

SAVE THESE INSTRUCTIONS FOR FUTURE REFERENCE
APPLICATION

The HAL-EMG-EXT-2X3W-2L Emergency Lighting System is designed to automatically provide illumination to designated areas during failure or interruption of power to the normal lighting system. The HAL-EMG-EXT-2X3W-2L is factory-assembled and wired, and consists of one battery and two light fixtures.

When properly installed, the following marine rated HAL-EMG-EXT-2X3W-2L emergency lighting systems are UL and cUL listed for use in:

- HAL-EMG-EXT-2X3W-2L *Power Supply* - Class I, Division 2, Groups B, C, D Class II, Division 2, Groups F, G
- HAL-EMG-EXT-2X3W-2L *Power Supply* - Class I, Division 2, Groups B, C, D Class II, Division 2, Groups F, G

The HAL-EMG-EXT-2X3W-2L power supply consists of a battery supply and battery recharging system housed inside a corrosion-resistant Krydon® material enclosure with all the circuitry to automatically turn on emergency DC lighting fixture(s) when the normal power supply fails. A pilot light indicates when normal power is being supplied to the unit. A "push-to-test" pushbutton switch is provided for periodic testing of the unit.

The light fixture used on the HAL-EMG-EXT-2X3W-2L system is a rugged, epoxy coated corrosion-resistant assembly, fully adjustable and lockable, and houses a high output LED lamp, which is included with the fixture.

DETAIL INDICATION LOGIC IS GIVEN BELOW:

Status Indication	Status Description	Status Definition
	No Light	AC Power Removed From Circuit
*	Steady Light (No blinks)	Fully Charged
* - *	Light Blinks Once	Battery Charging
** - **	Light Blinks Twice	Battery Failure
*** - ***	Light Blinks Three Times	Circuit Failure

Table 1. Detail Indication Logic

Immediately after supply power is initiated, the indicating lamp will blink/pulse to indicate that the unit is charging. Once installed with supply power, the HAL-EMG-EXT-2X3W-2L requires 72 hours to charge the battery. Once the unit has completed charging, the pilot light will stop blinking and go to steady.

Every six months, the unit will automatically perform a 90 minute battery discharge test. At the completion of the test, if it is determined not to have met the 90 minute requirement or if the battery connection is not adequate, the pilot lamp will blink twice, indicating battery failure. Every 30 days, the unit will also automatically perform a 30 second self-test. If the battery or board has been compromised the indicator light will blink accordingly.

IMPORTANT SAFEGUARDS - READ AND FOLLOW ALL SAFETY INSTRUCTIONS


RATINGS		
POWER SUPPLY	Input	• 120, 230 and 277 VAC $\pm$ 5%, 50 or 60Hz • 0.5 Amperes maximum
	Output	• 12 VDC; 2.5 Amperes • 28 Watts for 1½ hours at +40°C
	Ambient Temp	• 0°C to +55°C
LAMP FIXTURES	Input	• 12 VDC
	Ambient Temp.	• +55°C maximum
	Operating Temp. Code	• Class I, Division 2 40° - T5; 55° - T4A • Class II, Division 2 40° - T5; 55° - T4A

NOTE: Ambient temperature at which HAL-EMG-EXT-2X3W-2L is rated is 0°C to +55°C to maximize battery capacity.

NOTE: Unit comes standard with a 15 minute time delay to comply with NEC 700.16 for HID illumination.

National Electrical Code® is a registered Trademark of the National Fire Protection Association.


IMPORTANT

Emergency lighting system should be installed, inspected, operated, and maintained by qualified and competent personnel.


WARNING

To avoid personal injury, electric shock, or equipment failure:

1. Do not use this equipment for other than intended use.
2. Do not use accessory equipment not recommended by the manufacturer.
3. Electrical power must be turned OFF before and during installation and maintenance.
4. Equipment should be mounted in locations and at heights where it will not readily be subjected to tampering by unauthorized personnel.
5. Do not mount near heat producing equipment.
6. In Class I or Class II areas, install and seal all equipment in accordance with the National Electrical Code articles pertaining to hazardous (classified) locations, plus any other applicable codes.
7. Install only wiring systems with an equipment grounding conductor (which may be the conduit system) to supply the HAL-EMG-EXT-2X3W-2L.
8. Free installation area of hazardous atmospheres before wiring.
9. Observe all battery handling precautions contained herein.
10. To avoid shattering: Do not operate lamp in excess of rated voltage, protect lamp against abrasion and scratches, and against liquids when lamp is operating. Dispose of lamp properly.



WARNING

To avoid explosion, electrical power must be turned OFF before and during installation and maintenance.

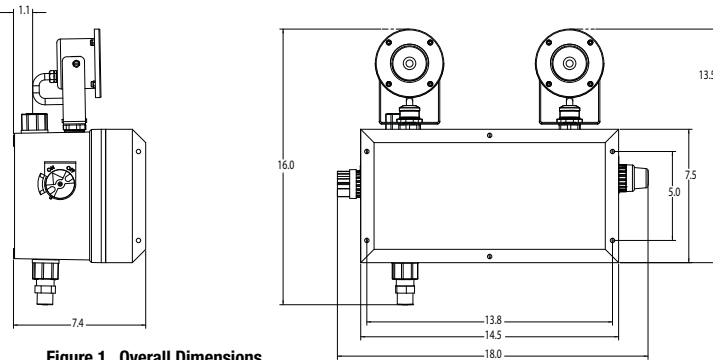


Figure 1. Overall Dimensions

INSTALLATION

A. INSTALL SYSTEM

1. Refer to overall dimensions (see Figure 1) to select a mounting location that will provide suitable strength and rigidity for supporting power supply and attached fixtures. See Figure 2 for mounting dimensions.
2. Loosen (do not remove) the captive cover screws (6) of the power supply housing and carefully place the cover aside for reassembly later.
3. Securely fasten the power supply enclosure to the mounting location using the appropriate length 1/4" diameter hardware through the four (4) mounting holes shown in Figure 2.

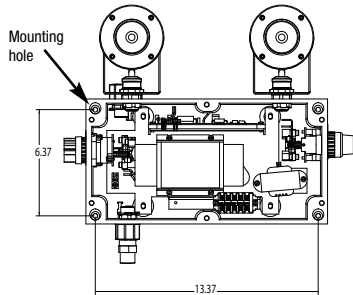


Figure 2. Mounting Dimensions



CAUTION

To avoid impairing operation and/or damage to the equipment, mount the enclosure with the back wall fastened to the vertical surface with the pilot light and push-to-test pushbutton located on the right side of the enclosure.

4. Adjust the lighting fixtures:
 - a. Loosen (do not remove) the gland nut and the lock nut at the mounting bracket center (see Figure 3).

Adjust fixture head and bracket to the desired position and re-tighten the two nuts.

- b. Loosen (do not remove) the screws on both sides of the light fixture (adjusting screws).

Adjust fixture head to desired position and re-tighten the two screws.

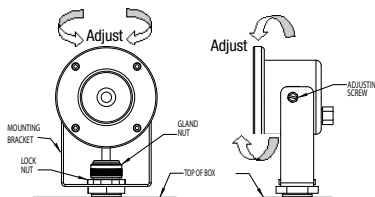


Figure 3

B. CONDUIT CONNECTION, WIRING, AND BATTERY INSTALLATION



WARNING

To avoid explosion, electrical power must be turned OFF before and during installation and maintenance, and installation area must be free of hazardous atmospheres before wiring.

1. Connect enclosure to wiring system in accordance with the National Electrical Code® plus any other applicable codes.

NOTE: The power supply is supplied with one Cooper Crouse-Hinds SSTG2 Myers™ Hub (3/4") and grounding bushing already installed. Use a thread sealant in conduit-to-hub joint to maintain maximum environmental protection.

2. Make all wiring connections following wiring diagram located on power supply battery bracket (see Figure 4).

NOTE: Although generally not required, the interior assembly may be removed to facilitate wire pulling. Remove four (4) 1/4-20 screws and lock washers and disconnect wire leads at the pilot light, DC disconnect switch, pushbuttons, and lamp heads. DO NOT handle interior roughly or place it in an area where dirt, dust, or grime will damage it. Replace as soon as all wiring has been pulled into enclosure.



WARNING

To avoid potential explosion, make wiring connection using methods that comply with the NEC and any local codes.

To prevent dangerous electrical shocks, use only on grounded wiring systems.

NOTE: Main lamp head wires may vary in color. Instead of WHITE (+), BLACK (-), and GREEN (Ground), wires may be BROWN (+), BLUE (-), and BLACK (Ground) respectively.

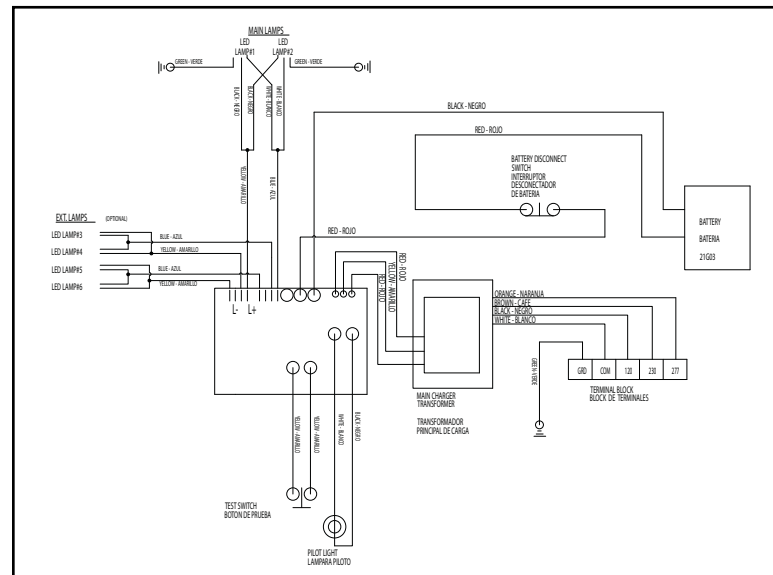


Figure 4. Wiring Diagram

- 2a. Connect 120 VAC primary (through designated disconnect) to terminal 120. Connect 230 VAC primary (through designated disconnect) to terminal 230. Connect 277 VAC primary (through designated disconnect) to terminal 277. Connect common to terminal COM. Connect all equipment grounding conductors to terminal GRD.
- 2b. Connect battery connector to circuit board (see Figure 4). Lamp heads will **not** light at this time. Verify that transformer connector is also connected to circuit board.
- 2c. Standard system is provided with two factory-assembled and factory-wired lighting fixture heads. (No additional fixture wiring connections need to be made by the installer).
- 2d. Test wiring for correctness with continuity checks and also for unwanted grounds with insulation resistance tester.
- 2e. If NOT installing remote fixture assemblies for connection to the power supply, proceed to Section C, "Complete Installation."

⚠ WARNING

To avoid electrical shock, use fixture only on systems with an equipment grounding conductor.

NOTE

Unit needs to charge for 72 hours before conducting any tests. Do not disconnect AC power until unit is fully charged.

C. COMPLETE INSTALLATION

1. Install CID101 corrosion inhibitor device (supplied in plastic envelope with instruction sheet). Recommended location is on the inside surface of the top of the enclosure near the right side fixture stem. Refer to CID101 instruction for installation.
2. Close cover and torque all cover (6) screws to 21-25 in.-lbs.
3. Test emergency lighting system for proper operation (see Table 1 on page 1 for detail indication logic):
Turn on the AC power and observe:
 - Indicating light marked "ON" should be operating
 - Momentarily press the push-to-test button and observe - emergency lights should be operating

NOTE: If emergency lights do not operate initially, allow battery to charge for at least 15 minutes or more, then repeat the test procedure.

4. Allow 72 hours charge time before depending on battery to operate at full capacity.

NOTE: Lock in ON position to prevent unauthorized persons from turning system OFF.

INSPECTION OF BREATHER/DRAIN

The breather/drain is installed to provide ventilation to minimize condensation and also allow liquids to drain out. Perform visual and mechanical inspections on a regular basis. Frequency should be determined by the environmental conditions. However, it is recommended that checks should be made at least once per year.

⚠ CAUTION

To minimize condensation, never disassemble breather or drain assemblies.

1. Remove drain or breather and replace it with either a plug or clean drain or breather.
2. Clean breather/drain by following "Flush-Cleaning" instructions.



⚠ CAUTION

To avoid damaging breather/drain, do not force handle or cap during inspection.

FLUSH-CLEANING

Flush-Cleaning may be required by the user's periodic maintenance program or when a drain or breather becomes clogged with foreign material.

1. Attach drain or breather to a clean water line with threaded end facing upstream (see Figure 5).

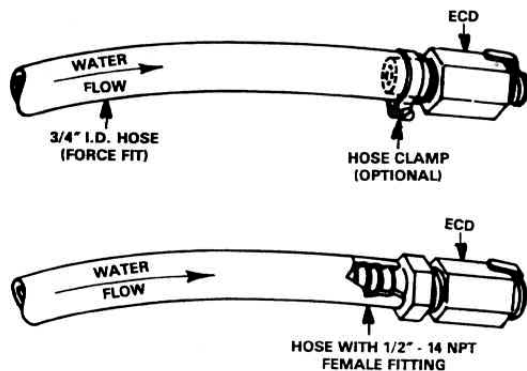


Figure 5

2. Flush ECD with water under line pressure (typically 30 to 75 psi). Discard the drain or breather if the foreign material is not removed.

NOTE: Different styles and sizes of ECD fittings will allow different amounts of water or air to pass through. To determine if a breather or drain has been cleaned, compare the volume or water passing through a clean, unused breather or drain of the same style and size.

3. After cleaning, attach the breather or drain to a pressurized dry air supply line in a similar manner to that used with the water line in Step 1.
4. Blow the fitting dry, inside and out, with the dry air.

PERIODIC TESTING

Article 700 of the National Electrical Code states, "Systems shall be tested periodically on a schedule acceptable to the authority having jurisdiction to assure their maintenance in proper operating condition." It also states, "A written record shall be kept of such tests and maintenance."

In the absence of periodic testing requirements by a local authority, the following recommendations from the NFPA 101 (2003) Life Safety Code® are strongly recommended:

1. **Monthly:** Momentarily operate push-to-test switch. Observe that emergency lighting fixtures are on full brightness for the entire test cycle.
2. **Annually:** Shut off AC power at the distribution panel. Verify that the emergency lighting fixtures remain "ON" for a minimum of 1 1/2 hours.

NOTE: Leave the battery disconnect switch "ON" during this test so that battery circuit is not interrupted. We suggest that this test be continued until the power supply automatically shuts the emergency light(s) off. This will help maintain full battery capacity.

Record the test on the Maintenance Record Card.

Allow 72 hours charging time before depending on the battery to operate at full capacity.

Failure to function properly in either test may indicate the need for battery or lamp replacement.

BATTERY REPLACEMENT

1. Turn battery disconnect switch to "OFF" and lock-out the switch.
2. Loosen (do not remove) the captive cover screws (6) of the power supply housing and carefully place the cover aside for reassembly later.
3. Disconnect the wire nut attaching black negative lead from the battery to the battery plug.
4. Disconnect the wire nut attaching red positive lead from the battery to battery disconnect switch, taking care not to touch the ground.
5. Remove the four (4) screws that fasten the battery hold-down bracket to the mounting plate. Remove battery. Retain hardware for use with replacement battery.

⚠ WARNING

To avoid potential explosion, do not short circuit the battery or connector terminals.

6. Reinstall new battery using hold-down bracket and four (4) screws previously removed.
7. Reconnect black and red battery conductors using wire nuts.
8. Close cover and torque all cover (6) screws to 21-25 in.-lbs.
9. Unlock designated disconnect switch to "ON" position. You may lock switch in "ON" position to prevent unauthorized persons from turning system "OFF."
10. Test replacement battery following Step 3 of Section C, "Complete Installation."

⚠ WARNING

To avoid explosion:

1. Exercise care in handling cells/batteries in order to prevent shorting of the cell with conductive materials such as rings, bracelets, and keys. The cell or conductor may overheat and cause burns.
2. Do not dispose of the cell/battery in open flame; cells may burst.
3. Do not open or mutilate cell/battery. Opened cells may release corrosive electrolytes which may have harmful effects on the skin and eyes, and may be toxic if ingested.

FIXTURE HEAD REPLACEMENT

WARNING

All electrical power must be turned OFF before and during installation and maintenance. Area should be free of hazardous atmospheres before maintenance is performed to reduce the risk of accidental explosion due to inadvertent shorting of battery during maintenance.

1. Disconnect AC power by opening the supply circuit at the distribution panel.
2. Disconnect DC power by turning designated disconnect selector switch to "OFF."
3. After removing all AC and DC power to the fixture, loosen (do not remove) the captive cover screws of the power supply enclosure and carefully place the cover aside for reassembly later.
4. Disconnect battery lead from charger board.
5. Disconnect fixture head wire leads, noting color coding of wires.
6. Remove nut from underside of fixture head threaded stem and remove fixture head/CGB fitting assembly from the power supply housing.
NOTE: Do not discard the nut, which will be used with the replacement fixture head.
7. Insert wiring for new fixture head assembly through the power supply opening, and insert the fixture CGB fitting.
8. Install the nut (removed in Step 6) while holding the fixture head assembly in the desired position.

WARNING

To prevent injury from electric shock, all power must be removed from the fixture during maintenance.

WARNING

Even after disconnect, batteries will still be live. To prevent electrical shock and explosion, take extra care not to touch leads together or to ground.

WARNING

To avoid explosion, always disconnect primary power source using designated disconnect switch before opening enclosure for inspection or service.

MAINTENANCE

1. Conduct periodic testing in accordance with local authority and Periodic Testing section of these instructions.
2. Clean fixture lens and exterior surfaces periodically. We recommend every three months or more frequently, if appropriate.
3. Frequent interior inspection should be made. A schedule for maintenance check should be determined by the environment and frequency of use. It is recommended that it should be at least once a year.
4. Perform visual, electrical, and mechanical checks on all components on a regular basis.
 - Visually check for undue heating evidenced by discoloration of wires or other components, damage, or worn parts, or leakage evidenced by water or corrosion in the interior.
 - Electrically check to make sure that all connections are clean and tight.
 - Mechanically check that all parts are properly assembled.
5. Do not attempt field replacement or repair of power supply cover gasket. Instead, remove damaged gasket and continue to use cover without gasket. This will assure safety for use in Class I and Class II hazardous (classified) locations. However, the enclosure will not be raintight.

Table 2

Wire Sizing for Remote Installation (for copper wire)

Running Distance* (ft.) Between Power Supply and Remote Lighting Fixture

Ambient Temp. °C	25			40			55		
Lighting Fixture Load-Max. Watts	12	24	30	12	24	30	12	24	30
Wire Size									
• 14 AWG	125	63	50	117	58	47	109	55	44
• 12 AWG	198	99	79	185	92	74	173	87	69
• 10 AWG	317	158	127	295	148	118	276	138	110
• 8 AWG	505	253	202	471	235	188	440	220	176

TROUBLESHOOTING GUIDE

SYMPTOM	SOLUTION
1. Pilot light does not light.	1a. Verify power to fixture. 1b. Verify transformer is properly connected to circuit board.
2. Pilot is blinking twice.	2. Verify battery is properly connected to circuit board.
3. After 72 hours, unit is not fully charged (pilot light steady) and lamp heads flash.	3. Remove leads from pushbutton N/C contacts and terminate the leads on the N/O contacts.
4. Pilot light is blinking three times.	4. Verify battery voltage under no load is 13.0V or higher after 72 hour charge. If less than 13.0V, consult factory for battery replacement. If more than 13 volts, consult factory for complete interior replacement as transformer and/or circuit board could be responsible.

THESE INSTRUCTIONS MAY NOT COVER ALL DETAILS OR VARIATIONS OF THIS PRODUCT FOR YOUR EQUIPMENT OR INSTALLATION REQUIREMENTS. SHOULD FURTHER INFORMATION NOT COVERED BY THESE INSTRUCTIONS BE REQUIRED, PLEASE CONTACT LARSON ELECTRONICS BY EMAIL AT SALES@LARSONELECTRONICS.COM OR BY PHONE AT 1-877-348-9680 FOR FURTHER ASSISTANCE.

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