PROJECTA

INTELLI-GRID 12V

DC-DC CHARGER

P/No. PMDCS30, PMDCS60, PMDCS30-20

Need technical help?
Contact Projecta on 1800 294 294

1. GENERAL & SAFETY INFORMATION

This section contains important safety and operation instructions. Please read and retain this manual for future reference.

The DC-DC charger should be installed by a qualified Auto Electrician with knowledge of automotive electrical systems. The following recommendations are to be conducted prior to installation:

- The unit MUST not be disassembled for Safety and Warranty reasons.
- The DC-DC charger is designed for internal installation ONLY.
- Recommended cable size for input and output connections to unit need to be followed. Output charging current of the DC-DC charger will depend on wire size of the auxiliary circuits in the Charging Vehicle.
- Check and verify the input voltage is within the specifications of the unit. (Refer to Specification table).
- Check and confirm the circuit connections to the Alternator or Vehicle battery and Input to the INTELLI-GRID / INTELLI-RV (if connected) and the polarity is correct.
- Use the shortest possible cable lengths to connect the Input and Output circuits to the unit.
- Ensure there is sufficient ventilation around the heatsink of the unit.

2. INTRODUCTION

2.1 GENERAL INTRODUCTION

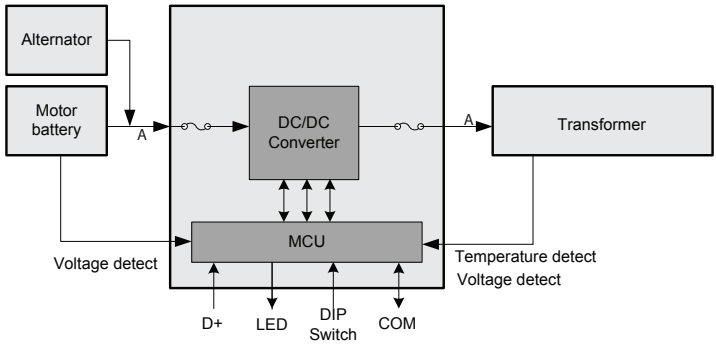
PMDCS DC-DC chargers are designed to integrate with INTELLI-RV or INTELLI-GRID battery/power management systems, but they can also function as standalone dual battery chargers. They come with stripped and tinned, labelled input and output wiring for ease of installation.

FEATURES

- Adaptive charge – adapts to smaller cables or excessive runs by adjusting the charge rate to avoid overloading wiring.
- Non-isolation design with maximum efficiency of 96%.
- Euro-6 engine (smart alternator) compatible.
- Built-in multi-stage charging algorithm.
- Built-in automatic temperature and voltage compensated charging.
- Built-in fuse protection.
- Built-in heat sink for cooling.
- RS485 communication port for future options and upgrades.
- Protection against input/output over voltage, output over current, output short circuit, internal over temperature, battery over temperature.
- Adjust current outputs and select battery type via dip switches.

2.2 BLOCK DIAGRAM

Figure 2-1: Block Diagram of DC-DC setup



The charging efficiency of the PMDCS is up to 96%.
PMDCS units also support communication of RS485.

PMDCS will treat it as conventional engine rather than Euro 6 engine.

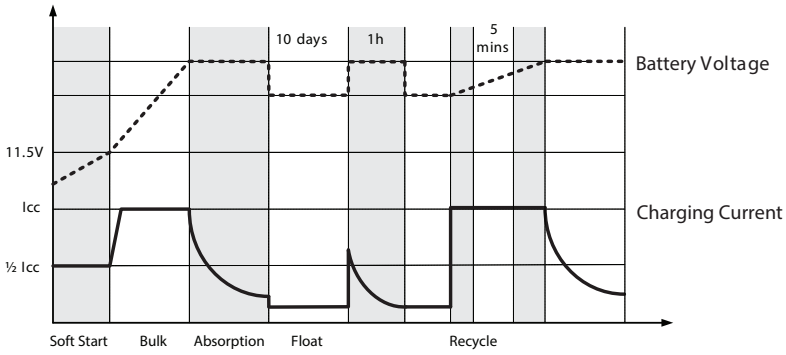
Alternator type	Alternator input voltage	Working state
Conventional alternator	13.2V with 10 second delay on	ON
	12.8V with 60 second delay off	OFF
D+ wired	11.7V	ON
	11.7V	OFF

Note: If D+ is used and you want to switch to conventional alternator mode, disconnect D+ and disconnect the PMDCS from the house/auxiliary battery and reconnect. This will reset the system.

2.3 MULTI STAGE CHARGING ALGORITHM

The charging algorithm is microprocessor-controlled with a variable absorption charging timer to ensure optimal charging for batteries with varying degrees of discharge.

Figure 2-2: Charging Algorithm



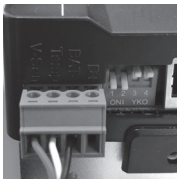
2.4 BATTERY TEMPERATURE COMPENSATION

Correct charging of the battery is affected by its temperature, so the charging formula must be adjusted automatically and in real-time based on the actual battery temperature to ensure that the battery is fully charged but not overcharged or undercharged. All charging voltages recommended by battery manufacture are applied at 20°C – 25°C.

The BTS (Battery Temperature Sensor), terminated to the PMDCS, measures the temperature of the battery and automatically makes adjustments at real-time to properly charge the batteries at the default compensation rate of -3mV/°C/cell.

If the BTS is not present or connected, the PMDCS will use 25°C as the default temperature setting.

Figure 2-3: Battery Temperature Sensor (BTS)

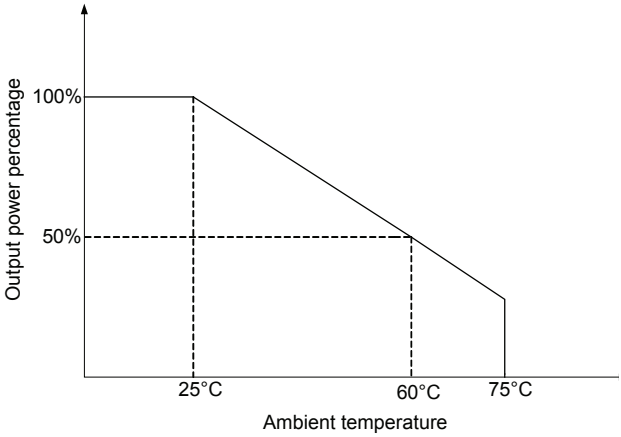


Wire	Input
Red	V-Sen
White	Temp
Black	BAT-

2.5 DE-RATE CURVE AGAINST TEMPERATURE INCREASE

The PMDCS charger will monitor internal temperature to decide output power. It will de-rate its output power against temperature increasing. The following curve shows how the output power changes with an increase in temperature.

Figure 2-4: De-rate curve against temperature increase

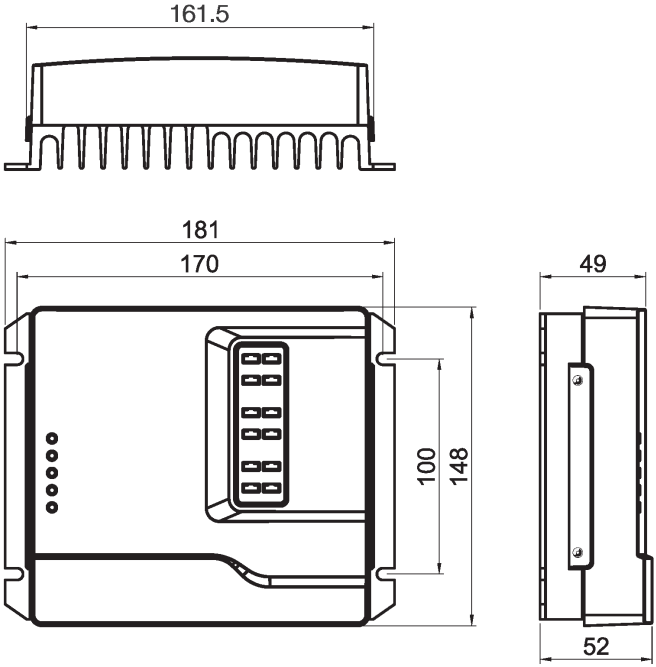


3. STRUCTURE AND DIMENSION

3.1 EXTERIOR AND DIMENSION

Figure 3-1: PMDCS front view

Figure 3-2: PMDCS dimensions



3.2 CONNECTORS AND TERMINALS

Figure 3-3: Connectors and terminals

Table 3-1: Connectors and terminals guide

No.	Print	PMDCS	Remarks	Circuit colours and labelling
1	Alternator	Connects to positive of Alternator	Connects to positive battery post	Red + Label "Aux+"
	BAT-	Connects to negative of Alternator	Connects to negative battery post	Black – Label "Aux-"
2	AUX BAT	Connects to positive of auxiliary battery		Red + Label "Vehicle Batt+"
	BAT-	Connects to negative and negative of auxiliary battery		Black – Label "Vehicle Batt-"
3	COM	For communication of RS485	Not Connected	
4	1	Only used on PMDCS30-20	Details of setting can be found as Chapter 4.6	
	2	Set on for 30Amp, off for 15Amps		
	3	Used to set battery chemistry		
	4			
5	BAT-	Connects to BTS' black cable	For battery temperature sensing	RED Ring Terminal connect to Battery +ve
	Temp	Connects to BTS' white cable		
	V-Sen	Connects to BTS' red cable	For voltage sensing	

Table 3-2: Fuse specification

No.	Print	PMDCS30	PMDCS30-20	PMDCS60	Protection for
6	Alternator	30A/32VDC	40A	Internal	Input from alternator
7	AUX BAT	20A/32VDC	20A	Internal	Output to charge auxiliary battery
N/A	Fridge	N/A	15A	N/A	Fridge output

3.3 STATUS INDICATORS

Table 3-3: LED codes

No.	Print	Power	Fridge/Load	Alternator	Charge	Fault
4-2	Alternator Present	Green Light On	Green Light Off	Green Light Off	Green Light Off	
4-3	Charger faulty	Green Light On	Green Light Off	Green Light Off	Green Light Off	Red Light On
4-5	Alternator over voltage	Green Light On	Green Light Off	**Green Light Flash**	Green Light Off	**Red Light Flash**
4-6	Fridge/Load Short Circuit*	Green Light On	**Green Light Flash**	Green Light On	Green Light Off	Red Light On
4-7	Fridge/Load Output Overload*	Green Light On	**Green Light Flash**	Green Light On	Green Light Off	Red Light On
4-9	Bulk Time out	Green Light On	Green Light Off	Green Light On	**Green Light Flash**	**Red Light Flash**
4-12	Output Overvoltage	Green Light On	Green Light Off	Green Light Off	**Green Light Flash**	**Red Light Flash**
4-13	Fridge/Load output	Green Light On	Green Light On	Green Light On	Green Light On	Red Light Off
4-14	Softstart Charging	Green Light On	Green Light On	**Green Light Flash**	**Green Light Flash**	Red Light Off
4-15	Bulk charging	Green Light On	Green Light Off	Green Light On	**Green Light Flash**	Red Light Off
4-16	Absorption charging	Green Light On	Green Light Off	**Green Light Flash**	Green Light On	Red Light Off
4-17	Float charging (charged)	Green Light On	Green Light Off	Green Light On	Green Light On	Red Light Off
4-18	Recycle Mode	Green Light On	Green Light Off	**Green Light Flash**	**Green Light Flash**	Red Light Off

4. INSTALLATION

4.1 CHECK YOUR PRODUCT

Before installation, check that the product is in good physical condition.

Please check the item with the list attached in the box.

4.3 PROPER INSTALLATION LOCATION

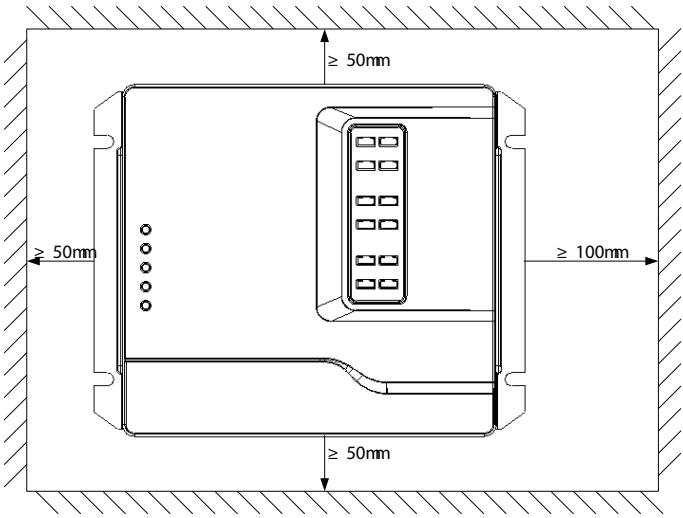
- The DC-DC charger is designed with IP20 and for internal installation ONLY.
- The temperature at the casing and heat sink of the DC-DC charger can be as high as 60°C during operation.
- Ensure the DC-DC charger is installed away from flammables and explosives.
- Ensure the DC-DC charger is installed out of reach of children.
- Ensure mounting surface is flat and rigid.

Never install the DC-DC charger in a sealed enclosure with battery.

4.4 INSTALLATION SPACE

For adequate ventilation, it is important to leave space around where the DC-DC charger is installed. See recommended spacing dimensions below.

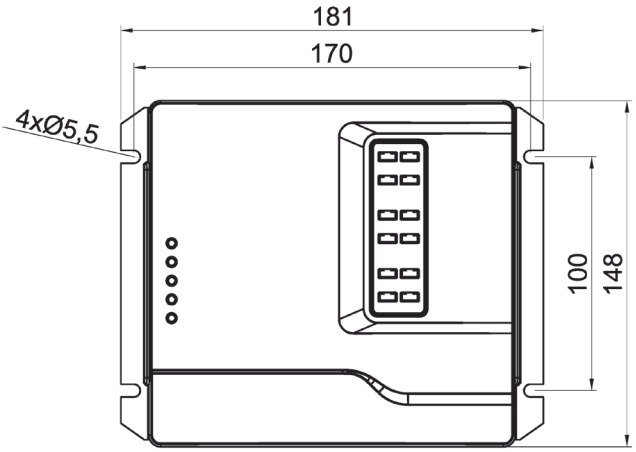
Figure 4-1: The required dimensions for ventilation



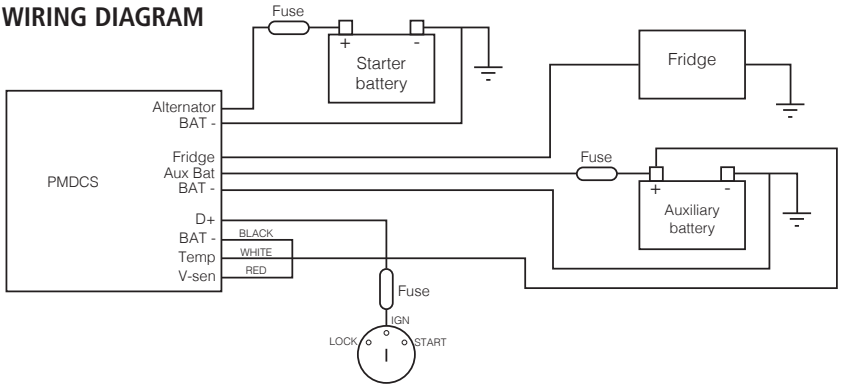
MOUNTING HOLES

Find an appropriate mounting surface, flat and rigid. Drill mounting holes per the dimensions below.

Figure 4-2: Drill holes for mounting



4.5 WIRING DIAGRAM



PMDCS30 Recommended cables:
– Alternator positive/negative cable: 8 B&S, 8mm² up to 9m, Fuse 80A
– Auxiliary positive/negative cable: 8 B&S, 8mm² up to 9m
– D+ signal: >0.64mm², Fuse 5A

PMDCS30-20 Recommended cables:
– Alternator positive/negative cable: 6 B&S, 14mm² up to 9m, Fuse 125A
– Auxiliary positive/negative cable: 8 B&S, 8mm² up to 9m
– Load cables: 8 B&S, 8mm², Fuse 80A
– D+ signal: >0.64mm², Fuse 5A

PMDCS60 Recommended cables:
– Alternator positive/negative cable: 4 B&S, 20mm² up to 9m, Fuse 175A
– Auxiliary positive/negative cable: 6 B&S, 14mm² up to 9m, Fuse 125A
– D+ signal: >0.64mm², Fuse 5A

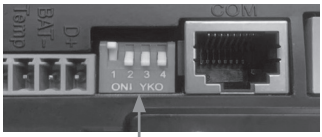
4.6 DIP SWITCH SETTING

Table 4-1: Dip switch setting for fridge operation for PMDCS30-20

Pin 1	Operation
OFF	Constant Load Relay On (Switches between car when running and battery when car not running) Ideal for Compressor fridges
ON	Load Relay On with Ignition Input (Vehicle Charging) Ideal for 3 way fridges

Table 4-2: Dip switch setting for output current

Output Current settings		
Pin 2	**PMDCS30 & PMDCS30-20**	**PMDCS60**
OFF	15A	45A
ON	30A (Default)	60A (Default)



Dip Switches
Set output current and battery type
UP = OFF DOWN = ON

Table 4-3: Dip switch setting for battery type

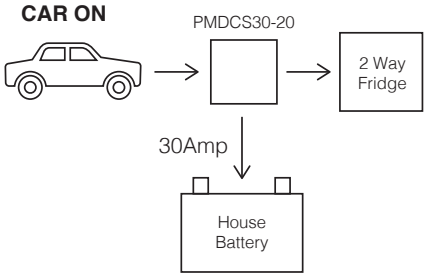
Dip switch for battery type setting		Battery type	Absorption charging voltage	Float charging voltage
Pin 3	**Pin 4**			
OFF	OFF	AGM (Default setting)	14.4V	13.5V
OFF	ON	GEL	14.1V	13.5V
ON	OFF	LFP	14.2V	13.5V
ON	ON	WET	14.7V	13.5V

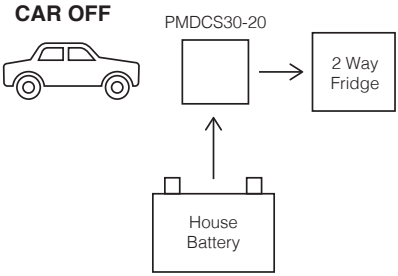
Do not connect the DC-DC charger to AC Mains

Please ensure the connections are tight and have correct polarity. Damages caused by improper installation may void warranty.

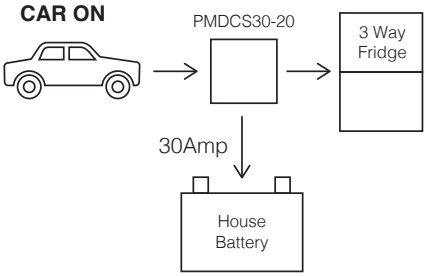
5. FRIDGE BYPASS MODE (PMDCS30-20 ONLY)

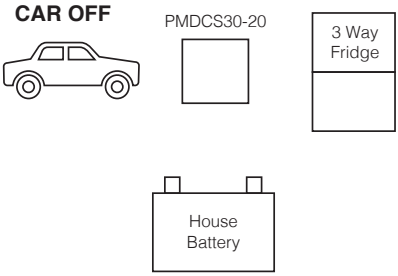
5.1 CONTINUOUS POWER MODE





5.2 NON CONTINUOUS POWER MODE





6. SPECIFICATION

Part Numbers	PMDCS30	PMDCS60	PMDCS30-20
Electrical			
Alternator input voltage range (Intelligent type)	12~16VDC		
Automatic activation D+	Yes		
Absorption charge voltage	Default Setting: 14.4VDC		
Float charge voltage	Default Setting: 13.5VDC		
Charge current	<30A	<60A	<30A
Total current of load and charging	<30A	<60A	<50A
Maximum charging efficiency	96%		
Temperature compensation	Default Setting: -3mV/°C/cell		
Voltage compensation	Yes		
Charge algorithm	Premium II Multi-Stage		
Protection	• Battery charger over temperature • Over load • Short circuit		
Communication	RS485, RJ45 connector		
Storage temperature	-40°C ~70°C		
Operating temperature	-40°C ~70°C		
Enclosure			
Battery Connection	Cable with connector		
Protection category	IP20		
Weight	1.0kg		
Dimensions (h*w*d)	181*148*52mm		
Standards			
Emission	ECE 10R-06, EN61000-6-1, EN61000-6-3		

WARRANTY STATEMENT

Brown & Watson International Pty. Ltd. ("BWI") of 1500 Ferntree Gully Road, Knoxfield, Vic., telephone 1800 294 294, warrants that all products described in its current catalogue will under normal use and service be free of failures in material and workmanship for a period of two (2) years from the date of the original purchase by the customer as marked on the invoice (see elsewhere for specific warranty period). This warranty does not cover ordinary wear and tear, abuse, alteration of products or damage caused by the purchaser.

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.

If 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. If 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
Phone: (03) 9730 6000
Fax: (03) 9730 6050
National Toll Free: 1800 113 443

NEW ZEALAND OFFICE
Griffiths Equipment Ltd.
19 Bell Avenue,
Mount Wellington,
Auckland 1060, New Zealand
Phone: (09) 525 4575