

# IOTA

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## ILC-3045 SERIES LOAD CENTER OWNER'S MANUAL

The ILC Load Center provides the convenience of an all-inclusive lightweight power center in a durable housing and injection-molded faceplate. The ILC includes AC circuit breaker positions, DC fuse panel, and DLS Series Converter for providing practical accessibility and the level of power you require.

### LOAD CENTER OVERVIEW

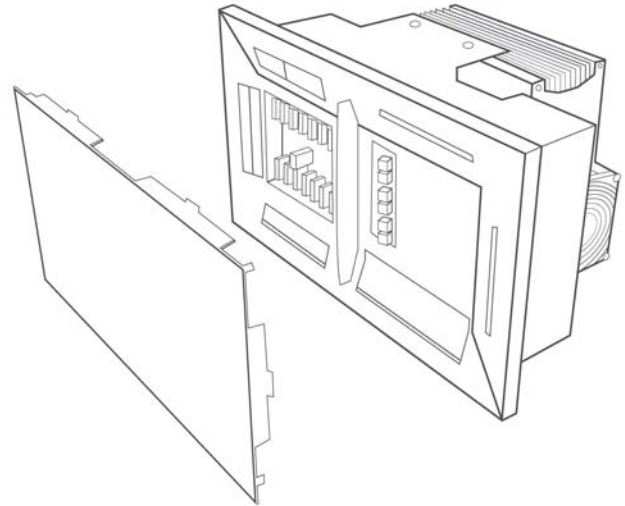
The ILC Series Load Center is a compact, attractive, electrical distribution panel designed to handle the 120 volt AC and 12 volt DC distribution of an RV or other similar AC/DC system. The 120 volt compartment is rated for 30 amps 120 VAC, and will accommodate from two branch circuits to a maximum of one pole main and seven branch circuits. Standard configuration for an RV with 30 amp powercord is a 30 amp main and five branch circuits. Installations with greater than five branch circuits require the incorporation of a listed energy management system. The 12 volt compartment will accommodate twelve circuits utilizing blade type fuses. The panel is acceptable for Canada by utilizing optional bushings in the 12 volt wire entry holes. It comes with a standard Two-Year Warranty.

### INSTALLATION

#### I. LOCATION

The ILC should be mounted on an interior vertical surface where there is sufficient depth to allow for space for the panel and wiring behind it. Typical locations include under counter cabinet fronts or sides, below closet compartments, overhead cabinet fronts, and bed pedestals. **Under floor storage compartments in the back wall of closets are not acceptable, as the panel must not be installed in the rear of any storage compartment.** Eye level locations are best, where possible, as it is easier to reset or replace breakers or fuses.

The location chosen must have access space in front for service after installation. This space is defined by the National Electric Codes as 24" wide by 30" deep. However, if the ILC is mounted facing the aisle, then one of these dimensions may be reduced to 22". Behind the wall, the converter on the back of the ILC requires a minimum of 3 cubic feet for 45A models and 5 cubic feet for 55A models.



When choosing a mounting location for the ILC, consideration should be given to its proximity to supply components, such as powercord (or powercord/generator/inverter lines from a transfer switch) on the 120 VAC side, and the battery/converter locations on the 12 VDC side. Where possible, consideration should also be given to mounting the ILC toward the middle of the RV, thus equalizing the length of the different 12 volt branch circuits, in order to minimize DC voltage drop. This is preferred to circuits which must run the entire length of the vehicle.

#### II. CABINET PREPARATION

Cut an opening in the face of the cabinet for the ILC. The cabinet face must be strong enough to support the unit during vehicle operation. Approximate dimensions for the opening are 7 1/8" high and 12 3/8" wide. If the opening is cut into light paneling the opening must be framed with support members into which Load Center mounting screws may be driven and to which cables may be attached.

Determine how many branch circuits will be used. Remove the rectangular knockouts for those branch circuits. Mount the ILC in the opening on the cabinet using four screws.

#### III. 120 VOLT COMPARTMENT

Install an 8 gauge copper chassis ground wire to the Load Center ground bar. A hole in the case is provided for wire entry directly to the bar.

**Powercord-** (Fig A) Attach a cable clamp in the 1" round opening for the supply wire (powercord, feed wire from transfer switch, etc.) Attach and tighten the cable clamp nut as required. Remove outer sheathing from the supply wire, and trim leads (recommended 1.5" for the ground wire, and 2.5" for the neutral and hot wires; see wire stripping guide, Fig. B). Strip 1/2" insulation from the ends of the lead. Insert the wire through the clamp. Connect the green (ground) conductor to the first terminal on the ground bar located toward the front of the compartment. Connect the white (neutral) conductor to the bottom terminal on the neutral bar located at the rear of the compartment. Tighten screws on cable clamp to secure supply wires. Do not install circuit breakers until other connections are made first.

**Branch Circuits-** (Fig. C) Remove sheathing from nonmetallic branch circuit wiring, and trim leads (recommended 1.5" for the ground wire, and 2.5" for the neutral and hot wires; see wire stripping guide, Fig. B.) Strip 1/2" insulation from the ends of the leads. Insert wires into rectangular openings; the sheathing must intrude into the compartment 1/4" or more. Wedge-shaped cable clamps can be provided for the ILC to secure the branch circuit nonmetallic cables inside the box as required by the National Electric Code. If wedge clamps are required, contact Customer Service at 1-800-866-IOTA (4682).

Insert ground wire into the ground bar and tighten terminal screw. Attach the neutral conductor to the neutral bar. Tighten securely. The NEC allows only one conductor per terminal on the neutral bar. Repeat this process with all the branch circuits.

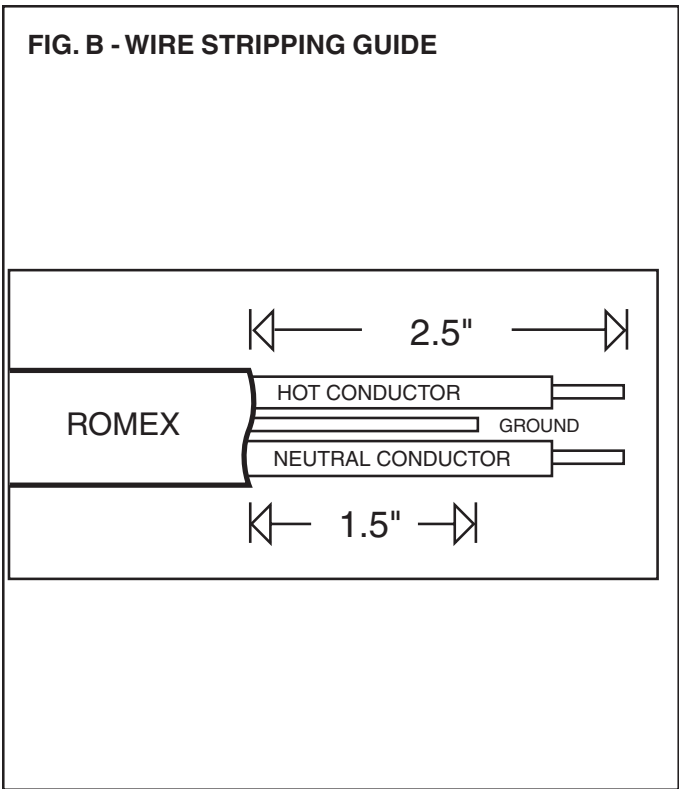
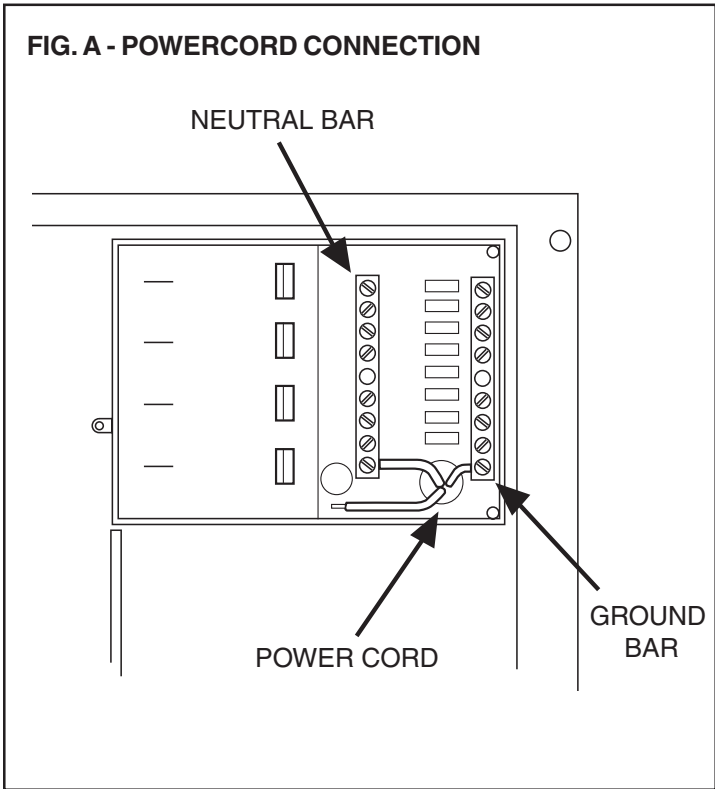
**IV. CIRCUIT BREAKERS**

Install circuit breakers (Fig. D.). Connect black (hot) wires to the circuit breakers. Tighten securely. The NEC allows only one conductor per terminal in the circuit breakers. NOTE: The Load Center is listed to accept any standard 1" wide circuit breaker if the interchangeable models currently on the market, whether one pole or twin. It is not brand or part number specific. ILC-30 models are listed for a 30 amp breaker as a main. The main breaker must be secured in place by means of a hold-down clip.

**V. 12 VOLT COMPARTMENT**

The fuse panel will accommodate ATO/ATC sized blade fuses. Install fuses or breakers of the correct amperage. Proper protection may be either to protect wires of a certain size on a general purpose branch circuit, or to protect individual appliances, such as a water pump or a TV antenna booster, on a dedicated circuit. All wires connected to the DC fuse panel extend out of the back of the ILC unit and are labeled with the fuse position number for ease of wiring.

**CANADIAN REQUIREMENTS:** Canada requires that all 12 volt fuses used in RVs be listed to CSA standards. There is also a requirement in Canada that low voltage panels be enclosed, "...such that an 1/8" diameter rod shall not penetrate." For Load Center installation in Canadian RVs, snap the optional round bushings into the 12 volt



wire entry holes; they may be installed from the outside or inside. The pie-shaped fingers in the bushings bend to allow wiring to pass, yet fill in the remainder of the space, complying with Canadian requirements.

## VI. LABELS

Install labels for 120 volt and 12 volt circuit identification. Labels may be preprinted or blank labels may be filled in by the installer. Labels must be visible after the deadfront is attached. 120 volt labels are intended to be attached to the circuit breaker. 12 volt labels are intended to be attached above and below the fuse openings. Labels should not be attached to the front cover, as the cover can be removed and lost.

## HI-POT TESTING

### (MANUFACTURING COMPANIES ONLY)

- 1) Turn on all circuit breakers in panel.
- 2) Make sure all power supplies including inverter and generator are off. If there are other power supplies present, and they are electrically connected to the RV system by means of a transfer switch, refer to the transfer switch hi-pot instructions before proceeding further. See Note.

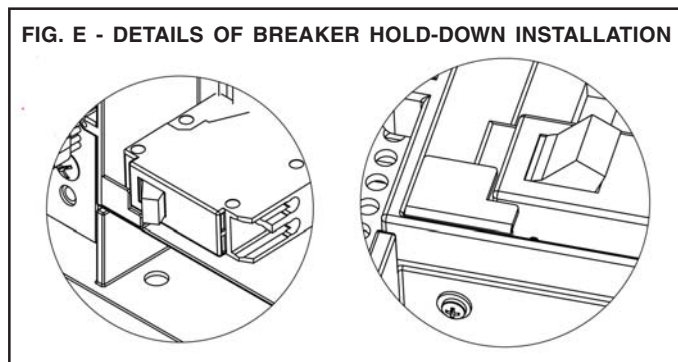
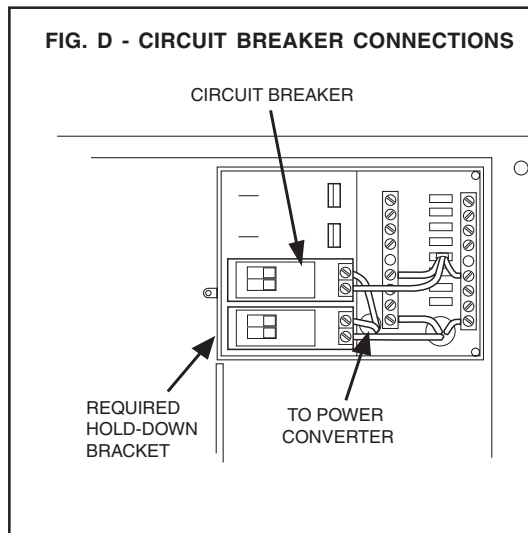
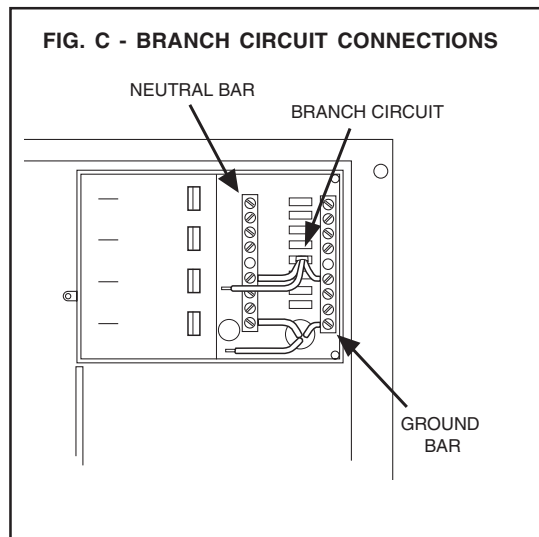
3) Turn off or disconnect all appliances that would be damaged by the hi-pot test.

4) Connect the hi-pot leads to the powercord plug: one lead to the hot and neutral prongs, the other lead to the ground prong.

5) Energize the hi-pot and conduct test. This will hi-pot test for leakage (short) between the current-carrying conductors and the ground in the entire RV 120 VAC circuitry. It will also test the powercord itself. Turn off hi-pot.

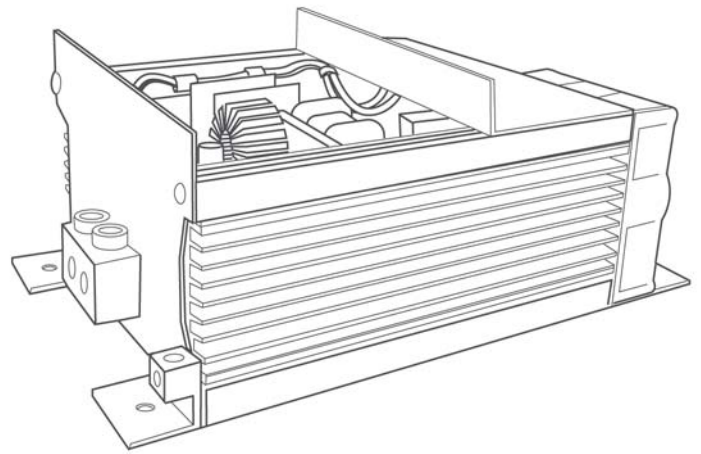
6) If hi-pot test fails there is a short in the system. The next step is to isolate the location of the short. Turn off the main breaker in panel and hi-pot test again. If test fails, fault is between the cord plug and the panel. Test cord for shorted plug. If second test passes, turn on main breaker, and turn off all branch breakers except one. Retest each branch circuit individually until short circuit is isolated. Repair fault and retest. Hi-pot test is successful when there are no more fault indications.

NOTE: If the hi-pot test is performed from the plug on the powercord, and there is a transfer switch present, the test may only hi-pot the cord itself; it may not test the RV wiring beyond the switch. In this case the hi-pot transfer switch should be performed from either the transfer switch output, or from the main panel, as well as from the plug to test the cord itself.



## DLS SERIES POWER CONVERTER

The DLS series power converter/battery charger utilized by the ILC converts 120 volts nominal A.C. to 13.6 volts D.C. As a power supply, its tightly controlled regulation allows the user to operate any 12 volt nominal D.C. load up to the converter's rated output current. As a battery charger, the converter will maintain the battery, delivering its full-rated current when the battery capacity falls sufficiently low. The voltage is set to deliver its maximum current for the necessary period of time that minimizes undue stress to the battery caused by heating of its cells. This helps to ensure the longest possible life of the battery. Over time, as the battery nears its full capacity, the converter will float-charge the battery to prevent self-discharge of its cells.



## PROTECTION FEATURES

The DLS series power converter/battery charger is designed with high quality components to help ensure years of continuous use. The DLS series is protected by multiple protection features for a long, trouble-free life.

1) *Reverse Battery Polarity Protection.* 2) *Brown-Out Input Protection.* 3) *Over-Current Protection* - cycle by cycle peak limiting as well as rated current limiting to maximize the life of the converter. 4) *Over-Temperature Protection.* In addition, it is designed with a unique "proportional" fan control circuit. Fan speed is directly proportional to the converter's internal ambient temperature. This enables the fan to turn on and off very slowly, minimizing unwanted fan-starting noise.

## WARRANTY

All IOTA Power Products come with a two-year warranty. IOTA warranties their products in the continental United States and Canada from defects in materials or workmanship under normal use for two years from date of retail purchase and will repair or replace any product under warranty found to be defective free of charge. For complete warranty information, consult Customer Service or visit [www.iotaengineering.com](http://www.iotaengineering.com).

### DLS-45

DC Output Voltage (No Load) approx.	13.6V (DC)
Output Voltage Tolerance (No Load)	+ or - .7%
Output Amperage, Max Continuous	45 Amps
Output Voltage (Full Load) approx.	>13.4V (DC)
Maximum Power Output, Continuous	600 Watts
Ripple and Noise	<50mV rms
Input Voltage Range	108-132 AC
Input Voltage Frequency	47-63
Maximum AC Current	11 Amps
Typical Efficiency	>80%
Max Inrush Current, Single Cycle	20 Amps
Short Circuit Protection	YES
Overload Protection	>100%
Line Regulation	100mV rms
Load Regulation	<1.5%
Fan Control*	PROPORTIONAL
Thermal Protection	YES
Working Temperature Range	0 - 40C
Storage Temperature	-20 to 80C
Withstand Voltage	1240V @ leads
Dimensions**	7" x 6.5" x 3.5"
Weight	5.5 lbs

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