

HALCYON SYMBIOS



PHOTO JULIAN MÜHLENHAUS

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PHOTOS JULIAN MÜHLENHAUS & JESPER KJØLLER



– A revolution in rebreather diving





GUE Instructor John Kendall
ready for yet another test dive
of the Halcyon Symbios in
Deep Dive Dubai.

PHOTO JESPER KJØLLER

Halcyon Manufacturing is set to redefine rebreather diving with the launch of the Symbios, a compact, chestmount closed-circuit rebreather (CCR) designed for maximum flexibility and performance. Debuting at the 2024 DEMA show, the Symbios combines cutting-edge wireless technology, a lightweight design, and unmatched versatility for both recreational and technical divers.

GUE diving instructor and Halcyon R&D team member John Kendall provides insights into the Symbios' development and groundbreaking features, showcasing how this innovative unit is poised to transform underwater exploration for divers worldwide.

Ever since Halcyon Manufacturing entered the scene, the company has enabled divers with novel tools to enrich their diving adventures. Halcyon's unique PVR-BASC (passive, variable-ratio, biased addition), also known as "The Fridge," was a semi-closed rebreather first built in 1994 and a vital element of the company's early history. This distinctive semi-closed-circuit rebreather has allowed countless adventurous divers to travel thousands of kilometers into the longest and deepest caves on the planet.

Subsequent iterations—the RB80 and RB-K—refined the pioneering concepts of these early units. Halcyon rebreathers, known for their robust construction and reliable operation, have been and continue to be at the forefront of exploration projects as both primary and bailout/redundant units for divers worldwide.

Historically, Halcyon divers and principals have used both semi-closed and fully closed rebreathers, adapting to the demands of spe-

cific dives. These projects revealed the value of a flexible rebreather configuration. Halcyon began using the RB80 as both a backmount and a staged sidemount rebreather in the early 2000s, a practice that evolved into its use in small caves for sidemount diving. The pursuit of a smaller, more flexible rebreather culminated in the latest addition to the Halcyon family: the Halcyon Symbios Rebreather. Compact, versatile, and high-tech, this rebreather meets the needs of "tcrecreational" and hardcore technical divers, conforms to a wide range of equipment configurations, and satisfies diverse dive requirements.

Why chestmount?

There are many reasons for using a chestmount rebreather instead of, or alongside, a traditional backmount unit. Initially, the team was drawn to the flexibility of adding the Symbios to sidemount or backmount setups. Over time, the ease of use and tremendous adaptability revealed a broader potential: the Symbios can easily integrate into almost any configuration.



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The chestmount design is ideal for new rebreather divers, allowing them to keep their existing cylinder setup and easily clip the rebreather onto their chest for a smoother learning curve.

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Seen from above, a group of Symbios divers appears similar to regular open circuit divers. The only giveaway is the absence of exhaust bubbles.

Industry-leading technology and an exceptionally small form factor (7.5 kg, 37 x 30 x 12 cm/16.5 lb, 15 x 12 x 5 inches without a tank) significantly enhance this flexibility. The compact size makes the Symbios attractive to traveling divers seeking a lightweight package with the capacity of much larger rebreathers. Whether traveling to remote dive sites or navigating dry caves to reach a sump, the Symbios has proven remarkably capable.

A chestmount configuration is also advantageous for divers new to rebreathers, as they can retain their existing cylinder setup and simply clip the rebreather onto their chest. This design provides a friendlier learning curve for novice rebreather divers.

Development of the Symbios

Chestmount rebreathers were among the first rebreathers ever built, so what makes the Halcyon Symbios unique? Three significant features set it apart.

The first is its completely wireless platform. The Symbios CCR uses redundant wireless

transmitters to relay all forms of data—including the pO₂ of all three sensors and O₂ pressure via an onboard pressure transmitter. Divers familiar with the frustrations of cabling will appreciate the wireless system, which eliminates tangled wires and enhances comfort and utility. The Symbios can send data to a handset and/or HUD without cables, and divers can even receive and read data from their dive buddies and students.

The Symbios integrates seamlessly with the Symbios wireless ecosystem, supporting pressure transmitters, navigation systems, GPS receivers, and operational specs for DPVs, lights, and trim sensors. Its wireless system employs magnetic transmission technology, ensuring higher data rates and reliability, with data sent twice per second.

The next innovation is the integrated BOV/ADV. The bailout valve is positioned on the chest and doubles as an ADV, allowing the diver to easily switch between CCR and open-circuit. The design avoids the drawbacks of traditional mouthpiece-based BOVs, such as weight and jaw fatigue.



PHOTOS JESPER KJØLLER

The Symbios chestmount system integrates well with a standard GUE configuration.

Oxygen sensing

A proprietary solid-state oxygen sensor developed with Oxygen Scientific is another significant evolution. The Greenflash sensor, powered by a small CR2477 battery, can function as a plug-in replacement for traditional galvanic oxygen sensors or output digital signals. In the Symbios, this system combines analog and digital sensors for enhanced reliability, mitigating risks like water accumulation and ensuring accurate oxygen readings in the breathing loop.



John Kendall

John Kendall is a GUE technical, cave, and CCR instructor who has turned his lifelong fascination with the underwater world into a global teaching career. He builds local GUE communities and pioneers underwater 3D photogrammetry for nautical archaeology, creating digital models of shipwrecks and caves. John authored the GUE

Despite its compact size, the Symbios is a remarkably capable electronic CCR. Its light-weight design (7.5 kg/16.5 lb for travel and under 11 kg/24 lb ready to dive) and 2.7 kg/6 lb scrubber offer long dive durations and easy portability, fitting into a small backpack.

The Symbios is currently undergoing CE certification, with the first units expected to launch in non-CE countries by the end of the year. Major training agencies, including GUE will offer Symbios training, and pricing is expected to be competitive, considering the remarkable benefits of this groundbreaking technology. ■

Photogrammetry class and serves on the GUE Training Council. A Fellow of the Explorers Club, he also joined Halcyon Manufacturing's R&D team, focusing on their new CCR. His work combines exploration, education, and innovation, helping researchers navigate underwater sites with unparalleled ease from their computers.



FACT FILE // SYMBIOS SPECS

CONTROLLER

Primary controller

Redundant controller

Secondary electronics/pO₂

Tertiary electronics

Onboard physical button with wireless monitoring

Optional corded controller/HUD/Buddy Light

Redundant "Sentinel" with independent transmitter array

Readable by an infinite number of compatible handsets and/or HUD units

SCRUBBER

Scrubber type

Axial

Scrubber volume

2.7kg

Temp. stick (scrubber monitoring)

No

Scrubber duration

CE: CO₂ 1.6l/m 5mb bypass TBC

LOOP

Work of breathing (WOB)

CE 100m test, trimix, horizontal TBC

Work of breathing (WOB)

CE 40m test, air, vertical 1.6 joules/liter

Active loop volume (liter)

CE Test

Counterlungs

Front-mounted

Detachable counterlungs

Yes

Oxygen injection

Before scrubber

Loop direction

Right to left

Automatic diluent valve (ADV)

Yes

Diluent shut-off valve

No

Bailout valve (BOV)

Yes (Built into the ADV system)

Mouthpiece retaining strap

Yes

Flood resistance

Exhalation lung has purgeable water trap.
All electronics sealed from water ingress.

HEAD & SENSORS

User upgradeable firmware?

Yes

Number of solenoids

1

Means of O₂ addition

Solenoid + MAV

Solid state O₂ sensor

Yes, Greenflash

Independent secondary O₂ reading

Yes

Helium sensors

No

CO₂ sensors

No

Dual computers

Yes

Independent electronics

Two monitoring systems in head with independent transmitters

Bailout mode

No

Battery type

Rechargeable



DISPLAYS & WARNINGS

Head-up display (HUD)

Buddy display

Other active warning devices

Near eye computer (HUD)

Fully featured dive computer HUD

Optional wired HUD with buddy light

Vibrating alert in rebreather head

Yes

HANDSET

Number of handsets

Infinite number of receivers

Pressure reading (air Integration)

Yes

Bluetooth on handset

Yes

Wi-Fi on handset

No

Digital compass

Yes

Multi-language interface

Yes

CYLINDERS

Cylinder options

Multiple options for onboard O₂

Onboard multi diluent tank option

N/A

Offboard gas feed

Yes

FORM FACTOR

Travel/mini version

Inherent in design

Stand

No

Sidemount conversion

Compatible with sidemount bailout configurations

SERVICE & SUPPORT

Supplied ready to dive

Yes

Warranty (months)

TBD

Worldwide service/support

Yes

Recommended service interval

Yearly

Cost of service

Service center dependent

SHIPPING & ORDERING

Weight ready to dive

~11 KG depending on O₂ tank used

Manufacturer website

www.halcyon.net

