EXPERTPOWER®

12V Inverter Charger

Pure Sine Wave 2000W/3000W

Models:
IVOCH2KW / IVOCH3KW

Table of Contents

WARNING

PLEASE READ INSTRUCTIONS BEFORE CONTINUING

This manual contains important safety installation, and operation instructions for the ExpertPower Inverter-Charger. Please do not operate the Inverter-Charger without reading this manual first.

General Information

- **Safety Information and Warnings**

Before designing and during production, the safety of the consumer and product have all been considered. Please follow the user instructions carefully to operate or install the machine to prevent injury or accident. Please keep this manual for future reference.

1. The installation of the inverter should be done by professionals or under the assistance of a local dealer.
2. Verify whether the input DC voltage range meets voltage polarity requirements (12V±20%). Confirm whether the load device voltage is single-phase 100V ~ 120VAC; power should not be more than rated output power of the inverter.
3. Do not spill any liquid on the inverter, or use a damp cloth to wipe the inverter casing. Do not touch the unit's terminals when running-- especially with wet hands, otherwise electric shock injury will occur.
4. If you need to change the working environment, do not do so yourself. It should be done by professionals or with assistance from the supplier/local dealer.
5. The operating environment of the inverter should be well-ventilated. Temperature range is -4 to 113°F. Keep away from fuel sources and direct sunlight. Do not run in humid or dusty environments. During operation, high temperatures are normal. To maintain proper ventilation, please keep a clean environment around the unit. Do not allow any vents be blocked.
6. Keep children away from this unit at all times. It is not a toy. Serious injury or death could occur.
7. Confirm if the inverter can be connected with existing wiring. The AWG rating should be sufficient for the loads that will be ran.
8. Do not open the inverter under any circumstances. Besides voiding the warranty, you are risking severe electric shock to yourself and others around you.

Introduction

- **ExpertPower Inverter-Charger**

The inverter is pure sine-wave with an on-board intelligence system that handles most of the heavy lifting within your electrical system. The inverter converts 12 volt direct current (VDC) into 110 volt alternating current (VAC), or more commonly, the power you utilize at home through your wall outlets. A typical solar power system consists of a solar panel, solar charge controller, inverter, battery, and components such as fuses and breakers.

This inverter has a bypass feature allowing you to use it WITH OR WITHOUT batteries meaning you can depend solely on shore-power for your AC and DC appliances.

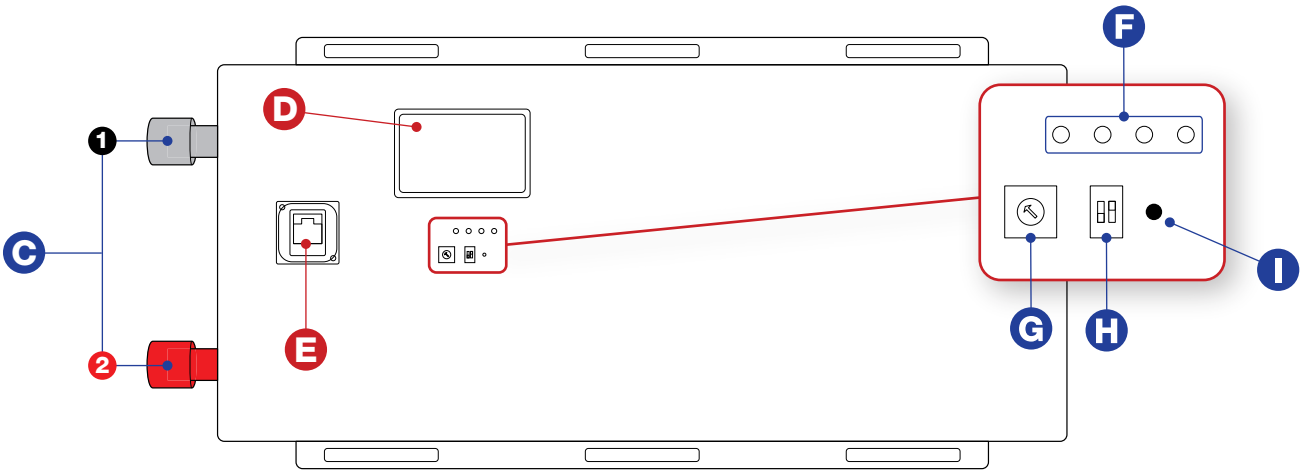
Core advantages of the inverter:

- CPU intelligent management
- Latest American technical inverter
- Best electric components
- High conversion efficiency(90%～99%)

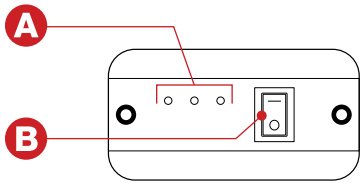
- **Applications**

Home Power Tools	Circular saws, drills, grinders, sanders, buffers, weed and hedge trimmers, air compressors
Office Equipment	Computers, printers, monitors, scanners
Household Items	Vacuum cleaners, fans, fluorescent and incandescent lights, shavers, sewing machines
Kitchen Appliances	Coffee makers, blenders, ice markers, toasters
Industrial Equipment	Metal halide lamp, high – pressure sodium lamp
Home Entertainment	Television, Blue-ray player, video games, stereos, musical instruments, satellite equipment

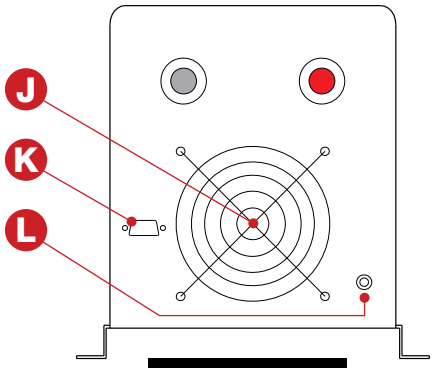
Diagram



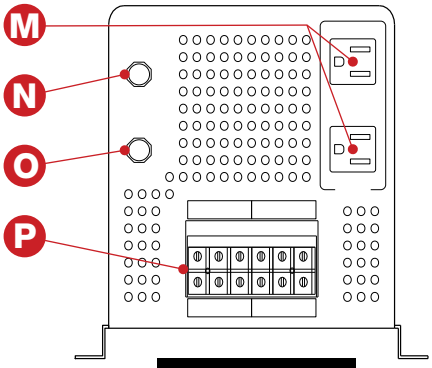
Top View



Switch Panel



Front View



Back View

A. On/Off Switch

B. Panel LEDs

C. Terminals:
- 1. Negative (-)
- 2. Positive (+)

D. LCD Screen

E. Interface Panel Port

F. Status LEDs

G. Battery Type Multi-Switch

H. 50Hz/60Hz Switch & Priority Modes

I. Next Page Button

J. Fan

K. Communication Port

L. Grounding Terminal

M. AC Ports

N. Inverter Output Protection

O. Charger Input Protection

P. AC Terminal

Technical Specs

• Utility Model Specifications

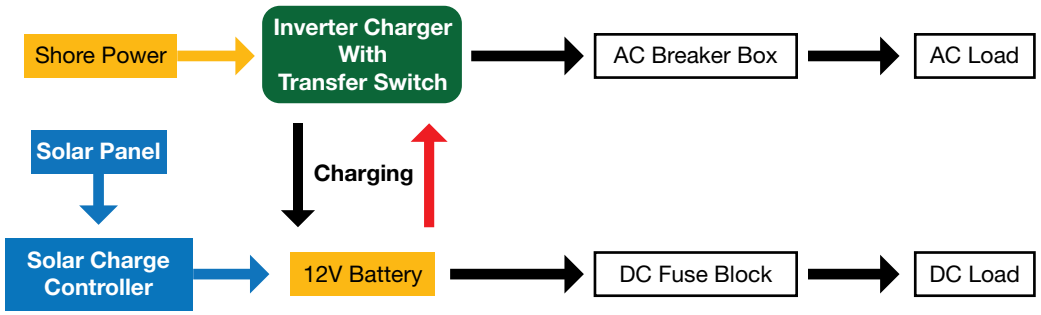
	AC110V
Efficiency	≥98%
Input Wave Type	Pure Sine Wave
Input Voltage Range	AC 75V~135V
Nominal Input Voltage	110Vac
Low Voltage shutoff	92Vac±4%
Low Voltage Recovery	97Vac ±4%
Over voltage Shut off	127Vac±4%
Over Voltage Recovery	122Vac±4%
Nominal Input Frequency	50Hz/60Hz (auto detect)
Output Wave Type	Pure Sine Wave
Transfer Time (AC to DC)	<5ms
Transfer Time (DC to AC)	<5ms

• Inverter Mode Specification

Power Factor	1 (Sufficient output power)	
Model Number	IVOCH2KW	IVOCH3KW
Continuious Power	2000W	3000W
Surge Power (1 Second)	6000W	9000W
Rated Input Voltage (V)	12Vdc	
Rated Output Voltage (V)	110Vac	
Nominal Output Frequency (Hz)	50/60 ± 0.3Hz	
Output Voltage Range	±10% rms	
Efficiency	>90% DC12V	
No Load Power Consumption	3% of Power Rating	
Overload Protection	(110%<load<125%) ±10%: Shutdown after 15 minutes; (125%<load<150%) ±10%: Shutdown after 60s; Load>150% ±10%: Shutdown after 20s	
Low Battery Alarm	10.5Vdc ± 0.3Vdc (12V Input)	
Low DC input voltage automatic shut-down	10.0Vdc ± 0.3Vdc (12V Input)	
High DC input voltage warning, then shut down	16Vdc ± 0.3Vdc (12V Input)	
High DC input voltage Recover	15.5Vdc ± 0.3Vdc (12V Input)	
Safety	CE / EMC	
Communication port	RS232	
Cooling	Variable Fan According to Temperature	
Operating Temperature Range	32°F to 140°F	
Storage temperature	5°F ~ 140°F	
Humidity	5% to 95%	
Noise	Max 60dB	

Basic Connection

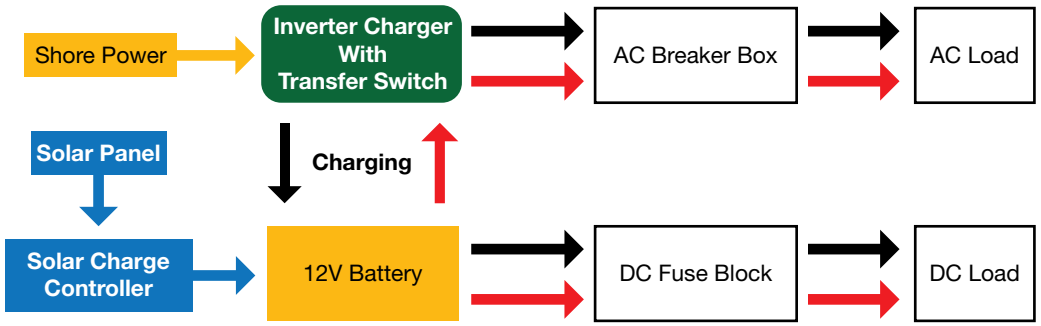
–This inverter charger is an essential part of any electrical system in an RV or camper. It's vital that the inverter works in unison with the rest of your system without conflict. Below is a typical example of what the electrical system is like. Shore power flows through the inverter-charger to provide AC power guarded by breakers or fuses while charging the battery bank. The same concept applies while under battery power, as the inverter will be powered by DC (battery) and then converted to AC while protected with battery specific fuses and breakers. The battery can be charged utilizing solar panels that flow into a solar charger controller to provide usable power.

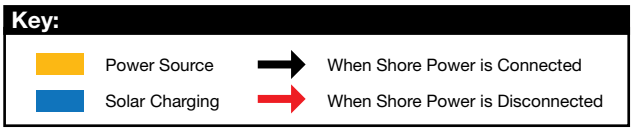


Auto Transfer Switch Priority Mode

— Priority Mode Selection (select on the front panel)

- **AC Priority**





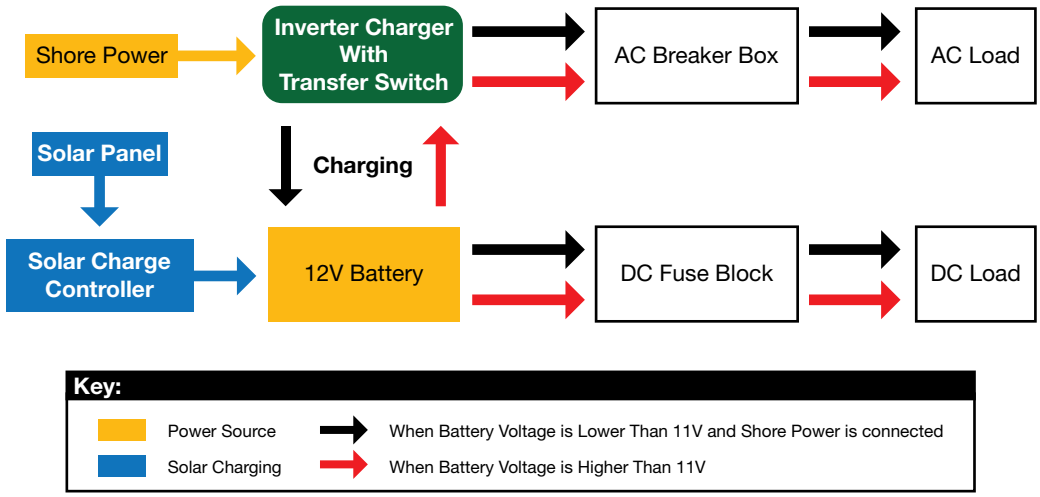
When set to AC priority, you will draw from shore power and not the battery bank. When not connected to shore power, DC power from the battery bank/solar will be converted into AC.

- When shore power is connected, it will be utilized over the battery bank to power the inverter while simultaneously charging the battery bank. Charging can be turned off by setting Battery Type switch to 0. (See page 10)

- When shore power is disconnected, the inverter automatically switches to solar/battery bank power in 5ms.

- When shore power is restored, the inverter will automatically switch the power source from battery bank to shore power in 5 ms.

- **DC Priority**



When set to DC priority, the inverter will utilize the battery bank for electricity. When battery voltage gets too low, it will automatically switch to shore power. Charging can be turned off by setting battery switch to 0. (See Page 10)

- AC and DC loads will be powered by the battery with the inverter if battery voltage is higher than **11V**.
- When battery voltage drops below **11V**, the inverter automatically switches to shore power (if connected) and charges the batteries.
- When battery is charged to **13.5V**, the inverter will automatically switch back to battery power.
- When shore power is not detectable and battery voltage is lower than 10V, the inverter will shut down. When shore power is detected again, the inverter will turn on automatically and switch to shore power and charge the battery or when battery is charged to **12V** (solar), inverter will automatically turn on and switch to battery power.

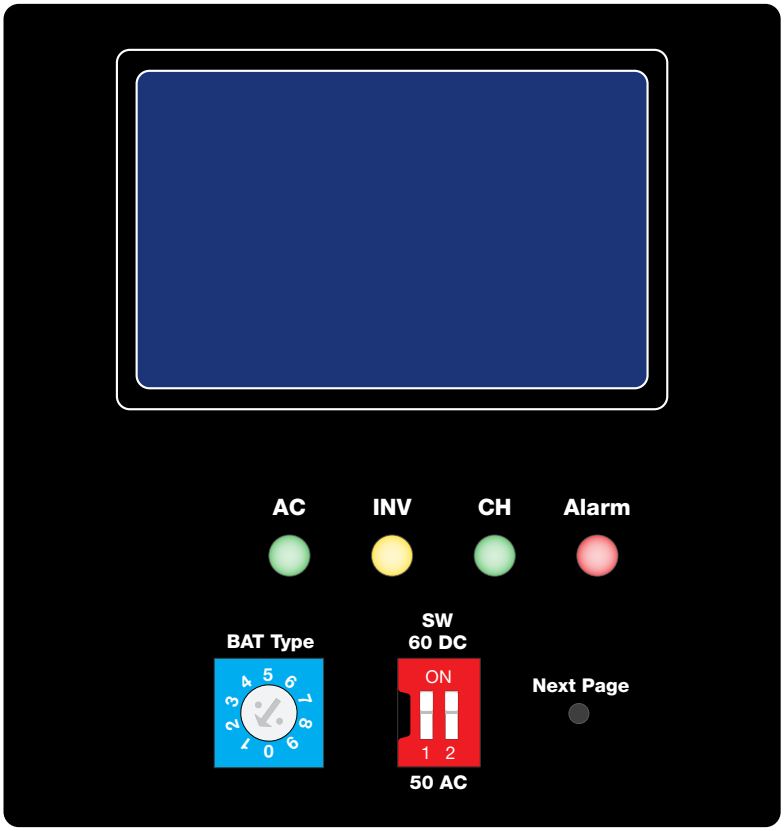
Charger

- **Information Table**

Model	Specifications	
	2KW	**3KW**
DC voltage level	12V	12V
Charging current	35A	50A
	Matching	
Theoretical charge voltage	According to the battery type	
Charging circuit protection	Circuit breaker protection	
Charging Rules	Lithium Battery: constant current charging (constant current stage) -> constant voltage (constant voltage stage) -> float (constant current stage)	
Charging-stage conversion	- constant current charging stages: input AC grid, the charger will run until to the constant voltage stage of maximum rated current. - constant voltage charging stage: The charger will keep the mode of constant voltage , then the voltage drops to float voltage. The minimum time is one hour, the maximum time is 12 hours. - floating stage: at the floating stage, the voltage will keep the float voltage. - If you re-connect the AC, the charger will recycle the steps of above when the battery voltage drops below 12Vdc - If the Chargers keep floating state for 10 days, the charger will restart the cycle	

Top Panel Settings

- **Panel Overview**



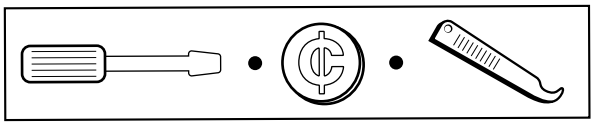
SHORE POWER ON		AC LED lights GREEN
INV (Inverter)		INVERTER LED lights up YELLOW to indicate it's on.
CH (Charger)		CH LED lights GREEN for bulk/float charging
ALARM		Alarm LED lights up RED
BAT Type		Battery Type 1-9 Selector
SW (Working Mode)	Frequency Selection	Adjust frequency between "50Hz" and "60Hz"
	AC/DC Switch	Adjust the AC/DC power priority
Next Page		Move to the next page in the information panel

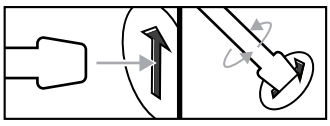
• Battery Type Selections and SW Switch

Different kinds of batteries have varying charging voltages. In order to protect your batteries, our inverter is designed to be suitable for a variety of different types of batteries. On the top of the inverter, you can choose the correct voltage specific to your needs using the **BAT Type Dial** and the **Gear Set Table** below to ensure that your battery is with in optimal condition.

Using the Battery Type Dial:

- To move the dial use a small screwdriver, coin, or other flat tool and insert it into the arrow shown on the left. Turn the screwdriver so that the arrow in the BAT Type Dial points to the desired **Switch Setting** shown below.





- Gear Set Table:

Switch Setting	Description	Boost Voltage 12V	Float Voltage 12V
0	FACTORY DEFAULT	Not charging	Not charging
1	Gel USA	14.0	13.7
2	AGM 1	14.1	13.4
3	AGM 2	14.6	13.7
4	Sealed Lead Acid	14.4	13.6
5	Lithium (LiFePO4)	14.4	13.8
6	Open lead acid	14.8	13.3
7	Calcium	15.1	13.6
8	Desulphation	15.5	4 hours then off
9	Not used	-	-

Using the SW Switch:

— Use your fingernail, pen, or small enough object to change the switches to the desired priority.

- SW 1:
  Move to "ON" to set frequency to 60Hz.
  For 50Hz, set the switch back down.

- SW 2:
  Move to "ON" to set priority to "DC". For AC priority, set the switch back down.

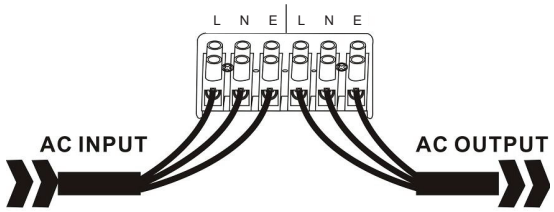
WARNING:

The output voltage of this unit must never be connected in its input AC terminal, overload or damage may result. Always switch on the inverter before plugging in any appliance.

AC Wiring Connection

- **120V Single Phase**

— We recommend using 10-12AWG wire to connect to the AC terminal block. There is only one way of connecting and wiring the terminal block. All of the wirings are CE compliant. Please contact our technical support team if you are not sure about how to wire any part of your inverter.

120V Single Phase	
• **Input:** Live + Neutral + Ground • **Output:** Live + Neutral + Ground	

DC Wiring Connection

- **Cable Type Selections**

— It is suggested the battery bank be kept as close as possible to the inverter. The following table is a suggested wiring guide for a 1 meter cable. In case of wiring longer than 1m, please increase the cross section of cable to reduce the loss.

Watt Model	Battery Voltage	Wire Gauge / Min		Watt Model	Battery Voltage	Wire Gauge / Min	
		0~1.0m	1.0~5.0m			0~1.0m	1.0~5.0m
2000	12 Vdc	60mm²	75mm²	3000	12 Vdc	90mm²	120mm²

- Please note that if there is a problem obtaining for example 90mm² cable, use 2*50mm² or 3*35mm².

- One cable is always best, but cable is simply copper and all you require is the copper, so it does not matter if it is one cable or 10 cables as long as the square area adds up. Performance of any product can be improved by thicker cable and shorter runs, so if in doubt round up and keep the length as short as possible.

Audible Alarm Protection

- **Alarm Indicators**

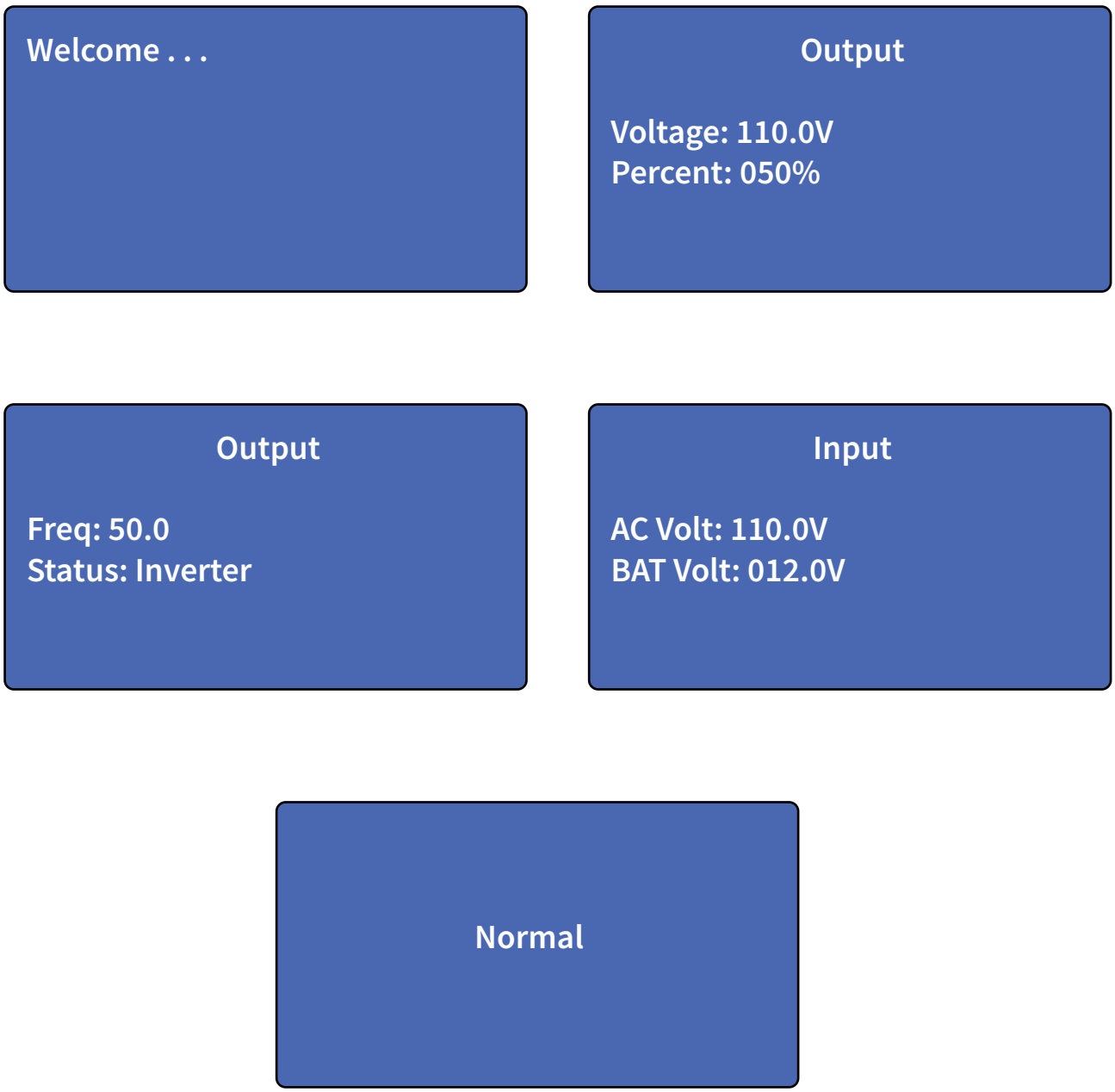
Indicator	
Battery Voltage Low	Inverter LED lights green and buzzer beeps every 5s
Battery Voltage High	Inverter LED lights green and buzzer beeps every 1s -- shuts down after 60s
Inverter Overload	110%< load<125%: No audible alarm for 14 minutes, Begins to beep every second at the start of the 15th minute, and shuts down after 15 minutes. 125% <load<150%: Beeps every 1s, and shuts down after 60s. Load>150%: Beeps every 1s, and shuts down after 20s.
Over-Temperature	Heat sink temp. >105°C, over temp. red LED Light flashes, beeps every 1s;

- **Fan**

Protection	
Over Temperature Protection	Heat sink temp.≥105°C, (shutdown) after 30 seconds
Back-Feed Protection	Yes
Recover from shutting down for fault	Mode of operation: restart the machine

LCD Display

- **LCD Will Display as Follows:**



Error Codes

- **Fault Status Description:**

  — Fault: TX 0000000 "TX" means the load and inverter do not connect, an internal line connection failure. For more detailed information on fault status, please refer to **Fault Status Table**. The inverter will display "System Normal" when working.

- **Fault Status Table:**

site	Name		
B0	Communication Failure	0- normal 1- failure	TX 0000000
B1	Battery Voltage	0- normal 1- failure	1000000
B2	Inverter Failure	0- normal 1- failure	0100000
B3	Fan Failure	0- normal 1- failure	0010000
B4	Output Overload	0- normal 1- failure	0001000
B5	Output Short Circuit	0- normal 1- failure	0000100
B6	Battery Failure	0- normal 1- failure	0000010
B7	Battery Over-Voltage	0- normal 1- failure	0000001

Troubleshooting for Audible and Visual Indicators

- **LCD, LED Indicator, & Buzzer Table:**

Status	Item	SHORE POWER ON	INVERTER	BATTERY CHARGER	ALARM	BUZZER
Line Mode	CC	✓	×	✓	×	×
	CV	✓	×	✓	×	×
	Float	✓	×	✓	×	×
	Standby	✓	×	×	×	×
Invert Mode	Inverter On	×	✓	×	×	×
Alarm Mode	Battery Low	×	✓	×	✓	Beeps Every 5s
	Battery High	×	✓	×	✓	Beeps Every 1s
	Overload on Invert Mode	×	✓	×	✓	Refer to "Audible alarm"
	Over-Temperature on Invert Mode	×	✓	×	✓	Continuous Beep
	Over-Temperature on Utility Line Mode	✓	×	✓	✓	Continuous Beep
	Overcharge	✓	×	✓	✓	Continuous Beep
Fault Mode	Fan Lock	×	×	×	×	Continuous Beep
	Battery High	×	✓	×	×	Continuous Beep
	Inverter Mode Overload	×	×	×	×	Continuous Beep
	Over-Temperature	×	×	×	×	Continuous Beep
	Overcharge	×	×	✓	×	Continuous Beep
	Back Feed Short	×	×	×	×	Continuous Beep

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Pure Sine Wave 2000W/3000W

IVOCH2KW / IVOCH3KW

Support:

Please Feel Free to contact us for any questions or support at:

(562) 630 - 3002

support@expertpower.us

6437 Alondra Blvd

Paramount, CA 90723