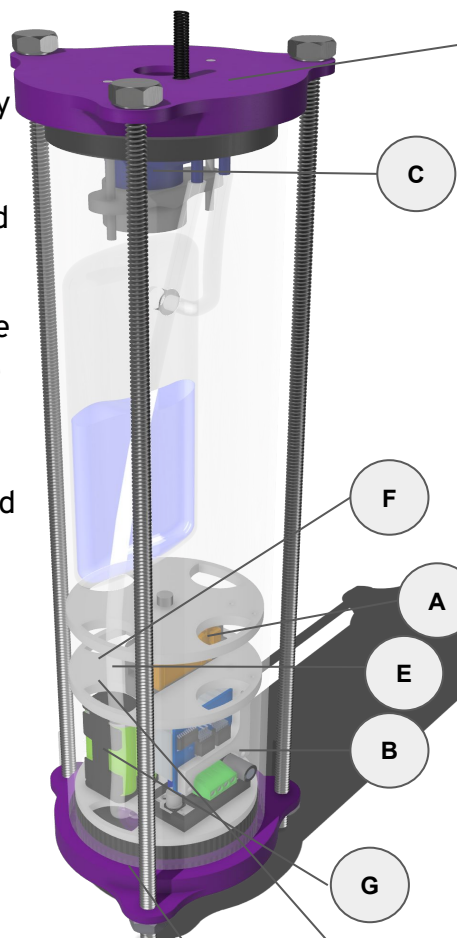


Non-ROV Float Design

Float is a free-floating, self-contained buoyancy engine developed by Team Jalpari to fulfill the MATE ROV 2025 non-ROV task requirements. It is designed to autonomously adjust and maintain a target depth between **2 to 3 meters**, in compliance with competition guidelines. The device collects and stores depth data over a 50-second period and is fully independent of the main ROV system.

Upon activation, FLOAT begins measuring ambient pressure using a Blue Robotics Bar30 pressure sensor located at the **bottom of the device**. It also includes an integrated pressure release valve positioned on the top cap of the enclosure. It safely vents excess pressure caused by trapped air or heat, protecting the housing and seals during operation. The sensor's placement ensures consistent, accurate readings by minimizing the influence of internal pressure pockets and movement at the water's surface.

The pressure data is sampled every **5 seconds for 50 seconds**, providing **10 total readings** at depth. FLOAT is programmed to stabilize around **2.5 meters**, holding position via a peristaltic ballast system.



Pressure Release Valve
Ø25mm



Ceramic Fuse



Bar 30

Pt no.	Component	Function
A	TTGO LoRa32	Microcontroller handling timing, motor control, and pressure logging
B	BTS7960 Motor Driver	Controls pump direction and speed for water intake/outtake
C	Peristaltic Pump	Allows reversible flow for buoyancy control; no internal valves to jam
D	Bar30 Pressure Sensor	Continuously measures depth based on water pressure (Resolution: ±2mm)
E	L7805 Voltage Regulator	Steps down 12V input to 5V for safe microcontroller operation
F	XL6009 Boost Converter	Steps up 12V to 20V to power the pump effectively
G	8x AA Alkaline Batteries	Connected in series to provide 12V at 1.5A
H	Ceramic Cartridge Fuses	Three 0.75A fuses provide short-circuit and overcurrent protection

Non-ROV Photosphere Design

Photosphere is a self-contained underwater imaging module developed by Team Jalpari to fulfill the imaging-focused non-ROV task for MATE ROV 2025. It captures immersive environmental visuals during mission tasks using a compact panoramic camera setup designed to operate passively and safely in underwater environments.

Photosphere uses the Insta360 Air camera to acquire spherical images, which can be stitched together post-mission for analysis and documentation. Since the camera is Android-compatible, it interfaces with a **Raspberry Pi** running **Emteria OS**, selected specifically to provide Android support not available on standard Raspberry Pi operating systems.

The camera connects via a **USB Micro to USB A** adapter. The Raspberry Pi is housed inside a waterproof enclosure and powered through an **IP68-rated connector**, which also carries **Ethernet** lines for data transmission. Ethernet allows data transfer to the ground station, where it links to a router for access or download.



Component	Function
Insta360 Air Camera	Captures 360° imagery for post-mission stitching and analysis
Raspberry Pi (with Emteria OS)	Android-compatible host device for camera control and data handling
USB Adapter (Micro to USB A)	Allows camera connection to the Raspberry Pi
IP68 Waterproof Connector	Transfers power and Ethernet to/from the sealed electronics enclosure
Ethernet Output	Enables wired connection to ground station router for data transfer
Dual Hemisphere Domes	Provides waterproof optical housing with full visibility
3D Printed Resin-Cast Ring	Holds domes in place and adds a gripping interface for the ROV