# LED N2LPS Emergency Lighting System

## Installation & Maintenance Information

**SAVE THESE INSTRUCTIONS FOR FUTURE REFERENCE**

### APPLICATION

The LED N2LPS Emergency Lighting System is designed to automatically provide illumination to designated areas during failure or interruption of power to the normal lighting system. The N2LPS is factory-assembled and wired, and consists of one battery and two light fixtures.

When properly installed, the following marine rated N2LPS emergency lighting systems are UL and cUL listed for use in:

- **N2LPS12222 Power Supply** - Class I, Division 2, Groups B, C, D, Class II, Division 2, Groups F, G
- **N2LPS12220 Power Supply** - Class I, Division 2, Groups B, C, D, Class II, Division 2, Groups F, G

The N2LPS 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 N2LPS system is a rugged, epoxy coated corrosion-resistant assembly, fully adjustable and lockable, and houses a high output MR16 LED lamp, which is included with the fixture.

### DETAIL INDICATION LOGIC IS GIVEN BELOW:

<table>
<thead>
<tr>
<th>Status Indication</th>
<th>Status Description</th>
<th>Status Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>*</td>
<td>Steady Light (No blinks)</td>
<td>Fully Charged</td>
</tr>
<tr>
<td>**</td>
<td>Light Blinks Once</td>
<td>Battery Charging</td>
</tr>
<tr>
<td>***</td>
<td>Light Blinks Three Times</td>
<td>Battery Failure</td>
</tr>
</tbody>
</table>

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 N2LPS 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

**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 N2LPS.
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.

### RATINGS

<table>
<thead>
<tr>
<th><strong>POWER SUPPLY</strong></th>
<th><strong>LAMP FIXTURES</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Input</strong></td>
<td><strong>Operating Temp. Code</strong></td>
</tr>
<tr>
<td>120, 230 and 277 VAC ± 5%, 50 or 60Hz</td>
<td>Class I, Division 2, 40° - 15; 55° - T4A</td>
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<tr>
<td>0.5 Amperes maximum</td>
<td>Class II, Division 2, 40° - T5; 55° - T4A</td>
</tr>
<tr>
<td><strong>Output</strong></td>
<td><strong>Ambient Temp.</strong></td>
</tr>
<tr>
<td>12 VDC, 2.5 Amperes</td>
<td>+55°C maximum</td>
</tr>
<tr>
<td>28 Watts for 1½ hours at +40°C</td>
<td><strong>Ambient Temp.</strong></td>
</tr>
<tr>
<td><strong>N2LPS 0°C to +40°C</strong></td>
<td><strong>Class I, Division 2</strong></td>
</tr>
<tr>
<td><strong>N2LPS S904 0°C to +55°C</strong></td>
<td><strong>Class II, Division 2</strong></td>
</tr>
</tbody>
</table>

**NOTE:** Ambient temperature at which N2LPS power supply is rated is 0°C to +40°C to maximize battery capacity. Ambient temperature at which N2LPS S904 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.

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

B. CONDUIT CONNECTION, WIRING, AND BATTERY INSTALLATION

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) \( \frac{1}{4} \)-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 N2LPS only on grounded wiring systems.
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.

5. Reconnect black and red battery conductors using wire nuts.

6. Reinstall new battery using hold-down bracket and four (4) screws previously removed.

7. Reinstall battery disconnect switch to “OFF” and lock-out the switch.

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.”

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. Record the test on the Maintenance Record Card (provided on page 5).
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. Loosen (do not remove) the captive cover screws (6) of the N2LPS power supply housing and carefully place the cover aside for reassembly later.
2. Disconnect the wire nut attaching red positive lead from the battery to battery disconnect switch, taking care not to touch the ground.
3. Disconnect the wire nut attaching black negative lead from the battery plug.
4. Open the cover and carefully remove the battery. Retain hardware for use with replacement battery.
5. Remove the four (4) screws that fasten the battery hold-down bracket to the mounting plate. Remove the four (4) screws that fasten the battery hold-down bracket to the mounting plate.

6. Reinstall new battery using hold-down bracket and four (4) screws previously removed.
7. Connect 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.”

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).
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.

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.

INSECTION 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.

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

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

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.
**REPLACEMENT CIRCUIT BOARD AND BATTERY KIT**

N2LPS K57 KIT CONSISTS OF:

1. Circuit Board and Charger Assembly with Mounting Bracket
2. IF 1595A
3. Sealed Ni-Cad Battery (A high temp. rated battery for N2LPS K57 5904 kit is included)
4. 2 Volt LED for Pilot Light
5. CD101 Corrosion Inhibitor Device (See IF 1595A for replacement).

**NOTE:** If the rating of your LED N2LPS Emergency Lighting System is from 0°C to 55°C, make sure you use a N2LPS K58 5904 replacement kit. Otherwise, use N2LPS K57 kit (see Figure 6 for temperature rating reference).

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**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 N2LPS 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.

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**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 N2LPS 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.

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**TROUBLESHOOTING GUIDE**

<table>
<thead>
<tr>
<th>SYMPTOM</th>
<th>SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Pilot light does not light.</td>
<td>1a. Verify power to fixture.</td>
</tr>
<tr>
<td>2. Pilot is blinking twice.</td>
<td>2. Verify battery is properly connected to circuit board.</td>
</tr>
<tr>
<td>3. After 72 hours, unit is not fully charged (pilot light steady) and lamp heads flash.</td>
<td>3. Remove leads from pushbutton N/C contacts and terminate the leads on the N/O contacts.</td>
</tr>
<tr>
<td>4. Pilot light is blinking three times.</td>
<td>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.</td>
</tr>
</tbody>
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**Table 2**

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

<table>
<thead>
<tr>
<th>Ambient Temp. ºC</th>
<th>25</th>
<th>40</th>
<th>55</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lighting Fixture Load-Max. Watts</td>
<td>12</td>
<td>24</td>
<td>30</td>
</tr>
<tr>
<td>12</td>
<td>24</td>
<td>30</td>
<td>12</td>
</tr>
<tr>
<td>Wire Size</td>
<td>14 AWG</td>
<td>125</td>
<td>63</td>
</tr>
<tr>
<td>12 AWG</td>
<td>198</td>
<td>99</td>
<td>79</td>
</tr>
<tr>
<td>10 AWG</td>
<td>317</td>
<td>158</td>
<td>127</td>
</tr>
<tr>
<td>8 AWG</td>
<td>505</td>
<td>253</td>
<td>202</td>
</tr>
</tbody>
</table>

*Maximum distance to limit line voltage drop to 5%.

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**RELATED PRODUCTS**

**CCH UX Series LED Exit Signs** (see IF 1537, IF 1538, IF 1539, and IF 1540 for installation instructions).

<table>
<thead>
<tr>
<th>CATALOG NUMBER</th>
<th>HOUSING FINISH</th>
<th>LETTER COLOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCH UX70GSDHAZ</td>
<td>Silver Housing</td>
<td>Red LED</td>
</tr>
<tr>
<td>CCH UX70RSDHAZ</td>
<td>Silver Housing</td>
<td>Green LED</td>
</tr>
</tbody>
</table>

**Ex-Lite Series LED Exit Signs** (see IF 1552 and IF 1553 for installation instructions).

<table>
<thead>
<tr>
<th>CATALOG NUMBER</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ex-Lite ZE</td>
<td>With Battery</td>
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</tbody>
</table>

Refer to CCH UX Series and Ex-Lite Series brochures for certifications and compliances.
MAINTENANCE RECORD

NFPA 101 (2003) REQUIREMENTS

“A FUNCTIONAL TEST SHALL BE CONDUCTED ON EVERY REQUIRED EMERGENCY LIGHTING SYSTEM AT 30 DAY INTERVALS FOR A MINIMUM OF 30 SECONDS. AN ANNUAL TEST SHALL BE CONDUCTED FOR THE 1 1/2 HOUR DURATION.

EQUIPMENT SHALL BE FULLY OPERATIONAL FOR THE DURATION OF THE TEST. WRITTEN RECORDS OF TESTING SHALL BE KEPT BY THE OWNER FOR INSPECTION BY THE AUTHORITY HAVING JURISDICTION.”

N2LPS EMERGENCY LIGHTING POWER SUPPLY
N2LPS EVI EMERGENCY LIGHTING FIXTURE (EXIT SIGN)
N2LPS EVA GB EMERGENCY LIGHTING FIXTURE (GB [Group B] EXIT SIGN)

SEE INSTALLATION AND MAINTENANCE INSTRUCTION SHEETS FOR METHODS OF TESTING

<table>
<thead>
<tr>
<th>DURATION OF TEST</th>
<th>DATE</th>
<th>30 SEC</th>
<th>1-1/2 HOUR</th>
<th>OTHER</th>
<th>BATTERY REPLACED</th>
<th>INSPECTED BY</th>
<th>LAMP REPLACED (RECORD FIXTURE LOCATION)</th>
<th>NOTES</th>
</tr>
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