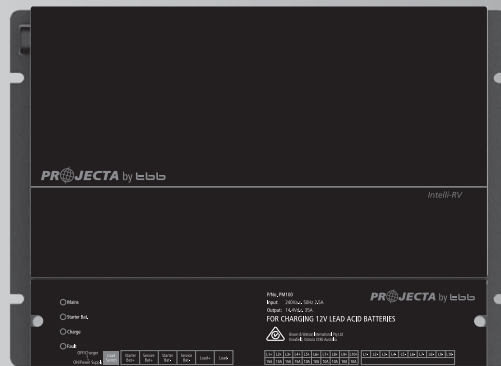


INTELLI-RV

12V POWER MANAGEMENT SYSTEM



P/No. PM100

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1. System Introduction PM100

PM100 is designed for use in caravans or motor homes. The PM100 is designed for an easy installation and a user-friendly interface without the need for a highly tailored cable harness.

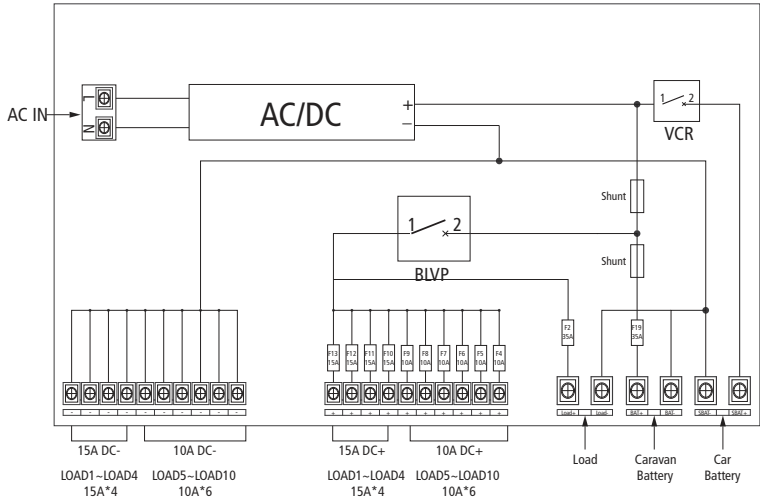


PM100 unit

1.1 Features

- Smart battery charger 12V 35A (20A for Charging Current)
 - Multiple battery charging stages to ensure the proper charging to battery
 - High efficiency, max 88%
 - PFC available
- Battery charging relay 12V 60A
 - 60A continuously and 100A for 30mins
- Battery Low Voltage Protection
 - Automatic disconnection when battery voltage is lower than 10.5VDC
 - Delay time is 60s
- 10 x Fused digital DC distributions (4 x 15A, 6 x 10A)
- Thermal-controlled fan

WORKING PRINCIPLE



MULTIPLE INPUTS

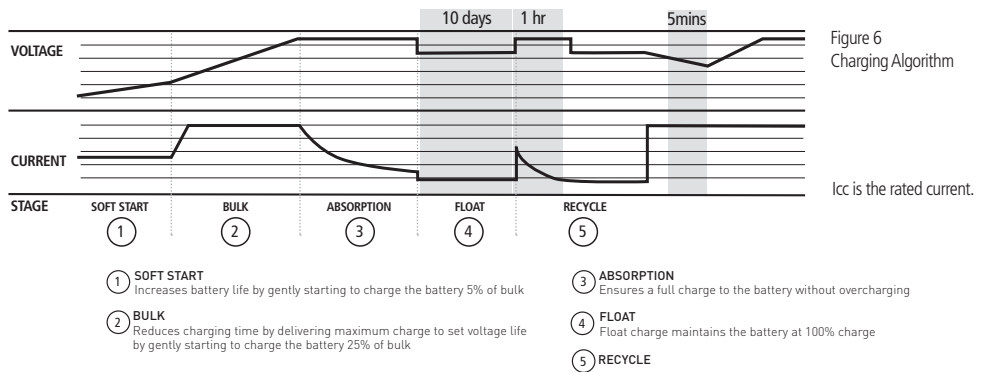
PM100 has two inputs: AC mains and auxiliary (AUX). There will only be one source providing power at a time, even if all are available, priorities are listed below.

AC Mains	✓
AUX(Starter battery)	✓
Dominating Source	AC Mains

1.2 Battery Charger of stationery/service battery

The charger automatically starts when the power is connected, either from grid or generator.

With multiple charging stages (soft start, bulk, absorption, float, recycle), PM100 is designed to fully charge the battery quickly. To guarantee the optimal charging for batteries of different states, the PM100 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.



POWER SUPPLY MODE

When the dip switch is set to “power supply” mode. PM100 offers a static 12.8VDC output for the DC loads.

1.3 Battery Low Voltage Protection (BLVP, also known as an LVD)

PM100 has a built-in low voltage protection relay. It will disconnect the load once the battery voltage drop below the threshold voltage. The default setting is 10.5VDC.

1.4 Voltage Charging Relay (VCR, also known as a VSR)

PM100 has a built-in voltage charging relay (VCR), which offers a convenient source to charge the service battery by alternator whilst engine is running. When the starter battery reaches 13.4VDC with threshold time delay, the VCR will charge the service battery from the alternator. VCR will continue the charging until the starter battery voltage drops under 12.8VDC.

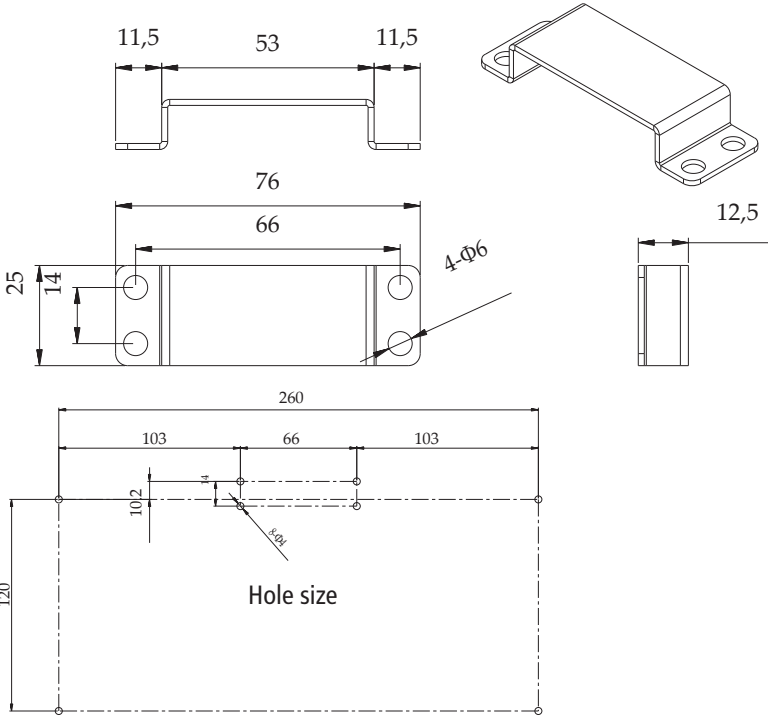
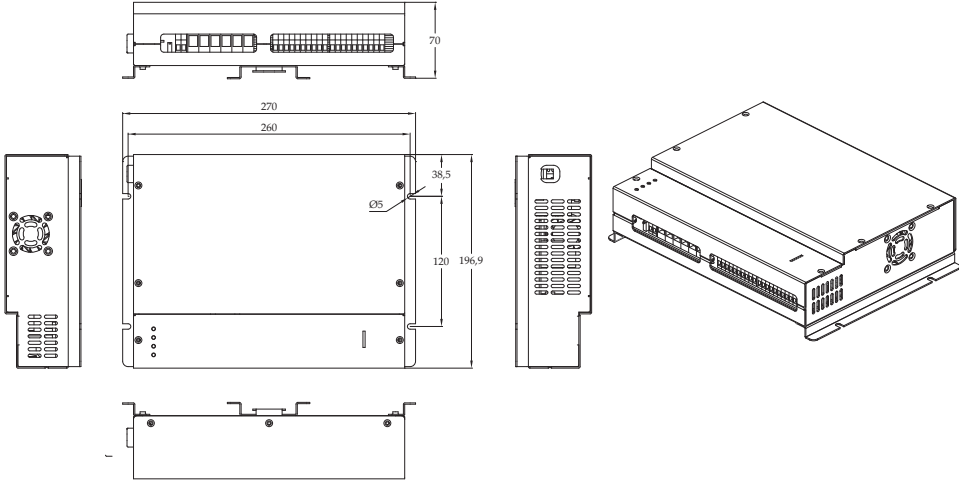
NOTE: The PM100 when charging from the starter battery does not provide the 5 stage charge. It simply takes whatever power and charging is available from the vehicle alternator.

1.5 Specification

Model		PM100
ELECTRICAL SPECIFICATIONS		
Grid	Normal input voltage (V)	240±10%VAC 50/60Hz
	Power factor	0.95
	Input current at full load	2.5A
Battery	Starter battery	12VDC
	Starter battery voltage range	12.8-16VDC
	Service battery	12VDC
	Service battery voltage range	10.5-16VDC
Charging Relay	Relay Specification	12Vdc 60A Continuous, Peak current 100A, 30min
	Connect voltage	13.4V
	Connection delay time	10 sec
	Disconnect voltage	12.8V
	Disconnect delay time	60 sec
	High voltage limit	16.0VDC
Service Battery charger Charger/ PowerSupply switch set to OFF)	Charge Algorithms	5 steps, soft start, bulk, absorption, float, recycle
	Battery type	AGM
	Start Voltage	0V
	Bulk current	20A
	Absorption Voltage	14.4±0.15VDC
	Float voltage	13.5±0.13VDC
Power supply mode (Charger/ PowerSupply switch set to ON)	Normal 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	PM100	
OTHERS		
Battery Disconnect (LVD)	Disconnect voltage	10.5VDC
	Delay off time	60Sec
	Reconnect voltage	11.5VDC
Current draw on battery	240VAC is off, no vehicle charging	200mA
	LVD battery <10.5V. Current draw on battery	60mA
	LVD battery <10.0V. Current draw on battery	0mA
Fused outputs	Numbers	10
	Rated current	10Ax6;15Ax4
Protection	Short circuit on output	YES
	Reverse Polarity	The fuse blown
	Overload protection	Reduce output, until overload is removed
	Battery charger over temperature	Battery charger shutdown
	Battery over voltage limits	Battery Charger Disconnects, Loads Disconnect
PHYSICAL SPECIFICATIONS		
Dimensions (L*W*H)	270x197x70mm	
Weight (kg)	2.6kgs	
Enclosure	steel case	
Battery Connector	M4 Screw (16mm ²)	
Load Connector	M3 Screw (4mm ²)	
Cooling	Fan colling	
Protection category	IP20	
APPROVAL		
Insulation resistance	≥50MΩ	
Dielectric strength	2KVDC/1min/1mA	
LVD	AS/NZS 60335.2.29	
EMC	CISPR14	

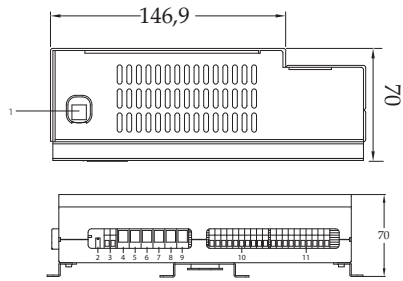
2. Structure



3. Operation

3.1 Configuration

SIDE PANEL



No.	Label	Definition	Description
1	POWER	AC input port	
2	OFF/Charger ON/Power supply	Mode selection switch	Power supply or charger mode
3	Load Switch	Load switch connector	Connect external switch
4	Starter Bat+	Starter battery connector	Connect to starter battery+
6	Starter Bat-		Connect to starter battery-
5	Service Bat+	Service battery connector	Connect to service battery+
7	Service Bat-		Connect to service battery-
8	Load+	Centralized output connector	Connect to DC load+
9	Load-		Connect to DC load-
10	L1+ → L10+	Separated DC outputs connector	Connect to DC load+
11	L1- → L10-		Connect to DC load-

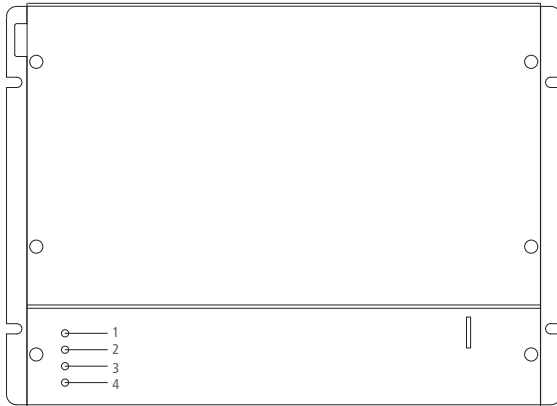
3.2 Wiring

Wiring Size:

DC cables must be sized to carry the maximum full load current and not to 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 cable Size
0-5A	1.0mm or 18 AWG
5-10A	2.0mm or 14AWG
10-15A	3.0mm or 13AWG
15-20A	4.0mm or 11AWG
20-25A	5.0mm or 10AWG
25-35A	6.0mm or 9 AWG

3.3 LED display



No.	LED	color	Status	Description
1	Mains	Green	ON	AC input ok
			OFF	AC disconnected
2	Starter Bat.	Green	ON	VCR connected
			Slow flashing (flash once every second)	The voltage of starter battery is normal but the service battery is charged by the AC
			Quick flashing (flash twice every second)	The voltage of starter battery doesn't meet the requirements, VCR disconnected
			OFF	No Starter battery connected
3	Charge	Green	ON	Battery is fully charged or in floating phase
			Flashing (flash once every second)	Battery is charging
			Slow flashing (1 second On 2 seconds off)	Battery is discharging
4	FAULT	Red	ON	Fault
			Flashes 1 time every cycle	Service battery voltage low
			Flashes 2 times every cycle	Service battery voltage high
			Flashes 3 times every cycle	Over temp (Heatsink)
			Flashes 4 times every cycle	Bulk charge timeout
			Flashes 5 times every cycle	VCR anomaly
Flashes 6 times every cycle	Over temp (Environment)			

4. Display explanation and Troubleshooting

☼	Illuminating
●	Dim
◐	Flash

* When the PM100 detects the voltage of the starter battery is below 2V, it assumes that starter battery is not connected to our system.

Mains	Str Bat.	Charge	Fault	Description	Solutions
Power supply mode (PS mode)					
☼	●	●	●	AC grid is working as the source of power supply. No starter battery connected	
☼	◐	●	●	AC grid is working as the source of power supply. Starter battery has been connected.	
Battery charger mode (CH mode)					
☼	●	◐	●	"Charge" flashes once every sec. No starter battery connected. Absorption charging by Mains Grid.	
☼	◐	◐	●	"Charge" flashes once every sec. Starter battery has been connected. Absorption charging by Mains Grid.	
☼	●	☼	●	Floating charge by Mains Grid. No starter battery connected.	
☼	◐	☼	●	Floating charge by Mains Grid. Starter battery has been connected.	
●	●	◐	●	"Charge" flashes as 1sec on then 2 secs off. Mains Grid is not available, $10.5V \leq$ Service battery voltage $<16V$. No Starter battery connected	
●	◐	◐	●	"Charge" flashes as 1sec on then 2 secs off. "Starter Bat." flashes twice every sec . Mains Grid is not available, $10.5V \leq$ Service battery voltage $<16V$. VCR doesn't charge because of the voltage of starter battery doesn't meet the requirements.	
●	☼	◐	●	"Charge" flashes once every second. Mains Grid is not available. The engine is charging the service battery via VCR.	

Mains	Str Bat.	Charge	Fault	Description	Solutions
Troubleshooting					
●	●	●	●	"FAULT" flashes once every sec. Service battery low voltage alarm. $10V \leq$ Service battery voltage $<10.5V$. No starter battery connected.	The service battery needs to be charged as soon as possible.
●	●	●	●	"FAULT" flashes once every sec. "Starter Bat." flashes twice every sec. Service battery low voltage alarm. $10V \leq$ Service battery voltage $<10.5V$. Starter batter has been connected, but VCR disconnect.	The service battery needs to be charged as soon as possible.
●	●	●	●	"FAULT" flashes twice every cycle. Service battery high voltage alarm. Service battery voltage $\geq 16V$. No Starter battery connected.	Please consult the distributor, installer or PROJECTA
●	●	●	●	"FAULT" flashes twice every cycle. Service battery high voltage alarm. Service battery voltage $\geq 16V$. Starter batter has been connected.	Please consult the distributor, installer or PROJECTA
☼	●	●	●	"FAULT" flashes 3 times every cycle. PM100 unit over temp alarm. PM100 is working under PS mode.	PM100 will restart automatically
☼	●	●	●	"FAULT" flashes 3 times every cycle. "Charge" flashes as 1 sec on then 2 sec off PM100 unit over temp alarm. PM100 is working under CHG mode.	Check the ventilation and try to disconnect some of the less priority loads. If the fault still exists, please contact the distributor, installer or PROJECTA
☼	●	●	●	"FAULT" flashes 4 times every cycle. "Charge" flashes as 1 sec on then 2 sec off. Bulk charging time out alarm.	1. Check the setting of the battery capacity. It should match the actual battery capacity. 2. Check the status of the battery. If the battery is dead, please contact the battery manufacturer or distributor.
●	☼	●	●	"FAULT" flashes 5 times every cycle. "Charge" flashes once every sec. VCR anomaly alarm.	Please consult the distributor, installer or PROJECTA
☼	●	●	●	"FAULT" flashes 6 times every cycle. Environment over temp alarm. PM100 is working under PS mode.	PM100 will restart automatically.
☼	●	●	●	"FAULT" flashes 6 times every cycle. "Charge" flashes as 1 sec on then 2 sec off. Environment over temp alarm. PM100 is working under CH mode.	PM100 will stop charging immediately.

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 one (1) year (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.