Progressive Industries EMS-PT30X Electrical Management System (EMS) Instruction Manual

Contents

Progressive Industries EMS-PT30X Electrical Management System (EMS)

Product Information: Electrical Management System (EMS)

The Electrical Management System (EMS) is a device designed to protect your recreational vehicle (RV) from electrical issues caused by unstable power sources. The EMS is available in two models, EMS-PT30X and EMS-PT50X, and it is capable of providing full protection to your RV against various electrical issues such as high/low voltage, open ground, open neutral, reverse polarity, and AC frequency variations.

The EMS is equipped with an error code display that can indicate various electrical characteristics and issues. The device can be used with 15A, 20A, 30A or 50A service, and it is recommended to limit the power to the lower amperage rating of the power source and RV.

Features

- Surge protection
- High/low voltage protection
- Open ground protection
- Open neutral protection
- Reverse polarity protection
- AC frequency protection
- Error code display

Warnings

When connecting or disconnecting power to the RV, it is important to follow the instructions below to minimize

shock hazard:

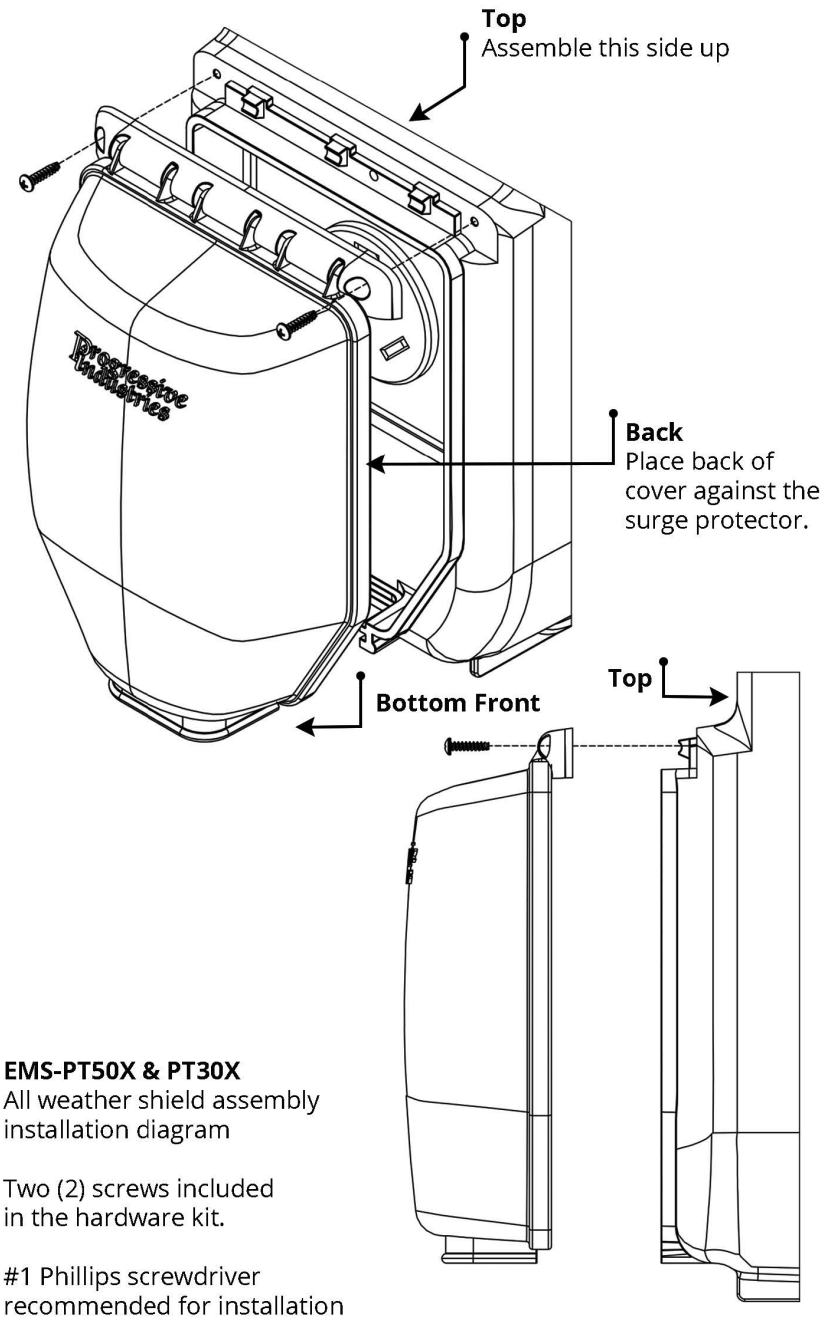
1. Turn off power to the RV before connecting or disconnecting power cable.
2. Connect power cable at the RV first.
3. Disconnect power cable at the AC power source first.
4. Close inlet cover tightly.

Maintenance Warning

Regular maintenance is required to keep the EMS functioning properly. It is recommended to periodically clean the device and inspect the power cord and plug for damage. If any damage is found, the device should be replaced immediately.

Product Usage Instructions: Electrical Management System (EMS)

1. Turn off power to the RV before connecting or disconnecting power cable.
2. Plug the EMS unit into the appropriate receptacle.
3. If the error code displayed is E 0, the AC power source is safe to use. Before you plug your RV cord into the EMS unit, disconnect the power at the AC power source. Once the power at the AC power source is disconnected, plug the cable from your RV into the EMS receptacle. Verify that the plug connection between the AC power source, the EMS unit, and the RV cable are secure and fully inserted.
4. The EMS display will indicate multiple electrical characteristics. Examples of these characteristics are listed in the product manual.
5. If an error code other than E 0 or E 10 is displayed, the EMS will not allow power to the RV. Refer to the product manual’s troubleshooting guide or contact Progressive Industries Technical Support.



Features

- Low Voltage Protection: Whenever the AC line voltage drops below 104V for longer than 6 seconds, the EMS will automatically shut down power to the RV.
  If using an EMS-PT30X, the display will show a low voltage error code of E 4.
  If using an EMS-PT50X, an E 4 error code indicates a low voltage error on line 1 while a low voltage error on line 2 will display an error code of E 6.
  If the EMS unit has shut off power to the RV due to a low voltage condition, it will continue to monitor the line voltage. If the line voltage rises above 104V, and no other error conditions are detected, the unit will initiate re-applying power to the RV by starting the 2 minute 16 seconds (136 seconds) timer. While the timer is active, the time delay indicator on the display will begin flashing. After the time delay duration of 2 minute 16 seconds (136

seconds) has expired, the EMS will once again provide power to the RV.

- High Voltage Protection: There are stepped voltage ranges used for overvoltage protection to account for line variations as described below.
    - If the AC line voltage rises above 132V but remains less than 140V for longer than 3 seconds, the EMS unit will automatically shut down power to the RV.
    - If the AC line voltage increases to a range greater than 140V but less than 156V, the EMS will automatically shut down power to the RV after 1 second.
    - If the AC line voltage is greater than 156V, the EMS controller will shut down power to the RV within 60 ms (0.06 seconds).

      If using an EMS-PT30X, the display will show a high voltage error code of E 3.

      If using an EMS-PT50X, an E 3 error code indicates a high voltage error on line 1 while a high voltage error on line 2 will display an error code of E 5.

      If the EMS unit has shut off power to the RV due to an overvoltage condition,

      it will still continue to monitor the line voltage. If the line voltage drops back below 132V, and no other error conditions are detected, the unit will initiate re-applying power to the RV by starting the 2 minute 16 seconds (136 seconds) timer. While the timer is active, the time delay indicator on the display will begin flashing. After the time delay duration of 2 minute 16 seconds (136 seconds) has expired, the EMS will once again provide power to the RV.
- Time Delay for A/C Compressor: When first plugging in, if AC power is interrupted, or the EMS detects a fault, the 2 minute 16 seconds (136 seconds) time delay is activated. This is to protect the air conditioning compressor.
- 3-Mode Surge Protection (EMS-PT30X): This feature provides three modes of surge protection; line to neutral (L-N), line to ground (L-G) and neutral to ground (N-G). The total joule rating is 1,790 J and 44,000 A surge current. Response time is < 1 ns (1-9 second).
- 5-Mode Surge Protection (EMS-PT50X): This feature provides five modes of surge protection; line 1 to neutral (L1-N), line 2 to neutral (L2-N), neutral to ground (N-G), line 1 to line 2 (L1-L2), and line to ground (L-G). The total joule rating is 3,580 J and 88,000A surge current. Response time is < 1 ns (1-9 second).
- Surge Indicator: In the event of a power surge causing the surge protection devices across line to neutral (L-N), line to ground (L-G) to become damaged or depleted within the EMS unit, the display will show an E 10 error code. This indicates that the surge protection module is depleted and is no longer providing surge protection to your RV. It is recommended that you replace the surge protector. This error will not shut off incoming power to the RV.
- Reverse Polarity Protection: Reverse polarity is a condition where the hot line and the neutral line are reversed. A reverse polarity condition could harm you and/or your RV electrical system and electrical equipment. If the EMS unit detects a reverse polarity condition, the EMS will not provide power to the RV and a reverse polarity error code of E 1 will be displayed.
- Open Neutral Protection: Open neutral is a condition where the neutral wire is disconnected and could pose a shock hazard. An open neutral condition could harm you and/or your RV electrical system and electrical equipment. If an open neutral condition is present, the EMS will not turn on. Since the EMS is off, the display will not illuminate and power to the RV will not be activated.
- Open Ground Protection: Open ground is a condition where the earth ground wire is open or the neutral and ground wires are not bonded together creating an electrical safety hazard. An open ground condition could harm you and/or your RV electrical system and electrical equipment. If the EMS unit detects an open ground condition, power to the RV will not be provided. The open ground error code shown on the display will be E 2.

- AC Frequency Protection: The normal operating frequency of the AC voltage should be 60 Hertz. AC frequency below 51 Hertz or above 69 Hertz could harm your RV electrical system and electrical equipment. If the frequency is outside the stated ranges, the EMS will shut down power to the RV. An error code of E 7 will be displayed if the frequency is high. If the frequency is low, the display will show an error code of E 8.
- Accidental 240V Protection: If 240 volts is detected when plugging into AC power the EMS will NOT allow power to the RV. Should this condition occurs while power is applied to the RV, the EMS will shut down power instantly. The EMS will indicate an E 3 error code and display the voltage. (SHOULD THIS OCCUR NEVER BYPASS THE EMS).
- Display: Display continuously updates, at 2 second intervals, all AC power information: voltage(s), current(s), frequency, error code, previous error code (if applicable).
- Previous Error Code: Previous error code (PE) indicates what error occurred and why power was interrupted. To delete code, disconnect power from EMS.
- Weather Resistant: Unit can be exposed to outside weather elements; however, the unit may not be submerged. Unit is designed to be mounted or used vertically.
- Built-in Locking Bracket: Helps prevent theft by securing the EMS to the power source pedestal using a lock, such as a bicycle cable lock.

NOTE: Provided you have the proper adapter, the EMS may be used with 15A, 20A, 30A or 50A service and will provide full protection. The power should be limited to the lower amperage rating of the power source and RV. The circuit protection at the power source and the RV are the current limiting devices.

Warnings

- RV wiring is different than house wiring. In an RV, neutral and ground conductors are isolated whereas in a house they are bonded at the service panel. Therefore; never connect neutral and ground as this can result in a ground fault condition, electric shock, and/or a fire hazard.
- The EMS can be used with a generator. A bonded neutral generator is recommended. If your generator is not neutral grounded you can find articles on multiple websites detailing ways to properly bond a generator.
- Do not exceed the electrical rating on the EMS for any reason.
- Do not modify the EMS in any way as this will void the warranty, could harm you and/or your RV electrical system and electrical equipment or compromise protection.
- When running an extension cord from the RV to the AC power source always use a 6/4 AWG or 6/3 + 8/1 AWG cable for your 240 Volt, 50 Amp device or a 10/3 AWG cable for your 120 Volt, 30 Amp device. Ensure your cable is rated for outdoor use and we recommend the length not to exceed 25’. Taking these preventative measures can help to reduce the risk of electrical shock and/or fire.
- NEVER plug the EMS into an inverter. EMS units can be used with inverter-generators.

Power Connection

WARNING: To minimize shock hazard, follow these instructions:

1. Turn off power to the RV before connecting or disconnecting power cable.
2. Connect power cable at the RV first.

3. Disconnect power cable at the AC power source first.
4. Close inlet cover tightly.

Maintenance Warning

- Before each use, examine the plug and receptacle of the EMS, the male plug of the RV power cord, and the receptacle on the AC power source. Look for signs of discoloration which indicates overheating.
- If any connection shows signs of overheating, replace both mating parts immediately.
- Carefully follow the wiring instructions supplied with all replacement devices to insure proper operation.

Operating Instructions

DO NOT plug your RV power cord into the receptacle of the EMS unit at this time.

1. Be sure that power is disconnected at the AC power source. Plug the EMS unit into the appropriate receptacle.
2. Re-apply power to the AC power source and monitor the EMS display. Once power is applied, the display will flash 888 as a check that all segments of the display are working and then the display will start scrolling through the voltage, current, line frequency measurements and any error code(s) (E 1 through E 10) that may be present. If there are no error codes, the AC power source is correctly wired and the voltage is within acceptable limits. If an error code is displayed, disconnect the EMS and report the error detected to the park manager or a qualified technician.
3. If error code displayed is E 0, the AC power source is safe to use. Before you plug your RV cord into the EMS unit, disconnect the power at the AC power source. Once the power at the AC power source is disconnected, plug the cable from your RV into the EMS receptacle. Verify that the plug connection between the AC power source, the EMS unit, and the RV cable are secure and fully inserted.
4. Re-apply power to the AC power source and verify that there are still no error codes other than E 0 displayed. If no error codes are present the 2 minute 16 seconds (136 seconds) timer will be activated. During this time, the delay indicator located in the bottom right corner of the display will flash. Once the timer has expired, power will pass through the EMS unit to the RV. Note that if there is an error code other than E 0 or E 10, the 2 minute 16 seconds (136 seconds) timer will not start and the time delay indicator will not blink.
5. The EMS display will indicate multiple electrical characteristics. Examples of these characteristics are listed below:
   EMS-PT30X EMS-PT50X
   - 120 – Voltage L-1 – Line 1 Characteristics
   - 7A – Amperage 120 – Line 1 Voltage
   - 60H – Frequency 7A – Line 1 Amperage
   - E0 – Error Code = 0 (Normal operation) L-2 – Line 2 Characteristics
   - PE3 – Previous Err or Code = E3 118 – Line 2 Voltage
     (This error has been corrected)
     5A – Line 2 Amperage
     60H – Frequency
     E0 – Error Code = 0 (Normal operation)
     PE3 – Previous Error Code = E3
     (This error has been corrected)

NOTE: If the display indicates an error code other than E 0 or E 10, the EMS will not allow power to the RV.

NOTE: Provided you have the proper adapter, the EMS may be used with 15A, 20A, 30A or 50A service and will provide full protection. The power should be limited to the lower amperage rating of the power source and RV. The circuit protection at the power source and the RV are the current limiting devices.

Troubleshooting Guide

If this is a new unit and you receive any of the errors below, please contact Progressive Industries Technical Support before filling out the warranty form or returning the product to the original point of purchase. If this is not a new unit and you are receiving an error code, please reference the information below before contacting Progressive Industries Technical Support.

Error Code	Description	Troubleshooting Steps	If Error Code Remains
E 0	Normal Operating Condition	None	No action required
E 1	Reverse Polarity	1. Plug RV into an AC power source at a different location. 2. If error code reads "**E 0**", contact park manager or a qualified electrician to notify them of a fault at the original AC power source.	Fill out the online warranty form for a replacement unit.
E 2	Open Ground	1. Plug RV into an AC power source at a different location. 2. If error code reads "**E 0**", contact park manager or a qualified electrician to notify them of a fault at the original AC power source.	**Note:** If plugged into a generator, read generator information located in the warning section for more information. Fill out the online warranty form for a replacement unit.
E 3	Line 1 High Voltage	1. Plug RV into an AC power source at a different location. 2. If error code reads "**E 0**", contact park manager or a qualified electrician to notify them of a fault at the original AC power source.	1. Verify AC power source voltage with a multi-meter or contact an electrician to verify the voltage. 2. If voltage reading is below 132 volts and stable, fill out the online warranty form for a replacement unit.

E 4	Line 1 Low Voltage	1. Plug RV into an AC power sourc e at a different location. 2. If error code reads “**E 0**“, contact park manager or a qualified elec trician to notify them of a fault at the original AC power source.	1. Verify AC power source voltage with a multi-meter or contact an electrician to verify the voltage. 2. If voltage reading is above 104 v olts and stable, fill out the online warranty form for a replacement unit. **Note:** If the voltage is low for a shor t period of time, it may be due to a l arge load such as a water heater or an air conditioning unit.
E 5	Line 2 High Voltage	1. Plug RV into an AC power sourc e at a different location. 2. If error code reads “**E 0**“, contact park manager or a qualified elec trician to notify them of a fault at the original AC power source.	1. Verify AC power source voltage with a multi-meter or contact an electrician to verify the voltage. 2. If voltage reading is below 132 v olts and stable, fill out the online warranty form for a replacement unit.
E 6	Line 2 Low Voltage	1. Plug RV into an AC power sourc e at a different location. 2. If error code reads “E 0”, contact park manager or a qualified elec trician to notify them of a fault at the original AC power source.	1. Verify AC power source voltage with a multi-meter or contact an electrician to verify the voltage. 2. If voltage reading is above 104 v olts and stable, fill out the online warranty form for a replacement unit. **Note:** If the voltage is low for a shor t period of time, it may be due to a l arge load such as a water heater or an air conditioning unit.

E 7	Line Frequency High	1. Plug RV into an AC power source at a different location. 2. If error code reads “E 0”, contact park manager or a qualified electrician to notify them of a fault at the original AC power source.	1. If the error code occurs only at dawn and/or dusk it may be due to motion sensing lights. 2. Neon lights connected on the same electrical circuit may cause a frequency error code. 3. Charging a depleted RV battery may also cause a frequency error code. 4. If none of the above conditions are causing the error, fill out the online warranty form for a replacement unit.
E 8	Line Frequency Low	1. Plug RV into an AC power source at a different location. 2. If error code reads “E 0”, contact park manager or a qualified electrician to notify them of a fault at the original AC power source.	1. If the error code occurs only at dawn and/or dusk it may be due to motion sensing lights. 2. Neon lights connected on the same electrical circuit may cause a frequency error code. 3. Charging a depleted RV battery may also cause a frequency error code. 4. If none of the above conditions are causing the error, fill out the online warranty form for a replacement unit.
E 10	Replace Surge Protector Module	None	The unit has protected your RV from a surge event. This unit will continue to provide error code information but will not protect your RV from future surge events.

Progressive Industries, Inc.
For more information regarding the Limited Lifetime Warranty, Troubleshooting and the Warranty Claim Form visit: **www.progressiveindustries.net**

Technical Support

- 800.307.6702
- **tech.progressive@oneasg.com**

Documents / Resources

	Progressive Industries EMS-PT30X Electrical Management System (EMS) [pdf] Instruction Manual EMS-PT30X Electrical Management System EMS, EMS-PT30X, Electrical Management System EMS, Management System EMS

References

- Rv Surge Protection | United States | Progressive Industries, Inc.
- Rv Surge Protection | United States | Progressive Industries, Inc.