CITYUHK
CityU Underwater Robotics
FRONTEER ROV

Buoyancy Engine Design

Name: Buoyancy Engine

Dimension (DxH): 175 mm x 500 mm

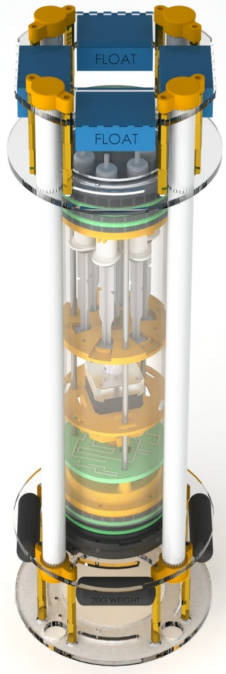
Weight: 3.17kg

Power Supply: Powered from A23 batteries*8 via internal module

Design Rationale:

The Buoyancy Engine is designed to perform vertrical profiles automously for specific duration, which is done by buoyancy adjusting.

The linear motion system is installed on the top of the engine as shown in figure. Syringes are installed vertically, the engine will be able to flow and sink corresponding to the buoyancy change. Electronics parts are stored at the bottom part of the engine, which could be detached for quick maintenance.



How Buoyancy Engine works:

The buoyancy engine is designed to operate by density changing by using syringes located on the top of the engine which is equipped with external floats and weights for initial buoyancy.

The engine becomes denser than the surrounding fluid when the syringes suck in water, the engine weight becomes larger than buoyancy force, then the engine sinks. Likewise, when syringes displace water, the engine becomes less dense than the surrounding fluid, initial buoyancy is resumed, and the engine flows to the water surface.

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