

"Megumi" Abyssal Underwater Operations Module

Developed for the "Megumi" Diving Suit, the Abyssal Underwater Operations Module (AUOM) is engineered to facilitate deep underwater operations with unparalleled safety and efficiency. The module made its debut in the market in YE 45.



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History and Background

The Abyssal Underwater Operations Module was conceived alongside the Megumi Diving Suit as a response to a near-tragic incident involving a diver in Rufusland. The incident raised concerns about the limitations of existing diving equipment, prompting Ryu Keiretsu to develop a more advanced, safer alternative. The module was designed by a specialized team within Ryu Heavy Industries in YE 45. The team focused on creating a module that would seamlessly integrate with the Megumi Diving Suit, enhancing its capabilities while maintaining user-friendly interfaces. Several prototypes were developed and rigorously tested before the final design was approved for mass production.

General Information

This section provides an overview of the Abyssal Underwater Operations Module.

Abyssal Underwater Operations Module	
YE Production Began	YE 45
Designers	Ryu Heavy Industries
Manufacturer	Ryu Heavy Industries

Abyssal Underwater Operations Module	
Nomenclature	RHI-G7-1A
Used By	Ryu Keiretsu, Independent
Damage Rating	Tier 2
Availability	Mass Production
Price	1,000 KS

Appearance

The Abyssal Underwater Operations Module resembles an armored, high-tech backpack. It covers the entire back of an average-sized humanoid and is designed to blend seamlessly with the Megumi Diving Suit. The module is primarily colored in deep ocean blue with silver accents, although customization options are available.

Dimensions:

Length	1.2 meters
Width	0.7 meters
Height	0.7 meters
Weight	50 kilograms

Subsystems

The Abyssal Module is a marvel of engineering, featuring multiple subsystems designed to operate both independently and in concert with each other.

Skin Materials

The module's exterior is made [Durandium Alloy](#) based laminate nanocomposite pressure shell and [Kinugoshi-ko](#) outer layer. designed for high-pressure resistance and durability. This material is also compatible with ["Megumi" Diving Suit](#).

Life Support Systems

Located below the main power system, the oxygen generation and storage unit employs electrolysis to separate oxygen from water, storing it in high-pressure tanks for later use. Located to the sides of the main power system, these tanks ensures a constant, renewable supply of breathable air. Complementing this is a set of CO2 scrubbers that remove carbon dioxide from the air, preventing the buildup of toxic gases within the suit.

The module's life support system also purifies local water and provides it to the diving suit to sustain the

biological needs of the user. Water vapor from respiration and perspiration is also captured and purified, then returned to the system. These components, working in concert, create a closed-loop system that maximizes efficiency and ensures a stable, breathable atmosphere for extended periods.

Breathing Mixtures

The primary concern with deep water operations isn't being crushed by the water, it is the ill-effects of [returning to lower pressure levels](#). This is largely contributed to the breathing atmosphere mix used to sustain the user. The Abyssal module is designed to change the ratio of gasses before it is breathed in.

To accomplish this, the Abyssal module's life support tanks are divided into a main oxygen section (70% of space) and an inert gas (30%). As the inert gas is not metabolized, it is recaptured and reused by the user. Normally the inert gas (Nitrogen, Helium, or even Hydrogen though it is not technically inert) tanks have the same elements. But trimixes are possible such as helium/nitrogen/oxygen. For dives more than 300 meters, Helium is highly recommended to be added to one of the inert tanks before diving.

Power and Propulsion Systems

At the core of the module is a compact inline [Compression Fusion Reactor](#). Utilizing the stored hydrogen generated when producing oxygen, the reactor is encased in a pressure-resistant shell that is cooled by drawing in water within a chamber surrounding it. The action of pumping the water in and out the other end of a channel done with [magnetohydrodynamics](#).

A pair of [Navitium](#) batteries act as rechargeable backup sources power. When fully charged, the main fusion reactor can be shut down and provide 6 hours of operation to the module before the main reactor must activate again. Should the main reactor not turn on, the module can make use of the diving suit's power sources to allow the user to head for the surface of the body of water.

To provide powered propulsion to the user, a detachable thruster array is located (and recharged) at the bottom of the module. Handheld via two hand holds, the propulsion sub-module employs a large magnetohydrodynamic (MHD) drive which allows for near-silent propulsion by ionizing water and pushing it through magnetic fields. The unit has its own rechargeable battery that allows it to operate for 4 hours with high-speed usage.

A buoyancy control unit, filled with variable-density fluids, allows for precise depth control, making the module adaptable to a wide range of underwater conditions.

Communications, Electronics, and Sensors

The communications subsystem is built in the top of the module using a quantum entanglement transceiver. Passive towed array sonar can be deployed to the back of the module to augment the diving suit's Deep Dive Helmet's sonar suites. It is all rounded out with an inertial navigation system, complete with gyroscopes and accelerometers, provides accurate positional data, while environmental sensors monitor temperature, pressure, and water quality in real-time.

Misc Systems

The Abyssal Module is not just about survival and mobility; it's also designed for functionality and utility. A hardpoint interface (on each side of the module) allows for the attachment of various tools and equipment, from hydraulic cutters to scientific instruments. Manipulator arms can be deployed for tasks requiring dexterity, such as sample collection or equipment repair. A cargo bay provides storage space for additional supplies or collected samples, featuring quick-release mechanisms for easy access.

Safety is another paramount concern, addressed through features like the Rapid Ascent Emergency System (RAES). This system is designed to quickly adjust the module's buoyancy in case of an emergency, allowing for a rapid but controlled ascent to the surface.

Usage

The Abyssal Module is designed for seamless integration with the Megumi Diving Suit. It attaches to the suit's back and lower torso via reinforced bolts and magnetic seals. Once connected, the module's systems are automatically synchronized with the suit's onboard computer, allowing for immediate and intuitive operation.

OOC Notes

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This was approved by Andrew on 2023/09/29.²⁾

Products & Items Database	
Product Categories	tools
Product Name	"Megumi" Abyssal Underwater Operations Module
Nomenclature	RHI-G7-1A
Manufacturer	Ryu Heavy Industries
Year Released	YE 45
Price (KS)	1,000.00 KS
Mass (kg)	50 kg

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<https://stararmy.com/roleplay-forum/threads/megumi-diving-suit.70932/#post-440841>

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