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MST
 Mazin Submersible Technology, Inc

Hands-free Leg-Mounted Underwater Propulsion System

The Jetboots Diver Propulsion System (J-DPS), manufactured by Mazin Submersible Technology, Inc. (henceforth MST) is a modular, hands-free diver propulsion system consists of three main components.

1. Two leg-mounted electric thrusters that strap on to the divers lower leg
2. A waist mounted control box that controls the thrust of the leg units
3. A battery

In the J-DPS system all three of these major components are modular and interchangeable – a new piece can easily be swapped for a damaged one to keep the system operational. The J-DPS system is covered by US patent #6,823,813.

Each unit comes with an operation and safety manual and records of performance test results.

Leg Units

The leg units are the heart of the J-DPS system. Designed to be comfortable, powerful, and reliable they are extremely light (~2.5 lbs in air) yet provide 25 lbs of thrust each. Each is plugged into the control box using robust wet-pluggable connectors. The propeller, the oil-filled rotary shaft seal, and the neoprene leg sheath are easily replaced by the end user. The user may choose either a matte grey or black finish.



Figure 1: J-DPS Thruster

| | <i>30 V 16 Ah Lithium Polymer Battery</i> | <i>30 V 32 Ah Lithium Polymer Battery</i> |
|--|---|---|
| Thrust | 0-50 lbs (0-23 kg) | 0-50 lbs (0-23 kg) |
| Top Speed | 3.5-5 mpg (5.6-8 kph) | 3.5-5 mpg (5.6-8 kph) |
| Battery Life at 75% Throttle | 42 minutes | 88 minutes |
| System Weight | 17 lbs (7.7 kg) | 23 lbs (10.5 kg) |
| Battery Size | Cylinder, 3.75" Diameter, 14.5" Long | Cylinder, 3.75" Diameter, 28.5" Long |
| Depth Rating | 300' (Deeper Available) | 300' (Deeper Available) |
| U.S. Price, including battery, charger, and hard case | \$8500 | \$9700 |



Figure 2: Close up of Propeller and Seal

Control Box

The control box, mounted on or near the diver's waist, manages the speed of the unit using a rotary control knob. It also contains an indicator light giving the approximate charge status of the battery. The user may choose a matte grey or black finish and a round or lever style knob. The unit is available without the engraved logo upon request.



Figure 3: Control Box with level-style knob

Rechargeable Battery with Charger and Waterproof Case

For demanding applications such as underwater diver propulsion a powerful battery is required. One of the best currently available rechargeable battery technologies is lithium polymer (LiPo). These batteries require a little more care in charging than nickel metal hydride (NiMH) but provide over three times the energy per gram.

The standard lithium polymer battery comes in two sizes, a 29.6 Volt, 16 Ah pack that is 3.75" in diameter and 14.5" long, and a 29.6 Volt, 32 Ah version that is 3.75" in diameter and 28.5" long. The smaller version lasts over 30 minutes at full throttle, and the larger version lasts over an hour at full throttle. The batteries weigh either 8 or 16 lbs in air, but they are only slightly negative (around -1 to -3 lbs) in salt water. The packs include a protection board featuring over-charge, over-discharge, and over-current protection. A smart charger (110/220 Volt) and balancer are included. The packs have been UN 3090 tested and may be shipped on cargo aircraft.

These batteries are rated for 500 charge and discharge cycles. The user may choose either a matte grey or black finish for the battery cylinder.



Disposable Battery and Waterproof Case

For missions requiring the longest possible battery life disposable lithium primary cells are the best choice. However, these cells are not designed to sustain high discharge currents, so the pack must be built large enough to handle the J-DPS current requirements. The end result is a large battery, but one that will last over three and a half hours.

Our disposable battery is a 24 Volt, 100 Ah lithium primary pack. The pack itself is a cylinder, 19" long, with a diameter of 5.25", and a weight of 18.5 lbs. It is enclosed in a watertight aluminum cylinder, approximately 20" long and 5.5" in diameter. The battery has a negative buoyancy of around -6 lbs. These packs have an extraordinary shelf life of over 5 years. The user may choose either a matte grey or black finish for the battery cylinder. These batteries are UN 3090 tested and may be shipped on cargo aircraft as a class 9 hazardous material.

MST, Inc. is glad to work with you to customize the system for your specific requirements. Please contact us at sales@jetboots.com for more information.

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