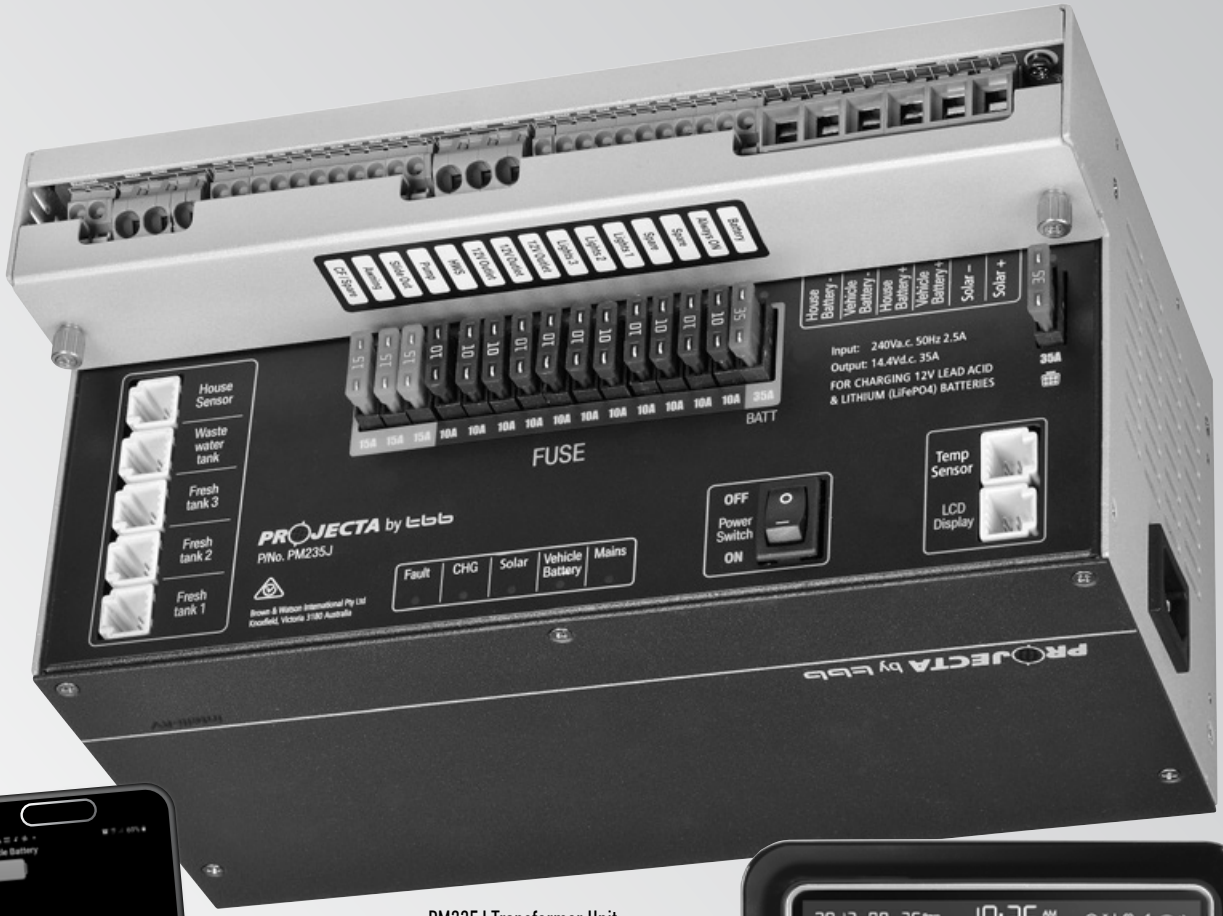
PROJECTA

INTELLIJay

12V POWER MANAGEMENT SYSTEM



PM235J Transformer Unit

Phone App

PMBTJ-02 Bluetooth Node
(PM235J-NODE system only)

PMLCD-BTJ LCD Screen
(PM200-BTJ system only)

P/No. PM200-BTJ & PM235J-NODE

Need technical help?
Contact Projecta on 1800 294 294

IMPORTANT SAFETY INFORMATION

Please read this manual thoroughly before use and store in a safe place for future reference.

WARNINGS

- Explosive gases. Prevent flames and sparks. Provide adequate ventilation during charging
- Before charging, read the instructions
- For indoor use. **Do not** expose to rain
- For charging Lead Acid and $LiFePO_4$ batteries **only** (of the size & voltage specified in the specification table.
- Always charge the battery on the correct voltage setting. Never set the charger to a higher voltage than the battery
- Disconnect the 240V mains supply before making or breaking the connections to the battery
- The battery charger must be plugged into an earthed socket outlet
- Connection to supply mains is to be in accordance with national wiring rules
- Do not attempt to charge non-rechargeable batteries
- Never charge a frozen battery
- If the AC cord is damaged, do not attempt to use. It must be replaced or repaired by a qualified technician
- Corrosive substances may escape from the battery during charging and damage delicate surfaces. Store and charge in a suitable area
- This charger 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 instruction concerning the use of the appliance by a person responsible for their safety
- Young children should be supervised to ensure that they do not play with the appliance
- If the recreational vehicle is to be put in to storage without power, please turn off the POWER SWITCH. If the recreational vehicle is to be put in to long term storage without power, disconnect ALL cabling from the battery.

CONTENTS

1. INTRODUCTION

PM200-BTJ and PM235J-NODE are power management systems designed for use in caravans or motor homes. These systems allow for easy installation and a user-friendly interface.

Both PM200-BTJ and PM235J-NODE systems come with the same PM235J transformer unit, which the circuits in the caravan or motor home are centrally wired to. This transformer features built-in battery charger, power supply, fused distribution blocks, PWM solar charge controller, voltage charging relay (VSR), low voltage disconnect (LVD), water pump controller, hot water system controller, water tank indicator and battery monitoring.

The main difference between the two systems is that PM200-BTJ comes with an Bluetooth-enabled LCD screen (PMLCD-BTJ), allowing a user to monitor and control the system via the LCD or the Bluetooth app. PM235J-NODE does not come with an LCD screen, instead utilising a separate Bluetooth node (PMBTJ-02) to connect with the Bluetooth app.

SYSTEM COMPONENTS:

1. PM235J Transformer Unit
2. PMBTJ-02 Bluetooth Node (PM235J-NODE only)
3. PMLCD-BTJ (PM200-BTJ only)
4. Cables (Refer to Chapter 4 for the cable list)

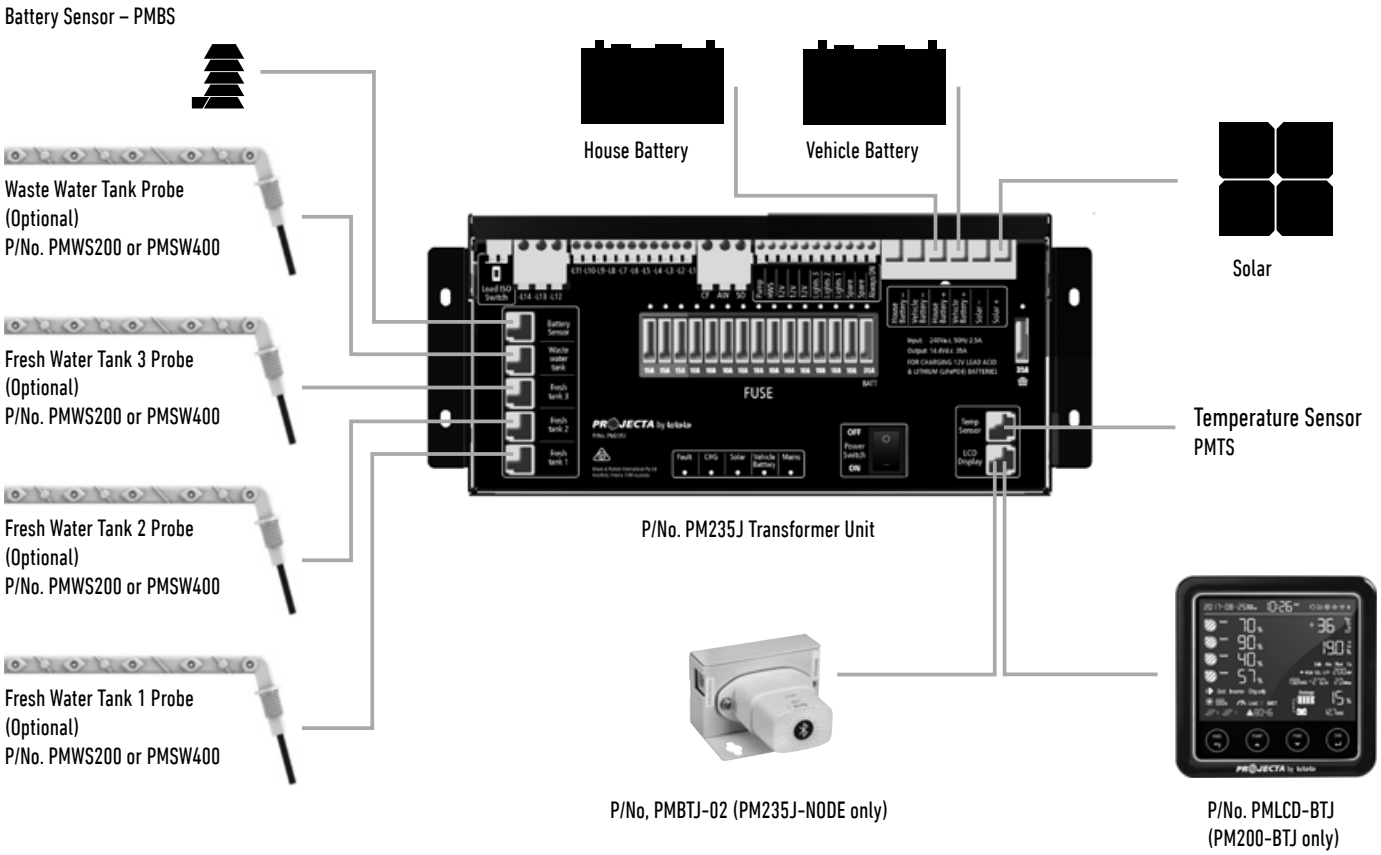


Figure 1 System Components for PM200-BTJ and PM235J-NODE

1.1 Features (PM200-BTJ and PM235J-NODE)

- Smart battery charger 12V 35A (30A for charging current)
- Multi stage adaptive charging algorithm
- Active Power Factor Correction (PFC) charging
- Temperature compensation charging
- Voltage compensation charging
- Solar charge controller (PWM), 30A
- 14 built in fused outputs
- Charging from Alternator at 12V 60A - 60A continuously, 100A 30mins
- Low battery voltage protection
- Built-in battery switch to isolate the battery when in storage
- Built-in shunt for precise battery measurement
- 1 water pump control with up to 4 connections for water sensors
- Thermal control fan
- Spring terminal and screw terminal
- T-bus compatible

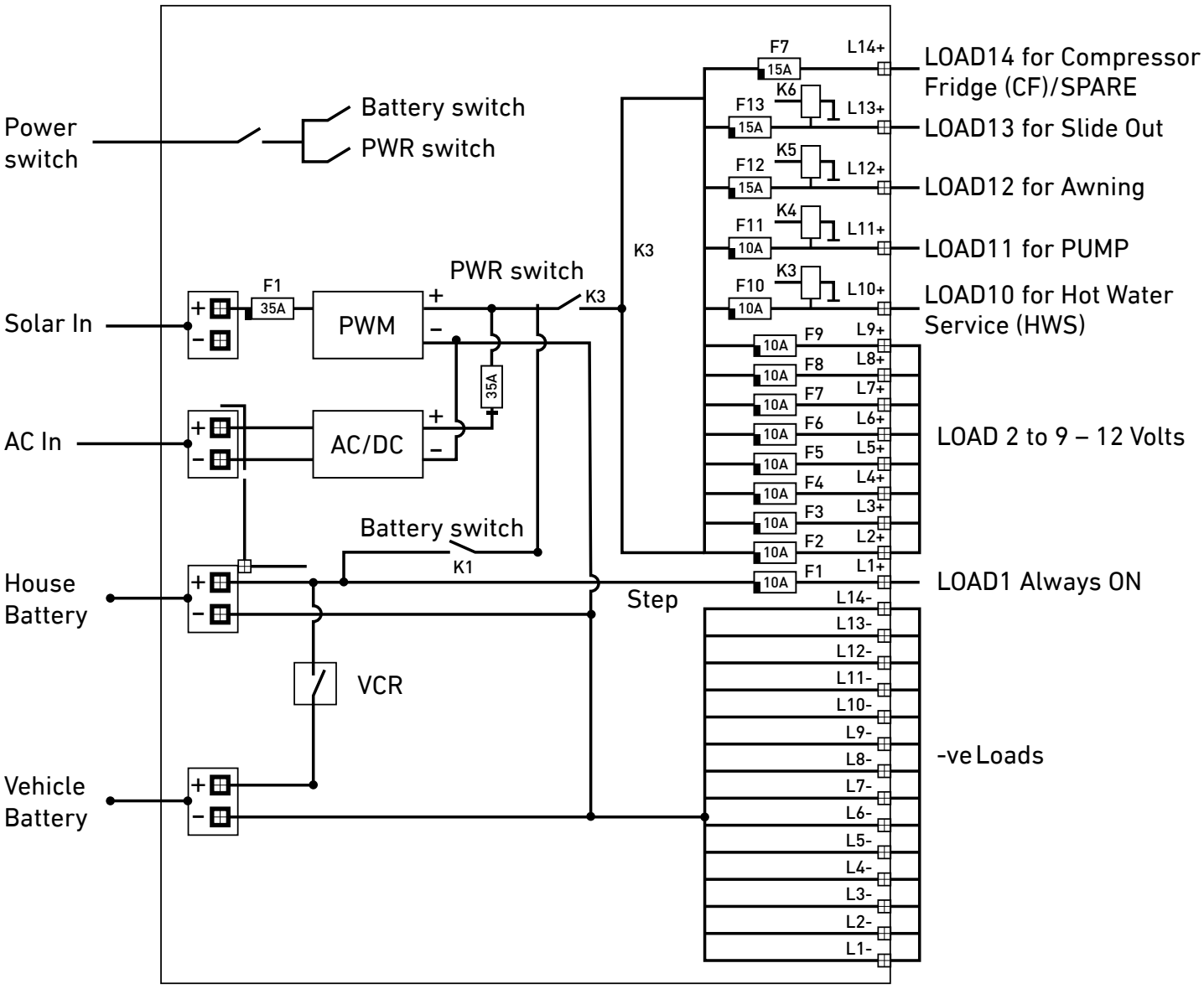


Figure 2 System Schematic

1.2 LCD Monitor PMLCD-BTJ (PM200-BTJ only)

The LCD monitor is a digital control center for the PM235J transformer unit. See section 5.2 for operation of LCD monitor.

FEATURES:

- T-Bus design (can be connected to multiple devices)
- System monitoring
- Configuration
- Built-in Bluetooth for pairing to smart phone

Figure 3 Overview of Monitor

1.3 Water Tank Probes

A maximum of up to 4 probes can be monitored by the system.

NOTE: Always check the probe required for the water tank before purchase.

There are 2 probe styles:

PMWS200:

- Side installation
- Suitable for water tank
- Depth >200mm

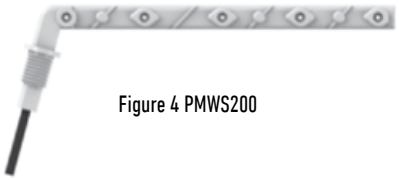


Figure 4 PMWS200

PMWS400:

- Side installation
- Suitable for water tank
- Depth 300-400mm

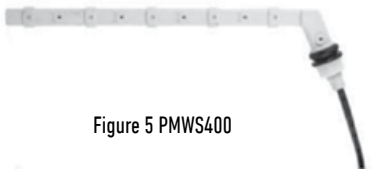


Figure 5 PMWS400

2. KEY FEATURES AND FUNCTIONS

2.1 Multiple Inputs

The PM235J transformer unit accepts inputs from AC mains, solar panel and vehicle battery. However, see Table 1 at right for details.

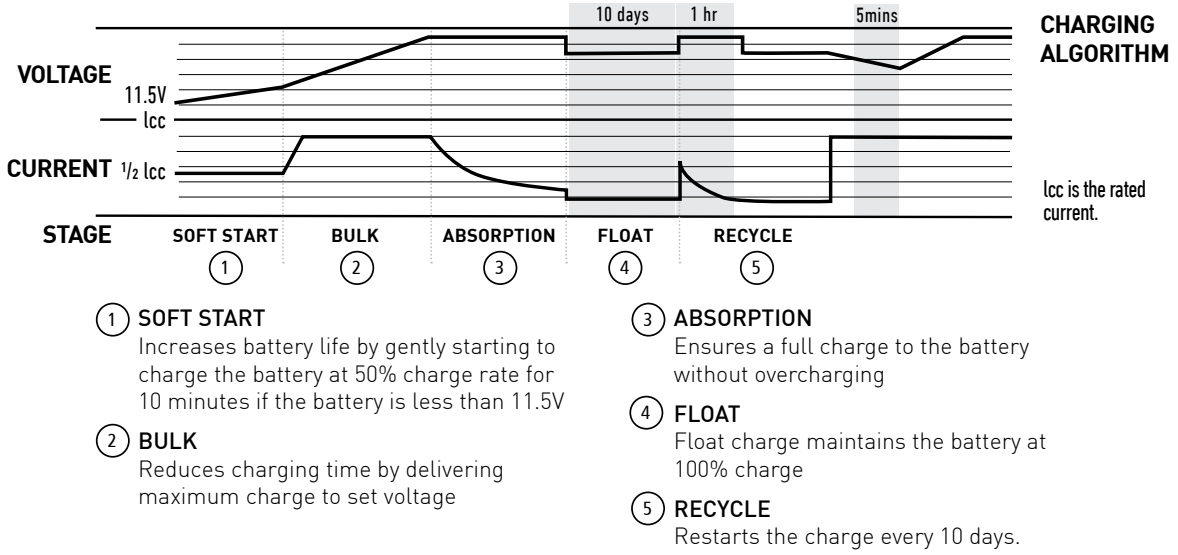
AC MAINS	**X**	**X**	
SOLAR	**X**		**X**
VEHICLE BATTERY		**X**	**X**
DOMINATING SOURCE	AC MAINS	AC MAINS	COMBINE

Table 1 Multiple inputs

2.2 Battery Charger Of House Battery

The charger automatically starts when the appropriate qualified power is connected, either from AC mains, alternator or solar.

With multiple charging stages (soft start-bulk absorption float-recycle), PM235J is designed to fully charge a battery quickly. To guarantee the optimal charging for batteries of different states, the PM235J features a Microprocessor-controlled charging algorithm. The Float and Recycle charging programs guarantees that the battery condition does not change despite being connected for a longer period.



1 SOFT START
Increases battery life by gently starting to charge the battery at 50% charge rate for 10 minutes if the battery is less than 11.5V

2 BULK
Reduces charging time by delivering maximum charge to set voltage

3 ABSORPTION
Ensures a full charge to the battery without overcharging

4 FLOAT
Float charge maintains the battery at 100% charge

5 RECYCLE
Restarts the charge every 10 days.

Figure 6 Charging Algorithm

Battery Temperature Sensor

The PMBS (battery sensor cable) is connected to measure the temperature of the battery and automatically adjusts, in real time, to charge the battery properly at compensation rate of – 4mv±10%/°C/cell. In case PMBS is not present, the PM235J will use 25°C as default.

Voltage Compensation Charging

With a voltage sensor the PM235J can automatically adjust its output to compensate the voltage drop caused by a cable.
This assures the right voltage is being delivered for optimal charging.

Adjustable Charging Capacity

Users can adjust the charging current by specifying the battery capacity. The charging current is set at threshold rate of 15% the of the battery capacity (I = 0.15C) by default.

Lithium Battery Charging

The PM235J can be configured to charge a lithium battery. With a lithium battery, the max charging current will automatically be set at 30% of battery capacity (Imax=0.3C).

2.3 Power Supply Mode

If no battery is attached to PM235J unit, it will work as a power supply automatically with a 12.8VDC output.

2.4 PWM Solar Charger Controller

PM235J has a built-in PWM charger for the house battery with:

- Max input voltage 25VDC
- Max charging current 30A

2.5 Voltage Charging Relay (VCR or commonly known as a VSR)

As a Safety feature, the Slide Out (+L12) and Awning (L13) outputs are disabled when towing vehicle is connected to the Caravan (and vehicle battery voltage is detected at >5V). To enable these outputs again, disconnect the vehicle's power plug from the caravan. If the VCR is still engaged, press the PWR button on the LCD or app ON / OFF / ON.

LEAD ACID BATTERY – When the vehicle battery reaches 13.4VDC with threshold time delay, the VCR will charge the house battery from the alternator. The VCR will continue the charging until the vehicle battery voltage drops under 12.8VDC.

LiFePO4 LITHIUM BATTERY – When the vehicle battery reaches 13.7VDC with threshold time delay, the VCR will charge the house battery from the alternator. The VCR will continue charging until the vehicle battery voltage drops below 13.3VDC with less than 2A charge to the house battery with threshold time delay.

NOTE: The PM235J, when charging from the vehicle battery, does not provide the 5 stage charge. It simply takes whatever power and charging is available from the alternator.

NOTE: If your vehicle is fitted with a smart alternator, the VCR charge system (Variable Voltage or Temperature Compensating), the VCR charge system may not function correctly and a Projecta IDC25 charging system is recommended.

Please contact Projecta for further information.

2.6 Categorised Outputs

The 14 outputs are categorised into groups and controls as per below:

OUTPUTS	DESCRIPTION	POSSIBLE LOAD SUITABLE
4	Relay controlled output with fuse, protected by main master switch relay	Awning, Slide Out, Hot Water System (HWS), Pump
9	Fused outputs, protected by master switch relay	Lights, ventilation fan, TV etc.
1	Always ON	Auto step, radio/clock memory etc.

Table 2 Categorised outputs

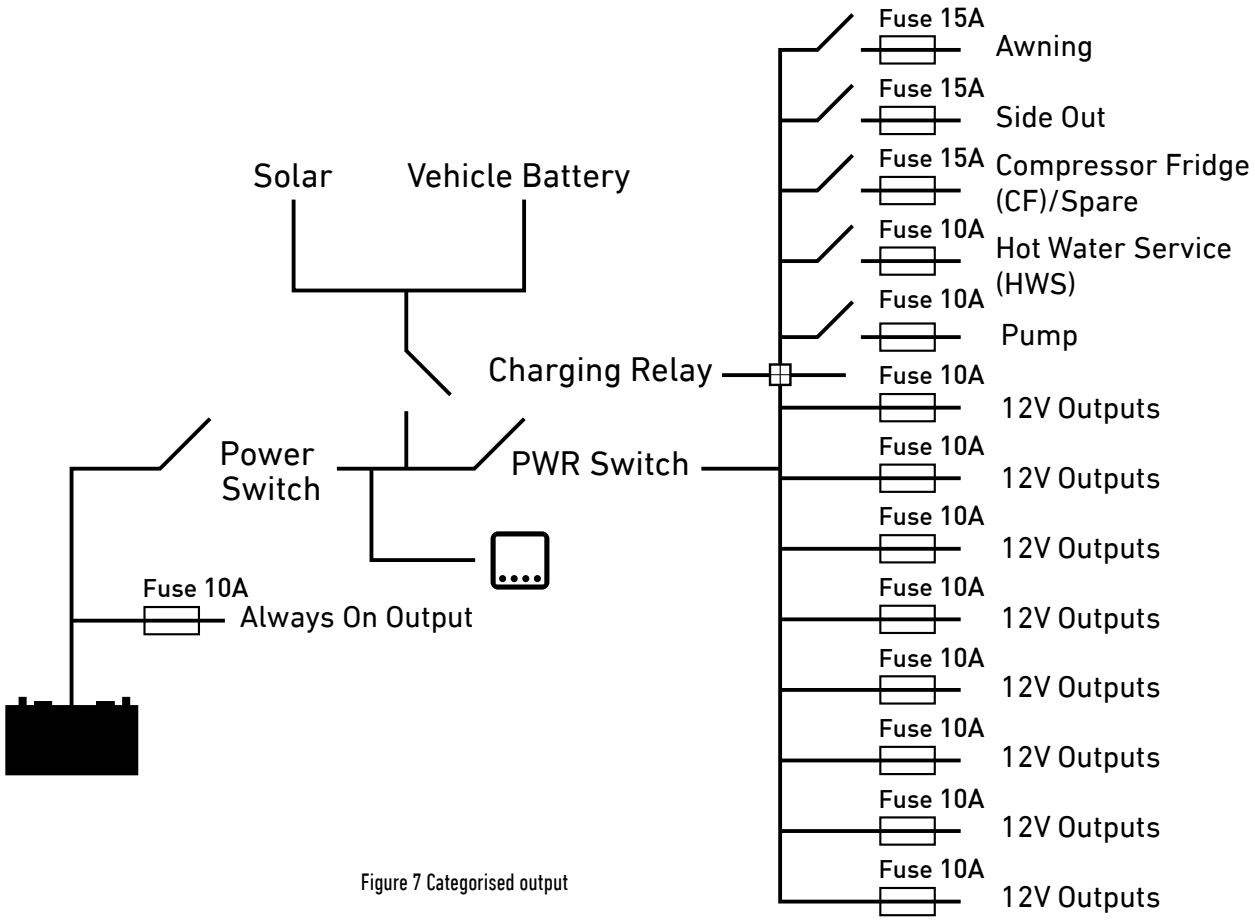


Figure 7 Categorised output

2.7 Battery Low Voltage Protection (BLVP or commonly known as an LVD)

The PM235J transformer unit has a built-in low voltage protection relay. It will disconnect the load once the battery voltage drops below the threshold voltage. The default setting is 10.5VDC.

2.8 Power Switch

The PM235J transformer unit offers a convenient way to cut off charger and switch off the outputs of the House Battery. It protects the House Battery from being drained by the on board electronics, completely isolating the battery, perfect for storage. This switch is located on the front face of the PM235J transformer unit.

2.9 Precise Battery Measurement

The PM235J transformer unit has a battery measurement system controlled by microprocessor. It measures battery voltage, charge/discharge current, remaining Amp-hours and display time to go.

Compared to conventional indicating meters, a small current can be measured and read accurately with this device.
With this feature, it highlights faults, alarms and installation errors.

NOTE: If you have loads connected directly to the battery instead of through the PM235J transformer unit, the measurement will not be accurate.

3. STRUCTURE AND INSTALLATION

3.1 PM200-BTJ and PM235J-NODE Power Management Systems

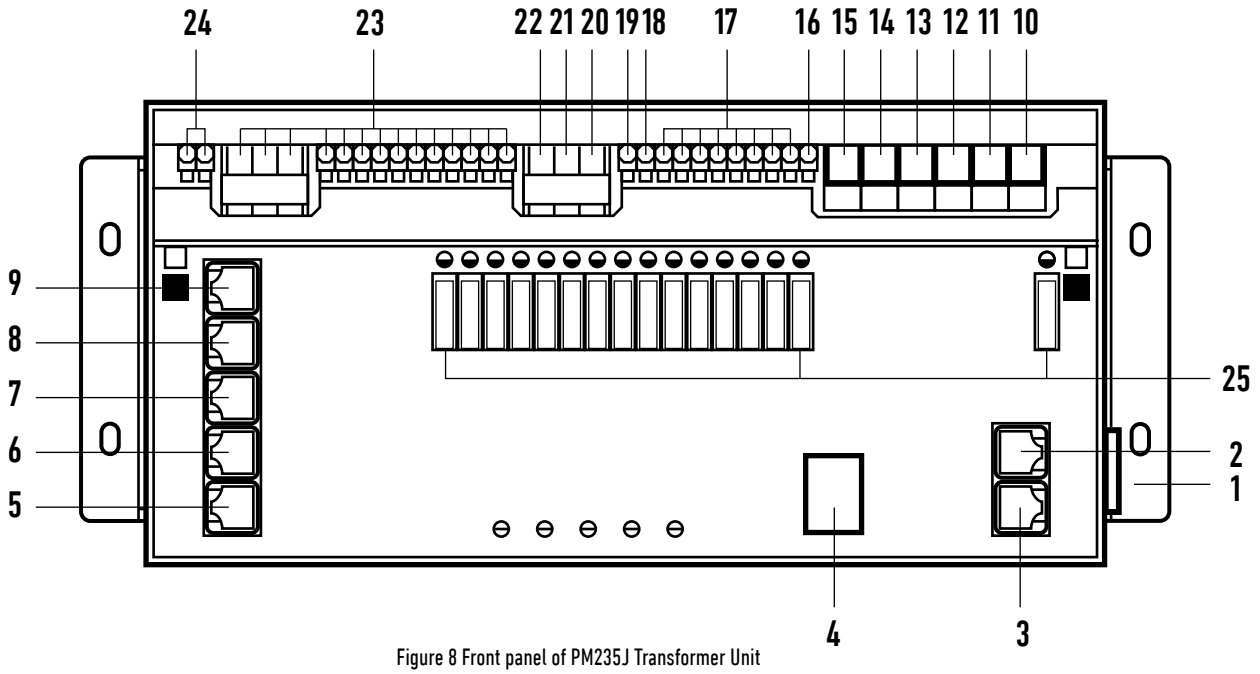


Figure 8 Front panel of PM235J Transformer Unit

Nº	LABEL	DEFINITION	DESCRIPTION
1	AC Mains	AC input port	Computer/IEC style plug socket
2	Temp Sensor	Comm port	Temperature Sensor input
3	LCD Display	Comm port	Connect to Monitor
4	Power switch	Charger and house battery switch	Manual battery switch
5	Fresh water tank 1		Connect to fresh water tank 1
6	Fresh water tank 2		Connect to fresh water tank 2
7	Tap water tank 3		Connect to tap water tank
8	Waste water tank 4		Connect to waste water tank
9	House Sensor	For temp compensation	Connect to house battery
10	Solar+	Solar input	Connect to solar panel + terminal
11	Solar-	Solar input	Connect to solar panel - terminal
12	Vehicle Bat+	Vehicle battery+	Connect to vehicle battery+ (<20Vdc)
13	House Bat+	House battery+	Connect to house battery+ (<20Vdc)
14	Vehicle Bat-	Vehicle battery-	Connect to vehicle battery-
15	House Bat-	House battery-	Connect to house battery-
16	L1+	Always ON	Connect to permanent +12 Volts
17	L2+ ~ L9+		Connect to isolating +12 Volts
18	L10+	HWS (Hot Water System)	Connect to HWS+
19	L11+	Water pump	Connect to water pump+
20	L12+	Slide out	Connect to slide out+
21	L13+	Awning	Connect to awning+
22	L14+	Spare/CF (Fridge)	Connect to CF+
23	L1- ~ L14-		Connect to DC load-
24	Remote ISO Switch	Terminal block	Connect to external switch (optional)
25	Fuse		Fuse and fuse failure indication

Table 3 Categorised outputs

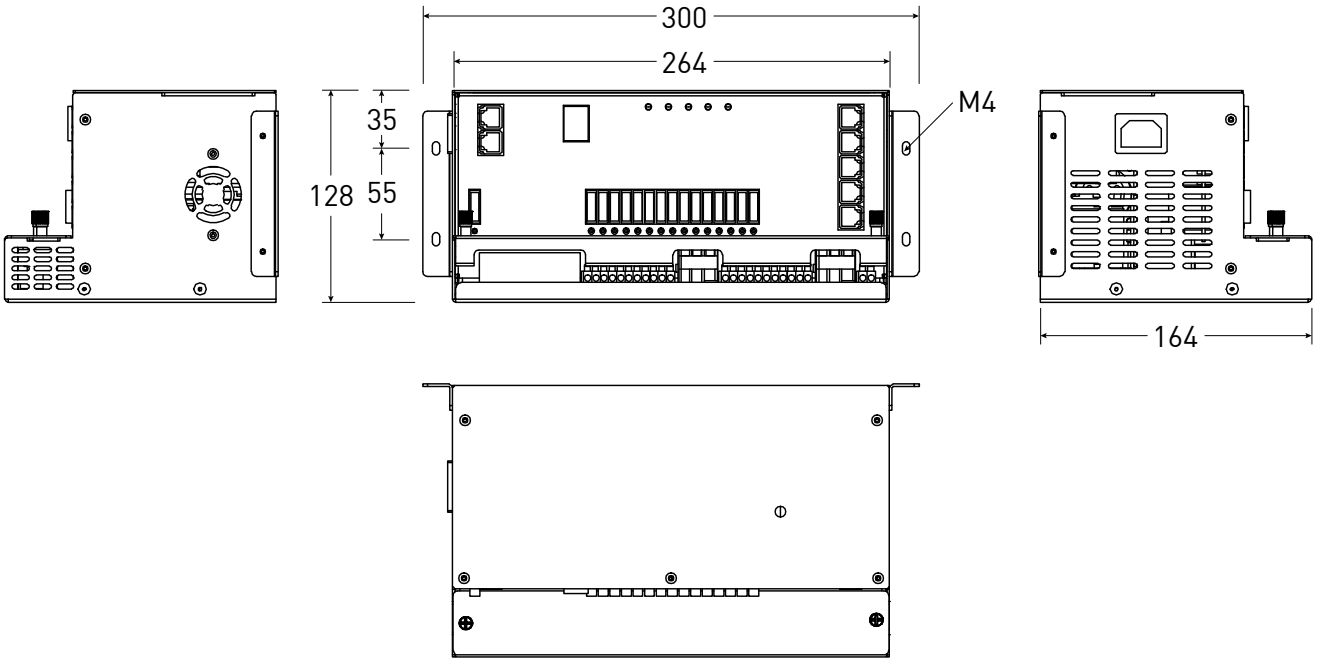
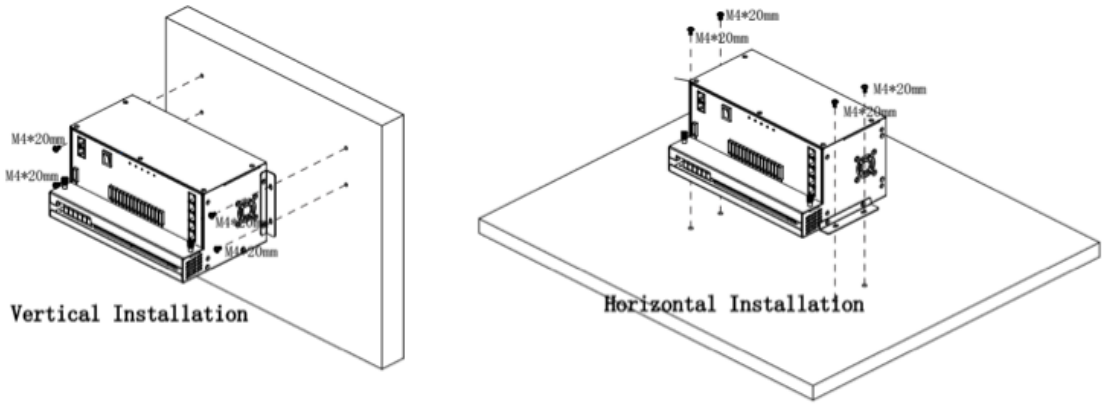
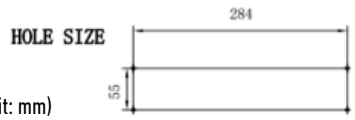


Figure 9 Dimension of PM235J (Unit: mm)

Installation:

PM235J can be installed on a horizontal surface or vertically on a wall. Please see following instructions:





Ensure clearance on both sides of PM235J unit upon installation. A recommended clearance of 5cm on each side.

Figure 10 Installation of PM235J (Unit: mm)

3.2 LCD Monitor (PM200-BTJ only)

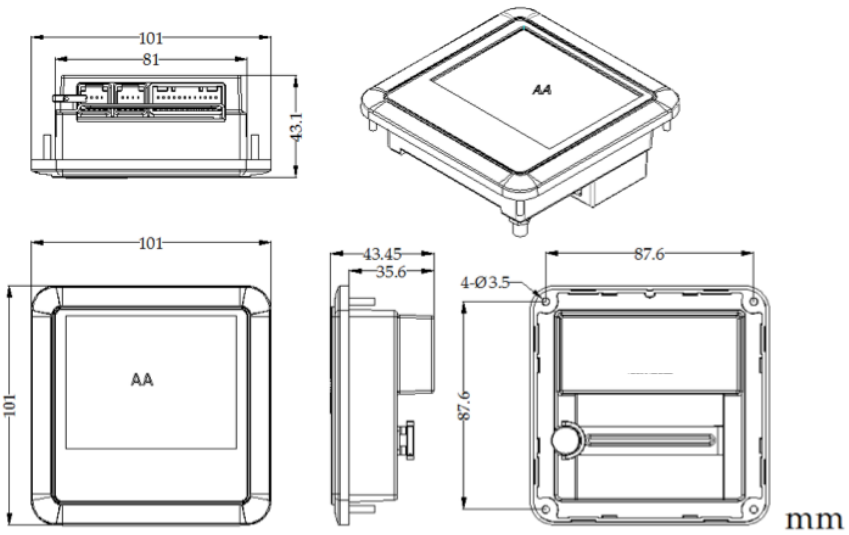


Figure 11 Dimension of Monitor PMLCD-BTJ (Unit:mm)

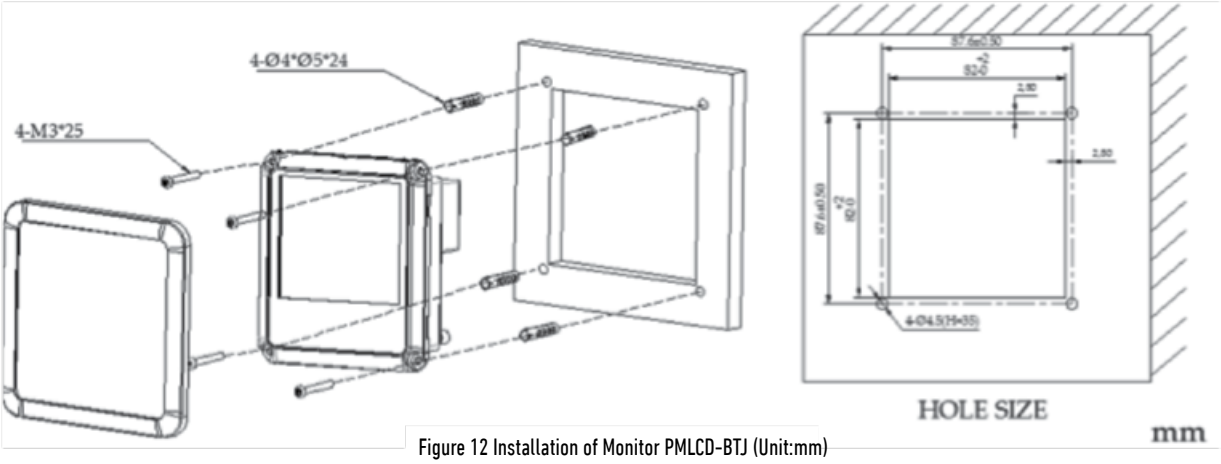


Figure 12 Installation of Monitor PMLCD-BTJ (Unit:mm)

3.3 Water Tank Probes

3.3.1 PMWS400 Water Tank Probe

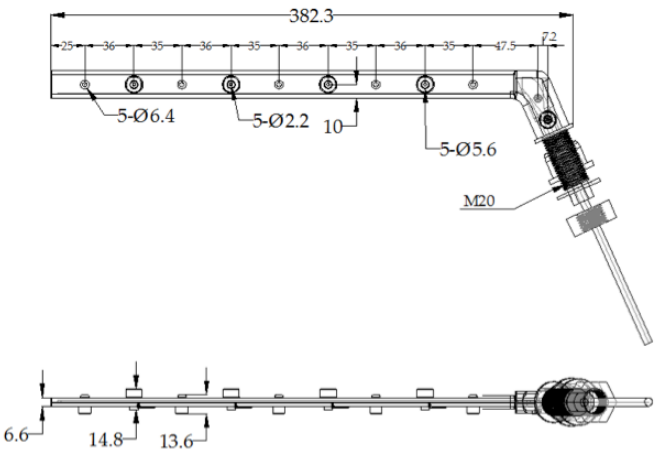


Figure 13 Dimension of PMWS400 (Unit:mm)

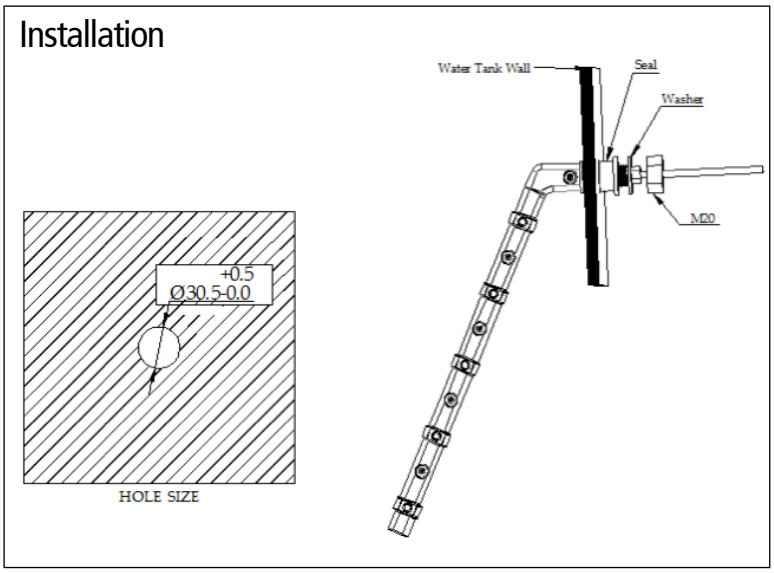


Figure 14 Installation of PMWS400

3.3.2 PMWS200 Water Tank Probe

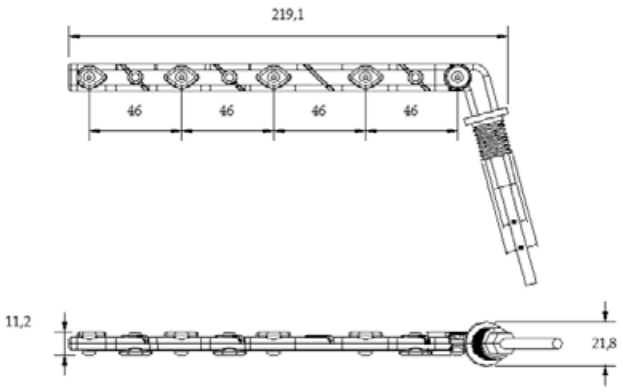


Figure 15 Dimension of PMWS200 (Unit:mm)

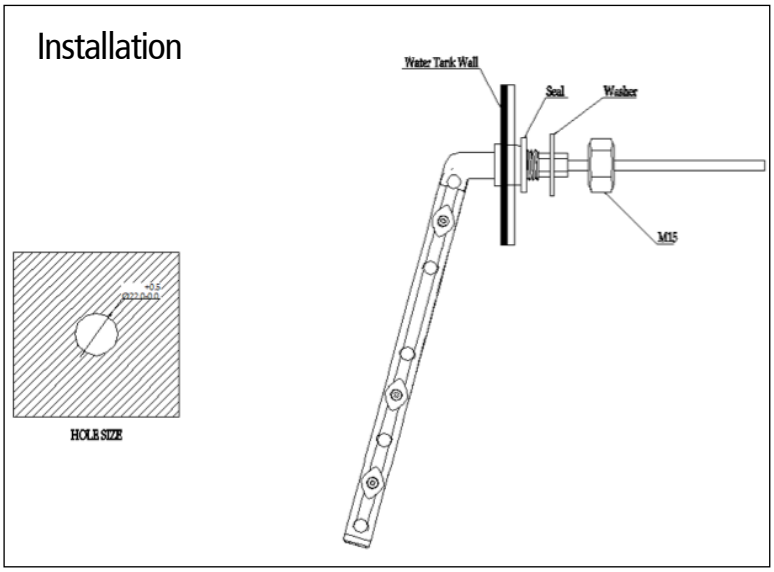


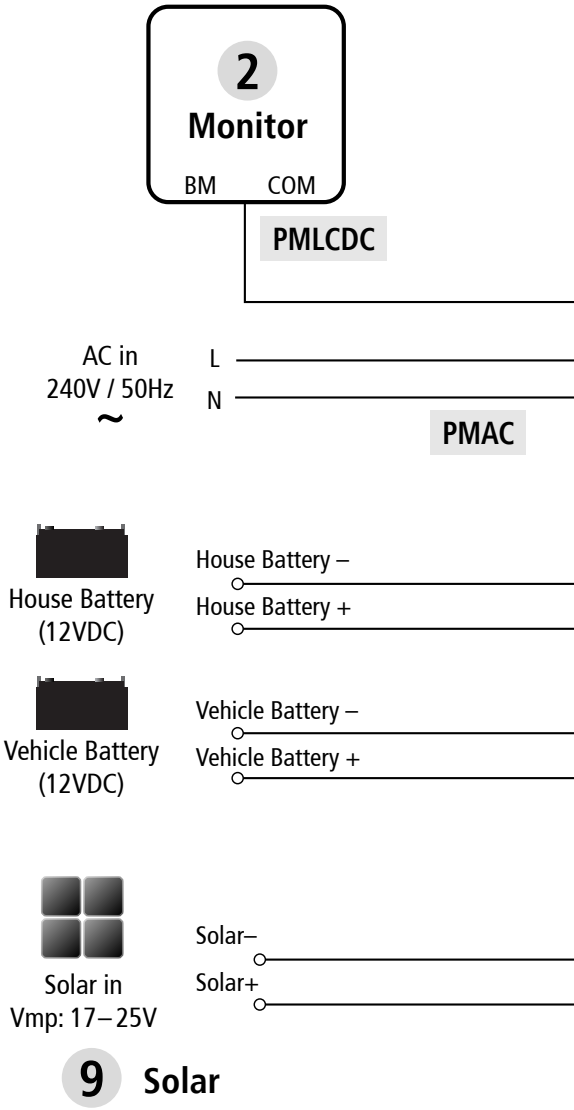
Figure 16 Installation of PMWS200

4. WIRING

4.1 Material

CODE	NAME	MODEL/ LENGTH	QTY	P/No. ON DRAWING
1	Transformer Unit	PM235J	1	1
2	LCD Monitor	PMLCD-BTJ	1	2
3	Fresh water tank 1 level sensor	Not included and to be ordered separately	0	4
4	Fresh water tank 1 level sensor		0	5
5	Tap water tank level sensor		0	6
6	Waste water tank level sensor		0	7
7	Solar		0	9
10	Communication line (RS485)	10m	1	PMLCDC-10
11	Temperature line	5m	1	PMTS
12	Battery sensor line	3m	1	PMBS
13	Water tank probe line	Not included	0	PMWS200 / PMWS400
14	Water tank probe line		0	
15	Water tank probe line		0	
16	Water tank probe line		0	
17	Power Cable	1.5m	1	PMAC

Table 4 Component List of PM200-BTJ



4.2 System Schematic

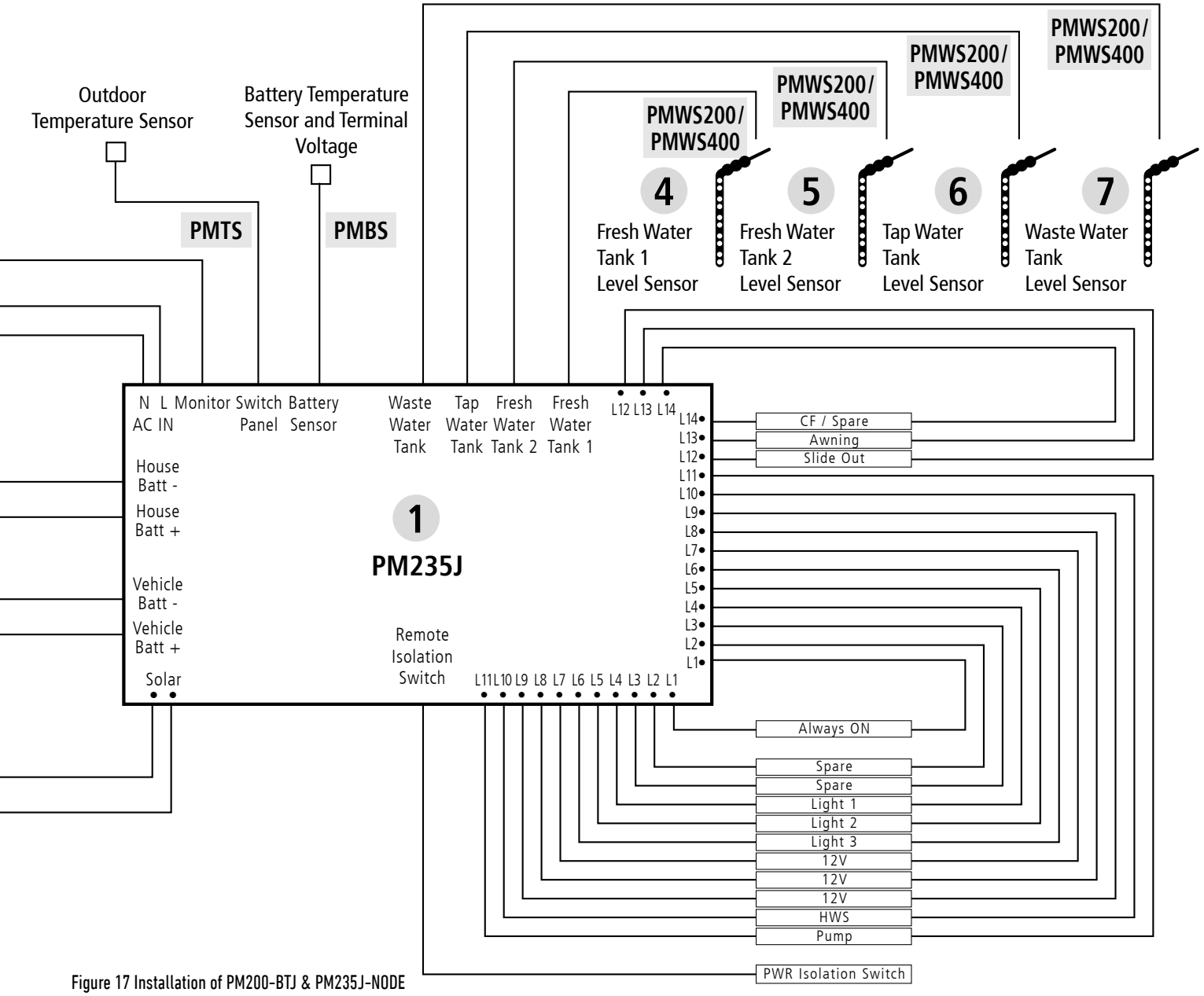


Figure 17 Installation of PM200-BTJ & PM235J-NODE

4.3 Preparation

PM200-BTJ and PM235J-NODE systems are designed with the concept of 'Plug in and Play' in mind. To complete the easy installation, a screw driver and DC cables are required. Follow Table 5 recommendation for minimum wiring size.

CURRENT	MINIMUM CABLE SIZE
0–5A	1.0mm^2 or 18 AWG
5–10A	2.0mm^2 or 14 AWG
10–15A	3.0mm^2 or 13 AWG
15–20A	4.0mm^2 or 11 AWG
20–25A	5.0mm^2 or 10 AWG
25–30A	6.0mm^2 or 9 AWG

Table 5 Minimum cable size

When running cables, if they pass through panels or wall, ensure the cables are protected from damage by sharp edges. In such cases, it is recommended to use cable glands.

4.4 Connection

PM235J transformer unit is designed with a spring and screw terminal. Please refer to following illustration at right.
Each type of terminal is designed to fit a different range of cables.

TYPE	TERMINAL MODEL NUMBER	SUITABLE CABLE GAUGE
Type 1	ERTB10-10.16	0.5mm^2 – 10mm^2
Type 2	Wago804-114	0.25mm^2 – 2.5mm^2
Type 3	Wago2704-103	0.5mm^2 – 6mm^2

Table 6 Recommended terminal and cable gauge

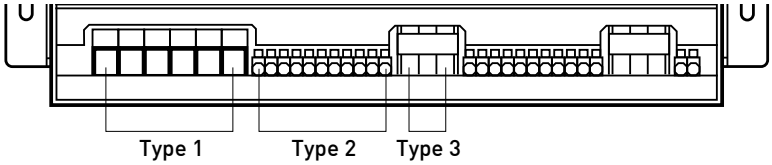


Figure 18 PM235J Terminals

TYPE 1

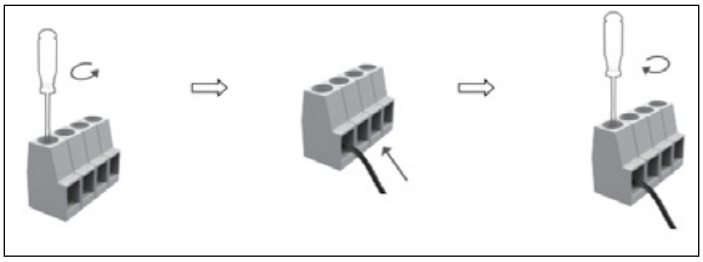


Figure 19 Connection of Terminal Type 1

TYPE 3

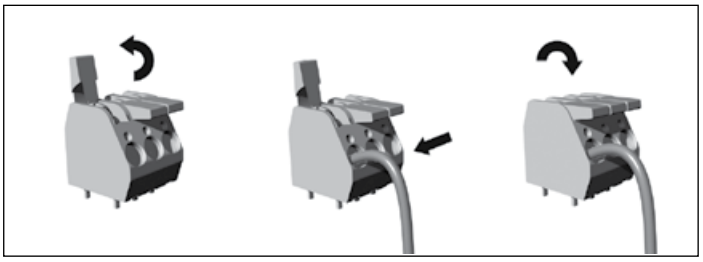


Figure 21 Connection of Terminal Type 3

TYPE 2

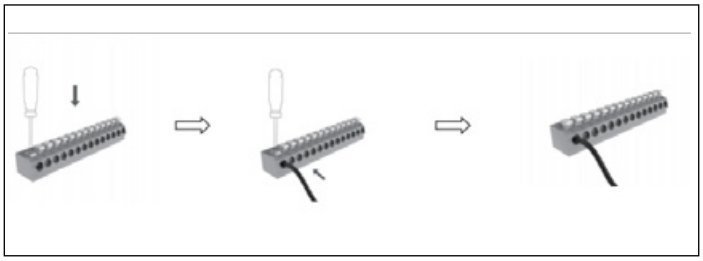


Figure 20 Connection of Terminal Type 2

5. DISPLAY

5.1 PM235J Transformer Unit

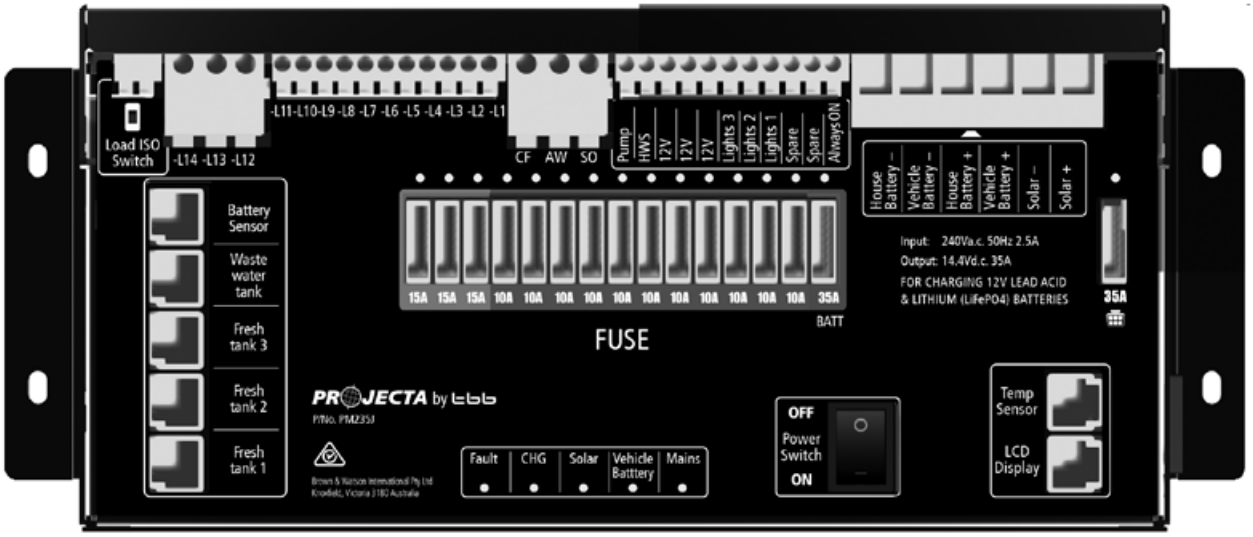


Figure 22 An overview of PM235J

No.	LED	COLOUR	STATUS	DESCRIPTION
1	Mains	GREEN	ON	AC input OK
			OFF	AC disconnected
			Quick flashing (flash twice every second)	AC input abnormal
2	Vehicle Bat	GREEN	ON	Alternator charging the house battery
			Slow flashing (flash once every second)	Vehicle battery is >13.4V and is being charged by the AC
			Quick flashing (flash twice every second)	The vehicle battery is 2~13.4V or >16.0V, while AC power is connected.
			OFF	Vehicle battery is disconnected.
3	Solar	GREEN	ON	Solar charging the battery
			Slow flashing (flash once every second)	The input voltage of the Solar is normal but it is charged by the AC or vehicle battery
			Quick flashing (flash twice every second)	Solar input voltage error – Solar voltage >25Vdc
			OFF	Solar disconnected
4	CHG	GREEN	ON	Battery charged
			Slow flashing (flash once every second)	Battery charging
			Quick flashing (flash twice every second)	Battery discharge
			OFF	Battery disconnected
5	FAULT	RED	ON	Short circuit
			Flash once per cycle	House battery voltage low
			Flash twice per cycle	House battery voltage high
			Flash 3 times per cycle	PM235J unit Over Temperature
			Flash 4 times per cycle	Bulk charge timeout
			Flash 5 times per cycle	VCR anomaly
			Flash 6 times per cycle	Environment Over Temperature

Table 7 LED indicator description of PM235J

5.2 LCD Monitor (PM200-BTJ only)

Figure 23 An overview of monitor

The PMLCD-BTJ monitor can be paired to a smart phone via the smart device app. This app will display the battery parameters, water tank levels, allow pump control and power isolation. Refer to section 6.3 for the Bluetooth pairing procedure.

5.2.1 LCD Monitor Symbol Explanation

No.	DESCRIPTION		COMMENTS
1	Water level		0%-25%-50%-75%-100%
	Water Tank 1	EMPTY	Flashing, the water is less than the recommended level
	Water Tank 2		
	Water Tank 3		
	Water Tank 4	FULL	Flashing, the gray water or waste water is more than the alarm level
2	Working Mode	MAINS	AC mains status
		CHARGE ONLY	Battery charger only
3	Power		Status of DC-Load switch in system: on / off
		BATTERY	DC loads are powered by battery
4	Water Pump		Pump 1 is ON
			Pump 1 is OFF
5	Alarm Error Code		Overload alarm
			Over temperature alarm
			System error code. Refer to the error codes on page 20
6	VCR connection		Voltage charging relay (VCR) is connected
			Voltage charging relay (VCR) is disconnected
7	Output power		Voltage of system output
			Current of system output

Table 8 Symbol Explanation

5.2.2 LCD Monitor Switch Explanation

SWITCH	FUNCTION	DESCRIPTION
HWS	To switch on/off Hot Water Service	HWS on: HWS off (Appears in top left of screen for 10 seconds)
PUMP	To switch on/off pump	Refer Figure 24
PWR	To switch off all the loads connected on DC charger	Refer Figure 25
DIM	To adjust the brightness and switch off the backlight of he monitor	Total three levels of brightness
DIM Hold (5 sec)	To set clock, battery battery tank quantity etc	Hold down the 'LIGHT' button until the Date zone (Table 16) shows the setting code. It means the unit enters the setting mode. For the full details of setting codes, please refer to Chapter 6.2.1

Table 9 Switch Explanation

Figure 24 Switch ON /OFF Pump

Figure 25 Switch ON /OFF all of the DC Loads

5.2.3 Alphabet Explanation

CHARACTER	A	b	C	d	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
ALPHABET	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y

Table 10 Alphabet code

6. OPERATION

6.1 Configuration on PM235J

Configuration of the battery type and capacity can be done through the LCD Monitor or the smart device app.

6.1.1 Load Remote Isolation Switch

This function allows for the use of a remote ISO switch to turn ON/OFF the L2-L14 outputs.

6.2 Configuration on LCD Monitor

Access to the configuration menu is safeguarded with a passcode. The default is 0000 and may be set by a user.

Passcode	**Descriptions**
0000	Factory Default, no passcode
1999	Factory access passcode
XXXX	User define

Press the 'DIM' button until the setting code is showing on the date time area which means the monitor is ready for configuration. The 'PUMP' button and 'PWR' button can be used to scroll through the configuration menu.

CODE	FUNCTION	DESCRIPTION
CLOC	Time Setting	Set date system 12H/24H and date.
bAtt	Battery Setting	
tyPE	Battery Type	AGM / GEL / LFP ($LiFePO_4$)/WET
CAPA	Battery Capacity	
bLuP	Battery Low Voltage Protection	To shutdown the output of loads
FACtry	Restore factory defaults	
CAnCEL	Cancel	Cancel to restore factory defaults
ACCEPt	Accept	Confirm to restore factory defaults
uEr	Version	Software version of devices. read only
CMP	CMP	Software Version of PM235J
LCd	LCD	Software Version of PMLCD-BTJ
UPdAt En	Update enable	Enable to update firmware

Table 16 Setting code of the Monitor

6.2.1 LCD Monitor Configuration Menu

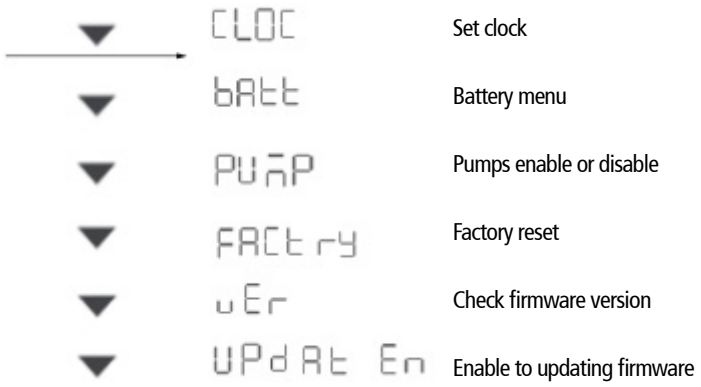


Figure 26 Main menu of setting

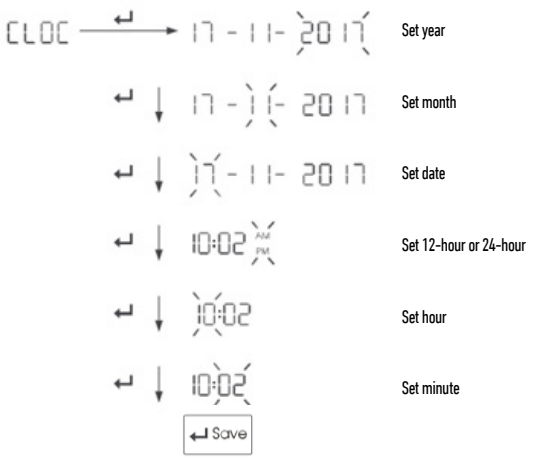


Figure 27 Date and Time setting

Figure 28 Battery Type setting

Figure 29 Battery Capacity setting

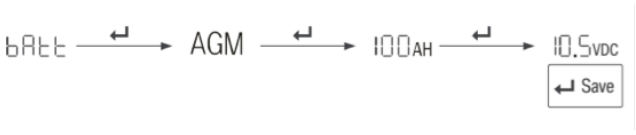


Figure 30 Low Voltage Protection setting

Figure 31 Restore factory setting

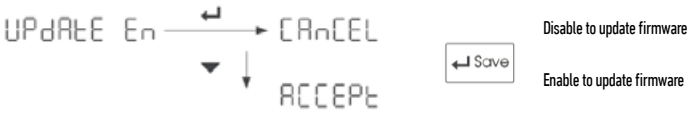


Figure 32 Update firmware

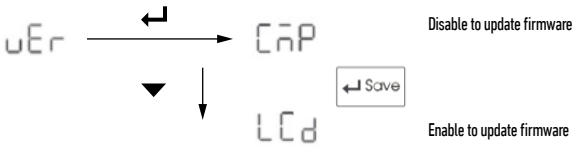


Figure 33 Check firmware version

6.3 Connecting to a Smart Device (Bluetooth)

1. Go to your smart device's App Store (iPhone/iPad) or Play Store (Android) and search for the Jayco "IntelliJay PM200-BTJ" app. Download this app to your smart device.

2. Ensure Bluetooth is enabled on your smart device and that permission is granted for the app to use Bluetooth and discover new connections.

3. Open the app and it will begin searching for either your PMLCD-BTJ LCD monitor (for PM200-BTJ systems), or your PMBTJ-02 Bluetooth node (for PM235J-NODE systems). When it shows up in the device list, tap and you will be prompted to enter a pairing code.

4. This pairing code will be displayed on the LCD monitor/screen of PM200-BTJ systems. For PM235-NODE systems, the pairing code is the last 4 digits of the serial number located on the side of the PMBTJ-02 Bluetooth node. Enter this code on your smart device and confirm.

If your system does not show up in the device list, ensure the following:

– You are within close enough proximity to the LCD monitor or Bluetooth node.

– The LCD monitor or Bluetooth node is properly connected to the PM235J transformer and operational

– Your smart device operating system is up to date (iOS 8.0 and higher, or Android 4.4 and higher)

6.4 Using the PM200-BTJ Remote App

1. Once you have established a paired connection with your smart device, the app will take you to its home screen where you may see a variety of system parameters.

2. It is now important to select your battery type, to ensure ideal charging and system operation. To do this, tap the white settings cog/gear down the bottom of the screen. Note: depending on your device, you may need to scroll to reveal this menu. Tap the down arrow under "Type". Choose your battery type from the list – AGM, GEL, LFP (lithium) or WET. Next, it is important to set your battery capacity in amp hours (Ah). You can find this information printed on your battery. Tap the right arrow under "Capacity" to specify your battery capacity.

3. It is also recommended that you update your PM200-BTJ or PM235J-NODE system to the latest firmware – this can be done by via the update function in the settings menu (your system may already be up to date). Please ensure you remain in close proximity to the system and do not disconnect power to the system or your phone during an update.

4. From the home screen, the PM200-BTJ app allows the user to remotely monitor key aspects of the power system from the convenience of their phone or tablet, as well as remotely switch on or off power to the output load, hot water system and water pump.

The following information is displayed in the app's home screen:

– House battery SOC, volts, amps, time remaining and temperature

– Vehicle battery voltage

– Charging mode/status

– Power input source (grid, solar/PV or VCR)

– Water tank levels (when sensors connected/installed/operational)

– Load, hot water system and water pump status and power buttons

The power button may be used to turn output load power on or off, resulting in startup or shutdown of all appliances and lighting wired to outputs on the PM235J transformer.

NOTE: This switch only affects output load – the app will continue monitoring parameters and retain its Bluetooth connection to your smart device, even with the load off.

6.5 MAINTENANCE

6.5.1 Battery SOC Monitoring

The PM235J transformer unit features built-in state of charge (SOC) monitoring for the house battery. To ensure accurate display of this information on the LCD monitor and in the app, the following conditions must be adhered to:

1. Battery capacity is set correctly in the LCD or app – refer to your battery specifications.
2. When replacing a battery, ensure it is fully charged via AC mains for the first time.
3. Fully charge battery via AC mains at least once every 3 months, until the 'CHG' LED light on the PM235J transformer unit remains on (solid) or 'float' shows on the monitor.

6.5.2 DAILY MAINTENANCE

- Ensure the Power Switch on the transformer unit is ON when you want to charge the battery with AC mains.
- Check the nominal battery voltage is 12VDC.
- Ensure there is space (10cm each side) beside the PM235J unit for the appropriate ventilation.

7. TROUBLE SHOOTING

7.1 L.E.D Display on PM235J Transformer Unit

No.	LED	COLOUR	STATUS	DESCRIPTION
1	Mains	Green	Quick flashing (flash twice every second)	AC input abnormal
2	Vehicle Bat	Green	Quick flashing (flash twice every second)	The vehicle battery is 2~13.4V or >16.0V, while AC power is connected.
3	Solar	Green	Quick flashing (flash twice every second)	Solar input voltage error – Solar Input >25Vdc
4	Fuse LED	Red	Solid	Fuse blown, need to check load and replace fuse
5	Fault	Red	ON	Short circuit
			Flash once per cycle	House battery voltage low
			Flash twice per cycle	House battery voltage high
			Flash 3 times per cycle	PM235J unit over temp
			Flash 4 times per cycle	Bulk charge timeout
			Flash 5 times per cycle	VCR anomaly
			Flash 6 times per cycle	Environment over temp

Table 17 Error LED indicator of PM235J

7.2 Error Code on LCD Monitor

ERROR CODE	DESCRIPTION
8001	Lose communication
8003	Loss of communication
8004	Battery voltage high
8005	Solar voltage low
8006	Solar voltage high
8010	Battery temperature high
8011	Battery temperature low
8012	Internal temperature high
8013	Vehicle battery voltage low

ERROR CODE	DESCRIPTION
8014	Vehicle battery voltage high
8015	Over load
8016	Output short circuit
8017	Module protection
8018	Battery maintenance notice
8027	VCR connect is error
8028	VCR disconnect error
8030	Environment temperature is high
8031	Bulk stage time-out

Table 18 Error Code List

8. SPECIFICATION

MODEL		PM235J
ELECTRICAL SPECIFICATIONS		
Mains	Nominal input voltage (V)	240±10%VAC 50/60Hz
	Power factor	0.95
	Input current at full load	2.5A
Battery	Vehicle battery	12VDC
	Vehicle battery voltage range	12.8-16VDC
	House battery	12VDC
	House battery voltage range	10.5-16VDC
Solar	Charger type	PWM
	Open circuit voltage	25VDC
	Max charging current	30A
	Maxium solar input	800W
Charging Relay	Relay specification	12VDC 60A continuous, peak current 100A, 30mins
	Connect voltage	Lead Acid - 13.4VDC $LiFePO_4$ - 13.7VDC
	Connect delay time	10sec
	Disconnect voltage	Lead Acid - 12.8VDC $LiFePO_4$ - 13.3VDC<2A
	Disconnect delay time	60sec
	High voltage limit	16.0VDC
Charger Mode	Charge Algorithms	5 Stage
	Battery type	AGM/GEL/LFP ($LiFePO_4$)//WET
	Start voltage	2V for Lead Acid 0V for LFP
	Bulk current	30A (Max)
	Absorption voltage	(14.4/14.1 /14.4/14.7) ±0.15VDC
	Float voltage	(13.5/13.5 /13.5/13.7) ±0.13VDC
Power Supply Mode	Nominal output voltage	12.8±0.2 VDC
	Rated output current	35A (Continuous)
Efficiency		88%
Working temperature		-40°C~+65°C (50°C:full load; 60°C:20A; 65°C: shutdown the output)

MODEL		PM235J	
ELECTRICAL SPECIFICATIONS			
Battery Disconnect (LVD)	Disconnect voltage	AGM/GEL/WET	10.5VDC (default)
		LFP ($LiFePO_4$)	11.2 VDC (Default)
	Delay off time	60 sec	
	Reconnect voltage	AGM/GEL/WET	11.5VDC (default)
		LFP ($LiFePO_4$)	12.2 VDC (Default)
Current draw on Battery	240VAC is off, no vehicle charging	330mA	
	Load switch off	255mA	
	LVD off, Service<10.5V current draw on battery	180mA	
	Battery switch OFF <10V draw on battery	0mA	
Fused outputs	Numbers	14	
	Rated Current	10A x 11, 15A x 3	
Protection	Short circuit on output	Fuse blown	
	Reverse polarity	Diode reverse isolation	
	Overload protection	Derate the output until overload is removed	
	Battery charger over temperature	Shut down PM235J	
	Ambient over temperature	Alarm	
	Battery over voltage limits	Battery charger disconnect, loads disconnect	
PHYSICAL SPECIFICATIONS			
Dimensions (L*W*H)	264 × 164 × 128mm		
Weight	3kgs		
Enclosure	Steel Case		
Battery Connector	M4 Screw (16mm^2)		
Load Connector	Wago804-114 (2.5mm^2)	Wago2706-103 (6mm^2)	
Cooling	Forced cooling		
Protection category	IP20		
Approvals			
Electrical	AS/NZS 60335.2.29		
EMC	CISPR14		

Table 19 Specification of PM235J

Notes

WARRANTY STATEMENT

Applicable only to product sold in Australia

Brown & Watson International Pty Ltd of 1500 Ferntree Gully Road, Knoxfield, Vic., telephone (03) 9730 6000, fax (03) 9730 6050, warrants that all products described in its current catalogue (save and except for all bulbs and lenses whether made of glass or some other substance) will under normal use and service be free of failures in material and workmanship for a period of three (3) years (unless this period has been extended as indicated elsewhere) from the date of the original purchase by the consumer as marked on the invoice. This warranty does not cover ordinary wear and tear, abuse, alteration of products or damage caused by the consumer.

To make a warranty claim the consumer must deliver the product at their cost to the original place of purchase or to any other place which may be nominated by either BWI or the retailer from where the product was bought in order that a warranty assessment may be performed. The consumer must also deliver the original invoice evidencing the date and place of purchase together with an explanation in writing as to the nature of the claim.

In the event that the claim is determined to be for a minor failure of the product then BWI reserves the right to repair or replace it at its discretion. In the event that a major failure is determined the consumer will be entitled to a replacement or a refund as well as compensation for any other reasonably foreseeable loss or damage. This warranty is in addition to any other rights or remedies that the consumer may have under State or Federal legislation.

IMPORTANT NOTE

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.

Distributed by

AUSTRALIA

Brown & Watson International Pty Ltd
Knoxfield Victoria 3180
Telephone (03) 9730 6000
Facsimile (03) 9730 6050
National Toll Free 1800 294 294

NEW ZEALAND

Narva New Zealand Ltd

22–24 Olive Road
PO Box 12556 Penrose
Auckland New Zealand
Telephone (09) 525 4575
Facsimile (09) 579 1192

IS469
Issue 2020/10