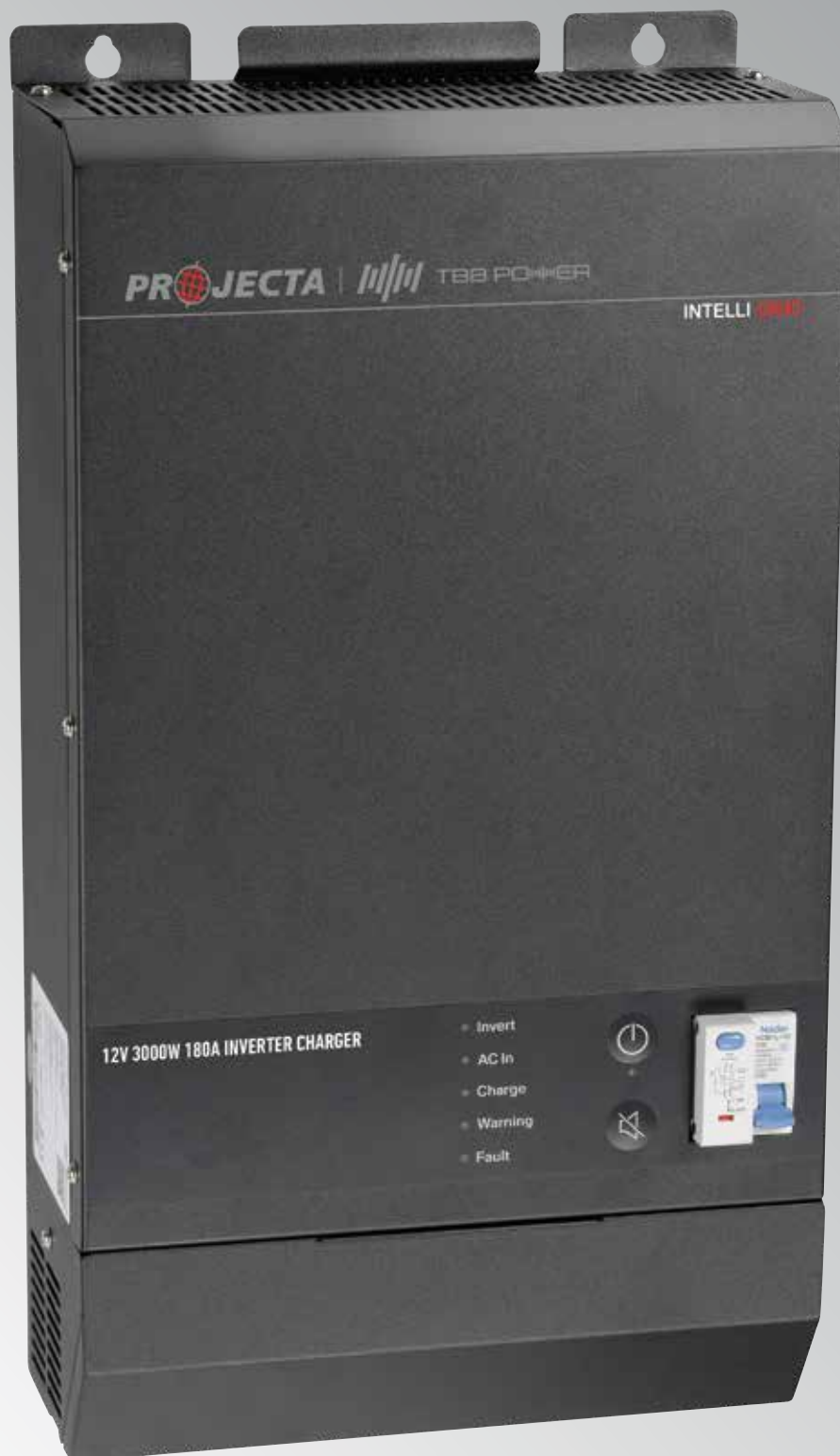


INTELLI-GRID 12V

INVERTER CHARGER



P/No INVCHR2, INVCHR3

WARNING

- High Voltages inside.
- The appliance is not to be used by persons (including children) with reduced physical, sensory or mental capability, or lack of experience and knowledge, unless they have been given supervision or instruction.
- Children being supervised are not to play with the appliance.
- This device can only charge 12V batteries:-
 - INVCHR2 can charge
 - 12V Lead Acid batteries from 100~2400Ah
 - 12V Lithium batteries from 100~1200Ah
 - INVCHR3 can charge
 - 12V Lead Acid batteries from 100~3600Ah
 - 12V Lithium batteries from 100~1800Ah
- When charging Lead Acid batteries or vented batteries, the batteries must be placed in well-ventilated area when charging.

CAUTION: THE POWER NEEDS TO BE REMOVED TO THE INVERTER CHARGER BY REMOVING THE FUSE OR DISCONNECTING THE BATTERY, PRIOR TO SERVICING

1. General Safety Instruction

1.1 Safety instruction

As dangerous voltages and high temperature exist within the Inverter Charger, only qualified and authorised maintenance personnel are permitted to open and repair it. Please make sure the Inverter Charger is turned off before opening and repairing it.

This manual contains information concerning the installation and operation of the Inverter Charger.

All relevant parts of the manual should be read prior to commencing the installation.

Please follow all local laws and regulations. Any misuse of the product according to the manual will not be covered by warranty.

1.2 General precaution

- DO NOT expose to dust, rain, snow or liquids of any type. The inverter is designed for indoor use. DO NOT block off ventilation, otherwise the Inverter Charger could overheat.
- To avoid fire and electric shock, make sure all cables selected are the right gauge and all connections are tight. Smaller diameter and damaged cables are dangerous and could risk fire.
- Please do not put any flammable goods near to inverter.
- NEVER place unit directly above Lead Acid batteries, gases from a battery will corrode and damage Inverter Charger.
- DO NOT place battery on top of Inverter Charger.

1.3 Precaution regarding battery operation

- If battery acid makes contact with your skin use plenty of water wash the acid off. If acid goes on your clothes, remove these clothes. If irritation to the skin occurs see medical advice.
- Lead Acid batteries may generate flammable gas during charging. NEVER smoke or allow a spark or flame in vicinity of battery.
- DO NOT place metal tools on the battery, a spark may occur and a short circuit might lead to explosion.
- REMOVE all personal metal items such as rings, bracelets, necklaces, and watches while working with batteries. Batteries can cause short-circuit current high enough to make metal melt, and could cause severe burns.

2. Instruction

2.1 Brief Instruction

2.1.1 General Description

INVCHR2 and INVCHR3 are 2-in-1 inverter chargers designed for high power management applications such as RV, utility vehicles, marine and emergency.

With the rapid charging capability of Projecta's lithium batteries, the Inverter Chargers can provide high current charging from a mains source and are capable of starting and powering the most demanding appliances, such as air conditioning, water pumps, washing machine, freezer, compressor, power tools and induction cooktops.

The inverter charger is fitted with an AC transfer switch which manages the AC power automatically switching between mains power and inverter power.

With their Grid Boost feature, INVCHR2 and INVCHR3 can work with a limited AC source such as a generator or restricted AC mains to provide an additional boost using DC power.

2.2 Structure

2.2.1 Front



2.2.2 Control panel

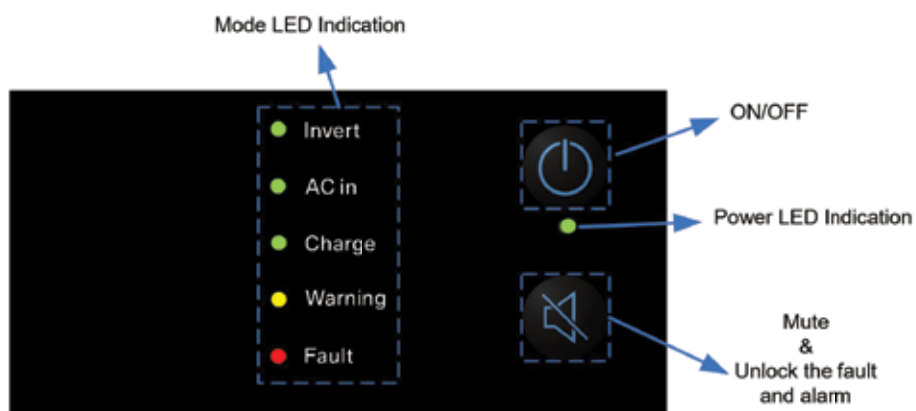


Table 2-1 LED directive funtion

LED	Function
Invert	It will illuminate when unit is inverting.
AC In	It will flash when unit detect any input, mains or generator.
Charge	It will flash when unit is in float charging. It will illuminate when unit is in bulk or absorption charging.
Warning	It will flash when unit has warning.
Fault	It will flash when unit has error.

2.2. Bluetooth LCD monitor (P/No. INVCHR-BT)

Allows users to remotely monitor and control Projecta Inverter Chargers. Displays battery voltage*, current*, Inverter load percentage, AC input/output voltage, frequency and power. Battery status can also be monitored via smart phone or tablet if connected with Bluetooth.

- Remotely switch on/off Inverter and AC power out of the Inverter Charger.
- Will show battery information when a Projecta HD series lithium battery is connected to the system.
- The APP can be downloaded from the APP store or Google play under PROJECTA Inverter Charger (INVCHR2/3).



Figure 2-3 Remote control and monitor MCK

2.2.4 Connection compartment

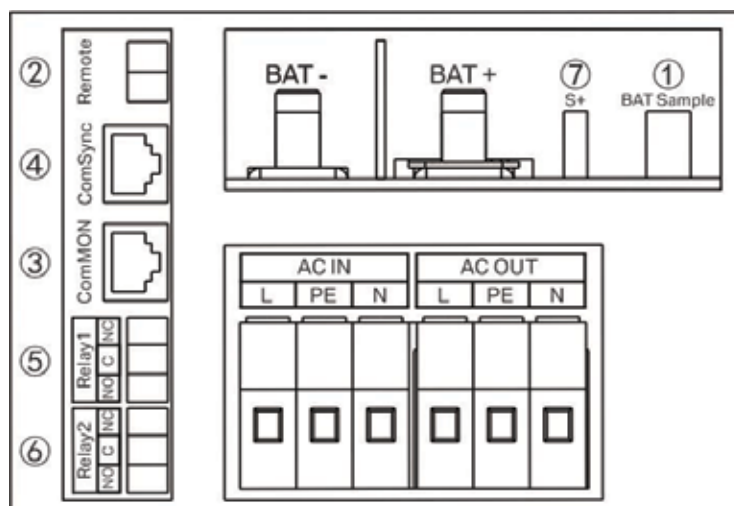


Figure 2-4 Signal terminal

Table 2-2 Signal terminal introduction

No.	Silk-screen	Definition
1	Bat Sample	Battery temperature and voltage sample.
2	Remote	A dry contact input for remote on/off.
3	Com MON	RS485 port for external monitor such as INVCHR-BT.
4	Com Sync	Communication with Projecta's HD series lithium batteries for advanced monitoring.
5	Relay1 (NO,C,NC)	Dry contact output control 1(NO,C,NC).
6	Relay2 (NO,C,NC)	Dry contact output control 2(NO,C,NC).
7	S+	Slave Charger for Starter Battery.

2.2.5 Dimension

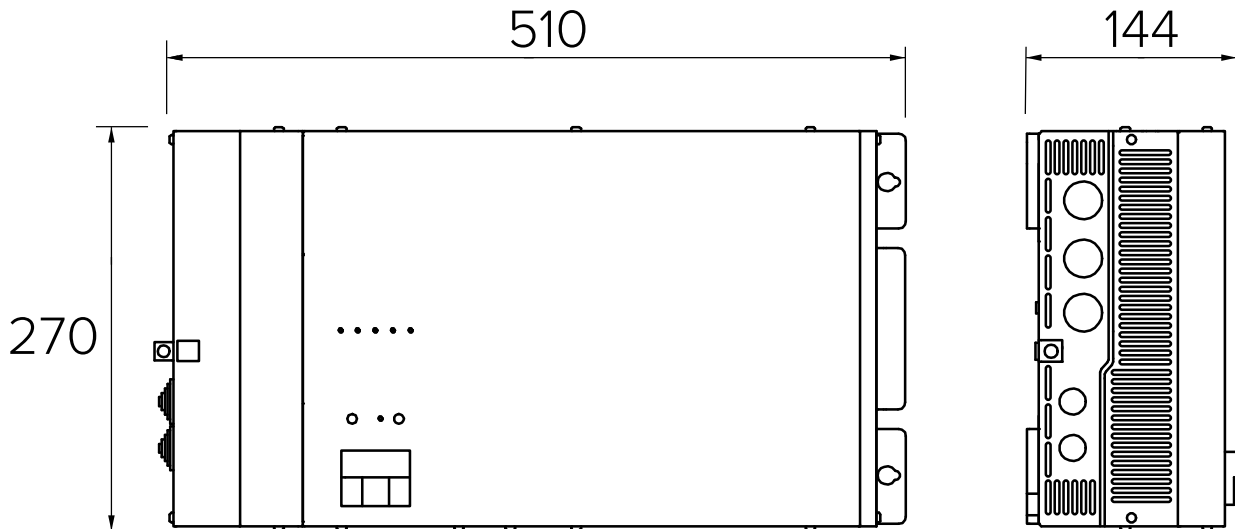


Figure 2-5 Dimension of unit

2.3 Inverter Charger Functions

Grid Boost is a useful feature when limited grid supply is available or working with a generator. The Inverter Charger will disconnect the mains AC power providing power from the inverter and battery or boost this power using AC mains and the inverter / battery power. With this feature, you can avoid tripping a shore power circuit breaker or reduce generator capacity by up to 50%.

2.3.2 Powerful and Reliable Inverter

High performance pure sine wave

INVCHR2 and INVCHR3 are pure sine wave inverters generating a near perfect waveform.

High surge power capability

Providing outstanding surge power capabilities you can easily run heavy inductive loads like fridges, coffee makers, microwaves, power tools, air conditioning and induction cooktops.

Battery low voltage protect

Inverter Charger provides configurable battery low voltage protection.

2.3.3 Professional Battery Charger for lead acid battery

Multi stage sophisticated charging algorithm for lead acid battery

Fitted with multistage charging algorithm (bulk-absorption-float-recycle), the built-in charger of Inverter Charger is designed to charge the battery quickly. Microprocessor controlled charging algorithm with variable absorption charging timer will guarantee optimal charging for batteries of different discharged state.

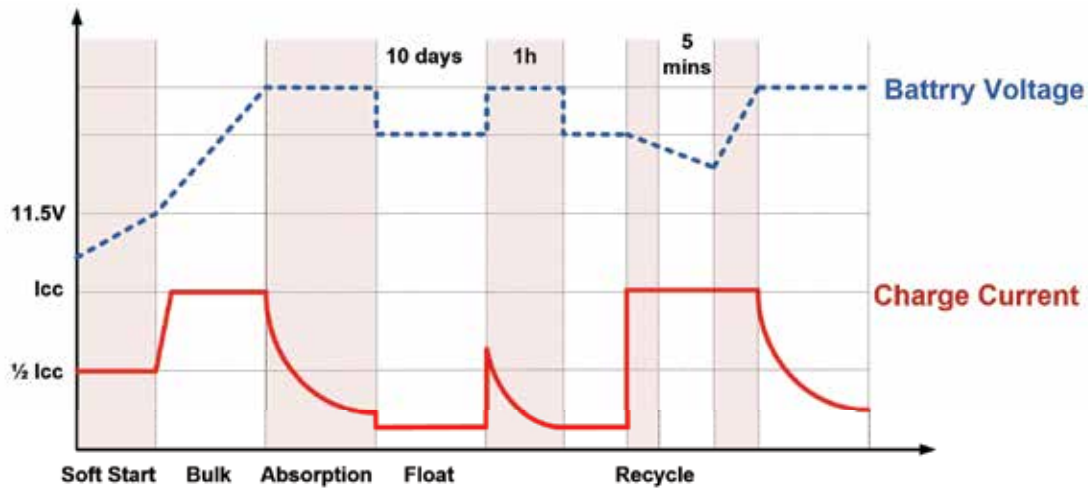


Figure 2-6 Multi stage sophisticated charging algorithm for lead acid battery

Float charging and recycle charging program guarantee your battery is getting proper maintenance in case of long standby periods providing less aging.

Battery Sample Cable (Temperature and voltage)

Battery temperature is a key factor in correct charging for lead acid batteries. The charging formula must be adjusted (automatically and in real time) according to 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 in fact ONLY applied at 20°C-25°C and the temperature probe ensures optimal charging..

The Battery sensor cable (battery temperature and voltage sensor) supplied with Inverter Charger measures the temperature of battery and automatically makes adjustments at real time to properly charge your batteries at compensation rate of $-4\text{mV}/^{\circ}\text{C}/\text{cell}$. In case of Battery sensor cable is not present, Inverter Charger will use 25°C as default setting. This feature is especially recommended for sealed batteries and/or when important fluctuations of battery temperature are expected.

Different battery chemistries

Inverter Charger offers premium charging algorithm for commonly encountered lead acid battery chemicals include AGM, GEL, Wet, lead-carbon and Lithium battery, of which you can set through the LCD/LED interface.

2.3.4 Lithium Battery Compatible

Projecta Inverter Chargers support universal LFP charging profile and offered pre-defined LFP charging profile for Projecta HD series lithium batteries.

Built in BMS pre-defined LFP charging and communication for LBXXX-HD series batteries.

According to cell temperature and real time SOC, BMS will send commands to battery charger asking for optimum charging voltage and current. This synchronization will prevent overheating or overcharging especially at the end of charging, to extend the life of the battery.

Instead of using voltage as protection, SOC value is used to avoid permanently damaging of lithium batteries due to being left discharged for long time.

2.3.5 AC Transfer Switch

In case of poor AC mains power (due to poor voltage/ frequency or waveform characteristic, the Inverter Charger will switch to inverter and battery power.

In case of AC mains failure or exceeding the maximum AC input current set by the user, the Inverter Charger will initiate a quick switch to inverter, which will guarantee continuous power. When stable AC power is resumed, the inverter charger will switch back to AC mains power after a 5 second delay. Due to its ultra quick transfer design, as quick as 0ms. The Inverter Charger could be used as a UPS.

Ground Relay

The neutral output of Inverter Charger is automatically connected to earth upon no external AC sources are available. Once external AC sources present, the ground relay will open. The Ground relay is required for the RCD to function correctly.

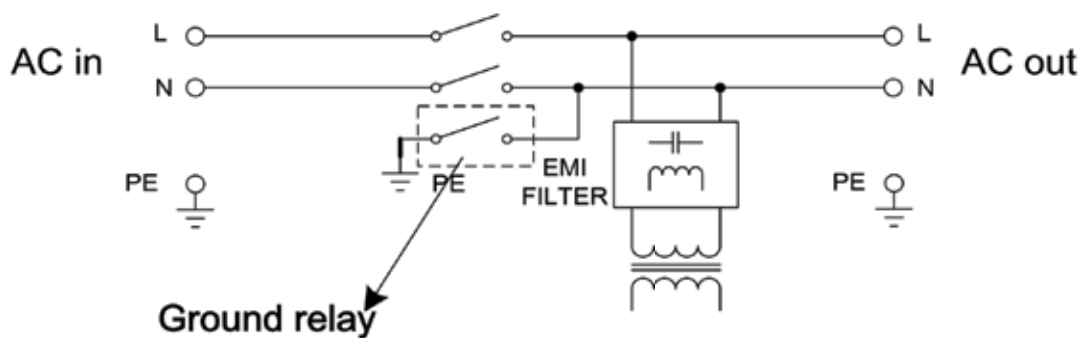


Figure 2-7 Ground Relay Schematic

2.3.6 Protections and Safeguards

The Inverter Charger is equipped with a series of complete hardware and software protection functions to ensure its stable and reliable operation.

Overload protection

When overload protection is trigger on, it will restart automatically after 60s. And after three consecutive overload shutdown protections, the equipment will not restart automatically. At this time, the user needs to manually restart.

Over temperature protection

When the internal temperature is too high, Inverter Charger will enter into the over-temperature protection. After the internal temperature returns to normal, it can automatically resume normal operation.

Short circuit protection

The equipment will automatically shut down when the AC output is shorted and needs to be manually activated.

Battery over temperature protection

During charging, the equipment will continuously monitor the battery temperature. When the battery temperature is too high, the equipment will automatically reduce the charging current. When the battery is hot the charger will automatically turn off to protect the battery.

Battery low voltage protection

To prevent the permanent damage caused by the over discharge of battery, the equipment will automatically cut off the output according to the low voltage protection point set by the user.

RCD (RCBO)

The Inverter Charger is fitted with an RCD (Safety Switch) to ensure maximum protection for our customers. The RCD is also fitted with an over current feature to protect wiring. If the RCD trips it will need to be manually reset.

2.3.7 Communication

Dry contact input

Inverter Charger is equipped with a dry contact input for remote on/off.

Dry contact output

Inverter Charger is equipped with two NO/NC relay type dry contact output. The following is the default setting:

- Relay1: The relay is closed when the battery is under voltage.
- Relay2: The relay is closed when a fault or overload occurs.

RS485

Equipped with a RS485 interface.

3. Installation and Wiring



Keep away from fire, avoid direct sunlight and rain; do not store near flammable, explosive or corrosive gases or liquids. Don't install in a working environment where metal dust can get into the inverter charger.

- Please install the equipment in a location of dry, clean, cool with good ventilation.
- Operating temperature: -20~65°C
- Storage temperature: -40~70°C
- Cooling: Force fan
- Relative humidity in operation: 95% without condensation.

4. Operation

4.1 Check before Operation

Please check before Operation according to the following.

- Inverter is installed correctly and steady.
- Reasonable cable layout to meet customer requirements.
- Make sure the grounding is reliable.
- Make sure the ground wire is properly connected, firm and reliable.
- Double check the battery breaker is OFF.
- Make sure the cables are properly connected, firm and reliable.
- Ensure there is plenty of space around the inverter charger and the area is clean and tidy.

4.2 Power ON Test



Make sure the battery voltage is within the permissible range before turning ON the breaker.

Note: there are three ways the inverter / charger can work

1. Default (test mode)
2. Fitted with Remote P/n: INVCHRD-BT.
3. Without remote or INTELLI-Grid connected.

Default Test Mode

Please follow the following instruction step by step.

- Step 1: Turn on the circuit breaker between the battery and the inverter.
- Step 2: Press the On/Off button to turn on the inverter entering into self diagnostic.
- Step 3: Press the On/Off button again to turn on the inverter.
- Step 4: Observe the LED light to make sure the inverter is running normally.
(refer to Table 2-2 LED directive function)

Power OFF



After the inverter power is turned OFF, there is still residual power and heat in the chassis, which may lead to electric shock.

- **Method 1:** Press the On/Off button about 2secs to turn off the output of inverter. Afterwards, you can press and hold the On/Off for 5secs, after hearing consecutive beep, you can permanently shut down the inverter.

- **Method 2:** Press and hold the On/Off for 5secs, after hearing consecutive beep, you can permanently shut down the inverter straight away.

Remote connected (P/n: INVCHRD-BT)

STEP 1: Turn on the circuit breaker between the battery and inverter.

STEP 2: Turn on the switch on the Remote (P/n: INVCHRD-BT). The inverter should now be working.

STEP 3: Long press "MUTE" button for INVERTER ON/OFF (Standby mode). This means Inverter Charger is powered but no AC output.

STEP 4: Turn the switch off to turn the inverter off.

Inverter Charger Previously used with Remote or INTELLI-Grid system with no remote connected

STEP 1: Wire in with a latching switch to the remote connections inside the wiring compartment.

STEP 2: Turn on the switch, this will turn the inverter on.

STEP 3: Turn the switch off to turn the inverter off.

5. Configuration

Settings may only be changed by a qualified person. Read the instructions thoroughly before implementing changes. During setting of the charger, the AC input must be removed.

5.1 Default Setting

Table 5-1 INVCHR2/INVCHR3t factory settings

System	Rate AC Voltage	230VAC
	Rate AC Frequency	50Hz
Battery	Battery Type	AGM
	Battery AGH	200AH
	Max Charge Current	100% of the Max charge current
	Absorption Voltage	14.4
	Float Voltage	13.5
	Undervoltage Protect Recover	13.0
	Undervoltage Warning	11
	Undervoltage Protect	10.5
	Deep Undervoltage Protect	9.9
AC Input	Power Assist Current	16

6. Specification

Model	INVCHR2	INVCHR3
Power Assist	YES	
AC input	Input Voltage Range: 175~265 VAC, Input Frequency: 45~65Hz	
AC input Current	32A (transfer switch)	
Inverter		
Nominal battery voltage	12VDC	
Input voltage range	10.5~17VDC	
Output	Voltage: 220/230/240 VAC ± 2%, Frequency: 50/60 Hz ± 0.1%	
Harmonic distortion	<2%	
Power factor	1.0	
Cont. output power 25°C	2000W	3000W
Output power (30min) at 25°C	2150W	3200W
Peak Power	4000W	6000W
Cont. output power at 40°C	1800W	2700W
Maximum efficiency	93%	
Zero load power	12W	16W
RCD safety switch	16A/30mA	
Charger		
Charge voltage “absorption”	14.4VDC	
Charge voltage “float”	13.8VDC	
Battery types	AGM / GEL / OPZV / Lead-Carbon / Li-ion / Flooded	
Battery charge current	120A	180A
Temperature compensation	YES	
Slave charger	3A	
General Data		
AC Output Current	32A (Limited by the 16Amp RCD 16A)	
Transfer time	<2ms(<15ms when WeakGrid Mode)	
Remote on-off	Yes	
Programmable relay	2x	
Protection	a) output short circuit, b) overload, c) battery voltage over voltage d) battery voltage under voltage, e)over temperature, f) Fan block g) input voltage out of range, h) input voltage ripple too high	
General purpose com. Port	RS485	
Operating Temperature range	-20 to +65°C	
Storage temperature range	-40 to +70°C	
Relative humidity in operation	95% without condensation	

Altitude	2000m	
Model	INVCHR2	INVCHR3
Mechanica Data		
Dimensions	513x275x145mm	
Net Weight	18.3kg	21kg
Cooling	Forced fan	
Protection Index	IP20	
Standards		
Electrical Safety Certified	Yes	
EMC	EN61000-6-1,EN61000-6-2,EN61000-6-3, EN61000-3-11,EN61000-3-12	

NOTES

[illegible]

NOTES

NOTES

[illegible]

This image shows a full page of blank, lined paper. It features approximately 28 horizontal blue or grey lines spaced evenly apart, typical of notebook paper. The lines extend across the entire width of the page, leaving small margins at the top and bottom. There are no vertical lines, text, or other markings on the page.

WARRANTY STATEMENT

Brown & Watson International Pty Ltd ("BWI") of 1500 Ferntree Gully Road, Knoxfield, Vic, telephone (03) 9730 6000, fax (03) 9730 6050, 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 three (3) years from the date of the original purchase by the customer as marked on the invoice. 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 the 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

Phone: (03) 9730 6000

Fax: (03) 9730 6050

National Toll Free: 1800 113 443

NEW ZEALAND OFFICE

Brown & Watson International NZ Ltd.

Mount Wellington, New Zealand

Phone: (09) 525 4575