

HALCYON *DIR Dive Systems*



*Explorer Pro/Apollo
HID & Halogen Primary
Lighting Systems*

Halcyon HID & Halogen Primary Light Owner's Manual

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Warnings, Cautions and Notes

Pay special attention to information provided in warnings, cautions, and notes, that is accompanied by these icons:



A **WARNING** indicates a procedure or situation that, if not avoided, could result in serious injury or death to the user.



A **CAUTION** indicates any situation or technique that could cause damage to the product, and could subsequently result in injury to the user.



WARNING: This manual provides essential instructions for the proper operation, inspection, and care of your new Extreme Exposure lighting product. Because Halcyon's lighting systems utilize patented technology, it is very important to take the time to read these instructions in order to understand and fully enjoy the features that are unique to your specific model.

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Replacement parts for Halcyon lighting products are available through Halcyon's dealer network. A complete list of Halcyon Network Partner and Associate dealers is available from <http://www.halcyon.net/dealers/> or by calling 1.386.454.0811.

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Congratulations on your purchase of a Halcyon primary light.

Halcyon's Extreme Exposure Explorer lights were created out of a very real need to produce a lighting instrument capable of withstanding the rigorous demands of exploration diving. Explorer lights are the culmination of more than a decade of careful refinement, resulting in a robust and reliable line of lighting products. Halcyon is a company unlike any other, and we are proud to count you among our select group of demanding customers. Formed by some of the world's leading explorers, our organization is dedicated to establishing a link between active underwater explorers and the manufacture of high end diving equipment. Who better than leading explorers to design and test your life support equipment? We are committed to creating a line of equipment that we would not hesitate to take from storeroom shelf directly to the waters of an exploration dive.



Every underwater light is individually inspected and pressure tested to over 400'. Design prototypes are tested to more than 700'.

The cylindrical canister style light is designed to be mounted on a diver's waist belt with a hands free "Goodman" style light head. The Extreme Exposure light is available in four different canister sizes and in two different lamp mechanisms- halogen and High Intensity Discharge (HID).

The Explorer Pro series is available with a 3, 4, 6, or 14 amp power pack. The Pro's canister is manufactured from a resilient high density polymer material. The Explorer Pro canister comes with a lifetime warranty against breakage.

HALOGEN AND HID LIGHTING SYSTEMS

Conventional halogen lighting systems utilize a filament similar to those found in a conventional light bulb. Halcyon incorporate the latest halogen lamp technology into our robust canister lights, providing you with a choice of economical primary lights in a variety of sizes.

High Intensity Discharge (HID) lighting technology replaces the filament of the light bulb with a capsule of gas. The light is emitted from an arc discharge between two closely spaced electrodes hermetically sealed inside a small quartz glass tubular envelope cap-



sule. To operate, HID lamps require ballasts, which supply proper voltage and control current. The amount of light produced is greater than a standard halogen bulb, while consuming less power, and more closely approximating the color temperature of natural daylight.

In all High Intensity Discharge lamps, light is produced by passing a current through a metal vapor. Free electrons colliding with an atom in the vapor momentarily knock an electron into a higher orbit of the atom. When the displaced electron falls back to its former level, a quantum of radiation is emitted. The wavelength of radiation depends on the energy zone of the disturbed electron and on the type of metal vapor used in the arc tube.

Although it produces 5% of its output when first ignited, the HID light requires a few seconds (usually 15-20) to come up to full output. Also, if power to the lamp is lost or turned off, the arc tube must cool to a given temperature before the arc can be restruck and light produced. Extreme Exposure Explorer HID lights only require a brief (15-30 second) cooling period before they can be relit.

What are the advantages of Extreme Exposure HID Explorer Pro lights over conventional halogen primary lights?

HID lighting has several advantages over conventional halogen primary lights:

- More light output. Extreme Exposure's 18 Watt HID light source produces approximately the same lumens at the light source as a 55 Watt halogen bulb at a three to five times the halogen's efficiency. The HID lamp's lumens per watt (LPW) efficacy is roughly six to eight times that of an incandescent amp.
- Whiter light. The color temperature of HID lighting more closely approximates the color temperature of natural daylight than does a halogen system, which appears yellowish in comparison. We use the term "correlated color temperature" to indicate that the light appears as if the discharge lamp is operating at a given color temperature- traditional measurements of color temperature are drawn from the properties of the metal used in the bulb's filament. Typical color temperatures are 2800K (incandescent), 3000K (halogen), 4100K (cool white or SP41 fluorescent), and 5000K (daylight-simulating fluorescent colors). Both of the Extreme Exposure HID lights produce a light with a color temperature approaching or above 5000K. A white light has a perceived brightness which may equate to the higher stated efficacies- i.e., although an HID lamp might have equivalent lumens as a higher wattage halogen bulb, the HID will appear brighter to the eye.
- Longer Service Life. An HID lamp will last, on the average, 3 to 5 times as long as a halogen bulb. In normal use, your Extreme Exposure HID bulb should last beyond one thousand ignitions.

Why do Halcyon's Extreme Exposure HID lights have the extra ballast unit on the handle?

The ballast in an HID lighting system generally has two purposes. It provides the proper starting voltage to strike and maintain the arc, and it regulates the proper current to the lamp once the arc is established.

Ballasts are not interchangeable among different types of HID lamps. A ballast design incorporates electronic circuitry to provide specific lamp/ballast operating characteristics. As an example, the effects of line voltage variations on resultant changes of lamp wattage are a function of the ballast circuit design. Requirements for a circuit which will



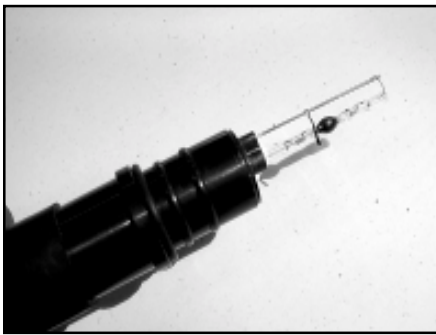
provide a finer degree of lamp regulation generally result in a higher ballast cost.

Special Considerations for HID Lighting Systems

The light emitted from the HID arc tube is intense and appropriate safety precautions relating to exposure protection are required. Metal halide bulbs operate at very high temperatures and pressures. The quartz glass of the bulb itself must be kept clean. The glass lamps should be handled with care giving special attention of the quartz arc tube. The Extreme Exposure HID light is a DC lamp; proper electrical wiring polarity must be observed to prevent damage to the lamp.

- !** **CAUTION:** Ultraviolet, visible, and infrared radiation is emitted from metal halide lamps. Possible skin or eye irritation can result from exposures exceeding 15 minutes. Do not stare at exposed lamp in operation. During operation, the bulb should be enclosed in a housing to prevent injury. Do not remove bulb from equipment until it has cooled. Never handle the bulb when it is operating!

Protect the quartz arc tube when handling the lamp. Keep the arc lamp clean. Do not touch the quartz tube, the inside surface of the reflector, and the connecting wires. Contamination can degrade lamp performance or cause premature failures. If necessary, clean the lamp by wiping with a lint free towel or swab immersed in denatured alcohol.



While HID bulbs last considerably longer than halogen bulbs, you should be aware of several characteristics that indicate that a bulb is approaching the end of its lifespan. Initial symptoms of end-of-life are characterized by low light output and/or intermittent starting. Visual signs include blackening at the ends of the arc tube and electrode tip deterioration. Note that HID bulbs contain metals, including mercury, that are harmful to the environment. Please be responsible in securing proper disposal of an HID bulb.

The bulb and ballast are sensitive to external operating temperature. Although the Extreme Exposure HID light doesn't generate the amount of heat of a halogen light, it should be treated like any other dive light. The HID lamp should only be operated while in the water, to provide proper cooling for the lamp assembly. While transporting your HID light, please don't leave the light in direct sunlight or in a car's interior on a hot day.

HID and Halogen Light Head Characteristics

Manufactured from a single piece of black Delrin, the Explorer Pro's indestructible Goodman-style head allows for hands-free operation while sitting cleanly on top of the diver's hand. The fully adjustable handle is hardcoated aluminum and can be ordered with an optional, reserve knife attached. The small 3" reflector can also be ordered with a dimpled surface for use as a video light.



Bulb Slug Assembly

The one-piece machined Delrin slug is temperature resistant and completely noncorrosive. The slug assembly consists of a bulb socket, bulb, test tube and cord. The bulb slug contains three o-rings. The two o-rings closest to the bulb actually provide the water tight seal while the base ring cushions the glass tube.



HID 10 Bulb Slug



Halogen Bulb Slug

The focus of your light may be set by loosening the locking screw on the Goodman light head and moving the bulb slug assembly backward or forward in the light head. To avoid the potential of breaking the bulb covering, be careful not to tighten the screw down on the glass tube. The focus should be set so that the beam forms a tight circle several feet in front of you, allowing for brightest illumination and more convenient signaling to one's dive buddy.

⚠ **Never leave your light on while at the surface!** Without the dissipating effect of the water the heat generated by the bulb will accumulate in the light head, damaging the assembly's components. With a halogen light, the heat will quickly result in a catastrophic failure; although HID lights do burn cooler than halogen, they can build up enough heat to damage the light head given a long enough burn when out of the water.

Should the bulb assembly become difficult to focus, make certain that the nylon adjustment screw is loose and not binding the assembly's movement. Occasionally dirt may become trapped in the light head, creating friction between the test tube and light head. To clean the dirt from the bulb assembly, simply loosen the locking screw and push the bulb assembly out toward the cord. Clean the light head and bulb assembly. Be careful not to pull a stuck assembly out by the cord while under water as the tube may come free from the assembly, flooding the light. The groove on your Explorer Pro's bulb assembly will prevent the unit from being accidentally pulled out from the light head by an entangled cord.

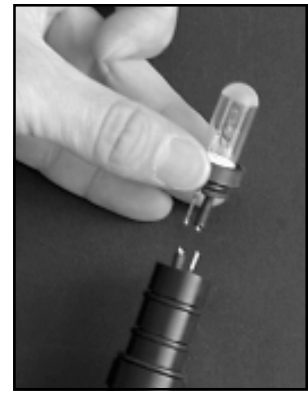
Commercial grade strain relief sleeves, located on each end of the light cord, are designed to prevent a kink from developing in the cord. The supportive commercial shrink wrap provides support without damaging the cord or slipping free. This unique design also holds the cord tightly, reducing wear from stress that may otherwise generate light failures.

Changing the Bulb

Should the bulb in your Explorer Pro light become damaged, it can be easily replaced by following these simple steps:

1. Remove the Goodman handle and reflector assembly from the light head.
2. Carefully remove the lamp cover (test tube) from the slug assembly. Pull the cover straight off; a twisting action is more likely to break the glass tube. It is advisable to use a protective barrier such as a rag to protect your hand from a possible break in the glass lamp cover. Be especially careful with the 18 watt HID lamp cover. The bulb is longer and more care needs to be used to prevent breaking the tip of the bulb.

3. Visually inspect the bulb and filament (halogen) or capsule (HID) for damage. If jarred, bulbs occasionally come loose in the socket. If the halogen filament appears intact, use a clean, oil-free rag to adjust the position of the bulb; touching the bulb leaves natural skin oils on the bulb and can cause uneven heating and premature failure of the bulb. Press the bulb gently into the socket, making sure that both posts are securely seated. Check to see if the light is now working by turning the switch on while the battery is plugged in. Do not allow Halogen lights to burn above water for more than one minute. If the light now works, clean the assembly as discussed in step 5 and then continue to step 6.



4. If you discover that the filament of a halogen bulb is damaged, or find any broken parts or sections of the HID bulbs, remove the bulb from the bulb socket. Open the package containing the new bulb. Do not touch the new bulb with your fingers; using a cloth to hold the bulb, gently push it into the socket. If there is any doubt that the bulb may have been contaminated by your touch, you should clean the bulb before its first use. Take a clean cloth dipped in a small amount of rubbing/isopropyl alcohol and gently brush off the bulb surface.
5. Wipe the bulb assembly o-rings clean with a cloth. Apply an extremely thin film of silicone lubricant to the bulb assembly o-rings. Wipe out any moisture that might have accumulated in the lamp cover.
6. After cleaning the bulb slug o-rings and the lamp cover, gently place the glass cover over the bulb slug and push it into place. Make sure that the lamp cover is seated all the way to the bottom o-ring on the slug assembly.
7. Place the bulb slug assembly back into the light head, focusing the light to a tight beam and locking down the screw. Do not allow Halogen lights to burn above water for more than one minute.

Explorer Pro Canister and Lid



Take the time to inspect the o-ring on the canister lid before every dive. The o-ring should be free of grit or dirt and should not have any signs of damage. Remove the o-ring from the lid and wipe it down with a clean cloth before every dive. The o-ring groove on the lid should also be cleaned of any dirt or debris.

Be careful not to damage the sealing surface on the lid or canister. During transport, the lid should always be attached to the canister to prevent accidentally nicking either surface. However, you should store your light for extended periods of time with the lid off or the battery removed from the canister. Over time, and especially after discharge, the rechargeable batteries will off-gas hydrogen. While

hydrogen off-gassing has not proven itself to be a common problem with lead-cell lights, divers should be aware of the potential risk by not allowing the canister to sit over time with discharged batteries sealed inside.

Clear acrylic lid

The clear acrylic lid allows a diver to see into the canister. Although acrylic is brittle in extremely cold temperatures, the strength of an acrylic lid should not be a concern unless you are

diving in a very cold climate.

Light Canister

The light canister must keep the battery dry and protected while you are diving at depth. Explorer Pro lights use two latches to secure the lid to the canister. When opening or closing your light, work both latches simultaneously to avoid stressing any side of the lid unevenly. Out of the water, the light canister lid should be rotated 180 degrees away from the plugging mechanism and then secured for travel, preventing the switch from being activated.



The battery is held in place by a recess slot cut into the bottom of the canister and by a unique self-plugging mechanism. These two features prevent the battery from damaging internal components by eliminating battery movement within the canister. The self-plugging mechanism also eliminates the wear on battery connections found on lights using manual plug connectors.

The canister is designed to be attached to the diver's waist belt. The unique three fold webbing attachment on your Explorer Pro light is held in place by two stainless steel bands. The three piece fold holds the light with more stability than conventional methods and prevents the light from accidentally releasing from the diver's hip. The steel bands can be raised or lowered on the canister to balance the light on your hip; the canister should rest parallel to your body when mounted on your harness.



Extreme Exposure Unbreakable Polymer Canister- The Explorer Pro's revolutionary light canister offers a tremendous benefit for divers concerned about the risk of damaging their light. The Pro's canister is essentially unbreakable under normal usage. The canister carries a lifetime warranty against breakage and maintains a material operating temperature down to -100°F (-73°C). The amazing ability of our polymer canister to resist shock is partly attributable to its slightly flexible nature. Destructive testing of the Explorer Pro's canister resulted in more broken testing tools than canisters!

Extreme Exposure canister operating temperature: 180°F (82°C) to -100°F (-73°C)

Extreme Exposure Power Systems

Halcyon carefully selects from among the finest batteries available to provide enhanced performance and reliability for our Extreme Exposure lighting systems. Batteries used vary relative to the best performers in each class of light and may differ among manufacturers. For example, one manufacturer may make the best 14amp battery while another may make the best 6amp power pack. Most manufacturers report burn time from the use of hypothetical equations, which never actually represent the true performance of a battery. Our reported burn times are derived from real world testing. Higher quality batteries typically result in the maintenance of longer burn times over the life of the battery. Burn times for Halcyon's Extreme Exposure lights are listed in Appendix A.

Bulkhead

The larger Explorer Pro series lights contain a bulkhead between the batteries that stabilizes the canister. Batteries from these lights are not interchangeable with other canisters, nor can another battery be used in the specially designed polyethylene canister.

Gimble Mechanism

All Extreme Exposure batteries are fitted with a unique self-plugging connector. This plug floats on a gimble mechanism to eliminate stress on the connection that result from changes in ambient pressure or from connecting the latches. The gimble mechanism also eliminates wear on the battery connectors and simplifies the connection process.



Battery Care and Maintenance

Rechargeable sealed lead acid batteries release small amounts of hydrogen gas that can become dangerous in a sealed environment. The release of hydrogen is more prominent while the batteries are being charged or discharged. Lights that have been discharged and then left sitting in a sealed canister over time should be opened prior to actuating the switch. While the risk of hydrogen gas ignition is limited, the risk should be treated with respect.



Warning: To reduce the risk of hydrogen gas accumulation, open the canister and allow the hydrogen gas to vent before use. Venting the canister is especially important if you have left the light closed over time or for transport after a deep discharge.

Charging the Battery

All of Halcyon's Extreme Exposure lights utilize the highest quality sealed lead acid batteries, providing years of consistent use. However, even the best batteries are only as good as the manner in which they are maintained. Batteries should always be charged as soon as possible after use and not left to sit for long periods in a discharged state. While sealed lead acid batteries do not experience the reduced discharge effect known as "memory" they can be damaged if left at low voltage levels. The charger provided with your Extreme Exposure light will charge the batteries up to approximately 13.5 volts and then turn off automatically.

Batteries tend to slowly discharge if left over time. Your Explorer Pro charger is designed to top the battery pack back to a full charge when left connected to the battery during storage. Halcyon recommends that you always store your Extreme Exposure battery pack connected to your battery charger if you plan to use your light within a few week's time. It is possible to leave the battery connected to the Extreme Exposure charger for extended periods of time; the charger will turn off when a full charge is reached. If the battery is going to be left unused for several months, you should charge it up, disconnect the battery and charger, and top off the battery prior to the next use. If the battery is to be stored without use for a long period, top it off with a recovery charge every six months.

After a dive, it should take your battery pack from 8 to 14 hours to reach a full charge. The actual charging time will depend largely on the state of discharge prior to charging. You may notice

that the charger will occasionally indicate that the battery is periodically charging, even days after the battery was connected. The charger is simply providing a top off charge to prevent the battery voltage from dropping so low that it would effect the usable portion of the battery.

Battery Longevity

Your battery should provide you with years of trouble free performance. The anticipated life of a battery is measured in the number of charge and discharge cycles it can tolerate. The life of a battery will depend on many factors, including the storage temperature, the discharge of the battery, and the charging efficiency.

Please see the recommendations below to establish other ways of increasing battery life.

1. Use only high quality batteries such as those included with your Extreme Exposure light.
2. Do not allow the batteries to discharge deeply (below about 9 volts).
3. Do not allow the batteries to sit in a discharged state.
4. Do not expose the batteries to extreme temperatures below -15° C (5° F) or above 50° C (122° F).

To be sure that your battery is adequately charged reference the following considerations:

1. Plug in the charger and verify that it is receiving power. In chargers with status lights, verify that the green power light is on when you connect the charger to the battery pack.
2. Plug in the battery while making sure that the positive (red) charger lead is mated with the positive (red) battery receptacle and that the negative charger lead mates with the negative battery receptacle.
3. If the power light shuts off, it is likely the result of crossed charging wires. If this is the case, reference step 2. If you are charging the battery pack with a nonstandard charger, the charger may not have a reverse polarity control. You will ruin your battery if you charge it with crossed charging wires on a nonstandard charger. To prevent potential damage to your battery pack, always double-check the connection before leaving the pack to charge.
4. Allow the batteries to charge until the red "charged" light activates (8 - 14 hours on average). You may verify the charge by using a volt meter to gauge the battery voltage. However, this reading is only reliable if the battery is under a load, such as when the light is activated. To ensure that your charger is operating properly, place the light head in a pot of water and connect the batteries to the lid, leaving the light out of the canister. Do not let the light burn for more than a minute out of the water. While the light is discharging the batteries, use a volt meter to gauge the voltage drop. If the pack is not properly charged, the voltage should drop rapidly (within one minute). A properly charged pack will slowly drop voltage from a high of around 13 to roughly 12 volts, and should hold 12 volts for about an hour.
5. The charger will turn off when a full charge is reached, so it is possible to leave the battery connected to the charger for extended periods of time. If the battery is going to be left unused for several months, charge the battery, disconnect the battery and charger for the length of storage, and then top off the battery with a new charge prior to the next use. If the battery is to be stored without use for a long period it should be topped off with a recovery charge every six months.

Burn Testing

You should burn test your battery pack at least yearly in order to establish the actual burn time

of your light. Frequent divers or those who often rely on longer burn times may choose to test their light more frequently. In order to conduct an effective test you will need the following equipment:

- Battery Pack
- Discharge method either the light head itself or a discharge array
- Volt meter
- Timer, preferably with an alarm
- Reservoir of water
- Paper to record time and voltage

The following steps will allow you to accurately determine your battery's burn time:

1. Make certain that the battery has been fully charged. For the best charge, burn the battery for ten minutes and then bring it back to a full charge.
2. Place the light head into the water. Make sure that there is enough water to prevent overheating. A one gallon supply is sufficient.
3. Plug the lid into the battery, but leave the battery out of the canister so that the electrical leads can be accessed.
4. Actuate the switch and measure the voltage.
5. Record the time and voltage every ten minutes until the pack reaches 10 volts. It is recommended that the timer have an alarm to alert you when an interval has ended. The alarm will prevent you from forgetting about the battery and discharging it completely. A complete discharge is practically certain to damage the battery's cells.
6. Stay near the pack to monitor the voltage decay as the 10 volt limit is approached. As the pack nears 10 volts, the voltage will drop more rapidly. Record the time when the battery reaches 10 volts. This time is the amount of time that your light battery can provide a useful light beam. In burn testing their own batteries, the Yuasa battery company uses a voltage of nine volts as their end point, yet this lower limit may stress the battery and does not typically produce a sufficiently useful illumination during a dive.
7. Record the burn time and date on the battery. Don't forget to update this information with each subsequent test of your battery.
8. Charge the battery immediately. Never discharge your battery below about 9 volts as it can damage the cells to experience deep discharge for any prolonged period. Any time the battery is discharged it should be charged as soon as possible. A quick recharge is especially important when the battery is deeply discharged.



Transporting Your Light

Your Explorer Pro light should be left unplugged during transport. You want to eliminate the possibility of activating the light while the unit is out of the water. Rotate the auto plug connector on the lid to the side opposite the battery connection and secure the latches. Be sure to reconnect the battery prior to getting into the water and to disconnect the battery prior to travel.

Troubleshooting Your Explorer Pro HID or Halogen Light

If you are experiencing problems with your HID light ahead of its expected lifespan, take a second to inspect the bulb and ballast assembly:

Bulbs

- Inspect for broken arc tube or outer lamp jacket
- Check connection where lamp broken where glass meets the base
- Make a visual inspection of the bulb for broken or loose components in lamp envelope
- Inspect for arc tube end blackening
- Inspect for deposits inside the outer glass envelope

Ballast and Capacitor points-of-failure

- Attempt ignition a second time after properly resetting the ballast by disconnecting, waiting 15 seconds, and then reconnecting the connectors attached to the lid.
- Are you using Extreme Exposure replacement lamps? Your ballast will not work with incorrect wattage lamps.
- Avoid possible overheat due to ambient temperature
- Inspect for miswiring/pinched wires
- Inspect ballast housing and wiring for mechanical damage

What to do if your light does not work

1. Verify that the battery is properly connected, that all wire connections are secure, and that the battery is not completely drained. Because a light bulb should burn even with a very drained battery, a total failure of the bulb to ignite is generally not charge related. Use a volt meter to verify that the battery has at least some voltage. If you believe that your power pack has failed, test the questionable light head with a different battery.
2. Verify that the bulb is not damaged. For a halogen lamp, the filament may look burned or may be broken free entirely. Bulb filaments are especially likely to break if the light head is handled roughly during transport. If the bulb needs to be changed please refer to the manual section on changing the bulb. Remember to be careful removing the lamp cover and to avoid touching the bulb with your bare hands.
3. Verify that the bulb is seated properly in the socket. Occasionally the bulb connection can be compromised if the light head is sufficiently bumped or jarred during transport. To check the bulb seating, the lamp cover must be removed. For a comprehensive discussion of this process please see the manual section on changing a bulb. In general, be sure that the bulb is not touched directly and that you are careful removing the lamp cover. Avoid twisting the lamp cover off; instead try to pull it straight off the slug.



**Incorrectly seated
halogen bulb**



**Correctly seated
halogen bulb**

4. Verify that the switch is functioning properly. This test must be done by checking the continuity with a volt meter. Place the volt meter in continuity mode and verify by touching the

two leads together. Place one lead at each solder point on the switch. If there is no continuity regardless of switch position, then there is an interruption in the current flow. The switch may have a damaged connection, the light bulb may be broken, or the gimble mechanism may be damaged. Please refer to the preceding steps to insure that the bulb is functioning properly. If the switch is suspect, the light head should be returned to Extreme Exposure and the switch replaced.

What to do with a light that works sporadically

If your halogen light flickers or only works sporadically, it is very likely to be the result of a poor connection. It is possible that this weak connection is at the bulb and socket or that wires leading to the battery are frayed. Please consult the troubleshooting section covering *What to do if your light does not work* for more detail on correcting these problems.

A sporadic light is more likely the result of a poor connection in the cord. Test for a poor connection by working the cord back and forth, starting by the light head and working back toward the canister, to see if the sporadic problem can be initiated. The purpose of the strain relief on either side of the light cord is to prevent the fittings from creating a kink. A kink in the cord is likely to eventually break the wire connections within the cord. The strain relief included with your Extreme Exposure light is purposely thin so as to taper out along the cord, distributing the stress. Testing indicated that items like hose protectors actually did little to protect the cord and instead acted to shift the location of the kink.

If your light is equipped with underwater pluggable connectors (E/O connectors), it is possible that this connection has become compromised. Over time, the female connection may widen out and not clamp securely over the male connector. A rather inelegant but effective method to rectify this problem is to gently tap the female connection with a hammer, carefully tightening the female receptacle. It is also possible that the switch has become damaged, perhaps with corrosion, resulting in the sporadic operation. If you detect corrosion in the switch mechanism, the light should be returned to Extreme Exposure and the switch replaced.

What to do if your light turns itself on

A light that begins burning with the switch in the off position must have the switch replaced. This problem occasionally occurs in lights that have been previously flooded. A light that turns itself on should be disconnected immediately to prevent any damage from overheating.

Lights should always be disconnected while transported.

What to do if your burn time is less than expected

For a halogen lamp, verify that your light contains the intended watt bulb and not some higher wattage bulb. Higher wattage bulbs will discharge the batteries much more rapidly. Bulbs usually have the wattage stamped on the side, making it easy to verify. Also, the filament on a higher watt bulb is larger and often fairly discernible. However, divers should not use a visual inspection of filament size as an accurate gauge in any situation where the light is mission critical.

For HID and halogen lamps, check the condition of the battery pack to confirm that the reduced burn time isn't the result of an error induced during charging. You can check a battery pack's condition with the following steps:

1. Verify that the charger is plugged into a properly functioning outlet. Be sure that this outlet is not controlled by a wall switch that may be shut off inadvertently.
2. Verify that the power light (if available on your charger) is activated when the charger is

plugged into an active outlet.

3. Verify that the light indicating “charged” is activated at the end of your charging cycle. Your Explorer Pro’s charger is designed to switch off when fully charged and start charging again when the voltage drops. Therefore it is common to see the “charged” light go on and off over time.
4. Verify that the charger is functioning by attempting to charge the battery a second time. Please note that your charger will only operate when put under a load, so a volt meter can’t be used to establish charger output. The battery must be charged completely and then placed under a load with a volt meter, typically as part of a burn test. If the battery voltage drops rapidly below approximately 12 volts, the battery is not charged. The voltage should drop slowly to approximately 12 volts and then continue to drop slowly. Please refer to the manual section on burn testing your battery prior to enacting these suggestions.

Do not let the light burn above water for more than one minute. If you are attempting to verify the voltage drop, submerge the light head in water before activating.
5. Gauge the actual burn time with a battery test. Please consult the earlier section in the manual for instructions on conducting a burn time test. If the battery is charging properly but the test indicates a lower than expected discharge time, it is likely the symptom of an aging or inadequately maintained battery. Please review the section on battery longevity for tips on maximizing battery life.

What to do if your light is leaking

This guide will provide instructions for identifying and repairing some possible leaks in your Explorer Pro light. If your light continues to leak after troubleshooting, contact Halcyon for instructions on returning your light for repair. If any doubt exists about potential damage, please contact Halcyon for consultation about possible repairs.

If the light has leaked into the lamp cover (test tube), the moisture will typically corrode the socket and continue to produce condensation. Any light that has leaked should be opened up and allowed to dry completely. If the light head has leaked, it should be opened up and allowed to dry as well. Please consult the manual section on replacing a bulb for more information on removing the lamp cover. Be careful not to twist the lamp cover while removing it and do not touch the bulb with bare hands.

Possible sites of water intrusion:

1. Typically, water leaks into the light as the result of dirty or damaged o-rings. Check the o-rings in the area of the leak. Replace the o-ring if it appears damaged. If it is dirty, clean the o-ring and the o-ring groove with a clean cloth.
2. Canister o-rings should be cleaned prior to every dive by removing the o-ring and cleaning the seating surface and o-ring thoroughly. Do not leave excess silicone on the o-ring; the lubricant will attract sand and dirt, increasing the risk of leaking. It is a good practice to occasionally lubricate the o-ring with silicone, but any excess should be wiped off with a clean cloth.
3. Bulb slug o-rings are highly unlikely to leak unless either the lamp cover (test tube) or o-rings have been changed from the original factory installed set. Slight variations in the size of an o-ring can prevent the lamp cover from sealing properly. Gently torque the lamp cover while it sits on the bulb slug assembly; watch to see if either of the two sealing o-rings break contact with the test tube.

If the o-rings break contact with the cover, the lamp cover or o-rings must be replaced. There are

occasionally slight variations in the size of lamp covers (test tubes). Extreme Exposure manages this problem by using components that fall within exact specifications. Therefore, individuals should be cautious about purchasing nonstandard lamp covers from other manufacturers or suppliers.

4. Verify that there are no prominent nicks in either the lid or canister. In the development of underwater canister lighting during the last two decades, the bottom plate of a canister has proven to be a source of occasional failure. Bottoms that are not sufficiently recessed into the canister may weaken over time. If the glue joint becomes compromised the canister will begin to leak; eventually the bottom will fall off entirely. Halcyon responded to this problem by manufacturing every light with a deeply recessed bottom, increasing support and glue surface. In more than a decade of testing, dive explorers have never reported a failure with canisters incorporating the recessed bottom. Non-recessed canisters, however, display this problem with unnerving frequency. Although the high failure rate among the non-recessed canisters can be attributed to the increased stress induced by the deep exposures encountered in dive exploration, you should be aware of the symptoms should a problem begin to develop. A compromised bottom joint becomes suspect when all other obvious sources of potential leaking are eliminated. A light with a damaged glue joint will usually begin to leak slowly-often a scant quarter cup of water over the course of a dive- and will continue to increase in quantity with longer exposures. If there is any concern that an Explorer Pro's bottom plate has been compromised, please notify us immediately.

Troubleshooting E/O Underwater Pluggable connectors

Wetmates E/O cords are an available option that adds flexibility and modularity to any Extreme Exposure lighting system. These underwater pluggable connectors are standard equipment on all Extreme Exposure video systems.

E/O cords offer great advantages in flexibility; however, they require some minor attention to ensure reliable service. Over time the rubberized connectors may loosen and weaken the connection. The problem is easily solved by placing the connector on a hard surface and firmly hitting it with a rubber mallet. This action will tighten the connector and prevent a sloppy connection. The only other problem that might occur is a slight oxidation on the connector tip after several dives in salt water. A light sanding with extra fine sand paper will remove any oxidation and ensure a good connection.

When used with a halogen bulb, an improper E/O connection will cause the light to flicker. With an HID lamp, an improper connection will cause the light to go out should the voltage drop below the level regulated by the ballast. The effect is the same as if you had turned the light off with the switch: the ballast must reset itself and the bulb cool before restriking. If your light should go off because of a loose E/O connection, re-seat the connection and wait ten to twenty seconds before restriking the lamp.



Appendix A:
Burn Times and Canister Specifications

Explorer Lighting System	System Specifications	35 watt halogen	50 watt halogen	100 watt halogen	10 watt HID	18 watt HID
Pro 3	4.25" OD/6.5" L Weight: 6 lbs Buoyancy: -2 lbs	35 min.	20 min.	N/A	150 min.	55 min.
Pro 4	4.25" OD/8" L Weight: 9 lbs Buoyancy: -2 lbs	55 min.	40 min.	N/A	240 min.	100 min.
Pro 6	4.25" OD/12" L Weight: 11 lbs Buoyancy: -3 lbs	85 min.	50 min.	N/A	330 min.	125 min.
Pro 14	5.25" OD/13" L Weight: 6 lbs Buoyancy: -6 lbs	240 min.	150 min.	75 min.	600 min.	330 min.

Appendix b:

Halcyon Extreme Exposure Replacement Parts & Accessories

Repair Kits and O-Rings

- 24.150.000 Deluxe field repair kit for halogen systems: includes all o-rings-light head (3), cord (2), lid (1), lamp cover (1), 50watt bulb, 35watt bulb, lamp cover, switch and switch boot
- 24.100.000 Field repair kit for halogen systems: includes all o-rings light head (3), cord (2), lid (1), lamp cover (1), 50watt bulb
- 24.200.018 Field repair kit for 18watt HID systems: includes all o-rings- light head (3), cord (2), lid (1), lamp cover (1), 18watt HID bulb
- 24.200.010 Field repair kit for 10watt HID systems: includes all o-rings- light head (3), cord (2), lid (1), lamp cover (1), 10watt HID bulb
- 24.010.000 Primary light o-rings (6), specify lighthouse type
- 24.010.001 Lid o-ring, specify light
- 24.010.002 Light head o-rings (3), specify lighthouse type
- 24.010.003 Cord o-rings (2)

Replacement Bulbs

- 27.200.050 50watt HID bulb
- 27.200.018 18watt HID bulb
- 27.200.010 10watt HID bulb
- 27.100.100 100watt bulb
- 27.100.050 50watt bulb
- 27.100.035 35watt bulb
- 27.100.030 30watt bulb-extra white
- 27.100.020 20watt bulb
- 23.040.001 Halogen lamp cover
- 23.040.002 HID lamp cover
- 23.040.003 Large video lamp cover
- 23.040.004 HMI lamp cover
- 23.070.000 Ceramic bulb socket for halogen lamp

Light Heads and Accessories

- 22.010.003 Goodman head; body & #3 reflector (no bulb slug assembly)
- 22.010.103 Exploration version Goodman head; body, #3 reflector, thumb holder, mini-knife (no bulb slug assembly)
- 22.010.091 Video reflector w/ 091 cone & Delrin base (no bulb slug assembly)
- 22.010.001 Small video head w/ #1 reflector & Delrin base (no bulb slug assembly)
- 22.200.050 50W HID bulb slug assembly w/ standard cord. No Goodman handle
- 22.200.150 50W HID bulb slug assembly w/ E/O cord. No Goodman handle
- 22.200.018 18W HID bulb slug assembly w/ standard cord. No Goodman handle
- 22.200.118 18W HID bulb slug assembly w/ E/O cord. No Goodman handle
- 22.200.010 10W HID bulb slug assembly w/ standard cord. No Goodman handle
- 22.200.110 10W HID bulb slug assembly w/ E/O cord. No Goodman handle
- 22.100.000 Halogen bulb slug assembly w/ standard cord. No Goodman handle
- 22.100.100 Halogen bulb slug assembly w/ E/O cord. No Goodman handle
- 22.060.003 Tekna mini-knife for Goodman handle

Replacement Parts

- 23.020.003 Light Canister 4.25" diameter, black, for Pro 3
- 23.020.004 Light Canister 4.25" diameter, black, for Pro 4
- 23.020.006 Light Canister 4.25" diameter, black, for Pro 6
- 23.020.014 Light Canister 5" diameter, black, for Pro 14
- 23.030.425 Acrylic lid for Pro 3, 4, and 6 (includes switch, strike & brass fitting)
- 23.030.500 Acrylic lid for Pro 14 (includes switch, strike & brass fitting)
- 23.050.000 Canister Latch, 2 pieces
- 23.060.001 Switch for Explorer Pro light

- 23.060.002 Switch Boot
- 23.060.003 Delrin switch protector
- 22.088.000 E/O cord (2 required for set)
- 22.088.001 E/O "Y" connector
- 23.080.048 48" standard cord
- 23.080.001 Brass cord sealing gland

Replacement Batteries (configured with bulkhead and gimble mechanism)

- 25.012.003 3amp battery pack
- 25.012.004 4amp battery pack
- 25.012.006 6amp battery pack
- 25.012.014 14amp battery pack
- 25.024.010 10amp, 24V battery pack for 200watt HMI light
- 25.015.012 1.2amp 12volt battery charger
- 25.015.024 3amp 24volt battery charger
- 23.090.300 Female banana plug assembly w/gimble mech
- 23.090.100 Male banana plugs, pair
- 23.090.425 Bulkhead assembly for battery pack, for Pro 3, 4 and 6
- 23.090.500 Bulkhead assembly for battery pack, for Pro 14

Lighting System Reflectors

- 26.010.003 #3 reflector (standard Goodman reflector)
- 26.020.001 #1 video reflector (dimpled reflector for Goodman handle)
- 26.020.091 091 video reflector (large, dimpled)



Warranty Information

Halcyon guarantees, to the original purchaser only, that the Explorer Pro series lights will be free of defects in materials and/or craftsmanship under normal diving use for one year from the date of purchase, provided proper care is performed on all materials as described within this manual. Should your Explorer Pro light prove to be defective for any reason (other than those listed in the limitations section below) it will be repaired or replaced (at Halcyon's discretion) free of charge excluding shipping and handling charges. Explorer Pro light canisters carry a lifetime guarantee, to the original purchaser only, under normal diving use and provided proper care is performed as described within this manual. All correspondence concerning this warranty must be accompanied by a copy of the original sales receipt.

Statement of Limitations

Warranty does not cover damage from accident, abuse, battery leakage, tampering, or lack of proper care and maintenance. Modifications or repair by anyone other than an authorized Halcyon service agent will void the warranty. Halcyon will not be responsible for recovery or replacement of the product in the case of loss or theft. By purchasing the product, you agree and understand that in no event will Halcyon, its distributors or retailers, be held liable for any personal injuries resulting from its operation, or for any other damages whether direct, indirect, incidental, or consequential even if Halcyon is advised of such damages. Some states do now allow the exclusion or limitation of implied warranties or liabilities for incidental or consequential damages, so the above limitations may not apply to you. Warranty does not extend to batteries, light bulbs, or damage due to accident, abuse, modification, or tampering.

