



SURVITEC EBS CREW

EMERGENCY BREATHING SYSTEM USER MANUAL

Survitec Part Number# 12727009 -
Emergency Breathing System (EBS CREW)

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MANUFACTURER

The Emergency Breathing System (EBS CREW) is manufactured by Survitec Group

SURVITEC EUROPEAN REPRESENTATION

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EC TYPE EXAMINATION CONDUCTED BY:

Products carrying the CE mark have the EC Type Examination conducted by:
SGS Fimko Oy, Takomotie 8, FI-00380 Helsinki, Finland
Notified Body0598

All products sold by SURVITEC in the EU (European Union) comply with the following requirements where applicable.

EN12021: This standard specifies the allowable contaminants and component gases that make up compressed air. This standard is the equivalent of the USA Compressed Gas Association's Grade E air. Both standards allow very small amounts of contaminants that are not harmful to breathe, but can cause a problem if present in systems using gases with a high percentage of oxygen.

EN4856: The EBS is considered a Category A Emergency Self-Contained Emergency Underwater Breathing Apparatus. As such, the EBS is designed for user deployment and operation with sufficient notice given to a user to deploy the device.

A "Declaration of Conformity" is on the SURVITEC website at: <http://apps2.survitecgroup.com>

The Survitec EBS is certified as an underwater escape breathing apparatus for use to a maximum depth of 4m in water temperatures of 4°C or greater.


It is certified that the EBS meets the Essential Health and Safety Requirements in Annex II of Regulation (EU) 2016/425 Personal Protective Equipment


This PPE satisfies the requirements for a shallow water underwater escape breathing apparatus based on relevant principles and elements of EN4856:2018 - Rotorcraft Emergency Breathing Systems (EBS), requirements, testing and marking. Also in compliance to harmonized standard EN250:2014 - Respiratory Equipment open circuit, self contained, compressed air diving apparatus, requirements, testing and marking.


WARNINGS, CAUTIONS, AND NOTES

Pay attention to the following symbols when they appear throughout this document. They denote important information and tips.

 **WARNINGS: ARE INDICATORS OF IMPORTANT INFORMATION THAT IF IGNORED MAY LEAD TO INJURY OR DEATH.**


 **CAUTIONS:** indicate information that will help you avoid product damage, faulty assembly, or unsafe conditions.

 **NOTES:** indicates tips and advice.


 **WARNING: It is essential that the user read this guide to familiarize themselves with the proper setup, care and use of this product. If the instructions given in this guide are not understood and followed, possible injury or death may result.**

 **WARNING: Proper training is essential for safety. One must be trained in breathing compressed gases, in-water survival and emergency egress.**


 **WARNING: This device must be tested and inspected for proper operation at regular intervals. If any part does not function properly, IT MUST BE REMOVED FOR SERVICE.**

 **WARNING: This device has a limited gas supply and is intended for use ONLY for emergency exit from shallow water depths after accidental or unplanned submersion of the user. It IS NOT intended to be and must NEVER be used as a supplemental gas supply in SCUBA diving.**


 **WARNING: Air Supplies used with the regulators must meet requirements for breathable air EN 12021 standards in Europe.**


 **WARNING: As with all underwater life support equipment, improper use or misuse of this product can cause serious injury or death.**

 **WARNING: Never overfill the EBS CREW unit.**

 **WARNING: The unit should always be pressurized to prevent corrosion and contamination of internal components. If the unit has been exposed to water ingress or contamination it must be serviced and cleaned by a qualified technician prior to being put back in service.**

 **WARNING: Discontinue use of any EBS CREW unit post exposure to extreme heat in excess of 121°C.**

 **WARNING: Units shall be serviced and maintained on a regular basis by trained and authorized technicians. The cylinder must be inspected and serviced in accordance with all local governing agencies. The regulator components must be serviced annually. Equipment that is not routinely serviced in a correct manner creates an unsafe condition that could lead to serious injury or death.**

 **WARNING: Failure to obtain proper training in specialized techniques and to properly equip for use in cold water environments such as under ice could result in regulator freezing. This would place the user at risk of serious injury or death.**

The EBS CREW Self-Contained Emergency Breathing Apparatus was designed for simplicity, reliability and compact size to protect against the risk of drowning due to unintended submersion of a user in shallow water evacuation of a submerged conveyance. By combining the function of a valve and regulator first stage, the EBS CREW reduces weight, bulk and a failure point.

The EBS CREW utilizes a robust piston style first stage that greatly reduces moving parts while still providing good breathing characteristics. Fewer parts also make it easy to service and maintain. A unique reverse valve lever design reduces second stage bulk. Variable mouthpiece positions, a swivel hose and extra porting allow for improved configuration options to meet your needs.

THE CYLINDER

The EBS CREW comes standard with a 0.32 L capacity AMS Type 3 carbon composite emergency oxygen cylinder, produced in line with the following standards and accreditations: ISO 11119-2 cylinder. This cylinder has an overall height of 16.7 cm and is full at a pressure of 310 bar.



GAS FILL PRESSURE (MAXIMUM FILL PRESSURE): 310 bar



CYLINDER CAPACITY WHEN FULL: 99 L @ 21° C



WARNING: THIS DEVICE HAS A LIMITED GAS SUPPLY AND IS INTENDED FOR IMMEDIATE EMERGENCY EXIT FROM SHALLOW WATER DEPTHS AFTER ACCIDENTAL OR UNPLANNED SUBMERSION OF THE USER. GAS USAGE WILL VARY GREATLY FROM PERSON TO PERSON AND THE GAS SUPPLY MAY PROVE INSUFFICIENT TO REACH THE SURFACE. APPROXIMATELY 45 BREATHS OR TWO MINUTES AT A DEPTH OF 4 METERS.

0.625-18UNF ISO11119-2 TW AMS ##### UN1002 BREATHING AIR

0.35KG V0.32L PS310BAR at 15° C PT465BAR AA6061 TS-50° C TO 70° C

2019/05 FIN 2034/05 C0029

AMS P-C-800

UNDERWATER USE

All cylinders shipped with an EBS are EU approved cylinders. Important information is detailed on the cylinder label, as shown below.

For more information regarding the cylinders used with the EBS, refer to the manufacturer's European Representative website for contact details:

<https://ams-composites.com/lightweight-durable-emergency-oxygen-cylinders/>



WARNING: FILL RATES MUST NOT EXCEED THE RECOMMENDED RATE OF FILLING PER THE CYLINDER MANUFACTURER'S RECOMMENDED GUIDELINES.

SLOW FILLING TIME FOR AN EMPTY CYLINDER SHOULD NOT BE COMPLETED IN LESS THAN 11 MINUTES. FILLING THE CYLINDER SLOWLY WILL SIGNIFICANTLY REDUCE HEAT PRODUCED DURING THE FILLING PROCESS.

COMPOSITE CYLINDERS CAN BE FAST FILLED AND RE-USED IF THE CYLINDER IS PROPERLY CARED FOR, WELL MAINTAINED AND UNDAMAGED. HOWEVER, THE FILLER SHOULD ENSURE THE SETTLED PRESSURE at 15°C DOES NOT EXCEED

THE RATED CHARGING PRESSURE. FAST FILLING UP TO A RATE OF 30 LITERS PER MINUTE IS ACCEPTABLE ONLY IF THE CYLINDER IS MAINTAINED AND CARED FOR PER MANUFACTURER'S RECOMMENDED GUIDELINES.

RATE OF FILLING MUST BE MONITORED TO ENSURE CYLINDER IS NOT OVERFILLED BEYOND RATED WORKING PRESSURE OF 310 BAR. EXCEEDING MANUFACTURER'S FILL RATE, MAXIMUM WORKING PRESSURE OR OVERHEATING CAN RESULT IN SERIOUS INJURY OR DEATH.

Cylinder Manufacturer Recommendations:

EBS CREW Cylinders have a design life of 15 years and an inspection period of 5 years, as indicated on the cylinder.

Cylinders must be subjected to a thorough periodic inspection in accordance with ISO 11623. The period of inspection for this composite cylinder is 5 years for non-toxic gases or 3 years for toxic gases. Check the specification packing provision column before filling gases in the composite cylinder with aluminum liner.

The periodic re-qualification requires each cylinder to be examined internally and externally for defects, and then subjected to a hydrostatic pressure test to the design test pressure. Only on completing these procedures satisfactorily can the cylinder be returned to service.

The inspector must follow regulatory authority requirements and criteria in the country the periodic inspection and testing takes place. If the following guidelines are less stringent than the regulatory requirements, apply the regulatory authority criteria.

Cylinders shall be rejected if they do not meet the volumetric expansion criteria or if any flaw has grown following repair and testing. Rejected cylinders shall be rendered unable to hold gas under pressure. In the event of doubt or dispute in connection with re-testing, AMS and, if necessary the approved Inspection Body shall be consulted.

IMPORTANT!!

Records of all examinations and testing and relevant test certificates must be retained as evidence of the examinations—for the lifetime of the cylinder. This includes the 5-year inspection period as noted above.

The manufacturer recommends that if there is evidence that a cylinder has been exposed to overheating but the temperature of the liner is not believed to have reached 350°F (176°C) for any duration of time, the cylinder must still be subjected to hydrostatic testing or condemned. A cylinder that has been exposed to temperatures great enough to change the temper of the liner could show an increase in total or permanent expansion as measured during hydrostatic testing. Cylinders showing unusually high total expansion or exceeding the regulatory limits for the relationship of permanent expansion to total expansion (i.e. 5%) should be condemned.

Composite cylinders are very resistant to impact damage, and a significant impact is required to cause damage sufficient to warrant condemning a cylinder. Acceptance criteria is demonstrated as below. CONTACT cylinder manufacturer for further inspection and service.


Abrasion and Cut Damage:

Minor abrasion such as scuffs less than 0.005 in. (0.127mm) deep is acceptable.


THE EBS CREW FIRST STAGE

The first stage is threaded directly into the cylinder to create a more compact package. The first stage delivers breathable gas pressure to the second stage for breathing. Additionally, the first stage utilizes a compact onboard pressure gauge, low pressure hose with swivel, on/off port, and fill port.

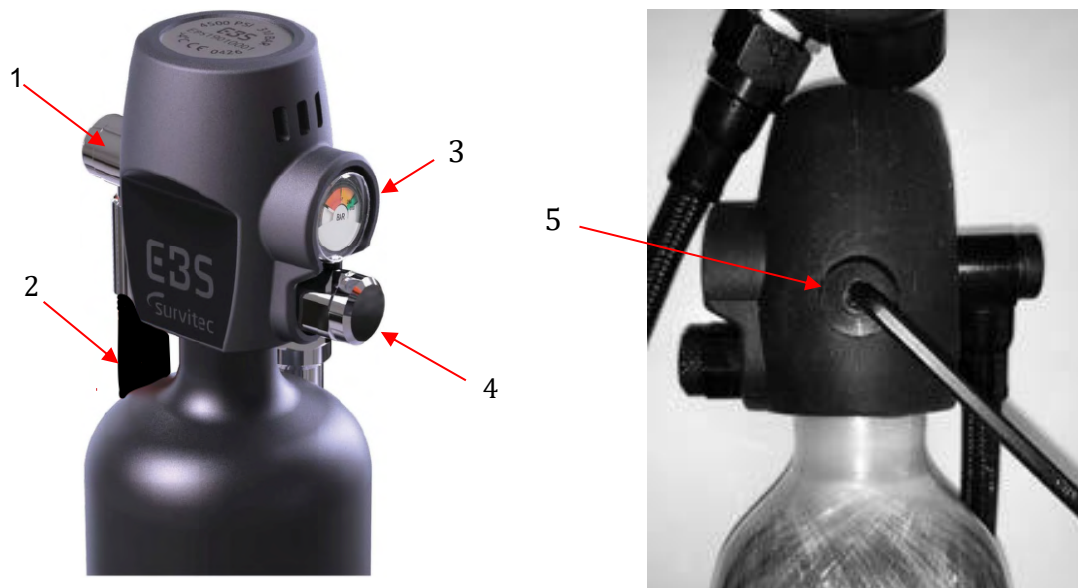
The EBS CREW is shipped from the factory with the first stage turned “ON”, ready to use and should always be left in the “ON” position during use. Should the EBS CREW be turned off for servicing, you can turn the gas supply back on. Using a 3.2mm allen wrench, turn the ON/ OFF port (5) counterclockwise until it stops rotating (approximately 1 1/4 turns).

 NOTE: The high-pressure ports - Pressure Gauge (3) and Fill Valve (4) are always active. It is not necessary to operate the on/off knob to fill the cylinder or check the internal pressure.

To prevent accidental activation of the second stage and resulting gas loss, ensure that the second stage protective cap is in place whenever the EBS is stored.

 **WARNING: THE EBS CREW IS SHIPPED IN THE “ON” POSITION. FAILURE TO ENSURE THAT THE EBS IS “ON” AS DESCRIBED ABOVE WILL RENDER THE EBS INCAPABLE OF DELIVERING GAS TO THE USER. NEVER TURN OFF THE GAS SUPPLY EXCEPT FOR SERVICING OR TO REPLACE THE SECOND STAGE.**

Each first stage has an individualized Serial Number engraved on the back of the first stage body.



1	LP HOSE SWIVEL
2	LP HOSE
3	PRESSURE GAUGE
4	FILL PORT
5	ON/OFF PORT

THE EBS CREW SECOND STAGE

With the On/Off port turned on, the second stage of the regulator assembly receives breathing gas at an intermediate pressure of approximately 9.7 bar from the first stage and delivers it to you at ambient pressure during inhalation.

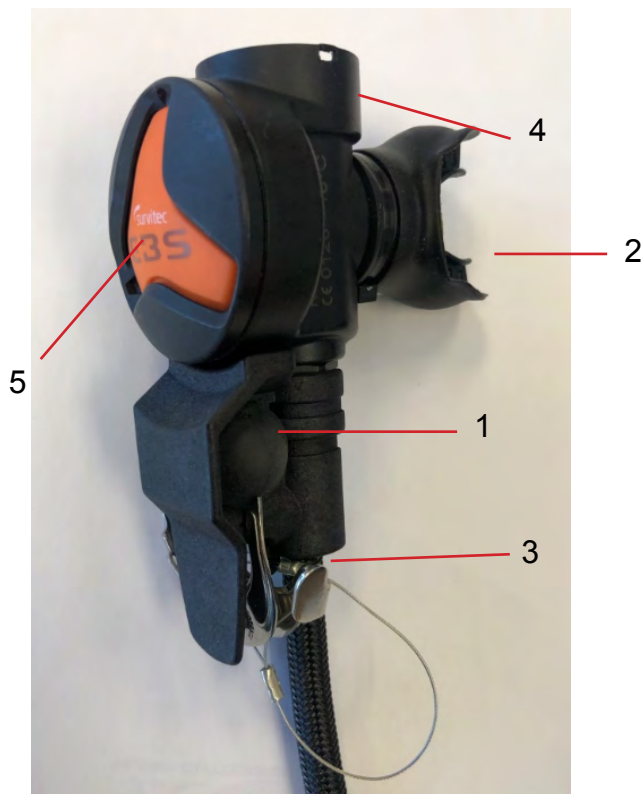
WARNING: DO NOT TEST THE OPERATION OF THE EBS WITHOUT ENSURING THAT THE SYSTEM CAN BE RE-FILLED TO ITS MAXIMUM WORKING PRESSURE IMMEDIATELY AFTER THE TEST, AND BEFORE IN-SERVICE PLACEMENT.

The mouthpiece is indexed to allow for ideal orientation and hose routing when using different mounting configurations. A service technician may adjust this simply by removing the tie wrap, repositioning the mouthpiece, then reinstalling a new tie wrap.

NOTE: The Second Stage Protective Cover is a Service Technician item only. An EBS CREW which has the Second Stage Protective Cover in place, indicates that the EBS CREW is either waiting for, or in process of being serviced or to be filled with breathing gas (See figure).



Purge Cover Cap



ITEM #	DESCRIPTION
1	NOSE CLIP
2	MOUTHPIECE
3	NOSE CLIP TAB
4	EXHAUST VALVES
5	PURGE COVER

FILLING THE CYLINDER

1. Turning counterclockwise, remove the port cap from the fill port.
2. Ensure that the fill port is free of moisture, corrosion and debris. Clean as needed.



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COMPOSITE CYLINDERS CAN BE FAST FILLED AND RE-USED IF THE CYLINDER IS PROPERLY CARED FOR, WELL MAINTAINED AND UNDAMAGED. HOWEVER, THE FILLER SHOULD ENSURE THE SETTLED PRESSURE at 15°C DOES NOT EXCEED THE RATED CHARGING PRESSURE. FAST FILLING UP TO A RATE OF 30 LITERS PER MINUTE IS ACCEPTABLE ONLY IF THE CYLINDER IS MAINTAINED AND CARED FOR PER MANUFACTURER'S RECOMMENDED GUIDELINES.

RATE OF FILLING MUST BE MONITORED TO ENSURE CYLINDER IS NOT OVERFILLED BEYOND RATED WORKING PRESSURE OF 310 BAR. EXCEEDING MANUFACTURER'S FILL RATE, MAXIMUM WORKING PRESSURE OR OVERHEATING CAN RESULT IN SERIOUS INJURY OR DEATH.



WARNING: IF A "YOKE" ADAPTER IS USED FOR FILLING, THE FILL PRESSURE MUST BE LIMITED TO 232 BAR



CAUTION: When filling the EBS CREW, use the fill station pressure gauge to ensure a complete fill (310 bar) as the fill station gauge is more precise than the on-board gauge.



Fill Adapter (Not Included)

3. Attach the EBS CREW Fill Port to a 6.4 mm Female Quick Disconnect Coupling (Not Included with the EBS CREW system). Begin filling process by turning supply gas on slowly. Filling should take at least 11 minutes. The process to safely fill the cylinder per the recommendations set forth is located on page 5 of this manual.




NOTE: Fill Adapters can be purchased through Survitec.

4. **DO NOT** overfill the cylinder. An empty cylinder should be slowly filled, taking 11 minutes or more to reach capacity of 310 bar with the cylinder at a temperature not to exceed 21 °C.
5. Close the supply valve (compressor side) and bleed the excess pressure from the fill adapter.

6. Remove the fill adapter from the fill port.

7. Threading clockwise, replace the port cap onto the fill port. Tighten until hand tight.

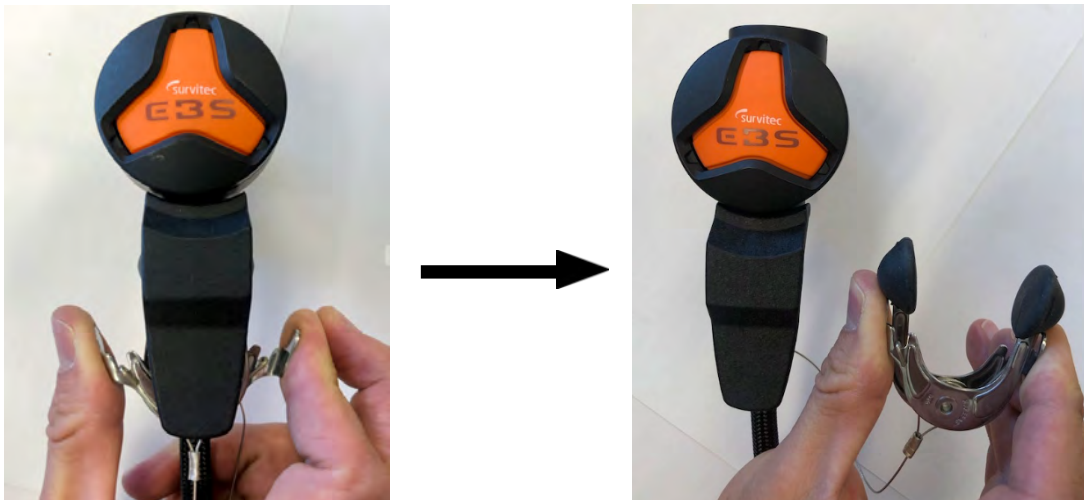
 NOTE: Rapid filling will result in incomplete cylinder fills. Use slow fills and cool-down rest periods during filling operations.

 **WARNING: DO NOT ATTEMPT TO FILL THE CYLINDER IN EXCESS OF 310 bar! DOING SO COULD DAMAGE THE CYLINDER, BURST DISK OR OTHER COMPONENTS.**


Deploying the EBS CREW for Emergency (Submerged) Evacuation

In the event of an in-water evacuation, deploy the EBS CREW in the following manner:

- 1: Using either hand that's NOT holding onto the nearest escape/exit, grasp the EBS CREW second stage around its housing and pull straight out in front of you to ensure the hose is free of entanglements.
- 2: With the EBS CREW Second Stage in your hand, use your thumb and index finger to push down on the Nose Clip tabs on either side of the Second Stage Body to open the Nose Clip. (See below).



3: Place your mouth around the mouthpiece and breathe normally. If the EBS CREW is already submerged, you will need to purge the water from the second stage prior to breathing.

 NOTE: Water can be purged from the small internal air space by exhaling a small puff of breathing gas into the mouthpiece, or by blocking the mouthpiece with your tongue and pressing the front mounted purge button to initiate a flow of breathing gas.

4: Release the Nose Clip tabs and allow the Nose Clip to restrict water ingress into your nose. Be careful to NOT attempt to breathe in from your nose.

5: When you stop inhaling, the second stage shuts off the flow of breathing gas and provides a path for exhaled gas. Airflow may also be initiated at any time by pressing the purge button to activate gas flow.

6: Continue breathing from the second stage—remembering that the EBS CREW has a limited supply of breathing gas—until you have reached the surface safely.

7: Once safely on the surface, discontinue use of the EBS CREW. **DO NOT** put the EBS CREW back into service until it has been properly serviced by an authorized Service Technician.

CARE AND MAINTENANCE

Transport and Storage:

If possible, transport the EBS CREW assembly (preferably dry) in a padded carrying case or equipment bag separated from sharp items that might damage or scratch the components. You should also protect the second stage from damage from heavy objects. If the EBS CREW is going in for service, install the Second Stage Protective Cover after the EBS CREW has been allowed to dry.



ONLY INSTALL THE SECOND STAGE PROTECTIVE COVER IF THE EBS CREW IS GOING IN FOR SERVICING OR FILLING.

After each individual use of product:

- If possible, immerse the entire assembly in a warm fresh water bath and soak for one hour, preferably while pressurized.
- Flush the ambient openings and the exterior of all components thoroughly to remove dissolved salt and other contaminants.
- Flush the second stage with running water into the mouthpiece and out the exhaust ports. **DO NOT** depress the purge button (if not pressurized) while rinsing, doing so will allow water to enter the first stage.
- Remove from the fresh water bath and dip all components of the breathing assembly in a bath of Edwards-Councilor Steramine Sanitizing Tablets® (Sanitabs). Use 3.8L of water per tablet. Do not rinse with fresh water after immersion in sanitizing bath.
 - Miltons tablets is a suitable alternative to Steramine Sanitizing Tablets. If choosing Miltons tablets, please follow instructions as provided for recommended cleaning protocols.
- If possible, lay the complete assembly flat in a cool, dry place (out of direct sunlight) and allow the components to dry naturally.
- **DO NOT** inject or spray lubricants into or onto the first and second stages. Doing so can attract contamination that may subsequently interfere with proper operation.




WARNING: DO NOT REMOVE THE PURGE COVER YOURSELF. IF THE PURGE COVER IS INCORRECTLY INSTALLED IT MIGHT DECREASE OR STOP THE SUPPLY OF BREATHING AIR TO THE USER.

Prior to storing the EBS CREW:

- Ensure that the complete assembly is clean and dry.
- If you were unable to clean the regulator prior to transport, or if it became exposed to other contaminated or wet equipment that was not thoroughly cleaned prior to transport, clean it thoroughly and allow it to dry naturally as previously described.

REPAIRS AND SERVICE

 **WARNING: DO NOT ATTEMPT TO DISASSEMBLE THE EBS CREW ASSEMBLY, OR TO ADJUST THE FIRST STAGE WITHOUT PROPER TRAINING AND AUTHORIZATION FROM THE DISTRIBUTOR. DOING SO COULD CAUSE MALFUNCTION WHILE UNDERWATER, RESULTING IN SERIOUS INJURY OR DEATH. IT WILL ALSO VOID ANY APPLICABLE WARRANTY.**

For operational units, service will be once each year.

For units in training, service will be once each or after every 200 uses, whichever comes first. Your complete EBS CREW assembly must be inspected and serviced by an authorized technician using ONLY Survitec supplied parts and service kits.

Additionally, the cylinder must be inspected periodically in accordance with the rules set forth by your local governing authorities and per manufacturer's guidelines as noted above.

The latest EBS CREW Service Manual, Document #: ZE.01.02.0024, is available for all trained technicians and can be requested from the manufacturer.



NOTE: If you are unsure of your local rules regarding cylinder inspection intervals, please contact your local Survitec Distributor.



NOTE: More frequent service is required when being heavily used, deployed in contaminated water or subjected to repeated submersion in salt or fresh water. If there are any questions on service and technician qualification, contact the distributor.