

# J35A/B

by  **BM**PRO

## OWNER'S MANUAL





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**Disclaimer** SETEC accepts no liability for any loss or damage, which may occur as a result of improper or unsafe use of its products.  
Warranty is only valid if the unit has not been modified or misused by the customer.

# SAFETY PRECAUTIONS

Please read the Safety Precautions carefully before using the J35 power supply. Be sure to observe all precautions without fail.



## WARNING

Failure to follow these instructions properly may result in personal injury or loss of life.

Ensure that there is always good ventilation for the battery and the J35 power supply.

This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have given supervision or instruction concerning the use of appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance should not be made by children without supervision.

Batteries are electrically alive at all times and must be treated with extreme caution. They can supply high short circuit currents, even if they appear damaged.

Dropping or touching of metal objects onto the battery cell may cause short circuits.

Remove any personal metal adornment such as a chain, watch or ring, which could cause short circuits and personal injury.



## CAUTION

Failure to observe these instructions properly may result in property damage or personal injury, which may be serious depending on the circumstances.

Apart from correct installation, correct usage is a critical factor in ensuring the safe operation of the power supply. If every consideration of these instructions has been satisfied the power supply will be safe to operate.

Ensure that cable connections to batteries are always in the correct polarity and are protected against accidental short circuit.

Ensure that the shrouding supplied with the battery is always fitted to the terminals.

Before servicing a battery, consult caravan dealer or a qualified personnel.

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



## CAUTION

Failure to observe these instructions properly may result in property damage or personal injury, which may be serious depending on the circumstances.

Do not allow water or other liquids to enter the installation area.

## ACCESSORIES

Accessories provided with this product are:

- 1.Owner's Manual

## ABOUT THE J35 SERIES POWER SUPPLY

J35 is a smart charger with a distribution system which has been designed for use in recreational vehicles. The unit operates from 240 VAC mains and provides an isolated DC output. There are three variants under the J35 series and below are the details.

- 1.J35-A: 7 x 12VDC outputs, 20A maximum output current.
- 2.J35-B: 14 x 12VDC outputs, 35A maximum output current.
- 3.J35-C: (high-end variant, excluded in this Manual)

Though maximum output current is lower for the J35-A, charging current is the same for all variants and is limited to 15A. All the necessary protection and operating features for the load and battery (i.e. thermal protection, over current, over voltage, multi-stage charging, low-voltage disconnect, etc.) are provided. J35 uses electronic fuses to protect the loads. They are internally located and are not serviceable.

Also available is a DC input which may be sourced from the 12V auxiliary system of the towing car. This input is an alternate of the AC mains to enable battery charging and powering of the load.

Refer to item Description of Parts for more details.

# DESCRIPTION OF PARTS

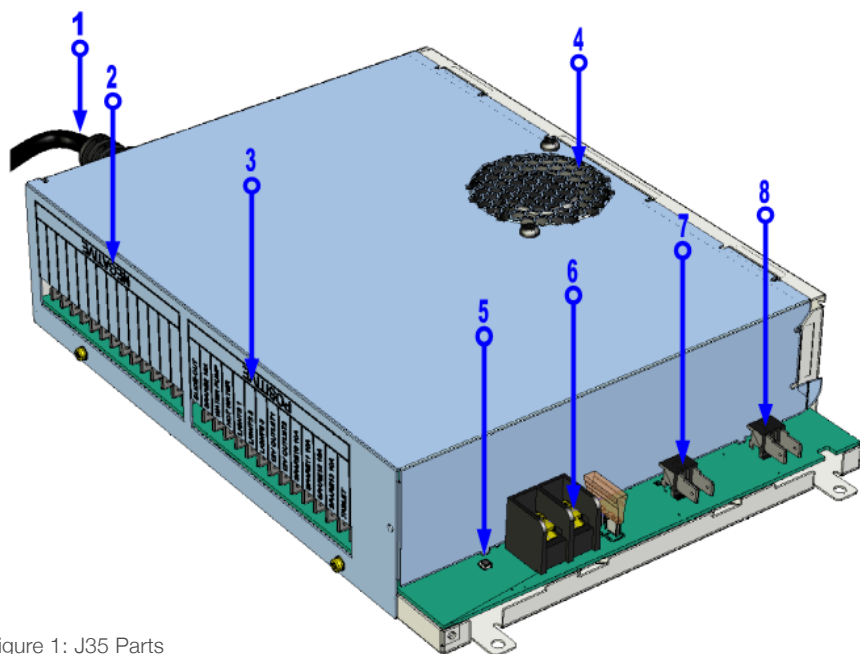


Figure 1: J35 Parts

## 1. Mains Cable (permanently connected)

240 VAC main input power for powering loads and/or charging the loads

## 2. Load Terminal Block, Common Negative Connection

Used for connecting the negative wire of the 12V loads

## 3. Load Terminal Block, 12V Load Outputs (Output labels for current rating)

### J35-A

1. LIGHTS, 15A
2. LIGHTS, 15A
3. PUMP, 10A
4. HWS, 10A
5. STEREO, 10A
6. SPARE 10A, 10A
7. SPARE 10A, 10A

### J35-B

1. SLIDE-OUT, 15A
2. SPARE2 15A, 15A
3. WATER PUMP, 10A
4. HOT WATER, 10A
5. LIGHTS 1, 10A
6. LIGHTS 2, 10A
7. LIGHTS 3, 10A
8. 12V OUTLET 1, 10A
9. 12V OUTLET 2, 10A
10. SPARE 10, 10A
11. SPARE 11, 10A
12. SPARE 12, 10A
13. SPARE 13, 10A
14. TABLET, 10A

#### 4. Fan

Fan to cool down internal temperature of **J35** when required.

#### 5. LED Indicator

The LED is a status indicator. Refer to item LED Output Status Indicator for more details.

#### 6. BATT+ and BATT-

Connection point for battery positive and negative terminal.

#### 7. AUX INPUT (Auxiliary)

Connection point for external DC input positive and negative wire.

#### 8. LOAD ISOLATION SWITCH

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

### MAINS CABLE



#### WARNING

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

This is pre-cabled and fitted with a mains plug. Ensure that AC Mains source always have the earth terminal.

### COMMON NEGATIVE CONNECTIONS

All load negative returns are connected directly to the **J35** negative terminals. All are terminated by using quick connect (QC). Dimension of the QC is specified in Figure 2.

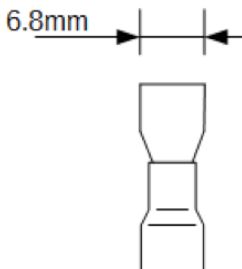


Figure 2:  
Quick Connect  
(QC) Dimension

## 12V LOAD OUTPUTS

Each load had been connected to a specific terminal. Load outputs are labelled accordingly. Figure 1 provides the details of output labels and current limit of each output.

### J35-B “SLIDE-OUT”

The Slide-Out output is different among other outputs. Unlike the others, the Slide-Out output is always OFF whenever the auxiliary voltage is present, regardless if AC mains is ON or OFF. This is a safety mechanism of the **J35**. To prevent from accidentally engaging the Slide-Out while caravan is in transit, **J35** effectively inhibits the Slide-Out to engage if auxiliary input is ON. To operate the Slide-Out, turn off auxiliary input. Turning off the towing car engine should suffice.

### J35-B “TABLET”

The TABLET output terminal is where charger (12V input/5V output) for tablets or mobile phones can be connected to. When the caravan battery is running low and reaches 10.8V (Low Voltage Disconnect), all the outputs will turn OFF except the TABLET output. This means that in case of emergency, the last remaining charge from the caravan battery can be used to charge a mobile phone and ensure phone calls can be made.

## FAN



### WARNING

Ventilation holes must never be blocked to ensure continuous air-flow.

Fan keeps the internal temperature to a safe and operational level. If there is blockage on the ventilation holes or the fan is externally prevented from operating, the internal temperature will rise. This may either cause the **J35** to shut-down or de-rate its current output from its maximum to a lower value, depending on the actual internal temperature.

## LED

The LED indicates the status of the **J35** power supply. Refer to section LED Output Status Indicator for more details.



## BATT+ AND BATT-

The terminal block with label Batt+ and Batt- is where the caravan battery connections are terminated. Termination is done via screw.



### WARNING

Terminating the battery negative return to any point other than the Batt- may cause the battery to overheat and be overcharged. It is imperative that the caravan battery negative return is not connected anywhere else, like earth ground or caravan chassis.

## AUX INPUT (AUXILIARY)

The power supply input terminal “AUX INPUT” provides an alternative option for powering the loads and charging the caravan battery when mains voltage is not present. This input is powered from a suitable +12 V system (e.g. your vehicle). The voltage of this external DC power source must not exceed 14.8 V.

This input is isolated using an internal relay, so it is strictly an input. **J35** will never supply current to anything connected to this terminal.

**Note:** **J35** does not provide battery charging management (Bulk, absorption, float and periodic boost) when operating in this configuration. In this configuration, current and voltage control for the battery must be provided through the external source.

## LOAD ISOLATION SWITCH

A pair of contacts, item 10 in Description of Parts, had been provided for connection to an external switch. When the switch is shorted, all loads are electronically disconnected and turned OFF.

Battery charging is not affected by this switch.

The actual load isolation switch may be located in the control panel inside a shelf in the caravan. Contact caravan dealer if assistance is required in locating the actual load isolation switch (or control panel).

# SERVICING, FEATURES AND MAINTENANCE

This product contains hazardous voltages and energy hazards, which can result in death or injury. Only qualified service personnel may service it. The only serviceable parts are the external fuses.

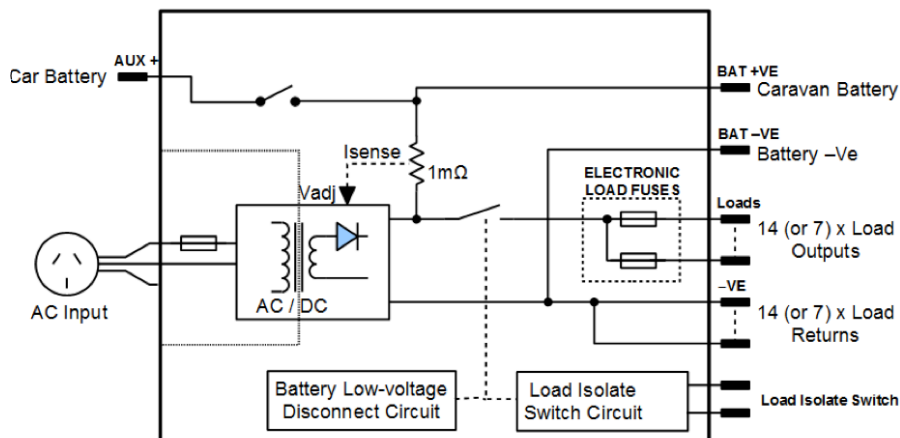


Figure 3: Functional Schematic

## AC/DC POWER SUPPLY

**J35** provides an isolated output for powering the loads and charging the battery. It enters into power supply mode if it is powered by AC mains without a battery, providing an output voltage of 12.8V. With a battery present, battery current is sensed and monitored by the power supply. Charging current is 15A maximum. Refer to item Battery Charging Management for more details.

## MULTIPLE INPUTS

**J35** may have two sources present at one time, AC mains or auxiliary. There will only be one source providing power at one time even though all are available. Priority matrix is given below.

AC Mains	✓	—
Auxiliary	✓	✓
Dominating Source	AC Mains	Aux

Table 1: Priorities when multiple inputs are available

**Note:** If no battery is attached to the **J35**, yet power is being supplied from mains or auxiliary, the nominal voltage is 12.80V.

## FAULT PROTECTION

The power supply provides automatic protection for overload including short circuit, over-voltage and over-temperature.

During overload and short circuit conditions, the specific output will momentarily shut down. It will automatically attempt to restart every 30 seconds until the fault is removed.

An output over-voltage condition (could be caused by surge, lightning, etc.) or excessive internal temperature will latch the power supply off until the fault is removed and **J35** AC mains is cycled on and off.

For Reverse Battery protection, two battery fuses are installed. (Refer to item Battery Fusing). If one or both of the fuses need to be replaced, contact dealer for assistance.

## FUSING

### Electronic Load Fuses

Each load output is protected by an internal electronic fuse which turns off for currents above its programmed limits. (For current rating of each output, refer to item Description of Parts).

Electronic fuses are auto-recoverable and they eliminate the need for the user to replace blown fuses when output is short-circuited (or overloaded). The status of the outputs can be checked through the state of the LED status indicator. In case of an output fault, corresponding output will shut-down but will auto-recover once the fault has been removed.

## Battery Fusing

Apart from the fuse along the Batt+ wire that is connected to the positive line of the battery, a 40A automotive fuse is also mounted in the PCB. In case there is a short circuit in the battery line, this may cause either (or both) the PCB mounted or the external battery fuse to blow. If the fuse/s need to be replaced, contact dealer for guidance.

## Auxiliary (AX) Fusing

To protect the auxiliary input from excessive current, a fuse (rating not exceeding 30A) along the auxiliary input wire has been installed. If the fuse needs to be replaced, contact dealer for guidance.

## Mains Fusing

The AC mains input is protected by an internal fuse. This is not serviceable. It is rated 250V 10A, quick acting, and high breaking capacity type.

# BATTERY

## Connection / Disconnection Procedure



### WARNING

Sparks have the potential to cause an explosion should combustible gases be 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 of the vehicle.

## BATTERY CONNECTION PROCEDURE

The caravan battery should be connected as per the following steps.

- 1.Remove input sources to **J35**
- 2.Disconnect all loads

***Turn off all 12V equipment connected to J35***

- 3.Connect the positive battery terminal
- 4.Connect the negative battery terminal

## BATTERY DISCONNECTION PROCEDURE

The caravan battery should be disconnected as per the following steps.

- 1.Disconnect all loads

***Turn off all 12V equipment connected to J35  
or disconnect the loads using the load isolation switch.***

2. Remove input sources to the **J35**
3. Disconnect the negative battery terminal
4. Disconnect the positive battery terminal

## BATTERY TYPES

**Note:** This battery charger is rated to charge lead acid battery banks of up to 300 Ah capacity. Charging current is limited to 15A. Refer to About the **J35** Series Power Supply.

When using batteries other than what is originally installed by caravan dealer, always consult with the battery manufacturer for a detailed description of the installation, uses, and maintenance of the battery.

This product is suitable for charging 12V Sealed Lead-Acid (SLA) batteries including Valve-Regulated Lead-Acid (VRLA) batteries, both Absorbed Glass Mat (AGM) and Gel batteries.

## PARALLELING BATTERIES

When paralleling multiple batteries, all batteries **MUST** be:

- of the same type, e.g. deep cycle battery
- of the same capacity, e.g. 100 Ah
- of the same manufacturer
- fully charged before connecting them together

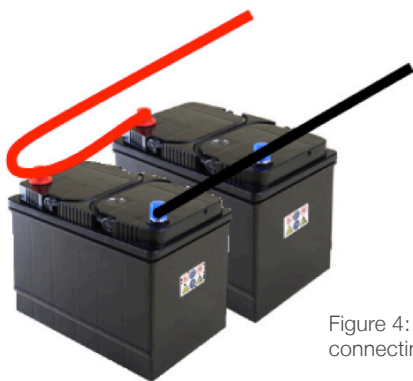


Figure 4: Recommended wiring for connecting batteries in parallel.

Figure 4 is only a recommendation. A qualified auto-electrician may wire this differently depending on system requirements.



### WARNING

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

## STORAGE

If the caravan is to be stored for a long period of time, fully charge the battery first and ensure all loads are disconnected. It is recommended to recharge the battery at least once every 6 months. Regular recharging will prevent the battery from becoming deeply discharged—a condition which can significantly shorten battery life.

## DEEPLY DISCHARGED BATTERIES

This battery charger is not designed to charge deeply discharged batteries. Its effectiveness in charging such a battery is a function of the depth of discharge and the battery size.

In normal use, a battery connected to **J35** should never become deeply discharged, so recharging it should never be a problem. If a battery has become deeply discharged though, **J35** will not charge it. Remove the battery and charge it with a stand-alone charger. Once the battery voltage has recovered to normal levels, it may be reinstalled. For guidance in reinstalling, refer to Connection/Disconnection Procedure.

## BATTERY CHARGING FEATURES

**J35** is a full battery management system with a multi-stage battery charger including bulk, absorption, float, and periodic boost charging modes to ensure long battery life. Charging current is limited to a maximum of 15A. Details of the charging process can be found in Figure 5: Charging Algorithm.

When powered by AC mains, the power supply is able to deliver 35A (or 450W) maximum to the battery and loads. The 15A battery charging rate is only possible if there are no load currents. If the load current is present, the maximum battery charging current may be reduced accordingly.

## BATTERY HEALTH PRESERVATION

**J35** preserves the health of the battery by inhibiting it from getting overly discharged. There are two stages in which this is achieved; via Low Voltage Disconnect and Storage Mode.

### Low Voltage Disconnect

**J35** disconnects the loads (except the TABLET output) from the battery when the battery is not charging and its voltage falls below 10.8V.

When the AC mains returns, the charging of the battery is commenced and the loads auto reconnect (turn back ON).

If instead of the AC mains, the auxiliary input is used to charge the battery after the **J35** system has gone through LVD, outputs will not turn back ON unless the Load Isolation Switch is cycled.

### **Storage Mode**

All loads, including the TABLET output for J35-B, are turned OFF when in this mode. **J35** enters into storage mode when the Load Isolation Switch is turned ON. To exit storage mode, turn OFF Load Isolation Switch .

Also, if caravan battery voltage has gone lower than 10.8V (LVD set voltage) and reaches 10.5V, **J35** consequently will be forced to enter storage mode. At this point, outputs will only turn back ON if:

- 1.battery is charged by AC mains, or
- 2.battery is charged by AUX and then Load Isolation Switch cycled.

### **BATTERY CHARGING MANAGEMENT**

To maintain the battery in a good state of health, an intelligently controlled charging algorithm is used. The purpose is to ensure that the correct voltages are applied to the battery terminals at the appropriate times throughout its charging cycle. The basics of the charging algorithm are detailed in Figure 5: Charging Algorithm.

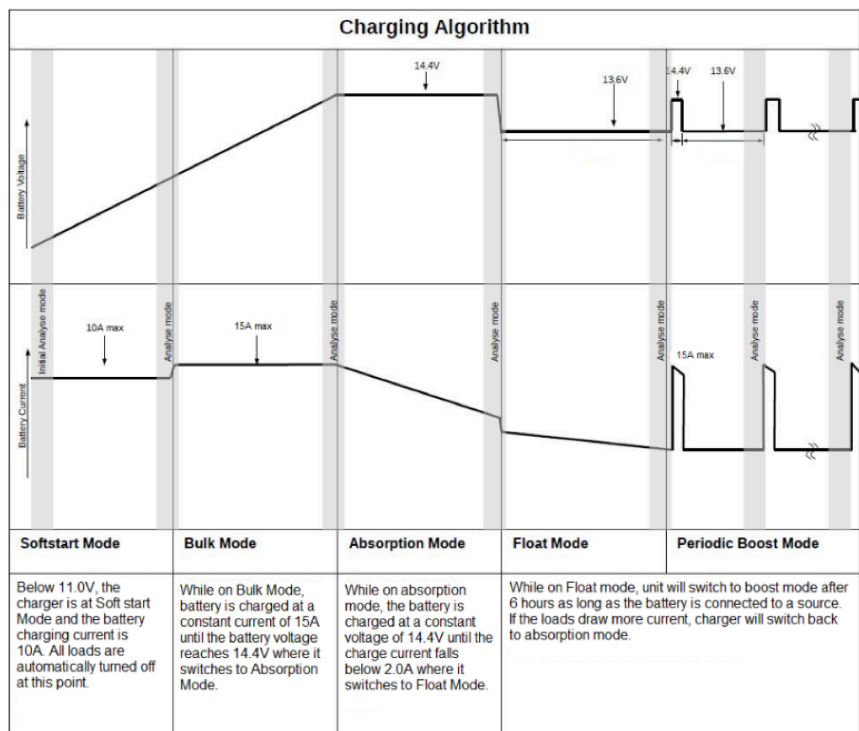


Figure 5: Charging Algorithm.

**J35** will operate as described above if all loads are connected to the load terminals, not directly to the caravan battery. Charging time for the battery depends on the capacity of the battery installed. **J35** auto detects the battery capacity and adjusts the time duration for Bulk/Absorption mode before it transitions to Float mode.



# SYSTEM STATUS INDICATOR (ON THE J35)

On the **JHub** System's **J35**, there is a multi-colour LED which is located between the 'battery' connection and the 'air suspension' connection. This LED is used to display the status of the **J35** unit. Below is a table which covers the different states that might be shown by the LED:

		Colour Code	Flashing Status
White	Internal Error	—————	On, Solid
	Identify Device	.....	Flashes, 5 Times Quickly
	Storage Mode	■       ■       ■	Flashes Every 2min
Yellow: Charging	AC, Charging Normally	—————	On, Solid
	AC, Low Battery Voltage	■   ■   ■   ■   ■	Flashes, 1 Time
	Aux, Charging Normally	... ..	Flashes, 3 Times Quickly
Green: OK	AC, Fully Charged or No Battery	—————	On, Solid
	Aux, Fully Charged	... ..	Flashes, 3 Times Quickly
	Normal, No source present	■   ■   ■   ■   ■	Flashes, 1 Time
Red: Error	One (or more) Output is Overloaded	—————	On, Solid
	Critical Fault	.... ..	Flashes, 4 Times Quickly
	Battery Fault	.. ..	Flashes, 2 Times Quickly
	Over Voltage Fault, or High Temperature Fault	■   ■   ■   ■   ■	Flashes, 1 Time
	Unit is Not Powered	Off	Off

# SPECIFICATIONS

J35 System Charger	
Input Voltage Range:	240 VAC nominal, $\pm 10\%$ , 50-60 Hz
Input Surge:	< 40 A (cold start)
Output Current:	<b>J35-A</b> 20A Continuous (load + battery current) <b>J35-B</b> 35A Continuous (load + battery current)
Factory Set Voltage:	13.65 V $\pm 2\%$ (Float voltage)
Output Ripple Voltage:	< 150 mV
Over Voltage Protection:	< 18 V
Over Current Protection:	<b>J35-A</b> 20A to 25A (load + battery current) <b>J35-B</b> 35A to 38A (load + battery current)
Battery Current Limit:	15A max
Battery Connect:	10.8 $\pm$ 0.2 V
Low Voltage Disconnect:	10.8 $\pm$ 0.2 V
Battery Drain after LVD:	< 8mA
Efficiency:	> 83 %
Cooling Fan:	Thermally controlled
Ambient:	0°C – 50°C
Weight:	2 kg
Standards:	Safety: IEC60335-2-29, IEC62109-1, UL458, CSA C22.2 No.107-1, EMC: CISPR 14, IEC61000-3-2, IEC61000-3-3 Approvals: RCM, UL, cUL

## J35 AFTER-SALES SERVICE



**WARNING** Do not disassemble, modify or repair the unit.  
Doing so may result in electric shocks or fire.

### REPAIRS AND AFTER-SALES SERVICE

Consult your BMPRO by Setec dealer.

# WARRANTY TERMS AND CONDITIONS

Registering your BMPRO by Setec product is an important step to ensure that you receive all of the benefits you are entitled to. Please visit [www.teambmpro.com](http://www.teambmpro.com) to complete the online registration form for your new product today.

1. BMPRO by Setec goods come with guarantees that cannot be excluded under Australian Consumer Law. You are entitled to a replacement or refund for major failure and for compensation for any reasonably foreseeable loss or damage. You are 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. The benefits under this Warranty are in addition to your other rights and remedies under a law in relation to the goods to which this Warranty relates (the Australian Consumer Law).

2. Setec, as the manufacturer of BMPRO by Setec goods warrants products against defects for a period of two years, commencing from the original date of purchase. Proof of purchase is required before you can make a claim under this warranty.

## 3. HOW TO PROTECT YOUR RIGHTS UNDER THIS WARRANTY:

The J35 is designed to be installed by a suitably qualified installer. You or your installer should carefully inspect the product 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 by Setec may seek reimbursement of any costs incurred by them when a product is found to be in proper working order or damaged as a result of one or more of the warranty exclusions mentioned in point 4 of this statement.

6. To enquire or make a claim under this warranty, please follow these steps:

- a. Prior to returning a BMPRO by Setec product, please email **warranty@teambmpro.com** to obtain a Return Material Authorisation (RMA) number.
- b. Package and send the product to: **BMPRO by Setec 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. Setec 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.

# THE BM<sup>PRO</sup> BATTERYCHECK



The BatteryCheck is an easy to install device that sets a new standard in battery management systems. This innovative product connects to your deep cycle battery and communicates wirelessly with smart phones. The BatteryCheck provides real time battery management data that allows you to effectively manage remaining battery energy via a simple to use app.

## Key features

- › Communicates via Bluetooth with smart phones
- › Free downloadable app via Google Play and App Store
- › Instant real time data - view information including volts and amps, time remaining, temperature, battery status, state of charge and battery health
- › Easy installation – no mechanical expertise required
- › Works with multiple batteries when in parallel (7Ah-800Ah Battery Bank)
- › Internal shunt capacity - 80 amps continuous
- › Set automatic alarm warnings via app
- › Compatible with any deep cycle 12 or 24V Lead Acid, AGM and Gel 7Ah-800Ah battery



**A WORLD FIRST, INNOVATION  
PATENTED PRODUCT SHOWCASING  
THE LATEST TECHNOLOGY IN  
WIRELESS BATTERY MANAGEMENT**