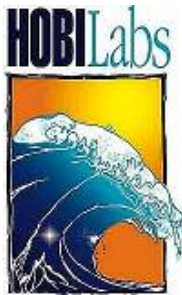


HydroPack Submersible Battery Pack

USER'S MANUAL



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1. INTRODUCTION

HydroPack is a submersible battery pack that uses of commonly available D cells for high-power or long-endurance oceanographic deployments. 20 cells are wired in two groups of 10 cells each, providing a nominal output of 15V and capacity of up to 36Ahr (see further notes on capacity below). Diodes prevent harmful interactions between the cell groups, and also allow multiple HydroPacks to be safely paralleled (with appropriate cables).

The output is protected with a 2.5A resettable fuse. In the event of an overload or short circuit, the fuse will activate and reduce the current to a low level. Once the fault condition is removed, the fuse will return to its normal state in a short time.

The HydroPack case is made from type 316 stainless steel to resist corrosion and safely operate at 800 meters depth. It is also equipped with a pressure relief valve that limits internal pressure build-up in case of a fault condition such as a water leak or gas generation by the batteries.

2. OPERATION

2.1. CONNECTING

The HydroPack uses an Impulse or SubConn MCBH2F connector. Mate to this using a MCIL2M inline connector. Pin 1 is positive, and pin 2 is the return.

2.2. REPLACING BATTERIES

Remove the endcap by inserting a 3/16" hex wrench into the bolt head in the center of the end cap (the off-center bolt is the pressure relief valve), and turning it counter clockwise until the end cap is free.

Remove the old batteries, and insert new ones. Always replace the entire set of batteries at once. Mixing batteries of different type, or



different states of

charge, can lead to battery leakage and failure. Orient all batteries with their positive ("button") ends up.



Inspect the o-rings on the end cap, and the inner surface of the case where the o-rings seal, to be sure they are free of damage and contamination. If the o-rings may have become dirty during handling, remove them from their grooves and clean both them and the grooves. Use care to avoid nicking either the o-rings or their grooves. If

the o-rings are dry, apply a light coating of an appropriate lubricant such as Dow Corning 55 or Parker O-Lube.



Position the end cap over the open end of the case, with the large springs centered on the battery tops, and the small springs on posts positioned to contact the posts between the batteries. Without rotating the cap, place it on the end of the case.

While holding the cap to prevent it from rotating, fully tighten the center bolt with the 3/16" hex wrench.

2.3. ENERGY CAPACITY

The actual energy capacity of alkaline batteries varies greatly depending on how heavily they are loaded, whether the load is continuous or intermittent, the temperature at which they are discharged, and the minimum voltage suitable for the load. It is difficult to accurately model all these effects, so one should always estimate conservatively, and if possible run tests under realistic conditions.

The highest-capacity alkaline D-cells currently available claim capacities of 18 Ahr, based on very favorable test conditions: room temperature, a light load of 25mA, and an ending voltage of 0.8V per cell. Because the HydroPack contains 2 paralleled groups of 10 cells, this corresponds to totals of 36 Ahr and about 7.5V (0.8V x 10 cells minus one diode voltage drop).

The following table uses figures derived from the data sheet for Energizer type X95 (marketed as "e2") D cells. They are based on an ending voltage of 1.05 V/cell (10V output from the HydroPack), and continuous room-temperature discharge. The capacity can be expected to drop at lower temperatures, to about 1/2 of these values at 0 C.

Load (mA)	Capacity (Ahr)
20	30
100	28
200	26
400	22
600	18
800	16
1000	14

For a given current load, especially for higher loads, intermittent use can provide significantly higher total capacity than continuous use. For example, at a current load of 1 A, reducing the duty cycle to 2 minutes per hour provides roughly 50% more total charge than continuous use. The discrepancy between intermittent and continuous use decreases at lower loads; at 50 mA or less there is no significant difference.

3. SPECIFICATIONS

- Diameter: 9 cm (3.5")
- Length: 37 cm (14.5"), not including connector;
- Materials: 316 stainless steel and acetal copolymer
- Weight, with batteries: 5.3 kg dry, 2.5 kg submerged
- Protective fuse: 2.5 A (slow-blow) self-resetting fuse
- Cell capacity: 20 D cells
- Battery configuration: 2 series strings of 10 cells, each with a high-efficiency diode to prevent reverse current.
- Output voltage: 16V max (with fresh alkaline cells)
- Connector: MCBH2F, 2-pin female.
 - Pin 1 = positive voltage out
 - Pin 2 = voltage return
- O-rings: 2-151 (inner), 2-235 (outer)

4. CUSTOMER SERVICE

If your equipment needs to be returned to HOBI Labs for repair, maintenance or calibration, contact HOBI Labs customer service (service@hobilabs.com or call the main office) with the following information at hand:

- Instrument Serial Number
- Reason for return
- Method of return (Federal Express, United Parcel Service, etc.)
- Point of contact
- Date needed (standard turnaround is three weeks)
- Delivery address

HOBI Labs will notify you of estimated cost and turnaround time as soon as possible after receiving the equipment. Repairs will not be started until you approve the cost estimate and turnaround time.

For technical support or questions about your instrument, contact our technical support department at support@hobilabs.com or call our main office.