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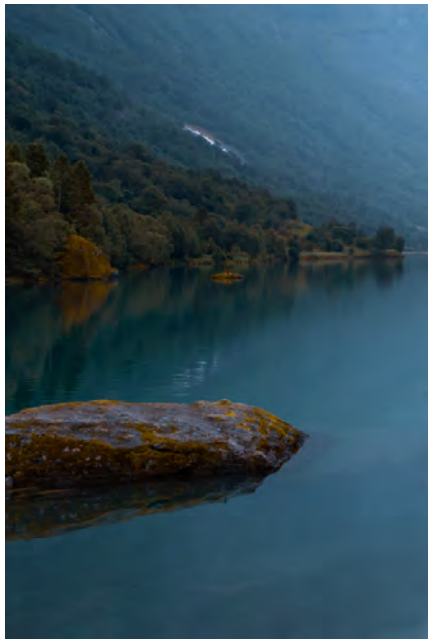
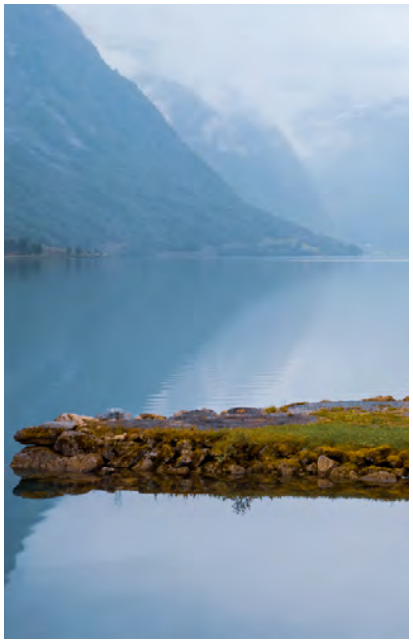
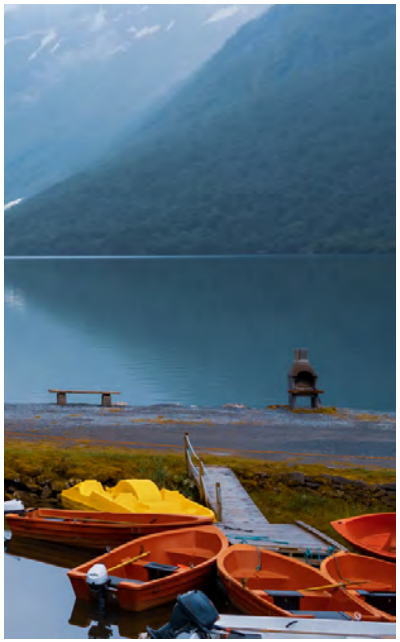
Installer's Guide

GTX12V315A-E2107-CS200RV INSTALLATION KIT

KISAE 3000 WATT



LITHIONICS BATTERY, CLEARWATER, FL 33765 USA | PH: 727.726.4204 | FAX: 727.797.8046 | WEB: LITHIONICSBATTERY.com

Table of Contents

Safety Information

This manual is intended to be used by qualified installers. Although it is quite detailed, it is meant only as an overall guide to the installation and not to replace the OEM manuals supplied by the relevant equipment manufacturers.

All electrical work should be performed in accordance with local and national electrical codes. Assume that voltage is present at the battery terminals; use insulated tools and gloves while working on the system. Always turn off equipment connected to the battery to isolate it from other electrical circuits before performing any repairs or maintenance on the system.

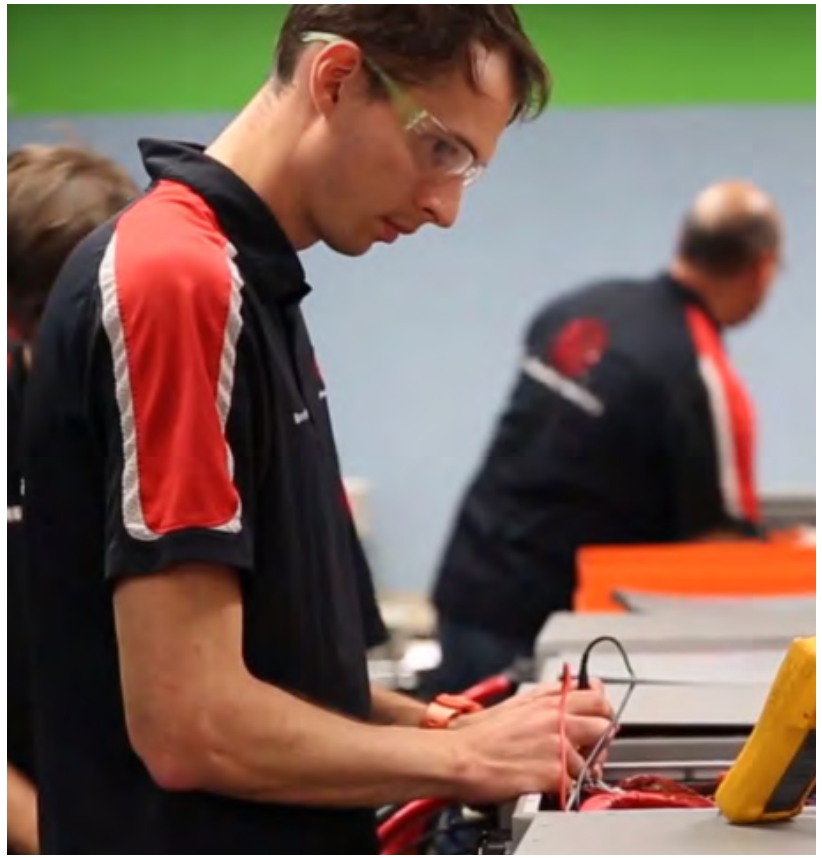
Always use the appropriate size cable to connect the system to inverters, chargers or other equipment. Always use crimped connections to connect to the battery terminals. Read and follow the inverter, charger or other equipment manufacturer's safety precautions prior to connecting the battery to that equipment.

Always use charging equipment compatible with Lithium Iron Phosphate battery chemistry.

Links to the installation manuals relevant to this kit are listed at the back of this manual.

Introduction

The Lithionics **GTX12V315A-E2107-CS200 Kisae** 3000 kit is based on two **GTX12V315A-E2107-CS200** batteries (630 amp hours) and a **Kisae** 3000 watt inverter / charger. This combination is capable of providing enough power to run most AC loads for extended periods of time. The inverter features true sine wave grid quality power and is capable of handling high surge loads.



Wiring Diagrams

- Main Diagram
- Inverter Diagram
- Kisae DMT-1250 Diagram
- Battery/IonGage Diagram

Main Diagram

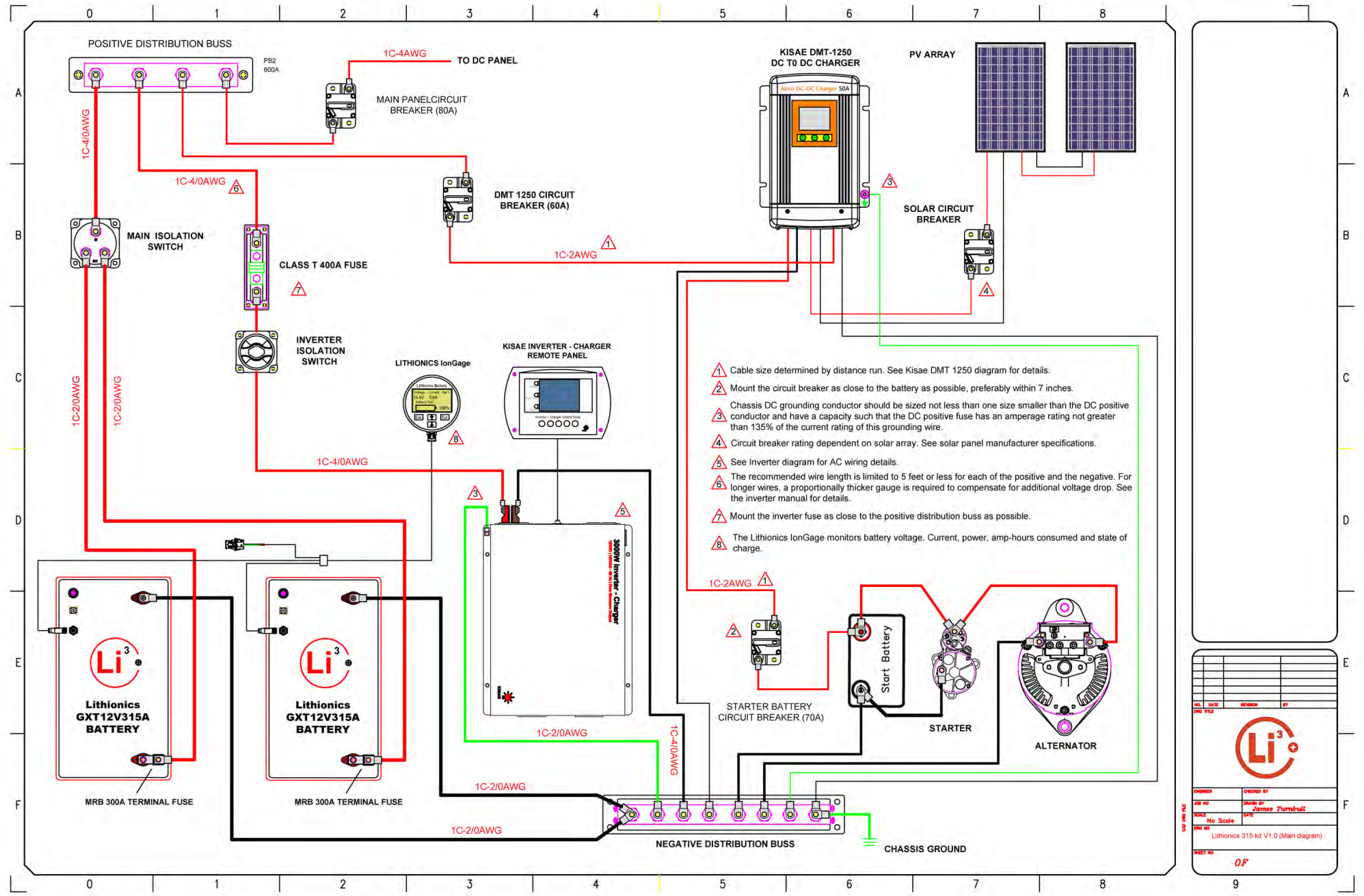
The main diagram depicts the general layout of the system. The 2/0 AWG battery positive cables are connected to the main positive distribution buss via two 300A marine rated battery terminal fuses and an isolation switch. The inverter is connected to the positive distribution buss via a 400A class T fuse and an isolation switch. The class T fuse block should be mounted as close as possible to the positive distribution buss. The isolation switch allows you to isolate the inverter in case of a malfunction as well as disabling the inverter if you need to work on the AC system. The chassis DC grounding cable (green) should be sized not less than one size smaller than the DC positive conductor and have a capacity such that the DC positive fuse has an amperage rating not greater than 135% of the current rating of this ground wire. If the positive cable supplying the inverter shorts to ground internally, then the chassis ground cable needs to be able to carry enough current to blow the inverter fuse without melting and possibly causing a fire.

The inverter is controlled by the **Multi-Function Display**. The display is used to provide information about the inverters status and can be used to customize its features.

The **Lithionics IonGage** monitors battery voltage, current, power, amp-hours consumed and state of charge.

The **DMT-1250** charger is connected to the positive distribution buss via a 60A circuit breaker (Ch-1). The PV solar array is connected to the MPPT charger input (Ch-2) via a circuit breaker. Please note that the maximum PV solar array voltage is 45VDC. The alternator / start battery input (Ch-3) is connected to the start battery via a 70A circuit breaker, this circuit breaker must be installed as close to the battery as possible.

MAIN DIAGRAM



Inverter Diagram

The inverter diagram depicts a typical AC installation. The main panel has an output breaker for the non- inverter loads. It is used to power the high power loads that are beyond the inverters capacity such as a water heater or an electric stove. The inverter AC input must be protected by a circuit breaker rated at 30A. Make all connections using proper crimp-on connectors (do not use twist on connectors).

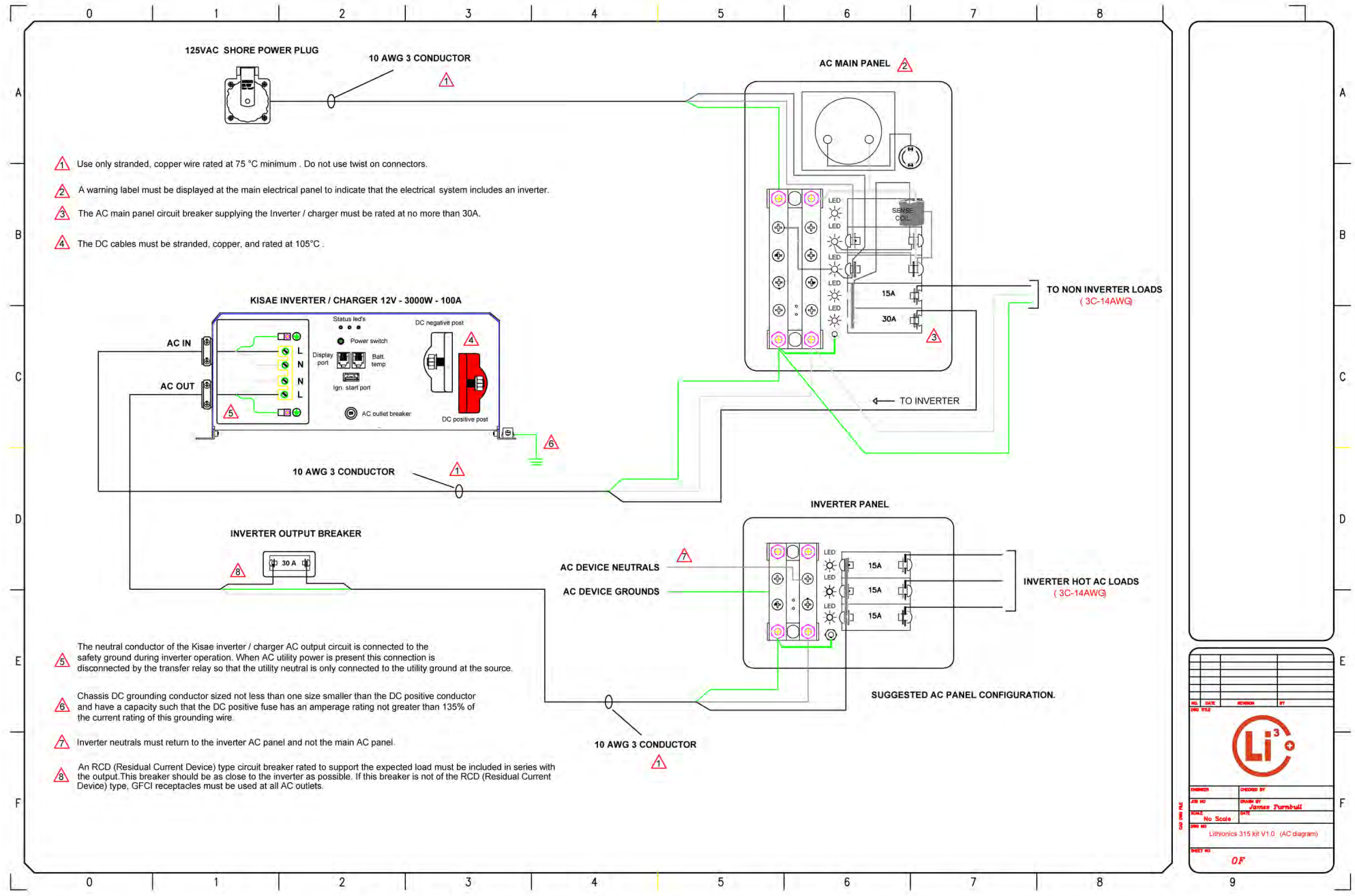
A Residual Current Device (RCD) type circuit breaker rated at 30A must be wired in series with the output. This breaker should be as close to the inverter as possible. If this breaker is not of the RCD type, GFCI receptacles must be used at all AC outlets.

The neutral conductor of the Kisae inverter / charger AC output circuit is connected to the chassis ground during inverter operation. When AC utility power is present this connection is disconnected by the transfer relay so that the utility neutral is only connected to the utility ground at the source. In an RV installation, the inverter chassis must be connected the vehicle chassis ground (via the negative distribution buss). The chassis grounding conductor must be sized not less than one size smaller than the DC positive conductor and have a capacity such that the DC positive fuse has an amperage rating not greater than 135% of the current rating of this grounding wire.

When using an inverter sub panel, the inverter neutral cables must return to the inverter sub panel and not the main AC panel.

A warning label should be installed at the main AC panel to indicate that there is an inverter in the system.

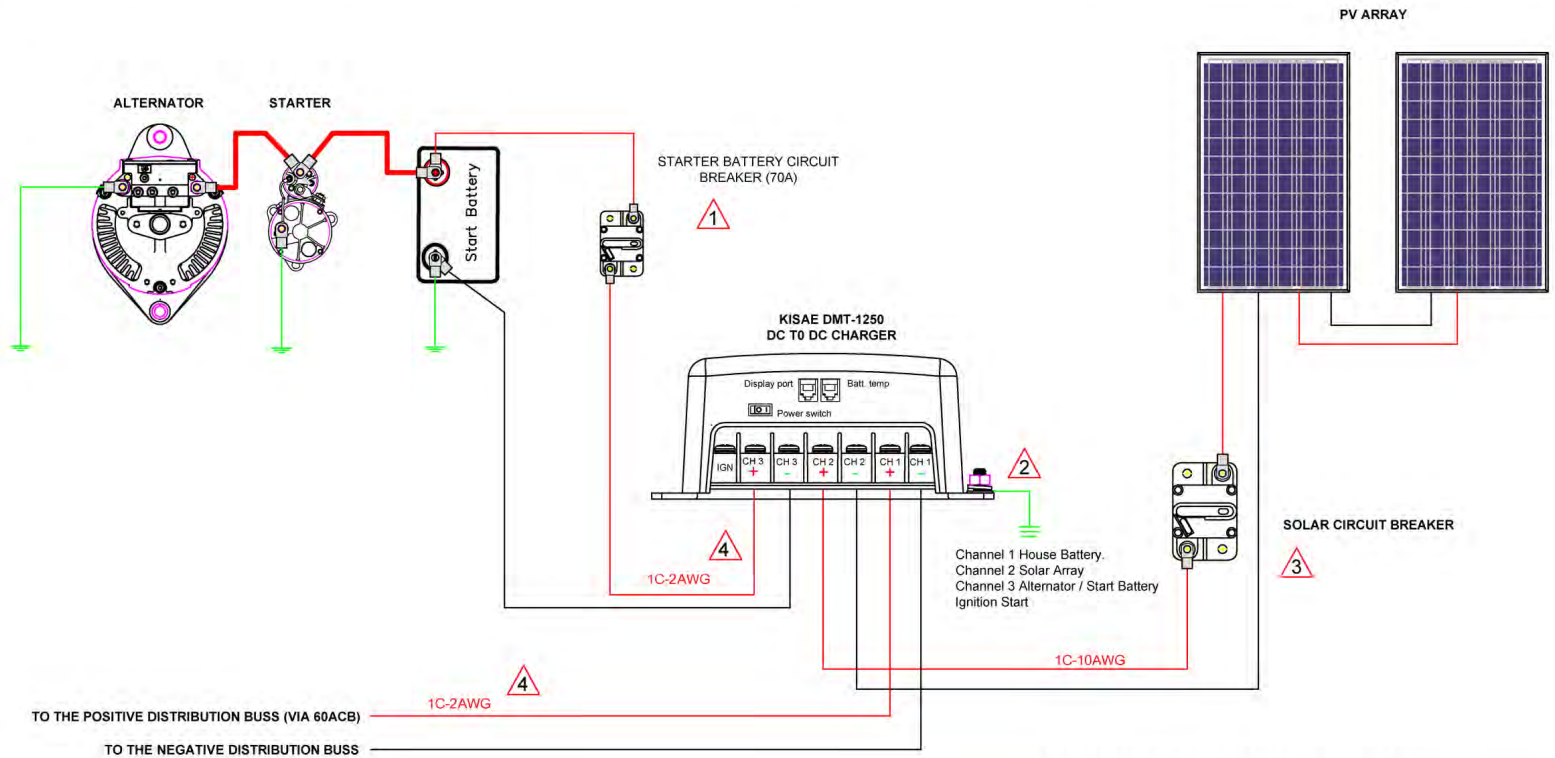
INVERTER DIAGRAM



Kisae DMT-1250

The **DMT-1250** DC to DC Battery Charger is a fully automatic multi-stage, multi-input battery charger with the ability to charge from either an alternator linked to a battery, or via solar power with the Maximum Power Point Tracking (MPPT) Solar Controller. With two inputs available, the house battery will be charged from either the engine while underway, or via the solar panels when stationary. The process to choose either engine or solar is fully automatic and both functions are controlled from within the unit itself without the need for external relays.

KISAE DMT-1250 DIAGRAM



1. Mount the circuit breaker as close to the battery as possible, preferably within 7 inches.
2. Chassis DC grounding conductor should be sized not less than one size smaller than the DC positive conductor and have a capacity such that the DC positive fuse has an amperage rating not greater than 135% of the current rating of this grounding wire.
3. Circuit breaker rating dependent on solar array. See solar panel manufacturer specifications.
4.

DC to DC Connection Input	Recommended cable size		
DMT 1250 @ 12VDC 50A	2 to 5 meters	Up to 10 meters	≥ 10 meters
From Alternator Battery	4 -2 AWG	1- 0 AWG	Not Recommended
House Battery Connection	4 -2 AWG	Not Recommended	Not Recommended
Note: Cable size quoted is one way from battery to device, the suggested cable size is calculated with return run			

KISAE DMT-1250 DC T0 DC CHARGER SPECIFICATIONS

Output Rating	DMT1250
Output Current	Maximum 50A
Output Voltage	12V Nominal
Output Power	775W
Charger DC output (CH 1)	
Selectable Battery Type	GEL, AGM, Flooded, Lithium,
Program Charger Voltage Range	13.8 -15.5 Vdc
Float Voltage Range	13.0 -13.8 Vdc
Charger Current	(User Selectable) 5-50A with 5A Steps
Charging Control	Two or Three Stage Selectable (Default 3 stage)
DC Output Bank	Single
Current draw from CH1 with unit ON	< 70 mA
Current draw from CH1 with unit OFF	< 200 uA
Efficiency	95%
DC Input Solar Array/Panels (CH2)	
Input Voltage	14.5 - 45 VDC
Maximum Solar Input Power	≤ 23V input, 500W (600W allowable) ≥37.5 - 45V input, 750W (800W allowable)
DC Input Alternator/ Start Battery (CH3)	
Input Voltage	10.5 - 16.0 VDC
Maximum Input Current	30A

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DWG TITLE

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JOB NO | DRAWN BY James Turnbull

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DWG NO Lithionics 315 kit V1.0 (DMT - 1250 diagram)

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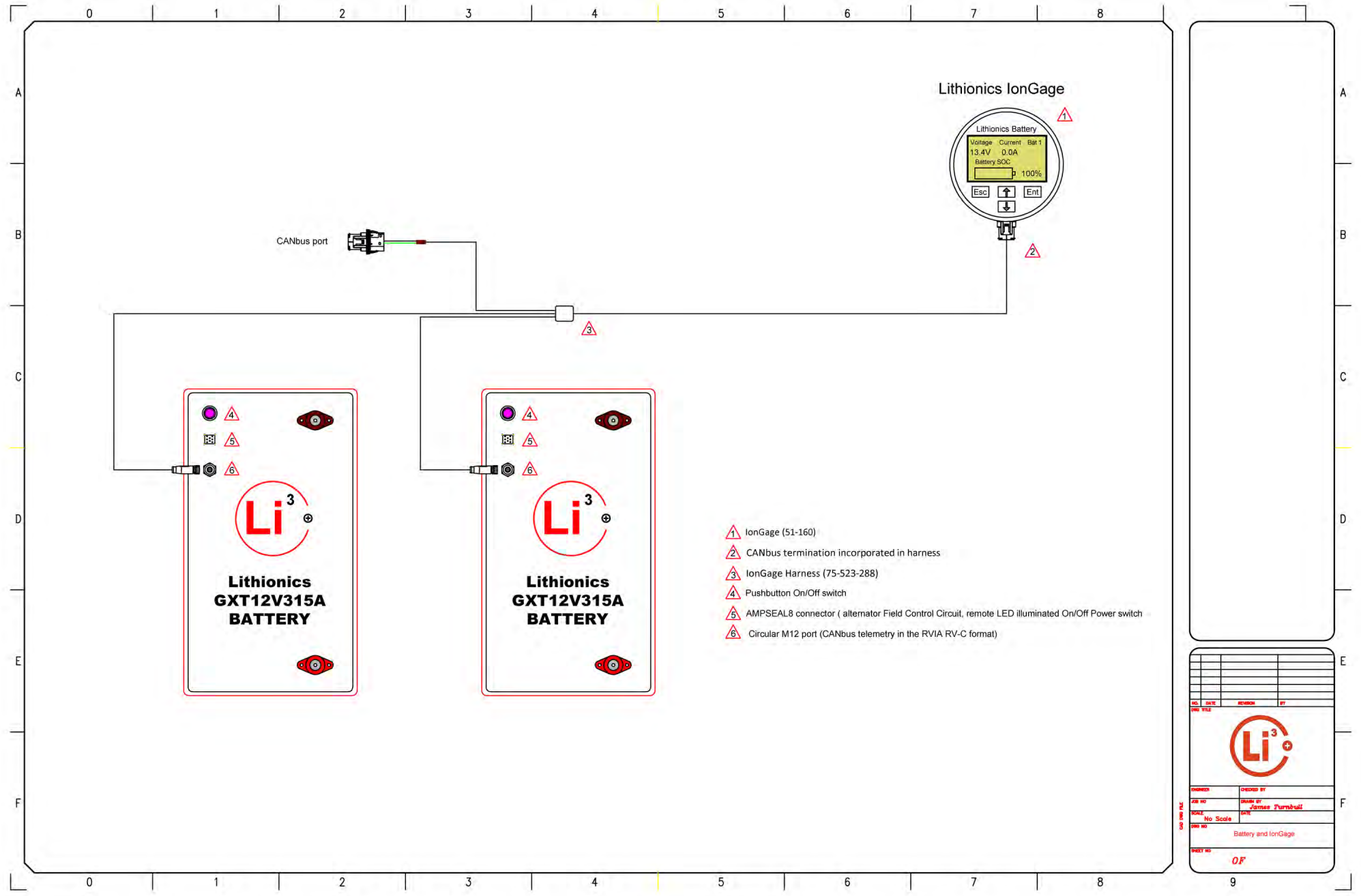
Battery/IonGage Diagram

The Advanced Series BMS includes an integrated SOC Gauge, designed to track battery state of charge (percent of usable energy left in the battery) as well as other useful data parameters. Tracking state of charge is accomplished by a Coulomb counter, based on an internal, high sensitivity hall-effect sensor. The SOC Gauge data will only be correct if the configuration parameters are set correctly, which are pre-set initially by Lithionics Battery, but are user adjustable with supporting hardware. The SOC Gauge will also track and display live amperage (A), live wattage (W), battery voltage (V), temperature (F/C), amp hours (Ah), watt hours (Wh), time remaining (d/h), etc. The meter will be most accurate if the battery is fully charged on a regular basis. If the battery is always partially charged, then the SOC meter reading may drift in the long term and will become less accurate. When the most accurate measurements are required it is recommended to perform a full charge at least weekly.

BATTERY/IONGAGE DIAGRAM



Parts List

QTY	PART NUMBER	DESCRIPTION	COMMENTS
1	BSS-2104	PowerBar 600A BusBar - Four 3/8"-16 Studs	Blue Sea Systems
1	BSS-2107	PowerBar 600A BusBar - Eight 3/8"-16 Studs	Blue Sea Systems
1	BSS-7140	187-Series Circuit Breaker - Surface Mount 60A	Blue Sea Systems
1	BSS-7141	187-Series Circuit Breaker - Surface Mount 70A	Blue Sea Systems
1	BSS-7136	187-Series Circuit Breaker - Surface Mount 30A	Blue Sea Systems
1	BSS-7142	187-Series Circuit Breaker - Surface Mount 80A	Blue Sea Systems
2	BSS-5191	MRBF Terminal Fuse Block - 30 to 300A	Blue Sea Systems
1	BSS-5502100	Class T Fuse Block with Insulating Cover - 225 to 400A	Blue Sea Systems
1	BSS-5121	Class T Fuse - 400 Amp	Blue Sea Systems
2	BSS-5190	MRBF Terminal Fuse - 300A	Blue Sea Systems
1	BSS-3000	HD-Series Heavy Duty On-Off Battery Switch	Blue Sea Systems
1	BSS-9003e	E-Series On Off Battery Switch	Blue Sea Systems
1	DMT-1250	Kisae DMT-1250 DC to DC charger	Kisae
1	BIC1230100	Kisae 3000 watt inverter / charger	Kisae
1		Inverter Remote Panel	Kisae
1	51-160	Lithionics IonGage	Lithionics Battery
1	75-523-288	IonGage Harness	Lithionics Battery

Battery Installation

Check the battery for visible damage including cracks, dents, deformation and other visible abnormalities. The top surface of the battery and terminal connections should be clean, free of dirt and corrosion, and dry.

Battery power should be turned off prior to the installation and for storage. Check the LED integrated into the Power button to make sure it is completely off. If the LED is on or blinking, press and hold the Power button for 3 seconds until LED turns off.

Lithium batteries do not release gas during normal use. There are no specific ventilation requirements for battery installation, although enough airflow should be provided to prevent excessive heat build-up.

The battery should be stored and installed in a clean, cool and dry place, keeping water, oil, and dirt away from the battery. If any of these materials can accumulate on the top surface of the battery, current leakage can occur, resulting in self-discharge and possible short circuits.

Battery Installation

The battery is equipped with two flat threaded terminals designed for a 5/16” or M8 size ring terminal lug and secured by included M8 bolts, flat washers and lock washers. When using flat washers, it is critical to place the ring terminal lug in direct contact with the top surface of the power terminal and then place the washers on top of the lug.

Connect the positive and negative battery cables with correct polarity and double check the polarity of battery circuit to avoid potential equipment and battery damage.

DO NOT place any washers between the battery power terminal and the ring terminal lug, as this could create a high resistance path and cause excessive heating of the connection which could then lead to permanent battery damage or fire. If you must attach more than one lug to each terminal, make sure at least 1/4” or 6mm of thread is available to secure the connection. Additionally, the ring terminal lugs need to be “clocked” in such a way that they do not interfere with their flat conducting surfaces. Acquire and use longer M8x1.25mm bolts if necessary.

Tighten both M8 power terminal bolts to a maximum of 108in-lbs/12.2Nm to ensure there is good contact with the ring terminal lug. Over tightening terminal connections can cause terminal breakage and loose connections can result in power terminal meltdown or fire.

Battery Installation

The battery cables should be sized to handle the expected load. Refer to NEC Table 310.15(B)16 for the maximum amperage based on the cable gauge size. Cable lengths in excess of 6 feet may require heavier gauge wire to avoid unacceptable voltage drop.

For more information refer to the National Electrical Code for correct cable size, which can be located at www.nfpa.org The battery circuit must be properly fused to handle the expected load and not to exceed the battery specifications.

After installation is complete, turn on the battery power by a short-press of the Power button. The LED indicator should come on to confirm the battery's state.

DO NOT connect multiple batteries in series to get higher voltage as it will damage the internal BMS.

DO NOT attempt to disassemble the battery, as it could lead to permanent battery damage and voids your battery warranty!!!

A link to the battery installation manual is listed at the back of this manual

Equipment Manuals

Please see below the web links for the manufacturer equipment manuals.

Lithionics Battery ***Kisae Inverter*** ***Kisae DMT-1250***