# REGULATORS

# PROTON ICE EXTREME - PROTON ICE EXTREME OCTOPUS

**⚠ WARNING**

**CAREFULLY READ THIS INSTRUCTION MANUAL BEFORE USE, AND KEEP IT FOR FUTURE REFERENCE.**

**INTRODUCTION**

Congratulations. You have purchased one of the finest, most dependable regulators available on the market today. Your Mares regulator has been constructed using manufacturing processes and materials which are the result of fifteen years of continuing research and evolution. This sophisticated technology is backed by the guarantee that every component of your regulator has been tested at our modern facility in Rapallo, Italy. All this is synonymous with reliability, a fundamental requirement for any piece of diving equipment, which you will find in EVERY Mares product.
This manual is intended as a guide for experienced technicians, and not as a comprehensive instruction book on all aspects of diving equipment for inexperienced repair personnel.
MARES periodically offers technical training courses at its factory. Technicians are strongly advised to obtain specific practical training in the servicing of MARES diving equipment before attempting any repairs.
Carefully read all parts of this manual before undertaking any repairs.

**Important:**

Any critical information or warnings that might affect the performance or result in the injury or death of the technician, regulator owner, or other persons is highlighted with the following symbols:

**⚠ DANGER**

**Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.**

**⚠ 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.**

MARES reserves the right to modify any products, processes and manufacturing techniques at any time. It is the technicians' responsibility to acquire the latest information and parts from Mares for service and repairs to be performed.

**IMPORTANT:**

If the instructions provided in the manual are unclear or difficult to understand, please contact Mares before using the regulator or attempting any repairs.

**⚠ WARNING**

**Carefully follow these and all the other instructions concerning your Mares regulator and all other SCUBA equipment. Failure to do so could lead to serious injury or death.**

**⚠ WARNING**

**As with all SCUBA equipment, Mares regulators are designed to be used by trained, certified divers only. Failure to fully understand the risks of using such equipment may result in serious injury or death. DO NOT use this regulator or any SCUBA equipment unless you are a trained, certified SCUBA diver.**

## EC CERTIFICATION

The Mares regulators described in this manual have been tested and certified by Registered Test Centre No. 0426 - Italcert - Viale Sarca 336, Milano - I, in compliance with EC directive 89/686/EEC of 21 December 1989. The test procedures were conducted according to the EN 250: 2000 standard, in conformance with the aforesaid directive which sets out the conditions for marketing and essential safety requirements for Category III Personal Protective Equipment (PPE).
The certification testing results are the following:

| Model | Warm water (Temp. = > 10 C (50 F)) | Cold Water (Temp. < 10 C (50 F)) | Marking | Position |
|---|---|---|---|---|
| Proton Ice Extreme | Approved | Approved | CE 0426 | On the first stage |
| Proton Ice Extreme Octopus | Approved | Approved | CE 0426 | On the hose |

The CE 0426 mark of the Proton Ice Extreme Octopus is an adhesive label affixed to the hose. This label must never be removed. If the label is accidentally removed, the applicable CE mark for the Proton Ice Extreme Octopus will be the one on the Mares first stage to which it is connected.
The CE mark certifies compliance with the essential health and safety requirements (DE 89/686/EEC Annex II). The suffix 0426 after the letters "CE" indicates the Italcert Registered Test Center in charge of monitoring the production under Art. 11B DE 89/686/EEC.

## REFERENCES TO EN 250: 2000 - OBJECT - DEFINITIONS - LIMITS

**Object:** The requirements and tests provided for in EN 250: 2000 are aimed at providing a minimum safety level for the operation of diving breathing apparatuses at a maximum depth of 50 m / 162 feet.
**Scuba - Definition:** Self-contained, open-circuit compressed air underwater breathing apparatus is an apparatus which has a portable supply of compressed air carried by the diver, allowing him to breathe underwater.
**Scuba - Minimum equipment (EN 250: 2000):**

a) Air tank(s).
b) Regulator.
c) Safety device, e.g. pressure gauge/computer, reserve mechanism or alarm.
d) Transport and retaining system, e.g. backpack and/or straps.
e) Facepiece (mouthpiece assembly or full-face mask or diving helmet).
f) User instructions.

**Limits (EN 250: 2000)**

- **SCUBA - Component Groups (EN 250: 2000):** The SCUBA unit can be made up of separate pieces of equipment such as a tank, regulator and submersible pressure gauge. The Mares regulators described in this manual can be used with other SCUBA unit components certified according to directive EEC/89/686 and EN 250: 2000. The air contained in the tanks must conform to the requirements for breathable air set out in EN 12021.

### ⚠ DANGER

**Mares regulators and octopus are designed and intended for use only with clean, compressed atmospheric air. Do not use this equipment with any other gas or enriched air.**
**Failure to adhere to this warning may result in serious injury or death due to fire and explosion or the serious deterioration or failure of the equipment.**

### ⚠ WARNING

**FOR NORTH AMERICA ONLY**

**Mares regulators, alternative second stages, and gas delivery components are designed for and compatible with open circuit SCUBA using compressed air or enriched air (Nitrox) mixtures not exceeding 40% Oxygen ONLY.**
**These limits conform to the DAN Nitrox Industry Workshop Proceedings of November, 2000.**
**Failure to follow this warning may result in SERIOUS INJURY or DEATH to the user due to fire, explosion, or the deterioration or failure of the equipment.**

- Maximum depth: 50 m / 162 feet.
- Pressure max 232 bar (international YOKE CGA 850 adapter) Fig. 1a.
- Pressure max 300 bar (DIN 477/50 screw) Fig. 1b.
- Warm water regulators - water temperature over or equal to +10°C (50°F).
- Cold water regulators - water temperature below +10°C (50°F).
  Under the EN 250: 2000 standard, water is considered to be cold at a temperature below 10°C. To use MARES regulators in cold water conditions, always install the CWD (Cold Water Diving) kit. THE CWD KIT SHOULD ONLY BE INSTALLED BY AN AUTHORIZED MARES SERVICE CENTER.

## CWD KIT

Because the Proton Ice Extreme is meant to operate in particularly demanding conditions and for professional use in cold water, the V32 first stage is equipped with the CWD kit, which fully isolates all the internal sections of the first stage from contact with the water.

### COLD WATER DIVING

According to standard EN 250: 2000, cold water is that at temperatures below 10°C.

### ⚠ WARNING

**Attempting to dive in cold water conditions (below 10°C) without adequate training may result in serious injury. Before diving in cold water, it is advisable to take a special training course under the supervision of a certified diving instructor.**

When diving in cold water conditions, parts of the regulator may be subject to “icing” phenomena. The variables that influence the possibility of ice forming inside and on the regulator are: temperature of the external environment, water temperature, temperature of the air in the tanks (and therefore the amount of time that the tanks were exposed to the cold before the dive), fresh water rather than salty, the level of humidity in the air in the tanks, the amount of air demanded by the regulator during the dive, and the breathing rhythm.

**⚠ WARNING**

**Since it is not possible in practice to control all of these variables and therefore to prevent freezing of a second stage in all situations, the Proton Ice Extreme equipped with the CWD kit could nonetheless demonstrate “icing” phenomena. In this event, regulators may not function properly. This may result in serious injury. Therefore, to minimize the potential hazards, it is essential to be adequately trained in the prevention and handling of the problems which may arise from a regulator subject to “icing” phenomena.**

Particularly in these situations, the following precautions should be observed:

1. Take a course to learn cold water diving techniques.
2. Refill the air tanks only at filling stations equipped with an efficient filtering and moisture removal system.
3. When preparing for a cold water dive, keep the tanks and regulator in a place that is sheltered from the cold until just before starting the dive.
4. Open the tank control valve for one or two seconds to make sure there are no water droplets or small ice crystals. Also check the inlet opening of the regulator.
5. In the event of repetitive dives, take particular care to ensure that the regulator is perfectly dry before starting the second dive.
6. Avoid breathing from the regulator outside the water.
7. As much as possible, try to prevent water from entering inside the second stage during the dive.
8. Never operate the purge button when not underwater.
9. Use the purge button as little as possible. In any case, never hold it down for more than 2 or 3 consecutive seconds; pressing it for longer may cause ice to form.
10. Try to breathe normally in order to minimize the cooling effect produced by the higher air velocity during overbreathing.

**⚠ WARNING**

**Do not pierce or prick the diaphragm of the CWD and avoid directing powerful jets of water against it (as for example from a hose). This could puncture the diaphragm or displace it, leading to subsequent oil leaks or infiltration of water. In these cases, it is necessary to disassemble the CWD kit and replace the diaphragm. This operation must be performed at an authorized Mares repair shop following the instructions in the maintenance manual.**

- The Proton Ice Extreme Octopus second stage may only be used with certified Mares regulator models.

**⚠ WARNING**

**For safety reasons, it is not advisable to use an Octopus second stage that is not a certified Mares Octopus. The manufacturer declines responsibility for damages to persons or property resulting from the use of different Octopus second stages. The Mares Octopus second stages have been designed and tested for use on first stage low pressure ports OTHER than the preferential port used for the primary second stage. An Octopus second stage may NOT be substituted for a primary second stage, and must in no circumstances be connected to the preferential low pressure port intended for the primary second stage.**

**⚠ WARNING**

**For safety reasons, the submersible pressure gauge / high pressure safety device to be assembled on the regulator must comply with the standard EN 250:2000. According to this regulation, with an upstream pressure of 100 bar, the maximum permitted airflow through the connector toward the first stage must not exceed 100 liters/min. If you have a submersible pressure gauge / high pressure safety device that complies with the EN 250:1993 standard or a different specification, check whether the instruction manual indicates the value of the maximum airflow.**
**The use of submersible pressure gauges / safety devices that do not comply with the EN 250:2000 standard, or which do not have an indication of the maximum permitted airflow through the first stage connector, may result in serious accidents.**

## GENERAL WORKING PRINCIPLE

Regulators reduce tank pressure, referred to as inlet pressure, to a pressure suitable for breathing. Modern regulators do this in two stages connected by a hose. The first stage provides pressure to the second stage; this reduced pressure remains constant despite the sizeable changes undergone by the cylinder inlet pressure during the dive (dropping from 3000/4350 to few hundred psi). The second stage brings pressure down to ambient pressure and delivers air only when the diver inhales. Each stage of the regulator contains an internal valve. When the diver inhales, the pressure inside the case is lowered and a pressure differential (imbalance) is created across the diaphragm (beginning of inhalation). The response of the diaphragm is to bend inward, contact the lever and open the second stage valve. Air continues to flow into the case until the pressure balance is regained (end of inhalation).

## FIRST STAGE

For the second stage to work properly, the first stage must deliver air at a correct and - most importantly - constant intermediate pressure. This characteristic, provided by all Mares first stages, is essential for obtaining optimal adjustment of the second stage and ensuring top performance for the entire duration of the dive, regardless of tank pressure. All MARES first stages are available with the following types of tank valve fittings: international YOKE CGA 850 adapter (max pressure 232 bar), or DIN 477/50 connector (max pressure 300 bar), in accordance with the standard EN 250:2000.

## SECOND STAGE

The purpose of the second stage is to deliver air at ambient pressure, only during the inhalation phase. The diagram of a second stage shown in Fig. 4 illustrates its operation. When the diver inhales, the pressure inside the second stage decreases, creating a pressure difference (imbalance) between the two sides of the diaphragm. This pulls the flexible diaphragm inward, pressing the demand lever and unseating the second stage valve. This opening allows air to flow in through the second stage and to the diver, until the diver stops inhaling. At this point the internal second stage pressure increases, pushing the diaphragm back in the opposite direction, causing the valve to return to its seat and shutting off the airflow.

### V32 First stage (Fig. 2)

The Proton Ice Extreme is equipped with the brand new V32 first stage complete with CWD, and it stands out immediately thanks to its unique and innovative look, and because it is especially light for a first stage of this level. Its technical characteristics, with a diaphragm design and DFC system, are those of the famous MR22. The forged brass body with chrome and nickel plated finish is protected by a shockproof and scratch-resistant coating. The high pressure valve features the SCS spherical seal system, for superior durability. The low and high pressure ports are positioned to offer the most sensible arrangement of the hoses, ensuring maximum comfort for the user.

### DFC system

The exclusive Mares DFC system fitted on the V32 first stage minimizes the intermediate pressure drop which occurs in all regulator first stages during the inhalation phase (Fig. 3). This phenomenon is all the more marked when higher airflow is demanded of the regulator. The DFC system substantially reduces breathing effort and inhalation resistance, especially during deep dives and under demanding conditions. The V32 first stage incorporates the DFC system on the primary LP port. Operation of the other low pressure ports (for octopus, inflator, etc.) is standard.

### Proton Ice Extreme second stage

The most compact metal second stage in the world. Thanks to the integrated VAD system, it offers top-level performance that vastly exceeds not only the requirements for CE certification, but the stringent U.S. Navy specifications as well. The all-metal technology, coupled with the fluoropolymer resin coating, makes the Proton ICE Extreme the number one regulator, with unparalleled performance in the cold.
It was tested by the U.S. Navy in extremely cold conditions. Approved for U.S. Navy use in water 29°F / -1.7°C and above.
Indeed, a unique and revolutionary design. The oversized purge button is extremely easy to use, even while wearing thick three-finger gloves. The “mesh grid” system minimizes the likelihood of free-flow in strong currents. The new design exhaust tee, with its streamlined shape, affords superior performance while directing air bubbles further away from the face.

### The fluoropolymer resin

The fluoropolymer resin on the metal parts of the second stage creates a coating that is resistant to the most aggressive chemical agents.
Naturally non-stick, it prevents ice crystals from attaching to the metal; approved for dietary use, fluoropolymer resin can also be used in high and low temperatures.

**⚠ WARNING**

**Variations in the color of the resin have no effect on performance.**

**⚠ WARNING**

**Fluoropolymer resin has only one limitation: its low resistance to scratches.**
**In order to protect the coating on your Proton ICE Extreme, you should follow these instructions:**
- **During use, protect the second stage from bumps and scrapes.**
- **Never clean it with abrasive products or sharp objects.**
- **Always store the regulator so that the second stage is not in contact with abrasive surfaces or spiky metal parts.**

**⚠ WARNING**

**However, any scratches on the exterior of the second stage will not impair its good performance in the cold.**

**⚠ WARNING**

**Components with scratch-damaged resin coating will not be replaced under the warranty.**

### VAD Integrated System (patented)

The Proton Ice Extreme second stage uses the Mares exclusive and patented V.A.D. (Vortex Assisted Design) integrated system. This system guarantees a low breathing effort at any depth, so that as the air from the hose passes through the second stage valve, it is routed directly to the mouthpiece via the by-pass tube (Fig. 4). This is a new version of the VAD system, with the bypass tube incorporated into the technopolymer body of the regulator second stage. This innovative technical development ensures great ease of breathing in an exceptionally compact and lightweight second stage.

### Proton Ice Extreme Octopus

The Octopus version second stage is fitted with a rather lengthy hose (100 cm). Its characteristic yellow color makes it immediately identifiable under any conditions.

| Technical characteristics | V32 Proton Ice Extreme first stage |
|---|---|
| Operation | DFC diaphragm balancing system, SCS |
| Materials:<br>Metal parts | <br>High-resistance moulded brass, nickel- and chrome-plated, stainless steel |
| Non-metal parts<br>Seals and membranes | High impact technopolymers<br>Nitryl rubbers, silicone rubbers |
| Capacity (pressure 180 bar) | 4800 l/min |
| Intermediate pressure:<br>Inlet pressure 300 bar<br>Inlet pressure 232 bar<br>Inlet pressure 30 bar | <br>from 9.8 to 10.2 bar<br>from 9.8 to 10.2 bar<br>from 9.8 to 10.2 bar |
| First stage ports:<br>High pressure<br>Intermediate pressure<br><br>Hose type:<br>Standard length<br>Octopus length | <br>n. 2 7/16” UNF<br>n. 1 1/2” UNF DFC (primary)<br>n. 3 3/8” UNF<br>super soft 1/2”<br>80 cm<br>100 cm |
| Weight | INT. 904 g / DIN 710 g |

| Technical characteristics | Proton Extreme Second Stage |
|---|---|
| Operation | VAD system, mesh-grid cover, all metal case |
| Materials:<br>Metal parts | <br>Nickel- and chrome-plated brass, stainless steel |
| Non-metal parts<br>Seals and membranes | High impact technopolymers<br>fluoropolymer resin, nitryl rubbers, silicone rubbers |
| Capacity (pressure 180 bar) | 2400 l/min |
| Intermediate pressure:<br>Inlet pressure 300 bar<br>Inlet pressure 232 bar<br>Inlet pressure 30 bar | <br>from 9.8 to 10.2 bar<br>from 9.8 to 10.2 bar<br>from 9.8 to 10.2 bar |
| Weight | 244 g |

## OPERATION AND MAINTENANCE

### ⚠ WARNING

**DO NOT attempt to use any kind of adaptor to connect the LP hose to the HP port, as this may lead to serious injury. The LP components are not designed for use with pressures higher than 20 bar.**

**Connecting accessories to the first stage**

The hoses and accessories should be connected in such a way as to avoid damaging the O-ring. Use a suitable wrench to remove the plug from the first stage port, and screw the terminal fitting of the hose firmly but gently into the first stage port.

### ⚠ WARNING

**The regulator in and of itself is not a complete SCUBA unit, but only one of its components.**
**Under the EN 250:2000 standard, a complete SCUBA unit must include at least the following Minimum Equipment:**

**a) Air tank(s).**
**b) Regulator.**
**c) Safety device, e.g. pressure gauge/computer, reserve, or alarm.**
**d) Transport and retaining system, e.g. backpack and/or straps.**
**e) Facepiece (mouthpiece assembly or full-face mask or diving helmet).**
**f) Operating instructions.**

**Your Mares regulator has been designed for use in conjunction with other SCUBA unit components conforming to the EEC/89/686 directive and certified with the EC mark. The air inside the tanks must conform to the requirements for breathable air set out in EN12021.**

**BEFORE ASSEMBLING THE COMPONENTS OF YOUR SCUBA UNIT, CAREFULLY READ ALL THE USER INSTRUCTIONS AND ANY WARNINGS WHICH THEY CONTAIN.**

### PRE-DIVE CHECKLIST

- Ensure that all the hoses have been correctly assembled onto the first stage, and check them for cuts, signs of wear or other damage. If the hoses are loose enough to be unscrewed manually, they must be tightened with a wrench before being pressurised.
- Make sure that the first and second stages do not show signs of damage.
- Position the tank control valve so that the valve opening is directed towards the diver.

- Remove the dust cap from the regulator yoke and position the A-clamp or DIN fitting so that it is centered on the tank valve opening.
- The first stage should be oriented in such a way that the hose leading to the second stage is routed over the diver's right shoulder.
- Tighten the yoke nut, or DIN connector, finger tight only, being careful not to damage the O-Ring on the tank valve in the case of a yoke connector.
- Check the submersible pressure gauge, making sure that the pressure reading is zero.
- Very slowly open the tank valve, allowing air to enter the regulator gradually.
- Do not turn the first stage connected to the tank when the system is pressurized.

**⚠ WARNING**

**During this operation, press the purge valve of the second stage. This helps to reduce the impact on the valve (Fig. 5). DO NOT PERFORM THIS OPERATION AT AMBIENT TEMPERATURES BELOW 10°C (50°F).**

- Check the pressure gauge to ensure that it indicates the proper and sufficient tank pressure for your planned dive.
- Check the cylinder and regulator connection for leakage. If leakage exists, it may be caused by incorrectly mounting the regulator on the valve or by a damaged cylinder valve O-ring.
- To confirm that the regulator delivers air properly, first exhale through the mouthpiece to blow any foreign matter from the second stage, then inhale. A few breathing cycles should indicate if there are any obvious problems that cannot be discovered by actually breathing from the regulator while underwater.

## DURING THE DIVE

- If you are using a second stage as an Octopus regulator, the dust cap should be used to prevent foreign matter from entering the second stage through the mouthpiece.
- When the regulator is out of the diver's mouth, free flowing of air may occur. This inconvenience may be easily eliminated by turning the regulator downward and lightly shaking it to fill it with water (Fig. 6). Should free flow continue, abort the dive immediately.

## POST-DIVE CARE AND PERIODIC MAINTENANCE

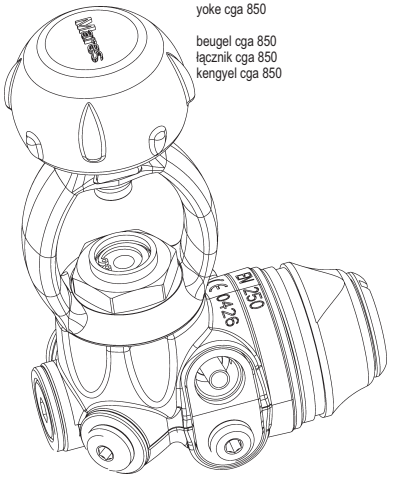
Ideally, your regulator should be rinsed with fresh water while pressurized. This allows the second stage to be rinsed internally without introducing contaminants into critical sealing areas. Rinse the first stage and also run water into the mouthpiece of the second stage and out of the exhaust tees to remove foreign matter. If the regulator is not pressurized, do not depress the purge button while rinsing. Actuation of the purge function may allow particles to contaminate the valve seat and cause leakage. In order to avoid filter and first stage contamination, prevent water from entering the first stage air inlet. Cover the first stage filter with the special dust cup (Fig. 7). Allow the regulator to dry thoroughly before putting it away. If the regulator is exposed for prolonged periods to direct sunlight, or left in greasy or dusty environments, some of its components may be damaged. Do not use lubricants. Lubricants should never be used in routine care and maintenance.

**⚠ WARNING**

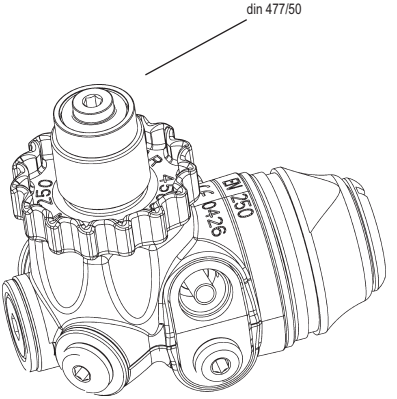
**Proper operation of your regulator also depends on appropriate maintenance. Therefore, your regulator should be submitted to a Mares authorized service center for inspection at least once a year. In particular, the first stage valve, or the seat connector (for SCS systems), should be replaced every two years or every 200 hours of diving.**

## WARRANTY

With the purchase of a Mares regulator, you receive a permanent "Original Owner Identification Card" made of durable plastic. Your card will have the model and serial number embossed on it. Please print your name and sign in the appropriate space provided. Keep this card, and present it whenever regulator maintenance is performed by any Mares Authorized Service Center




**1 a**




**1 b**

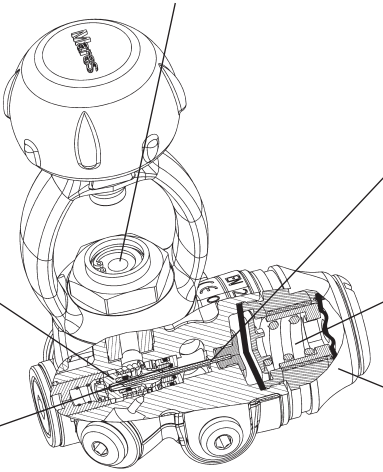
**PRIMO STADIO V32**
**V32 FIRST STAGE**
**ERSTE STUFE V32**
**PREMIER ÉTAGE V32**
**PRIMERA ETAPA V32**
**PRIMEIRO ESTÁGIO V32**
**EERSTE TRAP V32**
**V32 FÖRSTASTEG**

**ΠΡΩΤΟ ΣΤΆΔΙΟ V32**
**V32-PAINEENALENNIN**
**PIERWSZY STOPIEŃ V32**
**V32 ELSŐ LÉPCSŐ**

Filtro conico
Tapered filter
Sinterfilter
Filtre conique
Filtro cónico
Filtro cônico

Sinterfilter
Avsmalnat filter
Διαβαθμισμένοφίλτρο
Kartiomallinen suodatin
Filtr stożkowy
Kúpos szűrő

Spillo di spinta
Thrust pin
Ventilstift
Pointeau
Disco de empuje
Pino de empuxo
Spindel
Tryckstift
Ωστικός πείρος
Venttiilin neula
Trzpień zaworu
Nyomó csapszeg




Camera bilanciamento
Balancing chamber
Hochdruckkammer
Chambre de compensation
Cámara de compensación
Câmara de balanceamento
Hogedrukkamer
Balanskammare
Θάλαμος εξισορρόπησης
Tasapainotuskammio
Komora równoważąca
Kiegyenlítőkamra

Molla principale
Main spring
Hauptfeder
Ressort de membrane
Muelle principal
Mola principal
Veer
Huvudfjäder
Κύριο ελατήριο
Pääjousi
Główna sprężyna
Fő rugó

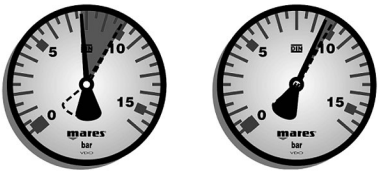
Sede valvola alta pressione
HP seat connector
Hochdruck-(HP)ventilsitz
Siège haute pression
Asiento de la válvula de alta presión
Assento válvula alta pressão
Hogedrukklepzitting
HP-säteskoppling
Σύνδεσμος βάσης HP
Korkeapaineistukan vastakappale
Złącze gniazda HP
Nagynyomású csatlakozóaljzat

CWD kit

CWD-set
CWD-sarja
Zestaw CWD
Zestaw CWD
Hidegvízi merülő készlet

**2**

Differenza della caduta della pressione intermedia in fase inspiratoria
Difference in intermediate pressure drop during inhalation
Unterschiede im Mitteldruckabfall während der Einatemphase
Comparaison de la chute de la moyenne pression à l'inspiration
Diferencia del descenso de la presión intermedia durante la fase de inspiración
Diferença de queda da pressão intermediária em fase de inspiração
Verschil in terugval middendruk tijdens inademing
Difference in intermediate pressure drop during inhalation
Διαφορά στην πτώση της ενδιάμεσης πίεσης κατά την εισπνοή
Välipaineen muutos sisäänhengityksen aikana
Różnica w spadku średniego ciśnienia podczas wdechu
A középnyomás-esés különbsége belégzés közben

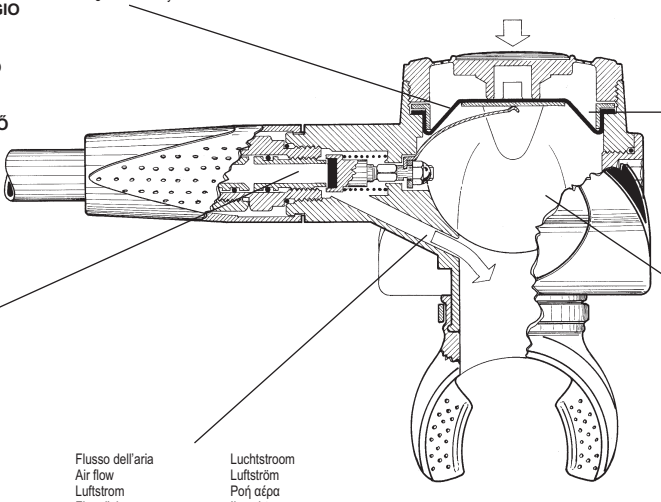



| Primo stadio tradizionale<br>Traditional first stage<br>Herkömmliche erste Stufe<br>Premier étage classique<br>Primera etapa tradicional<br>Primeiro estágio tradicional<br>Traditionele eerste trap<br>Traditionellt förstasteg<br>Κλασικό πρώτο στάδιο<br>Perinteinen paineenalennin<br>Tradycyjny pierwszy stopień<br>Hagyományos első lépcső | Primo stadio con D.F.C.<br>D.F.C. first stage<br>DFC erste Stufe<br>Premier étage D.F.C.<br>Primera etapa con DFC<br>Primeiro estágio com D.F.C.<br>Eerste trap met D.F.C.<br>D.F.C. förstasteg<br>Πρώτο στάδιο D.F.C.<br>D.F.C. -paineenalennin<br>Pierwszy stopień D.F.C<br>D.F.C. első lépcső |
|---|---|

**3**

**SECONDO STADIO**
**SECOND STAGE**
**ZWEITE STUFE**
**DEUXIEME ETAGE**
**SEGUNDA ETAPA**
**SEGUNDO ESTÁGIO**
**TWEEDE TRAP**
**ANDRASTEG**
**ΔΕΥΤΕΡΟ ΣΤΑΔΙΟ**
**ANNOSTIN**
**DRUGI STOPIEŃ**
**MÁSODIK LÉPCSŐ**

Membrana — Membraan
Diaphragm — Membran
Membran — Διάφραγμα
Membrane — Kalvo
Membrana — Membrana
Diafragma — Víznyomás



Pressione dell'acqua
Water pressure
Umgebungsdruck
Pression de l'eau
Presión del agua
Pressão da água
Waterdruk
Vattentryck
Πίεση νερού
Veden paine
Ciśnienie wody
Víznyomás

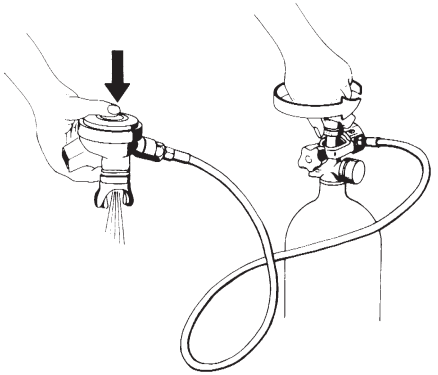
Pressione intermedia
Intermediate pressure
Mitteldruck
Moyenne pression
Presión intermedia
Pressão intermediária
Middendruk
Medeltryck
Ενδιάμεση πίεση
Välipaine
Średnie ciśnienie
Középnyomás

Flusso dell'aria
Air flow
Luftstrom
Flux d'air
Flujo de aire
Fluxo do ar

Luchtstroom
Luftström
Ροή αέρα
Ilmavirta
Przepływ powietrza
Légáramlás

Bassa pressione
Low pressure area
Niederdruckbereich
Basse pression
Baja Presión
Baixa pressão
Lage druk
Lågtrycksområde
Περιοχή χαμηλής πίεσης
Matalapainealue
Strefa niskiego ciśnienia
Kisnyomású zóna

**4**



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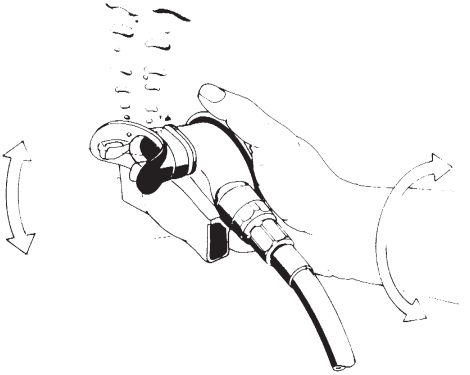

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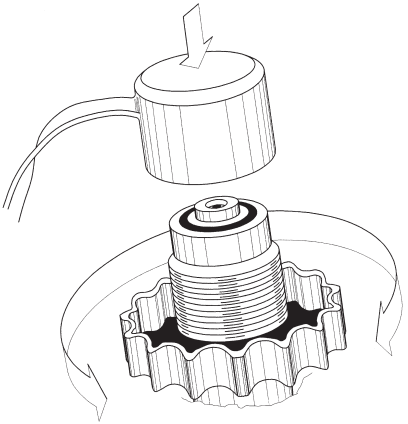

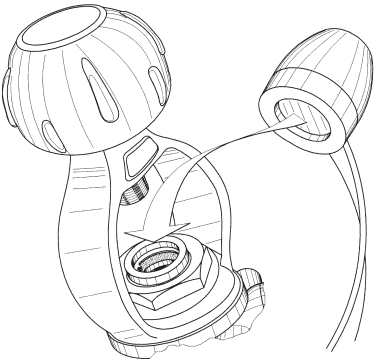

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