



Survival Egress Air



User's Manual

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SEA LW User's Manual PN AP5319LW

SEA LW 0.25L, 20" Hose, YEL PN EB001002 SEA LW 0.25L, 25" Hose, YEL PN EB001003 SEA LW 0.25L, 20" Hose, BLK PN EB001000 SEA LW 0.25L, 25" Hose, BLK PN EB001001

Please read the instructions in this manual carefully before using this product. If you have questions regarding the use of this product, please contact Aqualung Military Professional via our website at www.milproaqualung.com

Warnings, Cautions and Notes

Pay special attention to information provided in Warnings, Cautions and Notes that are accompanied by one of these symbols.



A WARNING indicates a procedure or situation that, if not avoided, could result in serious injury or death to the user.

A CAUTION indicates any situation or technique that could cause damage to the product and could subsequently result in injury to the user.

A NOTE is used to emphasize important points, tips and reminders.

Manufacturer

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EU Importer

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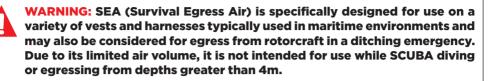
UK Importer

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GENERAL PRECAUTIONS AND WARNINGS



WARNING: Before using SEA, it is important to receive in-water survival training which simulates an emergency egress situation. You must also learn the basic principles and techniques for breathing compressed air underwater. Use of SEA without proper training is dangerous and can result in serious injury or death.

WARNING: It is imperative that manufacturer prescribed service on SEA is performed by a manufacturer trained service technician according to the procedures outlined in our technical manual once every two years under normal prescribed use OR once a year if operating in an environment where harsh / heavy / in-water or training use may exist.

WARNING: DO NOT attempt to overfill SEA beyond its maximum fill pressure at any temperature.

WARNING: DO NOT fill or use SEA if it has been exposed to extreme heat exceeding 121°C or open flame. Instead, discharge the cylinder completely and return it to a manufacturer trained service technician for inspection.

WARNING: SEA is designated to be compatible for use only with normal, atmospheric, compressed air (21% oxygen and 79% nitrogen by volume). DO NOT attempt to fill with other gases, including pure oxygen or air which has been enriched with oxygen exceeding 21% in content. Failure to observe this warning may result in serious injury or death due to fire and explosion or the serious deterioration and failure of the equipment.

WARNING: DO NOT apply any type of aerosol spray to SEA. Doing so may cause permanent damage to certain plastic components.

WARNING: Due to the materials used in the construction of SEA it is essential that the care and maintenance procedures laid out in this manual are adhered to. Failure to do so may cause permanent damage. Any damage to the protective coatings will cause premature corrosion of critical safety components. As part of the care and maintenance, regular and frequent inspections for corrosion must take place. **WARNING:** DO NOT apply any type of petroleum based lubricant, such as household oil or motor oil to any part of SEA. Lubrication is not required under normal circumstances, except during service performed by a manufacturer trained service technician.

WARNING: It is important to ensure that SEA is always pressurized whenever it is submerged in order to prevent the ingress of water into the system. If SEA has been completely emptied of air underwater, it is important to return it as soon as possible to a manufacturer trained service technician for visual inspection and any necessary service before attempting to refill it.

WARNING: It is important to fill SEA only with dry, filtered air with a water vapor content that does not exceed -53°C dew point. Excess water vapor in the air can cause ice to form inside the system and interfere with the operation of SEA at colder temperatures.

WARNING: Periodic inspection of dial indicator readings shall take place to prevent over pressurization of SEA. Systems shall be deemed over pressurized at 5% above working pressure. Should SEA be over pressurized, a manual purging of the system via the second stage is necessary to reduce the pressure in the cylinder. It is especially important to inspect the indicator when transitioning from cold to hot environments, due to thermal expansion of the gas.

NOTE: When instructed to **remove**, **unscrew**, or **loosen** a part, turn the part counter-clockwise.

When instructed to **install**, **screw**, or **tighten** a part, turn the part clockwise.

NOTE: When instructed to **"OPEN"** the handwheel, turn the handwheel counter clockwise. The **red indicator ring will not be visible** in the handwheel window, this indicates SEA is in the **"ON"** position.

When instructed to **"CLOSE"** the handwheel, turn the handwheel clockwise. The **red indicator ring will be visible** in the handwheel window, this indicates SEA is in the **"OFF"** position.

NOTE: When instructed to depressurize SEA, close the handwheel and depress the second stage purge button for 5 seconds and release for 5 seconds. Repeat this procedure until SEA is depressurized.

PRODUCT DESCRIPTION

SEA (Survival Egress Air) is specifically designed for use on a variety of vests and harnesses typically used in maritime environments and may also be considered for egress from rotorcraft in a ditching emergency.

A light weight cylinder with integrated regulator provides a source of emergency breathing air to allow crew members or passengers to safely egress from an underwater environment.

RISK IDENTIFICATION

SEA is designed to mitigate against the risk of drowning when egressing from a underwater environment in an emergency situation.



SEA Component Identification

Figure 1

Aqualung SEA have been tested in accordance with PPE regulation (EU) 2016/425, BS EN 4856 and BS EN 250. They are type approved by SGS Fimko Oy, Takomotie 8, FI-00380 Helsinki, Finland, Notified Body Number 0598 and are examined by DNV GL, Brooktorkai 18, 20457 Hamburg, Germany, as notified body for PPE identification number 0098 for sale in Europe. Aqualung SEA have been tested in accordance with UK Legislation Personal Protective Equipment (Enforcement) Regulations 2018 UK Statutory Instruments 2018 No.390 by Approved body SGS United Kingdom Ltd, Inward Way, Rossmore Business Park, Ellesmere Port, Cheshire, CH65 3EN, United Kingdom Ltd, Inward Way, Rossmore Business Park, Ellesmere Port, Cheshire, CH65 3EN, United Kingdom Jacoba VII20.

WARNING: For SEA to be compliant with BS EN4856, the nose clip must be fitted on the second stage. The nose clip is not included with SEA, but can be purchased separately. Instructions for installation are included with the nose clip.

PREPARATION AND SETUP

SEA is packaged fully assembled and ready to use after it has been filled with air. Before using, it is very important to carefully read and understand the procedures outlined in this manual.

GENERAL FILLING PROCEDURES

NOTE: The average duration of air supply listed in the **<u>Technical Specifications</u>** section of this manual is based upon the maximum fill pressure as marked on the cylinder. It is strongly recommended that the cylinder be filled to its maximum fill pressure (cold fill), in order to provide maximum breathing volume.



1. Before attempting to fill SEA, ensure that the fill adapter and first stage are completely dry – especially in the area surrounding the fill port.

2. SEA is configured with a 232 bar cylinder. Examine the cylinder markings to determine the maximum fill pressure. Cylinders must have a current visual inspection and hydrostatic test date (**Fig. 2**).

NOTE: Ensure hydrostatic retesting and visual inspection of cylinders is carried out in accordance with local regulatory requirements (Fig. 2).





WARNING: DO NOT attempt to fill SEA if the cylinder markings indicate that it is assembled with a non standard cylinder rated for a different fill pressure. Doing so may result in rupture or explosion in the event of fire or overfilling. Instead, immediately return SEA to a manufacturer trained service technician and do not use under any circumstances. WARNING: DO NOT attempt to loosen or remove any components of SEA other than instructed. Doing so could cause a dangerous malfunction which could result in serious injury or death.

3. Check to ensure the handwheel is closed and SEA is depressurized **(Fig. 3)**.

4. Unscrew the fill port cap from the fill port **(Fig. 4)**.

5. Closely inspect the fill port opening to ensure that no debris, residue or moisture is present.

CAUTION: If moisture is found to be present inside the fill port opening, this indicates that water may have entered the first stage and cylinder. DO NOT fill or attempt to use SEA until it has received complete inspection and any required service by a manufacturer trained service technician.



Figure 3

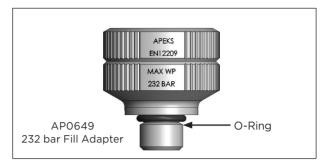


Fill Port Cap

Fill Port









NOTE: SEA does not include a HP fill adapter. The 232 bar fill adapter is available to be purchased separately **(Fig. 5)**.

CAUTION: Ensure that the pressure rating on the HP fill adapter matches the fill port and cylinder pressure rating.

CAUTION: Do not attempt to fill SEA directly from a compressed air filling station unless you have received the necessary training and authorization to do so. If done incorrectly, this procedure poses certain hazards which may cause severe injury or death.

CAUTION: The dial indicator is for reference only. Use the fill system gauge to indicate accurate cylinder filling pressure.

WARNING: DO NOT attempt to use the HP fill adapter to fill SEA from a compressor or air supply where the regulated pressure exceeds the cylinders maximum fill pressure. Doing so could cause a dangerous malfunction to the fill adapter, resulting in serious injury or death.

6. Inspect the fill adapter to ensure that the o-ring is present, not damaged and seated evenly at the base of the threads. Check the threads of the male fitting, making sure they are clean and not damaged.

7. Insert the threaded male fitting of the fill adapter into the fill port on the first stage. Screw the adapter into the fill port until finger-tight. DO NOT apply a wrench or otherwise overtighten the fill adapter (**Fig. 6**).



Figure 6

8. Connect to air supply fill whip (Fig. 7).

9. Open the handwheel to allow the dial indicator to register.



Figure 7

NOTE: SEA will fill with the handwheel in the **"OFF"** position **(red indicator ring visible)**. In this position the dial indicator will not register pressure. **This is not recommended**.

10. While supporting the cylinder with one hand, very slowly open the air supply valve to begin filling **(do not exceed a fill rate of 30 bar per minute)**. Make sure the dial indicator shows that the cylinder is filling properly.

11. When air can no longer be heard flowing from the air supply fill whip into SEA, completely open the air supply valve.

12. While holding the cylinder secure, close the handwheel on the air supply valve. Close the handwheel on SEA and depressurize the system.

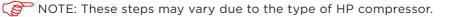
13. Open the bleed valve screw on the air supply fill whip to relieve the line pressure.

14. While supporting the cylinder with one hand, disconnect the air supply fill whip from the fill adapter. Remove the fill adapter from the fill port.

15. Check that the o-ring on the fill port cap is present, not damaged and seated evenly at the base of the cap. Thread the fill port cap back into the fill port until finger-tight.

16. Verify the cylinder has been filled to its maximum capacity as marked. This can be seen when the dial indicator reads in the green zone.

NOTE: Always fill the cylinder as slowly as possible (do not exceed 30 bar per minute) by turning the handwheel of the supply valve slowly to control the rate of fill. Rapid filling will generate heat and will result in an incomplete fill after the cylinder cools. If the cylinder is warm to the touch afterward, the fill rate was too rapid.



SECOND STAGE

The LW second stage incorporates a position keying feature that enables the user to adjust orientation of the second stage body in relation to the mouthpiece. This unique feature keeps the hose closer to the body and allows for more flexibility in various cylinder mounting configurations. The mouthpiece to body default position is horizontal which allows the hose to route either to the right or left of the second stage. If using the nose clip, the mouthpiece must be in the default horizontal position. The mouthpiece boss on the body is hexagonally shaped, which allows the mouthpiece to rotate to six different positions (**Fig. 8**).



Figure 8

WARNING: Failure to install the clamp strap will result in the mouthpiece separating from the regulator body during deployment.

OPERATING INSTRUCTIONS

Ensure LW second stage is securely attached to a first stage via the hose, and that there is an adequate supply of high pressure air in the cylinder.

To breathe from the LW second stage, simply place the mouthpiece into mouth and then, inhale and exhale.

The recommended way of fitting the LW second stage is as follows:

- 1. Insert mouthpiece into mouth.
- 2. Take nose clip between forefinger and thumb as shown (Fig. 9).

3. Apply pressure onto the nose clip via the forefinger and thumb. The nasal pads will now be open **(Fig. 10)**.

4. Place onto nose and release the pressure.



Figure 9



Figure 10

When using the LW second stage in an emergency underwater, firstly, expel any water from the LW second stage by purging or exhaling into the regulator, and then begin breathing as normal. Further exhaling will clear any other small amounts of water trapped inside the regulator.

To purge the LW second stage, simply depress center of the front cover. This will discharge large quantities of gas expelling any water trapped inside the regulator.



WARNING: Improper stowage of the hose may lead to a snag hazard being created.

PRE-USE INSPECTION

Before each use, SEA must be given a thorough visual inspection and functional test. NEVER use a SEA which shows signs of damage, leakage or substandard performance until it has received inspection and service from a manufacturer trained service technician.

1. Carefully inspect the first stage to make sure all external components (dial indicator, swivel port plug, etc) are properly secured.

2. Ensure the medium pressure hose is securely connected to the second stage. Inspect the hose and hose fittings to ensure that there is no blistering, cuts, or corrosion present.

3. Visually inspect the entire system for any external damage, such as dents, gouges, cracks or external corrosion.

4. Confirm the handwheel is closed and SEA is depressurized. Inspect the dial indicator to ensure that it reads "O bar" **(Fig. 11)**.



Figure 11

CAUTION: The dial indicator should read "O bar" when the handwheel is in the closed position and SEA is depressurized. DO NOT attempt to use SEA if the dial indicator indicates pressure until it has received inspection and service from a manufacturer trained service technician.

CAUTION: DO NOT attempt to pressurize SEA without first checking to ensure all components are securely fastened to the first and second stages.

5. Open the handwheel to pressurize SEA. Closely examine the dial indicator to ensure the cylinder is filled to its maximum capacity as marked **(Fig. 12)**.



Figure 12

NOTE: SEA utilizes a "GO" / "NO-GO" system of RED and GREEN segmented dial indicators based on usable gas volumes in accordance with EN 4856. The "GO" GREEN ZONES are set as follows:
 0.25 L 232 bar system has an indicated GREEN ZONE FROM 222 - 232 bar.

Cylinders are primarily measured in their floodable volume and secondly by their expanded volume as follows:

0.25 L 232 bar = 53 L usable gas volume (real gas)

Usable gas is defined as: "Volume of breathable air available to the user while the demand regulator is operating within the specified breathing performance". As stated in EN 4856 paragraph 3.22 usable volume of air.

6. Remove any mouthpiece covers from the second stage. Immerse SEA in water to check for any signs of leakage coming from the first or second stages. If any leakage is found, do not attempt to use SEA until it has received a thorough visual inspection and functional test by a manufacturer trained service technician. Upon completion of the immersion test, remove SEA from the water.

7. Briefly depress the purge button to ensure that sufficient airflow is provided to clear the second stage of water. Immediately after releasing the purge button, listen closely to ensure that the second stage does not continue to allow any airflow.

8. Close the handwheel and depressurize SEA, refill the cylinder to its maximum capacity as marked.

Provided that these Pre-Use Inspection requirements have all been met, SEA is now ready for use.

POST-USE INSPECTION

1. After use, close the handwheel and completely depressurize SEA. Check for signs of damage and contamination. Report any discrepancies to maintenance personnel.

CARE AND MAINTENANCE

It is important to provide the proper preventative maintenance in order to ensure the best possible performance and reliability of SEA. The following maintenance procedures should be performed routinely after each use of the equipment.



WARNING: Never use solvents to clean breathing equipment or components.

CAUTION: Disinfection of products for multi-use applications such as training equipment must be carefully considered. Do not use bleach based disinfectants or disinfectants known to be corrosive, as these can prematurely age or corrode the product being used. Only use the recommended disinfectant solutions as shown in the table below.

NOTE: Always follow the guidelines of use, cleaning procedures and safety data sheets published by the cleaning and disinfectant solution manufactures. Methods, temperatures, dilution ratios and times can vary. These cleaning solutions and disinfectants have been developed and are intended for use with compressed air diving and life support systems and are accompanied with detailed information.

Always follow your local regulations and cleaning solutions guidelines regarding disposal.

Disinfectant Solutions	Applications	Source
Liquid dishwashing detergent (diluted with warm water) *Soapy water is defined as "household" grade liquid dishwashing detergent diluted in warm water.	General low risk disinfecting	"Household Grade"
Chemgene HLD4L breathing apparatus surface disinfectant solution. Follow manufacturer's dilution recommendations.	All around non-corrosive disinfecting for all plastic and metallic parts. Shared training and rental equipment	MediMark Scientific www.medi-mark. co.uk

When SEA has been subjected to an aquatic environment but not used in a breathing capacity please follow points 1 - 9 in full.

1. After each in-water use, SEA must be cleaned, inspected, and prepared for the next use or storage.

2. As soon as possible after use in water, SEA should be soaked thoroughly. SEA is to be pressurized before being submerged in warm tap water for at least one hour (water temp should not exceed 49°C). Soaking allows any salt and minerals to dissolve. Before soaking, remove the mouthpiece cover to allow water into the second stage and spring chamber.

3. After SEA has been properly soaked, it is important to thoroughly rinse the first and second stages utilizing a pressurized stream of water. This will remove the salt and mineral deposits that were loosened during soaking.

4. To dry SEA after use for storage, the demand valve shall be purged with the breathing gas on while the demand valve is inverted and tipped downwards towards the mouthpiece. This is to ensure that all residual water has been drained from inside the demand valve if any had entered during the cleaning process. Store in a dry and clean environment with circulating air.

5. Close the handwheel and completely depressurize SEA before storing or transporting.

6. Due to the possibility of fire and exposure to extreme heat, SEA must be stored according to the cylinder manufacturers recommended guidelines.

7. Store SEA completely dry, in a clean equipment box or sealed inside a plastic bag. When possible, avoid storing it where it may be exposed to extreme heat or an electric motor, which produces ozone. Prolonged exposure to extreme heat, ozone, chlorine and ultraviolet rays can cause premature degradation to certain parts and must be prevented.

8. When transporting SEA, take the necessary precautions to ensure that it is surrounded by a protective cushion to prevent undue shock or impact.

9. Do not use any type of solvent or petroleum based substances to clean or lubricate any part of SEA. Do not expose SEA to aerosol spray, as some aerosol propellants attack or degrade rubber and plastic.

INSPECTION AND SERVICE

1. It cannot be assumed that SEA is in good working order on the basis that it has received little use since it was last serviced. Remember that prolonged or improper storage can still result in internal corrosion and/or deterioration of o-ring seals and valve springs.

2. It is imperative that manufacturer prescribed service on SEA is performed by a manufacturer trained service technician according to the procedures outlined in our Technical Manual once every two years under normal prescribed use OR once a year if operating in an environment where harsh / heavy / in-water or training use may exist. Manufacturer prescribed service consists of:

- Complete overhaul of the first and second stage regulator.
- Visual inspection of the cylinder in accordance with local regulatory requirements.
- Verification of current hydrostatic test date on cylinder. Re-test of cylinder in accordance with local regulatory requirements.
- Verification of cylinder end of life date. Cylinder must be replaced upon expiration of this date.

3. DO NOT attempt to perform any disassembly or service to SEA. Doing so may cause SEA to dangerously malfunction. All service must be performed by a manufacturer trained service technician.

CYLINDER ADVICE

1. On no account should anyone attempt to loosen or remove a valve from a charged (gas filled) cylinder. Additionally, on no account should anyone remove a valve from an empty cylinder unless they have the specific authority to do so, and the necessary knowledge and equipment to avoid damage to either the valve or the cylinder.

2. Luxfer gas cylinders supplied for SCUBA and SCBA are designed specifically for that purpose and must not be used under any circumstance for any other purpose whatsoever & must only be used by properly trained personnel.

3. A cylinder containing gas under pressure could be dangerous if used for anything other than its intended purpose. All SCUBA and SCBA cylinders must be used with a breathing regulator so as to protect the diver from the full pressure of gas inside the cylinder.

4. Do not alter or modify this gas cylinder, to do so may cause harm or danger to the user or individuals. Alterations or modifications invalidate the original design and approvals given by regulatory authorities. The pressure containment of the cylinder may be seriously impaired by unauthorized modification.

5. Do not attempt to saw, drill holes or weld attachments onto the cylinder.

6. Do not place this gas cylinder in hot or boiling water, close to heat sources such as radiant heaters, storage heaters, radiators, open fires or appliances that generate heat etc.
7. Do not discharge a cylinder in an uncontrolled manner as this may result in the pressure jet causing injury & risk to a diver through reduced breathing potential.

8. Do not completely empty a cylinder & leave the valve open as this may allow the ingress of moisture into the cylinder, which could facilitate corrosion.

9. Ensure that a cylinder is only filled with dry, oil free air from an approved storage source or via a correctly serviced & functioning compressor.

10. Should a cylinder leak after filling, as shown by a stream of bubbles leaving the cylinder after immersion in a tank of water, under no circumstances should the cylinder be used, even if the bubbles are small & infrequent. In such cases, the cylinders must be depressurised & taken to an Authorized Re-Test Centre for examination/testing by a competent person.

11. The stamped markings on a cylinder are important for the servicing and filling of the cylinder and must not be altered or changed

12. Do not stand or store gas cylinders for anything but short periods of time on concrete floors, wet decking or wet wooden racks or stillages. Cylinders should be stored on dry surfaces.

13. Do not throw the cylinder, or drop it from a height as it may cause damage to the cylinder & or/valve. Indents & other damage may result from impacts, which in turn could impair the integrity of the cylinder.

14. Do not throw the cylinder onto a fire for it may rupture violently.

15. Gas cylinders should not be used for target practice. Do not throw darts or fire arrows, air guns or more powerful weapons at gas cylinders. To do so is irresponsible and could result in a serious incident.

16. Do not attempt to crush squeeze or run over a gas cylinder. Do not use it as a battering tool, hammer, doorstop, load support, as a stop to prevent closure of scissors action machinery, jacks or other equipment, or for any other purpose other than for which it was made.

TECHNICAL SPECIFICATIONS

Cylinder Length with Regulator	29.5 cm / 11.6 in for 0.25 L Cylinder	
Cylinder Material	Aluminum	
Rated Cylinder Pressure	232 bar / 3365 psi	
Regulator First Stage	Piston	
Pressure Indicator	Dial Indicator 0-232 bar / 0-3365 psi	
First Stage Hose Connection	360 Degree Swivel	
Regulator Second Stage	Unbalanced Second Stage	
MP Hose Length	50.8 cm / 20 in or 63.5 cm / 25 in Braided	
System Weight	1018 g / 2.2 lb Empty w / 0.25 L Cylinder	
SEA tested and approved operating performance in accordance with EN 4856		
Depth Rating	4 m / 12 ft	
Extreme Cold Water Rating	1° C / 34° F	
Cylinder Volume*	0.25 L Floodable Volume 53 L Total Real Gas Volume	
Duration of Air Supply**	2.1 minutes or 21 Breaths using 0.25 L Cylinder at 4 m / 12 ft	
*Cylinder volume specifications are based upon the cylinder being filled to its maximum fill capacity as marked on the cylinder.		

**Based on an average breath volume of 1.5 liters at a breathing rate of 10 bpm, with a starting supply pressure of 232 bar.

SEA LW

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