



Cochran Undersea Technology

www.DiveCochran.com

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Environmental Compensation

Cochran Dive Computers are a new breed of dive computers that adapts its algorithm to the users diving environment and style as originally pioneered by Cochran. All of Cochran's current dive computers incorporate this capability

Water Temperature

Diving in cold water can lead to a lower diver core and skin temperature which can affect the gas exchange rate of the body's tissues. All Cochran dive computers feature two modes of Temperature Compensation, Normal or Reduced. The dive computer progressively makes its algorithms more conservative as the water temperature declines below 75 degrees F. Above this water temperature, there is no temperature compensation. In the Reduced Mode, the temperature compensation is made less conservative by approximately one-half the amount of the Normal Mode. If the diver is wearing an insulated dry suit and is relatively warm even in cold water, this temperature compensation factor may be set to Reduced Mode at the divers discretion using the Analyst[®] PC software.

Altitude

While many dive computers require the diver to manually set the altitude, Cochran products are fully automatic. Driving or flying to a dive site significantly higher in altitude requires special modifications to the "sea level" algorithm. All Cochran dive computers regularly sample the ambient barometric pressure to determine these changes in altitude whether the unit is On or Off. Accordingly, the algorithm is changed to reflect these barometric pressure changes. Note that temperature and weather systems also affect barometric pressure and hence, apparent altitude. Using the Time-To-Fly digits, the number of hours required to "adapt" to the new altitude is immediately known to the diver. If a significant altitude change occurs, a minimum of one hour should pass before diving to allow both the diver and the unit to adapt to this new altitude.

Microbubbles

There are several theories regarding the exact method by which an inert gas bubble forms from a microbubble which was formed from micronuclei. Currently the predominant theory states that in addition to other factors, more rapid ascents accelerate bubble formation. All Cochran dive computers comprehend and adjust for this phenomenon.

User Added Conservatism

Current dive computers cannot tell if the diver is dehydrated, tired, smokes, overweight, or has some other physical issue that may require additional conservatism in the algorithm. All Cochran dive computers allow the diver to input an added degree of conservatism to the algorithm from 0 to 50 percent in one-percent increments. This can be done via the Touch Contact Programming Mode or with the Analyst[®] Personal Computer Interface.

Previous Dive Profiles

One theory states that under some circumstances, recent dive activity can have an effect on inert gas loading, particularly if the diver engages in inverted profile diving. This occurs when a deep dive is followed by an even deeper dive. This recent dive history is used to compensate the inert gas loading for the current dive. This can be enabled or disabled with the Analyst[®] Personal Computer Interface. Current theories indicate that diving Inverted Profiles has no appreciable effect on Nitrogen loading. This compensation is turned off when the dive computer is shipped and must be turned on by the user.

Salt Water / Fresh Water

There is approximately a three percent difference in depth readings taken in salt water versus fresh water. Some dive computers are calibrated in feet of fresh water and some are calibrated in feet of seawater. Diving in a medium different from what the dive computer is calibrated will cause apparent depth errors. Only Cochran dive computers actually determine the type of diving medium and compensate the depth reading accordingly. This is accomplished by measuring the conductivity and capacitance of the water during a dive. Caution must be taken in interpreting this reading since some apparent fresh water is actually high in minerals or contaminants and is correctly compensated as salt water (High Conductivity, higher density). This commonly occurs in some caves, springs, and lakes.

Workload Compensation

This feature is available only on the Cochran Gemini dive computer which is Air Integrated. When a diver's work rate or exertion level increases, he consumes more breathing gas and his Breathing Mix Gas Consumption (GC)/Surface Air Consumption (SAC) increases. The diver exchanges and retains higher levels of nitrogen in his tissues at a high work rate as compared to a low work rate. As work load increases, Cochran dive computers compensate by progressively increasing the conservatism of its algorithms. The Workload Compensation starts when the diver's GC exceeds 35 psi per minute and reaches maximum compensation at 98 psi per minute. For accurate Workload Compensation the cylinder size, in liters, must be set correctly. This can be done via the Touch Contact Programming Mode or with the Analyst® Personal Computer Interface.

For more information:

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- See Cochran Tech Pub: "**Task Loading**"