

zeagle®

SYSTEMS, INC.

**Envoy - RaZor Regulator
Owner's Manual**



This owner's manual uses signal words recommended by the American National Standards Institute (see ANSI Z535.4) to designate levels of hazard seriousness. These signal words and their designations are as follows:



DANGER: Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.



WARNING: Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION: Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

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Congratulations on your Zeagle Regulator Purchase!

Your Zeagle Regulator has been designed and manufactured to the highest possible standards of performance and reliability. With the reasonable care outlined in this manual it will provide you with many years of diving enjoyment.

Since 1979, Zeagle Systems Inc. has been providing divers with Scuba equipment and Buoyancy Control Devices. Zeagle Systems and our worldwide network of authorized dealers are always ready to serve you. For more information on our products, and for the dealer nearest you, visit our web site at www.zeagle.com. Thank you for choosing Zeagle!

Safety Information

Read these instructions carefully before using your regulator, and keep this manual for future reference.

Following the care and maintenance section at the end of this booklet will help ensure reliable service.



Limited Lifetime Warranty To The Original Owner

1. Your regulator is guaranteed against defects in materials and workmanship. This guarantee does not cover normal wear, or damage from accident, abuse, neglect, alterations, improper usage, or failure to follow reasonable care and maintenance as outlined in this manual. Under this limited warranty, Zeagle will either repair or replace, at its sole option, any original equipment or parts that fail to perform as intended. Shipping and Labor charges are not included and must be paid by you. To validate your warranty, you must fill out and return your warranty registration card within 30 days of purchase. This Limited Lifetime Warranty excludes filters, hoses, O-rings, diaphragms and mouthpieces, which are warranted for two years from the regulator's date of purchase.

Filling out the card requires printing CLEARLY the serial numbers of both the first and second stages. The first stage serial number is stamped on the first stage on the side of the regulator (fig. 1).

1). The second stage serial number is stamped on the mouthpiece tube (fig. 2).



Fig. 2.



Fig. 1

2). To read this serial number

you must fold back the flexible silicone mouthpiece to expose the numbers. Each serial number consists of a pre-fix letter followed by six numbers. All of the digits of both the first and second stages must be CLEARLY

printed on your warranty registration card for your warranty to be activated. You can also go to www.zeagle.com to register on-line.

2. For proof of original ownership, you must save the original purchase receipt. It is your record of when and where the regulator was purchased. It also lets you know when your annual service should be performed.

3. To keep the original-owner Limited Lifetime Warranty in effect, you must have your regulator inspected and serviced annually, within 30 days before or after the anniversary of the purchase date. Failure to do so will invalidate your warranty. This servicing must be performed by an authorized Zeagle dealer. Save the receipts from this servicing for your records.



4. This limited warranty applies only to the original purchaser, and then only to certified divers.
5. Sometimes products from other manufacturers are attached to Zeagle Equipment. This warranty does not cover those other products or make any claims as to the performance or suitability of those other products.
6. This limited warranty applies only to regulators sold in the USA through authorized Zeagle Systems dealers.
7. This warranty gives you specific legal rights. You may also have other rights that may vary from state to state.
8. This warranty applies only to regulators purchased from Authorized Zeagle Dealers located within the United States. The regulator must be picked up by the original owner at the dive store. Regulators shipped to the customer in another location are not covered. Warranty coverage in countries other than the US varies. Outside the US your dealer will be able to get further Warranty information from the Authorized Zeagle Regional Distributor.

Disclaimer And Limitation On Remedy

(Some states do not allow limitations on how long an implied warranty lasts or do not allow exclusion of incidental or consequential damages, so the following limitations or exclusions may not apply to you.)

Zeagle expressly limits any and all warranties, expressed or implied, to the terms of the limited warranty as set forth above. Your remedies are limited to those contained herein and are in lieu of all other remedies, whether based on breach of warranty or contract, negligence, strict product liability or other tort. Zeagle specifically disclaims liability for any consequential, special or indirect damages arising out of the use of Zeagle Equipment.





CAUTION

Scuba products are subject to conditions of extreme wear and corrosion. Inspection and maintenance are required to ensure continued performance. Zeagle recommends that you have your regulator inspected and serviced once a year on the anniversary date of its purchase at any authorized Zeagle dealer worldwide. Zeagle Scuba equipment should be used by certified Scuba divers only.



WARNING

1. Scuba diving is an adventuresome activity that involves a degree of risk. Zeagle Systems Inc. Self Contained Underwater Breathing Apparatus (SCUBA) equipment is only to be used by those trained and certified by a nationally recognized scuba training agency. Diving without the necessary training in safe diving procedures, or without observing the practices outlined by your training agency for your level of certification, is extremely hazardous and could result in serious personal injury or death. This owner's manual is in no way meant to be a substitute for the instruction received from a certified scuba training agency.

2. Zeagle regulators must be serviced only by dealers or technicians trained and authorized to service Zeagle Scuba equipment. At no time should any unauthorized person attempt to repair the regulator or adjust any nuts, bolts or screws other than those used to mount the regulator to, or dismount it from the tank valve. Scuba equipment that is not properly serviced might malfunction during use, putting the diver at risk of serious personal injury or death.





CAUTION

1. The high-pressure outlets (HP Ports) are distinctly larger than the low-pressure outlets. Only devices with fittings, hoses and components designed for the full tank pressure that the regulator will be mounted on, such as Submersible Pressure Gauges, are to be installed in these ports.

2. During installation, the O-ring hose fittings will seal with hand-tight pressure, but may come loose during use if not tightened carefully with a small wrench. Proper torque for the hose fittings is 40-45 in lbs. (4.5 - 5 joules) Excessive tightening will not help the seal and may damage the parts (see DEMA Guidelines No. 101, Low Pressure Hose Installation Caution Statement; ANSI American National Standard for Underwater Safety, paragraph 9.3.1).



WARNING

Extreme cold water diving such as diving under ice requires specialized training and procedures. Do not attempt these activities unless you are fully qualified and properly equipped to do so safely.

NITROX USE

Zeagle regulators are manufactured using materials suitable for use with oxygen enriched gases (i.e., Nitrox, etc.) providing the oxygen content does not exceed 40%. The regulator must be kept "Oxygen Clean" and used only with certified clean air mixtures to maintain this status. Once the regulator is used with air not certified to be clean for enriched air use, the regulator will have to be cleaned again for enriched air use by a certified technician.





DANGER

Using nitrox (i.e., gas mixtures containing oxygen in excess of 21%) requires special training and procedures. Improper use of nitrox can lead to personal injury, convulsions, drowning, and death.



DANGER

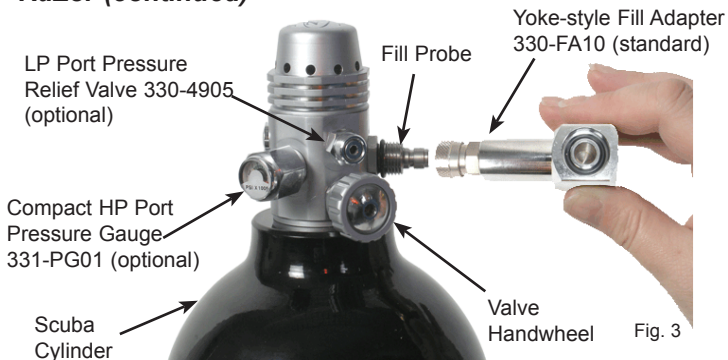
Use of gas mixtures containing oxygen in excess of 40% with this regulator, can lead to fires and explosions, causing severe personal injury and death.

RaZor FIRST STAGE FEATURES

The compact RaZor body, is combination of a Scuba valve with safety relief, on-off valve and quick-disconnect filling attachment, and a simple rugged Flow-by Piston first stage. The RaZor screws directly into a standard 3000 psi Scuba Cylinder and is much lighter and more compact than the separate Valve and Regulator pair it replaces. This makes the RaZor an excellent choice when bulk and weight are considerations, such as stage bottles and redundant air supply systems The RaZor reduces the high pressure air contained in the cylinder to a constant intermediate pressure of approximately 135 p.s.i. (9.2 BAR). Zeagle first stages are designed to do this with outstanding reliability.



RaZor (continued)



When the valve handwheel is turned off, tank pressure is applied to the safety relief burst disc, but not the HP (high pressure) Port or the regulator section of the RaZor. When the diver is ready to use the RaZor, the valve handwheel is turned in a counter-clockwise direction until it is fully open. This allows the air to move from the valve section of the RaZor into the upper pressure regulating section and out the LP (low pressure) ports. This also allows air to get from the cylinder to the submersible pressure gauge if one is installed in the HP Port.

Always keep the yoke-style fill adapter that came with your RaZor handy. When the Scuba cylinder needs filling, the filling station will remove the black plastic cap that should always be on the fill probe (see fig 1) and install your fill adapter to the fill probe. The Scuba cylinder can then be refilled with a standard yoke style filling whip.

Zeagle recommends that the Zeagle LP Port Pressure Port Relief Valve p/n 330-4905 always be installed in a low pressure port of a regulator that is left turned on unattended for extended periods of time, such as a Safety Stop Hang Bottle. Another very useful addition to the RaZor is Zeagle's compact HP Port Submersible Tank Pressure Gauge. It makes the RaZor system an even lighter and more compact package.



A 48" Transfer Filling Whip (see fig 4) p/n 330-6048 is available that allows the RaZor to be filled from the yoke valve of another Scuba cylinder. One end of the whip has a Yoke connection, the other has a combination on-off valve, purge valve, 5000 psi gauge and Quick-Disconnect that attaches to the fill probe on the RaZor.

When this Transfer Filling Whip is connected between the RaZor and a full Scuba Cylinder (see fig 6), the air will travel from the full cylinder, through the RaZor and into the cylinder that the RaZor is installed in until the pressure is equalized or the filling valve is turned off. When the air transfer is complete, the filler valve is turned off, the purge valve is opened and the fill valve is removed from the RaZor. A check valve in the Fill Probe will hold the air in the RaZor's tank. The Fill Valve Cap is then replaced.



Fig. 4

The RaZor can also be filled from a Yoke Valve on a larger tank by using the Zeagle Transfiller p/n 330-6050 (see fig 5 below)



Fig. 5

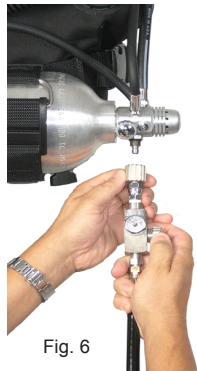


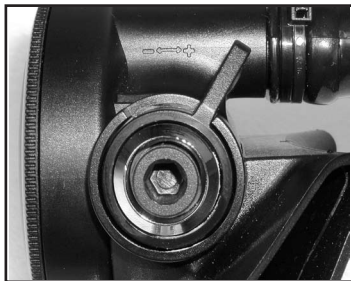
Fig. 6



SECOND STAGE FEATURES

The Zeagle Envoy second stage is pneumatically balanced and is among the most advanced diver adjustable breathing systems available. No fixed or “automatic” system can achieve an ideal level of breathing performance under all conditions.

DIVE / PRE-DIVE VENTURI LEVER



This lever controls the sensitivity of the regulator. The Plus and Minus Positions for the lever are marked on the case beside the lever. To avoid unexpected venturi free flows at the surface, or when jumping into the water, the lever should be set in the PRE-DIVE “-” (forward) position.

As soon as the diver is ready to descend, the lever should be moved to the DIVE “+” (back) position.

NOTE: Ask your authorized Zeagle Scuba dealer for in-store instructions and training on the use of the Dive / Pre-dive Venturi Lever. Your dealer will show you how to make adjustments to get the desired breathing results. To actually experience the effects of the adjustment range, the instruction should be conducted with the diver breathing through a regulator attached to a full air supply. The feel of the regulator breathing underwater is of course somewhat different from the feel of breathing above the surface.

OCTOPUS (Alternate Second Stage) USE

The diver controls available on the Zeagle standard Envoy second stage make it an excellent choice for Octopus use. An Octopus Regulator is often subjected to conditions that may cause a free-flow. For example, jumping into the water or swimming in a strong current. To minimize this, move the Dive / Pre-Dive Lever forward to the “-” Minus position. When the Octopus Regulator is needed for delivering air to a diver, the Dive / Pre-Dive Lever is moved back to the DIVE “+” position. Although breathing resistance will be somewhat greater, the regulator will still deliver ample air on demand if the Lever is accidentally left in the Pre-Dive position. Longer hoses are available from Zeagle for Octopus use.

WET BREATHING

The Envoy second stage is much “drier” than many other second stage designs during use. However, it must be remembered that water (including the diver’s own saliva) will always settle to the bottom of the case. If the diver is in an unusual position (i.e. head down or upside down looking upwards) the exhaust valve is no longer at the bottom of the case and the mouth tube is. This means that water will settle in the mouth tube area and sometimes is ingested by the diver. A tendency to wetness is aggravated by slow exhalations while inverted. This is because the exhaust valve is flapping open with little air velocity, thus letting water in. Of course a regulator that begins breathing wetter than it has before, should be checked out by a technician, but avoiding long periods of inversion, and using shorter stronger exhalations if inverted, will keep the interior of the regulator drier.

PRE-DIVE CHECK

1. Before diving with the RaZor. Check to be sure that the black cap is in place on the quick-disconnect filler (see fig. 3)

Diving without this cap in place will result in water and contaminant's being blown into the interior of the cylinder during filling, which in turn will cause future mechanical problems in the regulator and valve.

2. Prior to each dive always check to make certain your regulator has no potential water leaks by inhaling on the regulator with the RaZor's air valve turned off. You should be able to draw in very little if any air. If you can draw in any quantity of air, either the exhaust valve is failing to seal properly, or there may be a pinhole leak in the mouthpiece or second stage diaphragm.

3. Just before turning on the RaZor's air valve, check to make sure that the all hose connections are tight and that the regulator body is aligned properly, with no kinks in the hoses.

4. Turn the tank valve on slowly, check for air leaks and proper breathing function of the regulator. If any unusual leaks are heard, do not dive with the regulator. Take the regulator to your authorized Zeagle dealer for inspection and repair if necessary.



WARNING

Lifting the tank by the regulator or hoses may loosen a previously tight connection, which could cause unexpected air loss and put the diver at risk during a subsequent dive. You could be physically injured by high pressure air or parts that are propelled by high-pressure air.



CAUTION

If you hear any leaks, turn the tank valve off. Do not use the regulator until the source of the leak has been found and corrected by an authorized Zeagle Scuba service technician.



POST-DIVE CARE

1. After the dive, make sure the plastic cap on the filling probe is still in place. Periodically check the condition of the external O-ring on the fill probe. Ask your dealer to install a new O-ring if it looks torn or cut. Neglect of these simple procedures is a major cause of corrosion and wear in scuba regulators.

2. With the RaZor's air valve turned off, rinse the first and second stage in clean fresh water. DO NOT purge the regulator before or during rinsing since this may introduce water into the second stage and the low-pressure hose. After rinsing, reconnect the regulator to an air supply and thoroughly shake all excess water from the second stage. Press the Purge cover (with the RaZor's air valve turned on) several times to blow the rinse water out of the inner mechanism. Allow the entire regulator to air dry before storing. For reasons of hygiene, equipment subjected to frequent use in training, rental, etc. should finally be rinsed in water containing a suitable sterilizing agent. The best sterilizing solutions for your regulator are soap based. If any stronger chemicals are used, make the immersion very brief and rinse the regulator out again thoroughly. Failure to rinse sterilizing chemicals out of the regulator will cause serious damage to plastic parts of the regulator. This will result in cracking of hard plastic parts and shrinking or swelling of soft plastic parts.

NOTE: DO NOT USE SOLVENT CHEMICALS TO CLEAN THE REGULATOR

3. Store the clean dry regulator in a clean bag or storage box, away from sunlight, excessive heat and humidity.

MAINTENANCE

It is essential that your regulator is checked at least annually by an authorized Zeagle regulator technician. Unusually heavy use, or use in dirty or contaminated water may result in the need for more frequent service. A service record has been provided at the end of this manual to assist you in keeping your regulator's service up to date.



A. FIRST STAGE REGULATOR

MODEL: RaZor

FEATURES:

Flow-by Piston, Valve-Regulator Combination screws directly into standard Scuba cylinder.

WEIGHT

1.62 lb. (.73 kg.)

INTERMEDIATE PRESSURE

120-150 psi (8-10 bar)

LOW PRESSURE PORTS

4

HIGH PRESSURE PORTS

1

MATERIALS:

Body

Brass

O-rings

Buna-N

Seat

Teflon

Quick-Disconnect Fill Probe

Stainless Steel

B. SECOND STAGE REGULATOR

MODEL: Envoy

FEATURES:

Downstream valve, balanced diaphragm, Diver Adjustable Dive/Pre Dive Venturi Lever.

WEIGHT

.42 lb. (.19 kg) (w/o
hose)

HOSE LENGTH

30 in. (.76 mm)

MATERIALS:

Cover

Flexible Thermoplastic

Case

Thermoplastic

Poppet Seat

Elastomer

O-Rings

Buna-N

Diaphragm

Elastomeric Polymer

Exhaust Valve

Elastomer

Mouthpiece

Silicone



Notes:

The date of purchase, dive store, and contact information at the store should be written on this page. A copy of the receipt could also be stapled to this page for future records.





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