

### **Progressive Industries Warranty**

Progressive warrants its products are free from defects in materials and workmanship for a period of three years. This is in lieu of all other warranties, obligations, or liabilities expressed by the company. In the event that a properly installed EMS proves defective under normal use, Progressive will repair or replace the device at its discretion.

With the Hardwired EMS it is not necessary to return the entire system for repair. This product was specifically designed be modular therefore, any part of the EMS can be replaced without removing the entire product. For technical support call 919-462-8280.

Once technical support has properly diagnosed the problem if any, they will send you a replacement part. Do not remove damaged part unless instructed to do so; this will aid you when it comes time to install the replacement part.

When you receive your replacement part or parts, inside the box will be a return address label with RGA number, simply use the same box, and return label to ship back the damaged part.

The address below is strictly a mailing address, please do not try, or attempt to visit our facility during business hours, the company is not properly staffed or equipped to handle on site repair work. All returns must go through technical support.

**Progressive Industries**  
**1381 Kildaire Farm Road PMB 281**  
**Cary, North Carolina 27511**

**The unit should be properly packaged, with the postage paid and the following information:**

1. Date of purchase
2. A detailed explanation of the defect.

Progressive cannot assume responsibility for acts of god, alterations, shipping handling, or any other factors not under the control of Progressive Industries.

Progressive has no responsibility for installation, personal injury, property damage, incidental, contingent, or consequential damages of any kind resulting from defects or failure of the unit to function.

The remedy for breach of this warranty is limited to the repair or replacement of the defective product at Progressives option. In no case shall the liability prescribed by law exceed the purchase price. Some states do not allow exclusion or limitation of incidental or consequential damages or allow disclaimer, modifications, or limitations on how long a warranty last, therefore the above warranties may not apply to you. This warranty gives you certain legal rights, and you may have other rights, which may vary from state to state.

(rev a)

# **EMS**

## **Electrical Management system**

### **The complete operating and installation guide for:**

**EMS-LCHW30**  
**Rated at 120V/30A**

### **Manufactured by:**

**Progressive Industries**  
**Incorporated**  
**Cary, North Carolina**  
**919-462-8280**

**[WWW.progressiveindustries.net](http://WWW.progressiveindustries.net)**

## Features:

**High low voltage protection:** Whenever source power falls below 104 Volts, or rise above 132 volts the EMS automatically shut down power to the RV. Once the AC source rises above 104-volts, or below the 132-volt level the time delay indicator flashes for the preset time and then automatically restores power to RV.

**Time delay for A/C Compressor:** Whenever source power is interrupted by the source or the EMS, due to a fault condition the built in time delay is activated. There are two settings on the EMS; one is 136 seconds, and the other is 15 seconds. Consult you Air conditioner manual to see if it has a time delay built in if so use the 15-second delay if not use the 136-second delay

**3 Mode surge protection:** This feature provides full surge protection L-N, L-G, and N-G. Total Joule rating is 1780, response time of <1 nano second.

**Surge Indicator:** If ever a power surge damages the surge protector circuit within the EMS L-N, or L-G Digital display error code will read E-10. This is your indication that it needs to be replaced.

**Reverse polarity protection:** If source power is a reverse polarity condition, the EMS will not allow power to the RV and the error code will read E1.

**Open neutral protection:** If the source has an open neutral condition the display will not light, and will not allow power to the RV.

**Open ground protection:** If source power has an open ground condition the EMS will read an error code of E2 and will not allow power to the RV.

**AC Frequency Protection:** If source power frequency deviates +/- 9 hertz from 60 cycles per second the EMS will shut down source power, and indicate an E7 or E8 error code on the digital display.

**Accidental 220V protection:** If 220 volts is detected when plugging into source power the EMS will not allow power to the RV. If this condition occurs while power is applied to the RV, the EMS shuts off power instantly. In either case the display will read HHH for the voltage and E3 for the error code.

**Integrated information panel:** Scrolls continuously all of the power source information, voltage, current, frequency, error codes, and previous errors. Each reading is displayed for 2 seconds

**Previous error code:** This feature tells the user what the previous error was, and why power was interrupted to the RV. This is only displayed if an error actually occurs and goes away when power is disconnected to the EMS.

**Bypass :** Enclosed blue jumper wire allows the user to bypass the computer circuit in the EMS in the event of computer failure, thus allowing source power into the RV. This does not disable the surge protection portion of the EMS.

**Modular design** Replacement parts are designed for simple plug and play, making repairs extremely user friendly.

**Microprocessor controlled:** The computer, and remote display are driven by state of the art microprocessors that are programmed with software to drive the entire EMS. Should ever this software be changed EMS, owners can receive a free upgrade processor with the return of the old.

## Troubleshooting guide

### Common installation mistakes:

#### 1. Check cable connections

Unplug open control box and check connections. Look at small wires located under the input connections, and make sure the conductor colors match (small black wires and black RV input wire, and small white wires matches up with white RV input wire).

3. Make sure that input wires are in fact the input wires, connecting the output to the input of the EMS will result in the device not to function.

4. If the EMS is still not functioning at this point follow instructions below prior to calling technical support.

### Write down the following information prior to calling technical support:

1. Open up control box and look at computer board located on the side of the control box. You will notice a red light this should be on, if not stop there and call technical support. If is on go to next step.

2. Look at display if no reading is present call technical support. If the display is reading information note the error code message if the EMS is read Error 1-8 see error code chart on previous page this means device is functioning fine. If reading E-0 read on.

3. The delay indicator located below the digital read out is flashing wait out time delay you will see the indicator stop flashing at which time power should be on in RV. If not call tech support to install blue bypass jumper wire.

**Technical support can only help if the above information is provided, therefore please do not call till that information is obtained. To recap**

1. Are the connection right?

2. Is the red light on located on circuit board inside control box?

3. What is the Error code message being displayed on the display?

4. Is the delay indicator flashing?

## Operation instructions

1. Plug into source power,
2. Digital display will read 888 for 2-seconds then begin scrolling the voltage, amps, line frequency, and error code. In addition the time delay light will flash.
3. You may notice when first plugging in that the display may read E-9, don't worry about this it only means that the display as not gotten data from the computer yet. By the next time through it should read E-0 if the source power is normal.
4. The meter will give you a 3-digit number that is your line voltage. Next it will give you a "0A" reading this is the amp reading however it will read zero until the time delay is complete. Then you will notice a number between 0 and 30. That number indicates how many amps the RV is drawing. Then you will notice a number 60 H that is you line frequency. That number should remain fairly consistent, however it may read +/- one or two. Last you will notice the E code, E-0 is normal, only if E-0 is present will the delay light flash and ultimately bring power to the RV. Refer to your error code chart card that was provided or see below for details.
5. Verify that error code E0 is displayed
6. Set up is complete.

**NOTE:** if the wiring reads anything different than correct the EMS will not turn on and we recommend moving to a different source or use generator power. Also if power is below 104 volts or above 132 volts the EMS will not turn on, and we recommend using generator power.

**Important:** The display will only read voltages between 78 volts and 184 volts. If the display drops below 78 the display will read LLL and if the display goes above 184 the display will read HHH.

### Error code Chart

E-0 Normal condition

E-1 Reverse polarity condition ( hot and neutral wires reversed)

E-2 Open Ground (means no ground wire connection)

E-3 Line Voltage High (line Voltage above 132)

E-4 Line Voltage Low (line voltage below 104 volts)

E-7 Line Frequency High (line frequency above 69 cycles per second)

E-8 Line frequency Low (line frequency below 51 cycles per second)

E10 replace surge protector module

Accidental 220 Volt protection: Should this condition occur the remote display will read HHH instead of displaying the voltage, and the Error code message will read E-4. Power will shut down instantly. **Do not under any circumstances bypass the EMS; otherwise severe damage to the RV will result.**

## Warnings:

- Do not exceed the rating on the EMS for any reason, however these devices are designed to be reduced down to 120V/15A, and still maintain full protection.
- Do not modify the EMS in any way, this will void the warranty, compromise protection, and could result in possible shock, and or fire hazard.
- It is important to always check the pedestal power outlet for charring; this condition means that the source receptacle is providing a weak connection. DO not use, it could result into a possible melting of RV power plug.
- Progressive Industries recommends you have a certified electrician or an authorized dealer perform the installation of the EMS and any future repairs that may be required.
- When running extension cords from the RV to a power source always use a 10-gauge cable for your 120 volt 30 Amp system. Make sure that the cable is rated for outdoor use to reduce the risk of electric shock. Small gauge cable will have a higher resistance a will result in a voltage loss, plus it may result in an electrical fire.
- Whenever servicing or installing the EMS or any other AC powered device make source power is disconnected from the source.
- RV wiring is different than the wiring found in homes; the neutral and ground conductors are isolated in the RV, unlike in a home where they are tied together at the service panel. The reason is; homes have a bonded ground system, where as RV's do not. Therefore never bond the neutral and ground together for any reason. This will create a ground fault condition, and may result in electric shock and or fire hazard.

## Installation instructions for Models: EMS-HW30C

1. Unplug RV from the source and be sure generator is off.
2. Determine a location for the EMS control box.
3. Cut the RV power cord about 6 inches greater than the distance from junction box to the desired location of the EMS control box. Then strip back the outer insulation 3 inches on both the input and output cable.
4. Strip back each conductor 3/8 inch on both striped ends, and attach ring terminal to Green wires.
5. Remove control box cover. Grasp display circuit board with one hand and black connector holding it in place and pull out display. Next, back off the four setscrews from top of contactor and two groundnuts located on side of box.
6. Take your long cable with the plug end and connect it to the input side, by sliding through the input side then connect black above little black wires, white wire above little white wires, and green to ground nut. Torque down screws to secure connections.
7. The short cable coming from the junction box connects to the output in the same manner except the round sensing coil slides over the black wire. Make sure that the conductor's colors match up across from each other.
8. Double check all connections and make sure they are secure.
9. Secure cable end by tightening down strain relief's over outer jacket. Do not over tighten this could bite through insulation and cause a short.
10. Set time delay jumper on the circuit board. Factory set is for 15 seconds remove jumper to set for 136 seconds. See features section on time delay to determine which to use.
11. Reconnect Display card, with display facing you, and upright.
11. Attach lid with the six black machine screws provided.
12. Mount the control box.
13. Installation is complete. Next Plug in and follow operation instructions.

### Protection from both Generator and Source power.

1. Unplug RV from the source and be sure generator is off.
2. Locate transfer switch box, and determine location of EMS control box.
3. Measure the distance between the transfer switch and the control box and add 1 foot this is the length of cable that will be required for the installation. Make sure 10 gauge 3-conductor cables are used.
4. Remove lid from transfer box and remove the output cable.
5. Take jumper cable and strip back one end 3 inches, and the other end the same as the end removed from the transfer box.
6. Cut back end removed from transfer box so that each conductor is 3 inches if needed.
7. Strip back all conductors 3/8 inches, and attach ring terminals to green wires going to EMS.

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8. Remove control box cover, detach display card and back off four screws from top of contactor and two ground lugs on side of enclosure.
9. Take the jumper cable with 3 conductor strip, and slide it through the input side of the EMS control box Then connect black above little black wires, white above little white wires and green to ground screw and tighten each set screw.
11. The cable that came from the transfer switch connects to the output in the same manner except the round sensing coil slides over the black wire. Make sure that the conductor's colors match up across from each other on the contactor.
12. Connect the loose end of the jumper cable to the transfer switch. See wiring diagram on transfer switch if needed.
13. Double check all connections and make sure they are secure.
14. Secure cable ends by tightening down strain relief's over outer jacket. Do not over tighten this could bite through insulation and cause a short.
15. Set time delay jumper on the circuit board. Factory set is for 15 seconds remove jumper to set for 136 seconds. See features section on time delay to determine which to use.
16. Re-attach display card with display facing you and digits reading correctly.
17. Attach EMS lid with the six black machine screws provided, and attach transfer switch lid.
18. Mount both the control box and remote panel in desired location.
19. Installation is complete. Next, Plug in and follow operation instructions.

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