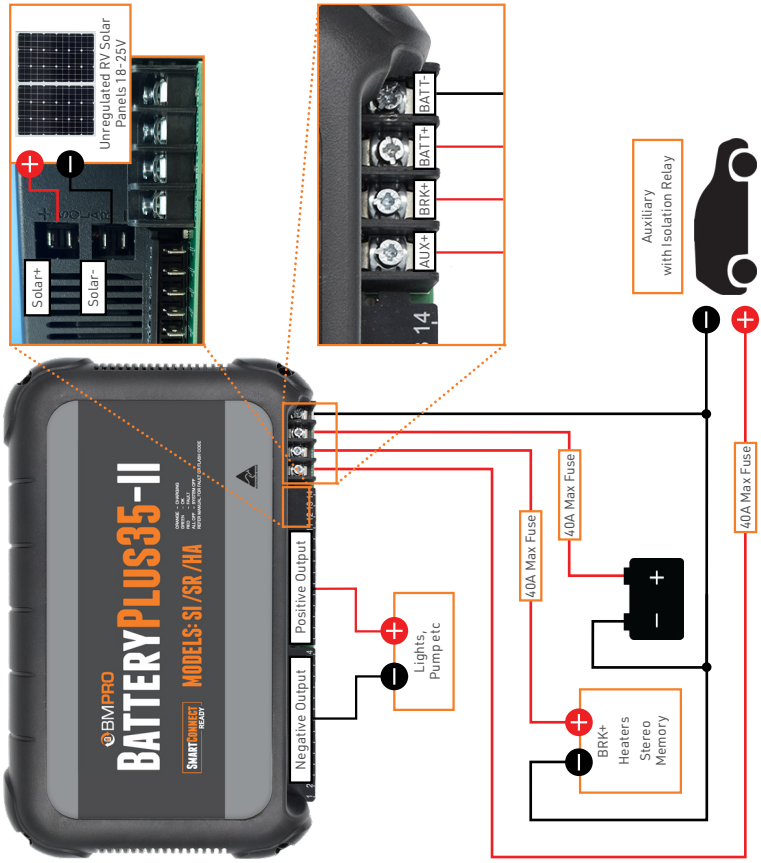
Note: All DC 12V positive cables must be wired to outputs 1-14 or the 40A battery output connection.

Loads greater than 15A

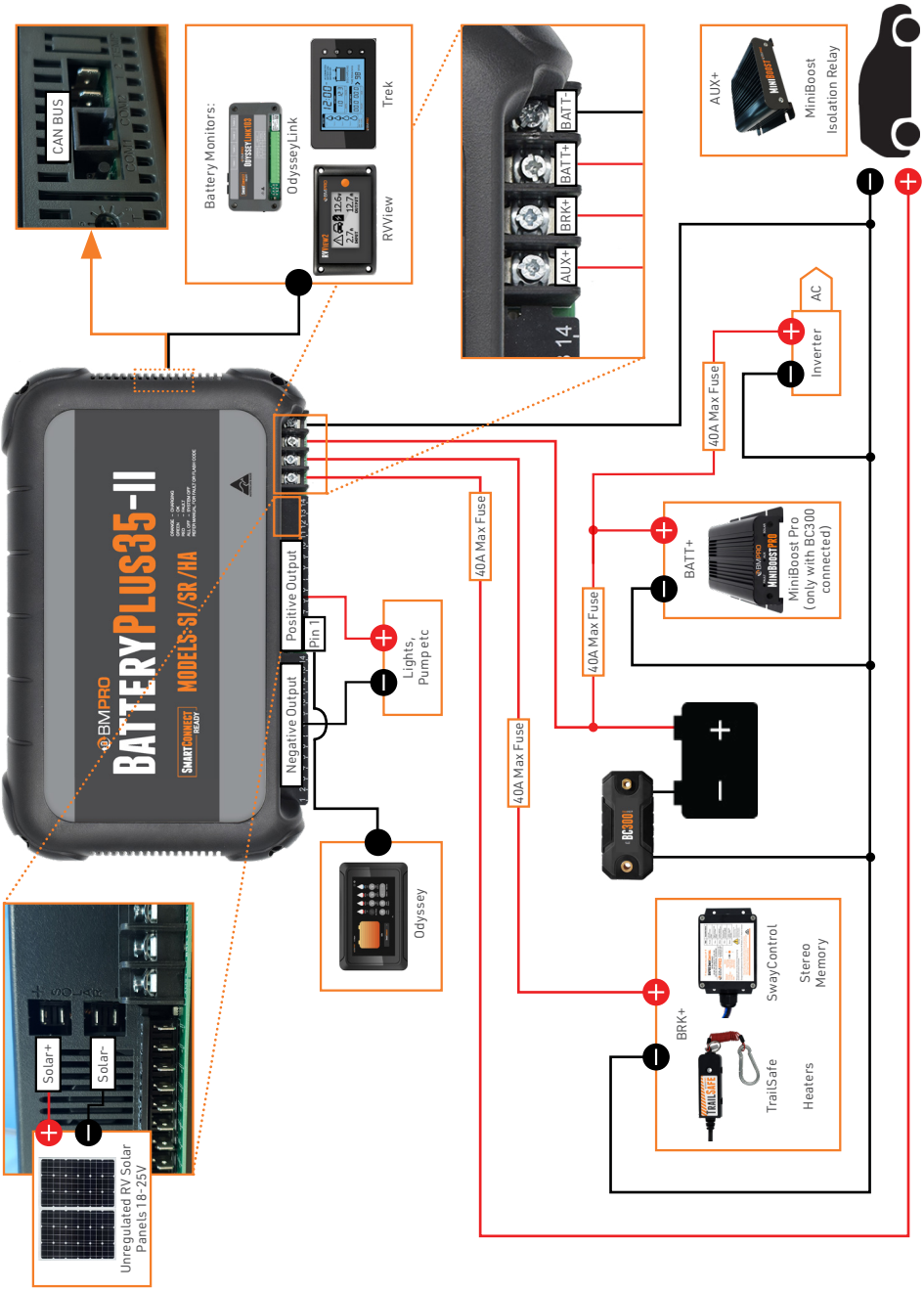
For DC 12V appliances that may draw greater than 15A, such as inverters, both positive and negative must be wired directly to the new battery negative on the BC300 to ensure the current is seen by the BatteryPlus35-II and the correct information displayed, such as the State of Charge and Time Remaining.

Refer to our website for more information on this product: **https://teambmpro.com/products/bc300-commlink-external-shunt/**

SIMPLE WIRING DIAGRAM



WIRING DIAGRAM WITH OPTIONS



VENTILATION, ORIENTATION AND THERMAL CONSIDERATIONS

The preferred orientation is with the load connection at the bottom and located so that there is a minimum of 80mm of free air space from all vented sides of the BatteryPlus35-II. This allows for the lowest operating temperature of the internal electronics and the highest reliability of the product.

The final enclosure must provide adequate ventilation to the outside world (or larger internal cavity) to prevent excessive heating of the air within the enclosure.

At normal room temperature (25°C), the unit is rated to provide full power in both vertical and horizontal orientations. At elevated temperatures of up to 50°C, the output current is de-rated to 32A.

⚠ WARNING

The enclosure air temperature can easily exceed 50°C if adequate ventilation is not provided.

The BatteryPlus35-II has over-temperature protection and will shut down if its internal temperature rises above the safe level. The BatteryPlus35-II will automatically restart once it has cooled to an acceptable level.

⚠ WARNING

Do not install the BatteryPlus35-II in a compartment where flammable material is stored, such as petrol or LPG.

MOUNTING

The BatteryPlus35-II should be securely mounted to a suitably rigid surface, using the four pre-drilled mounting holes.

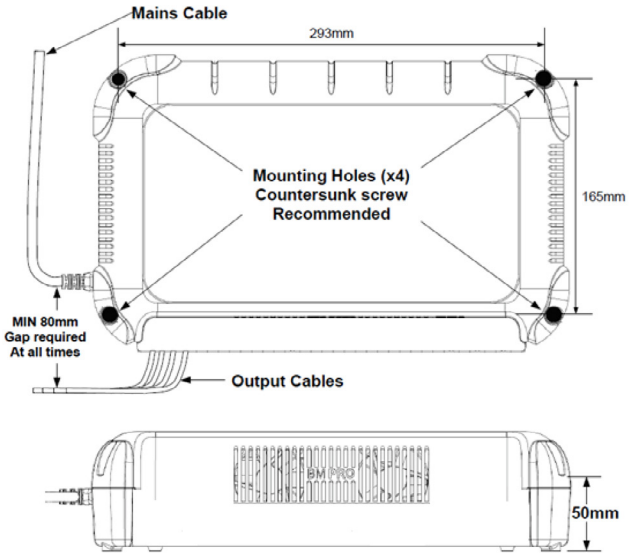


Figure 2: Mounting Diagram

MAINS CABLE

⚠ WARNING

If the supply cord is damaged, it must not be replaced and the appliance should be scrapped.

The BatteryPlus35-II is pre-cabled and fitted with a mains plug. Ensure that the connections to the mains supply are in accordance with the national wiring rules, and that the earth connection is installed. For more information, refer to the **Mounting** section.

The mains cable must be at least 80mm away from the output cables. For information on wiring, refer to the **Wiring Diagram** section.

The plug must be accessible during installation. If this is not possible, an accessible mains disconnection switch must be incorporated in the mains wiring where the plug is connected.

Wire Size

DC cables must be sized to carry the maximum full load current and to not exceed the system volt drop requirements. The following cable sizes are recommended. When running wires, if they pass through panels or wall, ensure the wires are protected from damage by sharp edges. The use of cable glands is recommended.

CURRENT	MINIMUM WIRE SIZE
0-10A	1.0mm² or 18 AWG
10-20A	3.0mm² or 14 AWG
20-30A	5.5 mm² or 10 AWG

Table 5: Wire Size Recommendations

The wiring method used with the installation shall be in accordance with National Electrical Code ANSI/NFPA 70.

LOAD, BATTERY AND EXTERNAL DC INPUT CONNECTIONS

Up to 14 loads may be connected. Loads are attached using female spade Quick Connects (QC). See *Figure 4: Quick Connect Dimensions*.

All load negative returns must be connected directly to the BatteryPlus35-II negative terminals only.

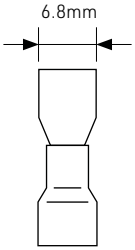


Figure 3: Quick Connect Dimensions

MAIN CHARGE CONNECTION

The following inputs / outputs require fork type connections:

Aux+ / Batt+ / Batt- / BRK+

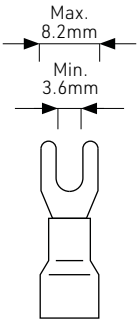


Figure 4: Fork Terminal Dimensions

CARAVAN BATTERY CONNECTION

⚠ WARNING

A fuse must be installed in the positive connection of the battery. This fuse MUST be as close as possible to the battery. This fuse protects against short circuits and reverse battery conditions. A fuse rating no greater than 40A must be used.

REPLACING BATTERIES

⚠ WARNING

Before using a battery other than that which was installed at the caravan dealership, consult with the battery manufacturer for a detailed description of the installation, uses and maintenance of the battery. Verify that the type and capacity of the battery or batteries used are compatible for use with the BatteryPlus35-II.

After fitting a new battery to the BatteryPlus35-II, make sure that it is configured in your battery monitor.

Correctly configuring the battery capacity and profile will ensure that the BatteryPlus35-II will select the best charging parameters for the caravan battery in use, and the software accurately estimates battery usage.

⚠ WARNING

Do not install a battery in the same compartment where flammable material is stored, such as petrol.

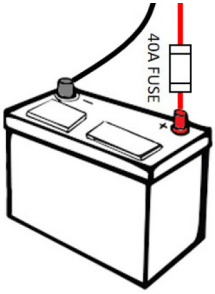


Figure 5: Wiring the battery to the BatteryPlus35-II.

To protect against short-circuits and reversed battery connections, install a 40A fuse as close as possible to the battery's positive terminal.

⚠ WARNING

Sparks have the potential to cause an explosion if combustible gases are present. The following procedures are designed to minimise the risk of spark generation while connecting or disconnecting the battery. The positive terminal of the battery **MUST NOT be connected to the chassis**.

Disconnecting a Battery from the BatteryPlus35-II

1. Power off all loads connected to the BatteryPlus35-II, the easiest way is with the switch connected to the BatteryPlus35-II's RSW input.
2. Turn off and remove all power sources (auxiliary/mains/solar) to the BatteryPlus35-II.
3. Disconnect the battery's negative (black) terminal from the BatteryPlus35-II Batt- connection point.
4. Disconnect the battery's positive (red) terminal from the BatteryPlus35-II Batt+ connection point

Connecting a Battery to the BatteryPlus35-II

1. Power off all loads connected to the BatteryPlus35-II. The easiest way is with the switch connected to the BatteryPlus35-II's RSW input.
2. Turn off and remove all power sources (auxiliary/mains/solar) to the BatteryPlus35-II.
3. Connect the battery's positive (red) terminal to the BatteryPlus35-II Batt+ connection point.
4. Connect the battery's negative (black) terminal to the BatteryPlus35-II Batt- connection point.

Connecting Multiple Batteries

Before connecting multiple batteries in parallel to the BatteryPlus35-II, check that all batteries are:

- the same manufacturer
- the same model
- the same capacity
- the same age, and
- fully charged.

The recommended wiring for connecting multiple batteries in parallel to the BatteryPlus35-II is below. Depending on system requirements, a qualified auto-electrician may wire the batteries differently.

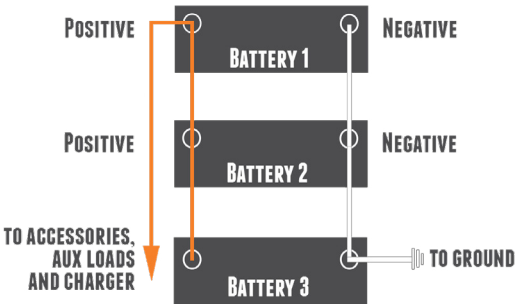


Figure 6: Recommended wiring to connect multiple batteries in parallel

USING YOUR BATTERYPLUS35-II

INPUT POWER SOURCES

The BatteryPlus35-II can charge from auxiliary, mains and solar input sources. When multiple inputs are available to the BatteryPlus35-II, the BatteryPlus35-II uses power as specified in the tables below to provide the current to simultaneously power caravan loads and charge the caravan battery.

INPUT SOURCE TO BATTERYPLUS35-II	POWER SOURCE
AUX + Mains	Mains
AUX + Solar	AUX/Solar Blending
AUX + Mains + Solar	Mains
Mains + Solar	Mains

Table 6: Input Power Sources to the BP35-II-SI, BP35-II-HA and BP35-II-SR

Auxiliary

⚠ WARNING

To prevent your car battery from discharging when the vehicle's ignition is off, please ensure the auxiliary is wired so that it is automatically disconnected in this condition.

The auxiliary input is designed for use with 12V DC power sources. The voltage of the DC power source connected to the auxiliary input must not exceed 14.8V.

Fuse protection is required at the auxiliary's positive input and to protect the wiring from the source. The rating on this protective fuse must not exceed 40A.

Mains

The BatteryPlus35-II mains power cord can accept power from either a 100 to 240V 50/60Hz voltage outlet.

Solar Input on the BatteryPlus35-II-SI

The BP35-II-SI features an in-built PWM charger. This enables solar panels to be connected directly to the BatteryPlus35-II-SI without the need for an external regulator.

The PWM charger supports the use of standard 12V solar panels up to a total of 20A / 300W 450W.

⚠ WARNING

Ensure the solar panel Open Circuit Voltage (Voc) does not exceed 26V and Short Circuit Current (Isc) rating does not exceed 20A.

Solar Input on the BP35-II-HA and the BP35-II-SR

The BP35-II-HA and the BP35-II-SR both feature an in-built MPPT charger. This enables solar panels to be connected directly to the BP35-II-HA or BP35-II-SR without the need for an external regulator.

The MPPT charger supports the use of standard 12V solar panels up to a total of 30A.

⚠ WARNING

Ensure the solar panel Open Circuit Voltage (Voc) does not exceed 26V.

BATTERY CHARGING AND MANAGEMENT

⚠ WARNING

Do not attempt to charge non-rechargeable batteries. Charging a non-rechargeable battery may result in the battery catching fire or a possible explosion.

The BatteryPlus35-II can deliver up to 35A to simultaneously power loads and charge the caravan battery, with a maximum charging current of 20A for the BP35-II-SI and BP35-II-SR and 30A for the BP35-II-HA with the difference being reserved to supply 12V loads.

The maximum charging current will be reduced if the loads present are drawing significant current and as the battery approaches full charge. To ensure that the caravan battery is charged by the maximum charging current, switch off non-essential loads.

Auxiliary Charging

When charging from auxiliary, the BatteryPlus35-II monitors the battery voltage level and charges as needed. Auxiliary charging is commenced only when the auxiliary voltage exceeds the battery voltage by at least 0.5V and is greater than 12.6V.

Mains Charging

When charging the battery from mains, the BatteryPlus35-II applies a multi-stage charging algorithm. Further details can be found in the **Appendices**.

Solar Charging with the BatteryPlus35-II-SI

When charging the battery from solar, the BP35-II-SI applies a multi-stage charging algorithm.

The BP35-II-SI will use solar as a charging source if the voltage generated by the solar panel is greater than the battery voltage.

Solar Charging with the BatteryPlus35-II-HA and BatteryPlus35-II-SR

When charging the battery from solar, the BP35-II-HA and BP35-II-SR applies a multi-stage charging algorithm.

The BP35-II-HA and BP35-II-SR will use solar as a charging source if the voltage generated by the solar panel is greater than 17.5V for at least two minutes.

Battery Health Preservation

The BatteryPlus35-II preserves battery health by preventing the battery from excessive discharge. The BatteryPlus35-II will start a two-stage shutdown or Low Voltage Disconnect (LVD), powering down the BatteryPlus35-II outputs. This is to conserve remaining battery capacity until the battery can be charged.

LVD MODE	LEAD ACID	LIFEPO4 (HA ONLY)
ECO	10.5V	12.0V
Storage	9.8V	11.5V
Recovery	12.8V	13.8V

Table 7: LVD Mode voltage thresholds

The BatteryPlus35-II will enter the two stages of LVD, ECO Mode and Storage Mode, when the caravan's battery voltage falls below the LVD thresholds.

Note: BRK+ Battery Output (40A rated) is not controlled by the LVD mode.

ECO MODE

In ECO Mode, the BatteryPlus35-II will continue to provide power to your battery monitor, however power to the load terminal block will be turned off (except for terminal 1).

To exit ECO Mode, start battery charging. The BatteryPlus35-II will exit ECO Mode when the battery charges to the Recovery voltage. Upon exiting ECO Mode, the BatteryPlus35-II will automatically return to its previous state of operation.

When in ECO Mode you may temporarily turn on caravan loads for a short time by cycling the switch connected the BatteryPlus35-II's RSW input or the battery button on the Trek, Odyssey or Mobile Apps. This feature allows you to retract slide-outs or electric steps.

STORAGE MODE

In Storage Mode, power to all loads and the accessories including battery monitors and remote controls will be turned off.

To exit Storage Mode, start battery charging. The BatteryPlus35-II will exit Storage Mode when the battery charges to the Recovery voltage.

When in Storage Mode you may temporarily turn on caravan loads for a short time by cycling the switch connected the BatteryPlus35-II's RSW input.

Heavily Discharged Batteries (Lead Acid)

The BatteryPlus35-II will not charge heavily discharged lead acid batteries.

In normal use, and with the BatteryPlus35-II battery health preservation, batteries should never become heavily discharged.

If your battery is heavily discharged, disconnect if from the BatteryPlus35-II and charge with a stand-alone charger. Reconnect the battery once the battery voltage has recovered to normal levels.

Heavily Discharged Batteries (LiFePO4 HA Model only)

The BatteryPlus35-II-HA can recover and charge a heavily discharged LiFePO4 battery if it is connected to a mains or AUX input. The internal Battery Management System (BMS) of a LiFePO4 battery will turn off the battery voltage if it detects that the battery is heavily discharged. The BatteryPlus35-II-HA will provide the voltage to restart the LiFePO4 battery's BMS and then commence charging of the LiFePO4 battery.

⚠ WARNING

The BatteryPlus35-II-HA cannot recover and charge a heavily discharged LiFePO4 battery if it is only connected to a solar input. It must be connected to a mains or AUX input to recover and charge a heavily discharged LiFePO4 battery.

USING THE BATTERYPLUS35-II AS A POWER SUPPLY (BATTERYLESS OPERATION)

The BatteryPlus35-II will act as a power supply if the following conditions are met:

1. A battery is not connected to the BatteryPlus35-II, and
2. The BatteryPlus35-II is configured to charge Lead Acid batteries, and
3. The BatteryPlus35-II is connected and powered by a mains power source, or
4. The BatteryPlus35-II is connected and powered by an AUX input.

Power Supply mode allows you to control and power your caravan's loads directly from mains or AUX without the need to connect the caravan battery. When powered from the mains, the BatteryPlus35-II provides an output voltage of 12.8V.

When powered from an AUX input, the output voltage will vary depending on the AUX input voltage. The outputs may turn-off if input voltage is less than 12.6V (right at the auxiliary input connector of the BatteryPlus35-II).

This mode of operation is unavailable with a solar power source.

FAULT PROTECTION

Electronic Load Fuse Protection

Each load output is protected by an internal electronic fuse. Electronic fuses are auto-recoverable and eliminate the need for the user to replace a blown fuse.

The electronic fuse will act if the BatteryPlus35-II detects a current greater than the current rating of the terminal. The Load Output Status Indicator will be flashing red and the System Status Indicator will be solid red.

The BatteryPlus35-II will automatically reconnect a faulty output up to 3 times within a 45-second window. If the fault is still present after the 3rd attempt, the output will be permanently disabled. Normal operation may resume once the fault has been rectified and the system is reset.

The system can be reset by pressing the reset button, or by disconnecting all sources (AC mains, auxiliary, solar and battery).

Note: Activating the remote switch (RSW) has the same effect as disconnecting the battery.

Over-Temperature, Over-Voltage and Short Circuit Overload Protection

The BatteryPlus35-II provides automatic protection for over-temperature, over-voltage and short circuit overload situations.

If any of these situations are detected, the BatteryPlus35-II will shut down and automatically attempt a restart every 30 seconds until the fault is removed.

SERVICING, MAINTENANCE AND STORAGE

SERVICING

This BatteryPlus35-II contains hazardous voltages and energy hazards that may cause death or injury. Only qualified service personnel may service the BatteryPlus35-II. Do not attempt to service the BatteryPlus35-II yourself, OR dismantle, modify or repair the BatteryPlys35-II yourself; this will void your warranty.

If your BatteryPlus35-II requires servicing other than what is stated in this Owner's Manual, please consult your BMPRO dealer.

MAINTENANCE

Use a dry or moist soft cloth to lightly remove dust or dirt from the BatteryPlus35-II. Do not use alcohol, thinners, benzene or any other chemical cleaner as these products may degrade the housing surface. Do not allow any liquids to enter the housing.

Be sure to turn off all power sources to the BatteryPlus35-II and disconnect the battery before cleaning.

STORAGE

Once your adventure is over be sure to charge the caravan's battery and power off all loads. Use the switch connected to the BatteryPlus35-II RSW input to enter Storage Mode and power off all loads.

When not in use, it is recommended that you regularly recharge the caravan's battery, ideally monthly, or every three to six months. Regular recharge prevents the battery from becoming heavily discharged - a condition which can significantly shorten the battery's lifespan.

If you have a solar panel fitted, a convenient way to maintain your battery is to park your caravan in the sun and put the BatteryPlus35-II into Storage Mode.

FAQS AND TROUBLESHOOTING

Need more help troubleshooting your BatteryPlus35-II?

Contact our customer service team online at **teambmpro.com/technical-support** or check out our how-to videos on our YouTube channel at **youtube.com/c/bmproau**

BATTERY

I've fitted a battery to the BatteryPlus35-II, but it's not detected by my BMPRO battery monitor?

Check the following:

1. The battery connections are tight and not loose or corroded.
2. The battery polarity, red lead-positive, black lead-negative.
3. The dealership fitted in-line fuse with the caravan battery is fitted and not blown. The correct value is 40A.

CARAVAN LOADS

I think one of my loads is not receiving power?

The load may be faulty, activating the protective electronic fuse and turning the load off. If this is the case, the Load Status Indicator LED will be flashing red and the System Status Indicator will be solid red.

Should you encounter any faulty loads, please contact your caravan dealership.

None of my loads appear to be powered but I can still use my battery monitor?

All loads will power down, but the battery monitor will still be in use if the BatteryPlus35-II was put into ECO Mode. The BatteryPlus35-II will be put into ECO Mode if:

1. The user pressed the Battery icon on their battery monitor.

   Check to see that the Battery icon on you monitor has been pressed on, which turns power off to the caravan loads.

2. The BatteryPlus35-II has entered ECO Mode and to conserve remaining battery charge will disable power to caravan loads.

   Connect the BatteryPlus35-II to a power source and begin battery charging.

None of my loads appear to be powered and the screen on my battery monitor has turned off?

All loads, including any battery monitor in use with the BatteryPlus35-II will power down if the BatteryPlus35-II was put into Storage Mode. The BatteryPlus35-II will be put into Storage Mode if:

1. The switch connected to the BatteryPlus35-II RSW input has been activated. This turns off power to all caravan loads and accessories connected to the BatteryPlus35-II CAN bus such as your battery monitor.
   Check that the switch has not been activated.

2. The BatteryPlus35-II has entered Storage Mode and to conserve remaining battery voltage will disable power to all caravan loads and accessories connected to the BatteryPlus35-II CAN bus.
   Connect the BatteryPlus35-II to a power source and begin battery charging.

SOLAR

My solar output appears lower than expected?

If the battery is close to fully charged, the BatteryPlus35-II will periodically turn off solar to protect the batteries from overcharging. As a result, you may see less output on your solar display.

The following tips will ensure you are getting the most of your solar set-up:

1. Make sure your solar panels are clean.
   For optimal performance of your solar panels, regularly clean them (when cool) with warm, soapy water.

2. Consider the location of your caravan.
   A shadow (for example from trees, buildings and even other accessories on the roof of your caravan) across any part of the solar panel can reduce the panel performance by up to 80%.

3. The time of day, month and year is important
   In some parts of the year (especially in southern parts of Australia) the sun will never be directly overhead, so your solar output will be reduced - sometimes by up to 50%.

APPENDICES

BATTERYPLUS35-II OPERATIONAL STATUS INDICATOR

Table 6 displays the operational status of the BatteryPlus35-II, as shown by the coloured flash of the LED Status Indicator on the BatteryPlus35-II.

LED FLASH KEY

- Solid Colour
- Flash Colour
- LED Off

Table 8: BatteryPlus35-II Operational Status and LED Flash Codes

●	AC Charging
1×	Low Battery Voltage LFP Mode No Battery
2×	**SI** Solar Charging **SR & HA** Solar or Aux/Solar Charging
3×	Aux Charging **SI** Solar/Aux Charging
●	Battery OK, AC available
1×	Battery OK, no sources available
2×	**SI** Battery OK, solar available **SR & HA** Battery OK, solar or Aux/Solar available
3×	Battery OK, Aux available
●	Fault on One or More Output Loads
1×	High Temperature Fault
2×	Battery Fault
3×	Solar Fault
4×	Other Fault
⊠	Power Off

BATTERY CHARGING MANAGEMENT ALGORITHM

The following describes the Battery Charging Management Algorithm used by the BatteryPlus35-II when charging the caravan battery from a mains power source and by the BP35-II-HA and BP35-II-SR with solar charging. The BatteryPlus35-II will operate as described when the caravan loads are connected directly to the BatteryPlus35-II and not the caravan battery.

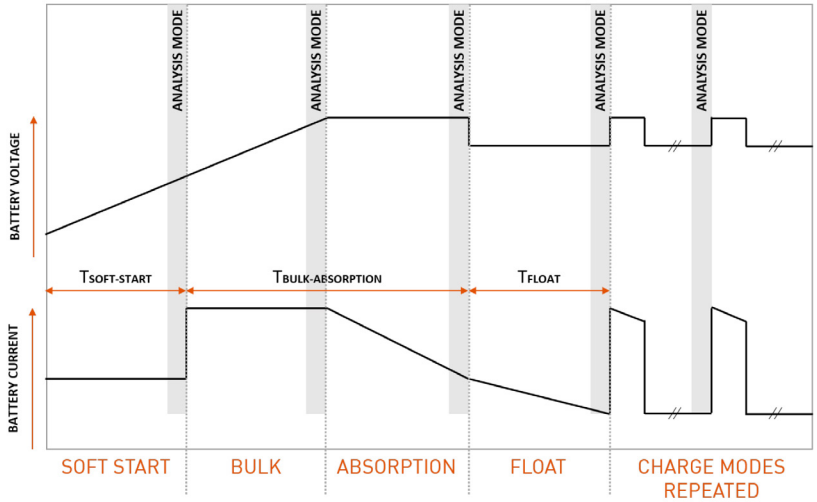


Figure 7: BatteryPlus35-II Battery Charging Management Algorithm

BATTERY CAPACITY	SOFT START	BULK- ABSORPTION	FLOAT
≤ 100Ah	6 Hours	5 Hours	6 Hours
150Ah	6 Hours	7.5 Hours	6 Hours
200Ah	6 Hours	10 Hours	6 Hours
250Ah	6 Hours	12.5 Hours	6 Hours
≥ 300Ah	6 Hours	15 Hours	6 Hours

Table 9: Timeout for each charging mode, based on battery capacity

	VOLTAGE LIMIT (V)		CURRENT LIMIT (A)		
CHARGE MODE	LEAD ACID	LIFEPO4	SI	SR	HA
Soft Start	12.3	12.3	10	10	10
Bulk	14.4	14.6	20	20	30
Absorption	14.4	14.6	20	20	30
Float	13.6	13.6	10	10	10

Table 10: Battery charging management algorithm voltages and currents

The BatteryPlus35-II intelligently controlled charging algorithm, automatically sets charging parameters so that the caravan battery will maintain the best state of health. The charging modes include:

Soft Start Mode

Charging current is maintained at 10A until the battery voltage reaches 12.3V or soft start timeout occurs.

Bulk Mode

Charging current is maintained at the Bulk current limit, until the battery reaches the Bulk voltage, after which charging proceeds to Absorption Mode.

Absorption Mode

Battery is charged at Absorption voltage until the current drops below 2A or Bulk-Absorption timeout occurs.

Float

Charging current is limited to 10A to keep the battery level topped up. Charging will remain in Float for 6 hours. After Float timeout, the BatteryPlus35-II will enter back into Bulk-Absorption modes.

SPECIFICATIONS

	BP35-II-SI	BP35-II-SR	BP35-II-HA
Input Voltage Range	110-240V AC ± 10%, 50-60Hz (AU) 100 - 120V AC, 60Hz (US)		
Input Surge	< 40A (cold start)		
Output Current	35A (Load + Battery Current)		
Factory Set Voltage	13.65V (Float Voltage)		
Output Ripple Voltage	<150mV		
Battery Current Limit	max. 20A	max. 20A	max. 30A
Low Voltage Disconnect (Lead Acid)	10.5V ± 0.2V		
Battery Connect after LVD (Lead Acid)	12.8V ± 0.2V		
Low Voltage Disconnect (LiFePO4)	12.0V ± 0.2V		
Battery Connect after LVD (LiFePO4)	13.8V ± 0.2V		
Battery Drain	<15mA (when in Storage Mode)		

	BP35-II-SI	BP35-II-SR	BP35-II-HA
AC/DC Efficiency	>83%		
Cooling Fan	Thermally Controlled		
Solar Output Current	max. 20A	30A (nominal)	
Solar Start Voltage	>VBatt	17.5V	
Solar Input Voltage (after start-up)	>VBatt	15-25V	
Ambient Temperature	0-50 °C		
Communication	Communication bus available		
Dimensions	327mm x 207mm x 82mm		
Weight	2kg		
Standards	Safety: AS/NZS 60335.2.29, UL 458, UL 1741 EMC: AS/NZS CISPR 32, FCC Part 15 Approvals: RCM, UL, FCC		

COMPLIANCE

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encourage to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna,
- Increase the separation between the equipment and receiver,
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected,
- Consult the dealer or an experienced radio/TV technician for help.

Warning: Any changes or modifications not expressly approved by BMPRO could void the user's authority to operate this equipment.

BatteryPlus35-II-HA Only

The converter/inverter is intended to recharge batteries. The battery that is connected to this product is only suitable if it complies with the given battery standard for that battery type and is provided with a battery management system that will monitor and control the electrical and thermal health of the battery during charging. When installing this converter/inverter, the battery is to be verified as in compliance with the applicable battery standard.

WARRANTY TERMS AND CONDITIONS

Registering your BMPRO product is an important step to ensure that you receive all the benefits you are entitled to. Please visit **teambmpro.com** to complete the online registration form for your new product today.

1. Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.
2. BMPRO warrants products against defects for a period of one year, commencing from the original date of purchase. Proof of purchase is required before you can make a claim under this warranty.

HOW TO PROTECT YOUR RIGHTS UNDER THIS WARRANTY:

3. The BatteryPlus35-II is designed to be installed by a suitably qualified installer. You or your installer should carefully inspect the products before installation for any visible manufacturing defects. We accept no responsibility in addition to our consumer guarantee obligations where a product has been installed incorrectly.
4. This warranty does not extend to product failures or defects caused by, or associated with, but not limited to: failure to install or maintain correctly, unsuitable physical or operating environment, accident, acts of God, hazard, misuse, unauthorised repair, modification or alteration, natural disaster, corrosive environment, insect or vermin infestation and failure to comply with any additional instructions supplied with the product.
5. BMPRO may seek reimbursement of any costs incurred by BMPRO when a product is found to be in proper working order or damaged as a result of any of the warranty exclusions mentioned in point
6. To enquire or make a claim under this warranty, please follow these steps:

   a) Prior to returning a BMPRO product, please email **customerservice@teambmpro.com** to obtain a Return Material Authorisation (RMA) number

   b) Package and send the product to:

   BMPRO Warranty Department
   19 Henderson Road
   Knoxfield, VIC 3180

   Please mark RMA details on the outside of the packaging

   c) Please ensure the package also includes: a copy of the proof of purchase, a detailed description of the fault and your contact details including phone number and return address.
7. BMPRO will not be liable for any costs, charges or expenses incurred in the process of returning a product in order to initiate a warranty claim.

POWERING YOUR ADVENTURES.

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