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(12/92)

Dacor Omni™ Pro Dive Computer User's Guide

DACOR

GEARED FOR THE ENVIRONMENT®

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Dacor's revolutionary Omni Pro is a true Air-Integrated Dive Computer. It provides the critical, extra margin of information you need to dive safer.

Omni Pro digitally displays depth, bottom time, decompression obligation, pressure and air time remaining based upon an individual's air consumption rate and dive profile - with all the precision you would expect from Dacor. The display is clearly separated to provide air status on the left side and dive profile information on the right. The custom display is both graphic and numeric to provide vital information at a glance. And to keep absolutely current, all data is monitored and updated every second.

Omni Pro also features a user programmable audible low air alarm - another Dacor exclusive. It automatically sounds when the diver must begin ascending to arrive at the surface with a minimum air pressure of 300 to 950 PSI (21.0 to 66.5 bar) preset by the user. This feature also considers the total ascent including decompression time required. And Omni Pro is designed to operate reliably, even in harsh, cold water conditions.

An exceptionally easy-to-read graphic display shows current decompression status in real time, while the enhanced log makes reviewing your dives a breeze. Plus, a replaceable lens cover protects the instrument face from abrasion underwater. Yet for all the sophistication, Omni Pro uses a standard user replaceable battery available anywhere. It's brilliant features like these that make Omni Pro our most intelligent dive instrument yet.

Our new Reef Saver™ instrument consoles are designed with the underwater environment in mind. Our unique cross chest mounting system prevents the console from hanging and causing damage to the aquatic environment and instruments. The Reef Saver console is curved to contour around the diver's chest for hands free viewing and reduced drag. All Reef Saver consoles have a unique swivel mount to accommodate a Modular System Compass. The optional System Compass (P/N 3617-00) patent pending, allows you to navigate and view the instruments simultaneously for convenience and safety.

THE OMNI® PRO DIVE COMPUTER
GEARED FOR THE ENVIRONMENT®

WARNING!

DO NOT ATTEMPT TO USE THE DACOR OMNI PRO DIVE COMPUTER WITHOUT READING AND UNDERSTANDING THIS ENTIRE USER'S GUIDE FIRST. If you do not understand all of the warnings and instructions in this User's Guide, do not attempt to use the Omni Pro Dive Computer! **IMPROPER USE OF THE OMNI PRO DIVE COMPUTER CAN RESULT IN SERIOUS PERSONAL INJURY OR DEATH.**

DANGER!

The use of S.C.U.B.A. (Self Contained Underwater Breathing Apparatus) equipment is hazardous for an untrained individual. Before attempting to use S.C.U.B.A. and/or any related equipment, you must receive training and certification in the use and maintenance of S.C.U.B.A. equipment from a nationally recognized certification agency. The Dacor Omni Pro Dive Computer is to be used only by certified divers who are aware of the potential hazards of diving. **USE OF THIS EQUIPMENT WITHOUT PROPER TRAINING IS HAZARDOUS AND CAN RESULT IN SERIOUS INJURY OR DEATH TO THE UNTRAINED.**

WARNING!

THE OMNI PRO DIVE COMPUTER DOES NOT AND CANNOT ELIMINATE THE RISK OF DECOMPRESSION SICKNESS. The algorithm used in the Omni Pro Dive Computer is only a theoretical model. Each individual person is different and must assume the risk of decompression sickness (the bends) when participating in the sport of S.C.U.B.A. diving. Factors such as lack of sleep, dehydration, temporary illness, alcohol or environmental extremes may increase an individual's susceptibility to decompression sickness even while observing safe decompression limits. The Dacor Omni Pro Dive Computer when used with common sense and care can aid in improving your diving pleasure and safety. **DECOMPRESSION SICKNESS CAN RESULT IN SERIOUS INJURY OR DEATH. DO NOT DIVE UNLESS YOU KNOW AND UNDERSTAND THE RISKS OF DIVING AND ACCEPT THE RESPONSIBILITY ASSOCIATED WITH THOSE RISKS.**

WARNING!

Dacor diving instruments are primarily intended for underwater use. Pressure gauges and dive computers are not approved for use with any gas mixture other than filtered, clean compressed breathing air (21% oxygen, 78% nitrogen). Equipment standards for the use of oxygen enriched air mixtures (EAN or Nitrox) are not presently approved. Therefore, the use of any other gas or gas mixture with this instrument is not approved by the Dacor Corporation.

DANGER!

The use of scuba products not designed or intended for use with mixtures at high pressure having high oxygen content (sometimes called enriched air or nitrox) may cause combustion of internal components of valves and regulators, high-pressure hoses, buoyancy compensators with inflation systems, and instruments which could generate fire and explosion and could lead to serious injury or death.

OMNI® PRO DIVE COMPUTER

- Air time remaining
- Programmable low air alarm
- Individual breathing rate
- Digital & graphic air pressure
- User replaceable battery
- Low battery warning
- Pre-dive planning
- No-decompression time remaining
- Dive time
- Current depth
- Maximum depth
- Dive number
- Temperature
- Fast ascent warning
- Graphic time bar
- Decompression stops and time
- Omitted decompression warning
- Omitted decompression info
- Total ascent time
- Surface interval
- Minimum time to fly
- Saturation remaining
- 9 dive log book
- Permanent record mode
- Altitude (freshwater) compensation
- Imperial & metric versions

REEF SAVER™ INSTRUMENT CONSOLE

- **Air Integrated Computer-** Rated to 4,000 PSI / 250 FSW (276 Bar / 76 MSW), automatically calculates air consumption and decompression status per individual profile. Electronic and battery compartments are separately sealed in a durable high impact plastic housing and are contained in a thermoplastic rubber (TPR) case.

- **Contoured Reef Saver Console & Lanyard-** The console is designed for cross chest mounting. The adjustable quick release lanyard keeps the instruments in an accessible position, and also keeps the console from hanging and damaging the aquatic environment or instruments.

- **Swivel Mount for Compass-** Allows direct sighting Modular System Compass (optional) to be mounted on the end of the console. The swivel mount allows you to tilt the compass 30 degrees to navigate and view the instruments simultaneously for convenience and safety.

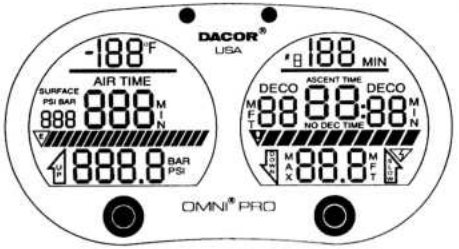
- **Modular System Compass-** Part # 3617-00 The optional add on System Compass provides a large, easy to read, luminescent dial and a side window that allows direct reading of the compass heading. A lubber line and rotating bezel help you maintain your direction.

- **Replaceable Protective Lens-** Part # 9783-00 Your new instrument is equipped with a protective lens that you can replace if it becomes scratched.

ACTIVATION- To activate the Omni Pro, depress and hold the ON/LOG button on the Right Side and make sure both sides are fully displayed. Ensure that the Omni Pro is activated at the surface prior to diving. the Omni Pro is then calibrated to the surrounding ambient pressure. Turning the Omni Pro on at depth will create a false "0" or surface point resulting in a inaccurate dive profile. the Omni Pro will not activate at a depth greater than 10 feet (3 meters). The diagnostic mode is displayed as a pre-dive check (Fig. 2). The diagnostic mode countdown must be completed before beginning the dive or the Omni Pro will turn off. If diving has not begun within 30 minutes, the Omni Pro will automatically turn off.

The Omni Pro Dive Computer also adjusts for altitude during the diagnostic mode. The computer is adjustable for diving up to 10,000 ft. (3048 m) (see Altitude Algorithm Adjustment). Over 10,000 ft. (3048 m), the computer will not activate.

Fig. 2- Upon computer activation, the digits in the diagnostic mode will count down from 9-0, set the surface mode, and no-decompression limits will begin scrolling.



PRE DIVE PLANNING SEQUENCE- Following activation, the decompression side (right) will scroll thru a pre-dive planning sequence displaying maximum no-decompression times allowed for the indicated depth. Displayed depths are in ten foot increments from 30 - 160 feet of seawater (9 - 48 meters of sea water). Allowable bottom times are displayed to the nearest minute (Fig. 3-5).

No-decompression times greater than 99 minutes are accompanied by a "plus" sign (Fig. 3). A time bar graphically corresponds in two minute segments and counts down from 20 minutes (Fig. 5). The dive number indicates repetitive dive status by displaying the number of previous dives. The dive counter only shows digits 0 - 9. The first dive will be dive #1. If more than nine dives are made, the display will wrap-around, whereas "0" = dive #10, then "1" = dive #11, "2" = dive #12 and so on.

The pressure side (left) will display tank pressure both graphically and numerically at depth. The initial air time remaining will display a default value based upon a 33 PSI / min (2.3 bar / min) consumption rate. NOTE: This metric value rounds to 0.1 BAR. Following one minute of breathing at depth this will be replaced by your personal rate. The default value will appear whenever the battery is changed. Repetitive or second tank dives will use the stored value from the previous dive. Current temperature is also displayed.

Fig. 3- No-decompression limits scroll in the display on the right. The plus sign indicates that greater than 99 minutes of no-decompression time is available at 30 feet. Air time and tank pressure are shown in the display on the left. The display indicates air time of 90 minutes and a tank pressure of 3000 PSI.

Fig. 4- This is a typical scrolling display. It indicates that there are 20 minutes of no-decompression time at 100 feet.

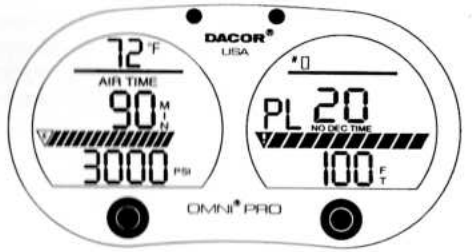


Fig. 5- This display indicates 3 minutes of no-decompression time at 160 feet. NOTE: The time bar has decreased. Each segment represents 2 minutes of no-decompression time. Segments are rounded down to the nearest minute.

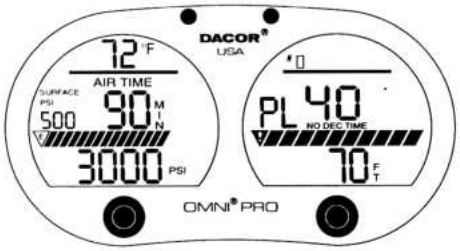
PROGRAMMING THE LOW AIR ALARM- The Omni Pro features a user-programmable, patent pending, audible low air alarm factory preset with the minimum air pressure of 300 PSI (21.0 BAR). The total ascent and decompression time required are included in this calculation. The user may set the returning air value from 300 to 950 PSI (21.0 to 66.5 BAR). NOTE: These metric values round to 0.5 BAR.

The alarm can be programmed at the surface following the diagnostic check. It cannot be accessed during the log mode or the 10 minute minimum surface interval following a dive. To set the alarm, depress the button on the left side for three seconds. A number will appear on the pressure side labeled surface PSI or BAR (Fig. 6). Depressing the button on the right will increase the value by 50 PSI or 3.5 BAR. Depressing the button on the left side will decrease the value by 50 PSI or 3.5 BAR. NOTE: The metric set point increment is rounded to 0.5 BAR. When the desired returning air pressure has been selected, release the button and the surface PSI or BAR value will disappear within one minute. The low air alarm will sound prior to the set returning air pressure, to include total ascent time and decompression stops. You will then arrive at the surface with the programmed returning air pressure remaining as reserve. The alarm will beep for 30 seconds, accompanied by the flashing "UP" arrow.

NOTE- If the battery is removed, the low air alarm will reset to the minimum 300 PSI (21.0 BAR) setting.

WARNING! The low air alarm is only a reminder, but not a substitute for visually monitoring your instruments throughout the dive!

Fig. 6- The "Surface PSI" set point shows the low air alarm has been set for surfacing with 500 PSI.



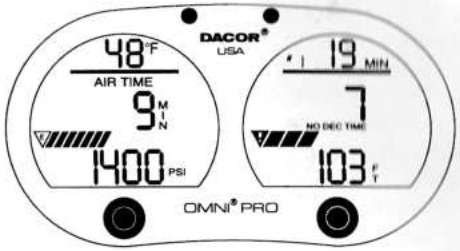
NO-DECOMPRESSION PROFILES- During descent, the bottom timer activates at a depth of 5 fsw (feet, sea water) 1.5 msw (meters, sea water), and the dive number is recorded. Upon activation, decompression values and air time remaining are calculated and updated once per second. The Omni Pro begins tracking the dive displaying the no-decompression time available at the current depth (Fig. 7). While diving, the current depth display appears for 15 seconds and alternates with the maximum depth display that appears for 3 seconds (Fig. 8). The entire display will blink each time the display alternates. With less than 20 minutes remaining the time bar begins counting down (decreasing) in increments of two minutes (Fig. 9). The time bar will round down to the nearest segment. The "EXCLAMATION" triangle is a decompression warning and not counted as a segment.

During descent, the pressure side will display air time remaining numerically. Air time remaining is based both on depth and breathing rate. Tank pressure is displayed both graphically and numerically. Each segment of the pressure bar represents 200 PSI or 13.8 BAR. The pressure bar will round down to the nearest segment. The "E" triangle does not count as a segment. Current temperature is always displayed (Figs. 7-9).

Fig. 7- The decompression display indicates dive #1, a bottom time of 11 minutes has elapsed, a current depth of 44 feet, and 71 minutes of no-decompression time remain. The air pressure display indicates air time of 23 minutes and tank pressure of 2100 PSI. Temperature is always displayed.

Fig. 8- This alternating display shows a maximum depth of 44 feet has been reached during the dive.

Fig. 9- The decompression display now shows a bottom time of 19 minutes, a descent to 103 feet has been made, and 7 minutes of no-decompression time remain. The air pressure display indicates 9 minutes of air time remain and tank pressure has dropped to 1400 PSI. NOTE: The graphic pressure bar and time bar have decreased.



Unlike dive tables, ascents are calculated into the nitrogen uptake and elimination curves, resulting in additional bottom time and multiple level profiles. The no-decompression time will increase as you ascend to a shallower depth (Fig. 10). Ascents and descents are also calculated into air time remaining. Air time also increases as you ascend to shallower depths. Multi-level diving and air time remaining are advantages to Omni Pro diving versus other computers or table diving.

The no-decompression dive is controlled by your no-decompression limits or air time remaining, whichever is less.

Fig. 10- Upon ascending to 80 feet, no-decompression time increases to 15 minutes. Air time remaining is 9 minutes and tank pressure has dropped to 1200 PSI.

As the air pressure and pressure bar decrease, so does the air time remaining. The air time remaining is based upon the programmed set point to arrive at the surface with a safe amount of air reserve in the tank. Ascending prior to an air time remaining of "0" will increases the air time at shallower depths (Fig. 11).

The audible alarm will beep for 30 seconds, and the flashing ascent arrow will appear on the pressure side (left) when the air time remaining equals "0" (Fig. 12). Ascend immediately to arrive at the surface with the programmed amount of air reserve available.

Fig. 11- As the tank pressure and pressure bar decrease, so does the air time. This display shows that 4 minutes remain before the low air alarm will sound and the flashing "UP" arrow will appear.

Fig. 12- The alarm is sounding and the "UP" arrow have appeared. Ascending now, the surface will be reached with 500 PSI remaining, based on current breathing rate.

VARIABLE ASCENT RATES- The Omni Pro Dive Computer monitors your ascent rate. It is essential to have a slow controlled ascent rate for off-gassing nitrogen and diving safety. The Omni Pro uses a variable ascent rate as follows:

- *Deeper than 60 feet (18M),* ascend less than 60 feet (18M) per minute.
- *Between 60 - 20 feet (18 - 6M),* ascend less than 45 feet (14M) per minute.
- *Less than 20 feet (6M),* ascend less than 30 feet (9M) per minute.

If you ascend faster than the prescribed ascent rates, the fast ascent warning ("SLOW" arrow) will appear (Fig. 13). Slowing your ascent rate will cancel the warning, however, the violation will be recorded in the dive log.

During ascent the bottom timer continues counting to a depth of 3 fsw (0.9 M), after which the surface interval timer begins counting.

Fig. 13- The "SLOW" arrow will appear, on the right side, if the ascent rate is exceeded. This display shows a fast ascent was made when air time reached "0".

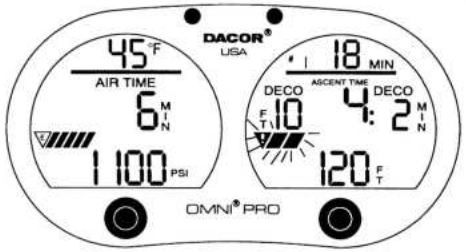
DECOMPRESSION PROFILES- When the diver enters the decompression mode, safe ascent directly to the surface is no longer permissible. The diver is obligated to remain below an indicated "ceiling" to off gas nitrogen. This is done during a decompression (DECO) stop or a series of DECO stops depending upon the amount of nitrogen saturation in the body.

As the no-decompression time approaches the critical limit, a warning begins flashing when less than 2 minutes remain (Fig. 14). If the no decompression warning flashes, and you remain at depth, the computer will switch into the decompression mode, and a decompression profile will be calculated.

The Omni Pro Dive Computer provides you with the depth at which to stop, the amount of time to stop, and total ascent time to reach the surface. Total ascent time represents travel to the surface at the prescribed rate of ascent plus the time spent at all DECO stops. As the decompression dive continues, the total ascent time will increase with nitrogen absorption (saturation). The total ascent time is represented by the flashing time bar (Fig.15). This bar will continue to grow with increasing saturation. As with no-decompression calculations, decompression calculations are updated every second. Multiple DECO stops may be required for dives with increased saturation.

Fig. 14- The decompression display shows 1 minute of no-decompression time remaining. NOTE: The time bar has disappeared and the decompression warning is flashing. If an ascent is not made in one minute, the Omni Pro will enter the decompression mode.

Fig. 15- This is an example of a decompression dive. The bottom time is 18 minutes, a current depth of 120 feet, and a decompression stop is required at 10 feet for 2 minutes. The total ascent time including decompression is 4 minutes. NOTE: The time bar is flashing, indicating decompression is required. The flashing bar will continue to grow if an ascent is not made.



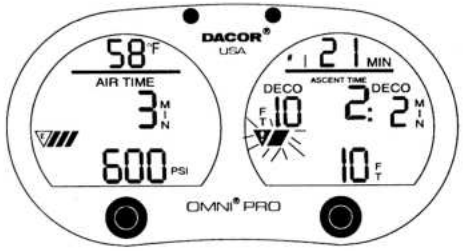
The Omni Pro will monitor your air supply during decompression diving. The air time remaining is based upon the programmed set point to arrive at the surface with a safe amount of air reserve in the tank. **Ascending prior to an air time remaining of "0" will increase safety** (Fig. 16).

Air time remaining includes the calculation of the total ascent including decompression stops. The audible alarm will sound and the flashing arrow will appear on the pressure side (left) when the air time remaining equals "0". Ascend immediately to your first decompression stop to arrive at the surface with the programmed amount of air reserve available.

The Omni Pro Dive Computer will display the depth of the deepest DECO stop first. When the first stop requirement is complete, the Omni Pro Dive Computer will display the depth of the next stop. Stops may be completed at a depth deeper than indicated. Calculations will be based on the actual depth at which you stop. As DECO stops are completed the total ascent time and flashing decompression bar will decrease (Fig. 17). Following correct decompression, the decompression display will clear and the no decompression time and bar will reappear indicating that it is safe to surface.

Fig. 16- Five minutes of air time remain before ascent is required to surface with 500 PSI remaining. This time includes total ascent plus decompression. Ascending prior to an air time of "0" will increase safety.

Fig. 17- This display indicates a 10 foot decompression stop has been reached. NOTE: The total ascent time and flashing time bar have decreased. At the end of the 2 minute stop, the display will return to the no-decompression mode and a safe ascent to the surface can be made.



If the decompression profile is violated or omitted, the "DOWN" arrow will guide the diver to return to a safe stop depth as displayed under DECO stop (Fig. 18). Violations will be calculated for hazardous exposure and the DECO time adjusted. If the decompression remains omitted for 2 minutes - 30 seconds, the Omni Pro will no longer compute for decompression and will now switch to Gauge Mode displaying only depth, bottom time, air pressure, and temperature until reaching the surface (Fig. 19). The "Out of Range" warning "EXCLAMATION" triangle and "DOWN" arrow remain displayed for 24 hours, and the last decompression requirement will be recorded as a violation in the dive log (Fig. 19). FURTHER IN WATER DECOMPRESSION IS FORBIDDEN.

Fig. 18- Warning! The decompression stop has been omitted and the flashing 'DOWN" arrow has appeared directing the diver to descend back to 10 feet for 2 minutes.

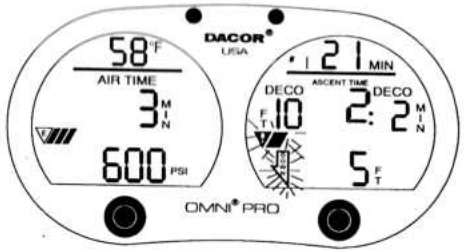
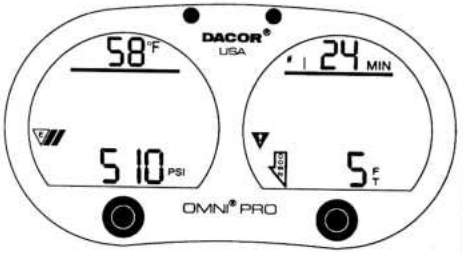


Fig. 19- If the 10 foot decompression stop is not reached within 2 minutes and 30 seconds, the Omni Pro will enter the Gauge Mode as illustrated and prevent diving for 24 hours after the dive is complete.



SURFACE MODE- During the minimum surface interval of 10 minutes, the display alternates between the previous dive displaying the maximum depth/bottom time and the surface = 0 ft. (m) for five seconds each. The remaining air time and tank pressure remain. If another dive is made during this 10 minute interval, the Omni Pro will calculate it as a continuation of the previous dive.

Following the minimum surface interval, the display shows the dive number and temperature. The alternating display now shows a coded sequence of the surface interval "SU" (Fig. 20), flight time "FL" (Fig. 21), and saturation remaining "SA" (Fig. 22). Each display remains on for 5 seconds, followed by scrolling of the adjusted no-decompression limits. This information scrolls repeatedly for 12 hours. At this time, the dive counter will reset to "0", and the Omni Pro will shut off. Surface interval times greater than 12 hours will scroll with saturation time once every minute preceding the pre-dive planning sequence when the Omni Pro is activated. Surface intervals will count to 24 hours unless the saturation time is greater. Surface intervals are also recorded in the log.

Tank/air information will be displayed and is based upon current tank status. The Omni Pro may remain pressurized with the last information displayed. When switching tanks, the new tank pressure is displayed. The previous air consumption rate, stored in the memory, will be used to calculate the air time until a new breathing rate is established at depth. (Figs. 20-22).

Fig. 20- "SU" indicates a surface interval of 1 hour and 20 minutes. The tank is on and an air time of 1 minute and 550 PSI remain after the dive.

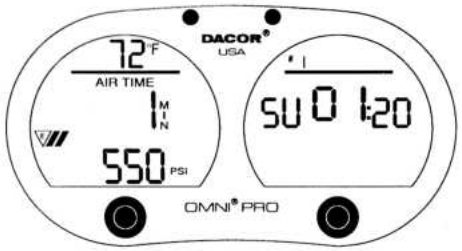


Fig. 21- "FL" counts down the minimum 12 hour wait before flying. The display shows 11 hours and 40 minutes remain after the elapsed surface interval time of 1:20. The tank has been removed and air time and PSI are both 0.

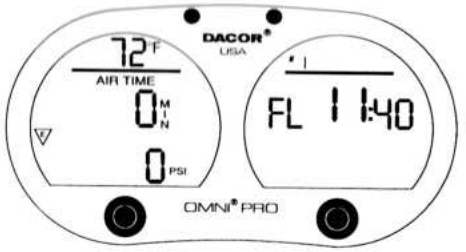


Fig. 22- The "SA" (saturation) display calculates the number of hours until residual nitrogen is off gassed. NOTE: For flying after diving, if the "SA" display is greater than the "FL" display, wait until the "SA" display clears to further reduce the risk of decompression sickness. The pressure side shows a new tank has been turned on.

FLYING AFTER DIVING- Residual nitrogen must be reduced to a safe level before boarding a commercial airliner after diving, even in a pressurized cabin. By reducing residual nitrogen levels, there is less risk of decompression sickness when exposed to the reduced atmospheric pressure at altitude.

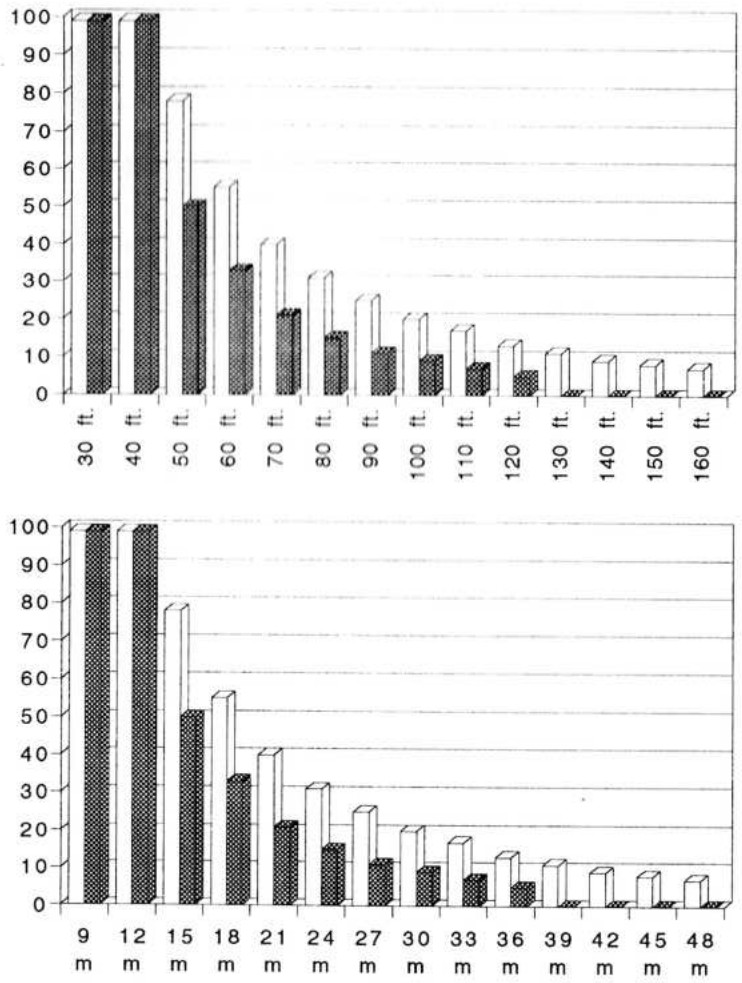
The Omni Pro Dive Computer gives time to wait before boarding a commercial airliner with a pressurized cabin. The Omni Pro Dive Computer bases this time on the 1991 revision to the Undersea Hyperbaric and Medical Society (UHMS) guidelines for flying after diving. The recommendation is a minimum surface interval of 12 hours / with extended surface interval beyond 12 hours for multiple day and decompression dives.

The Omni Pro Dive Computer will provide the minimum 12 hour wait for safe flight time. The display is located in the surface mode designated by "FL" (Fig. 21). The display will count down from 12 hours. For increased safety if saturation time "SA" is greater than flight time "FL", wait until the "SA" display reaches "0" before flying (Fig. 22).

ADJUSTED NO-DECOMPRESSION LIMITS- Adjusted no-decompression times will scroll during the surface mode between dives. To compensate for residual nitrogen, adjusted no-decompression times may be less than the original values. Only depths that can be attained as no-decompression dives will scroll. For example, compare the chart showing the original no-decompression times before a dive to 120 feet (36m) for 13 minutes and the adjusted no-decompression times after the 10 minute surface interval. Dives past 130 feet will not scroll because they cannot be attained as no-decompression dives (Fig. 23).

The Omni Pro Dive Computer will always start scrolling with the shallowest 30 foot (9 meter) depth first, every 60 seconds. To maintain the sixty second cycle, a blank screen will be displayed for depths that can no longer be attained as no-decompression dives.

Fig. 23



Profile: 120 ft. (36m)/13 min. SI= :10 min.

DIVE LOG- Up to 9 dives may be retained in the computer memory. Dives are recorded following the minimum surface interval. These are maintained as first in - first out and numbered in the same manner. The log may then be recalled any time during the surface interval by depressing the ON/LOG button on the Right Side. A complete log of up to 9 dives will scroll uninterrupted for 45 seconds. Holding the button freezes the log display. Avoid depressing the button for over 5 seconds during the first log entry (see External Access Mode). The log will remain displayed for an additional 5 seconds once the button is released.

The Dive Log Display is coded by "LG" and includes the dive number, bottom time, surface interval, maximum depth, air time remaining, ending tank pressure, and ascent violations. (Fig. 24). Decompression dives are indicated by "DECO" above the code "LG" (Fig. 25). Decompression violations are recorded and displayed flashing (Fig. 26). Low air conditions are recorded and displayed flashing (Fig. 27). The Permanent Record scrolls after the dive log.

Log entries are updated during desaturation and remain in the memory until the first dive is completed following a 12 hour period since the last dive, at which time, the log is erased and a new log is started.

The dive log records the temperature registered after the 10 minute minimum surface interval.

NOTE: Copy log information prior to the start of a new dive day. Also record your log information when changing the battery. The log is erased with each battery replacement. The permanent record is not affected.

Fig. 24- Log display of a no-decompression dive. The decompression side shows dive #1, 21 minutes of bottom time, 1 hour and 22 minutes surface interval, and a Maximum depth of 103 feet. The "SLOW" arrow indicates a fast ascent was made. The pressure side shows an air time of 20 minutes and 1000 PSI remained after the dive.

Fig. 25- Log display of a decompression dive. The word "DECO" over the "LG" indicates the dive was a decompression dive.

Fig. 26- Log display of an omitted decompression violation. The flashing time bar and "DOWN" arrow indicate decompression was omitted. The display shows the decompression requirement that was violated when the computer went into "Out of Range".

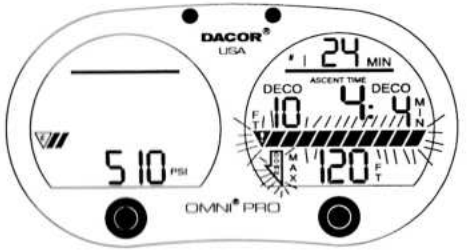


Fig. 27- Log display with air ascent warning. The "UP" arrow will appear on the pressure side if the dive was ended at or below the air set point.

EXTERNAL ACCESS MODE- If the right ON/LOG button is held for 8 seconds, during the first log entry only, the external access mode will be displayed on the screen designated by "EA". The computer must be in this mode to be factory calibrated and has no user advantages. The display will count down for 8 seconds and then disappear. This will not interfere with computer operation. The computer will then continue in a normal sequence.

PERMANENT RECORD MODE- User access to the permanent record mode provides a coded display for the maximum depth recorded "dr" (Fig. 28), the number of no-decompression dives "no" (Fig. 29), the number of decompression dives "DECO no" (Fig. 30) and the number of dive hours "hr" (Fig.31).

NOTE: For the total number of dives, add the totals for no-decompression and decompression dives.

These values scroll automatically after the dive log with a 5 second display for each.

Fig. 28

Fig. 29

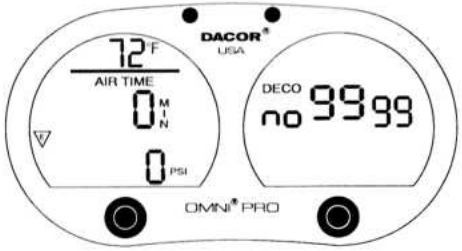


Fig. 30

Fig. 31

SHUT DOWN- Normal shut down of the computer will occur at 12 hours. The calculation of nitrogen elimination will continue up to 48 hours if absorbed nitrogen is present. Saturation time greater than twelve hours can be displayed by activating the Omni Pro. This information will scroll once every minute preceding the pre-dive planning sequence.

WARNING! Omitted Decompression, Depth Greater Than 250 Feet, and Decompression Stops Deeper Than 40 Feet (12m) will violate the computer and cause shut down. These violations can lead to decompression sickness and cause personal injury or death.

1. **Omitted decompression greater than 2 minutes -30 seconds** will prevent the Omni Pro from computing further decompression. The Omni Pro will now switch to Gauge Mode displaying only depth, bottom time, air pressure and temperature until reaching the surface (Fig. 19). The "Out of Range" warning ("EXCLAMATION" triangle) and "DOWN" arrow remains displayed for 24 hours, and the last decompression requirement will be recorded as a violation in the dive log. FURTHER IN WATER DECOMPRESSION IS FORBIDDEN.

2. **Exposure to depths greater than 250 fsw (76 msw)** is an out of range situation that will fix the maximum depth display at 250 ft. (76 m) During ascent the current depth alternates with a flashing "MAX 250 FT." every 15 seconds for 3 seconds. All other displays continue until reaching the surface. Calculation will be based upon 250 fsw (76 msw) exposure. At the surface the maximum depth display is locked with the out of range warning and will prevent diving for 24 hours.

3. **Decompression requirements deeper than 40 ft. (12 m)** stop depth will be preceded by flashing "DECO" symbols before the maximum stop requirement. **If the "DECO" symbols begin to flash, ascend immediately to the first decompression stop.** If the max-out condition occurs, the decompression display is replaced by the out of range warning and calculations will stop. The Gauge Mode displaying only depth, bottom time, air pressure and temperature is displayed until reaching the surface (Fig. 19, page 13). The out of range warning remains displayed and will prevent diving for 24 hours. (See Bail Out Schedule in Advanced Topics).

The violation shutdown is displayed as the "EXCLAMATION" triangle that remains on for 24 hours, accompanied by the violation that has occurred. Violations are recorded in the dive log and appear flashing. These entries remain until replaced by another dive. Following the 24 hour mandatory shut down the unit clears violations and permits diving.

NOTE: An out of range condition where the bottom time is greater than 199 minutes will not violate the computer. Upon reaching 199 minutes the bottom time display will begin flashing.

LOW BATTERY CONDITION- Battery power is measured each time the Omni Pro Dive Computer is activated. If the battery volts drop between 4 - 3.5 volts, the low battery indicator will begin to flash continuously. The unit will have sufficient power for a diving day and will not shut down. If the battery drops to 3.5 volts at power up, the warning flashes for 8 seconds and the computer will shut down.

The Omni Pro will not shut down during a dive. However, if the battery drops below 3.5 volts during a dive, the unit will wait and shut down during the following surface interval. Information essential to calculate repetitive dives will not be available. **WARNING!** If this occurs, DO NOT DIVE FOR 24 HOURS to assure that all nitrogen has off gassed. To avoid this situation, change the battery immediately when the flashing indicator appears during activation before any dives are made or when the unit is shut down.

BATTERY REPLACEMENT- The Omni Pro Dive Computer uses a 6 Volt, Alkaline J-cell, available wherever batteries are sold.

To replace the battery, remove the protective lens, carefully bend the console to remove the dive computer. Unscrew the ring, remove the battery compartment cap and replace the battery. Check that the O-ring seal and battery compartment are dry, clean and free from dirt. Apply a small amount of silicone grease to the O-ring. Replace the compartment cap (make sure the alignment posts are in their assigned holes) and screw down the ring and hand tighten to torque indicator (Fig. 32).

Bend the console and push the computer into the console. Carefully insert the protective lens cover under the retaining edge of the console. Upon inserting a fresh battery, the unit will flash on and immediately turn off. To activate the Omni Pro, depress and hold the ON/LOG button on the Right Side and make sure both sides are fully displayed.

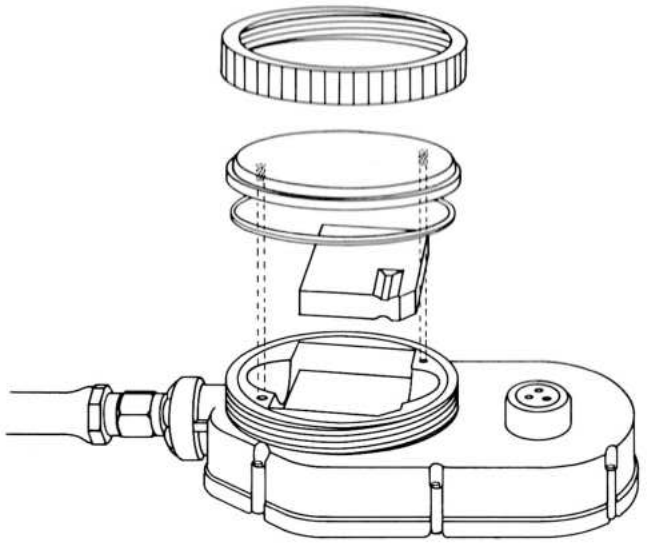
Change the battery only when the computer shows "0" saturation (SA). The log is erased with each battery replacement. If the battery is changed while the Omni Pro is counting down saturation, the current nitrogen values will be lost. The permanent record is not affected.

WARNING! If the battery is removed while saturation remains, nitrogen values will be lost! DO NOT DIVE FOR 24 HOURS!

NOTE-
1. If the battery is removed, the low air alarm will reset to the minimum 300 PSI (21.0 BAR) setting.
2. Write down your log book data before you change the battery so you will retain a record of this information.
3. Dacor recommends the battery be changed before each extended dive trip, just as you would maintain a camera or dive light.

FLOODED BATTERY COMPARTMENT- The battery compartment is sealed from the electronic components. If the battery compartment accidently floods, remove the battery immediately. Fill the battery compartment with household vinegar at full strength to clean the contacts. Rinse the compartment with fresh water and dry thoroughly. Replace the O-ring (P/N 0061-14). Be sure to lubricate the O-ring with silicone grease.

Fig. 32



REPLACEMENT BATTERY- 6 Volt, Alkaline J-cell.
Duracell 7K67
Eastman Kodak KJ
Eveready 539
Radio Shack 23471
Varta 4018

MAINTENANCE

CAUTION! Do not use silicone spray with chlorinated solvents on any of the rubber or plastic parts in your instrument or on the case. Use silicone grease on the tank air gauge O-rings.

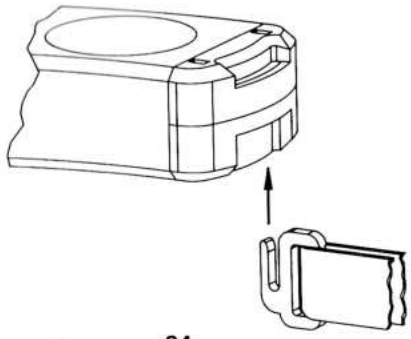
Dacor recommends this instrument should be checked for accuracy by your Dacor Dealer once a year or anytime the calibration is in question. Avoid strong impacts, this may damage the instrument.

As with any instrument, care should be taken during storage. Immediately after use, the instrument should be rinsed in fresh water and allowed to air dry.
The instrument is encased in a TPR (Thermal Plastic Rubber) boot. TPR is much more durable than rubber. However, common sense care can be applied to extend the life and appearance of the instrument boot.

1. Do not expose the instruments to sunlight or heat for extended periods of time.
2. Do not use suntan lotion on portions of the body that contact the console and instruments.
3. Rinse in fresh water after each use. Occasionally wash in warm, soapy water and rinse. This removes salt, perspiration, and chlorine.
4. When storing for an extended period, keep in a cool, dry place. Avoid storage in areas with electrical motors or generators, where ozone is present. Also avoid paint and gas fumes, these may affect the boot material.

CONSOLE LANYARD

Your new Dacor Reef Saver™ Console is designed for cross chest mounting. The adjustable quick release lanyard keeps the instruments in an accessible position, and also keeps the console from hanging and damaging the aquatic environment or instruments. Attach the lanyard to your buoyancy compensator. Then simply rout the high pressure hose through the hose clip on your Dacor Buoyancy Compensator and attach the console to the lanyard. Be sure the lanyard clip is inserted from the bottom of the console as illustrated below.



INTRODUCTION- We at Dacor, are proud of our developmental approach to bringing you the latest in dive computer technology. This section of Advanced Topics has been included for those of you who would like a look at the theory behind the new Dacor Omni Pro Dive Computer. We are happy to share this detailed information with you and hope you enjoy this background information.

We would, however, like to stress that this advanced information is NOT required reading for the safe operation of the Omni Pro.

ALGORITHM- The algorithm used in the Dacor Omni Pro Dive Computer is based upon Spencer no-decompression limits supported by Powell - Rogers research and further developed by Lewis. The following is a brief chronological history of this algorithm.

The U.S. Navy Standard Air Decompression Tables are based on the multi-tissue theory invented by Haldane (1908), and modified by Workman (1965). Logs of their use by the U.S. Navy for over 30 years represent the most extensive database available. The underlaying theory predicts that following an allowable no-decompression dive to one depth, additional dive time can be spent at a shallower depth without incurring a decompression obligation. The advent of ultrasonic bubble detection, commonly referred to as Doppler, saw use by Spencer (1976) during his work to verify decompression limits for compressed air diving. The concept of multi-level diving, has recently been verified by the experiments of Huggins (1983), Thalman(1984-86), and Powell (1987).

The U.S. Navy Repetitive Dive Tables represent a major departure from this theory. They are based on the single slowest (120 minute half-time) tissue considered by Workman. Attempts by the U.S. Navy (Thalman 1984) and the Royal Navy (Leitch and Barnard, 1982) to exceed these limits has met with failure. Only the recent experiments by Powell (1987) have successfully reduced surface intervals between repetitive dives, and these are based on reduced no-decompression limits of Rogers (1987).

AIR COMPUTATION- The algorithm for air consumption is a patented formula which takes into consideration changes in depth (ambient pressure) simultaneously with an individual's breathing rate to provide air time remaining during the dive. These values are updated every second.

OVERRIDE RESTRICTIONS- The Spencer, Powell - Rogers model, modified by John Lewis, provides override restrictions to shorten no-decompression limits (NDL's) on repetitive dives. These values are supported by Royal Navy studies on DCS incidence while repetitive diving. While the first dive lacks override restrictions based upon depth or time, repetitive dives are affected by an additional formula.

The chart below will show the effect of the override on repetitive NDL's. This example demonstrating the override, shows the original NDL's at 0 saturation. A minimum profile of 30 Ft. (9 M)/1 Min./surface interval = 10 minutes is used to effect a repetitive dive sequence. These repetitive dive NDL's show the relationship of subsequent dive depths following the same profile.

OVERRIDE RESTRICTIONS ON NDL's

Dive #	0	1	2	3	4	5
	(30 FT (9 M)/1 MIN, SI = :10 MIN)					
NDL @						
(9) **30'**	99+	99+	99+	99+	99+	99+
(12) **40'**	99+	99+	99+	99+	99+	99+
(15) **50'**	78	77	77	76	76	75
(18) **60'**	55	55	54	54	54	53
(21) **70'**	40	39	39	38	38	38
(24) **80'**	31	30	30	28	28	28
(27) **90'**	25	24	24	21	21	20
(30) **100'**	20	20	18	14	14	14
(33) **110'**	17	16	13	9	9	9
(36) **120'**	13	12	8	4	4	3
(39) **130'**	11	7	3			
(42) **140'**	9	4				
(45) **150'**	8					
(48) **160'**	7					

(meters)

The chart below shows the override reset transition back to the original NDL's after a 12 hour surface interval.

OVERRIDE RESET TRANSITION

SI =	0:11	1:00	2:00	3:00 → 8:00	9:00	10:00	11:00	12:00
NDL @								
(9) **30'**	99+	99+	99+	99+	99+	99+	99+	99+
(12) **40'**	99+	99+	99+	99+	99+	99+	99+	99+
(15) **50'**	75	77	77	78	78	78	78	78
(18) **60'**	53	54	55	55	55	55	55	55
(21) **70'**	38	39	39	40	40	40	40	40
(24) **80'**	28	29	29	29	30	31	31	31
(27) **90'**	20	21	22	22	22	25	25	25
(30) **100'**	14	14	15	15	15	20	20	20
(33) **110'**	9	9	9	9	10	16	17	17
(36) **120'**	3	4	4	4	4	10	13	13
(39) **130'**						6	11	11
(42) **140'**							7	9
(45) **150'**							4	8
(48) **160'**								7

(meters)

ALTITUDE ALGORITHM ADJUSTMENT- The Dacor Omni Pro Dive Computer will automatically adjust the algorithm for diving at altitude up to 10,000 feet above sea level. Freshwater corrections are based upon NOAA values for altitude diving.

Altitude adjustments to the NDL's will begin at 3,000 feet and at each additional 1,000 feet up to 10,000 feet shown in the following table. Exposures to elevations above 10,000 feet will not allow the unit to operate.

NDL ALTITUDE ADJUSTMENTS WITH FRESHWATER CORRECTIONS

Altitude FT.	0 3,000	3,001 4,000	4,001 5,000	5,001 6,000	6,001 7,000	7,001 8,000	8,001 9,000	9,001 10,000
NDL @ (m) ft.	No-Decompression Limits in minutes							
(9) 30'	99+	99+	99+	99+	99+	99+	99+	99+
(12) 40'	99+	96	88	81	74	69	63	58
(15) 50'	78	60	57	53	49	44	40	36
(18) 60'	55	41	38	36	33	30	28	26
(21) 70'	40	30	29	27	25	23	21	19
(24) 80'	31	24	22	20	19	17	15	13
(27) 90'	25	19	17	16	14	12	11	10
(30) 100'	20	15	13	12	11	10	9	8
(33) 110'	17	11	10	9	9	8	7	7
(36) 120'	13	9	9	8	7	7	6	6
(39) 130'	11	8	7	7	6	6	6	5
(42) 140'	9	7	6	6	6	5	5	5
(45) 150'	8	6	6	6	5	5	5	4
(48) 160'	7	6	5	5	5	5	4	4

BAIL OUT SCHEDULE- When using dive tables or dive computers, you should never dive to the absolute maximum rated depth. Always allow for a margin of safety. The Omni Pro Dive Computer is rated to 250 FSW (76 MSW). Decompression requirements deeper than 40 ft. (12 m) stop depth will be preceded by flashing "DECO" symbols before the maximum stop requirement. If the "DECO" symbols begin to flash, ascend immediately to the first decompression stop. If the max-out condition occurs, the decompression display is replaced by the out of range warning and calculations will stop. The Gauge Mode displaying only depth, bottom time, air pressure and temperature is displayed until reaching the surface (Fig. 19, page 13). The out of range warning remains displayed and will prevent diving for 24 hours. (See Shut Down- Decompression Requirements Deeper Than 40 Feet, page 21).

If this situation occurs, the Omni Pro has a bail out table on the back of the plastic prompt card. **THIS TABLE IS FOR EMERGENCY USE ONLY!** If the computer goes out of range at depth, ascend immediately and follow the 250 FT (76 M) bail out table shown below and on the prompt card.

If the Omni computer shuts down for an out of range mode all decompression computing will stop. However, current depth, bottom time and air information will continue.

	Profile	Stop Depth / Time					Total Ascent
	Ft. / Min.	50	40	30	20	10	Minutes
Omni Bailout Feet	250 / 9	1	1	2	3	7	18:50 @ 60 / 45 / 30 Ft. / Min.
		(Minutes)					

	Profile	Stop Depth / Time					Total Ascent
	M / Min.	15	12	9	6	3	Minutes
Omni Bailout Meters	76 / 9	1	1	2	3	7	18:50 @ 18 / 14 / 9 M / Min.
		(Minutes)					

FURTHER READING- If you would like to read and learn more about dive computers and decompression theory, Dacor would like to recommend the following books.

The Recreational Diver's Guide to Decompression Theory, Dive Tables and Dive Computers, By John E. Lewis and Karl W. Shreeves.

Diving with Dive Computers, By Ken Loyst and Michael Steidley.

Dive Computers- A Consumer's Guide to History, Theory, and Performance, By Ken Loyst with Karl Huggins and Michael Steidley.

Basic Decompression Theory and Application, By B.R. Wienke.

Proceedings of Dive Computer Workshop, By the American Academy of Underwater Sciences, September 1988.

Proceedings of Biomechanics of Safe Ascents Workshop, By the American Academy of Underwater Sciences, September 1989.

Proceedings of Repetitive Diving Workshop, By the American Academy of Underwater Sciences, March 1991.

1. **What table is the Dacor Omni Pro Dive Computer based on?**
The Dacor Omni calculates the diver's nitrogen absorption and elimination for 12 different tissues of compartments with half times ranging from 5 to 480 minutes. The basis of this selection is a modification of the no-decompression limits from Dr. Merrill Spencer's 1976 research. The modified model was proposed by Dr. Ray Rogers and tested by Dr. Michael Powell in 1987 employing Doppler ultrasonic bubble detection. Dr. John Lewis modified the algorithm to include the latest research on repetitive diving conducted by the Royal Navy. The result is a tissue model constructed to cover multi-level repetitive diving.

The algorithm for air consumption is a patented formula which takes into consideration changes in depth (ambient pressure) simultaneously with an individual's breathing rate to provide air time remaining during the dive.

2. **How conservative is the tissue model?**
This model represents a conscious approach to provide shorter surface intervals for safe repetitive dive profiles with altitude correction. In performance it measures at the median of currently available decompression models.

3. **What is the recommended ascent rate?**
The Omni Dive Pro Computer uses a 60/45/30 feet (18/14/9 meters) per minute variable ascent rate that is monitored by the computer. The ascent rate is spread due to tissue behavior under pressure. Refer to page 7 for more information.

4. **Does the computer adjust for altitude?**
YES. Altitude adjustment is automatic throughout the entire operating range with freshwater corrections.

5. **Does the computer go "Out of Range" if a depth of 130 feet (39 meters) is exceeded?**
NO. It is operational throughout the entire 250 foot (76 meter) range.

6. **Does the computer go "Out of Range" following decompression?**
NO. Since decompression is performed, repetitive dives will be calculated on previous exposure.

7. **Does the computer provide decompression information?**
Yes. If decompression is required, the Omni Pro Dive Computer directs you to the stop depth, providing the stop time and total ascent time.

8. **Is the Omni Pro Dive Computer affected by X-rays, radar, or radio transmitters?**
Not normally. Some airport security stations are not regulated. Request a hand inspection if in doubt. Properly installed radio and radar equipment pose no threat to the Omni Pro's electronics.

ACCESSORIES

These accessories for your instrument and diving enjoyment can be purchased from your local Dacor Dealer.

9492-00	**Omni Dive Computer Video-** An informative video on computer diving for the Omni & Omni Pro Dive Computers.
3617-00	Modular System Compass
9783-00	Replacement Lens Protector
9766-00	Replacement Lanyard for Console
9136-92	Instrument Bag

SPECIFICATIONS

Depth Reading-
Calibration- feet of seawater
Operating Range- 0-250 FSW (0-76 MSW)
Accuracy- +/- 1% across full scale
Metric display resolution to 0.5 meters

Tank Pressure-
Operating Range- 0 to 4,000 PSI (0 to 276 BAR).
Metric display resolution to 0.5 BAR

Audible Low Air Alarm-
User programmable from 300-950 PSI (21.0 -66.5 BAR)
Factory preset at 300 PSI (21.0 BAR)

Display-
LCD, low power consumption

Dive Timer-
Range- 0-199 minutes
Bottom Timer Activation- 5 FSW (1.5 MSW)
Surface Timer Activation- 3 FSW (0.9 MSW)

Dive Log-
Stores up to nine dives with roll-over
Records:
- Dive Number
- Bottom Time
- Maximum Depth
- Surface Interval
- DECO Dive Indicator
- Ascent and DECO Violations

Permanent Record Mode-
Maximum Depth Reached, 0-250 FSW (0-76 MSW)
Number of NO-DECO Dives, 0-9999 with roll-over
Number of DECO Dives, 0-9999 with roll-over
Number of Dive Hours, 0-9999 with roll-over

Variable Ascent Rate-
- *Deeper than 60 feet (18M),* ascend less than 60 feet (18M) per minute.
- *Between 60 - 20 feet (18 - 6M),* ascend less than 45 feet (14M) per minute.
- *Less than 20 feet (6M),* ascend less than 30 feet (9M) per minute.

Power-
1 user replaceable, 6 Volt, Alkaline J-cell.
Est. Life- Approx. 1,200 hours operation (100 dives)
Shelf Life- Up to five years depending on storage, use, and climate.
Battery not covered under warranty.

Switch-
Manual ON/LOG Button
Automatic Shutdown

Decompression Model-
Algorithm- Lewis modified, Spencer, Powell - Rogers model
Tissue Compartments- 12
Half Time Range- 5-480

Thermometer-
Minimum operating range 32°F to 160°F
Computer will read down to 20°F and shuts off below 20°F

Warnings-
Ascent Rate Exceeded, "SLOW" arrow flashing every second
Ceiling Exceeded, "DOWN" arrow flashing every second
Out of Range, "EXCLAMATION" triangle continuous 24 hour display
Low Battery Condition, "ENERGY" triangle
Low Air Warning, "UP" arrow flashing every second & audible alarm

DACOR CORPORATION TWO YEAR LIMITED INSTRUMENT WARRANTY

WHAT IS COVERED

This warranty covers to the original owner, all defects in material and workmanship in any Instrument sold by Dacor Corporation ("DACOR").

WHAT IS NOT COVERED

This warranty does not cover damage, failure or loss caused by wear and tear, failure to perform normal maintenance on Dacor items, cosmetic damage such as scratches, nicks, dents or discoloration, fading or any damage, failure or loss caused by:

1. Accident, misuse, neglect, abuse, improper assembly or improper maintenance.
2. Failure to follow instructions in the User's Guide.
3. Rental, Training class, Military, or Commercial usage.
4. Battery not covered.

FOR HOW LONG

The warranty coverage has a two year limit for instruments sold by Dacor, to the original purchaser, under the terms and conditions defined below.

TERMS AND CONDITIONS

Within the warranty period, Dacor will at its option, either repair or replace (with the same or equivalent product) the defective in-warranty product, part or accessory. Cost of labor for warranty repairs is not covered. **The product must be accompanied by dated proof of purchase for warranty service.** As a matter of warranty policy, the Dacor Corporation will not refund the consumer's purchase price.

Use of this equipment by a person who is not certified by a recognized agency shall render all warranties, null and void.

NO LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES

Repair or replacement of defective products or parts specified above are your sole remedy under this warranty and IN NO EVENT SHALL DACOR BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

HOW YOU CAN GET SERVICE

See your authorized Dacor dealer for service or write to Dacor Corporation, 161 Northfield Road, Northfield, Illinois 60093, for the name and address of your nearest authorized Dacor dealer.

YOUR RIGHTS UNDER THE LAW

This warranty gives you specific legal rights and you may also have other rights which may vary from state to state.

IMPORTANT NOTE: The above Two Year Limited Warranty applies to Instruments sold and serviced in North America and Caribbean. Consult your local dealer or importer for details of warranty coverage in your country. Instruments purchased in the United States, Canada, or the Caribbean but serviced in other countries will be subject to the warranty conditions in effect in the country of use and service. Terms and conditions subject to change without notice.