SOLUTION á (ALPHA) INSTRUCTION MANUAL

The SUUNTO SOLUTION á dive computer features:

- built-in simulator for dive planning before and between dives
- built-in calendar clock
- personal adjustment
- adjustment for altitude
- phosphorescent LCD display
- complete memory capabilities including 25 hour profile memory
- visual and audible alarms
- PC interface capability
- easily replaceable protective shield
- wrist and combo models

DEFINITION OF WARNINGS, CAUTIONS AND NOTES

Throughout this manual, special references are made when deemed important. Three classifications are used to separate these references by their order of importance.

WARNING - is used in connection with a procedure or situation that may result in serious injury or death.

CAUTION - is used in connection with a procedure or situation that will result in damage to the product.

NOTE - is used to emphasize important information.

WARNING!
READ THIS MANUAL!
Carefully read this instruction manual in its entirety, including Section 1, "For Your Safety". Make sure that you fully understand the use, displays and limitations of the SOLUTION á.

WARNING!
NO DIVE COMPUTER WILL PREVENT THE POSSIBILITY OF DECOMPRESSION SICKNESS (DCS)!
All divers must understand and accept that there is no procedure or dive computer that will totally prevent the possibility of a decompression accident. For example, the individual physiological make up can vary within an individual from day to day. The dive computer cannot account for these variations. As an added measure of safety, you should consult a physician regarding your fitness before diving with the SOLUTION á dive computer.

WARNING!
ONLY DIVERS TRAINED IN THE PROPER USE OF SCUBA EQUIPMENT SHOULD USE THE SOLUTION á!
No dive computer can replace the need for proper dive training.

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 depths and prolonged exposures including multiday exposures that tend to increase the risk of decompression sickness. Therefore, Suunto specifically recommends that the SOLUTION á be not used for commercial or other severe diving activity.

WARNING!
PERFORM PRECHECKS!
Always check the SOLUTION á before diving in order to ensure that all LCD segments are completely displayed, that the SOLUTION á has not run out of battery power, and that the altitude/ personal adjustment mode is correct.

WARNING!
USE BACK-UP INSTRUMENTS!
Make certain that you use back-up instrumentation including a depth gauge, submersible pressure gauge, timer or watch, and have access to decompression tables whenever diving with the SOLUTION á.

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INTRODUCTION

Congratulations on your choice of the SUUNTO SOLUTION á Dive Computer. The SOLUTION á is a compact and most sophisticated dive instrument that will give you years of trouble free and joyful diving. The SOLUTION á dive computer will provide you with important information that you will need during, between, and after your dives.

Key Features

The SOLUTION á monitors and reports vital information such as your dive time, current depth, maximum depth, no-decompression time and ascent rate. It will give you visual and audible warnings, as required. Its built-in simulator allows you to get acquainted with the features and displays of the SOLUTION á before diving and to plan dives before and between dives.

The SOLUTION á will also give you information, if through carelessness or emergency you are forced to exceed the no-decompression limits for any dive. The SOLUTION á has a built-in calendar and clock. It features versatile memory capabilities, including both detailed profiles and long-term historical data. It can interface with a PC, allowing for additional log book features and dive simulation. The instrument can be adjusted for diving at different altitudes or to add an extra level of conservativeness if desired. The screen is protected against scratches and damage by a replaceable shield.

The SOLUTION á is available either as a wrist unit or mounted in two gauge or three gauge console or in a hose mounted boot. The modular construction allows for the separate compass module to be attached to the two gauge console at a later stage.

Getting Started

A fast way for you to get started with the SOLUTION á is to let the built-in dive simulator demonstrate its features and displays. This is described in Section 2, "Getting Acquainted with the SOLUTION á". Before your first actual dive you must also read and understand Section 1, "For Your Safety" and Section 3, "Diving with the SOLUTION á" in their entirety. Section 4, "Menu Based Functions" teaches you how to access the memory functions and simulator, and how to set the altitude/ personal adjustment mode and the clock. Section 5, "PC Interface" gives you some information on the capability of this optional package. Section 6, "Care and Maintenance" and Section 7, "Technical Description" gives you detailed information on these two subjects. Finally, there is warranty information in Section 8, and a glossary in Section 9.

Metric and Imperial Units

All examples in this manual are shown in metric units, including meters and ◦C. The corresponding imperial units are shown in brackets. The SOLUTION á is also available with imperial units, i.e. feet and ◦F.

WARNING!
VERIFY THAT THE UNITS OF MEASURE, WHETHER METRIC OR IMPERIAL, ARE CORRECT BEFORE STARTING TO DIVE!
Any confusion resulting from improper selection of units may cause the diver to commit errors that may lead to serious injury.

1. FOR YOUR SAFETY

Always remember that THE DIVER IS RESPONSIBLE FOR HIS OR HER OWN SAFETY!

When used properly the SOLUTION á is an outstanding tool for assisting properly trained, certified divers in planning and executing standard and multi-level sport dives within the described no-decompression limits. It is NOT A SUBSTITUTE FOR CERTIFIED SCUBA INSTRUCTION including training in the principles of decompression.

DO NOT attempt to use the Suunto SOLUTION á without reading this entire Instruction Manual. If you have any questions about the manual or the SOLUTION á, contact your Suunto dealer before diving with the SOLUTION á.

Back-Up Instruments

WARNING!
USE BACK-UP INSTRUMENTS!
Make certain that you use back-up instrumentation including a depth gauge, submersible pressure gauge, timer or watch, and have access to decompression tables whenever diving with the SOLUTION á.

Sharing the SOLUTION á

WARNING!
THE SOLUTION á 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.

No dive computer can take into account dives made without the computer. Thus any diving activity 48 hours prior to initial use of the computer may give misleading information and must be avoided.

High Altitude/ Personal Adjustment

More information about this is given in Section 3.5, "High Altitude Dives and Personal Adjustment".

WARNING!
SET THE CORRECT ALTITUDE/ PERSONAL ADJUSTMENT MODE!
When diving at altitudes greater than 700 m [2300 ft] the altitude/ personal adjustment feature must be correctly selected in order for the computer to calculate no-decompression status. The diver should also use this option to make the calculation more conservative, whenever it is believed that factors which tend to increase the possibility of DCS exist (see Section 3.5). Failure to properly select the altitude/ personal adjustment mode correctly will result in erroneous data and can greatly increase the risk of DCS.

WARNING!
THE SOLUTION á IS NOT INTENDED FOR USE AT ALTITUDES GREATER THAN 2400 m (8000 ft)!
Diving at altitudes above this limit may significantly increase the risk of DCS.

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 á, 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. More information about this is given in Section 3.5, "High Altitude Dives and Personal Adjustment".

Decompression Dives

WARNING!
DO NOT USE THIS INSTRUMENT TO CONDUCT DECOMPRESSION DIVES!
Suunto does not recommend this instrument to be used to conduct decompression dives. However, if through carelessness or emergency a diver is forced to exceed the no-decompression limits on a dive, the SOLUTION á will provide decompression information required for ascent. After this the SOLUTION á will continue to provide subsequent interval and repetitive dive information.

Emergency Ascents

In the unlikely event that the SOLUTION á malfunctions during a dive, follow the emergency procedures provided by your certified dive training or, alternatively, immediately ascend at a rate slower than 10 m/min [33 ft/min] to a depth between 3 and 6 meters [10 to 20 ft] and stay there as long as your air supply will safely allow.

Higher Risk Dive Profiles

The user must understand that all decompression devices (decompression tables and/or dive computers) are based on mathematical models and that many experts are currently concerned that these models may not under certain conditions adequately describe the physiological phenomena. These conditions are presently identified as dives which incorporate the following:

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

- SAWTOOTH PROFILES where the diver alternates between greater and shallower depths repeatedly throughout the dive.

- CONSECUTIVE DIVES where the diver performs repetitive dives to approximately the same maximum depth with only short surface intervals between dives. The risk of DCS increases when depth and the number of repetitive dives increase and when the surface intervals are decreased.

- MULTIDAY DIVES repetitive dives performed for several consecutive days.

- DECOMPRESSION DIVES any dive during which the no-decompression limit has been exceeded or the diver is advised by the computer that he may not return directly to the surface.

WARNING!
DIVE PRACTICES WHICH INCLUDE THE ABOVE DESCRIBED "HIGHER RISK DIVE PROFILES" ARE CONSIDERED POTENTIALLY DANGEROUS AND SHOULD BE AVOIDED EVEN IF THEY CONFORM TO THE MATHEMATICAL MODEL!

Dive Computer Limitations

While the SOLUTION á is based on current decompression research and technology, the user/ diver must realize that the computer cannot monitor the actual physiological functions of an individual diver. All decompression schedules currently known to the authors, including the U.S. Navy Tables, are based on a theoretical mathematical model which is intended to serve as a guide to reduce the probability of decompression sickness.

The mathematical model uses an ascent rate of 10 m/min [33 ft/min]. Therefore it is critical that a proper ascent rate is always used.

The reader/diver is forewarned that individual physiological differences, severe environmental conditions and predive activities, especially those which tend to increase dehydration, may increase the risk of decompression sickness.

As a safety precaution Suunto recommends that divers using the SOLUTION á should maintain no less than 5 to 10 minutes no-decompression time remaining at all times during the dive. This is especially important for divers in poor physical condition, in cold water or other arduous conditions.

Historically divers have been advised to always include a margin of safety in their diving activities. Suunto supports these practices and strongly recommends that the diver make the deepest portion of the dive near the beginning of the dive and gradually progress into shallower depth, allowing time for a 3 to 5 minutes "safety stop" at a depth range of 3 to 6 meters (10 to 20 ft). This is believed to be effective in further reducing the risk of decompression sickness.

Furthermore, 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.

WARNING!
DO NOT USE THE SOLUTION á WITH NITROX MIX!
The mathematical tissue calculation model of the SOLUTION á has been designed for use with standard breathing air only (approximately 21% oxygen and 79% nitrogen by volume). Therefore, the SOLUTION á must not be used for diving with "Nitrox" or other mixed gases.

2. GETTING ACQUAINTED WITH THE SOLUTION á

This brief introduction will utilize the unique built-in dive simulator of the SOLUTION á. Following the simple steps described below you can see exactly what the display might show during different stages of a typical dive sequence.

WARNING!
READ AND UNDERSTAND THE ENTIRE OWNER'S MANUAL BEFORE DIVING!
Failure to complete this step may result in serious personal injury.

The purpose of this section is to provide the user with initial information to preview the operation of the computer. Since this information is limited, it is imperative that you read and understand the entire owner's manual before attempting to dive.

2.1 WATER CONTACTS

The SOLUTION á has three water contacts on the face of the instrument:
- COM: common contact
- ON/PLAN: activation and dive planning contact
- TIME/MODE: time display and mode selection contact

On the surface the SOLUTION á is operated by simultaneously touching the COM contact and one or two of the other contacts. When doing this, your finger tips should be wet or moist to establish the necessary electric contact. When submerged these contacts are automatically connected by the conductivity of the water.

2.2 ACTIVATION

The SOLUTION á is activated by touching the ON/PLAN and COM contacts.
The SOLUTION á confirms this with a short beep. The first display, the STARTUP, shows all available elements and immediately after this the serial number of the unit. A few seconds later the READY display will appear, showing zero values.

2.3 THE DIVE SIMULATOR - FOR EASY LEARNING

The SOLUTION á's built-in Dive Simulator is an excellent tool for becoming familiar with the SOLUTION á. It will allow you to "perform" dive profiles of your choice and see exactly what the display would look like during an actual dive. This includes

basic dive information, as well as audible and visual warnings.

In simulation mode the time has been speeded up, moving four times faster than real time when diving and 12 times as fast on the surface.

Enter the Dive Simulation Mode

To enter the dive simulation mode, keep your moistened fingers against the TIME/MODE and COM contacts. A bar on the right-hand side of the display will scroll through the different modes available. Lift your fingers when the scroll bar is in line with the letters dSI (dive simulation) next to the screen and the text dSi is shown on the display. If you accidentally enter the wrong menu selection, simply touch all the three contacts simultaneously to return to the READY display.

Before Diving (simulation)

To make the first dive. When you enter the dive simulation mode, as described above, the initial display is the READY display. Next, enter the DIVE PLANNING mode by touching the ON/PLAN and COM contacts for about one second. Release your fingers immediately when you hear a short beep. The DIVE PLANNING display will rapidly cycle through the no-decompression limits for various depths.

Diving (simulation)

To simulate a dive, use the three contacts as follows:

To descend: touch the ON/PLAN and COM contacts for as long as you want to descend.

To ascend: touch the TIME/MODE and COM contacts. You will have to lift your fingers momentarily to avoid an excessive ascent speed rate.

We are now ready to descend. Keep your fingers on the ON/PLAN and COM contacts for a couple of seconds at a time. Descend step by step to about 30 m [100 ft]. After about 9 minutes of diving, start the ascent. Check your ascent rate on the ascent rate indicator. The ascent rate is indicated in the upper left corner by one, two, or three bars indicating a maximum ascent rate of 5, 7.5, and 10 m/min [16, 25, and 33 ft/min, respectively]. If you exceed the maximum allowed ascent rate of 10 m/min [33 ft/min], all three bars and a blinking SLOW will be shown. Remember to make a safety stop at a depth of about 4.5 m [15 ft] before surfacing. Now it is time to surface.

Surface Interval (simulation)

Back on the surface the display shows the maximum depth and dive time of your simulated dive and the elapsed surface interval time or the no-flying time display.

It is also possible to simulate repetitive dives and to see how the SOLUTION á works e.g. during a decompression dive.

Exit the Dive Simulation Mode

You may any time exit the simulation mode by making contact between all three water contacts. This is most easily done by first covering the TIME/MODE and ON/PLAN contacts with your right thumb and then touching the COM contact with your left thumb. As usual, it helps if your fingers are wet or moist. This procedure will bring you back to the normal READY mode. The SOLUTION á is now ready for a dive. It will automatically switch off in about 10 minutes of surface time in case you do not use it any more and no real dives have been performed.

3. DIVING WITH THE SOLUTION á

This section contains instructions on how to operate the SOLUTION á and interpret its displays. Each display has been carefully designed to provide important information you will need to plan your dive or dive series.

You will find that the SOLUTION á is easy to use and read. Each display shows only the data relevant to that specific diving situation. For example, while you are on a dive, surface interval data is irrelevant and therefore not shown. On the other hand, while you are on the surface after a dive, remaining no-decompression time for that dive is irrelevant and therefore replaced with information for your next dive.

3.1 USE OF WATER CONTACTS

As described in Section 2.1, "Water Contacts", the SOLUTION á is controlled with the COM (common), ON/PLAN, and TIME/MODE contacts, as follows:

Activation: touch the ON/PLAN and COM contacts.
Dive planning: once the SOLUTION á has been activated, touch the ON/PLAN and COM contacts.
Clock: touch the TIME/MODE and COM contacts for a second. The time is then displayed for four seconds.

When the TIME/MODE and COM contacts are being touched over two seconds, the display will start to scroll through the following modes. Lift your fingers when the desired mode is displayed:

Memories:	at LOG the logbook and profile memories are accessed.
Dive history:	at HIS the history memory is accessed.
Altitude/ personal adjustment setting:	at Alt the altitude and/or personal adjustment can be set.
Dive simulator:	at dSI the dive simulator is ready for use.
Time setting:	at Set the clock can be adjusted.

Return: you can at any time exit the above modes by touching all three contacts at the same time. First make contact between the ON/PLAN and TIME/MODE contacts, e.g. by covering both contacts with your right thumb. Without lifting your right thumb, touch the COM contact with your left thumb. Alternatively, you can exit the modes simply by submerging the SOLUTION á in water.

You may sometimes encounter problems in using the contacts, or the SOLUTION á may activate on its own. The reason for this is probably contamination or invisible marine growth that may create an unwanted electric current between the water contacts. It is therefore important that the SOLUTION á be carefully washed in fresh water after the day's diving is completed. The contacts can be cleaned with a soft pencil eraser.

3.2 BEFORE DIVING

3.2.1 Activation, Prechecks and Battery Warning

The SOLUTION á is always ready for use and will activate if submerged. However, it is necessary to turn it on before diving to check the altitude/ personal adjustment setting, battery warning, etc. This is done, either by immersing it in water for a couple of seconds or by connecting the ON/PLAN and COM contacts with fingertips.

A short beep is heard. All display elements will turn on (showing mostly figure 8's and graphical elements). A few seconds later the serial number of the unit is shown. Next, the screen will alternate between two READY displays,
confirming that the activation is complete. At this time, perform your precheck making sure that:

* the SOLUTION á operates and provides a complete display
* the low battery indicator is not on
* the altitude/ personal adjustment setting is correct

The SOLUTION á is now ready for diving. If the SOLUTION á is not taken on a dive after activation, it will automatically turn off in 10 minutes to conserve the battery
power.

The SOLUTION á 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 in Section 7.1, "Operating Principles".

High Altitude Diving and Personal Adjustment

WARNING!
SET THE CORRECT ALTITUDE/ PERSONAL ADJUSTMENT MODE!
When diving at altitudes greater than 700 m [2300 ft] the altitude/ personal adjustment feature must be correctly selected in order for the computer to calculate no-decompression status. The diver should also use this option to make the calculations more conservative, whenever it is believed that factors which tend to increase the possibility of DCS exist (see Section 3.5). Failure to properly select the altitude/ personal adjustment mode correctly will result in erroneous data and can greatly increase the risk of DCS.
WARNING!
THE SOLUTION á IS NOT INTENDED FOR USE AT ALTITUDES GREATER THAN 2400 m (8000 ft)!
Diving at altitudes above this limit may significantly increase the risk of DCS.

If you are diving at higher altitudes, make sure that the altitude mode has been set according to the altitude of your dive site.

For information on how to select the correct altitude setting and how to use the personal adjustment, see Section 3.5, "High Altitude Dives and Personal Adjustment".

Battery warning

If the battery symbol is displayed, the SOLUTION á should not be used. It indicates that the battery is too low to operate the SOLUTION á. If the low battery symbol appears during a dive, you should abort the dive and begin ascent to the surface.

NOTE: Temperature affects the battery voltage. If the SOLUTION á is stored at temperatures below freezing point, the low battery warning may be displayed even though the battery has enough capacity in warmer conditions. Make sure that the low battery warning disappears before diving.

3.2.2 Dive Planning

It is possible any time on the surface to enter the DIVE PLANNING mode, simply by touching the ON/PLAN and COM contacts. The display will rapidly cycle through the no-decompression limits for various depths in 3 m [10 ft] increments starting at 9 m [30 ft]. It takes about 30 seconds to run through the complete cycle, after which the SOLUTION á will automatically return to the READY display.

Higher altitude/ personal adjustment modes will shorten the no-decompression time limits. These limits at different altitude/ personal adjustment mode selections are shown in Tables 7.1 and 7.2 in Section 7.1, "OPERATING PRINCIPLES".

3.2.3 Calendar Clock Function

The TIME display can be retrieved any time on the surface by touching the TIME/MODE and COM contacts for about a second. The current time and date will be shown for four. When diving, the dive entry time and date is registered in the logbook memory. Remember always to check before diving that the clock is set, especially when traveling to different time zones. For adjusting the clock, refer to Section 4.5, "Setting Time and Date".

In the metric version of the SOLUTION á, the 24-hour time system is used, while in the imperial version the 12-hour time system is used.

3.3 DIVING

3.3.1 Basic Dive Data

The SOLUTION á will remain in the SURFACE mode at depths less than 1.5 m [5 feet]. At depths greater than 1.5 m the SOLUTION á will go into the DIVE mode.

Each piece of information on the display is clearly marked. During a no-decompression dive, the following information will be shown:

- the available no-decompression time in minutes is shown as NO DEC TIME. It is calculated based on the five factors listed in Section 7.1, "OPERATING PRINCIPLES".

- your present depth is shown in meters [ft]. In addition to the digital display, the present depth is also displayed graphically with a depth bar graph along the left side of the display window.

- the elapsed dive time in minutes in the lower right corner, shown as DIVE TIME.

- the altitude/ personal adjustment setting (A0, A1, or A2).

In the lower left corner the following information will alternate:

- the maximum depth during this dive in meters [ft], indicated as MAX, for about 5 seconds. A single bar on the depth bar graph also shows the maximum depth reached.
- the water temperature, followed by °C for Centigrade [or °F for Fahrenheit], for about 2.5 second.

3.3.2 Ascent Meter

The ascent rate is shown graphically in the upper left corner, next to the notation

ASC SPEED, as follows:

Ascent rate indicator	Ascent speed
No segments	Below 2.5 m/min [8 ft/min]
One segment	2.5 - 5.0 m/min [8 - 16 ft/min]
Two segments	5.0 - 7.5 m/min [16 - 25 ft/min]
Three segments	7.5 - 10 m/min [25 - 33 ft/min]
Blinking SLOW and three segments	Above 10 m/min [33 ft/min]

The SLOW warning alternates with the current depth. The SLOW warning is an indication that the maximum ascent rate has been exceeded.

Whenever the SLOW warning appears, you should immediately slow down or stop your ascent until the warning disappears. You must not ascend shallower than 3 m [10 ft] with the SLOW warning on. If you reach this depth with SLOW on, you must stop at this depth and wait until the warning disappears.

WARNING!
RAPID ASCENTS INCREASE THE RISK OF INJURY!
Do not exceed the maximum recommended ascent rate.

You must never surface with the SLOW warning on. If you do this, the warning will continue to flash until the unit deactivates itself in the normal manner. This may take up to 48 hours.

WARNING!
DO NOT ATTEMPT TO DIVE FOLLOWING A SURFACE INTERVAL DURING WHICH THE SLOW INDICATOR REMAINS ACTIVATED!
Violation of the maximum ascent rate may invalidate the calculations for the next dive.

NOTE: SUUNTO highly recommends a safety stop at the end of every dive in the range of 3 m - 6 m [10 ft - 20 ft] for 3 - 5 minutes.

3.3.3 Audible and Visual Alarms

The SOLUTION á features audible and visual alarms to alert you when you are approaching dangerous situations or to acknowledge certain commands given by you:

Acknowledgment of commands using the water contacts: a short single beep, occurs when:
- the SOLUTION á is activated
- the DIVE PLANNING mode is activated
- scrolling the menu based functions, at each step
- returning from the menu based modes

Potential danger situations during a dive: a single beep, occurs when:
- 60 m [197 ft] depth is reached. Two arrows pointing upwards will appear, as dives below this depth are extremely dangerous.
- the no-decompression dive turns into a decompression dive. Two arrows pointing upwards and the ascend warning ASC TIME will appear.

NOTE: Suunto strongly recommends that sport divers limit their maximum depth to 40 m [130 ft]!

Immediate danger: continuous beeps. This happens when:
- the maximum allowed ascent rate, 10 m/min [33 ft/min], is exceeded. A blinking SLOW warning will alternate with the depth display.
- the ceiling depth is exceeded. A blinking error warning Er appears. You should immediately descend to or below the ceiling. The SOLUTION á will otherwise enter a permanent error mode in three minutes, indicated by a non-blinking Er.

3.3.4 Decompression dives

WARNING!
DO NOT USE THIS INSTRUMENT TO CONDUCT DECOMPRESSION DIVES!
Suunto does not recommend this instrument to be used to conduct decompression dives. However, if through carelessness or emergency a diver is forced to exceed the no-decompression limits on a dive, the SOLUTION á will provide decompression information required for ascent. After this the SOLUTION á will continue to provide subsequent interval and repetitive dive information.

Rather than requiring you to make stops at fixed depths, the SOLUTION á permits you to decompress within a range of depths.

Background

When your NO DEC TIME becomes zero, your dive becomes a decompression dive, i.e. you must perform one or several decompression stops on your way to the surface. The NO DEC TIME on your display will be replaced by a flashing notation ASC TIME.

WARNING!
YOU SHOULD ASCEND AND BEGIN DECOMPRESSION IMMEDIATELY WHEN

THE SOLUTION á SHOWS YOU THAT DECOMPRESSION IS REQUIRED!
Note the upward pointing arrows.

The ascent time (ASC TIME) is the minimum amount of minutes needed to reach the surface in a decompression dive. It includes: The time needed to ascend to the ceiling at an ascent rate of 10 m/min [33 ft/min]
plus
The time needed at the ceiling. The ceiling is the shallowest depth to which you should ascend
plus
The time needed to reach the surface after the ceiling has been removed.

WARNING!
YOUR ACTUAL ASCENT TIME MAY BE LONGER THAN DISPLAYED ON THE SOLUTION á.

The ascent time will increase if you:
- remain at depth
- ascend slower than 10 m/min [33 ft/min], or
- make your decompression stop deeper than at the ceiling.
These factors will also increase the amount of air required to reach the surface.

WARNING!
NEVER ASCEND ABOVE THE CEILING!

You must not ascend above the ceiling. In order to avoid doing so by accident, you should stay slightly below the ceiling.

Ceiling, Floor, and Decompression Range

When in decompression, it is important that you understand the meaning of ceiling, floor, and decompression range:
- The ceiling is the shallowest depth to which you should ascend when in decompression. At this depth, or below, you must perform one or several decompression stops. All decompression stops must be performed at or below the ceiling depth.
- The floor is the deepest depth at which decompression takes place. Decompression will start when you pass this depth during your ascent.
- The decompression range is the depth range between the ceiling and floor. Within this range, decompression takes place. However, it is important to remember that the decompression will be very slow at or close to the floor.

The depth of the ceiling and floor will depend on your dive profile. They will be fairly shallow when you enter the decompression mode, but if you remain at depth, they will move downward and the ascent time will increase. Likewise, the floor and ceiling

may change while you are decompressing.

The graphical depth scale on the SOLUTION á will show your ceiling. 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 blink.

When the sea surface is rough, it may be difficult to maintain a constant depth near the surface. In this case it will be more manageable to maintain an additional distance below to the ceiling, to make sure that the waves do not lift you above the ceiling. SUUNTO recommends that decompression takes place deeper than 4 m [13 ft], even if the indicated ceiling is shallower.

NOTE: It will take more time and more air to decompress below the ceiling than at the ceiling.

Display Below Floor

The blinking ASC TIME and two upwards pointing arrows indicate that you are below the floor. You should start your ascent immediately.

Display Above Floor

When you ascend above the floor, the ASC TIME display stops blinking and the two upward pointing arrows disappear. Decompression will now begin, but is very slow. You should therefore continue your ascent.

Display At Ceiling

When you reach the ceiling, the display will show you two arrows pointing toward each other. Do not ascend above this depth. As described above, it is recommended to do the decompression stop below the ceiling, to avoid accidental ascent above the ceiling.

Display Above Ceiling

If you ascend above the ceiling, a downward pointing arrow will appear and continuous beeping starts. In addition a blinking error warning Er reminds you that you have only three minutes to correct the situation. You must immediately descend to or below the ceiling.

If you continue to violate the decompression, the SOLUTION á goes into a permanent ERROR MODE. In this mode the SOLUTION á can only be used as a depth gauge and timer. You must not dive again for at least 48 hours. See also Section 3.6, Error Conditions.

During decompression, ASC TIME will count down toward zero. When the ceiling moves upwards, you can ascend to the new ceiling. You may surface only when the ascent time reaches zero and ASC TIME is replaced by NO DEC TIME.

3.4 AT SURFACE

3.4.1 Surface Interval

An ascent to any depth shallower than 1.5 m [5 ft] will cause the DIVING display to be replaced by the SURFACE displays, giving the following information.
- The surface time in hours and minutes (separated by a colon), telling the duration of the present surface interval. It is shown below SURF TIME in the center window of the display.
- The dive time in minutes, i.e. the total duration of the most recent dive, is displayed above DIVE TIME in the lower right corner.
- The maximum depth of your most recent dive in meters [ft] is shown in the same position as your depth readings during the dive. MAX indicator is then shown in front of the value. In addition the graphical depth display shows a single bar at the maximum depth.
- The temperature in ◦C [◦F] is shown in the lower left corner.
- The no-flying warning is indicated by a blinking airplane.
- The desaturation/ no-flying time in hours and minutes is shown next to the non-blinking airplane in the center window of the display.

If you start a new dive in less than 10 minutes at the surface, the SOLUTION á interprets this as a continuation of the previous dive. The DIVING display will return, the DIVE number will remain unchanged, and DIVE TIME will begin where it left off. After 10 minutes on the surface, subsequent dives are by definition repetitive. The DIVE counter displayed in the dive planning mode will progress to the next higher number if you make another dive.

Dive Planning

You may, any time, on the surface enter the DIVE PLANNING mode in the manner described in Section 3.2.2, by touching the ON/PLAN and COM contacts. The SOLUTION á will take into account the residual nitrogen caused by your previous dives. The no-decompression times given for different depths will therefore be shorter than before your first dive.

You may also read the time by touching the TIME/MODE and COM contacts, as described in Section 3.2.3.

3.4.2 Flying After Diving

The no-flying time is shown in the center window next to the non-blinking airplane image. The airplane is blinking as a reminder, when the alternative display showing surface time is on. Flying or traveling to a higher altitude should be avoided anytime the airplane symbol is displayed.

The no-flying time displayed by the SOLUTION á is equivalent to the so-called desaturation time. When this time has elapsed, the residual nitrogen is no longer a factor for subsequent dives. At this time the SOLUTION á will automatically deactivate itself.

Flying or traveling to a higher altitude after a dive may significantly increase the risk of DCS.

WARNING!
YOU ARE ADVISED TO AVOID FLYING ANYTIME THE COMPUTER DISPLAYS THE DO NOT FLY WARNING - INDICATED BY AN AIRPLANE!
Further, the Divers Alert Network (DAN) advises as follows:
- A minimum surface interval of 12 hours would be required in order to be reasonably assured a diver will remain symptom free upon ascent to altitude in a commercial jetliner (altitude up to 2400 m [8000 ft]).
- Divers who plan to make daily, multiple dives for several days, or make dives that require decompression stops, should take special precautions and wait for an extended interval beyond 12 hours before flight.
Suunto recommends that flying be avoided until both the DAN guidelines and the SOLUTION á wait to fly conditions are satisfied.

3.5 HIGH ALTITUDE DIVES AND PERSONAL ADJUSTMENT

The SOLUTION á can be adjusted for diving at altitude or for increasing the conservatism of the mathematical model.

When programming the SOLUTION á for the correct altitude, the diver needs to select the correct altitude mode according to Table 3.1. As a result the SOLUTION á adjusts its mathematical model according to the entered altitude, giving shorter no-decompression times at higher altitudes (Tables 7.1 and 7.2).

The entered altitude/ personal adjustment mode is indicated by A0, A1, or A2. Modes A1 and A2 are shown with a diver symbol. Section 4.3, Altitude Setting describes how the altitude mode is adjusted.

Table 3.1 Altitude ranges.

Altitude mode	Altitude range
A0	0 - 700 m [0 - 2300 ft]
A1	700 - 1500 m [2300 - 5000 ft]
A2	1500 - 2400 m [5000 - 8000 ft]

WARNING!
SET THE CORRECT ALTITUDE/ PERSONAL ADJUSTMENT MODE!
When diving at altitudes greater than 700 m [2300 ft] the altitude/ personal adjustment feature must be correctly selected in order for the computer to calculate no-decompression status. The diver should also use this option to make the calculations more conservative, whenever it is believed that factors which tend to increase the possibility of DCS exist (see Section 3.5). Failure to properly select the altitude/ personal adjustment mode correctly will result in erroneous data and can greatly increase the risk of DCS.

WARNING!
THE SOLUTION á IS NOT INTENDED FOR USE AT ALTITUDES GREATER THAN 2400 m (8000 ft)!
Traveling to a higher elevation can temporarily cause a change in the equilibrium of dissolved nitrogen in the body with the surroundings. It is recommended that the diver allow the body conditions to stabilize over a period of at least three hours before beginning to dive at altitude.

WARNING!
DO NOT USE THIS INSTRUMENT TO CONDUCT DECOMPRESSION DIVES!
Suunto does not recommend this instrument to be used to conduct decompression dives. However, if through carelessness or emergency a diver is forced to exceed the no-decompression limits on a dive, the SOLUTION á will provide decompression information required for ascent. After this the SOLUTION á will continue to provide subsequent interval and repetitive dive information.

Personal Adjustability

The factors, which tend to increase the possibility of DCS, include but are not limited to:
- cold exposure - water temperature less than 20 °C [68 °F]
- the diver is below average physical fitness level
- multiday or repetitive dive exposure
- diver fatigue
- dehydrated conditions
- previous history of DCS

This feature should be used to adjust the computer to intentionally introduce a factor to make it more conservative according to personal preference by entering higher altitude mode than required in table 3.1 (i.e. diving at sea level with the altitude/ personal adjustment set at A1 or A2). The no-decompression limits are then shortened accordingly.

3.6 ERROR CONDITIONS

The SOLUTION á is provided with warning indicators that advise the user to react to certain situations that would otherwise give rise to a significant increase risk of DCS if left unattended. If you do not respond to its warnings, it will enter an ERROR MODE, indicating the risk of DCS has greatly increased. If you understand and operate the SOLUTION á sensibly, it is very unlikely you will ever put the SOLUTION á into the ERROR MODE.

The ERROR MODE is shown by a blinking Er in the center display. Once in ERROR MODE, the SOLUTION á will continue to display current depth and dive time. You should immediately ascend to a depth of 3 to 6 m [10 to 20 ft] and remain at this depth until air supply limitations require you to surface. When the surface has been reached, no further diving should take place for a minimum of 48 hours.

Omitted Decompression

The most common ERROR MODE results from omitted decompression, when the diver stays above the ceiling for more than three minutes. During this three minute period the Er warning will blink and audible alarm beeps. The SOLUTION á will continue to function normally if the diver descends below the ceiling within three minutes. After this the SOLUTION á will enter a permanent ERROR MODE. In the permanent ERROR MODE the SOLUTION á will not show no-decompression or ascent times. Only a permanent Er warning is shown in the center window. However, all the other displays will function as before, to provide information for ascent. At the surface, the ASC TIME will be displayed in the center window.

Other ERROR MODES

Diving to a depth below 99 m [325 ft] will place the SOLUTION á in the ERROR MODE.

An OVERFLOW ERROR (blinking OE in the center window) will be shown when the microprocessor of SOLUTION á is not able to calculate any further nitrogen absorption in one or several compartments. This will, however, only occur under severe exposure conditions outside the limits of recreational diving. This feature can be observed in simulator mode.

If the entire SOLUTION á display begins to blink, allow the computer to complete its functional cycle and to deactivate. If, when reactivated, the display continues to blink, do not use the computer. Return your SOLUTION á to your dealer for service. The display will start to blink if the voltage of the battery drops occasionally to a level which is not sufficient for the operation of the SOLUTION á. This may be due

to very low battery, poor battery contacts or leakage to the battery compartment.

4. MENU BASED MODES

The menu based functions include the logbook, profile and history memories, the altitude/ personal adjustment setting, the dive simulator and the date and time setting. The menu based functions are activated using the water contacts. Keep your fingers on the TIME/MODE and COM contacts while the SOLUTION á scrolls through the menu.

The desired mode is selected by breaking the finger contact when the desired mode appears on the display:

- LOG: Logbook and Dive Profile Memories. The Logbook gives a summary of each dive to approximately 25 hours of diving. The Profile Memory shows the detailed profile of these dives.
- HIS: Dive History Memory. The Dive History is a summary of all dives recorded by the SOLUTION á.
- Alt: Altitude/ Personal Adjustment setting
- dSI: Dive Simulator
- Set: Date and Time Setting

When scrolling through the menu, a bar segment on the right-hand side of the display will indicate the scrolling sequence. Note that the menu based modes can be activated only when 10 minutes have elapsed after the dive. Make sure that the contacts and the instrument itself are dry and clean before trying to use the menu based modes.

All menu based modes can be deactivated by the RETURN command, i.e. by connecting all three contacts simultaneously, or by immersing the SOLUTION á in water.

4.1 Logbook and Dive Profile Memory

The SOLUTION á has a very sophisticated high capacity Logbook and Profile Memory, with data being recorded every 60 seconds. Dives shorter than the recording interval are not registered. This interval can be reduced to 20 or 30 seconds using the optional SOLUTION á PC INTERFACE.

Logbook Memory

The logbook memory is activated by touching the TIME/MODE and COM contacts until LOG appears. It will give access to approximately 25 hours of diving (14 or 9 hours in case the recording interval has been set to 30 or 20 seconds), starting with the most recent dive made.

The following information will be shown on three alternating displays:

DISPLAY I, main display:
- maximum depth
- dive time
- dive number
- altitude/ personal adjustment setting
- temperature at maximum depth
- a blinking SLOW if the diver has surfaced with this warning on
- ASC TIME symbol if the dive became a decompression dive
- downward pointing arrow if the ceiling was violated

DISPLAY II:
- surface interval time before dive

DISPLAY III:
- dive entry time and date

The data of the most recent dive is shown first. Preceding dives are recalled by touching the TIME/MODE and COM contacts. A brief touch of the contact will bring you to the previous dive, continuous contact scrolls backwards through the dives. Only DISPLAY I is shown, while scrolling the dives. The desired dive is selected by breaking the contact when that dive appears on the display.

When new dives are added (after approximately 25 hours of diving), the oldest dives are deleted. The memory will always retain approximately the last 25 hours of dive time. The contents of the memory will remain even when the battery is changed (assuming that the replacement has been done according to the instructions).

Dive Profile Memory

The detailed profile of each dive shown in the logbook at that moment is accessed by touching the ON/PLAN and COM contacts. Two LCD bar segments in the upper right-hand corner shows that the SOLUTION á is now in the Dive Profile mode. When in the Logbook mode, only one segment is shown.

The scrolling of the profile will start automatically. The dive time is displayed in one minute increments with each display being shown for about 4 seconds. The depths shown are the maximum values of each interval.

If the recording interval is set to 20 or 30 seconds, three or two maximum depths values, respectively, are shown within each time increment. A new depth value is marked with a beep. After the last depth figure of the selected profile, SOLUTION á automatically returns to the same dive in the logbook. If desired, the profile of the same dive can be recalled again following the above procedure.

When scrolling the Profile Memory, surfacing (depth 0.0 m [0 ft]), surfacing with SLOW warning on, the ASC TIME and downward pointing arrow are shown when they occurred during the actual dive.

At the end of the profile the depth 0.0 m [0 ft] is displayed together with the total dive time of that dive.

Dive Numbering

Several repetitive dives are considered to belong to the same repetitive dive series when the SOLUTION á has not deactivated itself. Within each series, the dives are given individual numbers. Thus the memory will contain dives with the same dive numbers, as these dives have been made within different dive series. When the surface time has been less than 10 minutes, the dives are considered to be the same. The dive number will not change for the second part of such a dive.

4.2 DIVE HISTORY MEMORY

The Dive History is activated by touching the TIME/MODE and COM contacts until HIS appears. This mode will show:
- the maximum depth ever reached
- the total accumulated dive time in hours
- the total number of dives

999 dives and 999 hours of diving can be registered. When these maximum values are reached, the counters will start again from 0.

4.3 ALTITUDE/ PERSONAL ADJUSTMENT SETTING

The current altitude/ personal adjustment mode is shown when diving as well as on the surface display. If the mode is not correct (see Chapter 3.5), it is imperative that the diver enter the correct selection before diving.

The new altitude/ personal adjustment setting is entered in the following way. In these figures the contacts which are connected are shadowed.

1. Activate the altitude/ personal adjustment setting mode by connecting the TIME/MODE and COM contacts continuously. Release your fingers immediately when Alt appears on the display. Within a couple of seconds the present altitude/ personal adjustment setting is shown.

2. Connect the ON/PLAN and COM contacts until a beep is heard and all three altitude/ personal adjustment modes appear. Release your fingers immediately at this point. The current mode is now blinking. Wait at least two seconds but not more than four seconds before the next step.

3. Connect again the ON/PLAN and COM contacts until the blinking altitude/ personal adjustment mode starts to scroll. Release your fingers when the desired mode is blinking. Wait at least two seconds but no more than four seconds before next step.

4. Connect the TIME/MODE and COM contacts to confirm this new altitude/ personal adjustment mode. A beep is heard, the blinking will stop and the other mode indicators will disappear.

5. The process is ended by the RETURN command, i.e. by connecting all three contacts at the same time. A double beep is heard and the SOLUTION á will return to the surface mode.

WARNING!
ALWAYS RECHECK THE ALTITUDE/ PERSONAL ADJUSTMENT SETTING TO ENSURE THAT IT IS NOT SET FOR AN ALTITUDE LESS THAN THAT OF THE DIVE SITE!

4.4 DIVE SIMULATOR

The simulation mode can be used to plan dives in advance, for demonstrational or educational purposes, or just for pleasure. The SOLUTION á has complete dive simulating capabilities, including repetitive dives. The simulator can also be used between dives. The simulator will take into consideration the nitrogen loading from previous dives and modify the no-decompression times accordingly.

The dive simulator is activated using the menu selection. Lift your fingers when dSI is displayed. When in simulation mode, the depth is controlled using the three water contacts. This has been described in detail in Section 2.3, "The Dive Simulator - For Easy Learning".

4.5 SETTING TIME AND DATE

The current date and time is read by connecting the TIME/MODE and COM contacts for about one second, as described in Section 3.2.3, "Calendar Clock Function".

The principle when adjusting the clock is that the TIME/MODE and COM contact scroll through the different displays, while ON/PLAN and COM changes the values of the selected display. In these figures the contacts which are connected are shadowed.

Thus, to correct the time, do as follows:

1. Activate the Time Setting mode by connecting the TIME/MODE and COM contacts continuously to scroll through the menu. Release your fingers immediately when Set appears on the display. The Time Setting display will now be shown.

2. The hour display starts to blink immediately. If you want to change it, keep the ON/PLAN and COM contacts connected. The hours will start to scroll. Release your fingers immediately when the correct value is displayed. [To change the A or P for a.m. or p.m. scroll the hours past 12:00].

3. To scroll through the minute, month, date, and year, keep the TIME/MODE and COM contacts connected. Release your fingers when the display you wish to change is blinking. Repeat step 2 to change this value.
NOTE: In case of the minutes, date and year, the change is made separately for both digits, as shown by the blinking digit. In case of the hours and month, the complete number is changed simultaneously.

4. Repeat steps 3 and 2 to change any additional values.

5. Restart the clock with the RETURN command, i.e. by connecting all three contacts at the same time. First make contact between the ON/PLAN and TIME/MODE contacts and after that with the COM contact.

If something goes wrong during this procedure, do not perform step 5. Within about two minutes the SOLUTION á will automatically return to the normal surface mode and restore the original time setting. You can now repeat the time setting procedure. If you use the RETURN command, the modified time will be set.

Remember to regularly check that the clock is on time especially when traveling to different time zones, as the entry time of all dives is stored in the memories.

5. PC INTERFACE

The SOLUTION á can be connected to an IBM compatible personal computer (PC), using the optional SUUNTO PC interface and its software. With the Interface the SOLUTION á dive data can be downloaded to a PC. The PC interface software can be used for educational and demonstrational purposes, for planning dives, as well as for keeping complete record of your dive history with the SOLUTION á.

Complete logbook data can also be included. Paper copies of your dive log and profiles can then easily be printed.

The data transfer is carried out using the water contacts of the SOLUTION á. The following data is transferred to the PC:
- depth profile of the dive
- dive time
- dive number
- altitude/ personal adjustment setting
- temperature at maximum depth
- surface interval time
- dive entry time (year, month, day and time)
- additional dive information (e.g. violations)
- serial number

It is also possible to manually add comments and other personal information to the PC based dive data file.

6. CARE AND MAINTENANCE

The Suunto SOLUTION á diving computer is a sophisticated precision instrument. Remember to treat it as such! It has been designed to withstand the rigors of scuba diving. It can be installed in a durable thermoplastic console boot and its display can be protected by a replaceable display shield.

The user should wash and rinse the unit in fresh water after every use. Protect it from shocks, extreme heat or direct sunlight and chemical attack. The SOLUTION á cannot withstand the impact of heavy objects like scuba cylinders, nor chemicals like acetone and alcohols (ethanol, isopropanol).

NOTE: Keep the water contacts clean to assure correct operation of the SOLUTION á. Store the SOLUTION á in a dry place.

NOTE: Frequently check the battery compartment for moisture trough the transparent battery cover of the SOLUTION á.

The SOLUTION á should be serviced every two years or after 200 dives (whichever comes first) by an authorized dealer. This service will include a general operational check and the battery replacement. The service requires special tools and training. Therefore, it is advisable to contact an authorized Suunto dealer for biennial service. Do not attempt to do any service that you are not sure about how to do.

The SOLUTION á will display a battery symbol as a warning when the power gets too low. When this happens, the SOLUTION á should not be used until the battery has been replaced (see also chapter 3.2.1 /Battery warning).

6.1 MAINTENANCE

If left without care for an extended period, a thin film (often invisible to the eye) will cover the unit. Much like the buildup on the glass of an aquarium, this film is the result of organic contaminates found in both salt and fresh water. Suntan oil, silicone spray and grease will speed up this process. As a result of this buildup, moisture will be trapped next to the contacts and will not allow your SOLUTION á to operate properly.

The water contacts can be cleaned with a soft pencil eraser.

IMPORTANT: The SOLUTION á should be soaked, then thoroughly rinsed with fresh water after each dive.

If the unit is mounted in a console boot, the entire console should be soaked in fresh water 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 á should be rinsed thoroughly and then dried with a soft towel. If the unit is mounted into a console boot, the computer unit will need to be removed from the console and cleaned before storage.

IMPORTANT: When removing the computer from the console, check the battery compartment for possible moisture or water. This is easily done through the transparent lid covering the compartment. DO NOT use the SOLUTION á if you detect any moisture or water inside.

CAUTION!
- 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 á in pressurized air.

6.2 BATTERY COMPARTMENT INSPECTION

Frequently check for leaks in the battery compartment. This is important specially after the battery replacement. If you find moisture inside the transparent battery compartment lid, there is a leak.

A leak must be corrected without delay, as moisture will seriously damage the computer, even beyond repair. Suunto does not take any responsibility for damage caused by moisture in the battery compartment, if the instructions of this manual are not carefully followed.

In case of a leak immediately bring the SOLUTION á to an authorized Suunto dealer/ distributor.

7. TECHNICAL DESCRIPTION

7.1 OPERATING PRINCIPLES

The Suunto SOLUTION á is a multi-functional sport diving instrument, which provides information on depths, times, and decompression requirements. Its electronic microprocessor mathematically models the absorption and release of nitrogen during all phases of diving, including ascents, surface intervals and repetitive dives.

WARNING!
DO NOT ATTEMPT TO USE THE SOLUTION á WITHOUT FIRST READING THE ENTIRE OWNER'S MANUAL!
The SOLUTION á must be activated before diving and operated correctly to provide accurate and correct information.

No-Decompression Limits

The no-decompression limits displayed by the SOLUTION á upon activation are for most dives to a single depth slightly more conservative than those permitted by the U.S. Navy tables, Tables 7.1-2.

TABLE 7.1 NO-DECOMPRESSION TIME LIMITS (min)
FOR VARIOUS DEPTHS [m] FOR THE FIRST DIVE OF A SERIES.

	High altitude/ personal adjustment mode		
Depth [m]	A0	A1	A2
9	---	153	104
12	127	90	67
15	72	58	43
18	52	40	30
21	37	29	23
24	29	24	19
27	23	19	15
30	18	14	12
33	13	11	9
36	11	9	8
39	9	8	6
42	7	6	5
45	6	5	5

Table 7.2 NO-DECOMPRESSION TIME LIMITS (min) FOR VARIOUS DEPTHS [ft] FOR THE FIRST DIVE OF A SERIES.

	High altitude/ personal adjustment mode			
Depth [ft]	A0	A1	A2	U.S. Navy
30	---	149	102	---
40	120	86	65	200
50	70	56	41	100
60	51	38	29	60
70	36	29	23	50
80	28	23	19	40
90	22	18	15	30
100	17	14	11	25
110	13	11	9	20
120	10	9	8	15
130 9	7	6	10	
140 7	6	5	10	
150 6	5	4	5	

Unlike the U.S. Navy tables, the SOLUTION á interpolates 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 dive times permitted by the SOLUTION á are often much longer than those that would be allowed by the U.S. Navy tables.

WARNING!
THE USER SHOULD BE AWARE THAT ANY DIVE, INCLUDING ONES WITHIN THE U.S. NAVY OR SOLUTION á LIMITS, DOES CARRY SOME RISK OF DECOMPRESSION SICKNESS.

Compartments and Half Times

When you dive with the SOLUTION á, it measures and displays depths and times as your dive progresses. It shows you available no-decompression time and possible decompression required based upon the following 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,
5. the altitude/ personal adjustment mode in use.

Back on the surface, the SOLUTION á will continue to calculate the no-decompression dive times available for various depths on the next dive. As the

surface interval increases, so does the available dive time for the next dive.

To perform these calculations, the SOLUTION á continuously models the absorption and release of excess nitrogen from theoretical compartments. Each compartment absorbs and releases nitrogen at a different rate. The 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 theoretical 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. the time required for 50 % equilibration to a pressure change) ranging from 5 minutes to 120 minutes.

The SOLUTION á includes the same six compartments, and three additional compartments for an increased range of the mathematical model. The calculations are based on all nine compartments for all phases of diving, including surface intervals and repetitive dives. The SOLUTION á's half times range from 2.5 to 480 minutes.

Altitude Diving

The atmospheric pressure is lower at high altitudes than at sea level. After traveling to a higher altitude, the diver will have additional nitrogen in his body, compared to the equilibrium situation at the original altitude. This "additional" nitrogen is released gradually in time and equilibrium is reached within a couple of days.

Before high altitude diving the SOLUTION á 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 á are reduced according to the lower ambient pressure.

As a result the allowed no-decompression limits are considerably reduced.

Surface Intervals

The SOLUTION á requires a minimum surface interval of 10 minutes between dives. If a surface interval is shorter than 10 minutes, the SOLUTION á dive counter and dive timer treat 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.

Depth Limits

WARNING!
SUUNTO STRONGLY RECOMMENDS THAT SPORT DIVERS LIMIT THEIR MAXIMUM DEPTH TO 40 m [130 ft]!

However, the SOLUTION á 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.

7.2 TECHNICAL SPECIFICATION

Dimensions and weight (wrist model):
- Diameter: 61,5 mm [2,42 in]
- Depth: 30 mm [1,18 in]
- Weight: 110 g [0,24 lb]

Depth Gauge:
- Temperature compensated pressure sensor
- Salt water calibrated (in fresh water the readings are about 3% smaller)
- Depth display range: 0 to 99 m [325 ft]
- Accuracy: ± 1 % (0 to 60 m [200 ft])
- Resolution: 0,1 m [1 ft]

Temperature display:
- Resolution: 1 °C [1,5 °F]
- Display range: - 20 ... +50 °C [- 40 ... +122 °F]
- Accuracy: ± 2 °C [± 3,6 °F] within 20 minutes of temperature change

Calendar Clock:
- Accuracy: ± 2 s /24 h
- 24 h display [12 h display in imperial version]

Other displays:
- Dive time: 0 to 999 min
- Surface time: 0 to 48 h
- Dive counter: 0 to 99
- No-decompression time: 0 to 199 min (- - after 199)
- Ascent time: 0 to 99 min (- - after 99)
- Ceiling depths: 2,5 to 30 m [8 to 100 ft]

Operating Conditions
- Normal altitude range: 0 to 2400 m [8000 ft] above sea level
- Operating temperature: 0 to 40°C [32°F to 104°F]
- Storage temperature: -20°C to +50°C [-4°F to +122°F]

However, it is recommended that the unit be stored in a dry place at room temperature.

NOTE: Do not leave the SOLUTION á in direct sunlight!

Battery

- One 3,6 V lithium battery (Saft LS 14250), size 1/2 AA (ANSI) or 1/2 R6 (IEC), spare part number K5504 + O-ring 26,7 mm x 1,78 mm 70 ShA, spare part number K5508
- Battery life: typically 2000 hours (at 20°C [68°F])

8. WARRANTY

NOTE: The warranty arrangements are different in different countries. Information is contained in the SOLUTION á packaging regarding the warranty benefits and requirements applicable to your purchase.

The Suunto SOLUTION á 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/or service registration card, as required in your country. 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 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 or 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.

This Instruction Manual should be kept with your SOLUTION á.

9. GLOSSARY

Altitude dive A dive made at an elevation above 700 m [2300 ft] above sea-level.

Ascent speed (rate) The speed at which the diver ascends toward the surface.

ASC SPEED Abbreviation for ascent speed (ascent rate).

Ascent time The minimum amount of time needed to reach the surface in a decompression dive.

ASC TIME Abbreviation for ascent time.

Ceiling On a decompression dive the shallowest depth to which a diver may ascend based on computer nitrogen load.

Compartment See "Tissue group".

DCS Abbreviation for decompression sickness.

Decompression Time spent at a decompression stop or range before surfacing, to allow absorbed nitrogen to escape naturally from tissues.

Decompression range On a decompression dive the depth range, between the floor and ceiling, within which a diver must stop for some time during ascent.

Decompression sickness Any of a variety of maladies resulting either primarily or secondary from the formation of nitrogen bubbles in tissues or body fluids, as a result of inadequately controlled decompression. Commonly called "bends" or "DCS".

Dive series A group of repetitive dives between which the SOLUTION á indicates some nitrogen loading is present. When nitrogen loading reaches zero the SOLUTION á deactivates.

Dive time Elapsed time between leaving the surface to descend, and returning to the surface at the end of a dive.

Floor The deepest depth during a decompression dive at which decompression takes place.

Half-time After a change in ambient pressure, the amount of time required for the partial pressure of nitrogen in a theoretical compartment to go half-way from its previous value to saturation at the new ambient pressure.

Multi-level dive A single or repetitive dive that includes time spent at various

depths and whose no-decompression limits are not determined solely by the maximum depth attained.

No-decompression time The maximum amount of time a diver may remain at a particular depth without having to make decompression stops or remain below a ceiling during the subsequent ascent.

No-decompression dive Any dive which permits a direct, uninterrupted ascent to the surface at any time.

NO DEC TIME Abbreviation for no-decompression time limit.

Repetitive dive Any dive whose no-decompression time limits are affected by residual nitrogen absorbed during previous dives.

Residual nitrogen The amount of excess nitrogen remaining in a diver after one or more dives.

SURF TIME Abbreviation for surface interval time.

Surface interval time Elapsed time between surfacing from a dive and beginning a descent for the subsequent repetitive dive.

Tissue group Theoretical concept used to model bodily tissues for the construction of decompression tables or calculations.