SEASTAR™

OPERATION AND MAINTENANCE MANUAL

Contents

Figures

Tables

WARRANTY

ROS, Inc. (hereinafter called "**ROS**") warrants its products as stated below subject to the conditions specified.

ROS warrants its products, when operated under normal conditions, to be free from defects in material or workmanship for a period of one year from the date of purchase provided that inspection by **ROS** discloses that such defects developed under normal and proper use. **ROS** products repaired or replaced pursuant to this warranty shall be warranted for the unexpired portion of the warranty applying to the original product. The liability of **ROS** under this warranty shall exist subject to the following conditions:

(a) Purchaser properly notifies ROS of such defects and the defective product is returned to ROS; transportation charges paid by Purchaser.

(b) ROS shall be released from all obligations under its warranty in the event repairs or modifications are made by persons not authorized by ROS.

(c) Representations and warranties made by any person, including distributors and representatives of ROS, which are inconsistent or conflict with the terms of this warranty, shall not be binding upon ROS unless reduced to writing and approved by an officer of ROS. ROS shall in no event be liable for other direct, special, incidental, consequential, indirect or penal damages.

(d) The laws of the State of California shall govern this warranty.

In the event the defect is determined to be within the terms of this warranty then **ROS** agrees to repair and/or replace (at **ROS**' discretion) the product or defective portion at no charge to the Purchaser. This warranty does not apply to expendable items or to normal wear-and-tear, and is conditional upon performance of normal preventative maintenance procedures.

Our commitment to quality and customer service directs us to constantly strive to improve our products. The materials and specifications presented in our manuals and data sheets are correct and accurate to the best of our knowledge, and are presented in good faith. However, the information is not guaranteed and is subject to change without notice.

LIMITATIONS OF REMEDIES

Purchaser assumes all risk and liability for results obtained in any installation, operation, or use of the product. Purchaser's sole remedy for any breach of warranty by vendor shall be limited to the "express remedies" set forth above. Otherwise, in no event shall vendor, its agents, or employees be liable to the original purchaser or any third party for any consequential or incidental damages or expenses of any nature arising directly out of or in connection with the use of vendor projects, even if vendor has been advised of the possibility of such damages or expenses. In any event, unless otherwise contrary to state law, vendor liability under this limited warranty shall not exceed the purchase price of the product.

Customer Assistance

ROS, Inc. uses a worldwide network of stocking distributors and representatives who are familiar with our products and are able to provide assistance during installation and/or operation of these products.

If you have any questions or problems with this product that are not covered by this manual or instruction, please contact our agent in your area, or contact us directly by phone or FAX or e-mail.

TEL: (001) 858-565-8500

FAX: (001) 858-565-8808

Sales: sales@rosys.com
Web Site: www.rosys.com
Technical Support: support@rosys.com

Change Record

REV	DESCRIPTION	DATE
A	SEE EC-03199	08JUN20
B	SEE EC-03210	18JUN20
C	SEE EC-03228	20AUG20
D	SEE EC-03358	06MAY21
E	SEE EC-03360	20MAY21
F	SEE EC-03403	23AUG21

1. Introduction

The Seastar (Figure 1) is a high-powered, light-weight, compact light for deep-ocean use. Options include flood or spot reflectors, and 120 VAC or 24 VDC power. AC powered lights provide full-range, flicker-free phase cut dimming. DC lights provide dimming via 0 – 10 V analog, 0 – 5 V analog, or RS48 serial commands. Custom input connectors and pinouts may be specified. The light may be installed at any angle.

Figure 1. Seastar

2. Product Specifications

Table 1 shows the mechanical specifications for the Seastar. Table 2 shows the electrical specifications. Figure 2 shows the spot and flood beam patterns.

Table 1. Mechanical Specifications

	Spot	Wide
Weight in air	1.9 lb (.86 kg)	1.8 lb (.81 kg)
Weight in water	1.0 lb (.41 kg)	.91 lb (.45 kg)
Depth rating	20,000 ft (6 km)	
Operating temp	-10 to 40°C	
Storage temp	-25 to 100°C	
Light output	9,000 lux	10,000 lm
Beam angle (50%)	50°	105°

Table 2. Electrical Specifications

	AC	DC
Voltage	110 – 130 VAC	20 – 26 VDC
Current	1.4 A	6.0 A
Inrush current	2.5 A, 10 ms	27 A, 1 ms
Color temperature	6300 K	
Color rendering index	65	

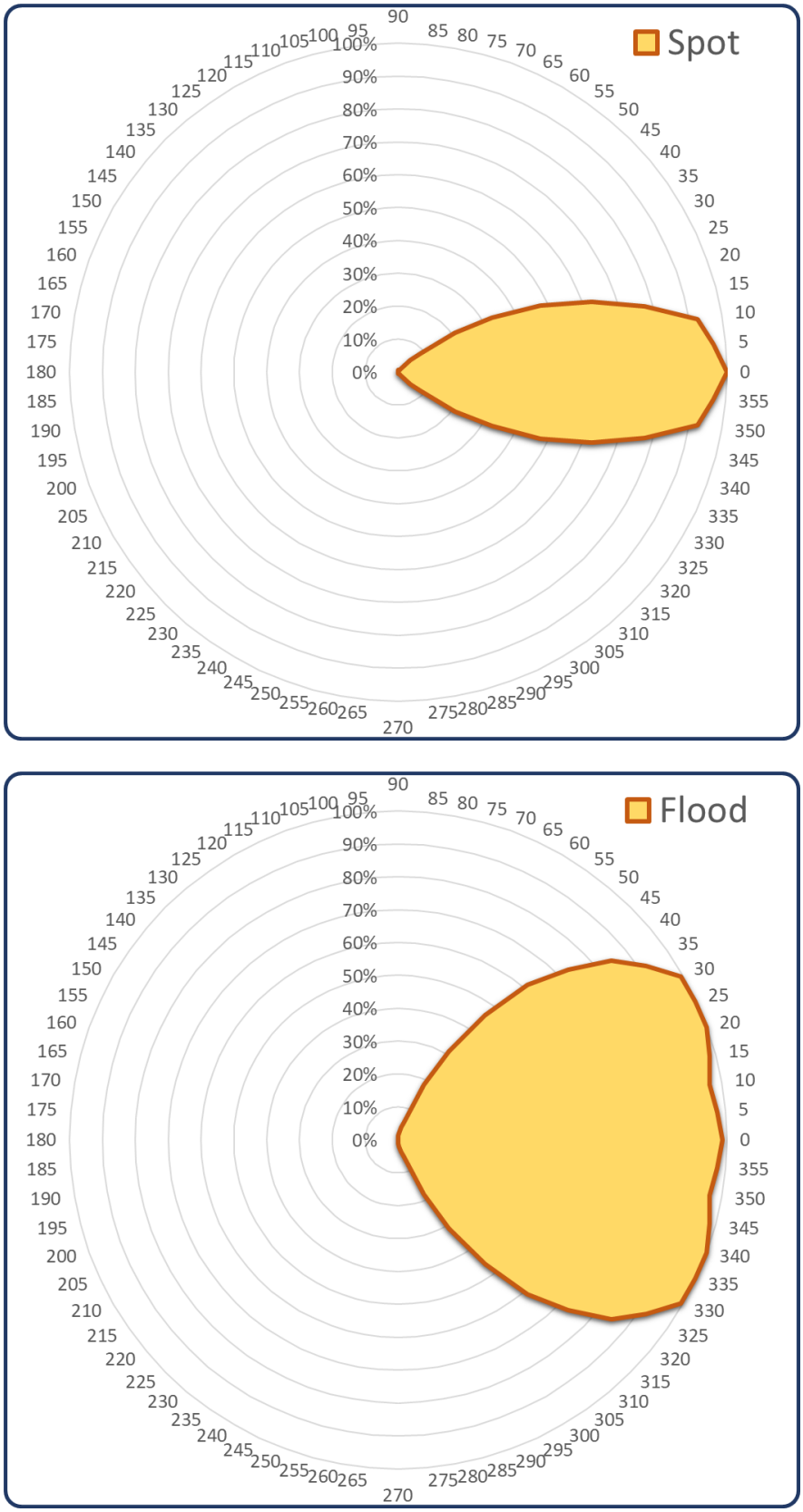

Figure 2. Beam Patterns

3. Installation

⚠ WARNING

The Seastar is an industrial product designed for use in rugged underwater environments. The Seastar installation and power system should be designed by a qualified engineer and installed by qualified technicians.

3.1. Mounting

Figure 3 shows the outline of the Seastar. If an ROS provided mounting kit is not used, the Seastar may be mounted by clamping the body of the light or using the three, 10-32 holes in the end bell. It is not recommended to clamp to the bezel of the light.

3.2. Electrical

The Seastar pinout will depend on customer selections; Figure 4 shows the default wiring. The ground pin should be wired to earth ground.

⚠ WARNING

The Seastar should be operated only through a circuit with ground fault interrupt protection.

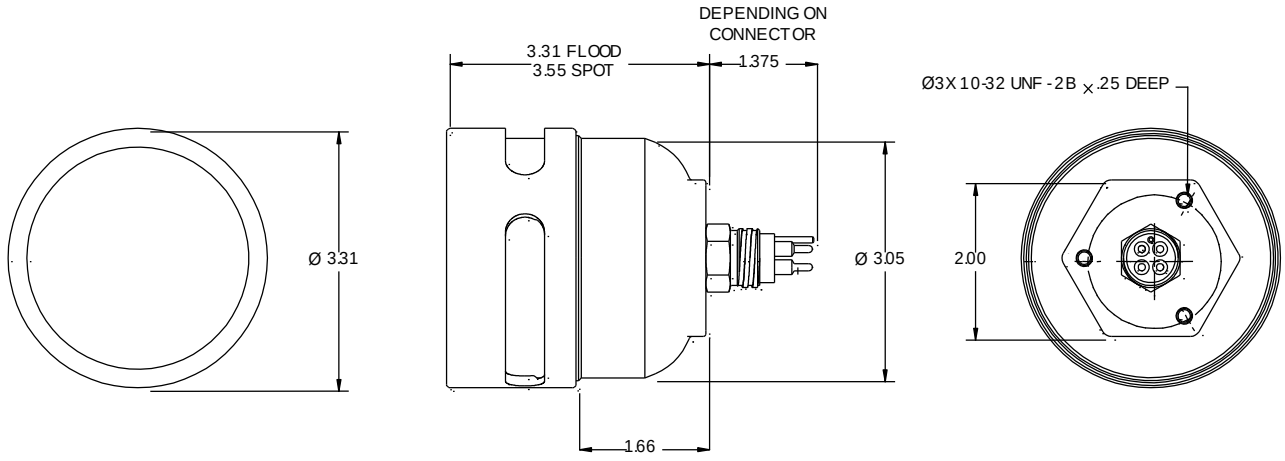

Figure 3. Installation Outline

AC WIRING	DC SERIAL	0-10 (0-5) V DIMMING
1 — EARTH GROUND	1 — EARTH GROUND	1 — EARTH GROUND
2 — 120VAC, 1P, 1.5A SUPPLY	2 — 24VDC, 5A SUPPLY	2 — 24VDC, 5A SUPPLY
3 — 120VAC RETURN/NEUTRAL	3 — 24VDC RETURN	3 — 24VDC RETURN
4 — 0-10VDC DIMMING CONTROL	4 — RS485+	4 — 0-10 (0-5) V+
5 — COMMON FOR DIMMING CONTROL	5 — RS485-	5 — 0-10 (0-5) V-

Figure 4. Sample Wiring

Note: Examples above to be used for reference only, check part number for actual pin out.

4. Operation

4.1. Pre-Operation

Prior to operating the Seastar, perform the following.

1. Verify the bezel cannot be rotated by hand.
2. Verify the window is tightly held by the bezel.
3. Verify the window o-ring is evenly compressed by the window.
4. Verify the connector is clean, dry (if dry mate) and in good repair.
5. Verify the power cable is securely connected.

4.2. Post Operation

After operating the Seastar, perform the following.

1. Rinse the light with clean water and remove any salt or fouling.
2. Inspect the exterior light for overt signs of damage.

4.3. AC Operation

Check the part number of the Seastar unit and see below for proper operation.

10-01310 (-03, -05)
This version is *only* compatible for operation with a Schilling Light Control Unit (LCU). The dimming mechanism of the light takes advantage of the rectified AC output from the LCU to achieve low light levels at the lower end of the dimming range. Use LCU application to turn on the light, the corresponding slider will determine the light output intensity. ***DO NOT PLUG DIRECTLY INTO WALL OUTLET,*** the unrectified AC sine wave will damage the driver board.

10-01310 (-01, -02,-04)
These versions are compatible for operation with a standard phase control dimmer such as a TRIAC or Crydom dimmer, they can also be plugged directly into a 120VAC wall outlet for 100% light output.

10-01349 (-01, -02)
These versions will only operate when using an isolated 0-10VDC voltage supply to control the light output intensity. Light output will be at 0% if only load, neutral, or earth ground are connected, or if the voltage supply is set to 0VDC. To change the light output intensity adjust the voltage supply between between 0-10VDC, with 10VDC setting the light output to 100% intensity. Light turns on at 1VDC input and max output is achieved at 8.5VDC.

4.3.1. AC Triac Dimming

Figure 5 shows the Seastar light output when used with a triac dimmer. The test was performed using a Lutron DVCL-153P-WH dimmer.

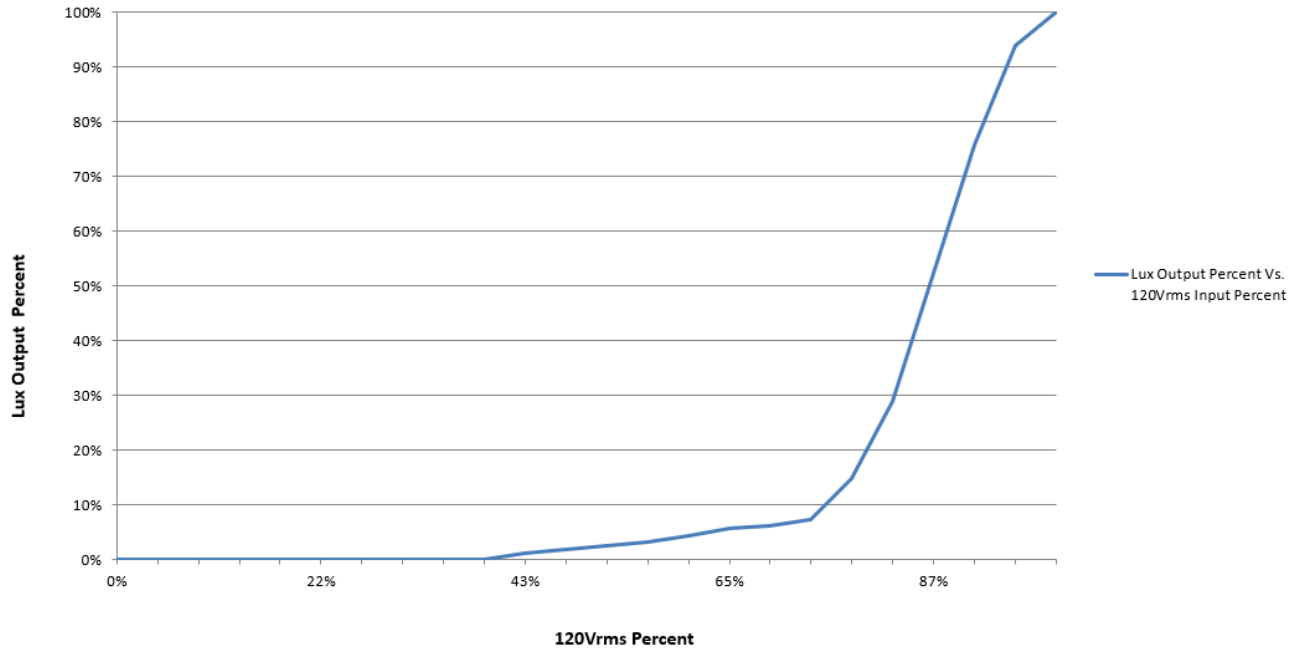

Figure 5. AC Lux Output with Triac Dimming

4.3.2. AC Crydom Dimming

Figure 6 shows the Seastar light output when used with a Crydom dimmer. The test was performed using a 10PCV2415 Crydom dimmer.

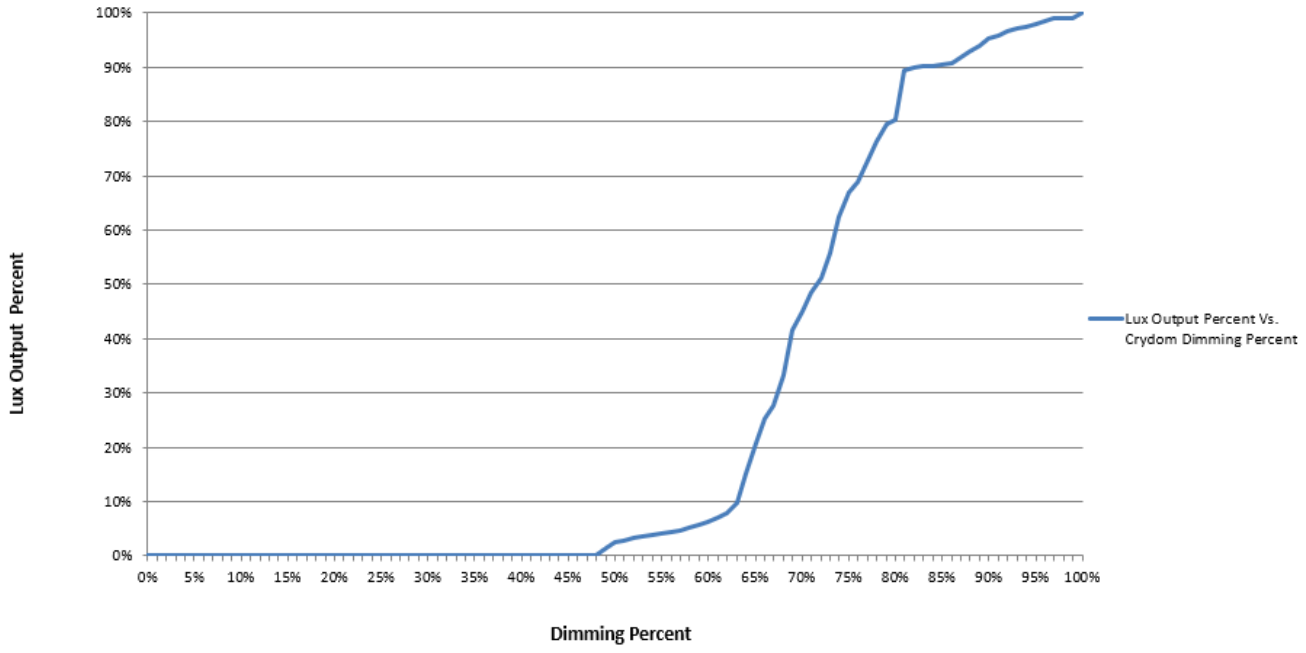

Figure 6. AC Lux Output with Crydom Dimming

4.3.3. AC 0-10VDC Dimming

Figure 7 shows the Seastar light output when used with a 0-10VDC power supply.

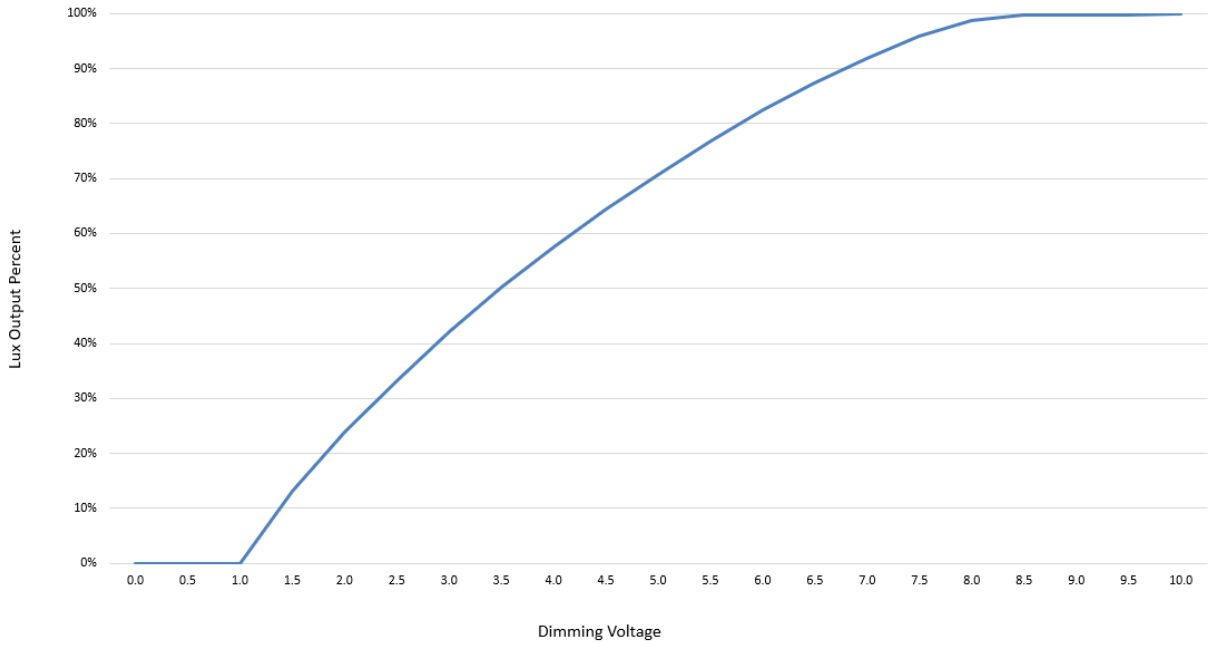

Figure 7. AC Lux Output with 0-10VDC Dimming

4.3.4. AC Inrush Current

Figure 8 shows the inrush current for the AC light at 120VAC input.

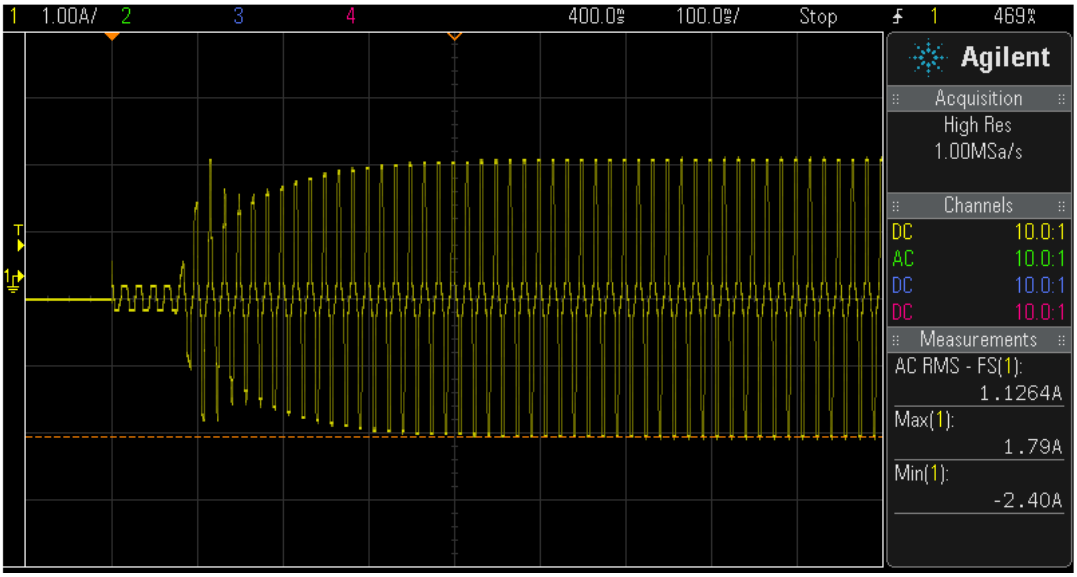

Figure 8. AC Inrush Current

4.4. DC Operation

The DC light will work with 20 – 26 VDC input. The light output will vary with input voltage. The DC light has been optimized for use with 24VDC input. The DC light can be configured for 0-5VDC, 0-10VDC, or RS485 control.

Check the part number of the Seastar unit and see below for proper operation.

10-01341 (-01)
This version is a 24VDC low power light controlled by a 0-5VDC voltage supply, with max power of 21W.

10-01317 (-01)
This version is a 24VDC standard power light controlled by half duplex RS485, with max power of 130W.

10-01317 (-02)
This version is a 24VDC standard power light controlled by 0-5VDC voltage supply, with max power of 130W.

10-01317 (-03)
This version is a 24VDC standard power light controlled by 0-10VDC voltage supply, with max power of 130W.

4.4.1. 24VDC With Analog Dimming

Figure 9 shows the Seastar dimming properties when used with a 0-5V or 0-10V analog dimmer.

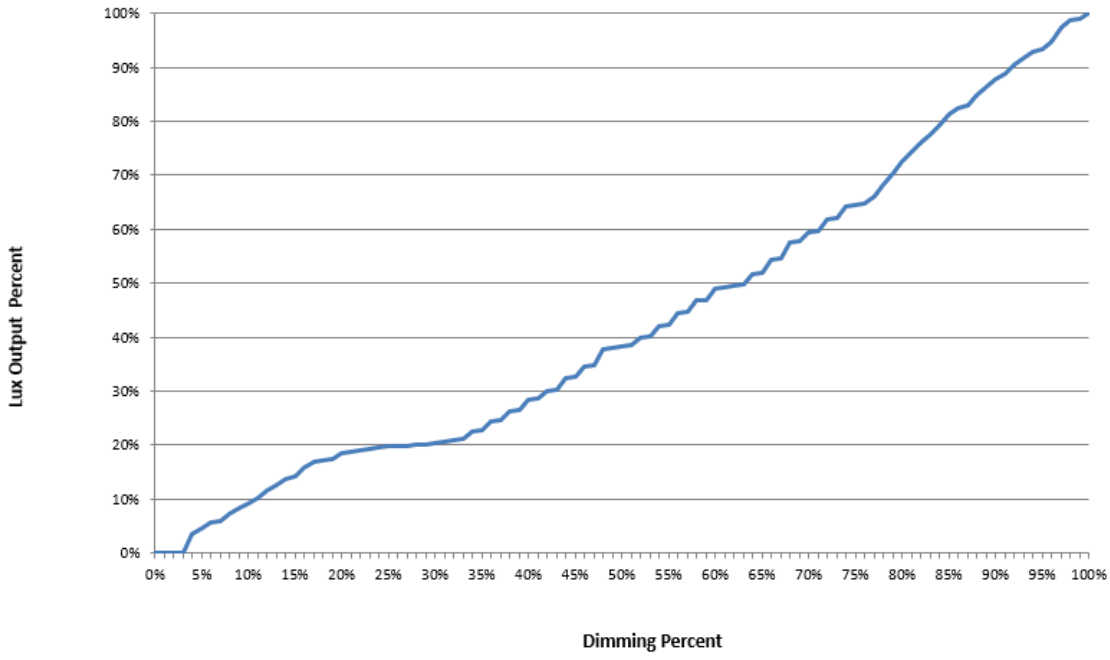

Figure 9. Lux Output vs Analog Dimming Percent

4.4.2. 24VDC With Serial Dimming Operation

Figure 10 shows the light's dimming properties when used with RS485 control. The serial-dimming Seastar can be operated using the ROS Eos GUI, or by sending serial commands from a customer device or software. Table 3

lists ROS VISCA serial parameters. Table 4 lists commands and inquiries that may be sent to the Seastar, along with their expected responses. Table 5 lists standard response messages.

NOTE

All serial commands, inquiries and responses are terminated with hex byte ff (255).

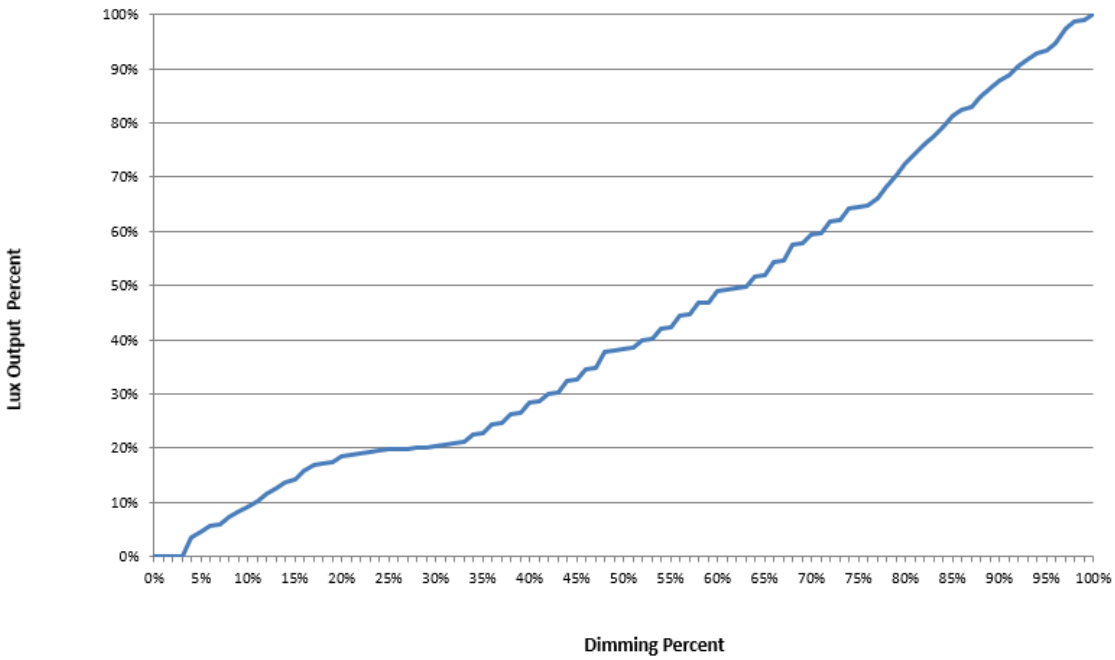

Figure 10. Lux Output vs Serial Dimming Percent

Table 3. Serial Parameters

Baud Rate	9600
Data bits	8
Start bits	1
Stop bits	1
Parity	None
Flow control	None

Table 4. Serial Commands and Inquiries

Command	Packet	Note

Table 4. Serial Commands and Inquiries

Command	Packet	Note
Set Address	88 30 0x ff	x = address 1 - 7 Returns 88 30 0y y = x + 1 When setting the address of an ROS VISCA device, any connected devices will respond, causing collisions. Consequently, only one device can be connected to a bus when setting the address.
Set Intensity	8x 01 10 01 yy ff	x = address yy = Intensity (0x00 – 0x64 hex, 0 - 100 decimal) Returns Command Completed if successful
Set Power Up Intensity	8x 01 10 02 yy ff	x = address yy = Intensity (0x00 – 0x64 hex, 0 - 100 decimal) Returns Command Completed if successful
Get Factory Info	8x 09 06 50 ff	x = address Returns comma separated factory information. The first two bytes are hex, all other bytes are text. z0 50 [unit pn],[unit rev],[unit sn],[cca pn],[cca rev],[cca sn],[firmware pn],[firmware rev] z = address + 8 (byte)
Get Temperature	8x 09 10 03 ff	x = address Returns z0 10 10 03 0y 0y 0y ff z = address + 8 (byte) yyy = Hexadecimal temperature in Kelvin
Get Intensity	8x 09 10 04 ff	x = address Returns z0 10 10 04 yy ff z = address + 8 (byte) yy = Light intensity percent (0x00 – 0x64 hex, 0 - 100 decimal)
Get Power Up Intensity	8x 09 10 05 ff	x = address Returns z0 10 10 05 yy ff z = address + 8 (byte) yy = Light intensity percent (0x00 – 0x64 hex, 0 - 100 decimal)

Table 4. Serial Commands and Inquiries

Command	Packet	Note
Get Error Status	8x 09 10 06 ff	x = address Returns z0 10 10 06 0y ff z = address + 8 (byte) y = 4 bits: bit 0 = MOSFET over-current true/false bit 1 = Driver Output over-voltage true/false bit 2 = LED over-current true/false bit 3 = 0

Table 5. Serial Response Messages

Response	Packet	Note
Command Completed	z0 5y ff	z = address + 8 y = socket (default 1) Returned when the command has been executed
Syntax Error	z0 60 02 ff	z = address + 8 Returned when the command format is different or when a command with illegal command parameters is accepted.
Command Not Executable	z0 6y 41 ff	z = address + 8 y = socket (default 1) Returned when a command cannot be executed due to current conditions. For example, when user issues a light intensity command with a value greater than the maximum allowed value.

4.4.3. DC Inrush Current

Figure 11 shows the inrush current for the DC light at 24VDC input.

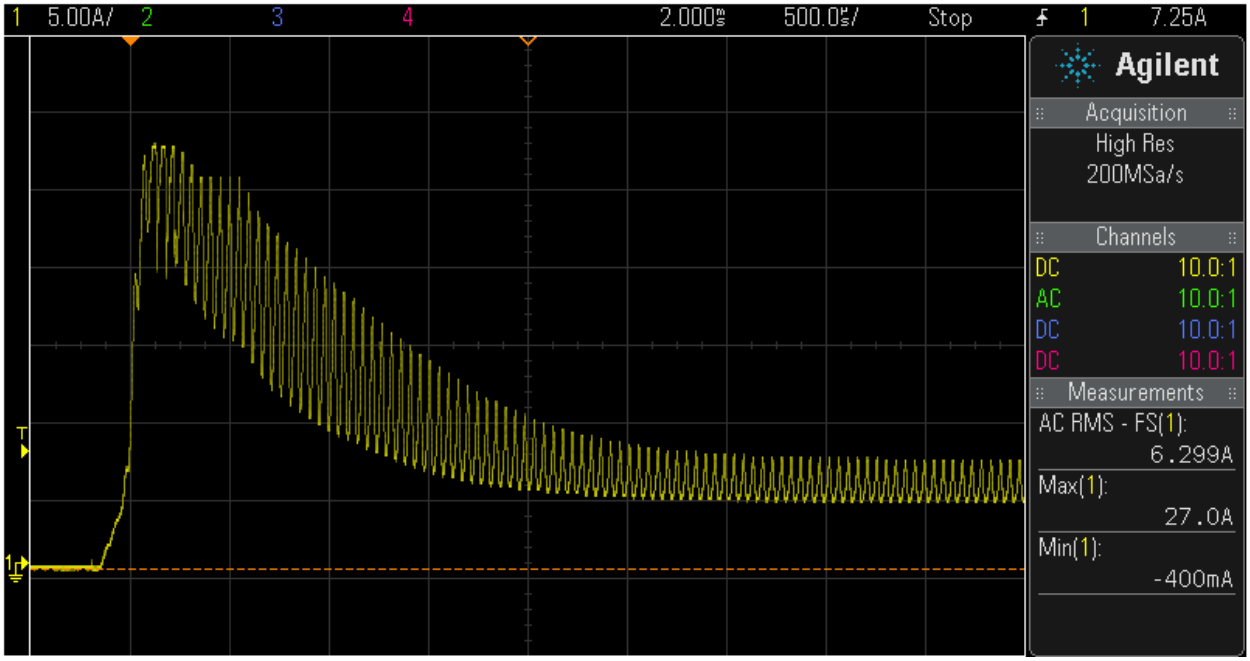

Figure 11. DC Inrush Current

4.5. Temperature Protection

4.5.1. 120VAC

The AC light will reduce the current output of the driver up to half the total value if an overheating condition is detected by the driver. The light will have to be power cycled to return to normal operation.

4.5.2. 24VDC

The DC light driver will reduce the light output of the driver to 15% of the maximum light output. The user will not be able to increase the light output until the light driver has detected that the temperature of the board has gone below approximately 50° Celsius. Once the light driver has gone below 50° Celsius, it will automatically return to its original light output level.

4.6. Electrical Protection

4.6.1. 24VDC

The DC light driver will stop the light output if it detects a MOSFET over-current, output over-voltage, or an LED over-current signal. If light is configured for 0-5V or 0-10V control, refer to section 6.4 for troubleshooting. If light is configured for RS485 control, the user can issue a “Get Error Status” command to check if the driver is in electrical protection mode.

CAUTION

Complete troubleshooting prior to restoring power to a light that has stopped to avoid energizing a shorted unit.

The light can be returned to normal mode by power cycling the unit, but refer to section 6.4 prior to doing so to avoid energizing a shorted unit.

5. Maintenance

5.1. Scheduled Maintenance

Pre- and post-operation checks are listed in Section 4. No other scheduled maintenance is recommended.

5.2. Unscheduled Maintenance

5.2.1. Open the Seastar

Opening the Seastar entails removing the end bell, bezel, and window. In order to open the Seastar, e.g., to troubleshoot or inspect internal components, proceed as follows. Refer to Figure 12Figure 12.

⚠ WARNING

Disconnect the Seastar from power prior to servicing or troubleshooting internal components.

CAUTION

The acrylic window and o-rings should not normally be reused once the Seastar has been disassembled as this may lead to leaks in service. These components are available as part of a rebuild kit.

1. Shut off the power to the Seastar and disconnect the power cable.
2. Use a two-inch wrench, large adjustable wrench, or a vise to hold the end bell, either by the hex flats on the end bell or the Seastar mounting bracket

CAUTION

The end bell is wired to the driver circuit card. Do not twist the end bell more than a few degrees to avoid damaging or breaking internal wiring. Avoid pulling the wires tight before they are disconnected.

3. Use a strap wrench to unscrew the bezel from the Seastar.
4. Pull the end bell 1-2 inches off of the housing.
5. If it is desired to leave the electronics connected, go on to the appropriate procedure at this point.
6. If required, disconnect the ground lug and the input connector.

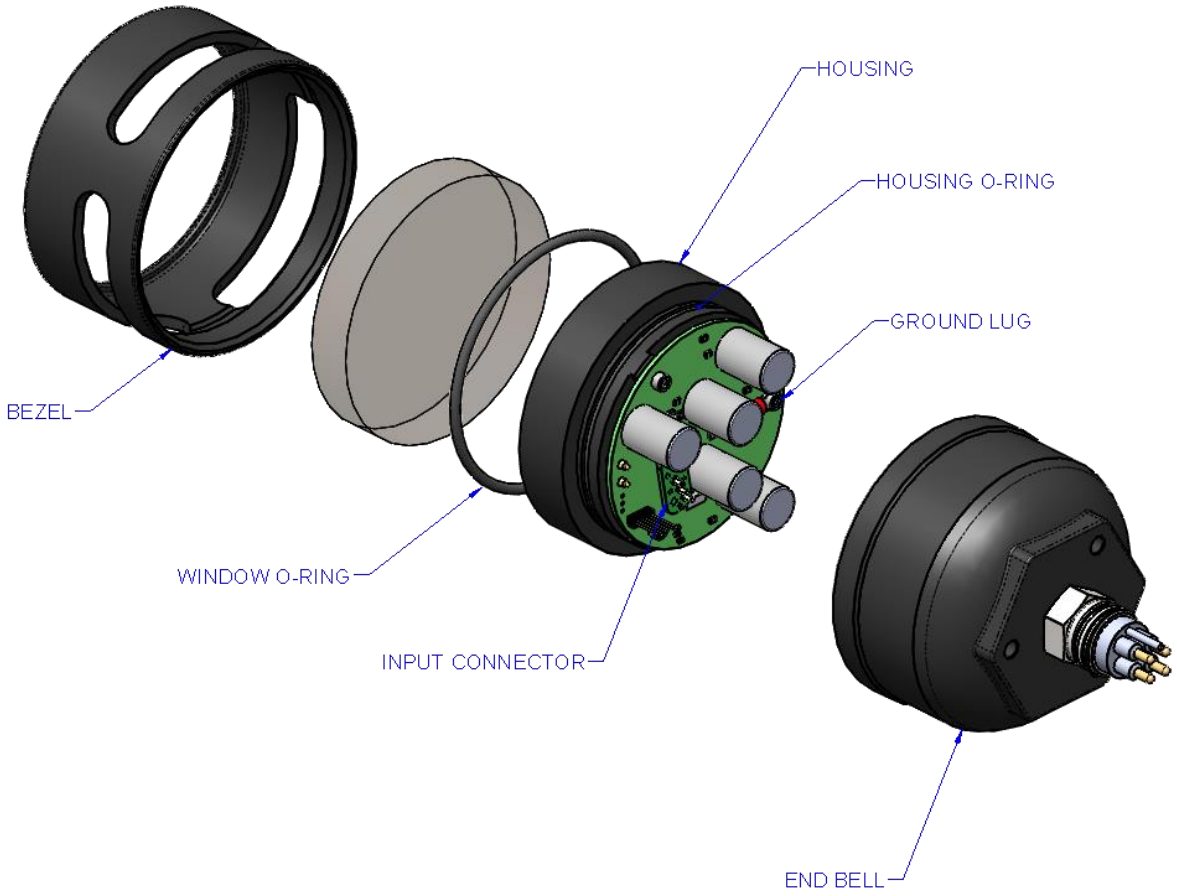

Figure 12. Driver Circuit Card Connections

5.2.2. Close the Seastar

In order to close the Seastar after it has been opened, proceed as follows.

CAUTION

The acrylic window and o-rings should not normally be reused once the Seastar has been disassembled as this may lead to leaks in service. These components are available as part of a rebuild kit.

1. Remove and discard the window o-ring and the housing o-ring from the housing.
2. Clean the end bell and bezel threads to remove as much fouling and dried thread locking compound (appears as red plastic) as possible.
3. Test thread the end bell and bezel together to ensure they turn freely.
4. Inspect the housing o-ring grooves an end bell sealing surfaces for damage. Replace components if necessary.
5. Put a small amount of Vibra-tite VC-3 (supplied with the rebuild kit) on the end bell threads and allow to dry for approximately 30 minutes.
6. Inspect the replacement housing o-ring for damage, lubricate it with a suitable, silicone-based lubricant, and put in the housing o-ring groove.
7. Connect the input connector and ground lug (Figure 12);

8. Arrange the wiring so that it will not be pinched by the housing or driver circuit card components, and press the end bell onto the housing over the housing o-ring.

NOTE

The window o-ring is installed without lubrication.

9. Inspect the widow o-ring and place it over the window o-ring groove on the housing.
10. Place the replacement window over the o-ring.
11. Clamp the housing by its mounting bracket of the hex flats on the back.
12. With the end bell seated fully onto the housing and o-ring, thread the bezel onto the housing as far as possible by hand. The o-ring should be visibly compressed and the window should be tightly held.
13. Mark the housing and the bezel as shown in Figure 13Figure 13.

NOTE

Tightening the bezel requires approximately 40 ft lb of torque, e.g., 40 lb pull on a 1-foot wrench or 20 lb pull on a 2-foot wrench. However, a torque wrench is not required for this procedure, and torqueing the bezel to even two-times this level will not damage the light.

14. Using a strap wrench, rotate the bezel until the marks are separated by at least 1 1/2 inch.
15. Verify the window o-ring is evenly compressed.

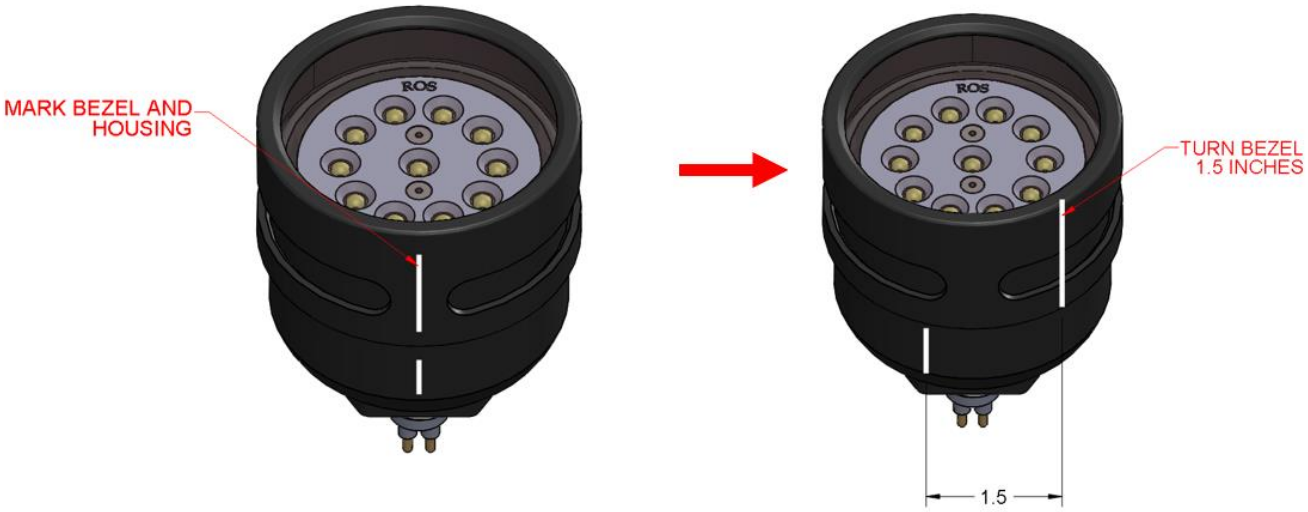

Figure 13. Closing the Seastar

5.2.3. Remove the Reflector and LED Array

In order to remove the reflector and gain access to the LED array, proceed as follows. Refer to Figure 14Figure 14.

⚠ WARNING

Disconnect the Seastar from power prior to servicing or troubleshooting internal components.

1. Open the Seastar (5.2.1).
2. Remove and discard the window.
3. Remove and discard the window o-ring.
4. Remove and save the reflector screws.
5. Remove and save the reflector.
6. Remove and save the thick yellow plastic cushion and the thin, translucent plastic insulator.
7. Remove and save the array power pins.
8. Remove and save the 5, Philips flat-head screws attaching the array.
9. Remove the array.

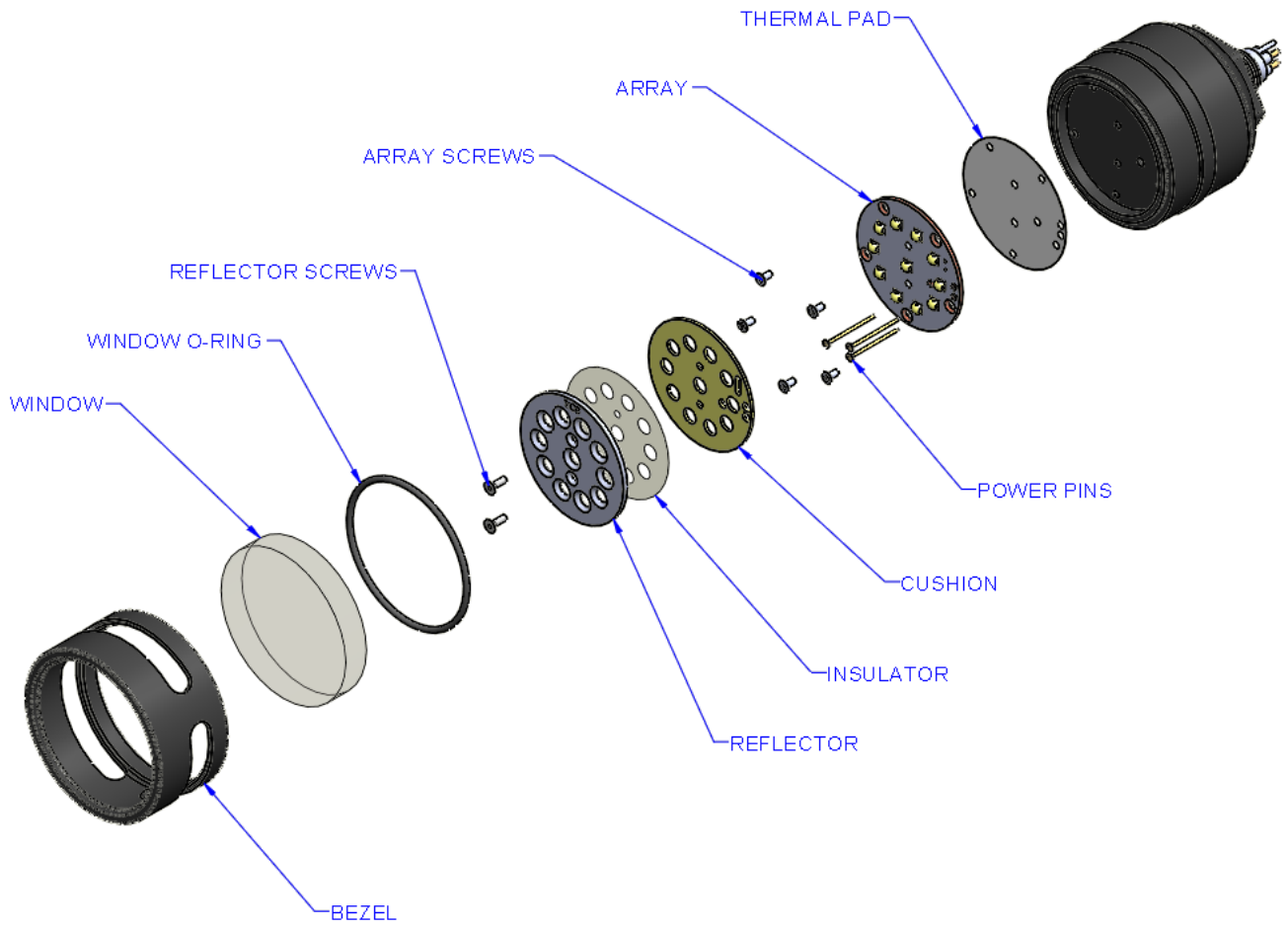

Figure 14. Window, Reflector and LED Array Replacement

5.2.4. Replace the Window, Reflector and LED Array

To replace the window, reflector and / or LED Array, proceed as follows. Refer to Figure 14.

NOTE

The window, o-ring and thermal pad are recommended to be replaced whenever the light is disassembled to a level that allows their removal. These components are available as part of a rebuild kit.

1. Place the thermal pad in the housing and align the holes.
2. Place the array in the housing and install the five attaching screws.

CAUTION

Insert the power pins gently and straight-in. It may be necessary to wiggle the pins slightly to find the sockets on the driver circuit card when seating the pins.

3. Install the three LED array power pins.
4. Place the thick plastic cushion over the array and align the holes.
5. Place the thin, translucent insulator over the cushion and align the holes.

NOTE

If the reflector is severely misaligned to the LEDs, Seastar light output may be reduced as much as 10%.

6. Place the reflector over the insulator. Align the cutouts to the LEDS, and install the two reflector screws.
7. Close the Seastar (5.2.2)

5.2.5. Replace the Connector

To replace the connector, proceed as follows.

⚠ WARNING

Disconnect the Seastar from power prior to servicing or troubleshooting internal components.

NOTE

The replacement connector comes in a kit from Remote Ocean Systems, which should include any materials and special hardware required to replace the connector.

1. Shut off the power to the Seastar and disconnect the power cable.
2. Lubricate the replacement connector o-ring, taking care not to get lubricant on the threads.
3. Apply Vibra-Tite VC-3 1/4 – 1/2 way around the threads of the replacement connector and set it aside to dry for 30 minutes.
4. Remove the end bell and disconnect the wiring.
5. Unscrew the connector from the end bell.
6. Inspect the sealing surface around the connector hole in the end bell. Replace the end bell if necessary.

CAUTION

Torque values in Table 6 reflect stainless steel connectors with metal wrench flats. It will be impossible to torque rubber, plastic, or other connectors to these values without breaking them. Install per manufacturer guidance.

7. Once the Vibra-Tite on the replacement connector has dried for 30 minutes, thread the connector into the end bell and torque per Table 6 (metal connectors) or per the manufacturer's guidance (other connectors).

Table 6. Threads Size vs. Recommended Torque

Thread	Torque
7/16-20	35 ft lb
1/2 – 20	54 ft lb
9/16 – 18	76 ft lb
5/8 – 18	106 ft lb

8. Close the Seastar (5.2.2)

5.2.6. Remove and Replace the Driver Circuit Card

To replace the driver circuit card, proceed as follows. Refer to Figure 18.

⚠ WARNING

Disconnect the Seastar from power prior to servicing or troubleshooting internal components.

1. Remove the end bell and disconnect the wiring (5.2.1).
2. Remove the circuit card from the housing and discard it.
3. Place the thermal pad onto the housing.

NOTE

Use care to align the array power pins with the driver sockets when inserting the replacement driver circuit card.

The 120VAC driver requires heat pad to be placed between the housing and U1, U2, U3, U4, and U5.

24VDC driver requires heat pad to be placed between U4 and housing and a TO-220 heat pad to be placed between Q1 and Q1 PCB footprint.

4. Place the replacement driver circuit card into the housing and seat it onto the array power pins.

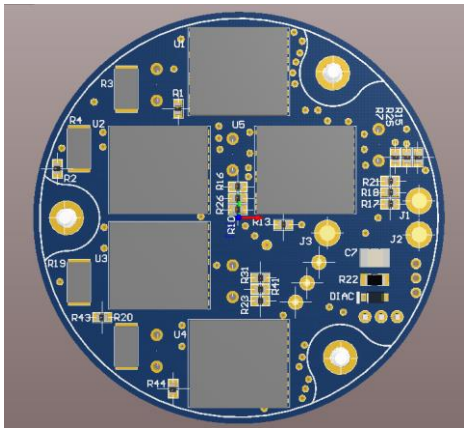

Figure 15. Top Layer 120VAC Driver Board

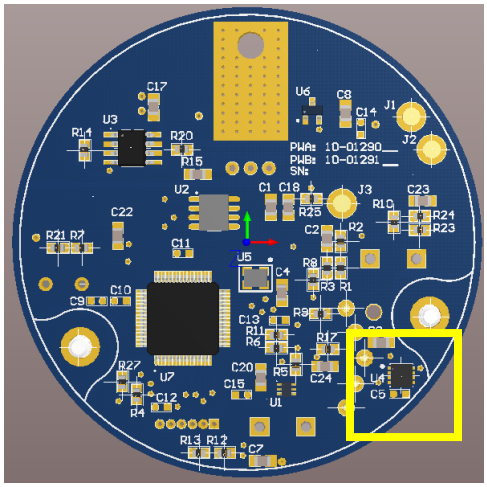

Figure 16. U4 on Top Layer 24VDC Driver Board

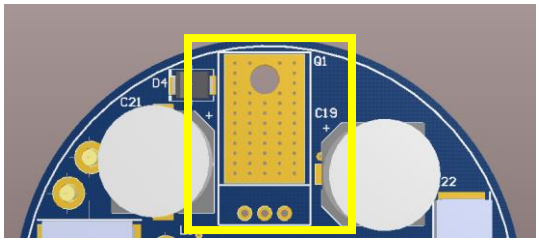

Figure 17. Q1 on Bottom Layer 24VDC Driver Board

5. Insert and tighten the two mounting screws shown in Figure 18.
6. Close the Seastar (5.2.2).

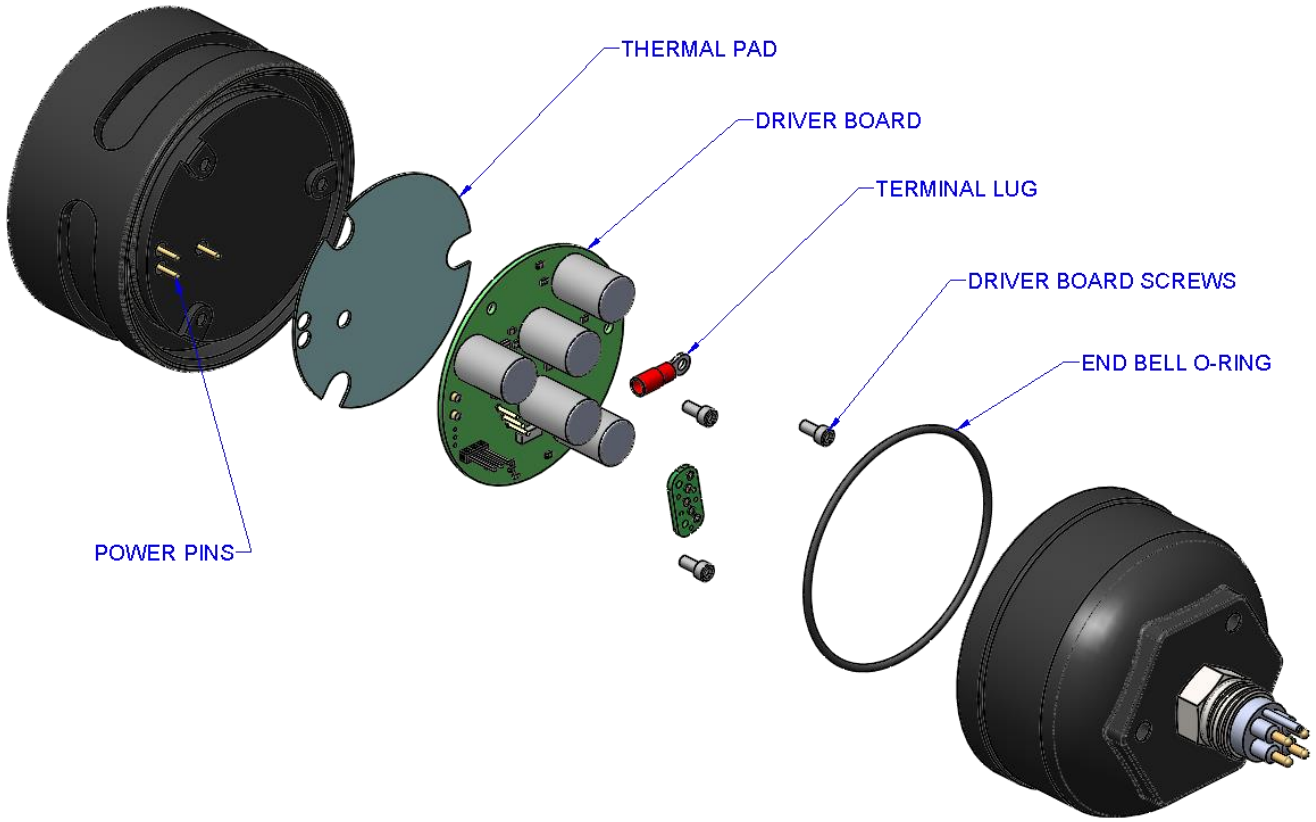

Figure 18. AC Driver Circuit Card Replacement

6. Troubleshooting

This section provides guidance for those problems with the Seastar most likely to be encountered.

⚠ WARNING

Troubleshooting should be performed only by trained technicians.

6.1. Leaking

The Seastar has three seals, one under the window, one at the end bell, and one under the connector. These seals are unlikely to leak when assembled correctly, and are not sensitive to minor assembly deviations. If a leak is discovered during the warranty period, contact Remote Ocean Systems for warranty support.

If the light is leaking outside the warranty period, it may need to be rebuilt (see Section 4.4.3 for maintenance instructions). If the leak has not caused any damage, this may involve replacing only the seals and window. Otherwise, either the driver, the array or both may need to be replaced. If the light begins leaking after having been rebuilt, the cause is likely to be one of the following.

- Damaged, missing, or incorrectly installed o-ring
- Damaged o-ring groove or sealing surface
- Connector or bezel not tightened—o-ring not compressed
- Connector or bezel backing out under pressure cycling or vibration due to missing thread-locking compound
- Housing and o-ring not lubricated correctly

6.2. Light Output Gradually Decreased

If the light output has gradually, but noticeably, decreased, consider the following guidance.

1. LEDs are normally yellow when turned off. If any of the LEDs show signs of browning, replace the LED array.

NOTE

LEDs should last at least 1000 – 2000 hours without significant loss of light output under normal use. This may be shortened if the lights are used in higher temperature environments.

2. Verify the voltage and current supplied to the light. The light should draw approximately 1.3 Amps AC at 120 VAC or 5.2 Amps DC at 24 VDC.
3. If the voltage and current are low, the problem is likely the power supply or dimmer.
4. If the voltage is correct but the current is low, the driver board may have failed.

6.3. Light Flickers or Intermittently Stops

A light that flickers in response to vibration or shock is most likely the result of a loose or worn connection. There are three connections to check (Figure 19):

1. Main (watertight) connector
2. Driver PCA input connector
3. LED Array power pins

Loose connections may show signs or arcing, such as deformation, blacking or browning. A light that flickers without shock or vibration may have a failing driver circuit card.

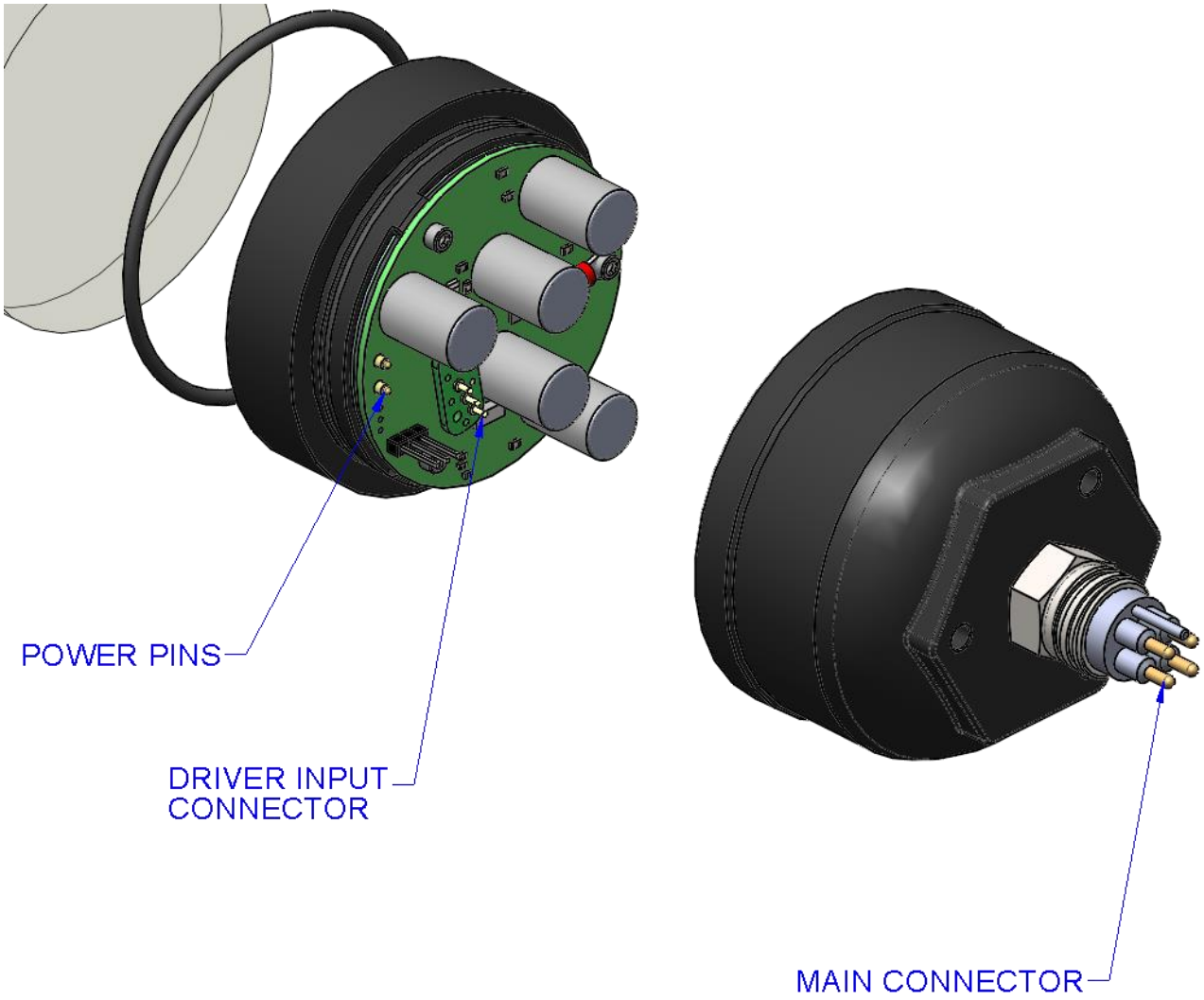

Figure 19. Connections

6.4. Light Output Suddenly Stopped

If the light has suddenly stopped outputting light, consider the following guidance.

> ⚠ **WARNING**
>
> A sudden light failure may indicate a short circuit. Do not reconnect the light to power until the root cause of failure has been identified.
>
> Replacing a shorted component may not address the root cause of failure, leading rapidly to a second failure. If the root cause of a short cannot be confidently identified and resolved, contact ROS support prior to replacing any components or rebuilding the light.

1. Disconnect the light from power.
2. Check any fuses or circuit breakers. A blown fuse or tripped breaker is a likely sign of a short.

3. Inspect the outside of the light for signs of a short, such as browned, blackened or melted components. Disconnect the power connector and inspect for signs of a short.
4. Verify the power cable is securely connected to the light.
5. Verify the power is turned on and any dimmers are set high enough to allow light output.
6. Verify the DC analog dimming signal or serial dimming is set high enough to allow light output.
7. Verify the power supply is outputting the expected voltage: 110 to 130VAC or 20 to 26 VDC.
8. Inspect the light for signs of water intrusion.

⚠ WARNING

Disconnect the Seastar from power prior to servicing or troubleshooting internal components.

Seastar contains high voltages and currents, and should be serviced only by trained technicians.

9. If the problem has not been identified and resolved, open the light (5.2.1).
10. Check for loose or disconnected wires.
11. Disconnect the driver input connector from driver board, check the connector for signs of a short.
    a. Use volt meter to check for resistance on the driver board input pins (see Figure 20).
        i. Pin 1 to pin 2: open circuit
        ii. Pin 2 to pin 3: open circuit
        iii. Pin 3 to pin 4: open circuit
        iv. Pin 4 to pin 5: open circuit
12. Check for broken components or signs of a short.
    a. Use volt meter to check fuse (F1) for continuity. If resistance is greater than 3 ohms, the fuse has been tripped and there may be a short circuit somewhere in the driver board or LED array.
    b. Use volt meter to check for isolation
        i. Check resistance between Output 1 pin and PCB mounting screw, resistance should read open circuit.
        ii. Check resistance between Output 2 pin and PCB mounting screw, resistance should read open circuit.
        iii. Check resistance between Output 3 pin and PCB mounting screw, resistance should read open circuit.

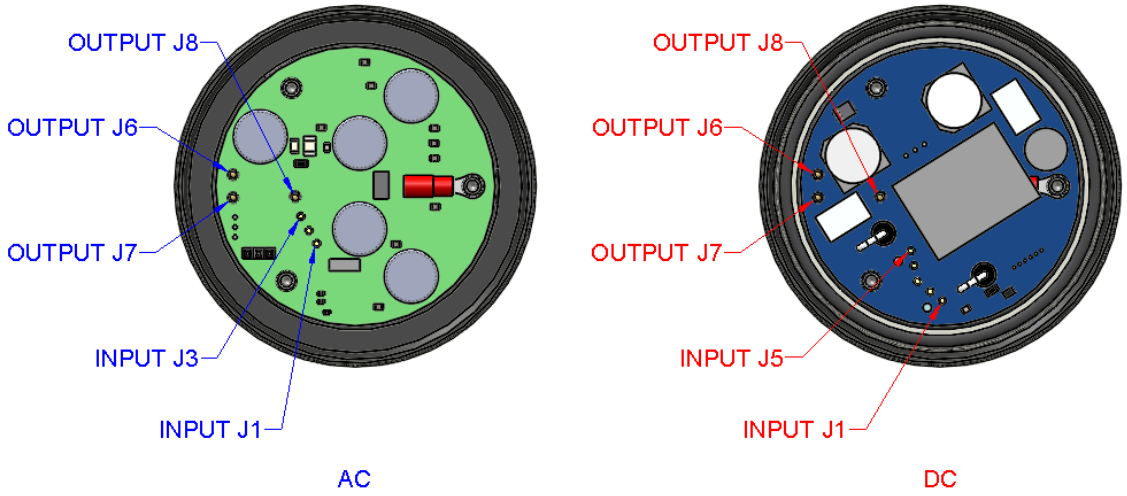

Figure 20. Driver Input and Output Power Pins

6.5. Serial Light Does Not Respond to Commands

If the light does not respond to serial commands, consider the following guidance.

1. If the light does not operate or draw current, consider the guidance in Section 6.4.
2. If the light operates, or does not operate but draws 180 ± 30 mA, use the Eos GUI to aid in the following steps
3. Verify the light is installed and connected properly (Section 3.2, 6.4), with the RS485 connection connected to the USB port of a computer with Eos available.
4. Power cycle the light.
5. Open the Eos GUI and check whether the light is detected.
6. If the light is detected, attempt to dim the light with the GUI. If the light works with the GUI, the light detected an overvoltage, MOSFET overcurrent, or LED overcurrent condition. Problem with customer dimming device or software is also possible.
7. If the light does not dim, or operate as expected, through the GUI, open the log window. The log window will list attempts to communicate on all available com ports. Inspect the list for the com port / address that the light should be on. The log should show whether the light sent a partial response, no response at all, or an incorrect response. The log window may also indicate that the light responded from a different address than expected. The GUI also provides a diagnostic window which provides tools to send commands out on a selected com port / address and observe the response. Compare any responses received to the expected responses listed in Table 5.

7. Parts List

Table 7 lists the parts in the Seastar. Figure 21 shows the front explode view. Figure 22 shows the back explode view. The main connector assembly is not listed, since it depends on the specific customer configuration.

Table 7. Bill of Materials

Item	Config	Part No.	Description	Spare
10	Wide	10-01306-01	HSG WIDE	
10	Spot	10-01306-02	HSG SPOT	
20		10-01305-XX	ENDBELL (dash number depends on connector)	
30	Wide	10-01307-01	BEZEL SPOT	
30	Spot	10-01307-02	BEZEL WIDE	
40		10-01308-01	WINDOW	X
50	Wide	10-01275-01	REFL WIDE	
50	Spot	10-01275-03	REFL SPOT	
60		10-01276-01	PAD THERMAL	
70		10-01277-01	CUSHION	
80		10-01285-01	INSULATOR	
90	AC	10-01293-01	PWA LED ARRAY 120 VAC	X
90	DC	10-01293-02	PWA LED ARRAY 24 VDC	X
100	AC	10-01279-01	PWA DRIVER 120VAC	X
100	DC	10-01290-01	PWA DRIVER 24V DC	X
110		60-20037-4	O-RING 2-037 70 SHORE BUNA N	X
120		60-20148-4	O-RING 2-148 70 SHORE BUNA N	X
140		62-20320-4	TERMINAL RING 22-18AWG #4 INSULATED	X
160		62-20156-4	SCREW SHHX 4-40X0.25 IN 316SS	X
170		62-00077-4	SCREW FHHX 4-40X0.375 IN 316SS	X
170		62-00942-4	SCREW FHHX 4-40X0.625 IN 316SS	X
180		62-21013-4	SCREW FHPH 100 DEG 4-40X0.25 IN 18-8SS	X
190		10-01315-XX	THERMAL PAD SEASTAR (XX depends on AC (-01) or DC (-02) version)	
200				
210		10-01284-01	PIN	X
220	AC	10-01333-XX	CONNECTOR (XX depends on customer-selected connector)	X
220	DC	10-01334-XX	CONNECTOR (XX depends on customer-selected connector)	
230		10-01327-01	TORQUE FIXTURE	X
240		10-01329-01	REBUILD KIT, AC (Table 8)	X
240		10-01329-02	REBUILD KIT, DC (Table 8)	X

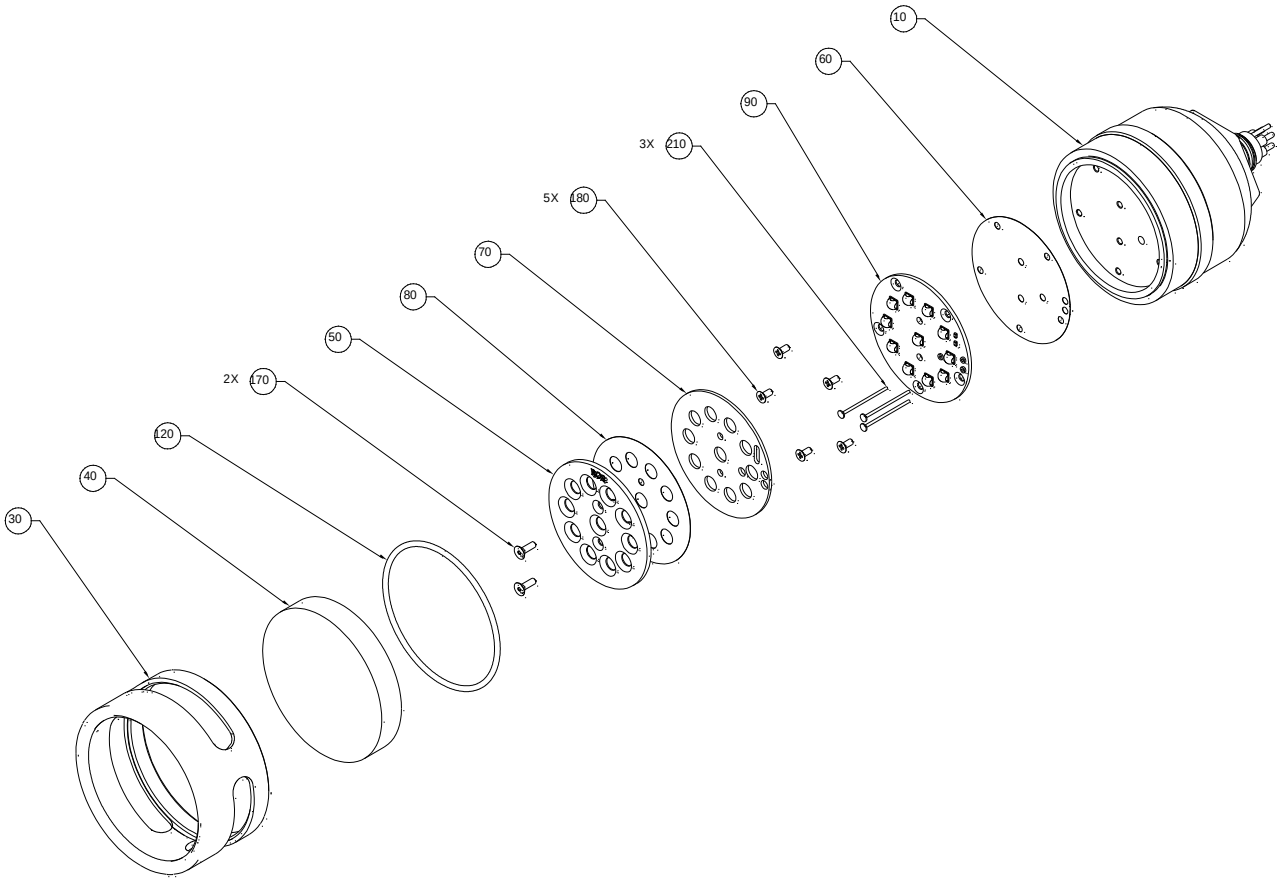

Figure 21. Front Explode View

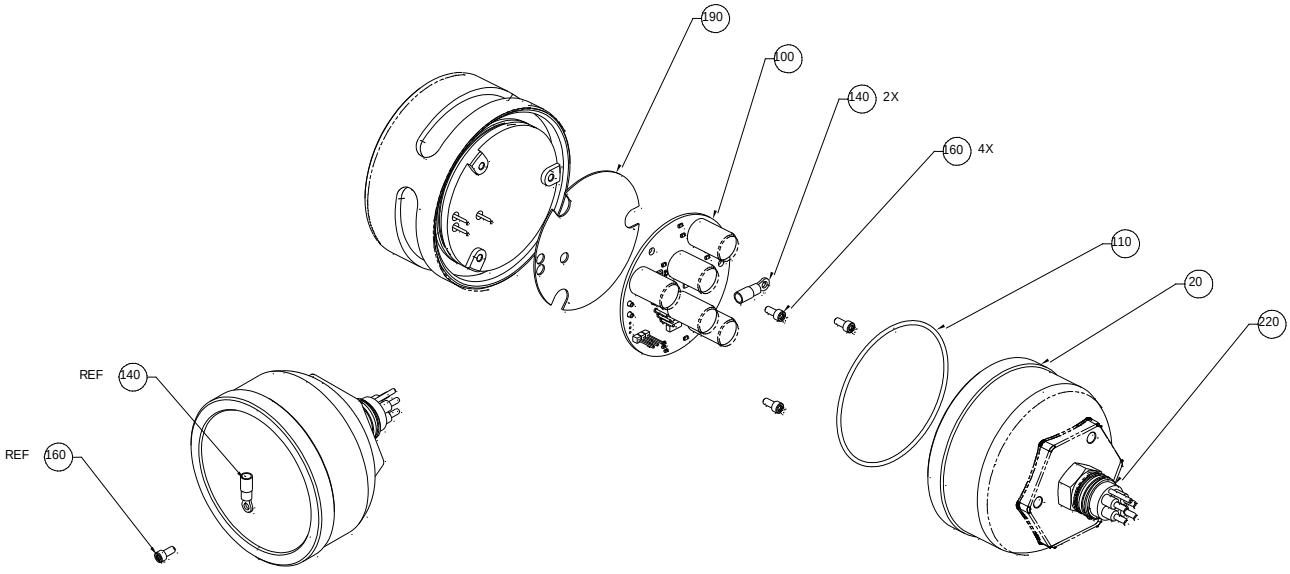

Figure 22. Back Explode View

Table 8. Rebuild Kits

NO	-01	-02	PART_ID	DESCRIPTION
10	1	1	10-01276-01	PAD THERMAL SEASTAR
20	1	1	60-20037-4	O-RING 2-037 70 SHORE BUNA N
30	1	1	60-20148-4	O-RING 2-148 70 SHORE BUNA N
40	4	4	62-20320-4	TERMINAL RING 22-18AWG #4 INSULATED
50	6	6	62-20156-4	SCREW SHHX 4-40X0.25 IN 316SS
60	4	4	62-00077-4	SCREW FHHX 4-40X0.375 IN 316SS
70	7	7	62-21013-4	SCREW FHPH 100 DEG 4-40X0.25 IN 18-8SS
80	1		10-01315-01	PAD GAP AC SEASTAR
80		1	10-01315-02	PAD GAP DC SEASTAR
90	1	1	10-01327-01	TORQUE FIXTURE