

Phoenix Robotics Non-ROV Device Design: Vertical Profiler Type 2

Device Description

The outer shell of the device is a 3-inch PVC tube that is approximately thirty-nine centimeters tall and sixteen centimeters wide. On the lower portion of the device, there are weights which make it slightly negatively buoyant. There is a wire mesh shroud on the bottom, protecting individuals from motor blades. A piece of quarter inch acrylic was laser cut in-house to have two holes for wires to run from an enclosed electronics compartment to the motor. Inside of the PVC shell fifteen centimeters from the end of the tube, the acrylic piece is sealed using putty epoxy, 3M Marine Grade 5200 Sealant, and wax. This creates a waterproof enclosure when a rubber PVC cap is on the end. Inside the enclosure, there is a 12V AA battery pack (8 AA batteries) which powers an Arduino board which runs a timer code which sends signals to the Cytron control board, telling when to power on and turn off a 1250 GPH bilge pump motor.

Completing the Profiles

Once the ROV has deployed the device naturally it will sink because it is negatively buoyant. After the device descends, the Arduino works as a timer where it sends a signal to the Cytron control board to turn on the motor, propelling the device to the surface. The motor creates torque, causing the whole device to spin clockwise. The black ABS plastic is shaped around the center of the PVC shell in a screw shape, which is there to naturally create propulsion from the spinning tendencies of the device.



Figure 1: Vertical Profiler Type 2