COMPOSITE BEAT ENGEL

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OPERATIONS AND MAINTENANCE MANUAL
DEEPSEA LIGHTWEIGHT DIVING HELMET TYPE B-2

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1. IMPORTANT REGULATIONS

For your protection while using the DeepSea Lightweight diving helmet, we call your attention to the following:

A. Any use of the equipment is conditional to reading, understanding and following this user instruction manual.

B. Use of the equipment is limited to those applications described in this manual and for purposes granted in writing from the manufacturer.

C. The equipment must be serviced annually, e.g. examined, serviced and if required, repaired by an authorized repair technician. This maintenance must be documented. Only original DeepSea Lightweight helmet parts and original spare parts for the demand valve and communication system may be used for maintenance and repair.

D. If the equipment is improperly serviced or repaired by persons not trained by the manufacturer(s), and in cases where the equipment is used for purposes not specifically designated, liability for the correct and safe function of the equipment transfers to the owner/user.

E. Instructions and statements contained in this manual are based on the latest information available prior to printing. COMPOSITE - Beat Engel reserves the right to make changes at any time.

F. Local statutes and regulations must be followed when transporting this equipment. The breathing air quality has to be in accordance to the rules of the norm EN 132 Annexe E.

2. TERMINOLOGY / MATERIALS

The DeepSea Lightweight diving helmet consists of various materials:

A. Composites	Glassfibres, carbonfibres, Kevlar, polyester and epoxy resins
B. Metals	Inox, nickeled brass, nickeled copper, lead
C. Rubber	Joints, O-rings, handles of bail out, freeflow and demand valve adjustment knob, oral/nasal mask
D. Polycarbonate	Screen (LEXAN aviation)
E. Polyurethane	Freeflow pipe
F. Neoprene	Neckdam, gaskets

3. TECHNICAL SAFETY REGULATIONS

The DeepSea Lightweight diving helmets are certified in accordance with the CE approval conditions (EN 250/0078) for similar helmets.
The recommendations and advise of a recognized professional diving instructional agency should be followed on every dive. Before participating in any diving activity, a thorough course of instruction in the theory and practices involved in professional diving should be successfully completed.
This user instruction manual does not replace a competent course of professional diving!

4. GENERAL SPECIFICATIONS

The helmet shell of the DeepSea Lightweight diving helmet is made of giassfibre and Kevlar.

Positive benefits:

- New ergonomical design enables a substancial reduction of weight and volume. resulting in a weight of ca. 12,5 kgs
- Underwater neutral buoyant
- Vastly improved angle of vision for the diver
- Face plate made of polycarbonate
- Strong side and front covers enable total protection for sideblock and demand valve.
- Optional demandvalves: SCUBAPRO B/A, R 380, S600
  secure and easy to service.
- Flexible handles on sideblock assembly and demand valve adjustment provide best protection from harsh subsea environnements
- Exhaled air/gas is vented toward the back of the helmet
- Solid neckring with firm dosing and locking system and integrated neckdam or possibility to adapt to the neckseal of general used suits
- As far as possible, standard obtainable parts are used
- Unexpensive and simple maintenance
- Compatible with the mostly used communication systems on the market
- All threaded inserts are stainless steel, not possible to pull out and metric
- All screws are metric, possible to find in any hardware store
- No special tools required to work on the helmet

5. TECHNICAL DESCRIPTION

5.1.1 Helmet body

This part is made of glassfibres, carbonfibres and Kevlar, laminated with polyester resin. The helmet body has provisions for attachment of the sideblock, demand valve, the screen, ballastweight and handle. Also a watertight passage or the freeflow tube. nose clearing device and communication cable.On the left side of the interior, are savings to install a loudspeaker. A smaller Loudspeaker can eventuallz be mounted in a saving in the right side. Ballast weight is place on the left side at the helmet and in the handle. A videocamera and a lamp can be fixed on top of both sides of the handle. A adjustable, comfortable chinstrap prevents the helmet from sliding. At the lower part of the helmet, a double overpressure valve is standard mounted. The underside of the helmet is equipped with a round metal ring and a locking system consisting of two locking handles on both sides of the ring. The helmet is finished with gelcoat and painted in its standard colour Gold.

5.1.2. Screen

The B type has a screen that is fixed with 18 metric Inox screws (M4 x 12). This screen is provided with a watertight passage for the nose clearing device. The screens are made from polycarbonate, 8 mm thick.

5.1.3. Sideblock

Is mounted at the right side of the helmet. It has two connections for incoming air/gas

- Suface supply, via umbilical equipped with a non return valve
- Reserve air/gas supply connected to bail out system

Both connections are UNF 9/16 male thread.
The sideblock distributes the air/gas directly to the demand valve and the freeflow/defogging device. The amount of air/gas to this device is manipulated by a adjustable valve and is at the same time the security system, should the surface supply fail. It also prevents a too high concentration of C02 inside the helmet. Superfluous air/gas escapes via the overpressure valve of the helmet.

Flexible handles on the sideblock assembly and the demand valve adjuster provide best grip and protection from harsh subsea environments. At the lower part of the sideblock is a 3/8" UNF female standard inflator connection to fit the buoyancy conpensation inflator hose. On demand, we can build in a restrictor. For the scheme of the sideblock see appendix I.

5.1.4. Breathing system

The DeepSea Lightweight helmets can be equipped with various demand valves:
SCUBAPRO B/A, S600, R380 have obtained CE Approval (Euronorm).
Mares Abyss, Mares Proton Ice, Apex, Aqualung and Beuchat are currently in the certification procedure.
The demand valves of the DSL B-2 helmets are standard equipped with a double exhaust valve for works in contaminated environments.
The front cover has a built in device to reach the purgebutton of the demand valve.

5.1.5. Oral/nasal mask

Is provided with a non return valve and the possibility to mount a microphone. The nose clearing device can be adjusted from outside.

5.1.6. Air/gas distribution system

The complete system is protected against damage by strong glassfibre covers. Exhaled and superfluous air/gas are guided to the back providing undisturbed Visibility for the diver.

5.1.7. Communication

Any commercial type of communication system can be installed in the helmet.
One loudspeaker is to be mounted in the left side of the helmet interior. One extra small narrow loudspeaker can be placed at the right side. The microphone is mounted in the oral/nasal mask.

5.1.8. Adjustment of the helmet

The ergonomical design of the helmet offers the pssibility to fit any head size or head form. A adjustable hood is delivered with all DSL helmets. All existing hoods from any other diving helmets can be used.

5.2. The neckring assembly

Metal ring which fits with a O-ring sealing in the ring of the helmet. After being placed into the helmet ring, two horizontal moving handles on both sides close and secure it by carabine hooks. A neoprene neckseal is mounted at the neckring and a carbonfibre cover prevents damage. To provide a watertight connection, the neckring can be attached to the rubber collar of the suit.

6. DRESSING PROCEDURE

6.1. When neckring is used with a neoprene neckseal:

A. Diver pulls the neckring over his head and adjusts the neckseal
B. Air/gas and reserve air/gas supply are opened and checked. The valve of the Reserve air/gas supply is closed again
C. The communication system is tested
D. Diver puts the helmet on his head, both handles folded to the outside, and adjusts the chinstrap
E. The neckring is placed into the ring of the helmet
F. The handles are moved towards the ring and and close the system. Then they are secured with the snaphooks
G. Inflator hose is connected to the suit
H. Overall check is done and confirmed by diver

6.2. Using a suit with attached neckring:

After the diver has entered the suit and put his head through the neckseal, the procedure is mainly identical like mentioned under point 6.1. from B. up to H.

7. MAINTENANCE AFTER USE

After the dive, any dirt is to be removed with warm water, mixed with fluid soap, desinfected and dried with a cloth. The breathing system is checked. Helmet has to be stored in a frostfree, dry surrounding.

8. TECHNICAL MAINTENANCE

Most parts of the DeepSea lighweight-helmets are available in every country and standardized DIN and EU-norms. All brands of demand valves mounted on the DeepSea helmets are represented in regular diveshops worldwide.

9. WARRANTY INFORMATION

COMPOSITE - Beat Engel warrants every DeepSea diving helmet and other products of it's fabric to be free of defects in workmanship for a period of 6 (six) month from date of purchase.
This warranty covers all metal and fibreglass parts.
This warranty excludes rubber parts, polycarbonate parts of helmet headliners as well as all parts which are known as wearing out parts.

Should any part become defective, contact your nearest authorized dealer or call directily COMPOSITE - Beat Engel at: + 41 79 351 05 05 at any time

Upon approval from COMPOSITE- Beat Engel, return the defective part, freight prepaid. The part will be repaired or replaced at no charge as deemed necessary by the manufacturer.

This warranty becomes null and void if:

- The product has not been properly serviced and maintained
- Unauthorized modifications have been made to the product
- The product has been abused or subjected to conditions which are unusual or exeed the products intended service.
- 6 month after delivery have passed.

10. SPARE PARTS AND TOOLS

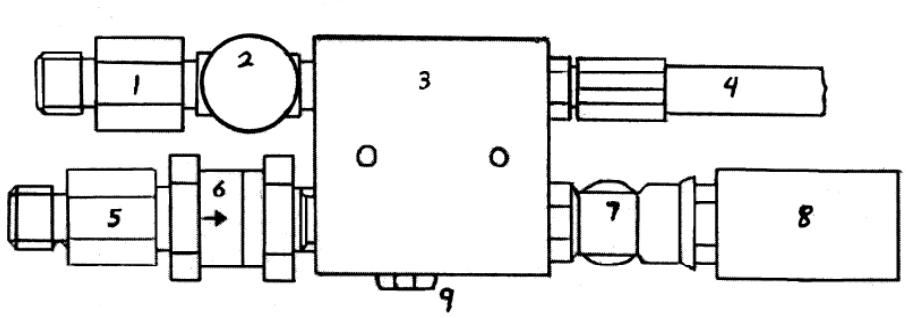
Together with each helmet are delivered the following parts and tools:

1 x neoprene gasket 20 x 14 x 2
6 x M3 x 30 inox imbus screws
6 x M4 x 12 inox imbus screws + washers
2 O-rings Viton + washer
4 0-rings Viton 10 x 2
1 Screwdriver N3 imbus with round head.
freeflow valve gasket
overpressure valves helmet covers, screen, DV attachment etc
axe nose clearing device
sideblock

APPENDIX I

FLOW SCHEME OF THE SIDEBLOCK

1. Bail out connector
2. Bail out valve
3. Sideblock
4. Midpressure hose
5. Surface connector
6. Non return valve
7. Freeflow valve
8. Handle freeflow valve
9. Inflator connection



APPENDIX II
OTHER RECOMMENDATIONS

REMOVING OF SIDEBLOCK:

- Take off side and frontcover
- Take off mid-pressure hose Take off freeflow hose and connector inside the helmet
- Take off sideblock screw M4
- Remove the sideblock

REMOVING OF DEMAND VALVE:

- Take off side and frontcover
- Take off midpressure hose
- Take off the the four M4 screws inside the helmet that hold the demandvalve Now you can proceed the standard revisions.

REPLACING THE SCREEN:

- Take off side and front cover
- Take off complete nose block device
- Take off the 18 M4 screws which hold the screen
- Take off the rubber gasket
- Exchange the screen and mount the parts in the reversed way.