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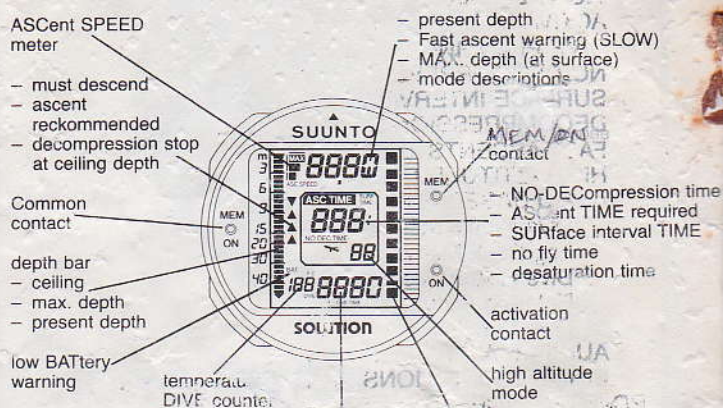
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OWNER'S INSTRUCTION MANUAL SOLUTION

SUUNTO
Diving Instruments

FIGURE 1 STARTUP



MODES (e.g. memory): touch MEM- & Common (MEM/ON)-contact
ACTIVATION: touch ON- & Common (MEM/ON)-contact
RETURN FROM MODE: touch MEM- and ON- & Common (MEM/ON)-contact

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! WARNING !

ALL DIVERS MUST UNDERSTAND THAT THERE IS NO PROCEDURE OR DIVE COMPUTER THAT WILL TOTALLY PREVENT THE POSSIBILITY OF DECOMPRESSION SICKNESS. E.G. DIVERS' METABOLISM VARIES FROM PERSON TO PERSON AND EVEN FROM DAY TO DAY.

CAREFULLY READ THIS INSTRUCTION MANUAL, ESPECIALLY CHAPTER "FOR YOUR SAFETY".

! WARNING !

NOT FOR PROFESSIONAL USE.

SUUNTO Diving Computers are intended for recreational use only.

The demands of commercial or professional diving often expose the diver to diving profiles that increase the risk of decompression sickness, and therefore Suunto specifically recommends against using the SOLUTION for commercial or other severe diving activity.

FOR YOUR SAFETY

THE DIVER IS RESPONSIBLE FOR HIS OR HER OWN SAFETY

Do not attempt to use the Suunto SOLUTION without reading this entire Instruction Manual. If you have any questions about the Manual or the SOLUTION, contact your Suunto dealer before diving with the SOLUTION. The SOLUTION is designed to assist fully trained, certified sport divers in planning safe, no-decompression dives. It is NOT A SUBSTITUTE FOR PROPER INSTRUCTION or for understanding the principles of decompression. A diver using the SOLUTION should also have access to a backup depth gauge, watch or other underwater timepiece, and decompression tables on every dive.

! WARNING !

THE SOLUTION SHOULD NEVER BE TRADED OR SHARED BETWEEN USERS WHILE IT IS IN OPERATION. Its information will not apply to someone who has not been wearing it throughout a dive or sequence of repetitive dives. Its dive profiles must match that of the user. If it is left on the surface during any dive, it will give inaccurate information for subsequent dives.

! WARNING !

WHEN DIVING AT HIGHER ALTITUDES (above 700 m [2300 ft]) IT IS ESSENTIAL THAT THE ENTERED ALTITUDE MODE, I.E. MAXIMUM ALTITUDE LIMIT, OF THE SOLUTION EXCEEDS OR IS EQUAL TO THE ALTITUDE OF THE DIVE SITE.

The altitude mode indicator must show either A1 or A2 depending on the altitude. Diving with a SOLUTION that has not been properly set for the correct altitude of the dive site GREATLY INCREASES THE RISK OF DECOMPRESSION SICKNESS. WHEN USED PROPERLY THE SOLUTION IS AN OUTSTANDING TOOL FOR ASSISTING PROPERLY TRAINED DIVERS IN PLANNING AND EXECUTING STANDARD AND MULTI-LEVEL SPORT DIVES WITHIN THE DESCRIBED NO-DECOMPRESSION LIMITS.

In addition: if through carelessness or emergency a diver is forced to exceed the no-decompression limits on a dive, the SOLUTION does have a provision for indicating decompression information. The SOLUTION will then continue to provide subsequent interval, and repetitive dive information.

While the SOLUTION is a "state of the art" dive computer, the user/diver must realize that it is only a computer and cannot monitor the actual physiological functions of an individual diver. All decompression schedules currently known to the author, including the U.S. Navy Tables, are based on a theoretical mathematical model which is intended to serve as a guide to minimize the probability of

decompression sickness. The principles and procedures discussed within this text are believed to be conservative with respect to the mathematical model utilized in the U.S. Navy Tables. However, the reader/diver should be forewarned that individual physiological differences, severe environmental conditions and pre-dive activities, especially those which tend to increase dehydration, may increase the risk of decompression sickness.

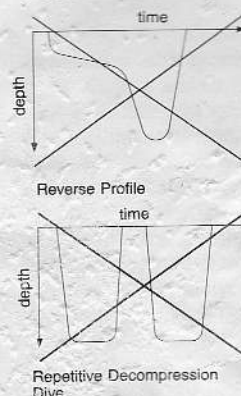
The user should understand that all decompression devices (dive computers and/or decompression tables) are based on mathematical models and that many experts are currently concerned that, under certain conditions, these models may not adequately describe the physiological phenomena.

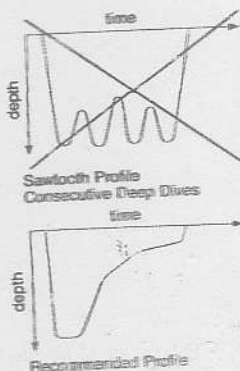
These conditions are presently identified as dives which incorporate the following:

REVERSE PROFILES - where the diver spends the majority of the dive at shallow depths and then descends to the maximum depth shortly before surfacing.

CONSECUTIVE DEEP DIVES - where the diver repeatedly returns to approximately the same maximum depth with only short surface intervals between dives.

REPETITIVE DECOMPRESSION DIVES - where the diver makes a series of multiple dives that all exceed the stated no-decompression limits.





CAUTION:

Dive practices which include the dive profiles described above are believed to increase the risk of decompression sickness even if they conform to the mathematical model, AND THEREFORE SUUNTO RECOMMENDS THAT SUCH PRACTICES BE AVOIDED.

Throughout the history of diver training and education, divers have been taught to always include a margin of safety and conservatism in their diving procedures, that the maximum depth of a dive should be obtained early in the dive profile and that the remainder of the dive should be directed to the slow return to the surface. The amount of safety margin and conservatism exercised by the diver should increase as the repetitive dive series increases.

Further, the reader/diver is advised that any dive carries some risk of decompression sickness and neither the authors, nor Suunto Oy will assume any responsibility or liability for accidents or injuries which might occur for any reason.

GENERAL DESCRIPTION

The Suunto SOLUTION is a multi-functional sport diving instrument which provides information on depths, times

and decompression requirements. Its electronic micro-processor mathematically models the absorption and release of nitrogen during all phases of diving including ascents, surface intervals and repetitive dives.

The information it provides is displayed in a logical, simple fashion so that only essential data is shown at the appropriate time. While underwater the display will show present and maximum depth, elapsed dive time, water temperature, high altitude mode, remaining no-decompression time or decompression information if required. Between dives, the display will show surface interval, not safe to fly indication (desaturation time), maximum depth and dive time for the last dive and available no-decompression times now available for planning the next dive. In addition you can recall detailed dive profiles for the most recent 8 hours of dive time. Before diving you can simulate your dives. For high altitude diving you can key in the altitude where you intend to dive. The SOLUTION is available in two versions: one which reads depths in feet of sea water, and another which reads depths in meters of sea water. The operation and maintenance of both versions is identical. The no-decompression limits displayed by the SOLUTION upon activation are slightly more conservative than those permitted by U.S. Navy tables for most dives to a single depth. These "low-bubble" no-decompression limits have been derived from recent research, and are believed to greatly reduce the chances of decompression sickness.

Unlike the U.S. Navy tables the SOLUTION does interpolate between depths, giving a diver "credit" for time spent in shallower water, rather than calculating no-decompression limits based on the maximum depth of a dive. As a result, no-decompression times permitted by the SOLUTION are often much longer than those that would be allowed by the U.S. Navy tables. Further

of this multi-level diving technique are provided below in OPERATING PRINCIPLES.

CAUTION

The user should be aware that any dive, even ones within the "low-bubble" or U.S. Navy limits, does carry some risk of decompression sickness. As a safety precaution, Suunto recommends that divers using the SOLUTION should have at least 5 minutes of no-decompression time remaining at all time during the dive. This is especially important for divers in poor physical shape, or divers in cold water under arduous conditions.

Suunto also recommends that divers take a "safety stop" of at least 3 minutes at a depth between 3 m [10 ft] and 6 m [20 ft] at the end of every dive if it is at all possible.

OPERATING PRINCIPLES

THE SOLUTION MUST BE ACTIVATED AND OPERATED CORRECTLY IN ORDER FOR IT TO PROVIDE ACCURATE INFORMATION.

When you dive with the SOLUTION, it measures and displays depths and times as your dive progresses. It shows your available dive time - and any decompression required - based upon five factors: 1) your present depth; 2) excess nitrogen absorbed during earlier portions of the dive; 3) residual nitrogen remaining from previous dives; 4) the no-decompression limits that apply to that depth; and 5) altitude classification.

Back on the surface, it displays the no-decompression dive times available for various depths on the next dive. As surface intervals increase, so do available dive times for the next dive.

In order to perform these calculations, the SOLUTION continuously models the absorption and release of excess nitrogen from theoretical "compartments". Each of the compartments absorbs and releases nitrogen at a different rate. Compartments that absorb and release nitrogen rapidly are believed to have a high tolerance for excess nitrogen, whereas compartments that absorb and release nitrogen more slowly are believed to be more sensitive.

The no-decompression limits in the U.S. Navy tables are based upon six compartments for single dives, and one compartment for surface intervals and repetitive dives. If you are familiar with table theory, you may know that they are characterized by half times (i.e. time required for 50 % equilibration to a pressure change) ranging from 5 minutes to 120 minutes. The SOLUTION includes the same six compartments, plus three additional compartments for an increased range of the mathematical model. Calculations are based upon all nine compartments for all phases of diving, including surface intervals and repetitive dives. The SOLUTION'S half times range from 2.5 to 480 minutes.

The atmospheric pressure is lower at high altitudes than at sea level. After travelling to high altitude the diver has "additional" nitrogen in his body compared to the equilibrium situation at that altitude. (This "additional" nitrogen is released gradually in time and equilibrium is reached within a couple of days.)

Prior to high altitude diving the SOLUTION must be set to high altitude diving mode to take this into account. The maximum partial pressures of nitrogen allowed by the mathematical model of the SOLUTION are reduced according to the lower ambient pressure. As a result the

allowed no-decompression limits are considerably reduced.

The SOLUTION requires a minimum surface interval of 10 minutes between dives. If a surface interval is shorter than 10 minutes, the SOLUTION'S dive counter and dive timer treats the next dive as a continuation of the previous dive. It adds the dive times, and calculates no-decompression limits or decompression stops based on excess nitrogen absorbed on both dives. In this regard, it is similar to the U.S. Navy tables. Upon recall, the dive profile recorder will show all dive segments based on the times from when the meter switched on at depth of 1.5 m [5 ft] until the meter switched off again at 1.5 m [5 ft].

CAUTION

SUUNTO STRONGLY RECOMMENDS THAT SPORT DIVERS SET THEIR MAXIMUM DEPTH TO 40 m [30 ft].

However, the SOLUTION will calculate below that depth to provide a wide margin of flexibility if, through carelessness or emergency, you are forced to exceed this recommended depth limit for a dive.

In several important aspects the SOLUTION is more conservative than the U.S. Navy tables. For example:

1. The SOLUTION uses an ascent rate of 10 m [33 ft] per minute. It is intended to allow the gradual release of nitrogen during ascent, and reduce the chance of 'bubbles' forming in the diver. If you exceed 10 m [33 ft] per minute, the SOLUTION asks you to slow down.
2. The SOLUTION does not calculate bottom time; it calculates dive time. Dive time includes all the time spent below a depth of 1.5 m [5 ft] including ascent

time. The U.S. Navy tables compute bottom time from the moment that you leave the surface until you begin your ascent, and do not include ascent times.

3. The SOLUTION continues to track residual nitrogen in compartments on the surface until they no longer affect no-decompression limits on subsequent dives. This may take up to 48 hours if you have been diving heavily. The U.S. Navy tables, by comparison, assume that you are completely free of residual nitrogen 12 hours after your last dive.

4. The SOLUTION'S "low-bubble" no-decompression limits are designed to allow less excess nitrogen to build up in compartments than the U.S. Navy tables permit.

For example, on a first dive descending directly to 18 m [60 ft], the U.S. Navy no-decompression limit is 60 minutes. The SOLUTION'S no-decompression limit for the same dive is 52 minutes.

USING THE SOLUTION

This section contains instructions for operating the SOLUTION, and for interpreting its displays. Each display has been carefully designed to provide all the information you need for various diving situations: **STARTUP**, **READY**, **DIVE PLANNING**, **DIVING** and **SURFACE**. In addition to these diving situations the SOLUTION has special modes (memory, dive simulation etc.) and **ERROR** displays if you have committed a serious error in its operation.

Each of these displays shows only the data needed during that diving situation. For example, while you're on a dive, surface interval data is irrelevant, and therefore not shown. While you're on the surface after a dive, remaining

no-decompression dive time for that dive is irrelevant, and therefore replaced with information about the times available on your next dive. You'll find that the SOLUTION is easy to use.

Activation



Fig. 3. STARTUP, I

The SOLUTION is always ready for use and will activate if submerged. It is not necessary to turn it on before diving. But it is recommended to activate the SOLUTION before diving either by immersing it in water for couple of seconds or by making ON-contact using moistened fingertips. All display elements will then turn on (Figure 3 and 4) and short beep is audible. The two STARTUP displays are visible for few seconds.

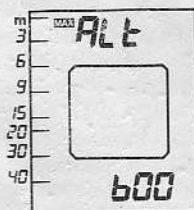


Fig. 4. STARTUP, II altitude limit indication. Highest altitude is set to 600 m (2000 ft)

! WARNING !
IF YOU ARE DIVING AT HIGHER ALTITUDES, MAKE SURE THAT THE ALTITUDE MODE HAS BEEN SET ACCORDING TO THE ALTITUDE OF YOUR DIVE SITE.



Fig. 5. READY display before the first dive

The READY display (Fig. 5) must appear after ALTITUDE display confirming that activation is complete. The SOLUTION is now ready to dive. During the READY and dive planning display dive number and temperature (Fig 5. 23°C [73°F] and Fig. 6.) are alternating. When diving, only temperature is shown.

NOTE: The SOLUTION may activate itself without following the above instructions. Simply holding it in your hand may make an electrical connection across the two contacts. This will have the same effect as immersing the SOLUTION in water and then lifting it out. In either case, if the SOLUTION is not taken on a dive after activation, it will automatically turn off in 3 minutes to conserve the batteries.

If "BAT" is displayed, the SOLUTION should not be used. BAT indicates that the battery is too low to operate the SOLUTION.

The READY display will alternate about every 30 seconds with the **DIVE PLANNING** display described below.

The SOLUTION does not need to be reactivated for repetitive dives. It will remain active until it has calculated that all residual nitrogen has off gassed. This may take up to 48 hours, as described, under OPERATION PRINCIPLES.

DIVE PLANNING

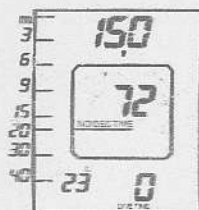


Fig. 6. DIVE PLANNING. NO-DEC limit for 15 m (50 ft) is 72 min.

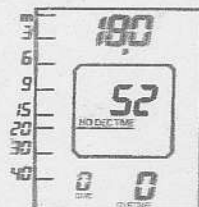


Fig. 7. DIVE PLANNING. (18 m = 60 ft).

Before your first dive, the DIVE PLANNING display (Fig. 6-7) will alternate with the READY display described above. The DIVE PLANNING display will cycle rapidly through the "low-bubble" no-decompression limits for various depths. Depths will appear in the Digital Depth Indicator, and times will be shown in the center window with the notation NO DEC TIME. It takes about 30 seconds to run through the cycle. The DIVE PLANNING display cycles through depths in 3 m [10 ft] increments: 9 m [30 ft], 12 m [40 ft], 15 m [50 ft] (Fig. 6), 18 m [60 ft] (Fig. 7) and so forth. At the end of a dive, the SOLUTION will return to the DIVE PLANNING display when you return to the surface or are shallower than 1.5 m [5 ft]. As you would expect each NO DEC TIME may be shortened to take residual nitrogen into account, but will increase as surface interval lengthens. The DIVE PLANNING display will alternate with the SURFACE display described below.

Non-Repetitive and Repetitive No-Decompression Dives

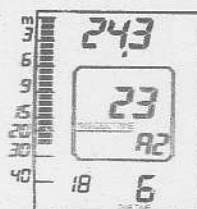


Fig. 8. DIVING, no-decompression dive

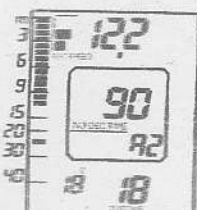


Fig. 9. DIVING, no-decompression dive

Any time you leave the surface and drop below 1.5 m [5 ft] you will see only the DIVING display (Fig. 8-9). The DIVING display will remain visible until you return to depths shallower than 1.5 m [5 ft]. Available no-decompression dive time – based on the five factors listed under OPERATING PRINCIPLES – will be shown in minutes in the center window, with the notation NO DEC TIME. Elapsed time in minutes will also be indicated by the DIVE TIME indicator.

Your present depth will be shown numerically in the Digital Depth Indicator, as well as graphically on the Depth Scale. The bottom bar on the Depth Scale will serve as a reminder of maximum depth attained. As you descend, the Depth Scale will extend downward. When you ascend, the bottom bar will remain in place, showing how deep you have gone on this dive. Water temperature is also indicated (18°C [64°F]).

Surface intervals

An ascent to any depth shallower than 1.5 m [5 ft] will cause the DIV-



Fig. 10. SURFACE, Dive planning



Fig. 11. SURFACE, Surface time

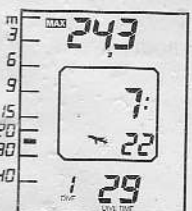


Fig. 12. SURFACE, no flying time is 7:22

ING display to be replaced with the SURFACE display (Fig. 10-12). DIVE PLANNING display (Fig. 10) will alternate with surface and desaturation time (no flying time) information.

In the center of the SURFACE display (Fig. 11), you will find your surface interval in hours:minutes with notation SURFACE TIME. The Digital Depth Indicator will read the maximum depth of the previous dive, and the DIVE TIME display will show elapsed time at depth. The DIVE counter will show the number of the last dive. The Depth Scale will have a single bar showing, marking the maximum depth attained on the dive.

Temperature display is alternating with dive counter value. The no flying time is also shown in the center of the SURFACE display (Fig. 12) with an image of an airplane. The blinking image of an airplane is a reminder that you should not fly or travel to altitudes above sea level. The no flying time displayed by the SOLUTION is equivalent with so called DESATURATION TIME. After this time the residual nitrogen is no longer a factor affecting subsequent dives. When this time reaches zero the SOLUTION will automatically deactivate itself. Research suggests that you should not fly for at least 12 hours after no-decompression dives,

and for 24 hours after a decompression dive.

Until SURFACE TIME reaches 10 minutes (0:10), the SOLUTION doesn't "know" if you're going to make a repetitive dive or continue the first dive. If you descend below 1.5 m [5 ft] before 10 minutes have passed, the DIVING display will return. DIVE number will remain unchanged, and DIVE TIME will begin where it left off.

After SURFACE TIME REACHES 10 minutes, subsequent dives are (by definition) repetitive, and the DIVE counter will progress to the next higher number if you make another dive.

DECOMPRESSION DIVES

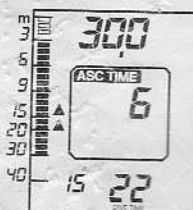


Fig. 13. DIVING, decompression dive

CAUTION

Suunto does not recommend decompression diving for sport divers.

However, if through carelessness or emergency, you are forced to exceed the no-decompression limits for any dive, the SOLUTION does have a provision for indicating decompression information. Rather than requir-

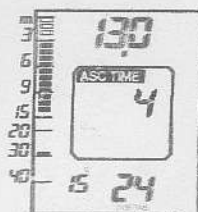


Fig. 14. DIVING, dec. dive, at floor

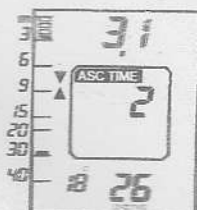


Fig. 15. DIVING, dec. dive, at ceiling

ing you to make stops at fixed depths, the SOLUTION permits you to decompress within a range of depths.

If your dive time exceeds the NO DEC TIME indicated on the DIVING display, the display itself will change. NO DEC TIME will be replaced with the flashing notation ASC TIME (Fig. 13). Ascent time is the minimum amount of minutes needed to reach the surface. It includes both the time needed to ascend to the ceiling (10 m [33 ft] per minute) and time needed to be spent at the ceiling. The ceiling is the shallowest depth to which you can safely ascend.

The depth of your ceiling will be shown clearly on the Depth scale. All of the depth bars shallower than your ceiling will blink. For example, if your ceiling is at 3 m [10 ft], all of the bars between 0 and 3 m [10 ft] will flash (Fig. 13-15).

The depth of the ceiling will depend upon your dive profile. The ceiling will be fairly shallow when it first appears, but if you remain at depth the ceiling will move downward and ASC TIME will increase. Both of these factors will increase the amount of air and time required for decompression or total ascent time.

Therefore, you should ascend and begin decompression promptly when the SOLUTION shows you that decompression is required. Note the upward pointing arrows.

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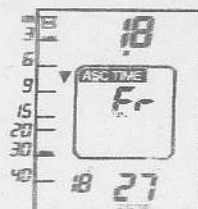


Fig. 16. DIVING, dec. dive, above ceiling

When you reach the ceiling, the display will show you two arrows pointing each other (hour-glass) (Fig. 15). If you ascend above the ceiling, a downward-pointing arrow will appear, warning you to descend immediately to or below the ceiling (Fig. 16). Blinking Error (Er) warning reminds you that you have only three minutes to correct your action before the SOLUTION goes into Error-mode. Suunto recommends staying

0.5 m [2 ft] below the ceiling to prevent the warning arrow from appearing.

During decompression, ASC TIME will count down toward zero, and the ceiling may move upward. You may surface only when ASC TIME reaches 0 and ASC TIME is replaced by NO DEC TIME.

Under some conditions – e.g. if the sea surface is rough – it may be more convenient to decompress below the ceiling than exactly at the ceiling. To determine when you are actually decompressing – rather than incurring additional decompression time – simply watch the ASC TIME display and upward pointing arrows (Fig. 13) during your ascent. When ASC TIME display stops flashing and upward pointing arrows disappear, you have entered the decompression range, and are shallow enough to begin decompression. What ever depth you choose within the decompression range, do not ascend shallower than the indicated ceiling. Since it's often hard to maintain a constant depth near the surface, you will probably not want to decompress at less than 4 m [13 ft], even if the ceiling is shallower than that.

Remember, it will take more time (and more air) to decompress below the ceiling than at the ceiling. ASC

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TIME is the amount of time that it would take to decompress at the ceiling. If you are decompressing below the ceiling, ASC TIME will still count downward, but it will run more slowly than usual and take longer to reach 0 (and decompress) than at the ceiling.

Fast Ascents and Ascent Speed Meter

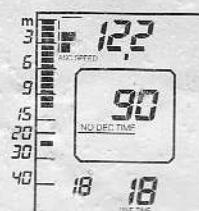


Fig. 17. DIVING, ascent speed 6 m (20 ft) per minute

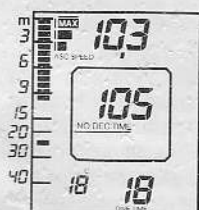


Fig. 18. DIVING, ascent speed 9 m (30 ft) per minute

The SOLUTION is equipped with ascent meter. If you are not ascending the meter display is not shown at all. If your ascent speed is between 2.5 m and 5 m [8 ft and 17 ft] per minute the first segment is displayed with the text ASC SPEED. First two segments are displayed at ascent speeds between 5 m and 7.5 m [17 ft and 25 ft] per minute (Fig. 17).

All three segments are displayed at ascent speeds between 7.5 m and 10 m [25 ft and 33 ft] per minute. If you ascend faster than 10 m [33 ft] per minute, the SLOW warning will blink on the DIVING display (Fig. 19) alternating with the depth reading.

You should slow down or stop coming up until the SLOW warning disappears, as long as you do not ascend shallower than 3 m [10 ft]. If SLOW is still on by the time you reach 3 m [10 ft] you must stop there until it goes off. You should not surface with SLOW on. If you do surface with the



Fig. 19. DIVING, ascent speed more than 10 m (33 ft) per minute

SLOW warning still flashing, it will continue to flash until you begin the next dive, or until the unit deactivates itself in the normal manner.

! WARNING !

IF YOU HAVE ASCENDED TOO FAST THE VALUES CALCULATED AND DISPLAYED BY THE SOLUTION MAY NO LONGER BE VALID FOR THE NEXT DIVE.

HIGH ALTITUDE DIVES

The SOLUTION can be adjusted for diving at high altitude. When programming the SOLUTION for the correct altitude setting the diver needs to simply select the altitude of the dive site by rounding up to the closes setting displayed. I.E. Dive site at 733 meters/diver programs the SOLUTION for 800 meter/A1 setting (see Entering Altitude Limit).

As a result the SOLUTION then adjusts the mode and correspondingly its mathematical model according to the entered altitude (see Operating Principles).

Table: The correlation between entered and indicated altitude mode.

Entered altitude in 200 m [700 ft] increments	Indicated altitude mode
400 ... 600 m [1000 ... 1700 ft]	"Sea level" mode (no indication)
800 ... 1400 m [2400 ... 4500 ft]	A 1
1600 ... 2400 m [5200 ... 8000 ft]	A 2

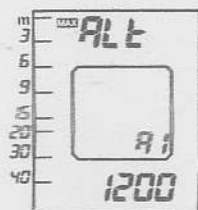
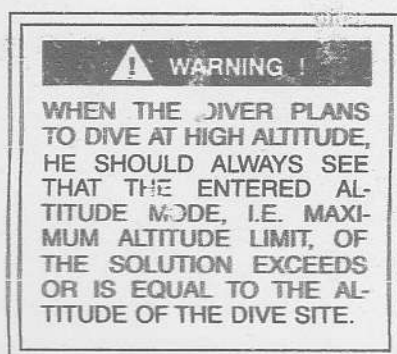


Fig. 20. STARTUP, altitude limit indication (altitude mode A1). Maximum allowed altitude 1200 m above sea level.



The altitude limit is displayed upon activation (Fig. 20) and it can be studied using the same mode, which is used to enter new altitude limits. The altitude mode is indicated both at the surface and during the dive by displaying A 1 (Fig. 21) or A 2 depending on the entered altitude limit. The diver can check the correctness of the altitude mode by comparing

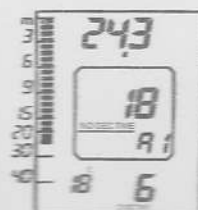


Fig. 21. DIVING, mode indication (altitude mode A1).

the displayed mode indicator and the altitude of the dive site using the Table above. If the mode is not correct the diver must enter new altitude limit (see Entering Altitude Limit).

You should notice that the no-decompression time limits for high altitude dives are much shorter than those for sea-level-dives (compare Fig. 8 and Fig. 21).

CAUTION

Suunto does not recommend decompression diving for sport divers and decompression dives at high altitudes greatly increase the risk of decompression sickness.

DO NOT PLAN DECOMPRESSION DIVES AT HIGH ALTITUDES.

It is recommendable to wait some time, e.g. a couple of hours, at high altitude before diving.

NOTE: If the diver wishes to have more conservative no-decompression limits, he can enter higher altitude mode than is actually needed. E.g. the diver diving at sea level can enter altitude mode A1 or A2.

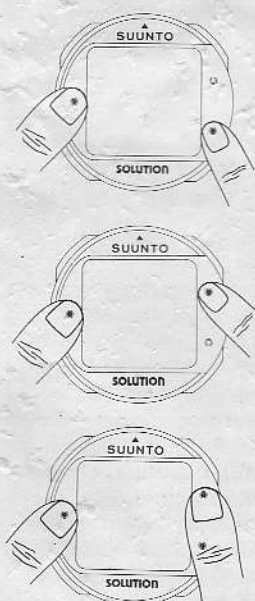
Indicated altitude mode is then changed to A 1. No-decompression limits are then shortened accordingly.

The indicated mode must be greater than actually needed mode in order to add extra conservatism (e.g. mode indicator should read at least A 1 when at sealevel or A 2 when A 1 would be otherwise sufficient).

MENU BASED FUNCTIONS AT SURFACE

Menu based functions are activated using the water contacts. The SOLUTION is equipped with three contacts (Fig. 1):

1. Common contact (MEM/ON)
2. Activation contact (ON)
3. Memory/mode contact (MEM)



Available control signals are:

1. ON (or activation)-signal: touch ON- & MEM/ON-contacts
2. MEMORY- and mode-signal: touch MEM- & MEM/ON-contacts
3. RETURN (FROM SELECTED MODE) -signal: Make first contact between ON- & MEM-contact e.g. by covering both contacts with your right thumb. Then touch the common (MEM/ON) contact (maintaining the connection between ON & MEM) e.g. by your left thumb.

To make good contact it may be necessary to moisten your fingertips.

Using the MENU-display you can select the function you need. MENU is activated by connecting MEM & MEM/ON.

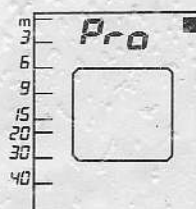


Fig. 22. MENU, dive profile memory

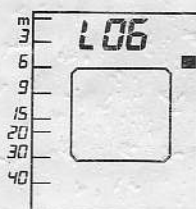


Fig. 23. MENU, log-book memory

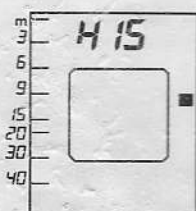


Fig. 24. MENU, dive history memory

As long as MEM-signal is active the SOLUTION scrolls through the MENU-selections (Fig. 22 – Fig. 26).

The desired function is selected by breaking contact with the symbol of the desired function appears on the display. (Pro for Dive Profile Memory, LOG for Logbook Memory, HIS for Dive History Memory, Alt for Altitude Entry and dSI for Dive Simulation).

Make sure that the contacts and the instrument itself are dry and clean before trying to use the MENU based functions.

Dive simulation can only be selected before actual diving has taken place.

All menu-based modes can be deactivated by RETURN-signal (= connecting all contacts together) or by immersing the SOLUTION.

MENU BASED FUNCTIONS CAN BE ACTIVATED ONLY WHEN 10 MINUTES HAVE ELAPSED AFTER DIVE.

As you know, it's important to keep written track of each dive you make. The information you record may be necessary for planning subsequent dives, especially in the unlikely event of battery failure or other malfunction of the SOLUTION between dives. The **SURFACE** and **DIVE PLANING** displays provide all the data you need at the end of every dive:

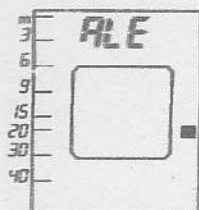


Fig. 25. MENU, altitude limit



Fig. 26. MENU, dive simulation

Dive Profile Memory



Fig. 27. DIVE PROFILE, surface interval 1:15 between 1. and 2. dive

maximum depth, dive time and NO DEC times at the intended depth(s) of your next dive. If you get into the habit of writing these down and recording what time you surface, you will always have an accurate account of your dives.

If you do not write down the necessary information immediately, but would like it later, the SOLUTION can supply this information for you. This section describes how to interrogate the SOLUTION for information on previous dives. The SOLUTION can show you a surprisingly detailed record of your most recent dive profile, as well as the most recent 8 hours of dive time.

Before interrogation the SOLUTION must be in an activated condition. Dive profile mode is activated using MENU-selection. Scrolling of the profile data of last dive begins automatically (Fig. 27 - Fig. 30). Dive time is shown in increasing increments of 3 minutes. Likewise, the maximum depths reached at each 3-minute recording interval are shown. After the

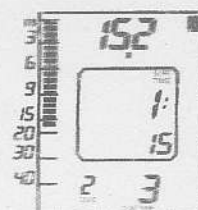


Fig. 28. DIVE PROFILE, 2-DIVE, max depth 15.2 m (50 ft) at the first 3 min.

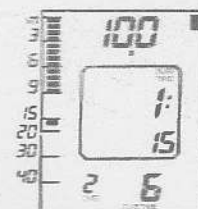


Fig. 29. DIVE PROFILE, second 3 min. segment

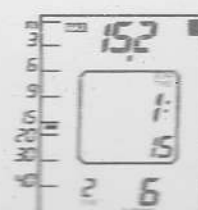


Fig. 30. DIVE PROFILE, second dive summary

last depth figure the display shows the duration and maximum depth of that dive. The surface interval time between that and preceding dive is displayed during the scrolling.

The scrolling of the profile data of preceding dive is started by MEM-signal (MEM and MEM/ON are connected). In this way approximately 8 hours of dive time can be recalled.

The dives have been separately numbered during each time of use. Therefore the memory will store dives with the same dive numbers as the dives that have been made during different repetitive series. The diver will need to keep a log as to the dates and locations of the separate files. The surface interval time before first dive is shown as "--" (Fig. 31).

The dives have been stored in the memory using the so-called 10 minute rule: when the surface interval time is less than 10 minutes, the dive times are counted together and the dive profiles combined. When all the dives in memory have been displayed to you, "END" will be shown in the dive time display.

The memory follows the ring memory principle: the oldest data is deleted when new data is entered. The contents of the memory will remain even when the batteries are changed.

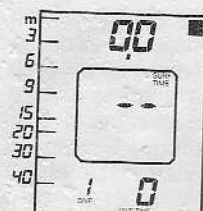


Fig. 31. DIVE PROFILE, first dive

Each segment will be shown for about 4 seconds. Most dives take less than one minute to scroll all the way through.

Some additional information is also stored in the memory:

- Blinking "SLOW" indicates that diver surfaced with "SLOW" on.
- "ASC TIME" sign is turned on during the scrolling at the time the dive changed to decompression dive.
- Downward pointing arrow is turned on, if ceiling has been violated, during the scrolling at the time the violation happened.

Dive History Memory

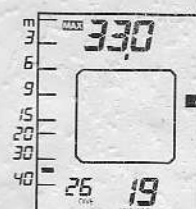


Fig. 32. DIVE HISTORY MEMORY

Activation using MENU-selection. Maximum depth ever reached (Fig. 32) (33 m [110 ft]), total dive time dived in hours and total number of dives are displayed.

Log Book Memory

When complete profile information is not needed, the log book memory is a fast and convenient way to review the memory. Log Book memory-mode is activated using MENU-selection. Maximum depth, dive time, surface interval time, dive number and same kind of additional information as in profile memory are shown for each dive. The data of last dive is shown first. The data of preceding dive is recalled by MEM-signal (MEM and MEM/ON are connected).

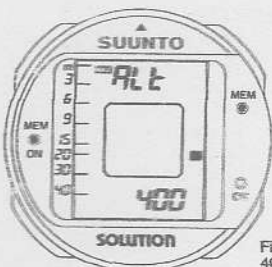


Fig. 33. ALTITUDE LIMIT
400 m (1300 ft)

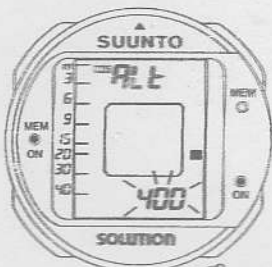


Fig. 33.1



Fig. 33.2



Fig. 33.3



Fig. 33.4

Entering Altitude Limits

After selection of this mode the valid Altitude Limit is shown (Fig. 33).

New value is entered in the following way:

Fig. 33.1

- Connect ON- and MEM/ON- contact until beep is emitted. Brake the connection when you hear the beep. Altitude limit value starts to blink indicating it is now possible to enter a new value.

Fig. 33.2

- Connect ON- and MEM/ON- contact again: the altitude limit value starts to increase in 200 m [700 ft] increments.
- Let the contacts off when desired value is displayed. The range is 400-2400 m [1000-8000 ft]. After 2400 m [8000 ft] the scrolling starts again from 400 m [1000 ft].

Fig. 33.3

- The new value is "chosen" using MEM-signal (MEM and MEM/ON). The blinking will then stop.

Fig. 33.4

- The process is ended by RETURN-signal (=connecting all contacts together). Double beep is emitted then. A delay of couple of seconds is needed between the contacts to ensure proper input operation. All contacts must be made exactly as described. This is to ensure high degree of protection against accidental change of altitude limit.

CAUTION

Remember always to check that the indicated mode is the one you wanted to enter!

Dive Simulation

Dive simulation can only be selected before actual diving has taken place.

When in simulation mode depth is controlled using ON and MEM-signal. ON-signal (ON and MEM/ON connected) increases the depth and MEM-signal (MEM and MEM/ON connected) decreases the depth. In simulation time goes four times faster than normal time. Simulation mode can be used to plan the diving in advance or for demonstrational purposes.

AUDIBLE ALARMS

Audible alarm is emitted when:

- Maximum ascent rate (10 m [33 ft] per minute) is exceeded
- The two up-pointing arrows are showed. They are showed when:
 - 60 m [196 ft] depth is reached
 - No-decompression dive turns into decompression dive
- Ceiling depth is exceeded

ERROR CONDITIONS

The SOLUTION is fairly forgiving of minor errors in its use, and provides adequate warnings of impending problems. If you do not respond to its warnings, it will revert to an Error Mode indicating a severe violation of its operating principles.

Any violation that puts the SOLUTION in the Error Mode will greatly increase your chances of getting decompression sickness.

Once in the Error-mode the SOLUTION will continue to display information allowing a diver to ascend and surface. At this point the SOLUTION MUST NOT BE USED AGAIN UNTIL IT HAS TOTALLY OFF GASED AND DEACTIVATED.

The Error-mode is shown by blinking "Er" in the center display. Error mode results from omitted decompression: the diver stays above the ceiling for more than three minutes. Blinking Er-warning is shown during that three minutes period. The ERROR mode also results if the depth of 99 m [325 ft] is exceeded. A careful sport diver is unlikely ever to put the SOLUTION in the Error mode.

If the whole display of the SOLUTION starts to blink, refrain from diving. Wait for deactivation. If the display is still blinking after reactivation, contact your dealer.

PC-INTERFACE

The SOLUTION can be connected to IBM compatible PC-computer using special communication interface available from SUUNTO. Data transfer is carried out using the water contacts of the SOLUTION.

This interface comes with software program with which the contents of SOLUTION'S dive profile memory can be easily transferred to the memory of PC. This software program can be used both as a computerized "log-book" and simulation (demonstration) tool.

QUESTIONS AND ANSWERS

1. Q: When is a dive not a dive?

A: When it's to a depth shallower than 1.5 m [5 ft].

The SOLUTION does not tally dive times for dives less than 1.5 m [5 ft] deep.

2. Q: What do the two horizontal lines mean in the DIVING display (— —)?

A: The horizontal lines appear for shallow depths where no-decompression limits are not specified because the number would be so large.

3. Q: Why isn't the Depth Scale linear (the divisions become closer together with increasing depth), and why doesn't it extend below 40 m [140 ft]?

A: In order to keep the SOLUTION compact, it was necessary to fit the Depth Scale into a space about 3 cm [1.5 inch] long. By comparison, a typical needle-type depth gauge can wrap its scale around a circumference of about 14 cm [5.5 inch]. If the divisions of the Depth Scale were kept equal in size, or extended below 40 m [140 ft] they would be much too close together to read. Suunto engineers decided to emphasize the shallow end of the Depth Scale as an aid to making decompression stops. For accurate depth readings — especially below 9 m [30 ft] — use the digital depth display.

4. Q: Do the ceilings shown by the SOLUTION match with US Navy decompression stop depths (e.g. 3 m [10 ft] and 6 m [20 ft])?

A: The SOLUTION offers you the flexibility of a decompression range, rather than fixed decompression stops. You may decompress at any depth within the decompression range. In most cases, the decompression range will lie between about 3 m [10 ft] and 9 m [30 ft].

5. Q: Is time spent in decompression counted as part of dive time?

A: Since the SOLUTION tracks compartment nitrogen levels throughout your dive, it will count both "safety

stops" and required decompression as part of dive time. It will show the total time spent below 1.5 m [5 ft] in the DIVING display as DIVE TIME.

At the end of a dive, the nitrogen levels in most compartments will be decreasing while you are in water less than 6 m [20 ft] deep. Consequently, NO DEC times for the next dive will show little (if any) reduction as a result of brief safety stops or required decompression. If you take a lengthy safety stop as an extra precaution, you may reduce your available dive time on subsequent dives slightly, but it is an excellent safety practice, especially after cold or hard-working dives.

6. Q: How long can the SOLUTION remember my last dive profile?

A: Even if the SOLUTION has deactivated, your dive profiles will remain in memory. They can be replayed as often and as many times as you wish to view them up until they have been 'overwritten'. That is until you have spent an additional eight hours underwater. (See page 23 for additional information on memory.)

7. Q: What does the SOLUTION consider a repetitive dive?

A: The SOLUTION considers a repetitive dive to be any dive following a minimum surface interval of 10 minutes, on which residual nitrogen restricts NO DEC time. This may include dives up to 48 hours apart. Once the residual nitrogen in all compartments is so low that it can no longer affect subsequent dives, the SOLUTION considers the sequence of repetitive dives finished, and deactivates itself.

8. Q: If I have put the SOLUTION into Error mode, can I still interrogate it to see my profiles?

A: Yes. The SOLUTION will show your profiles in the

normal fashion.

9. Q: Why should I bother to record NO DEC times for my next dive as soon as I have surfaced from my previous dive?

A: If you have been using the SOLUTION for multi-level dive profiles, and if it malfunctions after your previous dive, you may not be able to dive again for up to 48 hours (the maximum surface interval tracked by the SOLUTION). You won't know what the available NO DEC limits are for your next dive, since the SOLUTION does not compute repetitive groups. Therefore, you cannot easily transfer decompression information from SOLUTION multilevel profiles to the US Navy tables.

10. Q: How long will the SOLUTION track a surface interval?

A: The SOLUTION will track surface intervals as long as there is residual nitrogen in any of the nine compartments. If a diver has completely saturated the slowest compartments, this could be as long as 48 hours.

MAINTENANCE

The Suunto SOLUTION diving computer is a precision instrument. If left uncared for over an extended period of time a thin film (often invisible to the naked eye) will cover the unit. Much like the build-up on the glass of an aquarium, this film is a result of organic contaminants found in both salt and fresh water. Sun tan oil, silicon spray or grease will speed up this process. As a result of this build-up moisture will be trapped next to the contacts and will not allow your SOLUTION to operate properly.

The SOLUTION should be **SOAKED**, then thoroughly rinsed with fresh water after each dive. This is particularly important after use in salt water. If the unit is in a console boot, the entire console should be soaked in fresh water (much in the same manner as u/w photo gear) and then rinsed. Make sure that all salt crystals and sand particles have been flushed out of the console. At the end of a dive trip, the SOLUTION should be rinsed thoroughly and then dried with a soft towel.

If your unit is in a console it will need to be periodically removed and cleaned before storage. However, this will not be required after every dive trip. You will only need to remove the unit to clean in extreme cases of film build-up.

The contacts can be cleaned e.g. with soft pencil eraser.

- * Do not use compressed air to blow water off the unit.
- * Do not use solvents or other cleaning fluids that might cause damage.
- * Do not test or use the SOLUTION in pressurized air.

Service and Battery Replacement

The SOLUTION must be returned to an authorized Suunto dealer for service or battery replacement. Do not attempt to disassemble the SOLUTION. Special tools and training are required for service.

The SOLUTION should be serviced every two years, or after 200 dives (whichever comes first). During servicing, the operation of the unit will be checked and its battery replaced.

The SOLUTION will display BAT if there is not enough power left in the batteries (Fig. 1). If BAT is on, the SOLUTION should not be used.

TECHNICAL SPECIFICATIONS

Two versions: for wrist use and for console mounting. Consoles, in which the Suunto SOLUTION can be integrated: Combo-42 and Combo-43, and hose mount TN-1.

Depth Gauge

- Temperature compensated pressure sensor
- Depth display range: 0 to 99 m [325 ft]
- Accuracy: $\pm 1\%$ (0 to 60 m [200 ft])
- Resolution: 0.1 m [1 ft]

Operating Conditions

- Normal altitude ranges 0 to 2400 m [8000 ft] above sea level (altitude modes A1 and A2)
- Operating temperature: 0 to 40°C [32°F to 104°F]
- Storage temperature: -20°C to 50°C [-4°F to 122°F]
However, we recommend the unit be stored in a dry place at room temperature
- Battery life: typically 2000 hours (at 20°C [68°F])

TWO YEAR LIMITED WARRANTY

Important: Service and repair warranty registration and validation information

The Suunto SOLUTION is warranted against defects in workmanship and materials for a period of two years after purchase to the original owner, subject to and in accordance with the terms and conditions set forth below:

This warranty does not cover damage to the product resulting from improper usage, improper maintenance, neglect of care, alteration or unauthorized repair. This warranty will automatically become void if proper preventive maintenance procedures have not been followed as outlined in the use and care instructions for this product.

If a claim under this or any other warranty appears to be necessary, return the product, freight prepaid, to your Suunto Dealer or qualified repair facility. Include your name and address, proof of purchase and service registration card. The claim will be honored and the product repaired or replaced at no charge and returned in what your Suunto Dealer determines a reasonable amount of time, provided all necessary parts are in stock. All repairs made, not covered under the terms of this warranty, will be made at the owner's expense. This warranty is non-transferable from the original owner.

ALL IMPLIED WARRANTIES, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED FROM DATE OF PURCHASE AND IN SCOPE TO THE WARRANTIES EXPRESSED HEREIN. SUUNTO/SEAQUEST SHALL NOT BE LIABLE FOR LOSS OF USE OF THE PRODUCT OR OTHER INCIDENTAL OR CONSEQUENTIAL COSTS, EXPENSES OR DAMAGE INCURRED BY THE PURCHASE. ALL WARRANTIES NOT STATED HEREIN ARE EXPRESSLY DISCLAIMED.

Some states do not allow the exclusion of limitation of implied warranties of consequential damages, so the above exclusions or limitations may not apply to you. This warranty gives you specific legal rights, and you may also have other rights that vary from state to state.

This warranty does not cover any representation or

warranty made by dealers or representatives beyond the provisions of this warranty. No dealer or representation is authorized to make any modifications to this warranty or to make any additional warranty. For your records, please fill out the dealer information section on the next page. TO VALIDATE YOUR WARRANTY, PLEASE RETURN THE ATTACHED CARD WITHIN 15 DAYS.

This warranty and owner's manual should be kept with your SOLUTION at all times.

SERVICE RECORD - RETAIN WITH SOLUTION

DATE PURCHASED _____

SOLUTION SERIAL NUMBER _____

WHERE PURCHASED _____

CITY _____

STATE _____

NAME _____

ADDRESS _____

CITY _____

STATE _____ ZIP _____

OTHER _____

INSP. DATE _____ DEALER NAME _____

INSP. DATE _____ DEALER NAME _____

INSP. DATE _____ DEALER NAME _____

INSP. DATE _____ DEALER NAME _____