carmanah®

EG320/EG340 USER MANUAL

USER MANUAL • MANUAL DEL USUARIO • MANUEL DE L'UTILISATEUR

Model • Modelo • Modèle
EG320/EG340

we put solar to work™

Warnings and Precautions

The following symbols indicate important safety warnings and precautions throughout this manual. They are defined as follows:

WARNING indicates that serious bodily harm or death may result from failure to adhere to the precautions.

CAUTION indicates that damage to equipment may result if the instructions are not followed.

NOTE suggests optimal conditions under which the equipment will operate effectively and safely, or provides additional information to the reader.

Warranty Disclaimer

This manual will familiarize you with the features and operation standards of Carmanah's EG320/EG340 lights. Failure to comply with the use, storage, maintenance, installation or placement instructions detailed in this manual could void the applicable user warranty.

Standards

Perform all installation, wiring and maintenance in conformance with local building and electrical codes. Adherence to the National Electrical Code (NEC) is mandatory. Non-adherence to code may void the warranty.

Safety and Usage Precautions

Batteries are shipped fully-charged. Use extreme caution when handling the batteries as they are capable of generating hazardous short-circuit currents. Remove all jewelry (bracelets, metal-strap watches, etc.) before attempting to handle the batteries.

Solar modules produce DC electricity when exposed to light and can, therefore, produce an electrical shock or burn. To render solar modules inoperative, remove them from sunlight, or fully cover their front surface with an opaque material.

Before lifting any heavy or bulky equipment, ensure that the load is secured so that moving parts do not shift and it can be lifted as far as needed without back strain or loss of grip. Installation may require more than one person.

Until the system is ready for startup, keep the battery fuse out of the fuse holder. Ensure the equipment is not powered during installation and wiring of the system.

Re-check all completed wiring for proper polarity prior to energizing the system.

On Start-Up, follow the procedures described in the “Testing the system” section of this document.

NOTE

Changes or modifications to Carmanah equipment not expressly approved by Carmanah could void the user's authority to operate the equipment.

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Introduction

EG320/EG340 solar LED lighting products are ideal for street, parking lot and general site lighting.

Features and Functionality

The following components make up these products:

- EG320/EG340 Solar Engine, consisting of:
    - •Energy Management System (EMS)
    - •Chassis assembly
    - •Solar panel(s)
    - •Solar panel rails (2)
    - •Batteries
- LED fixture(s)
- EG320/EG340 programmer

The solar panel(s) and EMS work together to charge the batteries during the day. At night, the EMS controls the flow of power from the batteries to the LED fixture(s).

Installation

For details on the assembly and installation of EG320/ EG340 products, please see the appropriate Installation Guide.

A summary of the assembly and installation process is given below:

- EG320/EG340 solar engine is assembled and installed onto the pole using a crane and bucket truck
- The fixture wires are routed and the fixture installed
- The unit is programmed and tested

Accessory installation kits are available and recommended to facilitate system installation. The kits consists of lifting straps, shackles, and a solar panel connector disassembly tool. The part numbers are:

- EG320 20-degree install kit - Carmanah part # 65937
- EG320 45-degree install kit - Carmanah part # 70148
- EG340 20-degree install kit - Carmanah part # 65938
- EG340 45-degree install kit - Carmanah part # 70149

EG320/EG340 Programmer

The programmer is used to program the EMS with the correct operating profile for your application. The programmer is also used to test the EG320/EG340 system to confirm correct operation. The programmer is powered by two AA batteries (not included), and communicates with the EG320/EG340 EMS using two-way infrared signals.

The programmer has two buttons: Send and Test. The Send button is used to upload the operating profile (parameters) to the EG320/EG340 EMS, while the Test button is used to test that the EG320/EG340 system is operating correctly.

The 12 knobs and switches on the programmer come pre-configured with the correct settings for your application. If the knobs or switches get moved accidentally, return them to the positions indicated by the faceplate label.

NOTE

The EG320/EG340 uses two-way communication between the programmer and EMS. Therefore each EG320/EG340 EMS must be programmed one at a time. Problems arise when more than one EMS is in range during programming.

The programmer has indicator lights and a beeper to convey status to the user. The following table summarizes the meanings of the lights and the beeper:

Feedback	Status
Three short beeps & green OK light ~5s after pressing/holding Send button	Programming successful
One long beep & red Error light ~5s after pressing/holding Send button	Programming not successful
One short beep after pressing/holding Test button	Test command transmitted
One long beep & red Error light immediately after pressing Test or Send button	Replace 2 X AA batteries in programmer

Setting Brightness and Programming

As part of the installation process, the EG320/EG340 is configured with a fixture current, which sets the base fixture brightness, and an operating profile, which controls fixture on/off times and, for some profiles, fixture dimming.

The current setting for every EG320/EG340 system is carefully chosen to work together with the operating profile without consuming more than the available solar energy in the installation location.

The EG320/EG340 is configured in two steps: 1) installing the fixture current-setting resistor, and 2) programming the EMS using the EG320/EG340 Programmer.

Installing the current-setting resistor

The amount of current going to the LED fixture(s) is determined by the current setting resistor, which is installed in a sealed holder in the EG320/EG340 EMS wiring harness. When no resistor is installed, the fixture current reverts to the lowest possible setting.

The current-setting resistor should be inserted into the holder during the installation of the EG320/EG340 system (see EG320/EG340 Installation Guide for details). If this step was forgotten during installation, the current-setting resistor can be installed by pulling the resistor holder out through the access hole under the EMS, removing the cap, inserting the resistor, and replacing the cap.

The current-setting resistor can be inserted into the holder in any orientation. Make sure it is seated firmly in the electrical contacts.

Programming using the EG320/EG340 Programmer

The EG320/EG340 Programmer is used to upload (program) the operating profile into the EG320/EG340 EMS. This should be done during installation of the system (see EG320/EG340 Installation Guide for details).

Follow these steps to program the EMS:

- Make sure the knobs and switches are positioned as indicated by the label on the EG320/EG340 programmer.
- Point the programmer at the infrared transmitter/receiver on the EG320/EG340 EMS.
- Press **and hold** the Send button on the programmer.
- **Continue** to hold down the Send button until the programmer beeps.
- If the Programmer beeps three times and the green OK light on the programmer lights, programming was successful.
- If the Programmer emits one long beep and the red Error light on the programmer lights, programming was not successful.

If programming was not successful, try getting closer to the EG320/EG340 EMS and make sure you accurately aim the programmer at the infrared transmitter/receiver on the EMS while pressing and holding the Send button. Programming can be done from the ground, but may not work during the middle of the day, when the strong infrared radiation from the sun interferes with communications between the Programmer and EMS.

Testing the system

The EG320/EG340 Programmer can be used to test the EG320/EG340 system. To test the system:

- Point the programmer at the IR transmitter/receiver on the EG320/EG340 EMS.
- Press and hold the Test button on the programmer until it beeps once.
- The LED fixture should turn on briefly to indicate that the system is operating properly.

The test command may not be received by the EG320/EG340 EMS on bright, sunny days. Try getting closer to the EMS, or try testing later in the day when the sunlight won't interfere as much with communications. See the Troubleshooting section if the fixture still will not turn on.

EMS Indicator Lights

The EG320/EG340 EMS has three indicator lights which are visible from the ground at night. On bright days, the lights may be difficult to see from the ground, and a pair of binoculars can be used to see the lights (do not look at the sun directly when operating binoculars).

The following table summarizes the behaviour of the three EMS indicator lights:

Light symbol	Status	Function
	On (green)	Not charging (night detected)
	Flashing (green)	Charging (day detected)
	Off	No battery connected
	On (red)	Load low/high voltage disconnect (Load LVD/HVD)
	Flashing (red)	Load over-current
	Off	Load OK
	On (red)	Dimming due to battery low/high voltage disconnect (Battery LVD/HVD)
	Off	Time-controlled dimming
All 3 lights	Pulsing (all lights)	Programming

Maintenance & Product Care

The EG320/EG340 solar engines are designed to operate reliably for years with virtually no need for maintenance. Carmanah recommends routine inspections of the solar panels to ensure that they are unobstructed by anything that may prevent effective solar charging, including:

- dirt and dust
- snow
- leaves
- debris
- bird droppings
- shade that may have developed after installation due to adjacent plant growth.

The frequency of the inspections depends on location and local weather patterns. A yearly visual inspection of the EG320/EG340 solar engine is typically sufficient. The EG320/EG340 is designed to be maintenance free, however maximum system performance will be achieved when the LED fixture lenses and solar panels are clean.

Fuse Replacement

A wiring fault during installation or maintenance can sometimes cause the battery fuse to blow. The EG320/EG340 is shipped with one extra battery fuse in a small bag tie-wrapped to the battery fuse holder.

To replace the fuse:

1. Make sure you're not wearing any metal jewelry, or holding any tools or other conductive objects.

2. Check all wiring for any faults that may have caused the fuse to blow.

3. Carefully reach into the enclosure to the right of the EMS, above the Carmanah symbol, and pull out the fuse holder.

4. Pull the fuse holder apart and check the fuse.

5. Replace a blown fuse with the spare fuse supplied.

If additional fuses are required, use the following replacement fuses or equivalent:

EG320 - Littelfuse part # 0314015.

EG340 - Littelfuse part # 0314030.

Battery Replacement

When the EG320/340 system's batteries require replacement, it is recommended that the EG-series Maintenance Kit be used (Carmanah part # 75278). This kit provides maintenance brackets which allow the solar panels to be tilted out of the way to allow easy access to the batteries.

Battery replacement procedure should not be carried out in windy conditions. In all cases, the area at the base of the pole must be roped off to prevent people from being injured or killed by falling pieces.

Energy Management System (EMS) Recycling

Production of the EMS required the extraction and use of natural resources. The EMS may contain substances that could be harmful to the environment or human health if improperly handled at the product's end of life. In order to avoid release of such substances into the environment and to reduce the use of natural resources, we encourage you to recycle the EMS in an appropriate way that will ensure most of the materials are reused or recycled appropriately. Check your local municipality for electronics recyclers.

Troubleshooting

Symptom	Circumstances	Possible Cause (solution)
Fixture won't turn on…	…after test button pressed	Sunlight interfering with communications (try again later in the day)
		Too far away (get closer)
		Programmer battery dead (replace batteries)
		Programmer not aimed at EMS receiver (aim carefully)
		Blown battery fuse (check wiring, replace battery fuse)
		Fixture wiring problem (check fixture wiring for short/ open circuit)
Fixture won't turn on…	…at night time	EMS programmed incorrectly (check programmer knob/ switch settings, reprogram EMS)
		Blown battery fuse (check wiring, replace battery fuse)
		Solar panel shaded, causing drained batteries & low-voltage disconnect (prune trees, move pole)
		Solar panel wiring problem caused drained batteries & low-voltage disconnect (check SOLAR PANEL wiring)
		Fixture wiring problem (check fixture wiring for short/ open circuit)
Fixture turns off…	… in the middle of the night	EMS programmed to run for specific time after dusk. This may be correct operation. Please check with your Carmanah distributor.
		Solar panel shaded, causing drained batteries & low-voltage disconnect (prune trees, move pole)
Fixture turns on…	… during the day	EMS not programmed, or programmed incorrectly (check programmer knob/switch settings, reprogram EMS)
		Solar panel wiring open circuit causing system to think it is night. Check Solar panel wires & connectors.
Fixture dim…	… during the night	EMS programmed to run for specific time after dusk. This may be correct operation. Please check with your Carmanah distributor
		Solar panel shaded, causing drained batteries & low voltage disconnect (prune trees, move pole)
Green light on (night mode)...	… during the day	Solar panel wires not connected properly (check Solar panel wires & connectors)
Green light flashing (night mode)...	… during the night	Short between battery & Solar panel wiring (check all wiring)

Symptom	Circumstances	Possible Cause (solution)
Green light off...	… at all times	Blown battery fuse (check fixture & battery wiring, replace battery fuse)
		Battery wiring problem (check battery wiring)
		Dead batteries due to incorrect EMS programming, solar panel shading, or battery wear-out (check programmer knob/switch settings, reprogram EMS)
Red light on…	… during the night	EMS senses that fixture voltage too high or low (check fixture wiring)
Red light flashing…	… during the night	EMS senses that fixture current is too high (check fixture wiring)
DIM Red light on…	… during the night	Battery low-voltage condition due to incorrect EMS programming, solar panel shading, or battery wear-out (check programmer knob/switch settings, reprogram EMS)
All 3 lights (1 green, 2 reds) pulsing…	…during programming	This is normal behaviour.
Can't program with programmer…	…during the day	Sunlight interfering with communications (get closer to EMS, aim carefully at EMS, try again later in the day)
Can't program with programmer…	…at night	Programmer batteries dead (replace AA batteries)
		Programmer not aimed at EMS IR transmitter/receiver (aim carefully)
		Blown battery fuse (check wiring, replace battery fuse)

Warranty

This product is covered by the Carmanah warranty. Visit www.carmanah.com for additional information.

If contacting Carmanah's customer service department, please have the serial number of your system available (located on EMS) or sales order number, a brief description of the problem, as well as all details of the installation.

To contact Carmanah's Customer Service Department:

Mail: Carmanah Technologies Corporation
250 Bay Street
Victoria, BC Canada V9A 3K5

Phone: 1.250.380.0052
877.722.8877 (Toll Free in U.S. and Canada)

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Email: customerservice@carmanah.com

Website: carmanah.com

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