



# ***INVERTER***

TRUE SINE WITH AC TRANSFER SWITCH



## **User Manual**

**EN1120S-X / EN1120S-X-24V / EN1226S-X**

Rev. 1.3

# **INVERTER**

TRUE SINE WITH AC TRANSFER SWITCH

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## **Please Keep This Manual For Future Reference**

For safe and optimum performance, the Enerdrive Inverter must be used properly. Carefully read and follow all instructions and guidelines in this manual and give special attention to the CAUTION and WARNING statements.

## **Disclaimer**

While every precaution has been taken to ensure the accuracy of the contents of this guide, Enerdrive assumes no responsibility for errors or omissions. Note as well that specifications and product functionality may change without notice.

## **Important**

Please be sure to read and save the entire manual before using your Enerdrive Inverter. Misuse may result in damage to the unit and/or cause harm or serious injury. Read manual in its entirety before using the unit and save manual for future reference.

## **Product Numbers**

EN1120S-X	2000W 12v Inverter With AC Transfer & Safety Switch
EN1120S-X-24v	2000W 24v Inverter With AC Transfer & Safety Switch
EN1126S-X	2600W 12v Inverter With AC Transfer & Safety Switch

Enerdrive Inverter Owners Manual (Rev. 1.3)

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## 1 PRODUCT DESCRIPTION

The Enerdrive Inverter package includes the items list below.

- Inverter base unit (one of the following models)
- EN1120X ..... 2000W 12v Inverter With AC Transfer & Safety Switch
- EN1120X-24v ..... 2000W 24v Inverter With AC Transfer & Safety Switch
- EN1126X..... 2600W 12v Inverter With AC Transfer & Safety Switch
- 7.5 metre remote control cable
- C19 IEC plug
- C20 IEC Plug
- Owner's manual

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## **2 INTRODUCTION**

Thank you for purchasing the Enerdrive Inverter. With our state of the art, easy to use design, this product will offer you reliable service for providing AC power and 5V USB power for your home, boat, caravan, 4WD or commercial vehicle. The Enerdrive Inverter can run many AC powered appliances when you need AC power anywhere. The 5V USB power can charge many USB powered devices. This manual will explain how to use this unit safely and effectively. Please read and follow these instructions and precautions carefully.

### **IMPORTANT SAFETY INFORMATION**

This section contains important safety information for the Enerdrive Inverter. Each time, before using the Enerdrive Inverter, READ ALL instructions and cautionary markings on or provided with the inverter, and all appropriate sections of this guide. The Enerdrive Inverter contains no user serviceable parts. See Warranty section for how to handle product issues.



### **WARNING!**

#### **Failure To Follow These Instructions May Result In Death Or Serious Injury!**

- When working with electrical equipment or lead acid batteries, have someone nearby in case of an emergency.
- Study and follow all the battery manufacturer's specific precautions when installing, using and servicing the battery connected to the inverter.
- Wear eye protection and gloves.
- Avoid touching your eyes while using this unit.
- Keep fresh water and soap on hand in the event battery acid comes in contact with eyes. If this occurs, cleanse right away with soap and water for a minimum of 15 minutes and seek medical attention.
- Batteries produce explosive gases. DO NOT smoke or have an open spark or fire near the system.
- Keep unit away from moist or damp areas.
- Avoid dropping any metal tool or object on the battery. Doing so could create a spark or short circuit which goes through the battery or another electrical tool that may create an explosion.



### **WARNING! Fire & or Chemical Burn Hazard**

When charging batteries they can release explosive and corrosive gasses / chemicals. Please wear safety glasses and protective clothing including gloves when working around batteries



## **WARNING! Shock Hazard** **Keep Away From Children**

- Avoid moisture. Never expose unit to snow, water, etc.
- Unit provides 230 VAC, treat the AC output socket the same as regular wall AC sockets at home.



## **WARNING! Explosion Hazard**

- DO NOT use the Enerdrive Inverter in the vicinity of flammable fumes or gases (such as gas bottles or petrol engines or battery compartments).
- AVOID covering the ventilation openings. Always operate unit in an open area.
- Prolonged contact to high heat or freezing temperatures will decrease the working life of the unit.



## **LIMITATIONS OF USE**

Do not use in connection with life support systems or other medical equipment or devices.

### **CE EMC INFORMATION**

This equipment has been tested and found to comply with the limits for CE EMC standard. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help.

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## 3 INSTALLATION



### WARNING! Shock Hazard

Enerdrive recommends that all wiring be done by a certified technician or electrician to ensure adherence to the applicable electrical safety wiring regulations and installation codes. Failure to follow these instructions can damage the unit and could also result in personal injury or loss of life.

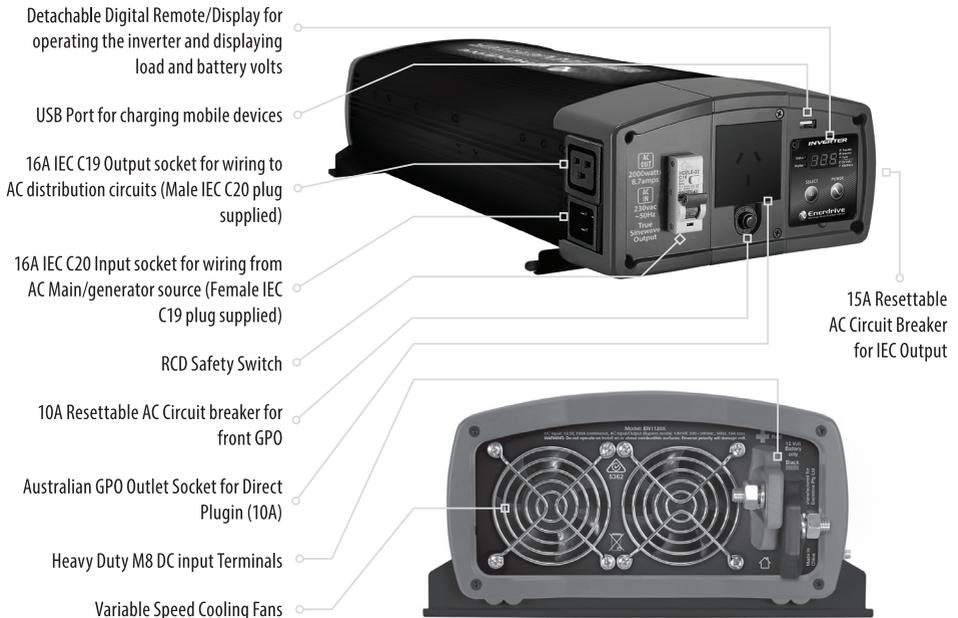


### CAUTION

Before beginning your Enerdrive Inverter installation, please consider the following:

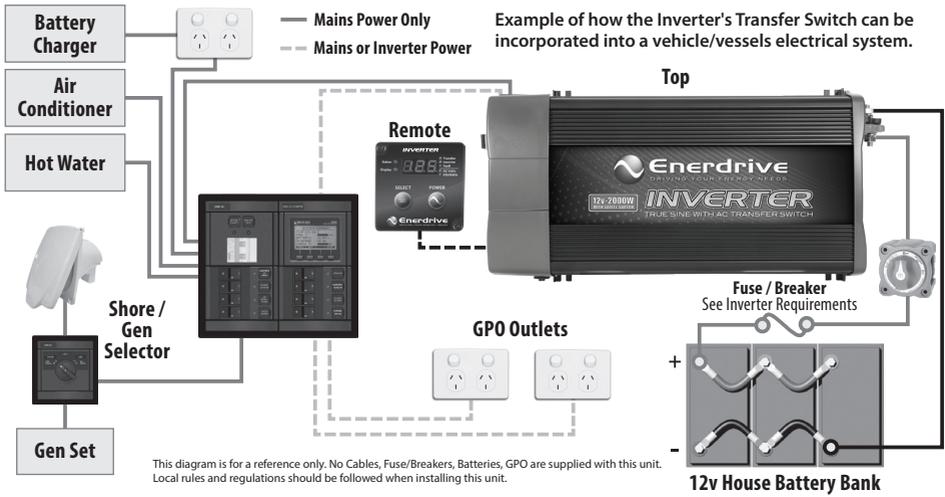
- The Enerdrive Inverter base unit should be used or stored in an indoor area away from direct sunlight, heat, moisture or conductive contaminants.
- When placing the unit, allow a minimum of 75mm of space around the unit for optimal ventilation.

## UNDERSTANDING THE UNIT FEATURES



## Material Prepare for Installation

Typical Wiring block diagram of the Enerdrive Inverter:



### 12V & 24V Battery Banks:

- The use of deep cycle battery is highly recommended for power inverter application.
- For battery size, you need to identify how much you will be using them between charges. Enerdrive recommends you purchase as much battery capacity as possible. See more on Battery Run time and Load in Section 4.

### Fuse or Circuit Breaker:

- DC rated fuse or DC rated circuit breaker connected along the DC positive line is required.

	2000W 24v Model	2000W 12v Model	2600W 12v Model
Fuse/Circuit Breaker Rating	150A <sub>dc</sub>	250A <sub>dc</sub>	350A <sub>dc</sub>

- For all applications, an over-current protective device needs to be installed within 17.8cm from the battery positive terminals

### Disconnect Switch:

- Select a Disconnect Switch with the same or higher the rating of the selected fuse or circuit breaker from the above. Use ignition protected switches when required by local codes.
- The Disconnect Switch is used to disconnect the DC power between the inverter and the battery bank during service, maintenance or trouble shooting.

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## Installing the Enerdrive Inverter System



### WARNING! Electrical Shock Hazard

The unit 'On/Off' switch does not disconnect the DC power from the battery. Use the DC Disconnect Switch or disconnect the DC input cables connection to disconnect the DC power from the battery before working on any circuits connected to the unit. Failure to follow these instructions can result in death or serious injury.

### Inverter Installation:

- Choose an appropriate mounting location.
- For indoor use, the orientation of the unit can be mounted in any direction except with the DC Input panel facing downwards.
- Use inverter mounting tabs as a template guide for mounting holes.
- Drill the 4 mounting holes and place the inverter in position and fasten the inverter to the mounting surface.

EN1120X & EN1120X-24V



EN1126X



## DC Input and Grounding Cable:

- All DC cables require insulated multi-strand low resistance cable.
- The DC cables must be copper and must be rated 105° minimum

Model	Minimum Wire Size	Recommended cable size between DC source and inverter
12v-2000W Unit	70mm <sup>2</sup>	< 1.5m
24v-2000W Unit	35mm <sup>2</sup>	< 1.5m
2600W Unit	120mm <sup>2</sup>	<1.5m



### CAUTION

Use of smaller gauge cable or longer cable length may cause the inverter to shutdown under heavy load. This may also lead to the cables melting or catching fire. This could result in death or serious injury. Choice of the cable size should also match with the rating of the DC fuse used.

#### Important:

The recommended cable length is limited to < 1.5m. This is due to the consideration of voltage drop between the battery and the unit. Change to use a bigger size cable is needed if long cable length is used.

## Inverter Chassis Grounding Connection:



### DANGER!

The Inverter chassis is to be grounded properly. Never operate the Inverter without proper grounding. Failure to do so will result in death or serious injury.

1. Connect the grounding cable's ring terminal to the unit ground screw.
2. Connect the other side of the cable to the common grounding point.

## Grounding Cable Size:

**Important:** The unit is grounded through the ground stud located near the DC Input terminal and the chassis of the unit has to be grounded properly before use.

- For caravan, RV and other mobile applications the unit has to be grounded with a minimum 4mm<sup>2</sup> copper conductor.
- For marine applications the unit has to be grounded with a copper conductor the same current capacity as the DC positive conductor.

## Inverter DC Input Connection:



### CAUTION

Reversing the DC Input terminal will damage the unit and cannot be repaired. Damage caused by reverse polarity connection is not covered by the warranty.

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1. Connect one end of the negative DC input cable to the Inverter DC negative terminal. Connect the other end of the negative DC input cable to the battery negative or System side of the Shunt if a battery monitor is installed.
- 2.
3. Connect one end of the positive DC input cable to the Inverter DC positive terminal. Connect the other end of the positive DC input cable to one of the terminal of the Disconnect Switch.
4. Connect a DC input cable between the other terminal of the Disconnect Switch and one side of the terminal of the fuse holder.
5. Connect a DC input cable between the other terminal of the fuse holder and the battery positive terminal.
6. Install the selected fuse to the fuse holder.
7. Turn disconnect switch (battery switch), if fitted, to the ON position.

## AC Output Connections:



### CAUTION

Please be sure that the AC Input source is not energized before making any Output connection and that the DC disconnect switch is turned OFF.

## Automatic AC Transfer Switch

This inverter is fitted with an Automatic AC Transfer switch. This transfer switch seamlessly diverts AC power from mains/generator supply and/or the inverter supply through the 16A IEC Output socket that's mounted on the side of the inverter. There are two IEC sockets, 1 x AC Inlet & 1 x AC Outlet that are required to be hardwired to your on-board electrical system if you wish to use the transfer switch option. When mains/generator power is applied to the AC Input IEC socket, the Auto Transfer Switch switches this power through to the 16A IEC Output socket as well as the 10A 3pin GPO outlet mounted on the front of the inverter.

When the inverter is operating as an "Inverter" both the IEC Output socket and 3pin GPO are supplied from the battery to a maximum wattage output of the inverter.

When the inverter is operating with mains/generator power input, the maximum transfer wattage is 3500W (16A AC) for the IEC Output socket or 2400W (10A AC) for the 3pin GPO outlet.

To use the 16A IEC sockets, the unit is supplied with a separate male & female IEC plug as standard. These plugs are designed to be hardwired by a qualified electrician to the AC distribution of the intended installation.

## AC Input Source and AC Branch Breaker:

- Standard AC Input wire is required for all the AC connections between the AC source & the AC Input port, and the AC Output ports to load.
- For 230V model and maximum By-Pass power rating, a minimum of 2.5mm<sup>2</sup> AC wire is required. A 16A branch circuit breaker is also required to connect between AC Input source and unit's AC Input port.

**Important:** Follow the local electrical and/or building code when you connect the unit to any AC source.



IEC Plug C19 Inverter Out



IEC Plug C20 Inverter In



## Residual Current Device (RCD Safety Switch)

This inverter is fitted with a Residual Current Device (RCD Safety switch as standard). The Residual Current Device (RCD) switch detects if there is an earth leakage fault and will automatically disconnect all output power sockets protecting the user from electrocution. Meets Australian Standards for AS4763 (portable inverters) and AS3001 (caravan installation)

The inverter has a Mains Earth Neutral (M.E.N) connection permanently installed on the inverter side of the AC Transfer switch. This allows the RCD to work correctly while on Inverter.

This system of earthing provides a reference between the Ground/Earth and the Neutral circuit allowing for detection of imbalance between the Active and Neutral Circuits in the event of a fault.

With no MEN connection in place, protective devices will not operate correctly to ensure the installation is electrically safe.

When the Transfer switch is active and allowing AC power from the IEC Input socket to pass through to the Outlet circuits, the RCD needs to rely on the M.E.N connection of the Input Power supplied for maximum protection.

**Please note:** The majority of generators on the market do not have an M.E.N connection. If no M.E.N is present on the IEC Input socket, the RCD will not supply the maximum protection while the Transfer Switch is active.

## Remote Control / Display Connection

- The Remote Display on the unit is detachable. To install the remote in a different location, the provided 6 pin standard RJ12 “rollover” cable is used.
- Remove the 2 screws at the front of the Display Panel and disconnect the small RJ12 cable from the unit.
- Install the RJ12 cable in your desired location and connect the RJ12 cable to the unit and the other end of the cable to the Display Panel. Please note polarity. Refer Appendix II

## Test the Inverter connection:

1. Switch the AC Branch Breaker to ON to provide AC Input power to the unit.
2. The LED on display will turn on. If AC input source is available, ‘Status’ LED turns green. This indicates the unit is running in By-Pass mode meaning AC output is running from the AC input source.
3. Disconnecting the AC input source by turning OFF the AC Input to the inverter. The ‘Status’ LED on the display will switch to amber.
4. Both AC outputs and 5V USB are now available and the unit is running on battery power.
5. Plug a small AC load into the front power point, like a 40W table lamp or small appliance to the front AC socket to verify AC is available.
6. The unit is successfully installed and functioning properly.

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## 4. FEATURE SETTING

To understand more about the unit features, read the following section and follow the instructions to make changes to the desired setting.

### Default Factory Setting:

- PS (Inverter): PS1 - inverter enabled in standby mode with load sense off
- PS (Inverter): PS6 - AC Transfer Switch is active with the Inverter switched ON or OFF.
- AL (Alarm): AL1 - alarm enabled
- Sd (UV shutdown): SdL - Under voltage shutdown set to low setting

## Understanding the Unit Settings

Inverter Setting	
PS0	Inverter is disabled, AC Output is getting the power from utility (AC Input) only. When utility power is not available, the unit will not provide AC backup function from the inverter, the display automatically turns off in approx 10 seconds. When the Power button is pressed again, the display will turn on for another 10 seconds. To enable the inverter or turn on the backup function, this PS0 setting has to be changed to other different setting.
PS1	Inverter is set to standby condition with power save (load sense) mode OFF. Unit will provide AC backup function when utility power is NOT available
PS2	Inverter is set to standby mode with power save (load sense) mode ON. Unit will provide continuous AC backup function only when utility power is NOT available AND the load connected to the output is >10W. Once it is ON, the unit will automatically return to power save (load sense) mode when the connected AC load drops to < 3W. <b>Note:</b> During power save mode, the Inverter will turn ON every few seconds for a few AC cycles to check on the >10W power consumption.
PS3	Not Used
PS4	Same function as PS1 and the <b>'Power'</b> button can be used to turn the AC Output ON and OFF, even with the AC-Input power being present in By-Pass mode. When the unit is turned OFF, using the 'Power' button, the display remains ON showing the battery voltage and the 'Status' LED turns off.
PS6	If the inverter is switched, with AC input present, the Inverter will pass the AC through to the Inverter output side. If the AC input is removed, the Inverter will stay in the OFF position. If the inverter is switched on, with AC input present, the inverter will pass the AC through to the inverter output side. If the AC input is removed, the inverter will stay in the on position supplying the inverter output side from the battery input.
Battery Under Voltage Setting	
SdL	Battery under-voltage setting is set to LOW (setting used for normal operation) Under-voltage alarm: ..... 11.0 Vdc Under-voltage alarm recovery: ..... 11.3 Vdc Under-voltage shutdown: ..... 10.5 Vdc Under-voltage shutdown recovery: ..... 12.0 Vdc

SdH	Battery under-voltage setting is set to HIGH (setting to avoid battery over discharge when connected to car start battery) Under-voltage alarm: ..... 12.1 Vdc Under-voltage alarm recovery: ..... 12.3 Vdc Under-voltage shutdown: ..... 11.8 Vdc Under-voltage shutdown recovery: ..... 12.6 Vdc
Alarm Setting	
AL0	Fault and the warning audible alarm is disabled. The display panel only shows error code and the audible alarm will not sound.
AL1	Audible alarm will sound when fault or warning occurs.
Manufacturing Default	
Fd	Reset all the settings to the manufacturing default settings (PS1, SdL, AL1)

### Enter the Function Menu for unit setting:

To enter the unit Function Menu, press and hold “Power” and “Select” buttons together for about 5 seconds until a beep is heard.

#### When you are in the Function Menu:

- Press **‘Power’** button for 1 second to toggle between different Function Menus like ‘In’, ‘Sd’, ‘AL’, and ‘Fd’ etc.
- Press **‘Select’** button for 1 second to enter Individual Function Menu and you can make changes to the settings.
- The unit will EXIT to the Main Menu automatically if **‘Power’** or **‘Select’** buttons are not triggered within 5 seconds.

#### When you are in Individual Function Set Menu:

- Press **‘Select’** button for 1 second to toggle between different setting values.
- Press **‘Select’** button for 5 seconds to set selected setting and exit to next menu

See more details on flow chart in Appendix I.

## 5 UNIT OPERATION

### Auto Backup Mode (whatever “PS” setting except “PS0”):

The unit is fully automatic. When utility power is available, the unit is running in AC By-Pass mode. AC output is supplied from the utility. When there is a power failure from the utility or an AC source is not available, the unit will run on battery power and the inverter will generate sinewave AC output to maintain and operate the load continuously (With ‘PS2’ setting, there is a minimum of 10W AC-Load sense threshold for the inverter to fully turn on).

### Non-Backup Mode (with “PS0” setting)

Same as Auto Backup Mode but when there is a power failure from the utility or the AC input source is not available; the inverter WILL NOT turn ON automatically. To turn on the inverter you are required to get into the setting mode to change the “PS0” setting to “PS1” or others. See more details on Inverter Setting.

### Turn ON & OFF the USB only (if AC power is not required)

- Press and hold the “Power/Select” button for 1 second until a single beep is sound. Display will show USB. Status LED will turn green. 5V is available at the USB port and AC is not available at the AC socket. This mode is used to save battery power if AC power is not required.
- Press “Power/Select” button to turn unit off.

### Turn ON and OFF the 230 VAC and USB

- Press and hold the “Power/Select” button for 2 seconds until the two beeps are sounded. Display will show the measured battery voltage and output power alternatively. Status LED will turn green. 5V USB and 230 VAC is available at the AC socket.
- Press “Power/Select” button to turn unit off.

## Understanding the Display & Status LED

### Display:

- USB Indicate only the USB is ON and 230 VAC is not available at the AC socket
- 12.5 Display shows measured battery voltage
- 0.80 Display shows total output AC power in kW (800W as shown)
- E01 Display shows error or warning code. See trouble shooting section in details

### Status LED:

- Green: Unit operation is normal
- Amber: Warning is detected. Unit will shutdown at any time. Please check error code to troubleshoot the unit.
- Red: Error is detected and unit has shutdown. Please check error code to troubleshoot the unit.

Status LED	Display LED	Display	Function/Status
Green (solid)	Green	'12.5'	By-Pass Mode. Display shows battery voltage in DC volts

Amber (solid)	Green	'12.5'	Battery/Inverter Mode. Inverter is running. Display shows battery voltage in DC volts
	Amber	'0.80'	Battery/Inverter Mode. Inverter is running, Display shows output power in kW (800W as shown)
Amber (flashing)	Battery (Inverter) Mode and AC Input is detected and unit will switch to By-Pass mode within 20 seconds		
Red (solid)	OFF	E01-E12	Unit has shutdown. Display shows error code (See error code reference chart on Page 17). Alarm sounding - Audible alarm present.

**Note:** 'Status LED' is used to indicate the status of the unit.

- Green: By-Pass Mode
- Amber: Battery (Inverter) Mode

**Note:** 'Display LED' is used to indicate the digital display function.

- Green: Display is showing Battery voltage in volts.
- Amber: Display is showing Output power in KW.

## Understanding the 'Power' and 'Select' push button function during normal operation

A beep sound will occur every time the '**Power**' or '**Select**' button is pressed.

### 'Power' button function:

- Turns the inverter On/Off during Battery Mode. Press and hold it for 1 second to turn the unit either ON or OFF.

**Note:** The '**Power**' button can be used to turn the AC Output OFF during AC By-Pass (when set in 'PS4' mode) without the need to disconnect the AC-Input as per "PS1" setting. See more on "Understanding the unit setting".

### 'Select' button function:

- Check the unit setting: Press once to check or verify unit's present set functions

## AC Load on the Inverter

Although the Inverter can provide high surge power up to two times the rated output power, some appliances may still trigger on the inverter protection system. A higher power inverter is required for those appliances.

## Estimate Run Time On Load

Following run times are estimates for reference, based on using different battery bank sizes. Actual run times may vary.

**Important: Power Drain from DC Battery Bank.**

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Please note that there is a power drain of approx 700mA from the battery bank when the Inverter is running in AC By-Pass mode. In order to avoid draining down the battery bank, a battery charger with sufficient power is required to maintain the battery bank voltage.

	Estimate run time on different 12V Battery Bank Size				
AC Load	60AH	120AH	180AH	240AH	300AH
50 W	11 hrs.	22 hrs.	33 hrs.	44 hrs.	55 hrs.
100 W	5 hrs.	11.5 hrs.	17 hrs.	23 hrs.	29 hrs.
200 W	2.5 hrs.	5 hrs.	8 hrs.	11 hrs.	13.5 hrs.
500 W	49 mins	2 hrs.	3 hrs.	4 hrs.	5 hrs.
1000 W	15 mins	49 mins	1.5 hrs.	2 hrs.	2.5 hrs.
1500 W	8 mins	27 mins	49 mins	1 hr	1.5 hrs
2000 W	N.R.	15 mins	34 mins	49 mins	1 hrs
2600 W	N.R.	11 mins	25 mins	37 mins	49 mins
Note: N.R. - Not Recommended					

## 6 TROUBLESHOOTING

### Understanding the Error Code

Code	Condition	Corrective Action
E01	When unit is in Battery (Inverter) mode, Input battery voltage is too low and AC Output is shutdown.	Recharge the battery immediately and restart unit. Make sure the battery is connected to the unit.
	When unit is in By-Pass Mode the unit continues supplying AC-Output power.	Check the battery is connected to the unit. Although the unit still provides AC Output power from Utility, recharge the battery ASAP.
E02	Input battery voltage is too high and unit has shutdown	Check battery voltage or determine if any external charger is connected to the battery bank
E03	AC output is overloaded or short circuited and unit has shutdown	Check load connected to the output. Reduce load and restart the unit
E04	Internal temperature is too high and unit has shutdown	Turn unit off and wait for 15 minutes before restarting. Check if any object has blocked the air flow of the unit.
E05	Input battery voltage is low and warning occurs	Recharge battery as unit will shutdown shortly
E06	In Battery Mode, AC output load connected has been sensed high and is close to shutdown limit	Reduce load
E07	Internal temperature is high and is close to shutdown limit	Reduce load and check if any ventilation of the unit is blocked
E08-11	Not used	
E12	Internal transfer switch temperature is high and shutdown occurs	Reduce load and check if any ventilation of the unit is blocked

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To troubleshoot the unit, please note the error code displayed on the main unit and review "Understanding the Error Codes" in this section.

Problem	Possible Cause/Condition	Solution
No AC Output. All the LEDs and the display are off.	The unit is turned off. <b>Note:</b> The power button On/Off action takes place at its release moment and after a "beep" is heard	Turn the unit ON by pressing the "Power" button (when the unit is in Battery/inverter mode, or in By-Pass mode if the PS4 parameter is set) otherwise the unit should always turn on automatically at the moment the AC-Input power is connected.
	No power coming into the unit	Check the battery DC fuse, the Disconnect Switch (if installed), the AC Input Source and the AC Input Branch Breaker is either tripped or turned OFF
No AC output on the front GPO or the side IEC-C19 socket and the Status LED is Green or Amber	The units thermal breaker/s and or RCD has tripped.	Check AC loads and reset the thermal breakers and or RCD.
AC Output turns ON and OFF.	Power Safe mode ("PS2") enabled and AC load <10W	The load connected must be below the AC load sense threshold of 10W +/-25%
No AC Output. Status LED is red	The unit has shutdown, check Error code shown on display.	Verify the error condition and make correction
During AC Input Power Outage, there is no AC Output power when battery power is available.	The unit is set to "Non-Backup" mode ("PS0") and AC Input Power is not available.	Change the "PS0" setting to a different setting if you want to turn the inverter ON.  With "PS0" setting, the inverter is completely OFF. When the AC Input Power is not available and the "Power" button is pressed once, the display and LEDs stay working for about 30 sec only. With this setting, the unit will provide AC Output Power only when the AC Input Power is available.

<p>"E01" or "E05" alarm in By-Pass (pass-through) mode ②</p>	<p>The unit is normal.</p> <p>The alarms indicate the battery voltage is low or the battery is not connected.</p> <p><b>Note:</b> There may be external DC loads connect to the DC input terminals and its drawing current from the current-limited built-in trickle battery charger within the inverter. However the unit continues supplying AC-Output power in despite of those alarms</p>	<p>Charge and/or connect the battery bank or disable all the audible alarms with the "AL0" setting when AC backup is not required.</p> <p><b>Note:</b> The main purpose of the internal trickle battery charger is to keep the unit's control electronics working and can still provide AC Out when utility is available even without the battery connected. It is not intended to act as a real trickle charger for your battery bank. Therefore do not rely on this small trickle charger as a source to charge your battery bank.</p>
<p>DC voltage is measured at the DC terminals without the battery being connected (EN1120x, EN1126X only)</p>	<p>This is normal.</p> <p>The voltage is supplied by a little built-in trickle battery charger with current limiting protection.</p>	<p>You can keep the battery disconnected. However if the DC-Input terminals of the unit are connected to a common DC bus being shared by other DC loads, a 12V back feed to those DC loads can occur when the DC bus is disconnected from the common battery bank. In this case the corresponding drawing current may trigger the "E01" or "E05" alarms as per the problem ②</p> <p>In cases where the back feed is not desirable, consider using a separate battery bank disconnect switch for the unit</p>
<p>The unit's 10A thermal breaker trips even when the unit is out of an overload condition</p>	<p>This happens mainly in By-Pass mode when the maximum rating of the unit's breaker is exceeded.</p>	<p>For maximum capacity use the 16A AC-Output socket which is out of the tripping influence of the unit's 10A thermal breaker. Otherwise do not exceed 10A on the front AC outlet respectively.</p>
<p>The unit cannot be turned off using the power button when in "By-Pass" mode</p>	<p>This is normal. The unit has "PS1" (factory default) setting. Use the procedure on the right to turn off the unit.</p> <p><b>Note:</b> The power button On/Off action takes place at its release moment and after a "beep" is heard</p>	<p>To turn the unit off while in By-Pass (pass-through) mode, first of all disconnect the AC-Input that feeds the unit to force entering into Battery (inverter) mode. Then push and hold the power button for 1 sec. (after hearing a beep) the unit will turn off.</p> <p>Set unit to PS4 mode. With this setting, the power button can be used to turn the unit ON and OFF during By-Pass and Battery (inverter) mode.</p>

# INVERTER

TRUE SINE WITH AC TRANSFER SWITCH

<p>The input battery under-voltage warning ("E05") and/or shutdown alarm ("E01") occurs in advance even when the battery voltage seems to be OK</p>	<p>Make sure you are measuring the voltage directly at the DC-Input terminals of the unit so as to check the possible voltage drop between the battery posts and the unit input terminals</p>	<p>Excessive voltage drop between the battery bank and the inverter, due to high resistance of the DC wires, battery disconnect switch, fuse or DC breaker if any. Make sure to use the recommended wire's gauge and length. Try to use fuses (or DC breakers) with very low voltage drop (i.e. Class T type fuses, etc.)</p>
	<p>Battery bank with high internal resistance, resulting in a voltage drop proportional to the DC current draw from the unit.</p>	<p>Too much battery voltage drop due to excessive drawing current in relation to the battery bank capacity. Increase the battery bank capacity (i.e. adding more batteries in parallel) and/or reduce the load being fed by the inverter</p> <p>Battery damaged and not able to keep a good state of charge. Replace the battery (or batteries)</p>
	<p>Battery bank is getting discharged.</p>	<p>This is normal condition. The E05 warning and then followed by the E01 shutdown occur while the battery bank is getting discharged. Charge the battery bank.</p>
	<p>Make sure to measure the battery voltage just before the "E01" battery under-voltage shutdown in battery (inverter) mode occurs and compare it with the corresponding voltage threshold in the specifications table. (allow +/- 5% of tolerance).</p>	<p>Just after the E01 occurs, the battery voltage increases rapidly since the battery is not under load condition after the inverter shutdown.</p> <p>This is normal in all battery banks and can confuse the user thinking the under-voltage shutdown that triggered the E02 alarm occurs in advance at higher voltage thresholds than the ones specified.</p>
	<p>The E05 warning and E01 shutdown alarm occurs well in advance due to the "SdH" setting</p>	<p>If you want to extend the run time of the battery bank as long as possible without the need to keep enough battery state of charge for engine cranking purposes, make sure to set the under-voltage shutdown threshold to low values setting ("SdL" - factory default setting) rather than the "SdH".</p>

<p>The display doesn't work as expected (no display or showing "888") and the operation of the unit may be affected</p>	<p>Loose contact or pin-out problems in the RJ12 detachable display panel cable</p>	<p>A short (7") RJ12 cable is used when the detachable display panel is mounted on the unit (factory default). Alternatively a long RJ12 cable is provided for installing the display panel up to 7.5m away. Swap the cable you are using with the other one and check display for correct operation.</p> <p>Check the pin-to-pin conductivity of the cable and the corresponding pin-out as shown in "Appendix II"</p>
	<p>Excessive EMI/RFI interference (electromagnetic induction or electromagnetic radiation) emitted from an external source</p>	<p>Avoid running the remote cable very close to motors, power contactors/relays, ballasts, transformers, or high voltage devices. In high EMI/RFI environments, consider using metal conduits or a shielded cable grounded at one end and/or reduce cable length</p>
<p>The RCD trips as soon as the load is connected to either outlet port</p>	<p>There is a Neutral to Ground (M.E.N) bonding on the AC load side of the IEC output socket</p>	<p>Locate and remove the Neutral to GND (M.E.N) bonding on the load side. If the output of the inverter is connected to an existing distribution panel/box, make sure the Neutral and GND connections inside the panel/box use separate bus bars, being the Neutral one isolated from the chassis ground. Otherwise consider using the 10A AC-Output socket on the front of the unit.</p>

## 7 SPECIFICATIONS

Note: Specifications are subject to change without notice.

Specifications: True Sine Wave Series			
Inverter	EN1120X	EN1120X-24v	EN1126X
AC Output Power	2000W	2000W	2600W
AC Output Current	8.7A	8.7A	11.3A
AC Output Voltage	230 VAC / 50 Hz		
AC Output Waveform	Sinewave (<3% THD)		
Nominal DC Input Voltage	12.5 VDC		
No Load battery draw	< 1.5 ADC		
DC Input Voltage operating range	10.5 – 15.5 VDC	21.0 – 31.0 VDC	10.5 – 15.5 VDC
Under Voltage Alarm	11.0 / 12.1 VDC	22.0 / 24.2 VDC	11.0 / 12.1 VDC
Under Voltage Alarm Recovery	11.3 / 12.3 VDC	22.6 / 24.6 VDC	11.3 / 12.3 VDC
Under Voltage Shutdown	10.5 / 11.8 VDC	21.0 / 23.6 VDC	10.5 / 11.8 VDC
Under Voltage Shutdown Recovery	12.0 / 12.6 VDC	24.0 / 25.2 VDC	12.0 / 12.6 VDC
Over Voltage Shutdown	15.5 VDC	31.0 VDC	15.5 VDC
USB Port	5V, 750 mA		
AC Transfer Switch			
Transfer Time	< 30 ms		
Transfer Relay Rating	16A (resistive load)		
AC Input socket IEC-C20	16A max		
AC Output socket IEC-C19	16A max		
AC Output Front GPO	10A max		
Safety and Environmental			
Conformance	All required Australian Standards, CE LVD: EN/IEC 62040-1, IEC61558-2-16		
EMI / EMC	CE EMC: EN/IEC 62040-2 category C1		
Agency Markings	RCM, CE		
Operating Temperature	0°C to 40°C		
Storage Temperature	-20°C to 60°C		
Relative Humidity	5 - 90% non-condensing		
Operating Altitude	Up to 3000 meters above sea level		
Weights and Dimensions			
Weight	5.9 kg	5.9 kg	7.0 kg
Dimensions (W x L x H)	435x230x115		560x230x115
Warranty	5 Years		

## 8 WARRANTY



### 5 Year Warranty

In the unlikely event that a technical issue arises with an Enerdrive product, customers are encouraged to initially contact the Enerdrive Support Team on 1300 851 535 or [support@enerdrive.com.au](mailto:support@enerdrive.com.au) for immediate and efficient expertise and first class product support.

#### IMPORTANT NOTE: CONSUMER PROTECTIONS

If you have purchased your product in Australia, you should be aware that:

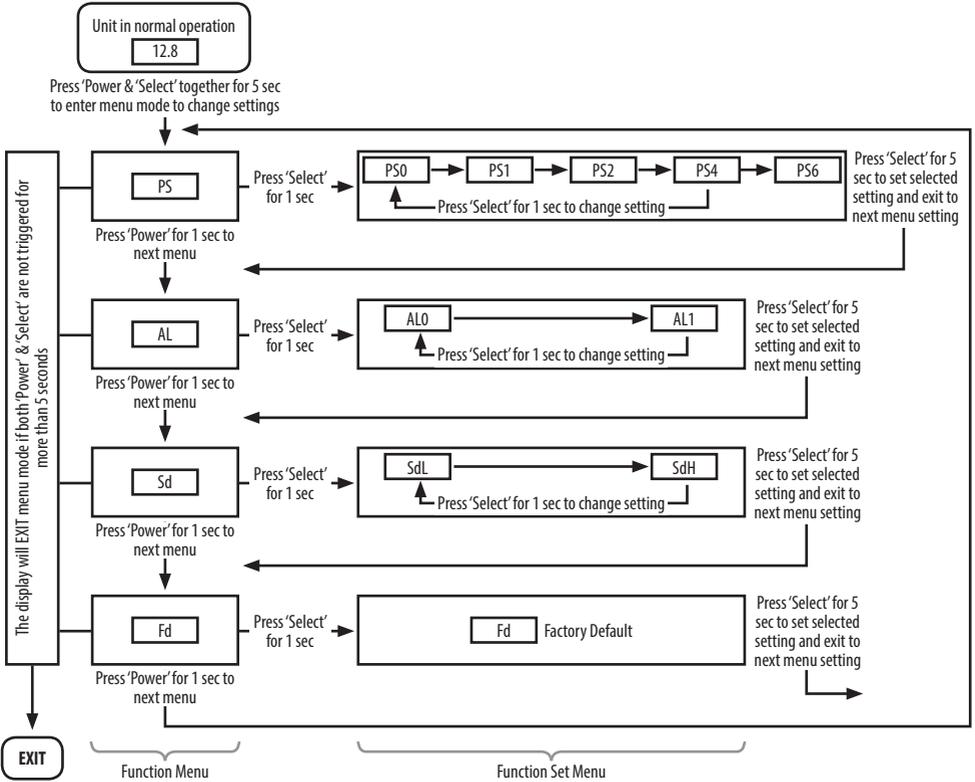
This warranty is provided in addition to other rights and remedies held by a consumer at law. Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable 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.

Enerdrive warrants that its Products will be free from defects in materials and workmanship (subject to limits, and in normal conditions, as described in the complete Enerdrive Warranty Policy) for up to 5 years from the date of purchase.

For full terms, conditions and claim process, refer to the Enerdrive website:  
<https://enerdrive.com.au/warranty/>

## APPENDIX I

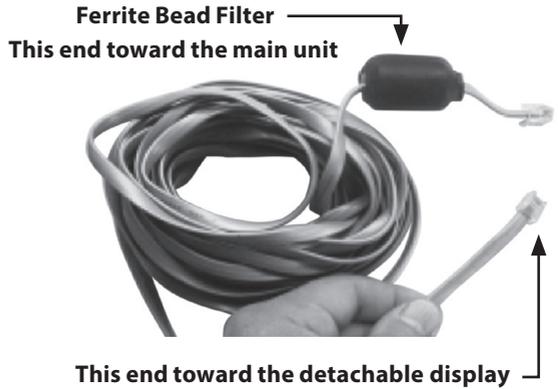
### Setting Mode Flo Chart:



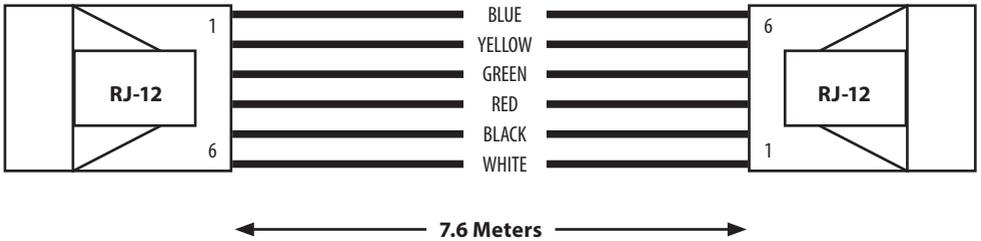
## APPENDIX II

### Detachable Display Panel Cable:

The display panel is detachable and can be installed away from the unit, using the provided 7.5m RJ12 cable. You will need to remove the two screws indicated below. Even though the unit can operate with the cable plugged in whatever direction, we suggest plugging the end with the ferrite bead EMI/RFI filter into the main unit.



The RJ12 "crossover" cable has 6 wires with the following pin-out:



**RJ-12 (6 wires) Rolled Over Cable (also called Rollover)**





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