



Deep Multi-SeaLite User Manual, Rev. 03/27/98



DeepSea Power & Light, Inc.

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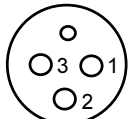
DEEP MULTI-SEALITE PRE- AND POST-DEPLOYMENT CHECKLIST: Each Deep Multi-SeaLite is shipped ready for immediate use. To ensure that the light will perform reliably, please observe the following maintenance guidelines:

1. Try to rinse the light with fresh water after use in salt water.
2. Always check to make sure that the rear bulkhead connector assembly is secure before deployment.
3. Check for condensation inside the glass dome, especially after changing lamps. If any condensation is evident, unscrew the connector/socket assembly from the body and remove the lamp. Place the connector/socket assembly and lamp inside a warm oven (at least 100 C or 212 deg F) for at least 30 minutes to bake out any moisture that may present. If possible, purge with dry nitrogen while reassembling the light.
4. After each deployment, examine the power cable and rear connector for damage.

Warning: After each deployment, carefully check to make sure the light has not flooded. It is possible for the light to partially flood and then reseal itself while underwater. Upon surfacing, the light can become internally pressurized, which may be potentially dangerous. Additionally, if the power remains on when the light has partially flooded, it is possible for electrolytic generation of an explosive mixture of hydrogen and oxygen gases. **If a light appears flooded upon removal from the water, it should be treated as potentially dangerous. Point the light away from persons and valuable equipment and verify whether or not it is internally pressurized. Make sure that the power is disconnected as soon as a flooded condition is suspected.**

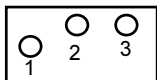
LAMP CHANGING PROCEDURE: To change the lamp, first disconnect the cable by unscrewing the plastic locking sleeves and pulling the connector halves apart. Unscrew the socket/connector assembly from the light body and remove the old lamp by twisting counter-clockwise. When installing the new lamp, be sure not to get any fingerprints on the surface of the lamp. Use a piece of tissue or other clean paper to hold the lamp while installing it. Fingerprints can be cleaned from the surface of the lamp with isopropyl (rubbing) alcohol.

CONNECTOR OPTIONS: Four different industry standard underwater connectors can be used with the Deep Multi-SeaLite: BH3MP, LPBH3MP, XSG3BCL, and 1503. The standard connector pin-outs are illustrated below.



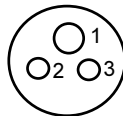
BH3MP

- 1 = Hot
2 = Neutral
3 = Ground to shell



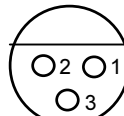
LPBH3MP

- 1 = Hot
2 = Neutral
3 = Ground to shell



XSG3BCL

- 1 = Ground to shell
2 = Hot
3 = Neutral



1503

- 1 = Hot
2 = Neutral
3 = Ground to shell

ELECTRICAL AND THERMAL WARNINGS: A Ground Fault Interrupt should be used whenever high voltage lights are being utilized; when divers are in the water this is especially critical! **Do not operate AC-powered lights without a GFI!** Additionally, all high voltage lights should be case

grounded for safety. It is also important not to burn the Deep Multi-SeaLite in air for more than a few seconds, as it relies on the surrounding water to provide cooling. When an underwater light is burned in air, the resulting heat buildup can pose a fire hazard. If the light is operated for testing purposes in air, be sure to let it cool down for a couple of minutes before immersing it in water. It is also a good idea to turn the light off a few seconds prior to removing it from the water.

LAMPS (MINI-CAN SCREW BASE): LOW voltage lamps (12V and 24V) are re-based and are available only through DeepSea.

Model Number	Part Number	Volts**	Watts	Hours	Color Temp	Lumens
MC-12/50	460-00018	12	50	2000	3000K	950
MC-12/100	460-00026	12	100	1000	3100K	2,200
MC-24/100	460-00099	24	100	2000	3000K	1,800
MC-24/150	460-00034	24	150	70	3400K	5,000
MC-24/250	460-00118	24	250			
MC-24/300	460-00097	24	300			
MC-120/100	460-00053	120	100	1500	2700K	1,600
MC-120/150	460-00055	120	150	750	2850K	2,400
MC-120/250	460-00059	120	250	2000	2900K	4,750
MC-120/325	460-00061	120	325			
MC-220/150	460-00078	220	150	1300	2800K	2,100
MC-220/250	460-00079	220/230	250	2000	2900K	4,500
MC-240/250	460-00082	240	250	2000	2900K	4,200

** 220/230V, 230V, and 240V lamps are used to meet a nominal 240V requirement.

DEEP MULTI-SEALITE SPECIFICATIONS:

Mechanical

Housing Material:	Hard anodized 6061 aluminum; titanium optional
Diameter:	79 mm (3.1 inches)
Length:	155 mm (6.1 inches) (with BH3MP connector)
Lens:	Clear tempered borosilicate
Reflectors:	Proprietary design spot, medium flood, or wide flood
Air Weight:	519 g (18 oz.)
Water Weight:	170 g (6 oz.)
Depth Rating:	6,000 meters (20,000 feet) of seawater

Optical

Beam patterns (full angle measured to half power point using 120V/250W lamp):

Wide Flood (WFL):	60 degrees conical
Medium Flood (MFL):	40 degrees conical
Spot (SP):	15 degrees conical

TROUBLESHOOTING:

PROBLEM	POSSIBLE CAUSE	RECOMMENDED ACTION
Light doesn't turn on.	Not plugged in.	Secure all connections.
	GFI tripped.	Reset GFI.
	Lamp burned out.	Change lamp.
	Cable defective.	Check continuity from one end to the other. Meg test if possible.
	Insufficient voltage	Make sure battery is fully charged. Verify power supply is adequate.
Light flooded.	Connector loose.	Tighten. If still leaking, replace.
	Damaged O-ring.	Replace as required.
	Glass cracked or chipped.	Return to DeepSea.

FLOODED LIGHT REPAIR

If the light is leaking, first suspect that there is a damaged O-ring, or that the glass envelope is cracked or has a chipped edge.

When looking for the source of a leak, first check if the rear connector is loose. If the connector is secure, check for a sliced or otherwise damaged O-ring; make sure the O-ring sealing surfaces are clean. If there is no apparently damaged O-ring, remove the glass dome and inspect the edge of the glass. If the edge is chipped, this is probably the source of the leak, and the dome should be replaced.

If a light is flooded and/or damaged, we recommend that the light be returned to DeepSea Power & Light for repair or replacement; DeepSea Power & Light cannot be responsible for any damage incurred during emergency field repairs. Such repairs should be undertaken only as a last resort and by qualified personnel. Spares kits are available from DeepSea Power & Light.

DEEP MULTI-SEALITE EMERGENCY FIELD REPAIR PROCEDURE

Note: Due to the pressure that the Deep Multi-Sealite operates at (10,000 psi) and the exacting assembly procedure, it is not recommended that users perform a repair themselves (except for changing the DS4 connector/socket assembly). Repair should be done at DeepSea Power & Light. If, however, time or logistics prevent a repair at DeepSea, users may use the following procedure. Users are warned that they should test the light in a pressure chamber before re-deploying.

1. Unscrew the cowl. Remove the 3 kapton seats, 3 titanium seats, glass dome, die cut retaining ring, and dome seal. Clean all parts, and inspect for damage. Remove lamp and connector. Discard all damaged parts.
2. Install die cut retaining ring in cowl. Sparingly lubricate the inside (ribbed) edge of the rubber seal; DeepSea recommends Dow Corning 111 lubricant. Install rubber seal in cowl, with twin ribs toward housing; the single rib edge will be toward the front of the cowl. (The rubber seal has twin ribs [two ribs side by side] on one edge, and a single rib on the other edge.) Insert new dome into cowl, making sure dome is straight. Check where dome is sitting relative to the rubber seal, and make sure it is in the same position relative to the seal all the way around.
3. Install one titanium seat against the glass dome, then a kapton seat, followed by the second titanium seat and second kapton seat, then the third titanium seat and third kapton seat. Both titanium and kapton seats must be clean and flat. They must not have any particulate or lubricant residue, and must be completely dry. They should be cleaned with alcohol prior to assembly. The glass dome, titanium seat, and kapton seats must be completely flat against each other or else they will pop out. They must also be in the same position relative to the seal all the way around.
4. Next screw the cowl onto the housing. Hand tighten until only the outside face of the last thread is visible on the housing. Do not overtighten.
5. Install the connector into the housing without a lamp. Pressure test to 10,000 psi. If you do not have a pressure chamber, put it in a bucket to perform a leak test. This should at least indicate water integrity. If the light passes pressure testing, remove the connector, install a lamp, and re-install the connector assembly.

GENERAL NOTES AND WARNINGS

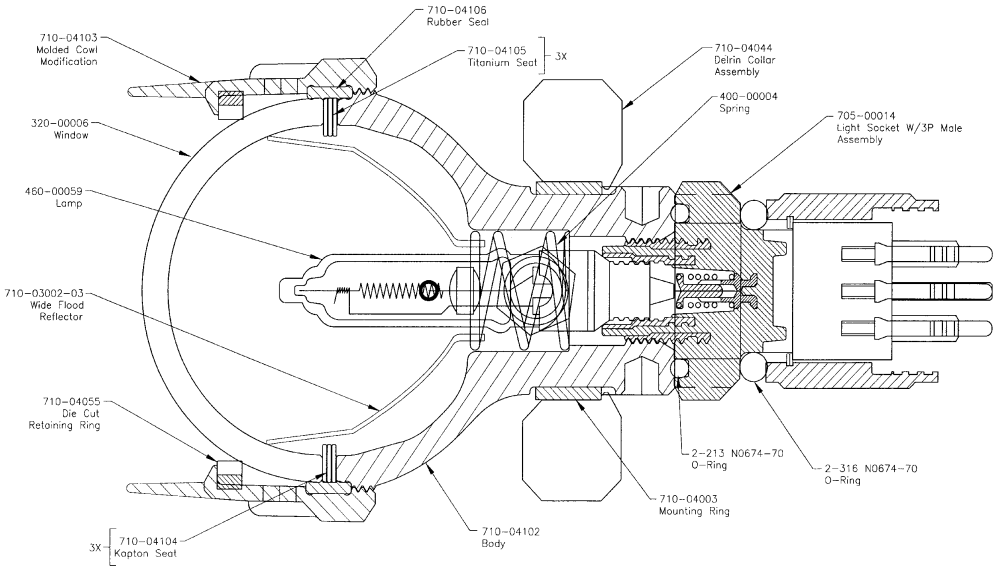
- Do not burn a Deep Multi-Sealite out of water for more than about 30 seconds.
- Do not operate any high voltage electrical equipment without using a Ground Fault Interrupt circuit for safety, especially when divers are in the water!
- Do not operate a lamp at higher than recommended voltage. The lamp filament will melt with severe over-voltage, and slight over-voltage drastically reduces lamp life.
- Be sure that any fingerprints are cleaned off the lamp with isopropyl alcohol before use.

OPTIONS

Model No.	Part No.	Description
IL3FS	140-00062	BH3MP mating connector with male locking sleeve on 18" (0.5m) whip
LPIL3FS	140-00094	LPBH3MP mating connector with locking sleeve on 18" (0.5m) whip
RMG3FS	140-00112	XSG3BCL mating connector with female locking sleeve on 18" (0.5m) whip
YMB	710-04059	Yoke mounting bracket (also attaches to UHMB)

SPARE PARTS

Model No.	Part No.	Description
DML-BOD	710-04102-02	Aluminum body
DML-BOD-S	710-04102-03	Stainless steel body
DML-BOD-T	710-04102-01	Titanium body
DML-CWL	710-04103	Utem plastic cowl
DML-OR	710-041-007	O-ring kit (includes kapton wafers; does not include DML-SR)
DML-SR	710-04106	Sealing ring (not included in DML-OR)
DML-TS	710-04105	Titanium ring
ML-GD	320-00006	Glass dome
ML-FGD	320-00008	Frosted glass dome
ML-SP	710-03002-01	Spot reflector
ML-MFL	710-03002-02	Medium flood reflector
ML-WFL	710-03002-03	Wide flood reflector
ML-RS	400-00004	Reflector spring
DS4-3WC	705-00014	BH3MP connector/socket assembly with female locking sleeve
DS4-3XS	705-00053	XSG3BCL connector/socket assembly with male threads
DS4-3LP	705-00048	LPBH3M connector/socket assembly
DS4-1503	705-00069	Burton 1503 connector/socket assembly
DS4-PEN	705-00042	Penetrator/socket assembly
ML-FLS	140-00031	Female Delrin locking sleeve for bulkhead connector
ML-MLS	140-00032	Male Delrin locking sleeve for mating connector
ML-DMC	710-04044	Delrin plastic mounting collar
ML-SG	710-04062	Spring guide for titanium housing





Deep Multi-SeaLite Custom User Manual for RTB Anlagenplanung



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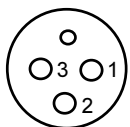
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2. Always check to make sure that the rear bulkhead connector assembly is secure before deployment.
3. Check for condensation inside the glass dome, especially after changing lamps. If any condensation is evident, unscrew the connector/socket assembly from the body and remove the lamp. Place the connector/socket assembly and lamp inside a warm oven (at least 100 C or 212 deg F) for at least 30 minutes to bake out any moisture that may present. If possible, purge with dry nitrogen while reassembling the light.
4. After each deployment, examine the power cable and rear connector for damage.

Warning: After each deployment, carefully check to make sure the light has not flooded. It is possible for the light to partially flood and then reseal itself while underwater. Upon surfacing, the light can become internally pressurized, which may be potentially dangerous. Additionally, if the power remains on when the light has partially flooded, it is possible for electrolytic generation of an explosive mixture of hydrogen and oxygen gases. **If a light appears flooded upon removal from the water, it should be treated as potentially dangerous. Point the light away from persons and valuable equipment and verify whether or not it is internally pressurized. Make sure that the power is disconnected as soon as a flooded condition is suspected.**

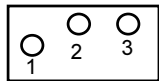
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CONNECTOR OPTIONS: Three different industry standard underwater connectors can be used with the Deep Multi-SeaLite: BH3MP, LPBH3MP, and XSG3BCL. The standard connector pin-outs are illustrated below. The connector for RTB Anlagenplanung is a Burton 5502-2004 on a penetrator.



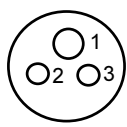
BH3MP

- 1 = Hot
2 = Neutral
3 = Ground to shell



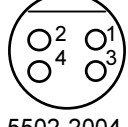
LPBH3MP

- 1 = Hot
2 = Neutral
3 = Ground to shell



XSG3BCL

- 1 = Ground to shell
2 = Hot
3 = Neutral



5502-2004

- 1 = Hot
2 = Neutral
3 = Ground
4 = Not connected

ELECTRICAL AND THERMAL WARNINGS: A Ground Fault Interrupt should be used whenever high voltage lights are being utilized; when divers are in the water this is especially critical! **Do not operate AC-powered lights without a GFI!** Additionally, all high voltage lights should be case

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MC-120/250	460-00059	120	250	2000	2900K	4,750
MC-120/325	460-00061	120	325			
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MC-220/250	460-00079	220/230	250	2000	2900K	4,500
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Reflectors:	Proprietary design spot, medium flood, or wide flood
Air Weight:	519 g (18 oz.)
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Depth Rating:	6,000 meters (20,000 feet) of seawater

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Beam patterns (full angle measured to half power point using 120V/250W lamp):

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TROUBLESHOOTING:

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	Lamp burned out.	Change lamp.
	Cable defective.	Check continuity from one end to the other. Meg test if possible.
	Insufficient voltage	Make sure battery is fully charged. Verify power supply is adequate.
Light flooded.	Connector loose.	Tighten. If still leaking, replace.
	Damaged O-ring.	Replace as required.
	Glass cracked or chipped.	Return to DeepSea.

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- Be sure that any fingerprints are cleaned off the lamp with isopropyl alcohol before use.

OPTIONS

Model No.	Part No.	Description
IL3FS	140-00062	BH3MP mating connector with male locking sleeve on 18" (0.5m) whip
LPIL3FS	140-00094	LPBH3MP mating connector with locking sleeve on 18" (0.5m) whip
RMG3FS	140-00112	XSG3BCL mating connector with female locking sleeve on 18"

		(0.5m) whip
UHMB	774-00011	Universal Helmet mounting bracket
YMB	710-04059	Yoke mounting bracket (also attaches to UHMB)
UHG		Universal Hand Grip

SPARE PARTS

Model No.	Part No.	Description
DML-BOD	710-04102-02	Aluminum body
DML-BOD-S	710-04102-03	Stainless steel body
DML-BOD-T	710-04102-01	Titanium body
DML-CWL	710-04103	Utem plastic cowl
DML-OR	710-041-007	O-ring kit (includes kapton wafers; does not include DML-SR)
DML-SR	710-04106	Sealing ring (not included in DML-OR)
DML-TS	710-04105	Titanium ring
ML-GD	320-00006	Glass dome
ML-FGD	320-00008	Frosted glass dome
ML-SP	710-03002-01	Spot reflector
ML-MFL	710-03002-02	Medium flood reflector
ML-WFL	710-03002-03	Wide flood reflector
ML-RS	400-00004	Reflector spring
DS4-3WC	705-00014	BH3MP connector/socket assembly with female locking sleeve
DS4-3XS	705-00053	XSG3BCL connector/socket assembly with male threads
DS4-3LP	705-00048	LPBH3M connector/socket assembly
DS4-PEN	705-00042	Penetrator/socket assembly
ML-FLS	140-00031	Female Delrin locking sleeve for bulkhead connector
ML-MLS	140-00032	Male Delrin locking sleeve for mating connector
ML-DMC	710-04044	Delrin plastic mounting collar
ML-SG	710-04062	Spring guide for titanium housing

