electronics_assembly

The Electronics Assembly consists the watertight enclosure with end cap mounted sensors, indicators, and penetrators, and the internal electronic and power components (i.e., assembled PCB and batteries). The assembly is secured to the frame's Base Plate with watertight enclosure clamps.

[Note: Alternate Version] The instructions and files here are for the 100mm (4-inch) diameter enclosure. Assembly for projects using a 130mm (5-inch) tube

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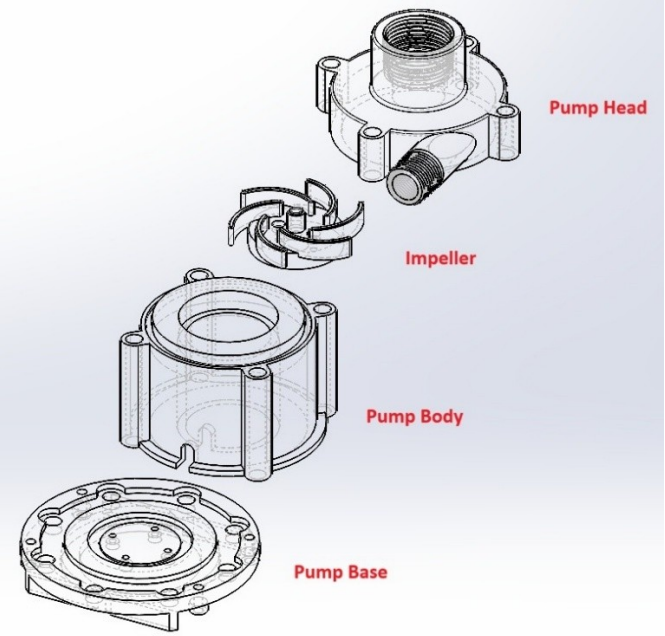
<td> 
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<tr>
<td>Pump Unit - exploded view
(Not shown: power cord & O-ring)</td>
<td>Pump Unit 3D printed parts</td>
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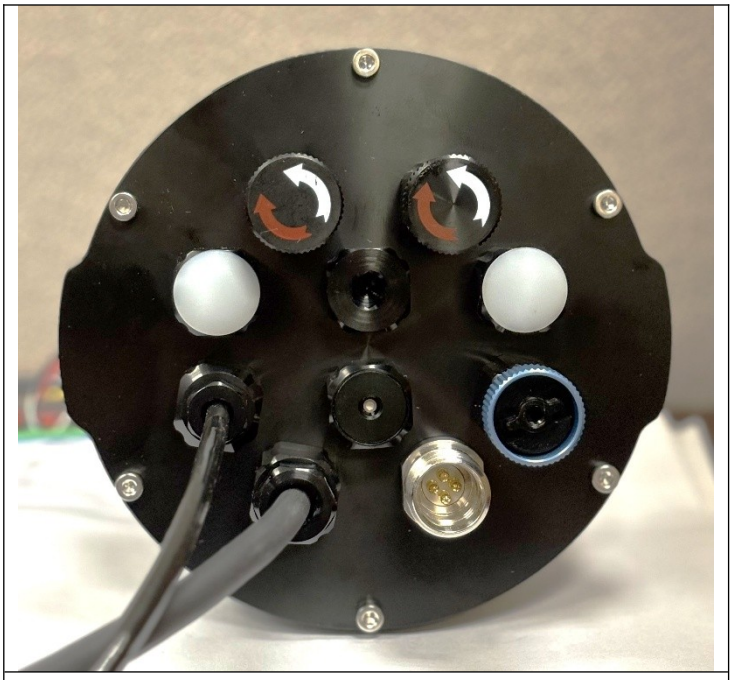
Assembly *(approximate time: 2 hours)**:***

[Recommended tools and supplies: Blue Robotics WetLink Bulkhead Wrench, adjustable wrench, bench vise, wire strippers, ratcheting crimping tool for JST connectors]

1. Mount the endcaps to the O-ring sealing flanges using the included face seal O-ring and end cap screws.
2. Prepare each wire by trimming it to ≈ 10cm, stripping the end, and crimping on a female pin connector.
3. Prepare Flow sensor wire by removing wires connected to the flow sensor module and replacing it with ≈ 65cm of PUR Subsea 3 conductor cable.

Note: The assembled 3-pin and 4-pin connectors will not fit through the M10 end cap holes. Therefore, it is recommended not to insert the wires into the plastic body until the component or penetrators has been mounted to the end cap.

4. Mount the following components to the M10 x10 hole end cap: WetLink penetrators for the motor and flow sensor, Bar30 pressure sensor, red and green LEDs, two switches, Cobalt bulkhead connector (USB), pressure relief valve, and a blank penetrator.



M10 x10 hole end cap with mounted components.

5. Insert each wire into the appropriate JST connector body.

JST XH Connector Wiring Guide						
						
ESC	Switch, T_Switch	Red LED	Green LED	Flow Sensor	Bar30	USB

6. Plug in the following components to the front of the Assembled Mainboard: red and green LEDS, two switches, Bar30 Pressure sensor, Cobalt connector wires (USB connection), Flow sensor, and ESC connector.
7. Insert the ESC power leads (thick red and black wires) into the front screw terminal block, and tighten down.
8. Insert the three banana connector male leads from the E200 motor into the matching female leads from the ESC.
9. Screw four M3x60mm brass hex spacers into mounting holes in the sealing flange.
10. Solder the banana connectors to the three conductors of the motor cable. Then apply heat shrink tubing to the connection.
11. Attach the motor to Pump Base with four M3 x 8mm screws.
12. Place the Pump Body over the motor.
13. Attach impeller to motor with two M3 x 8mm screws.
14. Insert O-ring into groove in Pump Body.
15. Seat the Pump Head over the Impeller and onto Pump Body.
16. Secure Pump Head to Pump Base with four sets of ¼ inch screws, washers, and wingnuts.

Bill of Materials (BOM)				
#	*Description*	*Cost (USD)*	*Qty*	*Supplier*
1	Watertight enclosure tube, 100 mm dia., aluminum	$410.00	1	Blue Robotics
2	O-ring sealing flange, 100 mm dia.	$48.00	2	Blue Robotics
3	End cap, blank, 100 mm dia., aluminum	$32.00	1	Blue Robotics
4	End cap, 10 x M10 holes, 100 mm dia., aluminum	$40.00	1	Blue Robotics
5	Pressure relief valve	$30.00	1	Blue Robotics
6	WetLink penetrator, blank, M10 thread	$6.00	1	Blue Robotics
7	Switch	$26.00	2	Blue Robotics
8	Subsea LED indicator, red	$16.00	1	Blue Robotics
9	Subsea LED indicator, green	$16.00	1	Blue Robotics
10	Bar30 pressure sensor	$85.00	1	Blue Robotics
11	Cobalt series bulkhead connector, 4-pin	$55.00	1	Blue Trail Engineering
12	JST XH-2P connector plug, female (2-pin)	$0.03	4	Amazon.com
13	JST XH-4P connector plug, female (4-pin)	$0.03	2	Amazon.com
14	Brass hex standoff spacer, M3 x 12mm +6mm, male to female	$0.45	4	Amazon.com
15	Brass hex standoff spacer, M3 x 30mm +6mm, male to female	$0.40	4	Amazon.com
16	Brass hex standoff spacer, M3 x 50mm +6mm, male to female	$0.65	8	Amazon.com
17	Brass hex standoff spacer, M3 x 60mm +6mm, male to female	$0.50	8	Amazon.com
18	Brass screws, M3 x 6mm, Phillips head	$0.02	4	Amazon.com
19	22 AWG silicone insulated wire	$13.69	1	Amazon.com
20	Crimp connectors			
21	USB-A to Micro USB cable, 15cm, 90 degrees angled up	$14.00	1	Amazon.com
22	Battery Holder Tube		1	3D Printed (PLA)
23	Batteries, c-cell	$1.00	14	Amazon.com
24	Flow Sensor Assembly	$9.95	1	Amazon.com
25	PUR Subsea Cable – Lumen/Gripper Cable (3 conductor, 22 AWG)	$16.00	1	Blue Robotics
26	M200 Motor	185.00	1	Blue Robotics
27	Pump Body, Base, Head, Impeller		1	3D Printed (Resin)
Total Cost: $1,005.72				