

CRESSI

SINCE 1946

Manuale d'uso
Direction for use
Manuel d'instructions
Bedienungsanleitung
Manual de instrucciones
Руководство
潜水呼吸调节器使用手册

erogatori
regulators
detendeur
atemregler
regulador
пользователя
呼吸调节器



⚠ WARNING: This handbook does not replace a diving training course! All Cressi-sub devices must be used by divers who have attended regular courses taught by certified trainers. Using diving equipment without a licence or the necessary technical training may be dangerous for the diver's safety and can even be deadly.

⚠ WARNING: Please read this instruction book carefully before using your equipment. Do NOT use your regulator until you have read this user manual. Make sure that you have fully understood the contents of this manual, and keep it to consult in the future.

NOTE: more detailed information about your product is available on the CD provided with this instruction booklet. It can also be found on www.cressi.com.

INTRODUCTION

Congratulations! Continual research and evolution carried out at our technical centres, together with Cressi-sub's well-known reliability, all stand behind the product you have just purchased, which will allow you to dive comfortably and safely for a long time.

All Cressi-sub regulators are certified for use to 50 m (146 ft) as dictated by standard EN 25 0:2014, in compliance with directive 89/686/EEC, which establishes the conditions for marketing any Personal Protective Equipment (PPE) and the minimum safety requirements for this equipment.

This type of equipment belongs to the maximum PPE category (category III), and has met the requirements called for by the tests established by standard EN 250:2014, recognized as the technical reference standard for regulators for recreational use produced and sold on the European market.

Consequently, all regulators in the Cressi-sub range bear the CE mark followed by the certifying agency identification number

0474, identifying RINA, the registered testing agency that monitors its manufacturing pursuant to Article 11 A of directive 89/686/EEC, as well as the critical health and safety requirements for category III PPE. It also regulates the conditions for bringing such equipment to market.

MAIN COMPONENTS OF A REGULATOR

The main task of a regulator is to reduce the pressure of the compressed air contained in the tank to the same level as that in the environment, supplying breathable air when the diver needs it.

Regulators must guarantee safe operation with advanced performance that is consistent over time, combined with sufficient air delivery and low breathing effort to avoid tiring the diver during the dive.

The most common regulators are two-stage regulators, consisting of a "first stage", which serves as the main pressure reducer, and a "second stage" (held in the diver's mouth), which makes the micrometric adjustments, bringing the breathing temperature to the exact value of the environmental pressure.

Together with the tank, valves and sling, the regulator is part of a complete underwater breathing system, known as "SCUBA" (Self Contained Underwater Breathing Apparatus).

NOTE: Standard EN 250:2014 defines SCUBA as an open-circuit, self-contained, compressed-air diving apparatus contained in a tank, and its equipment must include at least:

1. tank(s) with valve(s);
2. on-demand regulator;
3. pressure gauge or device for monitoring the pressure in the tank(s);
4. diving mask;
5. system for transporting, supporting, and connecting to the diver (e.g., harness, etc);
6. Manufacturer's user manual.

SCUBA equipment may also include an alternative air source (Octopus), a dive computer, etc.

NOTE: Cressi-sub regulators can be used with SCUBA units according to the certified combinations in compliance with directive 89/686/EEC, and with standard EN 250:2014.

FIRST STAGES

The first stage, which may use a piston or a membrane, is a pressure reducer that serves to reduce the pressure of the compressed air in the tanks to a correct, and most importantly, constant, intermediate pressure. This is crucial for ensuring that the second stage is correctly calibrated, allowing it to function optimally and deliver the very best performance throughout the entire dive.

All first stages in the Cressi-sub line are fitted with a connection to the tank unit valves, or with an international YOKE fitting according to UN EN 12209 (max operating pressure 232 bar), or a threaded DIN fitting in accordance with EN 12209 (max operating pressure 232/300 bar), consistent with standard EN 250:2014.

In addition, all first stages in the Cressi-sub range are equipped with multiple threaded intermediate pressure ports to which second stages, BCs, or dry suits can be connected in the most comfortable combinations.

Similarly, all first stages in the Cressi-sub range offer one or more threaded HP ports (7/16-20 UNF) to which the pressure gauge or console can be connected in the most comfortable combinations.

⚠ WARNING: an underwater pressure gauge or a computer with this function must be connected to the first stage HP port/s.

Since the tanks are not supplied with a reserve device, it is absolutely crucial that a pressure gauge be used at all times to indicate the progressive consumption of air during the dive, and which clearly shows when the reserve pressure has been reached. This reserve must be considered to be unusable for the purposes of diving, and reserved strictly as an emergency air supply.

Diving without a gauge is dangerous, since the diver cannot control his own air reserve, which might suddenly run out, resulting in serious risks to the diver's life.

SECOND STAGES

The purpose of the second stage is to reduce the intermediate pressure delivered to the first stage to ambient pressure, providing breathable air only when demanded by the diver's inhalation.

The 2nd stage is connected to one of the 1st stage's intermediate pressure threaded ports by means of a flexible medium-pressure and high-capacity hose.

All Cressi-sub second stages are **downstream**, that is, the valve automatically opens in the event of calibration loss in the first stage or of a sudden intermediate pressure increase.

This means that any over-pressure that occurs upstream of the second stage results in automatic free flow, never causing the regulator to get stuck.

They can be simple non-adjustable downstream types, or adjustable downstream types that make it possible to change the inhalation effort using an external knob.

All Cressi-sub second stages are fitted with a flow deviator to control and optimize the Venturi effect in two operating positions:

“DIVE” (sometimes marked with a “+”) and “PRE-DIVE” (sometimes marked with a “-”).

⚠ WARNING: Always remember to set the flow deflector’s lever in PRE-DIVE (-) mode when not using the regulator; otherwise, an accidental collision, the regulator falling into water, pressing the manual regulation button without having the mouthpiece in one’s mouth, or suddenly taking the regulator out of the mouth might trigger a strong free flow, causing high air consumption. The DIVE (+) position should only be used during the dive, and only with the regulator in the mouth.

OCTOPUS CONFIGURATION

The Octopus configuration entails a first stage connected to the tank to which two second stages are then connected (the main regulator and a back-up, usually called the "Octopus" and generally colored yellow).

NOTE: Cressi-sub discourages the use of this combination because it does not consider it the safest possible configuration, since a possible malfunction of the first stage could lead to potential danger for the diver. This risk increases significantly during dives conducted in cold water.

Standard EN 250:2014, while regulating the minimum safety requirements for an Octopus, similarly discourages the use of an Octopus for dives conducted in water temperatures below 10 °C. *It does not consider this configuration ideal for those conditions, and instead recommends the use of two complete regulators that are separate from each other, to be connected to a valve that offers two independent ports.*

⚠ WARNING: in order to undertake a dive in complete safety, Cressi-sub recommends the use of a tank fitted with a valve offering two independent ports to which two complete regulators can be connected.

In addition, again in accordance with standard EN 250:2014, use of an Octopus in dives with water temperatures below 10 °C can create significant risk of an accident.

⚠ WARNING: SCUBA equipment that does not comply with EN 250:2014 and intended for an Octopus configuration is marked with an "A" and can be used simultaneously by multiple divers as an escape device.

⚠ WARNING: if the components of the SCUBA equipment are configured and used simultaneously by multiple divers, the equipment may not be used at depths of greater than 30 meters, or at water temperatures below 10 °C (if specified).

USE OF THE DIVE REGULATOR AND RISK ASSESSMENT

⚠ WARNING: in order to undertake a dive in complete safety, Cressi-sub recommends the use of a tank fitted with a valve offering two independent ports to which two complete regulators can be connected.

Keep in mind that only those who have attended and successfully completed a specific dive training course and earned the corresponding diving licence may use a dive regulator.

Using underwater devices without a licence or the necessary technical training may be dangerous for the diver's safety and can even be deadly.

Furthermore, before every use, all environmental factors must be carefully assessed, such as the weather and water conditions, visibility, the presence of currents, the temperature of the water, and the physical and psychological condition of the diver, including imperfect health, emotionally or physically stressful situations, lack of physical training, fatigue, active digestion after eating, etc. If even one of these conditions proves a risk, the dive should not be attempted.

Please remember that the open-circuit air regulators are designed and tested for use to a depth of 50 m/164 ft, in accordance with the EN 250:2014 standard, but recreational diving should not be deeper than 40 m/131 ft., without any type of underwater work.

NOTE: Transport of this equipment is subject to local regulations in force; always respect applicable law and find out in advance which laws govern equipment transport in the country.

USE OF THE REGULATOR IN COLD WATER

⚠ WARNING: In the case of dives in cold water (temperatures below 10°C/50° F), Cressi-sub recommends using a tank supplied with a valve featuring two separate outlet ports to which two complete regulators can be connected.

Whenever the regulator is used in cold water (according to standard EN 250:2014, at water temperatures of < 10°C or < 50°F), Cressi-sub recommends abiding strictly by the following recommendations to reduce the risk of freezing the regulator:

1. Protect the regulator from any accidental water in-flow into the first and second stages;
2. Protect the equipment from the cold before diving, keeping it in a warm dry place;

3. Avoid breathing through the regulator or pressing the discharge button in freezing air before diving;
4. Avoid taking the mouthpiece out of your mouth when out of water and while getting into water, in order not to let cold water seep into the second stage;
5. As far as possible, avoid consuming a large amount of air during the dive (repeatedly inflating the gavi, inflating surfacing or signalling buoys, sharing air with another diver etc.);
6. Check that the air contained in the tank satisfies the requirements prescribed by the EN 12021 standard and is free from excessive humidity.

⚠ WARNING: diving in cold water at temperatures lower than 10°C/50 °F requires special technical training. Cressi-sub recommends this sort of diving only after having attended a special training course by certified trainers. The use of diving equipment without a licence or adequate training may be dangerous for the diver's safety and can even be deadly. The regulator must absolutely not get wet or be exposed to freezing air before use. Do not press the discharge button, particularly when the Venturi effect adjustment lever is on "dive". If possible, keep the regulator in a warm place before use.

⚠ WARNING: SCUBA devices complying with the EN 250:2014 standard must not be used by more than a diver at the same time.

⚠ WARNING: if the SCUBA equipment components are configured and used by more than one diver at the same time, their performance in cold water may not satisfy the requirements prescribed by EN 250:2014 standard.

USE WITH NITROX MIXTURES.

⚠ WARNING: Cressi-sub discourages Nitrox dives without proper training. Nitrox dives will expose the diver to different risks than those of air dives, including serious physical damage and, in extreme cases, even death.

⚠ WARNING: as regards EEC countries, Cressi-sub regulators and octopus devices can only be used with atmospheric compressed air that meets the requirements of the EN 12021 standard. Do not use these devices with other gas mixtures or with enriched air (corresponding to O₂ > 22%). Failure to comply with this warning can lead to operating defects, and also cause the equipment to wear prematurely, or even lead to possible explosions, which can cause serious damage.

⚠ WARNING: as regards Extra-EEC countries, Cressi-sub regulators and octopus are compatible with the use of open-circuit SCUBA equipment that uses compressed air or enriched air mixtures (Nitrox) with oxygen percentages no greater than 40%. Failure to observe this warning may result in serious or mortal injury to the user caused by fires, explosions, or deterioration or breakage of the equipment.

All Cressi-sub regulators are supplied with NBR O-rings and all inner components are greased with silicone; these materials guarantee the best lubrication and protection from the salty and corrosive sea environment.

As demonstrated by tests carried out by NASA (NASA DOCUMENT TR-900-001), the use of silicone lubricants is excellent for equipment using Nitrox hyper-oxygenated mixtures with oxygen percentages up to 40%.

The most recent European standards, EN13949 and EN144/3, dictate that all equipment using mixtures containing more than 22% oxygen must also be certified with a pure oxygen working test, which is clearly impossible to complete successfully using silicone lubricants.

Cressi-sub regulators are therefore EC certified only for use with air and mixtures containing less than 22% oxygen, and must not be used, in EEC countries, with hyper-oxygenated mixtures.

TESTS BEFORE USING YOUR EQUIPMENT

Before using your Cressi-sub regulator, we recommend that you carry out some easy but very important and vital checks, in order to avoid any kind of problem.

Check, for example, that all the hoses are perfectly connected with the first stage; if they have loosened, they should be screwed down with a wrench, before pressurizing the equipment.

It is good practice to check that the hoses show no signs of wear, or worse, nicks or cuts of any kind. If any damage is found, we recommend that you do not perform the dive and that you contact an authorized Cressi-sub centre.

Similarly, check that the first and second stages show no signs of damage, for example that there are no nicks or scratches on the 2nd stage mouthpiece, and that it is firmly connected to the case with a lock band. If any of these problems are found, we recommend that you do not perform the dive and that you contact an authorized Cressi-sub centre.

The pressure in the tanks must be checked by means of the special underwater gauge or a computer with this function: after opening the tank's valve, the gauge must show the tank's correct working pressure.

⚠ WARNING: shield the gauge dial with a hand or point it away from yourself and others to avoid the possible risks from a malfunction in the device.

⚠ WARNING: All regulators must be tested on the surface before the equipment is lowered into the water, by repeatedly pressing the manual air flow button to make sure that air flows normally; then, holding the mouthpiece in your teeth, take a few deep breaths in and out to make sure that it works properly (except for uses in water colder than $<10^{\circ}\text{C}$). The same must be done on the water's surface before jumping in, wearing your mouthpiece and turning your head so that the regulator is completely under water: inhale and exhale deeply to check that is working perfectly, both when supplying air and during the purge phase.

NOTE: If a sound check before the dive reveals any leaks at the connections, from the hoses, or a free flow of water from the second stage, we recommend that you do NOT perform the dive and that you contact an authorized Cressi-sub centre.

⚠ WARNING: check that the water-tight O-rings on the valves are in perfect condition. They must not have any nicks, scratches, or other signs of deterioration, and in any event they must be replaced at regular intervals even if they are completely intact, because they are subject to the high pressure of the air arriving from the tanks and atmospheric agents. Only original Cressi-sub spare parts may be used.

ASSEMBLING THE REGULATOR AND TANK

⚠ WARNING: Before assembling, check that the tank has been filled exclusively with compressed air at working pressure, using a suitable compressor, which supplies breathable air in compliance with the EN 12021 standard.

⚠ WARNING: only test certified tanks can be filled within the time interval shown on the certificate.

NOTE: Before opening the tank's valve, check that the underwater pressure gauge indicates zero pressure.

For yoke connected first stages, use following procedure: vent the tank slightly by opening that valve for a moment in order to remove any residual water that may still be in the end of valve. After unscrewing the yoke's lock knob, take the protective cap out of its seat and place the first stage on the air exit valve, checking that the second stage is positioned correctly.

Now, screw the yoke's knob to lock the first stage on the valve.

NOTE: It is not necessary to tighten down the 1st stage lock knob too far to ensure a seal between the regulator and the valves.

Open the tank valve, turning it counter-clockwise, while holding down the second stage manual supply button for a moment (this is to be avoided in cold water dives).

⚠ WARNING: diving in cold water at temperatures lower than $10^{\circ}\text{C}/50^{\circ}\text{F}$ requires special technical training. Cressi-sub recommends this sort of diving only after having attended a special training course by certified trainers. The use of underwater equipment without a licence or adequate training may be dangerous for the diver's safety and can even be deadly. It is crucial that you do not wet the regulator before use and then expose it to the air (which can be a good deal below zero). Do not press the discharge button, particularly when the Venturi effect adjustment lever is on "dive". If possible, keep the regulator in a warm place before use.

NOTE: As a rule, we highly recommend opening the tank valve slowly, so that the regulator gets filled gradually. If the regulator gets pressurized too sud-

denly, it creates an adiabatic compression of the breathable gas inside the 1st stage that might cause the equipment to work imperfectly. As soon as you hear air flowing out of the second stage, stop pressing the manual supply button and open the valve fully.

It is good practice to turn the valve clockwise for one quarter turn in order to avoid damaging the poppet thread.

For DIN connection first stages, the assembly procedure is not very different from that described above. You just have to screw the connection directly onto the valve; **again in this case, you don't need to tighten the handwheel too tight to ensure the seal between the regulator and the valves.** In the event that a second independent regulator is used, connect it to the additional valve outlet following the above instructions.

⚠ WARNING: Do not turn the first stage connected with the tank when the system is pressurized, and do not use the first stage connected to the valve as a handle to carry the equipment: it might damage the regulators, its O-rings and the valves.

⚠ WARNING: if the hoses are not positioned correctly, do not try to rearrange them well when the regulator is pressurized. Close the tank, depressurize and, only then, position the hoses correctly.

⚠ WARNING: Once assembled, the scuba equipment must be laid horizontally to prevent any accidental falls from damaging the components or injuring people.

CARING FOR YOUR EQUIPMENT

After use, close the tank valve by turning it all the way clockwise, without tightening too far. Press the second stage manual sup-

ply button in order to drain all water from hoses and connections. Disassemble the first stage by unscrewing the knob counter-clockwise.

Protect the sintered filter with your finger while blowing off all water and impurities from the protecting cap. The cap should then be placed on the first stage air inlet port and locked with the knob, making sure that the cap O-ring is in place as well.

After every use, you should rinse the regulator in fresh water while it is still pressurized; this allows you to wash the second stage completely without introducing any contaminants into the critical sealing areas of the regulator. Rinse the first stage, and run water through the mouthpiece of the second stage and out of the exhaust tees to remove any foreign matter.

When rinsing the depressurized regulator, rinse the first stage letting water flow also through the second stage's mouthpiece and the exhaust tees to wash out any contaminants: be sure not to press the manual supply button to prevent water from flowing into the hoses and inside the first stage.

Let the regulator dry in a cool, ventilated place, arranging the hoses in such way as not to form acute angle folds.

If a regulator is used by more than one person (schools, clubs, etc.), we recommend that it be disinfected by dissolving a packet of TEGO 103 in 5 liters of water and immersing the regulators in it for 10-15 minutes after having washed them in fresh water. Rinse them thoroughly after soaking, and then leave them to dry. Alternatively, you can disinfect the equipment by soaking it for 2-3 minutes in a 2% Stereamina G aqueous solution or similar products sold in pharmacies.

MAINTAINING YOUR EQUIPMENT

⚠ WARNING: Cressi-sub recommends that you have your regulator serviced at least once a year, regardless of how many dives you have taken. Servicing can also be performed more often if you use your regulator intensively.

In both cases, please remember that both the diver's safety and the regulator's performance go hand in hand, and depend largely on good maintenance.

This must include a full inspection of the equipment, a complete overhaul, and repairs, if needed, at an authorized Cressi-sub centre. The maintenance work must be documented by completing the Service Record forms regarding maintenance performed on the equipment (available in this manual and the task/maintenance/revision form) provided by Cressi-sub in the specific maintenance manuals for each regulator model. These can be consulted by clicking "professional area" on the www.cressi.com site dedicated specifically for authorized Cressi-sub maintenance centres, and it includes a complete series of specific information, such as exploded diagrams for spare parts, maintenance manuals, calibration procedures, etc.

NOTE: In order to ensure the best results, when maintenance operation are performed, we recommend using all the spare parts provided by Cressi-Sub in every procedure.

NOTE: Maintenance (or repair) operations for the equipment must exclusively use original Cressi-Sub spare parts.

⚠ WARNING: Users must never perform maintenance themselves; all maintenance must be performed by an authorized Cressi-Sub centre. If improper maintenance is performed on the equipment, performed by someone other than authorized Cressi-Sub personnel, or used for purposes other than those specifically intended, responsibility for proper and safe operations fall to the owner/user.

⚠ WARNING: the regulators must be serviced exclusively at an authorized Cressi-sub centre, using only original spare parts. Any tasks carried out by untrained personnel may cause very high risks to

the diver's health and put their life in danger. Cressi-sub declines any responsibility for any maintenance or calibration of regulator carried out by unauthorized and uncertified personnel.

NOTE: You can find your authorized Cressi-Sub centre by asking your dealer, or Cressi Sub S.p.A. itself by sending an e-mail to: info@cressi-sub.it.

LIMITED WARRANTY

Cressi Sub SpA guarantees that this product operates correctly. Your Cressi-Sub regulator is guaranteed for two years from the date of initial purchase against:

- clear manufacturing and/or assembly defects in the product or its individual parts;
- material considered unsuitable that causes the regulator to malfunction;
- clear errors in the design, or instructions and warnings that are incorrect or inadequate.

The warranty period begins on the date of the initial retail purchase as demonstrated by a receipt or invoice.

The warranty does not cover:

- damage caused by improper use of the equipment, poor maintenance, negligence or modifications, conversions, adaptations, or tampering with the finished product;
- damage resulting from repairs performed by personnel not authorized by Cressi Sub.

The warranty is forfeited automatically should any of these conditions occur.

During the warranty period, Cressi sub, or a Cressi sub authorized service centre, according to their exclusive judgement, will remove any defect in terms of material, design and workmanship, free of charge, by means of repair or replacement of the product according to this limited warranty.

The request for repair under warranty will be satisfied free of charge by Cressi-sub or by a Cressi-sub authorized service centre, according to their exclusive judgement, and the product will be repaired or replaced within a reasonable time.

If the product is deemed non-compliant with the terms and conditions of this limited warranty, Cressi sub or a Cressi sub authorized service centre reserve the right to charge service and/or repair costs.

The warranty cannot be transferred by the first purchaser to a third party. A purchase receipt (with purchase date) from an authorized Cressi-sub dealer is required for warranty service).

Any repairs not covered by the warranty will be carried out at the buyer's expense.

The warranty does not include any document or warranty granted by retailers or agents beyond this warranty's terms.

No retailer or agent is authorized to make any changes to this warranty or to grant an additional one.

For repair under warranty, send the product, carriage forward, to your Cressi-sub retailer or to an authorized Service Centre. Write down your full name and address and enclose the purchase receipt or invoice.

You can find your authorized Cressi-Sub centre by asking your dealer, or Cressi Sub S.p.A. itself by sending an e-mail to: info@cressi-sub.it.

Cressi sub assumes no responsibility for any work carried out by personnel not authorized by Cressi sub.

The instructions and directions found in this manual are based on the most up-to-date information about the equipment available before printing. Cressi Sub reserves the right to make changes to the content at any time.



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