Pensacola Catholic High School Crubotics
Non-ROV Device Design
“Ecumenical Ensign”

The Crubotics Non-ROV floatation device makes use of an outside tube (Figure 1) constructed with ABS and PVC pipe, as well as an internal endoskeleton (Figure 2) that houses the electronic and subversive components.

The float functions by taking in the water surrounding itself and storing it in an internal saline bag. The circuit that allows this is powered by three 9V alkaline batteries connected in parallel such that the power supply voltage is 9V and the current is 6A.

The power source is connected within 5 cm to a 7.5A blade mini-fuse. Following the fuse is an IP68 waterproof circuit switch. The power supply is connected to a terminal block that allows for power to be distributed to two self-priming water pumps and two electric solenoid valves, a 4-channel relay terminal, and an Arduino Uno board.

The Arduino Uno is connected to and directs power to a bluetooth transmitter and a pressure sensor. This circuit lies on an acrylic board with attached rings to fit it to the tubular frame. Each pump is connected to a corresponding solenoid valve via a rubber hose, acting as a pair.

Both pump-solenoid pairs are connected to an internal saline bag. The acrylic board is also attached to the bottom PVC cleanout plug (end-cap), allowing the float internals to be detached when the end cap is disconnected. Two hoses are attached to the bottom end cap, allowing for water to flow in and out of the device. Also attached to the end cap is a rubber plug for pressure relief, a protruding cable that leads to the side-attached circuit switch, and a pressure sensor encapsulated in a balloon to measure water pressure.

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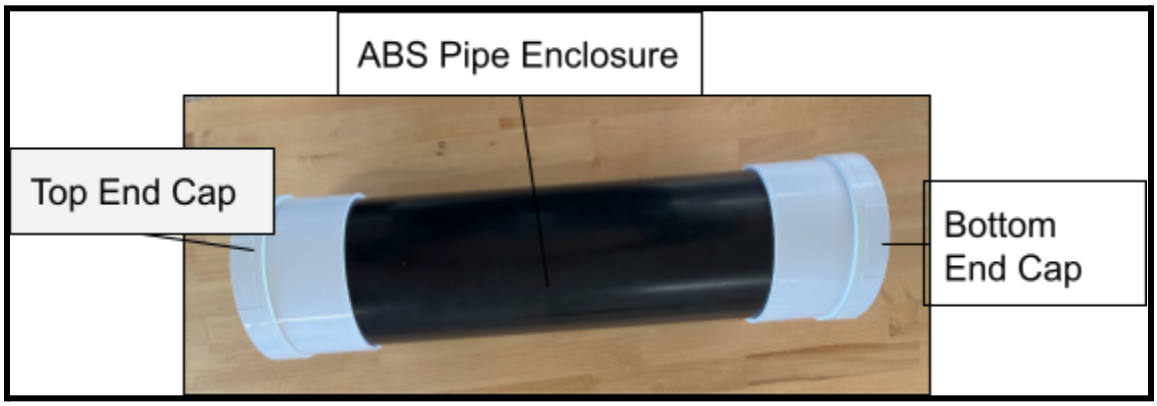

Figure 1 - Exoskeleton of Crubotics NON-ROV Device

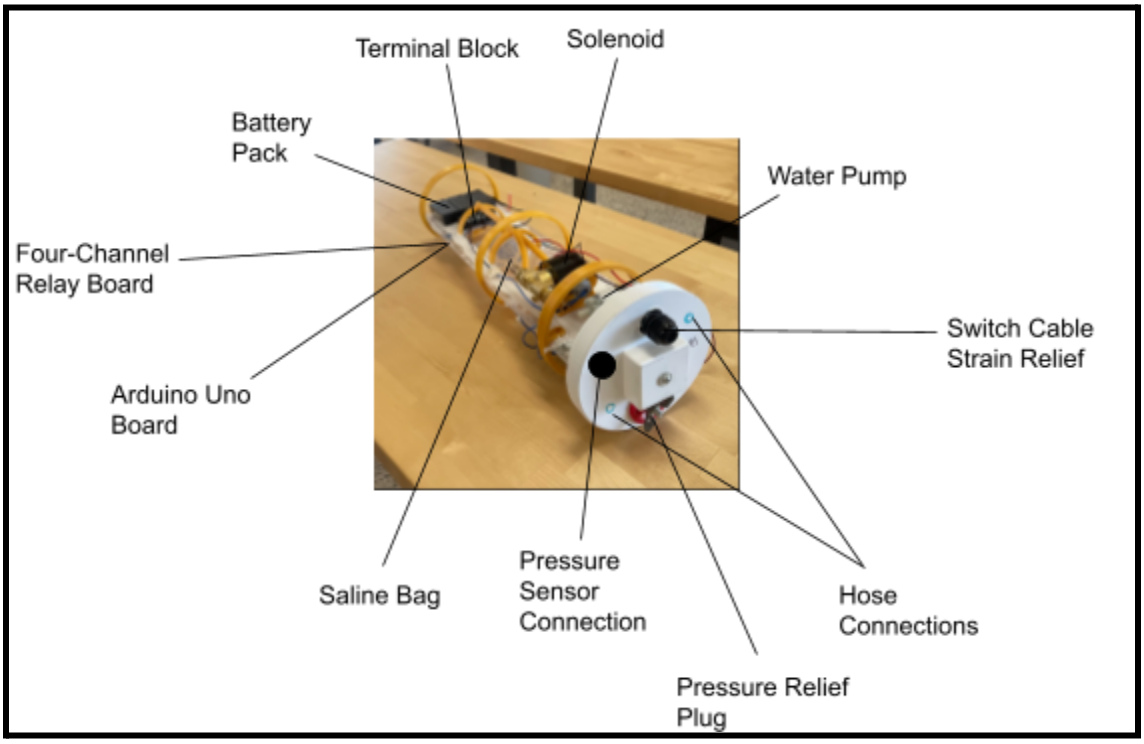

Figure 2 - Endoskeleton of Crubotics Non-ROV Device