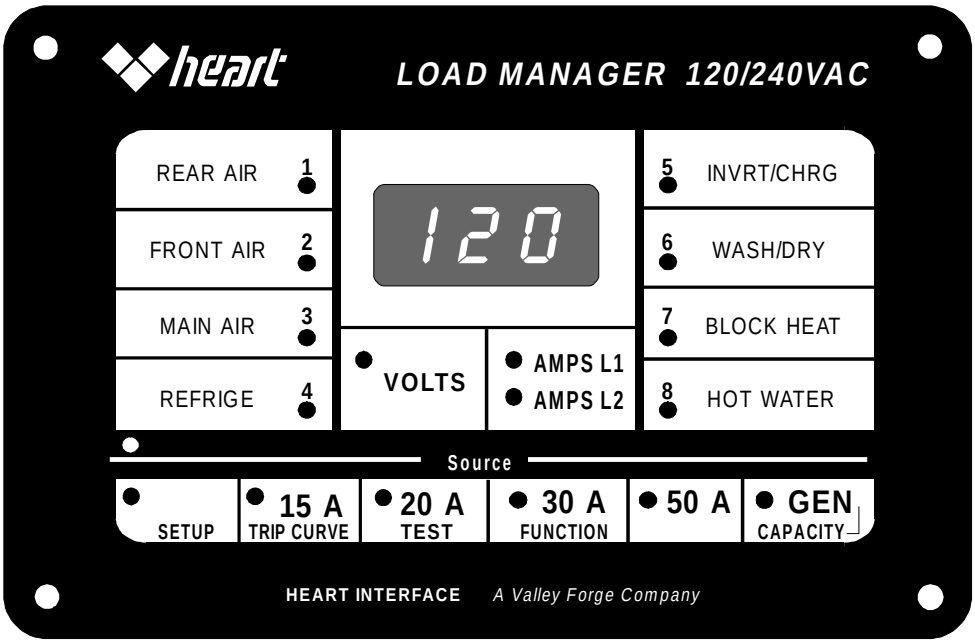
OWNER'S MANUAL

AC LOAD MANAGER 120/240VAC



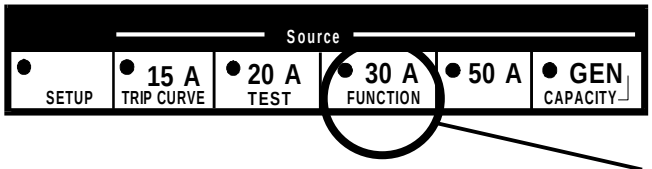
heart interface

A Valley Forge Company

Easy to Use Power Management!

The Heart Interface AC Load Manager for 120/240VAC systems ends the annoyance of popping circuit breakers when you plug in to AC power. Here's how the AC Load Manager works:

1 When you plug into an AC power source, notice the circuit breaker size where you plugged in. This breaker (which should be ***OFF*** while you're plugging in your power cord!) will generally be rated 15, 20, 30, or 50 amps. Occasionally, you may use *two* 30 amp connections to feed a 50 amp 240 VAC wired RV or boat.



2 Suppose you plugged into a 30 amp breaker. You would press the 30 amp button on the front panel of the AC Load Manager for 2 seconds. If you're running a generator, you would press the **GEN** button. If you're using *two* 30 amp connections (for 240 VAC), press the **50** amp button.

3 Now as you turn on various loads, such as air conditioners, heaters, and major household appliances, your Load Manager will turn off lower priority loads to prevent the current from exceeding the selected source limit and tripping the circuit breaker.

4 Loads will be managed to a preset order, determined by how your unit was wired when professionally installed.

5 If a load is off and you think it should be on, please make sure it is not a low priority load. *Never service a load without first turning off circuit breakers first!*

6 **DO NOT USE MANAGED CIRCUITS FOR LIFE SUPPORT DEVICES SUCH AS MEDICAL EQUIPMENT OR AQUARIUM PUMPS.** LOW PRIORITY LOADS MAY BE PRE-EMPTED BY HIGHER PRIORITY LOADS.

SAFETY SUMMARY

1. When working with AC power, always check with a meter or tester that the AC supply source is turned off before working with wiring, in the Load Manager Main Unit, or with electrical system components.

2. Since the Load Manager turns the AC supply on and off. It is essential that AC power be turned off prior to performing any service work***. Make sure power is off!***

3. If there is an inverter installed in the system, AC may be supplied from the inverter. The inverter should be turned off and disconnected from the battery power supply prior to working on the AC system.

4. If possible, work with another person in the vicinity who knows CPR and first aid. Observing good work practices and confirming that all circuits are off will minimize the risk of death or injury.

1. Table of Contents

2. INTRODUCTION

This owner's manual describes the installation and operation of the AC Load Manager, which automatically sheds (turns off) AC loads when there's more load demand than available current, and then turns AC load back as current for the load becomes available. Loads are managed on a priority basis assigned by the installer of the AC Load Manager.

2.1 System description

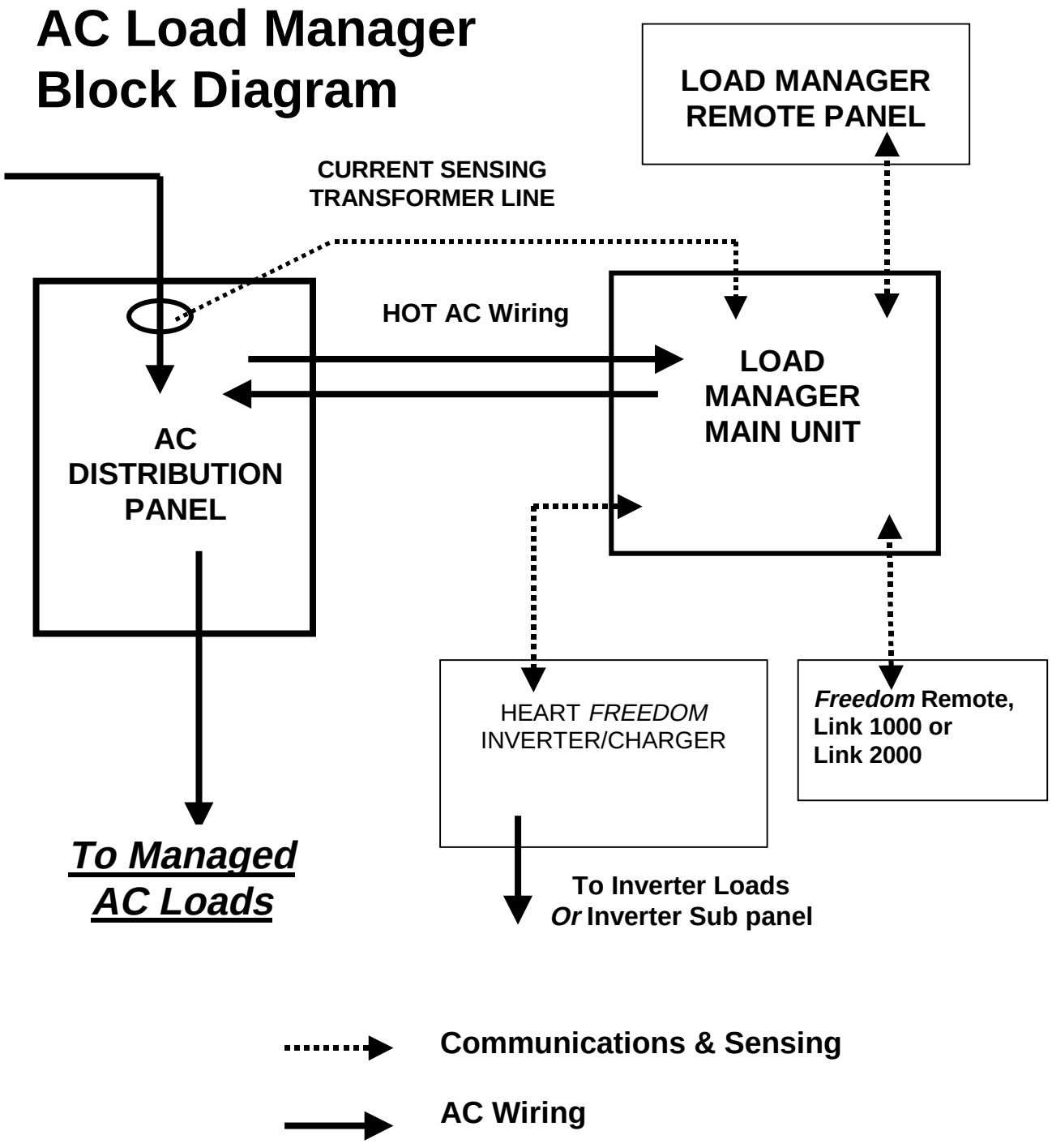
The AC Load Manager is a device that controls the amount of AC current available to an AC distribution system. It performs this function by employing relays to interrupt AC power to selected branch circuits. The Load Manager system is comprised of:

LOAD MANAGER MAIN UNIT	The Load Manager box is a UL approved metal enclosure. It contains the Control Board, Relay Board, and Back Off load control.
REMOTE PANEL	The Remote Panel displays system status, current and voltage measurements, and operator controls for the Load Manager system.
CURRENT TRANSFORMER(S)	The current transformer is a UL approved device that is used to measure all the AC current being consumed.

The relays in the Main Unit are connected in series between the output circuit breaker located in the main AC panel and the associated branch circuit. The branch circuit is prioritized by which relay it is connected. The highest priority circuit is connected to relay #1 and the lower priority loads are connected to relays 2 through 8 in descending order of priority. The total source current is measured by 1 or 2 current transformers that encircle Leg 1 and Leg 2 hot wires. The Load Manager provides for five source current limits: 15, 20, 30, 50 and Generator. If total load demand exceeds the selected source current limit, the Load Manager *sheds loads*. Beginning with load 8, the resistive back off load, additional loads are shed until load demand is below the selected source current limit.

The Load Manager employs a remote control which has lights that illuminate to show which branch circuits are getting power. It has a numeric display that shows AC input voltage, Leg 1 current, Leg 2 current, total current, and the set-up functions. The volts switch selects the AC input voltage to be displayed, the amps switch selects Leg 1, Leg 2, or Leg 1 *plus* Leg 2 current to be displayed. There are 5 switches that select the AC source limit, which is based on the breaker for grid power. There is a switch for selecting the generator as the AC input source. The set-up switch allows the user to select the size of the generator, run a self test routine, set the trip curve, the speed at which loads are shed, and to select various imbedded software functions.

2.2 System Diagram



3. Specifications

Device Operating Power

Power Requirements:	16 Watts, 0.13 AC Amps @120VAC
AC SOURCE Voltage and current ranges:	90 - 140 VAC, 60 Hz, at 15, 20, or 30 Amps plus Generator (which may be set from 2 - 12 kW) ***or*** 240 VAC, 60 Hz at 50 amps plus Generator (which may be set from 2 - 12 kW)

Controlled Circuits

AC LOADS Managed by system:	8 channels total, microprocessor controlled 6 channels at up to 30 amps total @ 120VAC 2 channels handle *either* 120 or 240VAC 30 Amps Inductive (Compressor loads) 30 Amps Reactive (Non-compressor loads)
Variable channels:	1 Variable, SCR controlled, 20 amp resistive
Total managed load capacity:	50 Amps at 120 / 240 VAC

Physical and Wiring

Dimensions:	Main Unit 12" X 12" X 4" Remote Panel 5 3/4" X 3 3/4"
Weight:	Main Unit: 11.2 Lbs. Remote Panel: 1.2 Lbs Current Transformer: .4 Lbs
Environmental:	Non-explosion proof enclosures and wiring. Install in moisture free environment.
Temperature ranges: Storage: Operation:	 -20 to 150 °F 0 to 120 °F
Wire connections:	Knock outs for 3/4", 1", 1 1/2", and 1 3/4". Terminal Strips for wire connections to AC. Phone Cable connection from Main Unit to Remote Panel and Inverter/Charger.

3.1 Controls & Indicators

The Load Manager is operated via the Remote Panel, which is included with the Load Manager, and is used for programming and display of system status, AC voltage, and AC current. The Remote Panel is connected to the Main Unit by telephone type modular cable.

Remote Panel lights indicate which loads are active. The lights are labeled to correspond to load 1, 2, 3.....8. Lights which are on indicate power is available for that load.

The user sets a source limit which is the maximum amount of power available from the AC source. The Load Manager Remote Panel is used to set this source current limit. One of 5 current levels can be selected: 15A, 20A, 30A, 50A, and Generator. The Generator setting may be set for 2.0 to 12.0 kW units in 0.5 kW steps, or OFF if a generator larger than 12 kW is used.

The preset generator capacity (**GEN**) is one of the current source limits available on the front of the Remote Panel.

3.2 Parts List

DESCRIPTION	PART NO.
Load Manager Main Unit*	
Load Manager Remote Panel	90-0002-00
Remote Panel mount screws (4)	
Load Manager - Complete system	84-2017-01
Load Labels - sheet	
Warning Label - distribution box	
Warning Labels - appliances	
Phone cables (2)	
Current Transformer(s) (2)	
* Control Board (in Main Unit)	
* Relay Board (in Main Unit)	
* Back Off Controller (in Main Unit)	
Manual	90-0116-00

4. INSTALLATION

4.1 Receipt of equipment

Inspect the exterior surfaces of the shipping containers and equipment for possible damage prior to accepting the product. Note all damages on the receiving document prior to signing for receipt of product.

The product should be unpacked immediately on receipt, and inspected to determine if any shipping damage has occurred (broken components, disconnected wiring, loose connections, etc.)

No special handling is necessary, however, care should be taken to avoid dropping the unit or exposing it to moisture or dirt.

4.2 Physical Installation

4.2.1 Main Unit

The Main Unit should be located in an area free from moisture and dust, and in close proximity to other AC distribution and supply panels. The main unit is securely attached to a bulkhead or other appropriate surface using the four mounting holes inside the panel.

Knock outs are located around the sides of the panel for wire entry through conduit, flex, or box connectors.

4.2.2 Remote Panel

The Remote Panel may be installed in any convenient indoor location with other related electrical control panels, or in the main living area. A rectangular cutout is required and may be easily made using the template provided (Part Number 90-0002-00). The panel is attached to the wall with four screws (supplied).

Next, the phone cable which connects the Remote Panel to the Main Unit is installed. It is desirable to route this cable away from electrical noise sources such as gas ignitors (found in refrigerator, stove, hot water), gensets, radio transmitters, small DC motors which use brushes (DC water pumps for example) and microwaves. Protect this cable from extremely hot surfaces and protect it from abrasion.

4.2.3 Current Transformer(s)

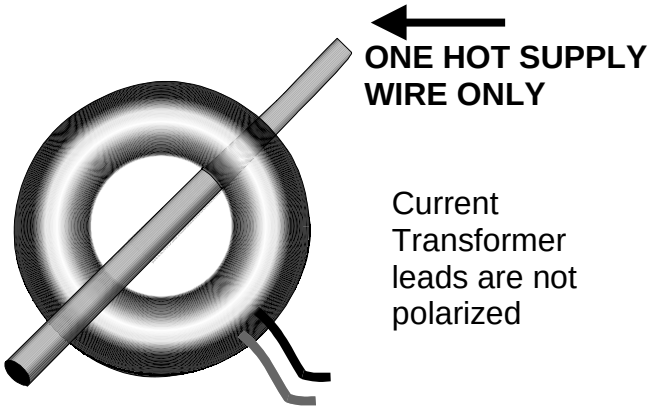
Be CERTAIN that ALL AC and DC power is disconnected prior to working on this part of the system.

Depending on the main breaker size of the AC distribution box. one or two current transformers (or "CT's") may be required:

120/240 VAC:
50 Amp service - 2 current transformers
120 VAC:
30 Amp service - 1 current transformer

The current transformer(s) are installed in the AC distribution panel between the source coming into the AC box and the Main Breaker. In the 120 VAC installation one current transformer is installed between the hot supply and the Main Breaker. In the 240 VAC installation, a current transformer is installed on *each leg* of the 240 VAC input between the hot supply and the Main Breaker. All AC source switching of generators and shore power must be done ahead of the current transformer(s). No other wiring may be routed through the current transformer sensing coil. Only the HOT wire goes through the sensing coil. Neutral and ground make their normal connections inside the distribution panel to the neutral bus and ground bus respectively.

The donut shaped current transformer is installed as follows: One HOT wire, coming into the AC distribution box, attached to one Main Breaker (usually 50 amps) is disconnected. This single HOT wire is then passed through one of the current transformers and is reconnected. On a 240 volt system, the process is repeated for the other hot wire attached to the other Main Breaker. *In both cases, the neutral and ground wires are not routed through the Current transformer.* After inserting the wire, the current transformer should be physically secured using plastic wire ties or a bracket.



If you are installing a 240 VAC Load Manager, repeat this procedure with input Leg 2.

4.2.4 Warning Labels

Attach the supplied *white* Caution labels to the outside of the AC distribution panel in such a way that anyone opening the distribution panel will be alerted the presence of the AC Load Manager.

Attach the smaller *black* Caution labels to managed circuit appliances and outlets.

4.2.5 Power Supply Wiring

If you are using your Load Manager only on 120 VAC, connect power from a 15 amp breaker in the distribution box to the terminal on the control board marked "L1".

This wire will provide both power for the Load Manager and provide a means to sample AC system voltage on Leg 1.

If you are using a 240/120VAC system, use a double pole breaker. On one side, you will power the Load Manager and sample Leg 1 voltage. The other side of the double pole breaker is used to sample Leg 2 voltage.

4.3 Connecting Load Wiring

4.3.1 How Loads are Managed

The AC Load Manager is designed to work with three types of sheddable loads:

1) Compressor Loads
   Channels 1-4
2) Inverter/Charger Loads
   Channels 5
3) Non-Compressor Loads
   Channels 6-7
4) A single Back Off Load
   Channel 8

Let's consider how each load variety is managed.

Compressor loads use a compressor for heating or cooling. Examples might include your front and rear air conditioners, the refrigerator, and perhaps a freezer. When a compressor load is shed (because of higher priority demands) it stays off for at least 5 minutes. This prevents damage to a compressor from restarting prematurely.

The **Inverter/Charger** load is treated in a special manner: If battery voltage falls below 11 volts, then load 5 (where the primary Inverter/Charger AC is connected) becomes the highest priority load for 3 hours. This is to insure you'll always have adequate battery power. If a *second* Inverter/Charger is used, it should be assigned to channel 4. At all other times, (when the battery voltage is sufficient), this channel shares lowest priority with the Back Off load.

Your Load Manager also automatically sets the *Power Share* feature on your Heart Interface *Freedom* series Inverter/Charger. This function frees charger power for higher priority loads.

Non-compressor may be turned off or on at any time with no restart delay. Loads such as the washer/dryer and the block heater fall into this category.

The **Back Off Load** is special. This load, hooked up to Channel 8 must be a *purely resistive* load. It's usually a water heater. This load may be turned partially on to use all available current. The Back Off Load must be wired to Leg 1.***

4.3.2 Load Prioritization

Before wiring loads to the Load Manager Main Unit, you will need to identify the electrical loads and assign switching priorities of each load.

Loads with the lowest priority are shed first as the Load Manager senses demand has exceeded the available supply declared by the user. Thus, a priority 4 load would be shed before a priority 2 load.

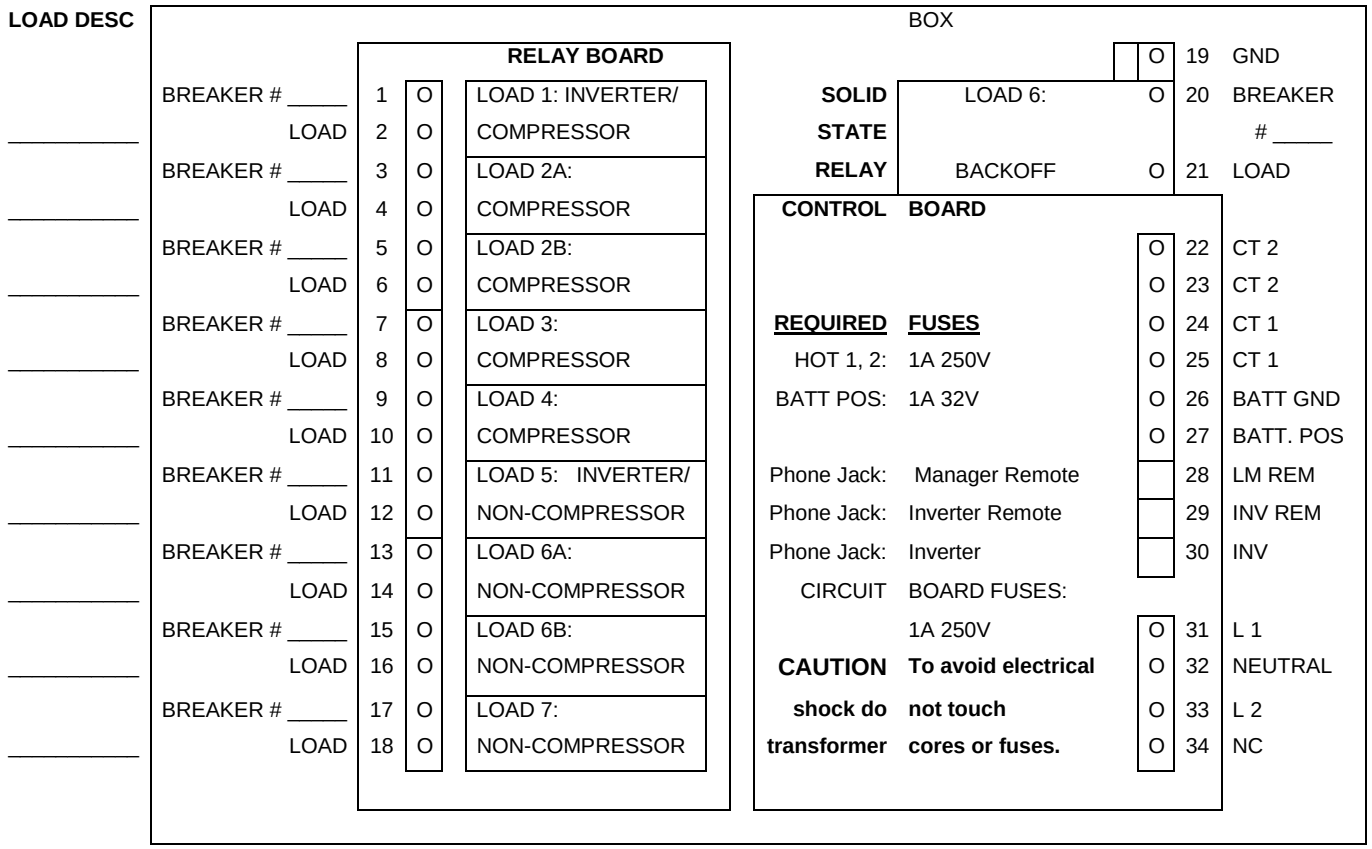
The following table should be completed using the information developed in the worksheet in Appendix A.

LOAD PRIORITY	LOAD DESCRIPTION
1	
2A	
2B	
3	
4	
5	
6A	
6B	
7	
8	

Channels 2 and 6 have two breakers. These two channels should be used for any loads that require 240 VAC. All other channels are for 120 VAC circuits.

4.3.3 Wiring Diagram - Inside of Main Unit (Cover Off)

Use this diagram to help locate terminals when wiring. It is also on the inside of the Main Unit cover.



4.3.4 Control Board Connections

Inside the Main Unit there are two circuit boards: Control Board and Relay Board. This section covers wiring connections for the Control Board. All wires used must be rated for at least 300VAC. Follow all applicable NEC codes and use good wiring practices.

The Control Board connections are identified in the schematic in Figure 4.3.3 (Page 11)

Install the 12 Volt Inverter/Charger battery sense leads using a 2A fuse per the Installation Diagram. 16 AWG wire is recommended.

The current transformer(s) leads are connected to terminal pairs marked CT 1 and CT 2, Connect one current transformer pair to the CT1 terminals and the other pair to the CT2 terminals. It does not matter which wire (Black or White) goes to which terminal. The Current Transformer wires may be extended up to 20 feet with #16 AWG wire recommended.

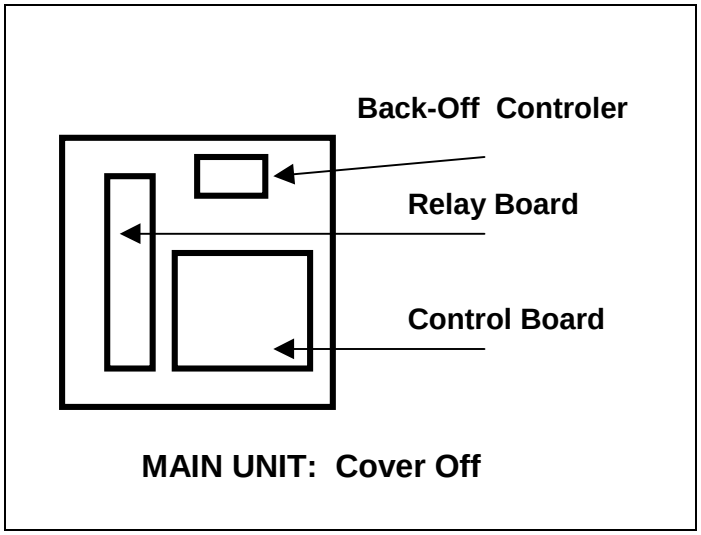
Caution: Shock Hazard!

Make sure the current transformer leads are connected before AC power is applied.

4.3.5 Relay Board connections

MAKE SURE THE AC POWER IS TURNED OFF.

Locate the Relay Board inside the AC Load Manager Main Unit:



1. Identify the load side of the circuit breaker in the distribution box which would feed Load 1.

2. Connect a wire from this point (the load side of the breaker for Load 1) to the Terminal 1 of the relay board.

4.3.6 Control Board and Relay Board

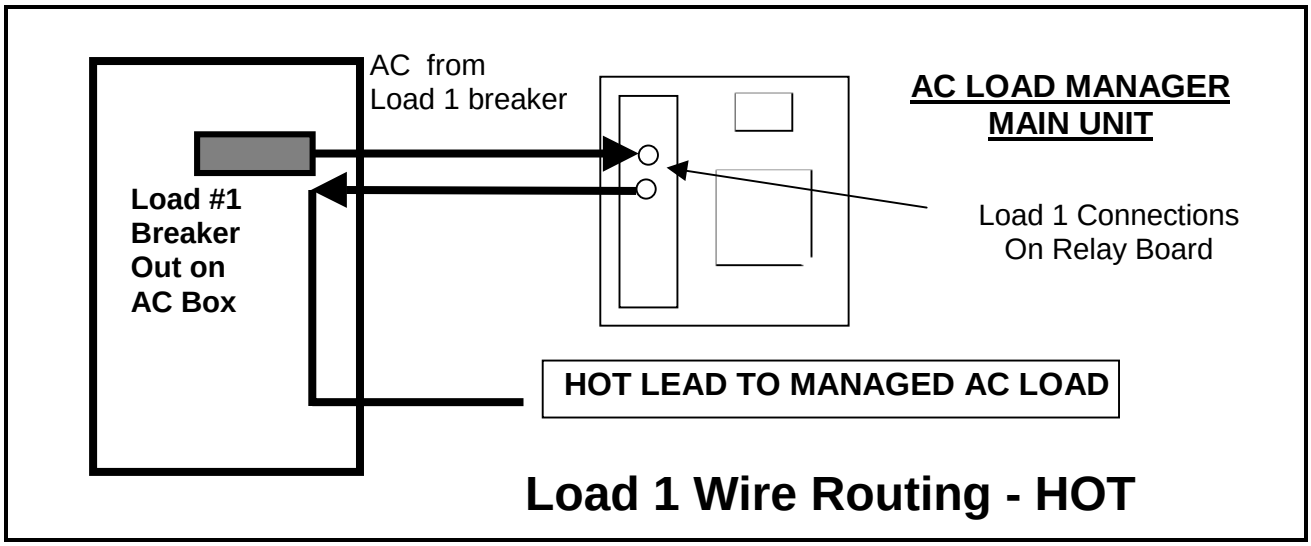
All wires used must be rated for at least 300VAC. Follow all applicable codes and use good wiring practices

Locate the circuit breaker for each of the loads as listed on the Priority list.

Identify the amperage rating for each circuit and make sure that it is not over the Load Manager's current limit for that specific load.

3. Next, connect the hot wire to Load 1 to Terminal 2 of the relay board.

4. Repeat this procedure for all the AC loads.



4.3.7 Remote Panel Connection

The Remote Panel is connected to the Main Unit by a phone cable at location (28), which is the only electrical connection.

Check to make sure the phone cable is installed in the correct direction, and that the locking tab on the plug secures the connector in place in the Remote Panel receptacle.

4.4 Checks prior to initial power on

Prior to connecting primary AC, generator, or inverter you should re-check your installation. Be sure that all wires are securely connected in the Main Unit, Remote Panel, and at the current transformer(s). Also check that all parts of the system are securely attached with appropriate abrasion protection.

4.5 Initial Power Up

Turn off the AC breakers for all the loads and apply AC to the Load Manager. This is done by turning on the 15 amp AC breaker (120VAC systems) or dual 15 amp breaker (240VAC systems) which supply L1 and, if appropriate, L2 voltage.

The Load Manager's Remote will come on and display L1 if connected to a 120 VAC source, or L1 + L2 if connected to a 240 VAC source.

After a few seconds the load indicator lights should come on in sequence until all 1 through 8 are on.

If everything looks good at this point, please turn to ***Setup*** operations described in Section 5.3 (page 16) and continue.

5. OPERATION

5.1 THEORY OF OPERATION

The AC LOAD Manager's primary purpose is to prevent overloading the AC system. Whether it is being used to protect a Generator from being overloaded or eliminate the possibility of blowing a Main Breaker on a Shore Power source, the function is the same. The effectiveness of automatically managing loads directly depends on the Main Breaker size of the boat or RV. The AC Load Manager will operate properly, without manual load managing, even if the available source is less than half the onboard main breaker size. Examples: An RV with 50A main breaker can run off of a 30A source or an RV with a 30A main breaker can run off of a 15A source. Of course, if more loads which require more than the current limit are selected, they may never come on until higher priority loads are turned on or cycle off.

5.2 Load Definitions

There are two different types of loads: Managed and Non-Managed. Managed loads are loads that can be turned off and on by the Load Manager. Non-managed loads are loads that cannot be turned on and off by the Load Manager. Thus the Load Manager only controls Managed loads.

5.2.1 Non-managed Loads:

These are loads which must run when they are turned on and, as such, are not controlled by Load Manager. Because these loads are important enough to be considered Non-Managed, it is important that the shore power source be at least capable of running the Non-Managed loads without overloading. If the shore power source is not capable of running the Non-Managed loads without overloading, then the user must turn off some of these loads. Loads in this group might include lights, cooking equipment, and emergency or communications equipment.

5.2.2 Managed Loads

These are loads which may be turned off at any time to limit the total current draw. Managed Loads are divided into four distinct groups: Back off load, Compressor loads, Non-Compressor loads, and an Inverter/Charger load.

5.2.3 Back Off Load

The Back off load must be a resistive load. This load is turned on in $1/8^{th}$ steps. As the Backoff load is turned on the Load Manager will continue to increase the on time by $1/8^{th}$ increments every AC cycle until the available power is being used. The Back off load may be any resistive load such as a water heater or radiant space heater.

5.2.4 Compressor Loads

Compressor loads are special in that they are not turned off during routine automatic evaluation, and should they be shed, they will remain off for at least 5 minutes. These loads are designed this way to enable use of compressors, such as refrigeration or air conditioning loads, without the risk of trying to re-start them before the internal pressures have equalized.

5.2.5 Non-Compressor Loads

Non-Compressor loads are managed loads which may be turned off or ON at anytime.

5.2.6 Inverter-Charger Load

The Inverter/Charger load is a managed load that has a 35 second wait after it is turned on to allow the charger to turn itself up.

5.3 General setup

The Load Manager needs to be properly configured prior to use. The items needing completion are:

1. Load Assignment Table & Labels (supplied)
2. AC Source Breaker Trip curve selection
3. Generator Capacity selection
4. Activate Load Manager

These items are accessed on the Remote Panel. By carefully configuring the setup functions as described below, you can obtain the best performance of the Load Manager system.

5.3.1 Load Assignment Labels

The AC Load Manager controls the AC load by shedding loads to limit the total AC load to the maximum selected by the user. It is important that the user understand which loads are connected to a particular relay, and to have these listed. Please refer to Appendix A - Load Prioritization Worksheet to develop the list. Labels identifying the loads should be installed into the Remote Panel in their appropriate slots. The labels are peeled off the label sheet Part Nr. 570050, and are carefully inserted into the label slots on each side of the panel.

Please note that the AC loads turn on and off in sequence (1 to 8 turning on; 8 to 1 turning off). The assignment of load priorities was accomplished by wiring loads to the appropriate terminals on the relay board.

5.3.2 AC Source Breaker Trip Curve

You should normally never need to change the Breaker Trip curve. However, if a load never stays on, the trip curve may need to be changed.

The way to tell between normal load shedding and a trip curve error, is to turn off all AC loads. Next, turn off the Load Manager's power breaker(s). Then, turn the Load Manager back on. Now, turn on the troublesome load only. If the trouble load does not stay on, the problem is likely the breaker trip curve. (The other possibilities are a ground fault, if the troublesome load is a GFI protected load, or the load is to big for the source.)

AC circuit breakers trip when their rated load is exceeded. There are several factors affecting the speed at which a circuit breaker will trip when a high current load is applied. The Load Manager can be configured to take advantage of this time delay by not immediately switching off loads, but waiting a few seconds to evaluate the load situation. This eliminates unnecessary turning off of the loads.

The Trip Curve setting is entered through the setup function.

AC Load Manager sensing speed may be adjusted as follows:

1. With the Load Manager connected to AC power, press the SETUP button and hold for 2 seconds until the indicator light on the button starts flashing.
2. Push button labeled 15 A/Trip Curve. This enters the trip curve function.
3. Repeatedly push Trip Curve button until the desired curve number is indicated. Refer to table below for trip curve response for each number:
4. Wait approximately 4 seconds for the display to return to normal (Only one of the Source indicator lights will be illuminated).

TRIP CURVE SETTING	RELAY RESPONSE RATE
C01	Instantly (Default)
C02	Slight hesitation
C03	Delayed

6. Functions

6.1 Functions

Functions are not normally used. AC Load Manager operation is usually a matter of pushing the button on the Remote Panel that corresponds to the power source you've plugged into. Here are other functions you may wish to be aware of:

6.1.1 Test Function

The Test Function provides a method of testing all relays and indicator lights for operation. The test mode should only be used when connected to a 50 amp service, or if using a smaller service, make sure that AC loads are turned off so that you do not exceed the rated capacity of the AC source supply breaker.

1. Enter the Setup mode by holding the Setup button for about 2 seconds until the Setup button light is flashing.

2. Immediately depress the Test button and release. All indicator lights should turn on, and all relays should be engaged.

Press TEST again to return to normal operation.

6.1.2 On/Off and Software Functions

There are three functions that allow selection of viewing of the following items:

Function	Description
F1	Load manage on/off
F2	Not Used
F3	Not Used
F4	Remote SW version
F5	Control Module SW version

Function **FI** is used to turn off Load Management functions.

Functions **F4** and **F5** are useful when speaking with Heart Interface service technicians who may ask you to tell them which version of software your system is using.

6.2 Setting Generator Capacity

The Generator Capacity is entered through the setup function and can be set from 2.0 kW to 12.0 kW in 0.5 kW steps. An additional step, OFF, is available if you have a generator larger than 12.0 kW.

CAUTION: If you set Generator Capacity larger than 3.5 kW on a 120 VAC system with a 30 amp main breaker, you may overload the main breaker. Similarly, if you set the generator limit to OFF, and your generator produces more than 12 kW at 240VAC, you may overload 50 amp main breakers. The Generator Capacity OFF position should only be used when main breakers of more than 50 amps @ 240VAC are used.

1. With the Load Manager connected to AC power, enter the Setup mode by holding the Setup button for about 2 seconds until the Setup button light is flashing.
2. Push button labeled GEN/ Capacity.
3. Repeatedly push GEN/Capacity button until the desired generator output rating is indicated.
4. Wait approximately 4 seconds for the display to return to normal display.

The initial default value is 6 kW. If your generator is larger than 12.0 kW, select the OFF setting for generator size only if you have a Main Breaker larger than 50 amps on AC box.

7. Normal Operation

Normal operation of the Load Manager is automatic. You only need to press the size of source (15, 20, 30 amps, etc.), to use the unit.

When correctly configured via the Remote Panel, the Load Manager will automatically turn on and off loads as required to limit current demand to the user set source limit. Loads are turned on and off according to the priority assigned.

7.1.1 Setting the Source Current Limit

The remote control allows the user to select 15A, 20A, 30A, 50A, & GEN settings, depending on available shore power capacity. Normal operation of the Load Manager includes connection to a source of AC power and selecting the current capacity (Amps) of the source on the remote. During start-up the Load Manager automatically detects if 120VAC or 240VAC is available. If 240VAC is detected, 50A is automatically selected as the source limit. If 120VAC is detected, 30A is automatically selected as the source limit.

When you connect to the AC source the Load Manager will initially turn off all loads. (Indicator lights for each load will be extinguished) Each load will then be turned on consecutively until all loads are on, or until the source limit has been reached. The Load Manager, upon sensing an increase in the total load demand, will turn off Managed loads, and after a few seconds will attempt to restart each Managed load.

If there is enough power available to leave on a managed load, it will be turned on and the Load Manager will attempt to bring on the next lower priority load. If there is not adequate source available, loads will be left off.

Relay number 8 is the back-off load, and will be turned on last. As small loads vary, the *Backoff Load* will be increased or decreased according to need. After approximately 15 minutes an Automatic Evaluation occurs. During Automatic Evaluation higher priority loads that are off are tried again. All compressor loads are left off for a minimum of 5 minutes to protect the compressor.

7.1.2 The Remote Panel

The display indicates AC system voltage and current measurements. The voltage measurement can be selected by pressing the VOLTS button on the Remote Panel.

The current measurement can be selected by pressing the AMPS button on the Remote Panel. Pressing the button consecutive times will display current on L1, L2, or combined total load.

7.2 Deactivating Load Manager

The Load Manager may be deactivated in two ways:

1. Use Function F01 (See Section 6.1.2).

2. You may turn off the breaker (or dual breaker) supplying L1 and L2 voltage and power. This breaker is generally in the AC distribution box.

8. APPENDIX A - LOAD PRIORITIZATION WORKSHEET

8.1 EXAMPLE COMPLETED WORKSHEET

LOAD PRIORITY	LOAD TYPE	TYPICAL LOAD
1	Compressor	Rear Air Conditioner
2A	Compressor	Front Air Conditioning
2B	Compressor	
3	Compressor	Center Air Conditioner
4	Compressor/2nd Chgr	Refrigerator
5	Inverter/Charger/ Non-Compressor	Freedom Inverter
6A	Non-Compressor	Space Heater
6B	Non-Compressor	Washer/Dryer
7	Non-Compressor	Block Heater
8	Backoff	Water Heater

To develop a list of prioritized loads, you need to begin by identifying the AC loads in your system. Start with your AC distribution panel and write down a description of each of the branch breakers in the Load Description column below.

LOAD DESCRIPTION	COMMENTS	PRIORITY	RELAY CONTACTS

Next, you will need to evaluate and prioritize loads in the order you want them to be turned on and off.

9. APPENDIX B - EXAMPLE OF LOAD MANAGER OPERATION

9.1 SUMMER BREAKFAST EXAMPLE

SETTING: 10:00 A.M. Water heater thermostat satisfied, batteries are charged, front and rear air "ON" and 30A shore power is connected.

We decide to have brunch and begin to use the gas range, electric coffee maker, microwave oven, and toaster. The Load Manager removes power from Loads 2 through 8. If no more that 15 Amps is required. If more than 15 amps is required, power will be removed from the rear air to comply with the source limit. Since the toaster and coffee maker are inverter loads, the batteries were slightly discharged while the Front and Rear air were left on.

LOAD	STATUS	DESCRIPTION	AMPS
1	on	Rear air (not in use)	12
2	on	Front air (not in use)	12
3	on	Mid air (not in use)	0
4	on	Refrigerator	0
5	on	Inverter/Charger (in Float)	0.5
6	on	Wash/dry (not in use)	0
7	on	Block Heat (not in use)	0
8	on	Hot water	0
		Unmanaged loads	0
		TOTAL:	24.5

LOAD	STATUS	DESCRIPTION	AMPS
1	on	Rear air (not in use)	12
2	on	Front air (not in use)	12
3	off	Mid air (not in use)	0
4	off	Refrigerator	3
5	off	Inverter/Charger (in Float)	2
6	off	Wash/dry(not in use)	0
7	off	Block Heat (not in use)	0
8	partly on	Hot water	0.5
		Unmanaged loads	0
		TOTAL:	29.5

After we turn off the various appliances, the Load Manager will reassess and repower Loads 2 through 8. The charger will want to recharge the batteries. We used some hot water, so the water heater thermostat wants power, and the refrigerator was used so it will demand some power. As the rear and front air cycle, the extra power will be used by the charger to charge the batteries, and the hot water heater.

9.2 WINTER BEDTIME EXAMPLE

SETTING: 10:00 P.M. Rear and Middle (kitchen) heaters ON. 30A source limit.

LOAD	STATUS	DESCRIPTION	AMPS
1	on	Front air (not in use)	0
2	on	Rear air (in use)	12
3	on	Mid air (in use)	12
4	on	Inverter charger (in float)	2
5	on	Inverter/Charger (in float)	2
6	on	Wash/dry (not in use)	0
7	on	Block Heat (not in use)	0
8	partly on	Hot water (in use)	0.5
		TOTAL:	28.5

At Midnight the thermostatically controlled bay heater, which uses 4 amps, comes ON.

The Load Manager senses the current increase and removes power from Loads 4-8. Once the current is below the source limit the hot water heat is turned up.

LOAD	STATUS	DESCRIPTION	AMPS
1	on	Front Air (in use)	0
2	on	Rear Air (in use)	12
3	on	Mid Air (not in use)	12
4	off	Inverter/Charger (in float)	0
5	off	Inverter/Charger (in float)	0
6	off	Washer/Dryer (not in use)	0
7	off	Block Heater (not in use)	0
8	partly on	Hot water (in use)	0.5
		Unmanaged Loads Bay heater (in use)	4
		TOTAL:	28.5

LOAD	STATUS	DESCRIPTION	AMPS
1	on	Front Air (not in use)	0
2	on	Rear Air (not in use)	12
3	on	Mid Air (not in use)	12
4	off	Inverter/Charger (in float)	0
5	off	Inverter/Charger (in float)	0
6	on	Washer/Dryer (not in use)	0
7	on	Kitchen Heater (in use)	0
8	partly on	Hot Water (in use)	0.5
		Unmanaged Loads Bay heater (in use)	4
		TOTAL:	28.5

After a short delay, the Load Manager assesses the current and begins to apply power.

When the Bay Heater is turned off by its thermostat, the extra amps are sent to the Hot Water heater load.

LOAD	STATUS	DESCRIPTION	AMPS
1	on	front air (in use)	12
2	on	rear air (in use)	12
3	on	mid air (not in use)	0
4	off	Inverter/Charger (in float)	0
5	off	Inverter/Charger (in float)	0
6	on	wash/dry (not in use)	0
7	on	heater (not in use)	0
8	partly on	hot water (in use)	4.5
		Unmanaged Loads: Bay heater (in use)	0
		TOTAL:	28.5

After about 5 minutes has passed load 4 and 5 will be tried again. This time they will fit since the bay heater has cycled off. This type of cycle can also be initiated by the ice maker and will repeat throughout the night. Morning will find the coach warm, the water hot, and the main circuit breaker “ON”.

LOAD	STATUS	DESCRIPTION	AMPS
1	on	front air (in use)	12
2	on	rear air (in use)	12
3	on	mid air (not in use)	0
4	on	Inverter/Charger (in float)	2
5	on	Inverter/Charger (in float)	2
6	on	wash/dry (not in use)	0
7	on	heater (not in use)	0
8	partly on	hot water (in use)	0.5
		Unmanaged Loads: Bay heater (in use)	0
		TOTAL:	28.5

10. Notes

11. Warranty

Your Heart Interface AC Load Manager is under limited warranty for either 18 months from date of purchase.

Terms of the warranty are detailed on the warranty registration card. Please complete this card and return it to Heart Interface to register your warranty.

If the unit requires service, contact Heart Interface by telephone. The service technician will ask for the serial number of your unit. Please have this information ready.

Phone Numbers: (253) 872-7225

(800) 446-6180

A return authorization number will be required on all returns. This number is issued by the service technician and should be written on the packaging.

You must ship the unit to Heart Interface or a field service center freight prepaid.

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