



Non ROV Device (Float), Design Document

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The Mosasaurus Vertical Profiling Float contains an integrated buoyancy engine. This innovative system consists of various components, including an ESP32 microcontroller, a DRV8871 motor driver, a Bar 30 depth sensor, a 5-volt regulator, a piston, a 12-volt battery pack, and six 10-milliliter syringes. The float utilizes rechargeable NiMH AA batteries to provide 12-volt. Due to the float's full-load amp being less than 2A (1.1A), a 2A fuse is used.

To prevent overpressure, the lid pops off when pressure is higher on the inside. The ESP32 microcontroller serves as the control center of our vertical profiling float. It is responsible for establishing a connection with a computer and executing precise commands to control the piston's movement. By pushing or pulling the syringe, the piston enables us to draw water into the float or drain it out. This mechanism can provide a 0.6 Newton difference to the vertical profiling float to influence its buoyancy, allowing it to ascend or descend in the pool as needed. Additionally, we have installed steel bars on both sides of the float, on which we can place different small steel weights to regulate the balance of the float.

This version differs from the old one in that we've added two limit switches. Firstly, in the old version, we used a timer to make the float rise and fall, but in actual testing, we found that water pressure issues caused inaccurate timing. Secondly, without limit switches, we couldn't control the push rod distance; in other words, there was a risk of the linear actuator breaking. Therefore, we added limit switches to prevent this from happening.



Fig. 1 the float



Fig 2. Ampere range

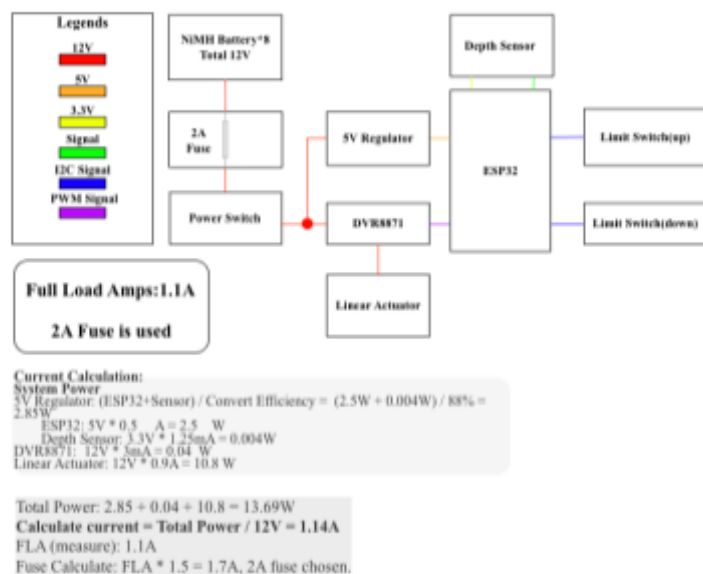


Fig 3. SID of Float