

Vertical Float Design Document

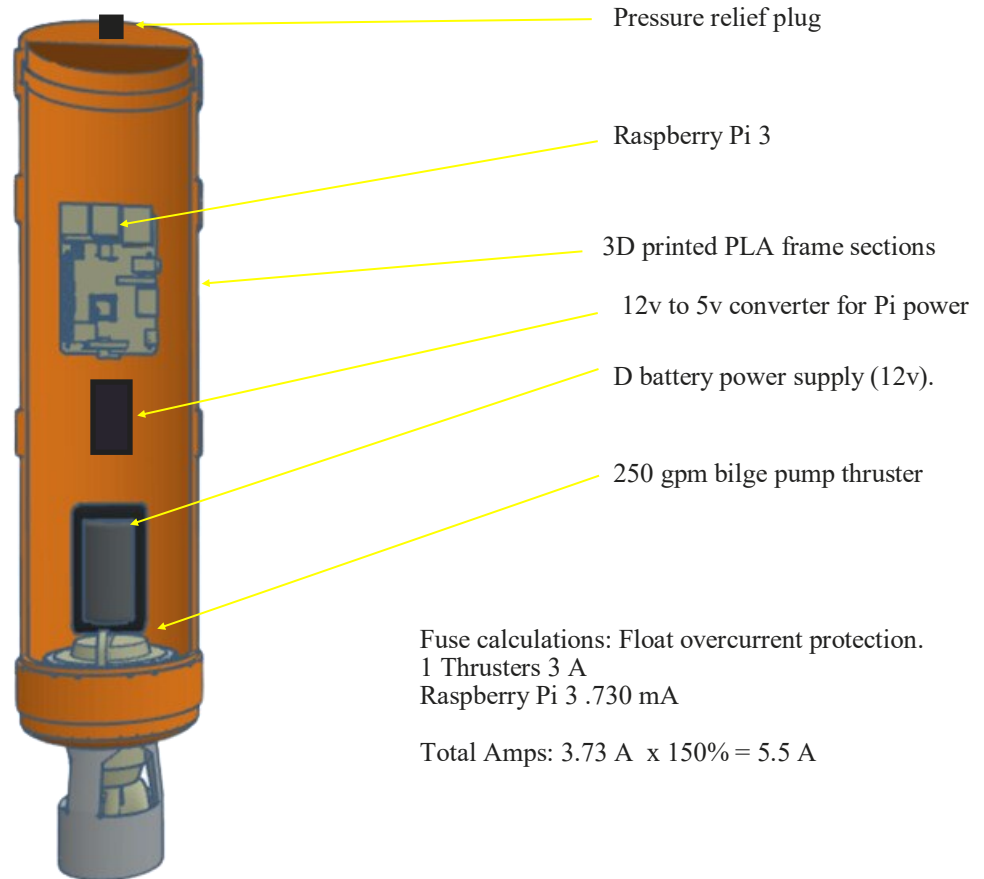
Safety Features:

- 7 amp inline fuse
- Pressure relief plug
- Waterproofed enclosed casing
- Shrouded exterior thruster

Underwater Research
Robotics Company
500 East River St.
Alpena, MI 49707



Vertical Float Design



Fuse calculations: Float overcurrent protection.
1 Thrusters 3 A
Raspberry Pi 3 .730 mA

Total Amps: $3.73 \text{ A} \times 150\% = 5.5 \text{ A}$

Vertical Profiling Float Thruster Controlled Buoyance

Our team created two vertical profiling float devices. Both can take a vertical profile of the body of water they are placed in. We made a thruster-controlled float first, then the buoyance-controlled float. Both work autonomously to collect data and transfer the collected data wirelessly to an assigned shore station. The design team started developing the hardware and software to drive the float. While the team was developing the components, we started drawing the float and how it would all fit together. The float needed to be designed to be neutrally buoyant to work. We calculated the tube size and how much water it would display. The float needed to weigh about 13 kg to match its displacement volume. Once we had the number, we created the thruster vertical sampling float.

The float is designed with a raspberry pi 3 as the main controller. The float is powered by eight D batteries connected in series. This provides a total voltage of 12v. We chose the D batteries for two purposes. One was for a sustained power sources that we could fit into the interior of the float and the other reason was added weight.