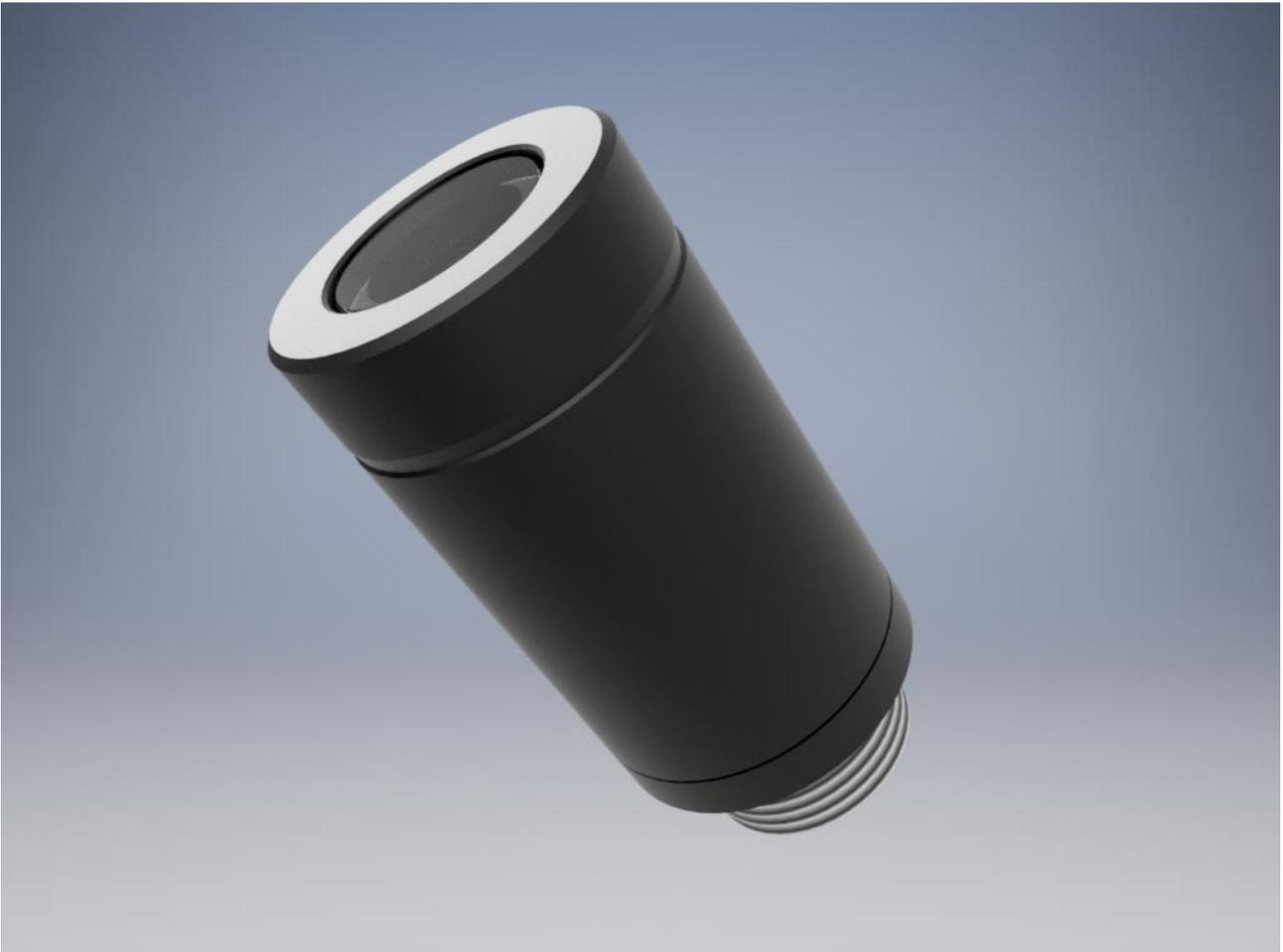


Leak Sentinel™ V5

Pre-dive and dive leak detection system for underwater camera housings with

TEMPERATURE COMPENSATION
LOW BATTERY INDICATION
OVERNIGHT FUNCTION
RESET FUNCTION



USER MANUAL

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Thank you for choosing Leak Sentinel V5, the premier pre-dive vacuum leak detection system for underwater camera housings.

Please read this manual carefully before installing and using the Leak Sentinel.

1. Safety precautions

Never dive or immerse the housing in any water without the protective cap. The rubber valve is not watertight and serves only to hold the underpressure during the evacuating process. Diving or immersing the housing without the protective cap will result in flood and/or damage to your housing, camera and Leak Sentinel. Replace the protective cap immediately after achieving pre-dive testing vacuum. See figure 1 below for a description of the Leak Sentinel V4 parts.

Always use a CR11108 (CR1/3N) battery or equivalent. Please observe the battery polarity. The positive (+) side contact is on the metal casing, the negative (-) contact is on the printed circuit board. Installing the battery with the wrong polarity can damage the circuit and will void the warranty.

Follow the standard pre-dive testing procedure immediately after installation to confirm there is no leak. All units are tested thoroughly prior to shipping. In case your test shows there is a leak, re-check the seal between the Leak Sentinel and the housing. It is the sole responsibility of the user to ensure the tightness between the Leak Sentinel and the housing. Vivid Housings will not be held responsible for any damage that may result from the faulty installation and use of the product. If a problem persists, please do not use the product and contact the manufacturer.

When screwing or unscrewing the protective cap and/or pump cap, always hold the valve body with the opposite hand to ensure the housing body does not loosen from the camera housing, which could cause a camera housing leak.

It is not advisable to dive without a negative vacuum on the camera housing with the Leak Sentinel installed. While diving with a negative vacuum on the housing should not result in any damage, it is advised to always test the water-tightness of the housing and Leak Sentinel prior to diving. After all, peace of mind, knowing the camera housing is secure, is the reason for installing the Leak Sentinel in the first place. One should plan the dive so there is time for pre-dive testing. It may also be noted that many leaks occur in the rinse tank; this is because the o-rings seal better under pressure and there is very little water pressure in a rinse tank. The vacuum causes additional pressure on the o-rings which will help prevent rinse tank floods.

Always perform any test procedures in a dry place. The rubber valve that is pressed to switch the Leak Sentinel on and off, as well as release the vacuum

is not watertight. Any water inside the unit could damage the circuit. Activate the unit and create a vacuum before boarding small boats. The power consumption of the circuit is minimal and the battery capacity is sufficient for at least 100 hours, so there is no need to risk getting the inside of the unit wet by trying to conserve battery power.

2. Warranty

Vivid Housings will repair or replace at it's option any product that proves to be defective in construction or materials within one year from the date of purchase.

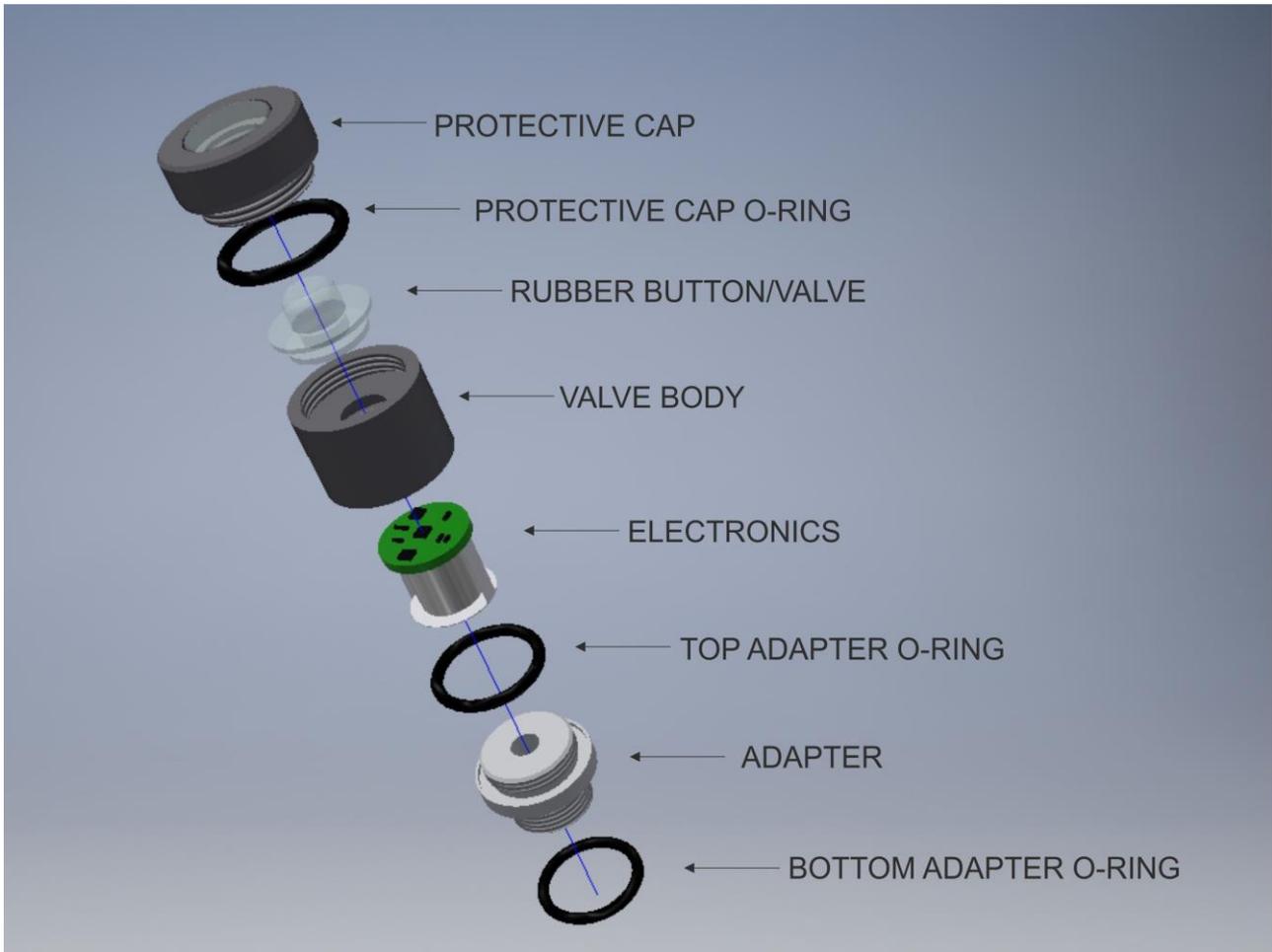
Vivid Housing is not liable for damage to the equipment caused by leakage of water into the housing, nor for loss of data or income that may result from such leakage, or any accident during which Leak Sentinel was in use.

This warranty is void in case of negligent handling of the Leak Sentinel including, but not limited to, physical damage, immersion of the unprotected electronic circuit in water, modifications by other than the manufacturer, and improper care.

There is no express or implied warranty, except as stated above.

The buyer understands and agrees that, because of the nature of this product, he/she uses Leak Sentinel at his/her own risk and agrees to hold Vivid Housing harmless, except as stated above.

3. Identification of parts



4. Installation

Before installation and operation of your Leak Sentinel, please familiarize yourself with the parts by referencing the figure above!

The installation procedure depends on the type of adapter and camera housing. In general, the steps are as follows:

a. Depending on your housing type, remove the lid from the accessory port (Nauticam, Aquatica, Isotta, Hugyfot, Seacam, Nexus, Subal etc.), the bulkhead cap (Sea&Sea), the control gland (Ikelite) or the bulkhead itself (Sea&Sea etc.).

b. Unscrew the adapter from Leak Sentinel's bottom. Be careful not to drop the electronics on the floor, which could cause damage to the adapter. It is

best to hold the Leak Sentinel with the camera housing adapter pointing up to avoid the electronics falling out of the Leak Sentinel.

c. Screw the adapter into the opening in the housing. The adapter has a hexagonal hole on top. Use a 6mm allen wrench to tighten the adapter. You can use Loctite® Threadlocker Blue 242®, or similar product, to secure the adapter more permanently, but that's not mandatory. We advise not to use the RED version of Loctite®. The RED version creates an almost permanent seal.

d. Screw the valve body with the electronics onto the adapter. Tighten snugly by hand.

5. Pre-Dive Procedures and Operation

1. Remove the protective cap by unscrewing the cap in a counter-clockwise motion, being sure to hold the Leak Sentinel body to avoid loosening the Leak Sentinel from the camera housing.
2. Press the translucent button on the rubber valve in a downward motion, until the switch clicks, which can be felt by the finger.
3. The red LED will give one long blink, then will start blinking steadily, indicating the circuit is active. At this time, ambient pressure is measured and memorized by the unit.
4. Detach the tubing from the pump cap. Screw the pump cap into the valve body. Attach the tubing back to the pump cap.
5. Start pumping by pulling in and out on the pump handle, or by simply pressing the button in case you are using the electric pump.
6. The LED should start alternating with a red and green LED light. The red and green alternating LED is indicating that a pressure change is detected and the circuit is active.
7. After the number of strokes needed to achieve the proper vacuum, which depends on the housing volume, the green LED will perform one long blink, then keep blinking steadily. Stop pumping after two consecutive green blinks after the long green blink.
8. Detach the tubing from the pump cap and remove the pump cap.
9. Replace and tighten the protective cap. Be sure the protective cap o-ring is lubricated with a small amount of o-ring grease.
Now, observe the LED. If the green LED still blinks after 15-20 minutes then no leakage is present and the housing is ready for immersion in water. If the green LED stops blinking and the alternating red-green or red LED starts blinking, there is a leak, so it is not safe for any type of immersion in water. If there is a leak, then a procedure for locating and eliminating the cause of the leak should be followed. Be sure and test the camera housing again with the Leak Sentinel after any repairs are made to the camera housing and/or its o-rings.

10. During the dive, be sure to occasionally observe the LED. If the green LED stops blinking and an alternate red/green or red LED starts blinking, this indicates the rise of internal housing pressure and a possible leak. If there is a possible leak, it is advisable to immediately ascend to minimize the risk of flooding. **Be sure to follow all dive safety procedures when ascending!** It is advisable to point the housing port downwards to cause any water in the housing to flow into the port and away from the camera and housing electronics.

Post Dive Procedures

1. After every dive, rinse and dry the valve body along with the camera housing. There is no need to remove the Leak Sentinel from the camera housing to rinse the housing and/or Leak Sentinel. To remove the Leak Sentinel from the housing during rinsing procedures could cause the housing to flood.
2. Remove the protective cap.
3. Switch the circuit off, pressing the rubber valve button.
4. Gently move the rubber button sideways to equalize the pressure. You will hear the air hissing into the housing as the pressure within the camera housing equalizes with the outside air pressure. When the air pressure starts to equalize with outside pressure the red LED will start blinking. Be careful not to pull the bottom rubber disc from the other side of the lid; if this happens, remove the upper lid and pull the lower disc through the hole, then reinstall the upper cover.
5. Replace the protective cap, being sure the o-ring is greased and clean of debris.

6. Special functions

- **Temperature compensation**

The Leak Sentinel V5 has temperature compensation. Temperature compensation means that the circuit constantly monitors temperature changes and compensates for the pressure changes accordingly. This feature eliminates the possibility of false alarms in situations where the housing is set up in a cold environment and used in a warmer environment. No user action for this feature is required; this feature is always on when the circuit is active.

- **Overnight function**

The Leak Sentinel V5 offers the possibility of setting up the housing in advance. For instance one might want to set the housing up the night before the dive. To do so, just switch the Leak Sentinel off by pressing the rubber

valve on/off button without equalizing the pressure. When the circuit is switched on again, by again pressing the rubber valve on/off button the Leak Sentinel will automatically detect the vacuum, taking the present pressure as a reference, and keep monitoring by blinking green after a brief red blink.

- **Low battery indication**

The Leak Sentinel V5 will indicate if the battery is low. If the red LED starts flashing rapidly after the circuit is switched on, the battery should be changed soon since the battery is exhausted and may shortly malfunction. Although it is possible that the battery could last for another hour or two, it is recommended to change the battery as soon as possible.

- **Reset function**

The circuit can be reset at any time by pressing the rubber valve button for more than 3 seconds.

7. Replacing the battery

Always use a CR11108 (CR1/3N) or equivalent lithium 3V battery. The battery life with the circuit switched on is more than 100 hours. Always switch the circuit off when not in use.

To replace the battery, unscrew the valve body from the adapter. With clean hands, take the electronics out and replace the battery with a new one. The positive (+) pole of the battery must face the outer metal enclosure, the negative (-) pole must face the printed circuit board.

Apply a thin film of silicone grease to the o-ring. If necessary, clean all the parts, except the printed circuit board, with a soft lintless cloth. Put the printed circuit back into the valve body. Screw the valve body back onto the adapter.

FUNCTION	USER ACTION/DESCRIPTION	LED INDICATION
Start/Power on	Short press on the rubber valve button	1 second red flash>steady red flashing
Low battery	After turing the unit on	1 second red flash>fast red flashing
Pressure change	Pumping/Leak alarm	Alternate red/green flashing
Vacuum hold	Monitoring	Steady green flashing