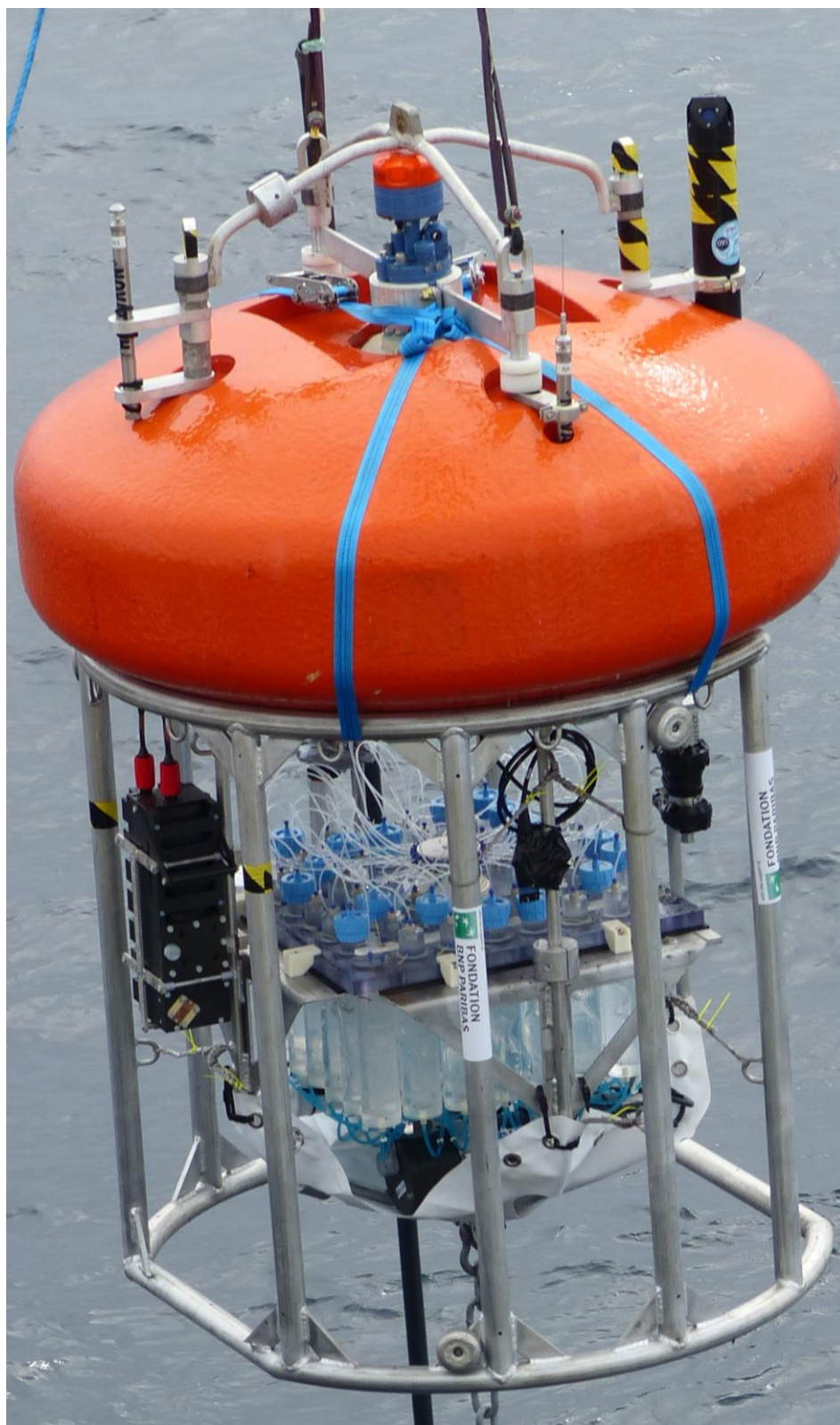


RAS500 MACLANE



RAS-500 Specifications

Dimensions	Height	128 cm
	Width	73 cm
	Length (body)	73 cm
Weight	In air, sample containers empty	110 kg (240 lbs)
	In air, sample containers filled	148 kg (325 lbs)
	In water	57 kg (125 lbs)
Multi-port Valve	Material (50 Ports)	HYDEX valve stators
	Drive	High torque stepper motor
	Gear head	100:1 planetary
	Positioning	Optical sensor with slotted disk
Sample Bags (48)	Material	Acrylic with Polycarbonate caps
Pump	Flow rate / Flow rate error	75 ml/min fixed / rate error $\pm 3\%$ average
	Type	Gear pump; not effected by dilute acid
	Drive	Brushless 3 phase DC motor
Controller	Housing Material	Aluminum, 6061-T6 hardcoat anodized
	Power Supply	31.5 VDC Alkaline battery pack
	Current consumption	3500 mAh (1 year deployment)
	Communications	Serial (RS-232)
Frame	Material	316 electro-polished stainless steel (titanium option available)
	Structure & bridle configuration	In-line mooring, weldment, 4 in-line
	Frame & bridle eyes	19 mm diameter, insulated
	Max. in-line tension	2,300 Kg (5,000 lbs)
Operation Conditions	Maximum depth	5,500 meters
	Min. / Max deployment time	10 minutes per sample / 18 months
	Operating temperature	0 to 50°C (Electronics tested to -10°C)

RAS-500 Components

The RAS-500 components are further described below.

Component	Description
Controller Housing	The controller housing is a sealed pressure housing tested to a depth of 5,500 meters. The housing contains a battery pack, a micro-controller, a 3-phase pump-motor driver, and a stepper-motor driver for the multi-port valve.
Communications	The communication link between the RAS-500 and a PC is a standard, 3-wire, full duplex, RS-232 connection.
Pump Assembly	A positive displacement gear pump draws seawater through small disc filters in the sample containers at a fixed rate of 75 ml/min. A brushless DC 3-phase servo-motor is magnetically coupled to the pump head. The motor is in a pressure compensated housing filled with Dow Corning 200 fluid (5 cSt.). Hall-effect encoders provide feedback to control shaft speed.
Multi-port Valve	A multi-port valve directs the seawater to the sample bags. The multi-port valve can be programmed to flush old water from the tubes and valve before each sample is collected to help prevent sample contamination and reduce accumulated bio-fouling. A small 25 mm disc filter with a pore size from 3 to 20 microns is placed in-line with the water port to protect the valve from potential damage by large particles.
Sample Bags	Each sample bag is connected in series between the intake head (top half of valve) and the exhaust head (lower half of valve). The pump draws water out of the sample container in which the collapsed sample bag is mounted. This pumping creates a pressure gradient that drives the flow of ambient seawater through the intake and into the sample bag. After each sample is taken, the multi-port valve returns to the Home Port (0), sealing the sample in the bag.