

REGULATOR
OWNER'S MANUAL



Congratulations on your purchase of your DECO regulator. Developed with our research and manufacturing partners, we are confident that you will enjoy exemplary performance and reliability from our products. We thank you for placing your confidence in DECO regulators, and we look forward to providing you with many years of support and service.

1. CE standards and EN250:14 requirements

All DECO regulators have successfully passed the stringent requirements set forth under the EN 250:2014 harmonised standards in compliance with EU regulation 2016/425. This regulation establishes the conditions required for taking a product to market and the essential minimum safety requirements for Personal Protective Equipment (PPE). Our regulators belong to the maximum PPE category (category III) and have met the requirements called for by the tests established by standard EN 250:2014, recognised as the technical reference standard for regulators for recreational use produced and sold in the European market (DECO regulators are made in the EU).

1.1. Limitations of the EN250:2014 standard: what does that mean?

The harmonised standards decided in 2014 outline that an 'octopus' rig (single 1st stage and two 2nd stages) is unsuitable for an escape device for more than one diver at a time if diving deeper than 30m or water colder than 10°C. In other words, the EN250:2014 standard applies to a single diver on a regulator system without a buddy. The EN250 A is an additional set of standards over and above the EN:250:2014 standard. It uses more stringent criteria for two divers breathing from a single regulator (i.e. an out-of-air emergency).

1.2. EN250 Annex A (EN250A)

EN250A tests a regulator 1st stage with a demand on the primary and alternate demand valve to simulate two divers breathing off a single 1st stage. If the 1st stage can deliver gas to two 2nd stages at the same time and still not exceed the limits of

the EN250:2014 standard, then it is classified as EN250-A. There is a further distinction for those regulators that are either warm water certified (EN250A>10°C) and those rated for cold water (EN250A>4°C). All DECO regulators have met the stringent EN250-A standard.

2. WARNINGS AND IMPORTANT INFORMATION

- 1.This manual must be read and understood entirely before using the product. We suggest you keep this manual available to refer to at any time.
- 2.Use the equipment according to the instructions in this owner's manual and only after reading and thoroughly understanding all warnings and instructions.
- 3.Cylinders must only be filled with dry, filtered, atmospheric compressed air (EN12021). Any moisture in the cylinder may cause freezing and subsequent regulator malfunction during dives carried out in low-temperature conditions (<10°C).
- 4.The equipment must be serviced and overhauled at the prescribed intervals using only original DECO replacement parts.
- 5.When diving, you must follow the rules and apply the skills that a recognised scuba diving training agency has taught you. Before engaging in any diving activity, it is mandatory to have completed a scuba diving course covering both the theoretical and technical aspects of diving.
- 6.This manual is NOT a substitute for a diving instruction course.

DECO Diving Equipment PTY (Ltd) refuses all responsibility for damages caused by non-compliance with the instructions contained in this manual. These instructions do not extend the warranty or the responsibilities stated by DECO diving equipment terms of sales and delivery.

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

3. The SCUBA regulator system

The function of the regulator is to reduce high pressure from a pressurised SCUBA cylinder to the same pressure as the ambient pressure surrounding the diver to enable the diver to breathe the gas when required. The regulator comprises a 'first stage' that connects to the cylinder valve and acts as the primary pressure reducer to the intermediate pressure (the pressure in the hose). The 'second stage' (kept in the divers' mouth) reduces the intermediate pressure further to precisely that of the surrounding water pressure. The regulator, cylinder, valves, hoses, and gauges are known as SCUBA (Self-Contained Underwater Breathing Apparatus). This owner's manual details all the DECO regulator models in the range, their features, and the easiest ways to maintain and care for the regulator.

3.1 First stage

The first stage attaches to the cylinder valve and reduces high cylinder pressure to a lower intermediate pressure in the hose (about 9,5-10 bar). The first stage can be either a downstream flow by piston (unbalanced), a balanced flow-through piston, or a balanced diaphragm design mechanism. DECO regulators come standard with a DIN477/50 (300Bar) fitting to attach the valve to the cylinder.

3.2 Second stage

The second stage is held in the diver's mouth and receives intermediate pressure from the first stage via the low-pressure hose. The second stage reduces the intermediate pressure to ambient pressure, enabling the diver to breathe. The regulator's second stage may have breathing adjustments such as flow control (adjusting the second stage's breathing effort) or venturi assist (a moveable lever that acts as a 'gas flow booster' while breathing underwater).

3.3 Alternate Air Source (Octopus)

The Alternate Air Source is an emergency alternate air gas supply second stage. The AAS is attached to the first stage and is used by the diver should the primary regulator malfunction or another diver require an emergency air source. Only regulators that are EN250-A certified are considered suitable to be used by two divers simultaneously. All DECO regulators meet the EN250-A standard and are suitable for alternate air source (octopus) use.

4. DECO First stages

P50 - Unbalanced, classic downstream (flow by) piston first stage

D70 - Balanced, diaphragm first stage

P90 - Balanced, flow through piston first stage

4.1.1. P50 - Unbalanced, classic downstream piston first stage

The P50 is a classic downstream, unbalanced piston first stage. Machined from a solid bar of marine grade brass and then nickel and chrome plated for lasting protection and aesthetic appeal, the P50 is the obvious choice for general sport divers, diving schools and dive charter rentals.

The compact P50 first stage is a 'bullet-proof' design with one moving part that makes it virtually indestructible, incredibly easy to maintain and unquestionably reliable.

The P50 has one high-pressure port and four low-pressure ports arranged in such a way as to enable flexible hose routing and attachment. The P50 body has been machined to maximise surface area (that acts as a heat sink) and



Is EN250-A certified for cold water diving (>4°C) due to its superb cold water tolerance and manners. A 300 bar DIN fitting (EN ISO 12209 standard) is a standard feature in the first stage. The P50 piston head has been enlarged to ensure a very responsive breathing performance, while the seat working range has been extended to maximise gas flow during the inhalation cycle.

Inside the P50 first stage is a conical DIN filter that provides 200% higher filtration than a standard flat filter to prevent even the finest of impurities from the cylinder from reaching the internal workings of the regulator. The Low-Pressure port internals have been enlarged to increase airflow significantly from the first stage. The performance of this compact P50 first stage is inspiring, delivering ANSTI test scores that compete with most high-end regulators at 50m depth, 4°C, and 50 bar supply pressure.

4.1.2. D70 - Balanced diaphragm first stage

The D70 is an air-balanced diaphragm first stage with 2 HP ports and 4 LP ports pre-angled for optimal hose routing. Developed for more challenging dive conditions (regular diving below 25m, cold, dirty water and diving with strong currents), the D70 is up to any challenge. Due to the positioning of the ports, the D70 is also perfect for use as a bailout cylinder regulator where streamlining of the hoses is required. The D70 regulator is EN250-A certified for cold water diving (>4°C) and is delivered standard with a 300 Bar DIN fitting. The D70 first stage features an easy-to-access IP adjustment for simple and convenient servicing and maintenance.



4.1.3. P90 Balanced, flow through piston first stage

The P90 is a high-performance, balanced flow-through piston design. The P90 has two HP and 4 LP ports (A 5th port adapter is also available). Due to the size of the piston bore, the P90 is capable of delivering significant air flow at all depths and is well-suited for twinset and side-mount hose configurations. The P90 is ideally suited for divers requiring higher gas flow, such as deep air and trimix diving. The P90 also features an externally adjustable Interstage Pressure (IP) adjustment nut to easily adjust the first-stage IP without disassembly. The dynamic sealing O-ring anti-extrusion bush of the piston limits any 'stiction' or O-ring extrusion, providing flawless performance and reliability of the P90 first stage. The P90 is EN250-A certified for water temperatures greater than **>10°C**.



5. DECO Second stages

T600 - Second stage with Venturi effect control (pre-dive / dive) preventing the regulator from free-flowing on the surface and providing inhalation assistance during the dive.

T620 - Second stage with breathing effort control while diving and Venturi effect control (pre-dive / dive) to limit free flow on the surface.

A600 - Alternate second stage (Octopus) with Venturi effect control (pre-dive / dive) prevents the regulator from free-flowing on the surface and provides inhalation assistance during the dive.

N600 - Nitrox dedicated second stage with Venturi effect control (pre-dive / dive), preventing the regulator from free-flowing on the surface and providing inhalation assistance during the dive.

5.1.1 T600 second stage (A600, N600 are different face plates on the same regulator body for easy recognition)

The T600 is a full-featured second-stage design using only the best materials and manufacturing techniques. Featuring an all-metal valve body and lever made from chromed marine grade brass and stainless steel, the internal components enclosed in a robust fibreglass resin case make the T600 the ideal companion for many years of trouble-free, peace-of-mind diving. The Venturi effect control of the second stage is used to prevent free flow when on the surface, and the second stage is out of the divers' mouth (the lever is turned to -ve, away from the diver). When the Venturi effect control is activated (turned to the +ve, towards the diver), the T600 transforms into an exceptional performing regulator with world-class performance scores.



5.1.2. T620 second stage

The T620 features the same exceptional features, quality and workmanship as the T600 but with the addition of a breathing resistance control. This

additional control allows the diver the flexibility to modify the sensitivity of the regulator during the dive.

Prolonged head first positions, facing into strong currents, breathing more dense gas (at depth), and intentionally detuning a stage cylinder second stage are all examples of where a diver may prefer to have the option to de-tune or enhance the regulator breathing response. The available Venturi control and the breathing resistance control make the T620 the ideal choice for the demanding diver.



Before the T620 regulator's second stage is released from the DECO Quality Control system to the diver, it is finely tuned to perform at its peak. If the diver feels a slight trickle of air escaping from the second stage after pressurising the system, this can be stopped by turning the breathing resistance control clockwise till the airflow stops. This is not a malfunction or fault; it is easily field-remedied and does not affect regulator performance or reliability.

6. Important Pre-Dive steps

Before every dive, it is essential to check the status of your regulator. Look for signs of wear, damage, or any debris trapped in the mouthpiece or exhaust valve. Check the hoses for any signs of significant abrasion (it is why DECO hoses do not have hose protectors that cover up potential areas of damage or wear).

1. Look closely at the first stage; the hoses should be checked for abrasions, kinks, or surface deterioration. DO NOT dive with a regulator with hoses that appear damaged.
2. Unscrew the DIN cap from the regulator's first stage and store the dust cap in a dry area. Check the O-ring in the DIN fitting that seals inside the cylinder. There should be no tears or pieces of the o-ring missing. If there is any doubt, replace the O-ring. Make sure that the hoses are correctly orientated to the correct side of the diver (Primary regulator and secondary regulator to the RIGHT of the diver, BC hose and pressure hose to the LEFT of the diver), insert the DIN fitting into the cylinder valve and screw the DIN wheel clockwise until the fitting is firm but finger tight into the cylinder valve.

DECO regulators are delivered standard with a 300 Bar DIN fitting and will still have some threads visible even when threaded into a 232 Bar cylinder valve. This is normal and should not be a cause for concern.
3. Look closely at the second stage, and check that the mouthpiece is securely attached to the second stage and that there are NO TEARS or cuts in the mouthpiece.
4. Once the regulator has been attached to the first stage and BEFORE the valve is opened, put the regulator into your mouth and breathe in through the regulator. There should be NO airflow! If there is any airflow, then DO NOT DIVE the regulator until the issue is resolved. (This could be a torn diaphragm, damaged exhaust valve or mouthpiece).

5. Once the regulator has passed the above checks, ensure the venturi level is turned to 'minus' or 'pre-dive', hold the purge button in, and slowly open the cylinder valve. Once you hear the gas starting to flow, slowly release the purge button and turn the cylinder valve fully open. There should be NO gas leaking from the second stage.
6. Put the regulator into your mouth and fully exhale to clear any water or debris in the second stage, and then breathe in slowly through the regulator, checking for any irregularities in airflow. Monitor the pressure gauge to ensure the needle does NOT move. If it does, it could suggest that the cylinder valve has yet to be opened fully. Sometimes, a dry diaphragm can 'stick', making a 'honking' sound when inhaling or exhaling. DO NOT worry; this can be normal and not a reason to abandon the dive. This will stop immediately after the second stage is in the water. Read the section for COLD WATER DIVING for cold water best practices which prohibit test breathing.
7. Once you are satisfied that the regulator is delivering gas smoothly, remove the regulator from your mouth and ensure that the Venturi lever is turned to 'minus' or 'pre-dive' (away from the diver). The reason for keeping the Venturi on the second stage on 'MINUS' when on the surface and out of your mouth is that this prevents the second stage from free-flowing if the purge button is depressed or the second stage drops into the water.
8. If the Venturi lever is left on 'PLUS' on the surface and not in your mouth, it could easily free flow, causing a waste of gas and a big fright for everybody around your gear! Once the second stage is in your mouth (be it on the surface or underwater) and the venturi lever is turned to 'plus' or 'dive' position, it will never free flow while in your mouth; instead it will significantly enhance the performance of your regulator.

7. Removing a DIN regulator from a cylinder

Close the cylinder valve in a clockwise direction. Press the regulator purge valve to de-pressurise the valve and regulator. Loosen the DIN hand wheel by turning it anti-clockwise (Lefty loosey) and remove it from the cylinder valve. DO NOT blow air from the cylinder into the DIN opening. Screw the DRY DIN protective cap onto the din threads and tighten finger tight. This will ensure that the internal components of the first stage remain dry and free from contamination. **NOTE: DECO does NOT recommend attaching the DIN cap to the regulator while diving but rather keeping the cap on land in a dry, protected place.**

8. Important second-stage adjustments DURING the dive.

During the dive, it is highly recommended to turn the Venturi lever to the 'DIVE' or 'PLUS' position (turn the over towards the diver). The test bench and ANSTI tests have shown that the regulator performance is significantly enhanced when making this simple adjustment and is worth remembering to do. One can think of the Venturi lever action as 'turbo-charging' the breathing characteristics of the regulator.

The breathing control adjustment knob can be turned full anti-clockwise (fully open) and left in that position both before and during the dive to suit the divers' preferences and needs. This is particularly useful for deeper or more strenuous dives requiring higher gas flow.

PLEASE NOTE: Turning the breathing adjustment knob of the T620 second stage to increase breathing resistance will not save air or reduce air consumption!

9. Second stage adjustments on SURFACING

After surfacing from the dive, it is advised to turn the Venturi lever to 'minus' (away from the diver) to avoid regulator free flow when the second stage is removed from the diver's mouth in the water. The breathing control adjustment knob can be left as the diver used it.

10. Post Dive regulator care / Storage

Once the regulator has been removed from the cylinder and the supplied dry dust cap securely attached to the DIN wheel, it is best to immerse the entire regulator into fresh, clean water (Never use water hotter than 50°C) for 30 minutes. The purge button of the second stage mustn't be pushed once the unpressurised regulator is in the water; moisture can enter the regulator system and significantly affect its safety and performance. Spraying the regulator with a high-pressure washer is strongly discouraged due to the risk of water being forced into the second-stage valve.

After soaking, wipe down excess moisture and let the system air dry in a dry, shady area. DO NOT dry the regulator in the sun; this will significantly reduce the lifespan of your regulator and hoses. Do not store the regulator with tightly coiled hoses; if possible, the regulator should be loosely packed in a cool, dry space. Before storage, unscrew the breathing resistance knob of the T620; this lightens the spring pressure and prolongs the poppet seat performance.

11. Regulator servicing

Your regulator will provide years of reliable service with proper care and maintenance. This involves post-dive care and regular servicing. Over time, mineral deposits and salt build-up will accumulate on your regulator, adversely affecting its performance. Proper cleaning and regular inspection/maintenance of your regulator will prevent any inconvenient 'downtime' of your equipment and keep it performing at the levels it did 'straight out of the box'. **Regulator performance is all about proactive maintenance.**

DECO recommends that your regulator be serviced every year or every 100 dives, whichever comes first.

Higher-use scenarios such as dive schools and dive charters should service their regulators **every six months / 100 dives** to keep the regulators performing at their best.

If the regulator hasn't been used for an extended period (more than nine months), an inspection service will re-lubricate moving parts, replace ageing O-rings that keep the regulator performance at its peak and re-check the fine 'tune' of the regulator for that butter smooth breathing experience.

Servicing DECO regulators does not require specific tools other than what a good regulator service bench would readily have available. Provided that the correct servicing tools and regulator testing equipment are available, we believe the willing and capable owner has the 'right to repair' and all service kits are made available to the public without restriction. Your safety depends on the correct servicing and setting of your regulator. Use only DECO-supplied spare parts and service kits. Self-service is performed at the diver's own risk, and DECO DIVING EQUIPMENT accepts no responsibility for any damage, loss, injury or death as a result of self-servicing of regulators.

It is always recommended that any regulator servicing be followed with proper testing to extract the maximum performance from the regulator. DECO regulator owners can also return their regulator to the DECO head office for service assistance and regulator testing.

12. Safety Rules

- Before any dive, always inspect ALL your equipment, including your regulator. Never use a regulator that shows any signs of wear and tear, damage or leaking. Any faulty regulator must be inspected and serviced if required by a qualified person or DECO DIVING head office.
- Never lift or carry the SCUBA unit at the first stage. Equipment should be carried at the cylinder neck or a tank handle.

- Before entering the water, always ensure your cylinder valve is fully opened, and gas flows from both second stages.
- Always fully depressurise the SCUBA unit BEFORE trying to unscrew the DIN wheel. A pressurised unit WILL NOT be released by hand.
- Never leave your regulator in direct sunlight or a high-temperature environment.
- Unless you are confident enough and suitably experienced in regulator repair, please don't attempt to service your regulator. Instead, please return it to your nearest DECO DIVING dealer or return the regulator to DECO for a factory-approved service and/or repair.
- Never use any lubricant, chemicals, aerosols or liquids on your regulator unless these have been approved for use by DECO DIVING EQUIPMENT.

13. Using NITROX / EANx

DECO diving regulators have been produced to work with enriched air (EAN) up to 40% without further specialised cleaning. Should higher mixtures of enriched gas be required, the regulator must undergo specialised oxygen cleaning and preparation. Once a regulator has been dedicated to a greater percentage of mixtures, it should be kept in an oxygen-clean condition. Standard compressed air (EN12021-compliant air) is considered to be contaminated. Should a dedicated Nitrox regulator be used with such air, it would require an oxygen-clean service to re-enter.

DO NOT USE SILICONE GREASE ON COMPONENTS IN THE HIGH-PRESSURE AREA OF THE FIRST STAGE, AS THIS WOULD COMPROMISE COMPATIBILITY WITH NITROX MIXES.

SECOND-STAGE REGULATORS, PRESSURE GAUGES, CONSOLES, AND OTHER ACCESSORIES USED IN COMBINATION WITH NITROX FIRST-STAGE REGULATORS MUST ALSO BE COMPATIBLE WITH THE USE OF NITROX MIXTURES.

14. Cold Water Diving

EN250:2014 norm defines 'cold waters' as those with temperatures lower than 10°C. It requires regulators certified for such conditions to be tested and approved to work correctly in temperatures of 4°C.

DECO diving regulators (P50, D70 first stage and T600, T620, A600, N600 second stages) are cold water rated regulators (>4°C water) according to the EN250-14 standard.

Although being cold water-rated regulators, incorrect use may significantly increase the risk of icing and free flow while diving. Diving in water temperatures below 10°C requires specialised training and experience. Using two independent regulators in these conditions (two first and two second stages) is recommended.

Additional important notes on cold water diving:

- Ensure that the cylinder is only filled with dry air. Any humidity in the air could significantly increase the risk of icing.
- In a cold air environment, check the operation of the regulator in a warm room. Avoid breathing through the regulator and pressing the purge button before starting the dive.
- During the dive, increased gas use may cause the regulator to freeze. Avoid activities that cause significant airflow through the regulator, such as the use of the purge button, heavy exertion, use of the inflator while inhaling and the simultaneous use of two second stages from the same first stage.
- **Freezing of a regulator is a frequent cause of diving accidents in very cold water conditions. For your safety, adhere to these rules when diving below 10°C!**

15. Regulator hose configuration

DECO regulators are offered with various hose length configurations depending on the diving application and size of the diver. Once a diver has chosen the regulator best suited to their requirements, the next step is to choose the hose length configuration that best fits their diving application and preferred hose layout.

DECO hose length chart				
Application	Cylinder configuration	Primary regulator hose	Secondary regulator hose	SPG hose
Sport diver small	Single cylinder	60cm	90cm	66cm
Sport diver large	Single cylinder	73cm	90cm	70cm
Adv. sport diver small	Single cylinder	1,5m	56cm	61cm
Adv. sport diver large	Single cylinder	2,1m	60cm	66cm
Sidemount diver	Sidemount twins	2,1m	71cm	2 x 15/23cm
Technical diver	Twinset	2,1m	56cm	61cm
Technical diver	Stage cylinder	100cm	na	15cm

- Low-pressure ports for connecting second-stage regulators, B.C. inflator hose, and drysuit inflator hose are all equipped with a 3/8" UNF thread.
- High-pressure ports for connecting a pressure gauge hose or transmitter are equipped with a 7/16" UNF thread.
- All DECO hoses are CE-certified and are manufactured in strict compliance with the EN250 standard. All DECO Rubber and Braided hoses come standard with Viton O-rings that are oxygen-cleaned before being individually packed to maintain their oxygen-clean state.

- Tight bends in diving hoses typically cause accelerated wear. This may lead to failure of the hose integrity and potential gas leaks during the dive. Avoid tightly coiling and bending hoses, and keep hoses out of direct sunlight for long periods.
- It is **STRONGLY** recommended that SCUBA hoses be replaced at least every five years. This includes regulator primary and secondary, BC system inflator hoses, and pressure equate hoses.

16. WARRANTY

DECO diving equipment regulators include a limited lifetime warranty to the original owner. This limited lifetime warranty covers materials and manufacturing defects, excluding consumable parts such as O-rings, seats, filters, mouthpieces and low-pressure hoses. This warranty does not include abuse, neglect, improper use or improper maintenance, modifications, incorrect servicing parts, accidents, fire or any other casualty. This warranty does not extend to equipment used for commercial purposes, including rental, governmental, or military purposes.

Should your DECO regulator prove defective for many reasons (other than those listed above), it will be repaired or replaced (at DECO Diving's discretion) free of charge, excluding shipping and handling charges.

It is dangerous for untrained persons to use equipment covered by this warranty. An untrained person's use of these products renders all warranties null and void. The use of SCUBA equipment by anyone who is not a certified diver or who received training through a recognised certification agency shall render void all warranties, expressed or implied.

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