

# **COBRA**

## **INSTRUCTION MANUAL**

# QUICK REFERENCE GUIDE

## Arrows:

- Decompression Stop at the Ceiling Depth ▼
- Mandatory Safety Stop Zone ▲
- Ascent Recommended ▲
- Must Descend ▼

## Present Depth Dive Counter

## Bookmark Symbol

## Diver Attention Symbol

## Bar Graph:

- Mode Indicator
- Consumed Bottom Time
- Oxygen Limit Fraction

## Do Not Fly Icon

## Remaining Air Time / Oxygen Percentage in Nitrox Mode

## Altitude Adjustment Mode

## Personal Adjustment Mode

## Cylinder Pressure Temperature Week Day Mode Text

## Scroll Button Indicators

Plan Button  
(increase value, ascend)

Time (alternative display) Button  
Scroll Button (decrease value, descend)

Maximum Depth  
Ceiling Depth on Decompression Stop  
Mandatory Safety Stop Depth  
Average Depth in Logbook  
Oxygen Partial Pressure  
AM/PM Indicator

Safety Stop Warning  
Safety Stop Indicator

Fast Ascent Warning  
(SLOW)

## Bar Graph:

- Ascent Rate Indicator
- Battery Power Indicator
- Logbook Page Indicator

Current Time Display  
Surface Interval Time  
No Flying Time  
No-Decompression Time  
Total Ascent Time  
Safety Stop Time

## The Smart Button:

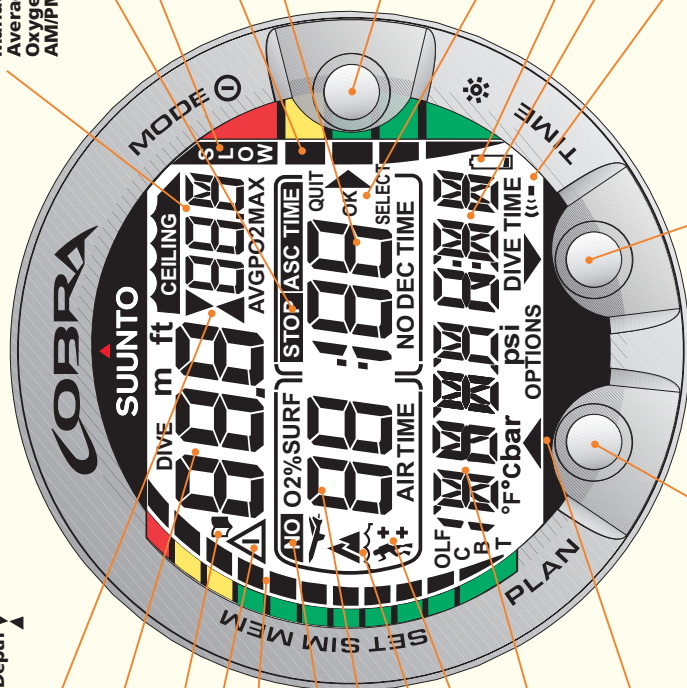
- Activation
- Backlight
- Mode Operations

Smart Button  
Indicators

Low Battery Warning

Dive Time  
Time  
Month, Day

Daily/DiveTime/Depth Alarm  
On Indicator



## 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.

<b>WARNING</b>	is used in connection with a procedure or situation that may result in serious injury or death.
<b>CAUTION</b>	is used in connection with a procedure or situation that will result in damage to the product.
<b>NOTE</b>	is used to emphasize important information.

## COPYRIGHT, TRADEMARK AND PATENT NOTICE

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Patents have been issued or applied for one or several features of this product.

### CE

The CE mark is used to mark conformity with the European Union EMC directive 89/336/EEC. The SUUNTO dive instruments fulfill all the required EU directives.

FIOH, Laajaniityntie 1, FIN-01620 Vantaa, Finland, notified body no.0430, has EC type-examined this type of personal protective equipment.

EN 250 Respiratory equipment - Open circuit self-contained compressed air diving apparatus - Requirements, testing, marking.

The tank pressure gauge and the parts of this product used in measuring the tank pressure meet the requirements set in the section of the European Standard EN 250 that concern tank pressure measurements. The instruments must be serviced by an authorized dealer every second year or after 200 dives (whichever comes first).

### PrEN 13319

PrEN 13319 "Diving accessories - Depth gauges and combined depth and time measuring devices - Functional and safety requirements, test methods" is a European diving depth gauge standard draft. The COBRA is designed to comply with this draft standard.

### ISO 9001

SUUNTO Oyj's Quality Assurance System is certified by Det Norske Veritas to be according to the ISO 9001 in all SUUNTO Oyj's operations (Quality Certificate No. 96-HEL-AQ-220).

## **WARNINGS**

SUUNTO Oyj does not assume any responsibility for losses or claims by third parties, which may arise through the use of this device.

Due to continuous product development, the COBRA is subject to change without notice.

### **WARNING!**

**READ THIS MANUAL!** Carefully read this instruction manual in its entirety paying close attention to all warnings listed below, including section 1.1. "Safety Precautions". Make sure that you fully understand the use, displays and limitations of the dive computer because any confusion resulting from neglecting to follow this instruction manual or from improper use of this device may cause a diver to commit errors that may lead to serious injury or death.

### **WARNING!**

**NOT FOR PROFESSIONAL USE!** Suunto dive computers are intended for recreational use only. The demands of commercial or professional diving may expose the diver to depths and exposures that tend to increase the risk of decompression illness (DCI). Therefore, Suunto strongly recommends that the device be not used for commercial or professional diving activity.

### **WARNING!**

**ONLY DIVERS TRAINED IN THE PROPER USE OF SCUBA DIVING EQUIPMENT SHOULD USE A DIVE COMPUTER!** No dive computer can replace the need for proper dive training. Insufficient or improper training may cause diver to commit errors that may lead to serious injury or death.

### **WARNING!**

**THERE IS ALWAYS A RISK OF DECOMPRESSION ILLNESS (DCI) FOR ANY DIVE PROFILE EVEN IF YOU FOLLOW THE DIVE PLAN PRESCRIBED BY DIVE TABLES OR A DIVE COMPUTER. NO PROCEDURE, DIVE COMPUTER OR DIVE TABLE WILL PREVENT THE POSSIBILITY OF DCI OR OXYGEN TOXICITY!** An individual's physiological make up can vary from day to day. The dive computer cannot account for these variations. You are strongly advised to remain well within the exposure limits provided by the instrument to minimize the risk of DCI. As an added measure of safety, you should consult a physician regarding your fitness before diving.

## **WARNING!**

SUUNTO STRONGLY RECOMMENDS THAT SPORT DIVERS LIMIT THEIR MAXIMUM DEPTH TO 40 M [130 FT] OR TO THE DEPTH CALCULATED BY THE COMPUTER BASED ON THE SELECTED O<sub>2</sub>% AND A MAXIMUM PO<sub>2</sub> OF 1.4 BAR SETTINGS!

## **WARNING!**

DIVES WITH REQUIRED DECOMPRESSION STOPS ARE NOT RECOMMENDED. YOU SHOULD ASCEND AND BEGIN DECOMPRESSION IMMEDIATELY WHEN THE DIVE COMPUTER SHOWS YOU THAT A DECOMPRESSION STOP IS REQUIRED! Note the blinking ASC TIME symbol and the upward pointing arrow.

## **WARNING!**

USE BACK-UP INSTRUMENTS! Make sure 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 dive computer.

## **WARNING!**

PERFORM PRECHECKS! Always activate and check the device before diving in order to ensure that all Liquid Crystal Display (LCD) segments are completely displayed, that the device has not run out of battery power, and that the oxygen, altitude and personal adjustments are correct. Also, exit the Data Transfer mode before diving, as the computer does not automatically revert to Dive mode from Data Transfer mode.

## **WARNING!**

YOU ARE ADVISED TO AVOID FLYING ANY TIME THE COMPUTER COUNTS DOWN THE NO-FLYING TIME. ALWAYS ACTIVATE THE COMPUTER TO CHECK THE REMAINING NO-FLY TIME PRIOR TO FLYING! The computer goes into the stand-by display automatically 5 minutes after the dive has ended. The stand-by display shuts off after two hours. Flying or traveling to a higher altitude within no-fly time can greatly increase the risk of DCI. Review the recommendations given by Diver's Alert Network (DAN) in chapter 3.6.3. "Flying After Diving". There can never be a flying after diving rule that is guaranteed to completely prevent decompression illness!

## **WARNING!**

THE DIVE COMPUTER 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 up to four days prior to initial use of the computer may cause misleading information and must be avoided.

## **WARNING!**

DO NOT EXPOSE THE COBRA DIVE COMPUTER WITH IT'S STANDARD HOSE TO ANY GAS MIX CONTAINING MORE THAN 40% OXYGEN! Enriched air with greater oxygen content presents a risk of fire or explosion and serious injury or death.

## **WARNING!**

DO NOT DIVE WITH A CYLINDER OF ENRICHED AIR IF YOU HAVE NOT PERSONALLY VERIFIED ITS CONTENTS AND ENTERED THE ANALYZED VALUE INTO YOUR DIVE COMPUTER! Failure to verify cylinder contents and enter the appropriate O<sub>2</sub>% into your dive computer will result in incorrect dive planning information.

## **WARNING!**

THE DIVE COMPUTER WILL NOT ACCEPT FRACTIONAL PERCENTAGE VALUES OF OXYGEN CONCENTRATION. DO NOT ROUND UP FRACTIONAL PERCENTAGES! For example, 31.8% oxygen should be entered as 31%. Rounding up will cause nitrogen percentages to be understated and will affect decompression calculations. If there is a desire to adjust the computer to provide more conservative calculations, use the personal adjustment feature to affect decompression calculations or reduce the PO<sub>2</sub> setting to affect oxygen exposure.

## **WARNING!**

SET THE CORRECT ALTITUDE ADJUSTMENT MODE! WHEN DIVING at altitudes greater than 300 m [1000 ft] the Altitude Adjustment feature must be correctly selected in order for the computer to calculate the decompression status. THE DIVE COMPUTER is not intended for use at altitudes greater than 3000 m [10000 ft]. FAILURE TO SELECT the correct Altitude Adjustment setting or diving above the maximum altitude limit will result in erroneous dive and planning data.

## **WARNING!**

SET THE CORRECT PERSONAL ADJUSTMENT MODE!, Whenever it is believed that factors that tend to increase the possibility of DCI exist, it is recommended that you use this option to make the calculations more conservative. Failure to select the correct Personal Adjustment setting will result in erroneous dive and planning data.

## **NOTE!**

It is not possible to change between Air, Nitrox and Gauge modes before the instrument has counted down the no-flying time.

There is one exception to this: You can change from Air to Nitrox mode even during the no-flying time. When planning both air and nitrox dives during the same dive series, you should set the instrument in Nitrox mode and modify the gas mix accordingly.

In Gauge mode, the no-flying time is always 48 hours.

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# 1. INTRODUCTION

Congratulations on your purchase of the SUUNTO COBRA advanced dive computer. The Cobra builds on the Suunto tradition of delivering feature-rich dive computers. The Cobra provides many new and enhanced features that cannot be found in any other air-integrated dive computer. Push button controls access a wide selection of choices. The display is optimized for the dive mode chosen. This air-integrated dive computer is a compact and sophisticated multipurpose dive instrument, designed to give you years of trouble-free service.

## CHOICE OF OPERATING MODES AND SET-UP OPTIONS

User options for the Cobra are selected using the push buttons. Pre Dive configuration and setup options include:

- Choice of operating mode - Air / Nitrox / Gauge
- Choice of unit - Metric / Imperial
- Maximum depth alarm
- Dive time alarm
- Backlight settings
- Clock, calendar, daily alarm
- Mix Oxygen fraction % (Nitrox mode only)
- Maximum PO<sub>2</sub> (Nitrox mode only)
- Altitude adjustment
- Personal adjustment

## CONTINUOUS DECOMPRESSION WITH SUUNTO RGBM

The Suunto Reduced Gradient Bubble Model (RGBM) utilized in the Cobra predicts both dissolved and free gas in blood and tissues of divers. It is a significant advance on the classic Haldane models, which do not predict free gas. The advantage of Suunto RGBM is additional safety through its ability to adapt to a variety of situations and dive profiles.

In order to optimize how to respond to different added risk situations an additional category of stop, referred to as a Mandatory Safety Stop, has been introduced. Also a countdown for the Recommended Safety Stop is included. The combination of stop types will depend on the specific dive situation.

To get the most from the safety benefits be sure to read the summary of the Suunto Reduced Gradient Bubble Model on page 62.

## **1.1. SAFETY PRECAUTIONS**

Do not attempt to use the dive computer without reading this instruction manual in its entirety, including all the warnings. Make sure that you fully understand the use, displays and limitations of the instrument. If you have any questions about the manual or the dive computer, contact your SUUNTO dealer before diving with the dive computer.

Always remember that **YOU ARE RESPONSIBLE FOR YOUR OWN SAFETY!**

When used properly, the dive computer is an outstanding tool for assisting properly trained, certified divers in planning and executing sport dives. It is **NOT A SUBSTITUTE FOR CERTIFIED SCUBA INSTRUCTION**, including training in the principles of decompression.

Diving with enriched air mixtures (nitrox) exposes the user to risks different from those associated with diving with standard air. These risks are not obvious and require training to understand and avoid. Risks include possible serious injury or death.

Do not attempt to dive with any gas mix other than standard air without first receiving certified training in this specialty.

### **1.1.1. EMERGENCY ASCENTS**

In the unlikely event that the dive computer malfunctions during a dive, follow the emergency procedures provided by your certified dive training agency or, alternatively,

**STEP 1:** Assess the situation calmly and then move promptly to less than 18 m [60 ft].

**STEP 2:** At 18 m [60 ft], slow down your ascent rate to 10 m/min [33 ft/min] and move to a depth between 3 and 6 meters [10 to 20 ft].

**STEP 3:** Stay there as long as you assess your air supply will safely allow.  
After reaching the surface stay out of the water for at least 24 hours.

### **1.1.2. DIVE COMPUTER LIMITATIONS**

While the dive computer is based on current decompression research and technology, you 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 theoretical mathematical models, which are intended to serve as a guide to reduce the probability of decompression illness.

### **1.1.3. NITROX**

Diving with nitrox provides the diver with an opportunity to reduce the risk of decompression illness by reducing the nitrogen content in the breathing gas mix.

However, when the gas mix is altered, the oxygen content of the mix is generally increased. This increase exposes the diver to an oxygen toxicity risk not usually considered in recreational diving. In order to manage this risk, the dive computer tracks the time and intensity of the oxygen exposure and provides the diver with information to adjust the dive plan in order to maintain oxygen exposure within reasonably safe limits.

In addition to the physiological effects of enriched air on the body there are operational considerations to be addressed when handling altered breathing mixes. Elevated concentrations of oxygen present a fire or explosion hazard. Consult with the manufacturer of your equipment in regards to its compatibility with nitrox.

## **2. GETTING ACQUAINTED**

### **2.1. FUNCTIONS**

You can select the dive computer model between the Regular Air Dive Computer, Nitrox Dive Computer and Depth Gauge with Timer mode.

The COBRA multipurpose dive computer is an air integrated computer featuring three dive computer modes (AIR, NITROX, GAUGE), three main operating modes (TIME/STAND-BY, SURFACE, DIVING), three menu based main modes (MEMORY, SIMULATION, SET) and 16 - 18 menu based submodes (review separate Quick Reference Guide). You can scroll through the modes using the push buttons. The mode indicator at the left side and the mode text at the bottom of the display indicate the selected mode.

The timekeeping display is the default display of the instrument (Fig. 2.1.). If a button is not pressed within 5 minutes, the dive computer beeps and returns to the timekeeping display automatically (except in Diving and Simulation Modes). The timekeeping display shuts off after two hours, but pressing the PLAN or TIME button activates it.

### **2.2. CONNECTING THE COBRA TO A REGULATOR**

Upon purchasing the Cobra, Suunto strongly recommends you have your dealer attach it to the first stage of your regulator.

If you decide to attach it yourself, follow the steps outlined below:

1. Remove the high pressure (HP) port plug on the first stage of your regulator using an appropriate sized wrench.
2. Thread the high pressure hose of the Cobra into the port of your regulator with your fingers. Tighten the hose fitting with a 16 mm [5/8"] wrench. **DO NOT OVERTIGHTEN!**
3. Attach the regulator to a charged scuba cylinder. Slowly open the valve. Check for leaks by submerging the first stage regulator in water. If leaks are detected, consult your dealer.

## 2.3. PUSH BUTTONS

The dive computer has easy-to-use push buttons and an advisory display, which guides the user. The **SMART (MODE)** button is the key to the system. The two scroll buttons, **PLAN** and **TIME**, are used for scrolling up and down the menus and to show the alternative displays. The dive computer is controlled with these three push buttons as follows (see Fig. 2.2.).

### Press the SMART (MODE) button

- To activate the dive computer.
- To change from the Surface Mode to the menu based modes.
- To select, confirm or quit a submode (short press).
- To immediately exit any submode to the Surface Mode (long press).
- To activate the electroluminescent backlight (in the Surface Mode hold down the mode button for more than two (2) seconds, during a dive for one (1) second).

### Press the arrow up scroll (PLAN) button

- To activate the timekeeping display, if the display is blank.
- To activate the Dive Planning in the Surface Mode.
- To make a special bookmark in the profile memory during a dive.
- To scroll up the options (▲, increase).

### Press the arrow down scroll (TIME) button

- To activate the timekeeping display, if the display is blank.
- To activate the Time display(s) and/or alternative display(s).
- To scroll down the options (▼, decrease).

The dive computer is controlled with the **SMART (MODE/On/Backlight/Select/OK/Quit)** and the **PLAN ▲** and **TIME ▼** push buttons and with the water contacts as follows:

Activation	press the <b>SMART</b> (On) button or immerse the instrument in water for five (5) seconds.
Dive Planning	in the Surface Mode, press the <b>PLAN</b> button.
Menu Modes	press the <b>SMART</b> (MODE) button.

The display is illuminated by holding down the **SMART** button for more than two seconds.

## 2.4. WATER CONTACTS

The water contacts control the automatic activation of the Dive Mode.

The water and data transfer contacts are located on bottom of the case (Fig 2.3.). When submerged the water contacts are connected to the push buttons (which are the other pole of the water contact) by the conductivity of the water. The "AC" text (Active Contacts, Fig. 2.4.) will appear on display. The AC text will be shown until the water contact deactivates or the dive computer enters the Dive Mode automatically.

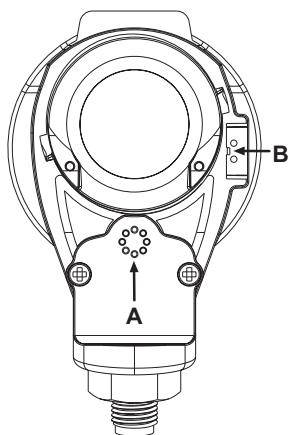


Fig 2.3. Depth sensor (A), water/data transfer contacts (B).



Fig. 2.1. Time keeping display. Pressing PLAN or TIME button activates display.

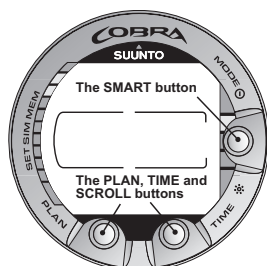


Fig. 2.2. Push buttons of the dive computer.



Fig. 2.4. Active water contacts are indicated by the text AC.



Fig. 3.1. Startup I. All segments shown.

## 3. DIVING WITH THE COBRA

This section contains instructions on how to operate the dive computer and interpret its displays. You will find that this dive computer is easy to use and read. Each display shows only the data relevant to that specific diving situation.

### 3.1 BEFORE DIVING

#### 3.1.1. ACTIVATION AND PRECHECKS

The dive computer will activate if submerged deeper than 0.5 m (1.5 ft). However, it is necessary to turn on the Dive Mode before diving to check the cylinder pressure, altitude and personal adjustment settings, battery condition, oxygen settings etc. Press the **SMART** (On) button to activate the instrument.

After activation all display elements will turn on showing mostly figure 8's and graphical elements (Fig. 3.1.). A few seconds later the battery power indicator is shown and the backlight and the buzzer are activated (Fig. 3.2. display a, b, c or d depending on the battery voltage). If set to Air mode the screen will enter the Surface mode (Fig. 3.3.). If set to Gauge mode the text **GAUGE** is shown (Fig. 3.4.) and if set to Nitrox mode the essential oxygen parameters are shown with the text **NITROX** (Fig. 3.21.) before the Surface mode.

At this time, perform your precheck making sure that:

- the instrument operates in the correct mode and provides a complete display (Air and Nitrox modes)
- the low battery indicator is not on
- the altitude and personal adjustment settings are correct
- the instrument displays correct units of measurement (Metric/Imperial)
- the instrument displays correct temperature and depth (0.0 m [0 ft])
- the buzzer beeps

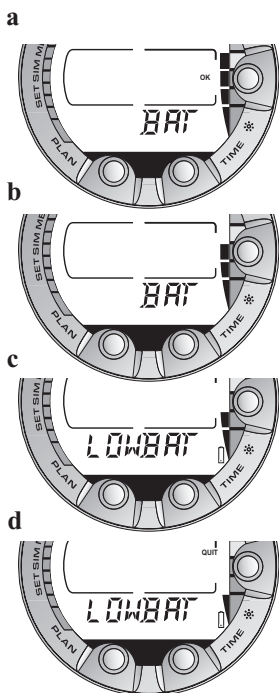


Fig. 3.2. Startup II. Battery power indicator.



- you have enough air for your planned dive. You should also check the pressure reading against your back-up pressure gauge.

And if set to Nitrox mode, make sure that:

- the oxygen percentage is adjusted according to the measured Nitrox blend in your cylinder
- the oxygen partial pressure limit is set correctly.

The dive computer is now ready for diving.

### 3.1.2. BATTERY POWER INDICATOR AND LOW BATTERY WARNING

This dive computer has a unique graphic Battery Power Indicator designed to give you an advance notice of impending need to change the battery.

The Battery Power Indicator can always be seen when the Dive Mode is activated. The electroluminescent backlight will be on during the battery check. The following Table and Figure show the various warning levels.

TABLE 3.1. BATTERY POWER INDICATOR

Display	Operation	Figure 3.2
BAT + 4 segments + OK	Normal, full battery.	a)
BAT + 3 segments	Normal, battery power is getting low or the temperature is low. Battery replacement is recommended if you are going to colder conditions or if you are planning to make a dive trip.	b)
LOWBAT + 2 segments + low battery symbol	Battery power is low and the battery replacement is recommended. The battery symbol is displayed. The backlight is disabled.	c)
LOWBAT + 1 segment + QUIT+ low battery symbol	Change the battery! Returns to the Time display. Activation and all functions are disabled.	d)

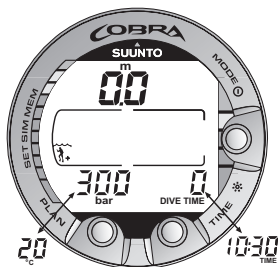


Fig 3.3. Startup III. Surface mode. Depth and dive time are zero and cylinder pressure is 300 bar [4350 psi]. Pressing TIME button activates alternative display of temperature and current time.

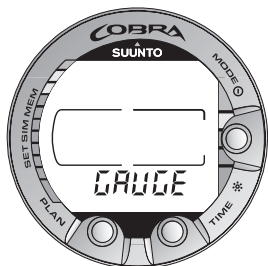


Fig. 3.4. Startup IV. Gauge mode.

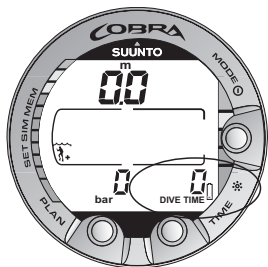


Fig. 3.5. Low Battery Warning. Battery symbol indicates that the battery is low and battery replacement is recommended.

Temperature or an internal oxidation of the battery affects the battery voltage. If the instrument is stored for a long period, the low battery warning may be displayed even though the battery has enough capacity. The low battery warning may also be displayed at low temperatures, even though the battery has enough capacity in warmer conditions. In these cases repeat the battery check procedure.

After battery check the Low Battery Warning is indicated by the battery symbol (Fig. 3.5.).

If the battery symbol is displayed in the Surface mode or if the display is faded or weak, the battery may be too low to operate the dive computer and battery replacement is recommended.

**NOTE! For safety reasons the backlight cannot be activated when the low battery warning is indicated by the battery symbol.**

### 3.1.3. DIVE PLANNING [PLAN]

To enter Planning Mode, press the PLAN button at any time during Surface Mode. After showing the text "PLAN" (Fig. 3.6.), the display will show the no-decompression limit for the depth of 9 m [30 ft]. By pressing the down arrow (▼) TIME button, the dive computer will calculate and show the next deeper no-decompression limits in 3 m [10 ft] increments ending at 45 m [150 ft]. By pressing the up arrow (▲) PLAN button, the next shallower depth will be shown again.

The Planning Mode is cancelled by pressing the SMART (QUIT) button.

**NOTE! The Planning mode is disabled in Gauge mode and in Error mode (see section 3.9. "Error Conditions").**

Higher Altitude and conservative Personal Adjustment Modes will shorten the no-decompression time limits. These limits at different Altitude and Personal Adjustment Mode selections are shown in Table 6.1 and 6.2 in section 6.1. "Operating Principles".

The Planning mode also accounts for the following information from previous dives:

- any calculated residual nitrogen
- all dive history for the past four days
- oxygen toxicity (Nitrox mode)

The no-decompression times given for different depths will therefore be shorter than before your first "fresh" dive.

## DIVE NUMBERING SHOWN DURING DIVE PLANNING

Dives belong to the same repetitive dive series if the instrument was still counting down the no-fly time at the beginning of the dive.

The surface interval must be at least 5 minutes for a dive to be considered a repetitive dive. Otherwise, it is considered a continuation of the same dive. The dive number will not change and the dive time will continue where it left off (see also section 3.6.2. "Dive Numbering").

### 3.1.4. USER DEFINABLE FUNCTIONS AND ALARMS

This Cobra has several User Definable Functions and depth and time related alarms that you can set according to your personal preference.

The dive computer model, unit of measurement and backlight preferences can be set in the MODE- SET- SET PREF submode. The dive time and the depth alarms can be set in the MODE- SET- SET DIVE submode and the alarm clock can be set in the MODE- SET- SET TIME submode. Setting of the user definable functions and alarms are explained in detail in section 4.3. "Set Modes".

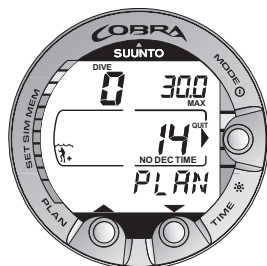


Fig. 3.6. Dive Planning. Planning mode is indicated by PLAN text. No-decompression time limit at 30.0 m [100 ft] is 14 minutes in A0/P1 mode.

## 3.2. SAFETY STOPS

Safety stops are widely considered "good diving practice" and are an integral part of most dive tables. Reasons to perform a safety stop include a reduction in sub clinical DCI, microbubble reduction, ascent control, and orientation before surfacing.

The Cobra displays two different types of safety stops: Recommended Safety Stop and Mandatory Safety Stop.

The Safety Stops are indicated by:

- STOP label, when in the depth range 3 m - 6 m [10 ft - 20 ft]  
= Recommended Safety Stop Countdown
- STOP + CEILING label, when in the depth range 3 m - 6 m [10 ft - 20 ft]  
= Mandatory Safety Stop Time display
- STOP label, when deeper than 6 m  
= Mandatory Safety Stop scheduled

### 3.2.1. RECOMMENDED SAFETY STOP

With every dive over 10 meters the instrument has a three minute countdown for the recommended safety stop, to be taken in the 3 - 6 meter [10 ft - 20 ft] range. This is shown with the STOP sign and a three-minute countdown in the center window instead of the no-decompression time (Fig. 3.11.).

The Recommended Safety Stop, as the name implies, is recommended. If it is ignored, there is no penalty applied to the following surface intervals and dives.

### 3.2.2. MANDATORY SAFETY STOP

When the ascent rate exceeds 12 meters/min [40 ft] momentarily or 10 meters/min [33ft] continuously the micro-bubble build-up is predicted to be more than allowed for in the decompression model. The Suunto RGBM calculation model responds to this by adding a Mandatory Safety Stop to the dive. The time of this Mandatory Safety Stop will depend on the severity of the ascent rate excess.

The STOP sign will appear in the display and when you reach the depth zone between 6 m to 3 m [20 ft to 10] also the CEILING label, ceiling depth and the calculated Safety Stop time appear in the display. You should wait until the Mandatory Safety Stop warning disappears (Fig. 3.14.).

The Mandatory Safety Stop time always includes the three minute Recommended Safety Stop time. The total length of the Mandatory Safety Stop time depends on the seriousness of the ascent rate violation.

You must not ascend shallower than 3 m [10 ft] with the Mandatory Safety Stop warning on. If you ascend above the Mandatory Safety Stop ceiling, a downward pointing arrow will appear and a continuous beeping starts (Fig. 3.15.). You should immediately descend to, or below, the Mandatory Safety Stop ceiling depth. If you correct this situation at any time during that dive, there are no affects on the decompression calculations for future dives.

If you continue to violate the Mandatory Safety Stop, the tissue calculation model is affected and the dive computer shortens the available no-decompression time for your next dive. In this situation, it is recommended to prolong your surface interval time before your next dive.

## 3.3. DIVING IN AIR MODE

### 3.3.1. BASIC DIVE DATA

The dive computer will remain in the Surface mode at depths less than 1.2 m [4 feet]. At depths greater than 1.2 m the instrument will go into the Diving mode (Fig. 3.7.).

All information on the display is labeled (Fig. 3.7. and 3.8.). During a no-decompression stop dive, the following information will be displayed:

- your present depth in meters [ft]
- the Remaining Air time
- the Altitude Adjustment setting on the left side of the center window with a wave and mountain symbols (A0, A1, or A2) (see Table 3.3.)
- the Personal Adjustment setting on the left side of the center window with a diver symbol and + signs (P0, P1, or P2) (see Table 3.4.)
- the maximum depth during this dive in meters [ft], indicated as MAX
- the cylinder pressure in bar [or psi] displayed in the lower left corner
- the elapsed dive time in minutes, shown as DIVE TIME in the lower right corner
- the available no-decompression time in minutes in the center window as NO DEC TIME and as a bar graph on the left side of the display. It is calculated based on the five factors described in Section 6.1. "Operating Principles".

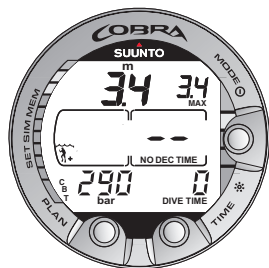


Fig. 3.7. Dive has just begun and no air time is shown. First estimate of remaining air time will be shown after 30-60 seconds.



Fig. 3.8. Diving display. Present depth is 19.3 m [63 ft] and no-decompression stop time limit is 23 minutes in A0/P1 mode. Maximum depth during this dive was 19.8 m [65 ft], elapsed dive time is 16 minutes.

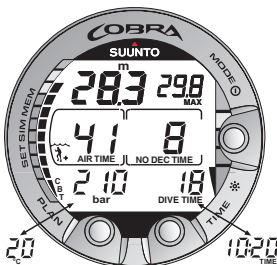


Fig. 3.9. Diving display. Present cylinder pressure is 210 bar [3045 psi] and remaining air time 41 minutes. Alternative display of current time and temperature is shown for 5 seconds after pressing TIME button.

Alternative displays by pressing the TIME button (Fig. 3.9.):

- the current time, shown as TIME
- the water temperature followed by °C for Centigrade [or °F for Fahrenheit].

**NOTE! In Dive Mode the TIME / TEMPERATURE display automatically changes back to DIVE TIME / CYLINDER PRESSURE after 5 seconds.**

### 3.3.2. BOOKMARK

It is possible to make special marks in the profile memory during a dive. These Bookmarks will be shown as a dive log symbol when scrolling the profile memory on the computer display. The Bookmarks will also be shown as annotations in the PC-software, Suunto Dive Manager. To make a bookmark on the profile memory during a dive press the PLAN button (Fig. 3.10.).

### 3.3.3. CYLINDER PRESSURE DATA

The air pressure of your scuba cylinder in bars [psi] will be shown digitally in the lower left corner of the display. Anytime you enter into a dive, the remaining air time calculation begins. After 30 - 60 seconds (sometimes more, depending on your air consumption), the first estimation of remaining air time will be shown in the left center window of the display. The calculation is always based on the actual pressure drop in your cylinder and will automatically adapt to your cylinder size and current air consumption.

The change in your air consumption will be based on constant one second interval pressure measurements over 30 - 60 second periods. An increase in air consumption will influence the remaining air time rapidly, while a drop in air consumption will increase the air time slowly. Thus a too optimistic air time estimation, caused by a temporary drop in air consumption, is avoided.

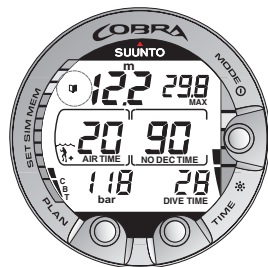


Fig. 3.10. Bookmark activation. An annotation, Bookmark, is placed in the profile memory during a dive by pressing PLAN button. Note Logbook symbol.

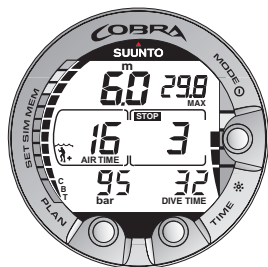


Fig. 3.11. A three minute Recommended Safety Stop.

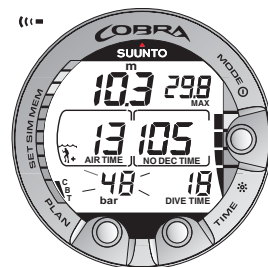


Fig. 3.12. Cylinder pressure warnings. Pressure has dropped below 50 bar [725 psi]. Pressure display is blinking and there is an audible alarm.

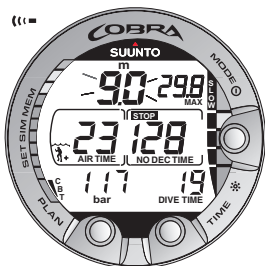


Fig. 3.13. Ascent Rate Indicator. Blinking depth reading, SLOW and four segments are shown together with an audible alarm: ascent rate is more than 10 m/min [33 ft/min]. This is a caution to slow down! STOP sign means that you are advised to make a Mandatory Safety Stop when you reach a depth of 6 m [20 ft].

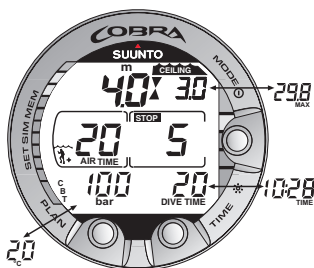


Fig. 3.14. A Mandatory Safety Stop. You are advised to make a Mandatory Safety Stop in the depth zone between 6 m and 3 m [20 ft and 10 ft]. Pressing TIME button shows alternative display.

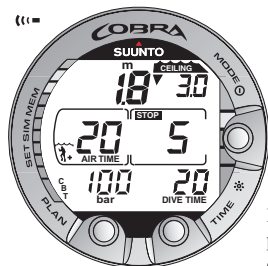


Fig. 3.15. Violated Mandatory Safety Stop. Downward pointing arrow and an audible alarm indicate you should descend to ceiling zone.

The remaining air time calculation includes a 35 bar [500 psi] safety reserve. This means that when the instrument shows the air time to be zero, there is still about 35 bar [500 psi] pressure left in your cylinder depending on your air consumption rate. With a high consumption rate the limit will be close to 50 bar [725 psi] and with a low rate close to 35 bar [500 psi].

**NOTE! Filling your BC will affect the air time calculation, due to the temporary increase in air consumption.**

**NOTE! A change of temperature will affect the cylinder pressure and consequently the air time calculation.**

## LOW AIR PRESSURE WARNINGS

The dive computer will warn you with three audible double beeps and a blinking pressure display when the cylinder pressure reaches 50 bar [725 psi] (Fig. 3.12.). The next three double beeps are heard when the cylinder pressure reaches 35 bar [500 psi] and when the remaining air time reaches zero.



### 3.3.4. CONSUMED BOTTOM TIME (CBT)

The available no-decompression stop time is also shown visually in the multi-function bar graph on the left side of the display (Fig. 3.7., 3.8. and 3.9.). When your available no-decompression time decreases below 200 minutes, the first (lowest) bar graph segment appears. As your body absorbs more nitrogen, more segments start to appear.

**Green Zone** - As a safety precaution Suunto recommends you should maintain the no-decompression bar graph within the green zone. Segments start to appear when the available no-decompression time decreases below 100, 80, 60, 50, 40, 30 and 20 minutes.

**Yellow Zone** - As the bars reach the yellow zone, your no-decompression stop time is less than 10 or 5 minutes and you are getting very close to no-decompression limits. At this point, you should start your ascent towards the surface.

**Red Zone** - As all of the bars appear (red zone), your no-decompression stop time has become zero and your dive has become a decompression stop dive (for more information see section 3.3.6. "Decompression dives").

### 3.3.5. ASCENT RATE INDICATOR

The ascent rate is shown graphically along the right side of the display as follows:

TABLE 3.2. ASCENT RATE INDICATOR

Ascent Rate Indicator	The equivalent ascent speed	Example in Fig.
No segments	Below 4 m/min [13 ft/min]	3.8
One segment	4 - 6 m/min [13 - 20 ft/min]	3.9
Two segments	6 - 8 m/min [20 - 26 ft/min]	3.10
Three segments	8 - 10 m/min [26 - 33 ft/min]	3.11
Four segments	10 - 12 m/min [33 - 39 ft/min]	3.12
Four segments, the SLOW segment, blinking depth reading, the STOP sign and an audible alarm	Above 12 m/min [39 ft/min] or continuously above 10 m/min [33 ft/min]	3.13

When the maximum allowed ascent rate is exceeded, the fifth SLOW warning segment and the STOP sign appear and the depth reading starts to blink, indicating that the maximum ascent rate has been exceeded continuously or that the current ascent rate is significantly above the allowed rate.

Whenever the SLOW warning segment and the STOP sign appear (Fig. 3.13.), you should immediately slow down your ascent. When you reach the depth zone between 6 m to 3 m [20 ft to 10 ft] the STOP and CEILING depth labels will advise you to make a Mandatory Safety Stop. Wait until the warning disappears (Fig. 3.14.). You should not ascend shallower than 3 m [10 ft] with the Mandatory Safety Stop warning on.

### **WARNING!**

**DO NOT EXCEED THE MAXIMUM ASCENT RATE!** Rapid ascents increase the risk of injury. You should always make the Mandatory and Recommended Safety Stops after you have exceeded the maximum recommended ascent rate. If this Mandatory Safety Stop is not completed the decompression model will penalize your next dive(s).

### **3.3.6. DECOMPRESSION DIVES**

When your NO DEC TIME becomes zero, your dive becomes a decompression stop 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 an ASC TIME notation and the maximum depth will be replaced by a CEILING notation and an upward pointing arrow (Fig. 3.16.).

If you exceed the no-decompression limits on a dive, the dive computer will provide decompression information required for ascent. After this, the instrument will continue to provide subsequent interval and repetitive dive information.

Rather than requiring you to make stops at fixed depths, the dive computer lets you to decompress within a range of depths (Continuous Decompression).

The ascent time (ASC TIME) is the minimum amount of time 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 at the Mandatory Safety Stop (if any) **plus**
- the 3 minute Recommended Safety Stop **plus**
- the time needed to reach the surface after the ceiling and safety stops have been completed.

### **WARNING!**

**YOUR ACTUAL ASCENT TIME MAY BE LONGER THAN DISPLAYED BY THE INSTRUMENT!** 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.

## **CEILING, CEILING ZONE, FLOOR AND DECOMPRESSION RANGE**

When in decompression, it is important that you understand the meaning of ceiling, floor, and decompression range (Fig. 3.20.):

- The ceiling is the shallowest depth to which you should ascend when in decompression. At this depth, or below, you must perform all stops.
- The ceiling zone is the optimum decompression stop zone. It is the zone between the minimum ceiling and 1.8 m [6 ft] below the minimum ceiling.
- The floor is the deepest depth at which the decompression stop time will not increase. 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.

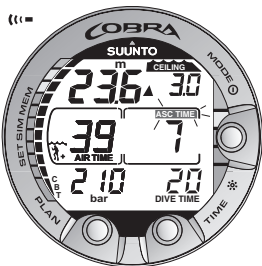


Fig. 3.16. Decompression dive, below floor. Upward pointing arrow, blinking ASC TIME label and an audible alarm tell you to ascend. Minimum total ascent time including safety stop is 7 minutes. Ceiling is at 3 m [10 ft].

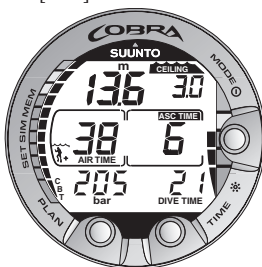


Fig. 3.17. Decompression dive, above floor. Upward pointing arrow has disappeared and ASC TIME label has stopped blinking, which means that you are in the decompression range.

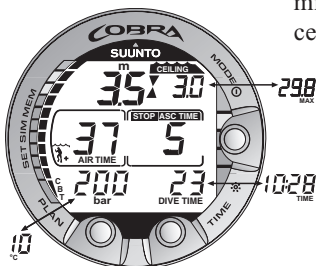


Fig. 3.18. Decompression dive, at ceiling zone. Two arrows point at each other ("hour glass"). You are in the optimum ceiling zone at 3.5 m [11 ft] and your minimum ascent time is 5 minutes. Pressing TIME button activates alternative display.

The depth of the ceiling and floor will depend on your dive profile. The ceiling depth will be fairly shallow when you enter the decompression mode, but if you remain at depth, it will move downward and the ascent time will increase. Likewise, the floor and ceiling may change upwards while you are decompressing.

When conditions are 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 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.**

## WARNING!

**NEVER ASCEND ABOVE THE CEILING!** You must not ascend above the ceiling during your decompression. In order to avoid doing so by accident, you should stay somewhat below the ceiling.

## DISPLAY BELOW THE FLOOR

The blinking ASC TIME and an upward pointing arrow indicate that you are below the floor (Fig. 3.16.). You should start your ascent immediately. The ceiling depth is shown on the right top corner and the minimum total ascent time on the right side of the center window.

## DISPLAY ABOVE THE FLOOR

When you ascend above the floor, the ASC TIME display stops blinking and the upward pointing arrow disappears (Fig. 3.17.). Decompression will now begin, but is very slow. You should therefore continue your ascent.

## DISPLAY AT THE CEILING ZONE

When you reach the ceiling zone, the display will show you two arrows pointing at each other (the "hour glass" icon, Fig 3.18.). Do not ascend above this zone.

During the decompression stop, ASC TIME will count down towards zero. When the ceiling moves upwards, you can ascend to the new ceiling. You may surface only after the ASC TIME and CEILING labels have disappeared, which means that the decompression stop and any Mandatory Safety Stop has been completed. You are advised, however, to stay until the STOP sign has also gone. This indicates that the three minute Recommended Safety Stop has also been completed.

## DISPLAY ABOVE THE CEILING

If you ascend above the ceiling during a decompression stop, a downward pointing arrow will appear and a continuous beeping starts (Fig. 3.19.). In addition, an 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 dive computer goes into a permanent Error Mode. In this mode the instrument can only be used as a depth gauge and timer. You must not dive again for at least 48 hours (see also section 3.9. "Error Conditions").

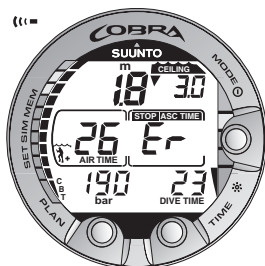


Fig. 3.19. Decompression dive, above ceiling. Note downward pointing arrow, Er warning and an audible alarm. You should immediately (within 3 minutes) descend to or below ceiling.

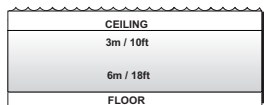


Fig. 3.20. Ceiling and Floor zone. Recommended and Mandatory Safety Stop zone between 6 m and 3 m [20 ft and 10 ft].

## 3.4. DIVING IN NITROX MODE

### 3.4.1. BEFORE DIVING

This dive computer can be set for diving with standard air only (Air mode) or it can be set for diving with Enriched Air Nitrox (EANx) (Nitrox mode).

If set to the Nitrox mode, the correct oxygen percentage of the gas in your cylinder must always be entered into the computer to ensure correct nitrogen and oxygen calculations. The dive computer adjusts its mathematical nitrogen and oxygen calculation models according to the entered  $O_2\%$  and  $PO_2$  values. Calculations based on Nitrox result in longer no-decompression times and shallower maximum depths. When the dive computer is set in Nitrox mode then the Dive Planning and Dive Simulation modes both calculate with the  $O_2\%$  and  $PO_2$  values that are currently in the computer.

### DEFAULT NITROX SETTINGS

In the Nitrox mode, the default setting is for standard air (21%  $O_2$ ). It remains in this setting until the  $O_2\%$  is adjusted to any other percentage of oxygen (22% - 50%).

If unused, the computer will retain the manually entered value for the selected oxygen percentage for about two hours, after which it will revert to the default setting of 21%  $O_2$ .

The default setting for maximum oxygen partial pressure is 1.4 bar, however you are able to set it in the range of 1.2 - 1.6 bar.

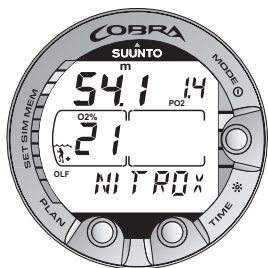


Fig. 3.21. Nitrox display.  
Maximum depth based on set  $O_2\%$  (21%) and  $PO_2$  (1.4 bar) is 54.1 m [177 ft].

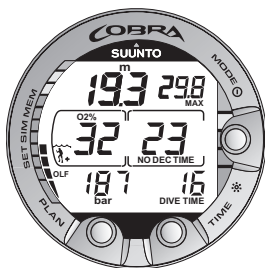


Fig. 3.22. Diving in Nitrox mode. The  $O_2\%$  is set to 32%.

### 3.4.2. OXYGEN DISPLAYS

If set to Nitrox mode the NITROX display, with all labeled oxygen information and the label NITROX, is shown after activation. In Dive Planning mode the nitrox display shows (Fig. 3.21.):

- the oxygen percentage, labeled with  $O_2\%$ , is shown in the left side of the center window
- the set oxygen partial pressure limit, labeled with  $PO_2$ , is shown in the upper right
- the maximum allowed depth based on the set oxygen percentage and partial pressure limit
- the current oxygen toxicity exposure shown with an Oxygen Limit Fraction (OLF) bar graph along the left side of the display (instead of the CBT).

In the Dive modes, the oxygen percentage labeled with  $O_2\%$  and the current oxygen toxicity exposure shown with an Oxygen Limit Fraction (OLF) bar graph are shown (Fig. 3.22. and Fig. 3.23.). The  $O_2\%$  is shown until the remaining air time is less than 30 minutes. After this, the remaining air time is displayed in its place. During a dive, the oxygen partial pressure, labeled with  $PO_2$ , is also shown instead of the maximum depth in the upper right display, if the partial pressure is greater than 1.4 bar or the set value (Fig. 3.24.).

By pressing the TIME button during a nitrox dive, the alternative display appears, which includes (Fig. 3.25.):

- current time
- temperature
- Consumed Bottom Time
- maximum depth (during decompression stop dive).
- Oxygen percentage when remaining air time less than 30 min

After five seconds the display will automatically revert to the original display.



Fig. 3.23. Diving in Nitrox mode. After air time is less than 30 minutes  $O_2\%$  is substituted by Air Time display.

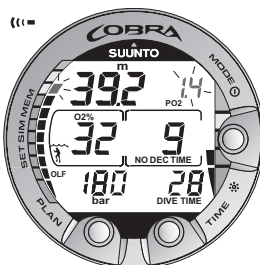


Fig. 3.24. Oxygen partial pressure and OLF displays. There is an audible alarm as oxygen partial pressure is greater than 1.4 bar or set value, and/or the OLF has reached 80% limit.



Fig. 3.25. Alternative display. Pressing TIME button displays current time, maximum depth, temperature, CBT and O<sub>2</sub>%, if Air Time is less than 30 minutes.



Fig. 3.26. The lowest bar graph blinks to indicate that the OLF value shown relates to OTU.

### 3.4.3. OXYGEN LIMIT FRACTION (OLF)

In addition to tracking the diver's exposure to nitrogen, the instrument tracks the exposure to oxygen, if set to Nitrox mode. These calculations are treated as entirely separate functions.

The dive computer calculates separately for Central Nervous System oxygen toxicity (CNS) and Pulmonary Oxygen toxicity, the latter measured by the addition of Oxygen Toxicity Units (OTU). Both fractions are scaled so that the maximum tolerated exposure for each is expressed as 100%.

The Oxygen Limit Fraction (OLF) has 11 segments, each representing 10%. The OLF bar graph displays only the value of the higher of the two calculations. When the OTU value meets and exceeds the CNS value then in addition to displaying its percentage the lowest segment blinks to indicate that the value shown relates to OTU. The oxygen toxicity calculations are based on the factors listed in section 6.3. "Oxygen Exposure".



### 3.5. DIVING IN GAUGE MODE

If set to Gauge mode, the dive computer can be used for diving with technical diving mixed gases. If you are trained for technical diving and you plan to use Gauge mode on a regular basis, it may be preferable to set the instrument permanently to its Gauge mode (see section 4.3. "Set Modes").

If set to Gauge mode the text GAUGE is shown after activation (Fig. 3.4.).

In the Gauge mode the present depth, maximum depth, dive time, cylinder pressure, remaining air time and ascent rate indicator are displayed during the dive (Fig. 3.27.). In addition, temperature and current time are shown in the alternative display.

**NOTE! If you dive with the Gauge mode, it is not possible to change between the modes within 48 hours.**



Fig. 3.27. Diving in Gauge mode.

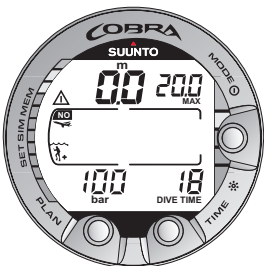


Fig. 3.28. Surface display. You have surfaced from a 18 minute dive, which maximum depth was 20.0 m [66 ft]. The present depth is 0.0 m [0 ft]. Airplane symbol indicates that you should not fly and diver attention symbol indicates that you should prolong your surface interval time because of excess micro-bubbles.



Fig 3.29. Surface interval, Surface time display. Pressing TIME button once will show surface time display.

## 3.6. AT THE SURFACE

### 3.6.1. SURFACE INTERVAL

An ascent to any depth shallower than 1.2 m [4 ft] will cause the DIVING display to be replaced by the SURFACE display, giving the following information (Fig. 3.28.):

- maximum depth of last dive in meters [ft]
- present depth in meters [ft]
- no-flying warning indicated by an airplane icon
- Altitude Adjustment setting
- Personal Adjustment setting
- Diver attention symbol indicates if you should prolong your surface interval time
- STOP label for 5 min, if the Mandatory Safety Stop was violated
- Er, if the decompression ceiling was violated (= Error Mode) (Fig. 3.31.)
- Cylinder pressure in bars [psi]
- dive time of last dive in minutes, shown as DIVE TIME.

Or when the TIME button is pressed once or twice:

- the current time, shown as TIME instead of the DIVE TIME
- the current temperature with °C for Centigrade [or °F for Fahrenheit]
- the surface time in hours and minutes (separated by a colon), telling the duration of the present surface interval (Fig. 3.29.)
- the desaturation/no-flying time in hours and minutes is shown next to the airplane in the center window of the display (Fig. 3.30.).

If set to Nitrox mode, the following information will also be shown:

- the oxygen percentage labeled with  $O_2\%$  is shown on the left side of the center window
- the current oxygen toxicity exposure shown with an Oxygen Limit Fraction (OLF) bar graph along the left side of the display.

### 3.6.2. DIVE NUMBERING

Several repetitive dives are considered to belong to the same repetitive dive series when the dive computer has not counted the no-flying time to zero. Within each series, the dives are given individual numbers. The first dive of the series will be numbered as DIVE 1, the second as DIVE 2, the third as DIVE 3, etc.

If you start a new dive with less than 5 minutes of surface interval time, the dive computer interprets this as a continuation of the previous dive and the dives are considered to be the same. The diving display will return, the dive number will remain unchanged, and the dive time will begin where it left off. After 5 minutes on the surface, subsequent dives are, by definition, repetitive. The dive counter displayed in the Planning Mode will increment to the next higher number if another dive is made.



Fig. 3.30. Surface interval, no-flying time. Pressing TIME button twice will show no-flying time, indicated by an airplane symbol.

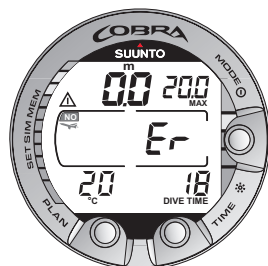


Fig. 3.31. Surface Mode after a violated decompression dive. Er symbol indicates that you have violated the ceiling for more than three minutes. You must not dive again for at least 48 hours.



Diver Attention Symbol



Violated Decompression Ceiling



Do Not Fly Symbol

### 3.6.3. FLYING AFTER DIVING

The no-flying time is shown in the center window next to the airplane image. Flying or travelling to a higher altitude should be avoided at any time the computer counts down the no-flying time.

**NOTE! The airplane symbol is not shown on the stand-by display. You should always activate the dive computer and check that the airplane symbol is not displayed prior to flying.**

The no-flying time is always at least 12 hours or equivalent to the so-called desaturation time (if longer than 12 hours).

In the permanent Error mode and Gauge mode the no-flying time is 48 hours.

Divers Alert Network (DAN) recommends the following on no-flying times:

- 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. Further, the Undersea and Hyperbaric Medical Society (UHMS) suggests divers using standard air tanks and exhibiting no symptoms of decompression illness wait 24 hours after their last dive to fly in an aircraft with cabin pressure up to 2400 m [8000 ft]. The only two exceptions to this recommendation are:
- If a diver had less than 2 hours total accumulated dive time in the last 48 hours, then a 12 hour surface interval before flying is recommended.
- Following any dive that required a decompression stop, flying should be delayed for at least 24 hours, and if possible, for 48 hours.
- Suunto recommends that flying is avoided until all the DAN and UHMS guidelines and the dive computer wait to fly conditions are satisfied.

## 3.7. AUDIBLE AND VISUAL ALARMS

The dive computer features audible and visual alarms to advise when important limits are approached or to acknowledge preset alarms.

### **A short single beep occurs, when:**

- the dive computer is activated.
- when the dive computer automatically returns to the TIME mode.

### **Three double beeps occur, when:**

- the cylinder pressure reaches 50 bar [725 psi]. The cylinder pressure display will start to blink (Fig. 3.12.).
- the cylinder pressure reaches 35 bar [500 psi].
- the calculated remaining air time reaches zero.

### **Three single beeps with a two second interval and the backlight activated for 5 seconds occur, when:**

- the no-decompression dive turns into a decompression stop dive. An arrow pointing upwards and the blinking ascent warning ASC TIME will appear (Fig. 3.16.).

### **Continuous beeps and the backlight activated for 5 seconds occur, when:**

- the maximum allowed ascent rate, 10 m/min [33 ft/min], is exceeded. SLOW and STOP warnings will appear (Fig. 3.13.).
- the Mandatory Safety Stop ceiling is exceeded. A downward pointing arrow will appear (Fig. 3.15.).
- the decompression ceiling depth is exceeded. An error warning Er and a downward pointing arrow appear. You should immediately descend to, or below, the ceiling. The instrument will otherwise enter a permanent Error Mode within three minutes, indicated by a permanent Er (Fig. 3.19.).

You are able to preset alarms before the actual dive. The user programmable alarms can be set for maximum depth, dive time and time. The alarms activate when:

- The preset maximum depth is reached
  - continuous beep series for 24 seconds or until any button is pressed.
  - the maximum depth blinks as long as the present depth value exceeds the adjusted value.
- The preset dive time is reached
  - continuous beep series for 24 seconds or until any button is pressed.
  - the dive time blinks for one minute, if no button is pressed.
- The preset alarm time is reached
  - the current time is shown.
  - continuous beep series for 24 seconds or until any button is pressed.
  - the current time blinks for one minute, if no button is pressed.

## OXYGEN ALARMS IN NITROX MODE

### **Three double beeps and the backlight activated for 5 seconds occur, when:**

- the OLF bar graph reaches 80%. The segments exceeding the 80% limit start to blink (Fig. 3.24.)
- the OLF bar graph reaches 100%.

The blinking of the segments exceeding 80% will stop, when the OLF is not loading anymore. At that point the  $PO_2$  is less than 0.5 bar.

### **Continuous beeps for 3 minutes and the backlight activated for 5 seconds occur, when:**

- the set oxygen partial pressure limit is exceeded. The maximum depth is replaced with a current blinking  $PO_2$  value. You should immediately ascend above the  $PO_2$  depth limit (Fig. 3.24.).

**NOTE! When the backlight is turned OFF, it does not illuminate when an alarm is activated.**

## WARNING!

WHEN THE OXYGEN LIMIT FRACTION INDICATES THAT THE MAXIMUM LIMIT IS REACHED, YOU MUST IMMEDIATELY ASCEND UNTIL THE WARNING STOPS BLINKING! Failure to take action to reduce oxygen exposure after the warning is given can rapidly increase the risk of oxygen toxicity and the risk of injury or death.




## 3.8. HIGH ALTITUDE DIVES AND PERSONAL ADJUSTMENT

The dive computer can be adjusted both for diving at altitude and also to increase the conservatism of the mathematical nitrogen model.

### 3.8.1. ALTITUDE ADJUSTMENT

When programming the instrument for the correct altitude, you need to select the correct Altitude Mode according to Table 3.3. The dive computer will adjust its mathematical model according to the entered altitude mode, giving shorter no-decompression times at higher altitudes (see Section 6.1. "Operating Principles", Table 6.1. and 6.2.).

TABLE 3.3. ALTITUDE ADJUSTMENT RANGES

<i>Altitude mode</i>	<i>Symbol on display</i>	<i>Altitude range</i>
A0		0 - 300 m [0 - 1000 ft]
A1		300 - 1500 m [1000 - 5000 ft]
A2		1500 - 3000 m [5000 - 10000]

The entered Altitude Adjustment Mode is indicated by mountain symbols (A0, A1 = one mountain, or A2 = two mountains). Section 4.3.1.1. "Altitude Adjustment and Personal Adjustment Setting" describes how the Altitude Mode is adjusted.

Traveling to a higher elevation can temporarily cause a change in the equilibrium of dissolved nitrogen in the body. It is recommended that you acclimate to the new altitude by waiting at least three hours before making a dive.

### 3.8.2. PERSONAL ADJUSTMENT

There are adverse personal factors for DCI which divers can predict in advance and input into the decompression model. Factors that may affect susceptibility to decompression illness vary between divers and also for the same diver from one day to another. The three-step Personal Adjustment Mode is available, if a more conservative dive plan is desired.




The personal factors which tend to increase the possibility of DCI include, but are not limited to:

- cold exposure - water temperature less than 20 °C [68 °F]
- the diver is below average physical fitness level
- diver fatigue
- diver dehydration
- previous history of DCI
- stress
- obesity

The Personal Adjustment Mode is indicated by a diver symbol and plus signs (P0 = a diver, P1 = diver +, or P2 = diver ++). Section 4.3.1.1. "Altitude Adjustment and Personal Adjustment Setting" describes how the Personal Mode is adjusted.

This feature should be used to adjust the computer to be more conservative, according to personal preference, by entering the suitable Personal Adjustment Mode with the help of Table 3.4. In ideal conditions, retain the default setting, P0. If conditions are more difficult or other mentioned factors which tend to increase the possibility of DCI exist, select P1 or even the most conservative P2. As a result the dive computer adjusts its mathematical model according to the entered Personal Adjustment Mode, giving shorter no-decompression times (see section 6.1. "Operating Principles", Table 6.1 and 6.2).

TABLE 3.4. PERSONAL ADJUSTMENT RANGES

<b>Personal mode</b>	<b>Symbol on display</b>	<b>Condition</b>	<b>Desired tables</b>
P0		<i>Ideal condition</i>	<i>Default</i>
P1		<i>Some mentioned factors or conditions exist</i>	<i>Progressively more conservative</i>
P2		<i>Several mentioned factors or conditions exist</i>	



### 3.9. ERROR CONDITIONS

The dive computer has warning indicators that alert the user to react to certain situations that would significantly increased risk thew of DCI. If you do not respond to its warnings, the dive computer will enter an Error Mode, indicating that the risk of DCI has greatly increased. If you understand and operate the dive computer sensibly, it is very unlikely you will ever put the instrument into the Error Mode.

#### OMITTED DECOMPRESSION

The Error Mode results from omitted decompression, i.e. when you stay above the ceiling for more than three minutes. During this three-minute period the Er warning is shown and the audible alarm beeps. After this, the dive computer will enter a permanent Error Mode. The instrument will continue to function normally if you descend below the ceiling within this three-minute period.

Once in the permanent Error Mode only the ER warning is shown in the center window. The dive computer will not show times for ascent or stops. However, all the other displays will function as before to provide information for ascent. 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.

After surfacing, you should not dive for a minimum of 48 hours. During the permanent Error Mode, the Er text will be displayed in the center window and the Planning Mode will be disabled.

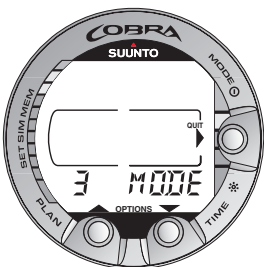


Fig. 4.1. Main menu based Mode options. [3 MODE].

## 4. MENU BASED MODES

To make yourself familiar with the menu based functions, please use your Quick Reference Guide supplied with the Cobra together with the information in this chapter.

The main menu based functions are grouped under 1) memory, 2) dive simulation and 3) setting modes.

### THE USE OF THE MENU BASED FUNCTIONS

1. Activate the menu based modes by pressing once the **SMART** (MODE) button in the Dive Mode (Fig. 4.1.).
2. Scroll the mode options by pressing the arrow up/down buttons. When scrolling the options, the label and an equivalent number are shown on the display (Fig. 4.2. - 4.4.).
3. Press the **SMART** (Select) button once to select the desired option.
4. Scroll the submode options by pressing the arrow up/down buttons. When scrolling the options, the label and an equivalent number are shown on the display.
5. Select the desired option by pressing once the **SMART** (Select) button. Repeat the procedure, if there are more submodes.
6. Depending on the mode, you are now able to have a look at the memories, simulate a dive, or make desired settings (use the the arrow up/down buttons). The **SMART** button is used to Quit or to confirm the settings (OK).

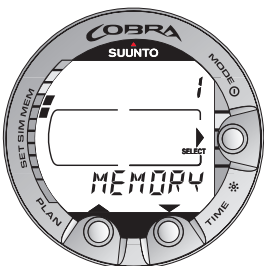


Fig. 4.2. Memory option. [1 MEMORY].

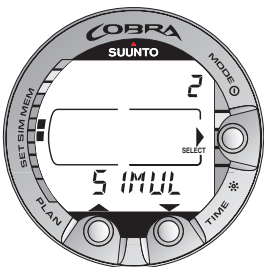


Fig. 4.3. Simulation option. [2 SIMUL].

If you do not press any of the buttons for 5 minutes while in a Menu based mode, the instrument beeps and returns to the timekeeping display. In the Simulation Mode, however, the equivalent time is 60 minutes.

## EXIT / QUIT!

By pressing the SMART button for more than 1 second, any menu based function or submode can be quit and the dive computer will return directly to the Dive Mode.

## THE LIST OF THE MENU BASED MODES

### 1. MEMORIES AND DATA TRANSFER [1 MEMORY]

1. *Logbook and Dive Profile Memory* [1 LOGBOOK]

2. *Dive History Memory* [2 HISTORY]

3. *Data Transfer and PC-Interface* [3 TR-PC]

### 2. SIMULATION MODE [2 SIMUL]

1. *Dive Simulator* [1 SIMDIVE]

2. *Dive Planning Simulator* [2 SIMPLAN]

### 3. SET MODES [3 SET]

1. *Dive Parameter Settings* [1 SETDIVE]

1. Altitude Adjustment and Personal Adjustment Settings [1 AdJ MODE]

2. Dive Time Alarm Setting [2 d ALARM]

3. Maximum Depth Alarm Setting [3 MAX DPTH]

4. Nitrox/Oxygen Settings [4 NITROX]

2. *Setting Time* [2 SET TIME]

1. Adjusting Time [1 AdJ TIME]

2. Adjusting Date [2 AdJ DATE]

3. Adjusting Daily Alarm [3 T ALARM]

3. *Setting Preferences* [3 SET PREF]

1. Backlight Setting [1 LIGHT]

2. Dive Computer Units Setting (Metric/Imperial) [2 UNITS]

3. Dive Computer Model Settings (Air/Nitrox/Gauge) [3 MODEL]

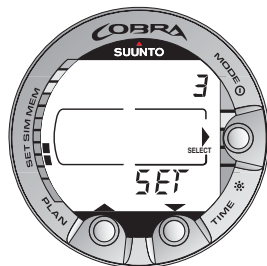


Fig. 4.4. Set option. [3 SET].

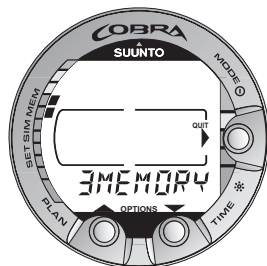


Fig. 4.5. Memory options. [3 MEMORY].

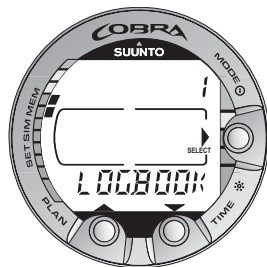


Fig. 4.6. Logbook option. [1 LOGBOOK].

**NOTE! The menu based modes cannot be activated until 5 minutes after the dive.**

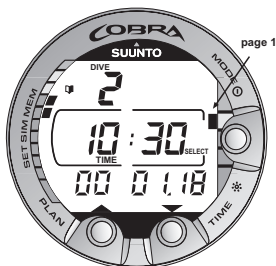


Fig. 4.7. Logbook, page I.  
Scroll different pages of specific dive.

## 4.1. MEMORIES AND DATA TRANSFER [1 MEMORY]

The memory options (Fig. 4.5.) for this dive computer include the combined Logbook and Dive Profile Memory (Fig. 4.6. - 4.12.), Dive History Memory (Fig. 4.13. - 4.14.) and the Data Transfer and PC-Interface functions (Fig. 4.15.).

The dive entry time and date is registered in the Logbook memory. Always check before diving that the time and date are correctly set, especially after travelling between different time zones.

### 4.1.1. LOGBOOK AND DIVE PROFILE MEMORY [1 LOGBOOK]

This instrument has a very sophisticated high capacity Logbook and Profile Memory, with data being recorded every 20 seconds. Dives shorter than the recording interval are not registered. You have the possibility to set the recording interval to 10, 20, 30 or 60 seconds with the optional PC-interface unit and software.

To enter the Logbook Memory Mode select **MODE-1 MEMORY-1 LOGBOOK**.

For each dive there are four pages of logbook dive information. Use the scroll buttons to scroll the display between Logbook pages I, II, III and IV. The data of the most recent dive is shown first.

The logbook dives can be scrolled through displaying only the first page of each dive, or scrolling through the 4 different pages of a dive.

When at the first page of a dive use the **MODE** button to change the scroll sequence. When the arrow icon is next to the Mode button the scroll button will scroll through the first page only of each dive.

When **Select** is displayed next to the mode button the scroll buttons will scroll through the four pages of the selected dive.

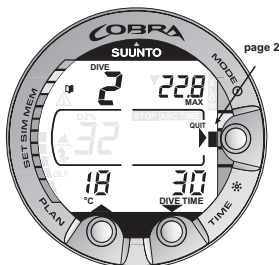


Fig. 4.8. Logbook, page II.  
Main dive related data.

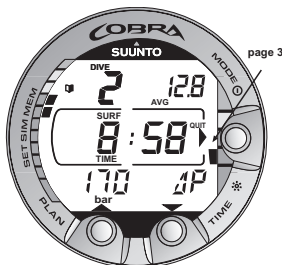


Fig. 4.9. Logbook, page III.  
Surface interval time, average depth and consumed air indicated by  $\Delta P$ .

The END text is displayed between the oldest and most recent dive. (Fig. 4.12.)

Note that chronological sequence in the logbook is determined by the date, not by the dive number.

The following information will be shown on four pages:

#### **Page I, main display (Fig. 4.7.)**

- dive number in the dive series
- dive entry time and date.

#### **Page II (Fig. 4.8.)**

- dive number in the dive series
- maximum depth  
(NOTE! Due to lower resolution, the reading may differ from the maximum depth reading of the Dive History up to 0.3 m [1 ft].)
- total dive time
- temperature at the maximum depth
- Altitude Adjustment setting (not displayed in Gauge mode)
- Personal Adjustment setting (not displayed in Gauge mode)
- SLOW label, if the diver has violated the maximum ascent rate
- STOP label, if the Mandatory Safety Stop was violated
- ASC TIME label, if the dive was a decompression stop dive
- Diver attention symbol, if the dive was started while symbol was displayed
- downward pointing arrow, if the ceiling was violated
- oxygen percentage (only in Nitrox mode)
- maximum OLF during the dive (only in Nitrox mode).

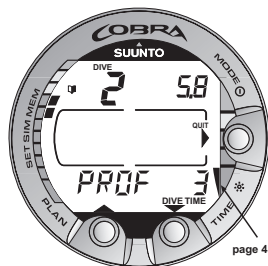


Fig. 4.10. Logbook, page IV. Profile of specific dive.



Fig. 4.11. Logbook, page I. Press SMART (Select) button once to be able to scroll between different dives.

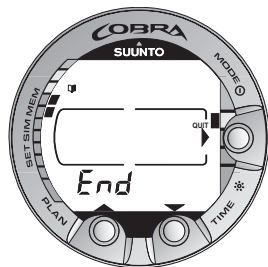


Fig. 4.12. Logbook, end of the memory. END text is displayed between oldest and the most recent dive.

### **Page III (Fig. 4.9.)**

- dive number in the dive series
- average depth
- surface interval time before the dive
- $\Delta P$  describing Cylinder pressure drop during the dive.

### **Page IV (Fig. 4.10.)**

- dive number in the dive series
- the profile of the dive, automatic scrolling during which:
- logbook symbol blinks when the user has pressed the PLAN button for Bookmark
- blinking SLOW label when registered
- blinking ASC TIME label when the dive became a decompression dive.

Press the **SMART** (Select) button once to change the scroll buttons to scroll the different dives forward and backward (Fig. 4.11.). Press the **SMART** (>Select) button again to change function of the scroll buttons back to scroll the different pages of the selected dive. When searching the dives, only the page 1 is shown. The END text is displayed between the oldest and the most recent dive (Fig. 4.12.).

The memory will retain approximately the last 36 hours of dive time. After that, when new dives are added, the oldest dives are deleted. The contents of the memory will remain when the battery is changed (assuming that the replacement has been done according to the instructions).

## **DIVE PROFILE MEMORY [PROF]**

The scrolling of the profile will start automatically when the Logbook page IV (PROF) is entered.

With the default setting, the dive profile is recorded and displayed in 20-second increments with each display being shown for about three seconds. The depths shown are the maximum values of each interval.

Pressing any button stops the scrolling of the profile.

**NOTE! Several repetitive dives are considered to belong to the same repetitive dive series if the no-flying time has not ended. See "Dive Numbering" in section 3.6.2. for further information.**

### 4.1.2. DIVE HISTORY MEMORY [2 HISTORY]

The Dive History is a summary of all the dives recorded by the dive computer. To enter the Dive History Memory Mode select MODE- 1 MEMORY- 2 HISTORY (Fig. 4.13.).

The following information will be shown on the display (Fig. 4.14.):

- the maximum depth ever reached
- the total accumulated dive time in hours
- the total number of dives.

The Dive History Memory can hold a maximum of 999 dives and 999 diving hours. When these maximum values are reached, the counters will start again from zero.

**NOTE! The maximum depth can be reset to 0.0 m [0 ft] using the optional PC-Interface unit and Suunto Dive Manager software.**

### 4.1.3. DATA TRANSFER AND PC- INTERFACE [3 TR-PC]

The instrument can be connected to an IBM compatible personal computer (PC), using the optional PC-Interface and software. With the PC-Interface unit, dive data from the dive computer can be downloaded to a PC. The PC software can be used for educational and demonstration purposes, for planning dives, and for keeping a complete record of your dive history with the instrument. Additional Logbook data can also be added. Paper copies of your dive log and profiles can easily be printed.

The data transfer is carried out using the connector on the bottom of the unit.

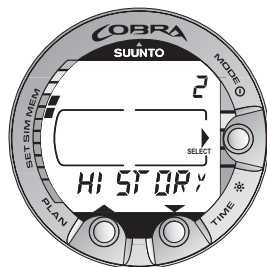


Fig. 4.13. Dive History Memory Mode. [2 HISTORY].

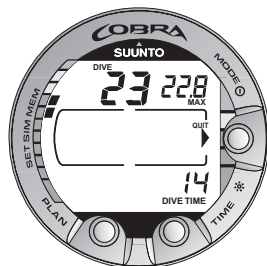


Fig. 4.14. Dive History information. Total number of dives, dive hours and maximum depth.

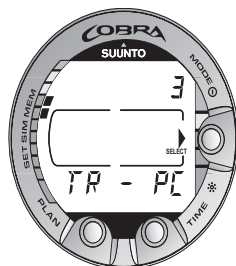


Fig. 4.15. Data Transfer mode. [3 TR-PC].

The following data is transferred to the PC:

- depth profile of the dive
- dive time
- preceding surface interval time
- dive number
- Altitude and Personal adjustment settings
- oxygen percentage setting and maximum OLF (in Nitrox mode)
- tissue calculation data
- temperature at the beginning of the dive, maximum depth and end of the dive
- dive entry time (year, month, day and time)
- additional dive information (e.g. SLOW and Mandatory Safety Stop violations, Diver Attention Symbol, Bookmark, Surfaced Mark, Decompression Stop Mark, Ceiling Error Mark)
- dive computer serial number
- personal 30 character information
- cylinder pressure at the beginning and at the end of the dive (i.e. pressure drop  $\Delta P$  during dive)
- surface air consumption.

Using the PC software, you are able to enter setup options such as:

- change the sample rate for profile records/logbook from the default 20 second interval to 10, 30 or 60 seconds
- input a personal, 30 character field into the Cobra (i.e. your name)
- reset the Dive History's maximum depth to zero.

It is also possible to manually add comments and other personal information to the PC based dive data files. The PC-Interface package comes complete with the interface unit, the software and an installation guide.

To enter the Data Transfer mode select MODE- 1 MEMORY- 3 TR - PC (Fig. 4.15.).

**NOTE! While in the Data Transfer mode, the connector/water contacts are used only for the data transfer. The Dive Mode IS NOT automatically activated if the contacts are submerged.**

After you have finished the data transfer, press the **SMART** (Quit) to exit Data Transfer mode. If a button is not pressed or no data is transferred within 5 minutes, the instrument beeps and returns to the timekeeping display automatically.



## 4.2. SIMULATION MODE [2 SIMUL]

The Simulation mode can be used to acquaint yourself with the features and displays of the instrument before diving, to plan dives in advance, for demonstration or education purposes, or just for pleasure.

The dive computer has two simulation modes (Fig. 4.16.):

- The DIVE SIMULATOR (Fig. 4.17.)
- The DIVE PLANNING SIMULATOR (Fig. 4.19.).

In Simulation Mode, time moves four times faster than real time (when diving), i.e., 15s = 1min.

### 4.2.1. DIVE SIMULATOR [1 SIMDIVE]

The Dive Simulator mode is an excellent tool for becoming familiar with the dive computer and planning your dives. Suunto recommends using the dive simulator to run through different dive scenarios. The Dive Simulator will allow you to "perform" dive profiles of your choice and see what the display would look like during an actual dive. This includes basic dive information, as well as audible and visual warnings. Cylinder pressure drop is simulated with a constant, depth dependant consumption.

To enter the Dive Simulator mode select MODE- 2 SIMUL- 1 SIMDIVE (Fig. 4.17. and 4.18.).

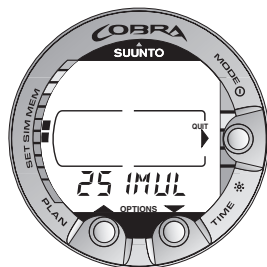


Fig. 4.16. Dive Simulation options. [2 SIMUL].

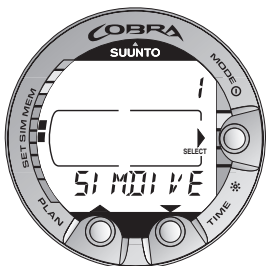


Fig. 4.17. Dive Simulator mode. [1 SIMDIVE].

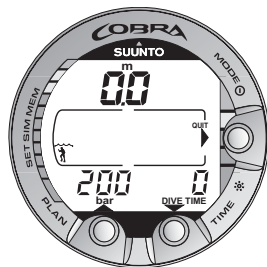


Fig. 4.18. Selected Dive Simulator mode. Descend by pressing the arrow down (TIME) button and ascend by pressing the arrow up (PLAN) button.

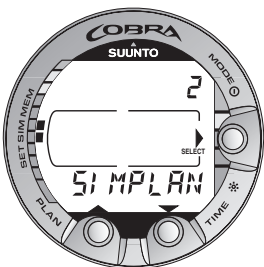


Fig. 4.19. Dive Planning Simulator mode. [2 SIMPLAN].

## 4.2.2. DIVE PLANNING SIMULATOR [2 SIMPLAN]

The Dive Planning Simulator mode shows you the present no-decompression limits. In this mode, you are also able to add the desired surface interval increment to present surface interval time, which allows you to plan your dives in advance.

This mode is also used to add the desired surface intervals for dive simulations. Add the desired surface interval increment to present surface interval by pressing the arrow down (TIME) and arrow up (PLAN) buttons.

To enter the Dive Planning Simulator mode select MODE- 2 SIMUL- 2 SIMPLAN (Fig. 4.19.).

**NOTE! This display is only shown for repetitive dives.**

**NOTE! The Dive Planning Simulator mode is disabled in Gauge mode and in Error mode (see section 3.9. "Error Conditions").**

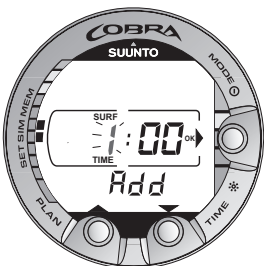


Fig. 4.20. Selected Dive Planning Simulator mode. Add desired surface interval increment (to present shown surface interval) by pressing TIME and PLAN buttons. This display is only shown for repetitive dives.



Fig. 4.21. Dive Planning Simulation.

## 4.3. SET MODES [3 SET]

The Set Modes (Fig. 4.22.) are divided into three submodes for setting the dive-related parameters, time-related parameters and your personal preferences.

### 4.3.1. DIVE PARAMETER SETTINGS

#### [1 SET DIVE]

To enter the Dive Parameter Setting Mode select MODE- 3 SET- 1 SET DIVE. The Dive Parameter Setting mode has two to four options depending on the dive computer mode. In Gauge mode there are two options, in Air mode three options and in Nitrox mode four options.

#### 4.3.1.1. ALTITUDE ADJUSTMENT AND PERSONAL ADJUSTMENT SETTINGS

##### [1 ADJ MODE]

The current Altitude and Personal Adjustment modes are shown when diving and at the surface. If the mode does not match the altitude or personal conditions (see section 3.8. "High Altitude Dives and Personal Adjustment"), it is imperative that you enter the correct selection before diving. Use the Altitude Adjustment to select the correct altitude mode. Use the Personal Adjustment to add an extra level of conservatism.

To enter the Altitude Adjustment and Personal Adjustment Setting mode, select MODE- 3 SET- 1 SET DIVE- 1 Adj MODE. Now you are able to select from the three altitude modes (Fig. 4.23.) and the three personal modes (Fig. 4.24.).

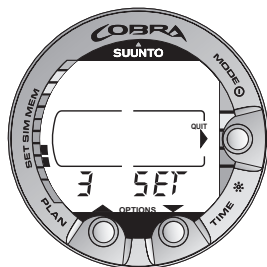


Fig. 4.22. Setting Options. [3 SET].

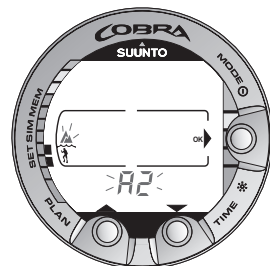


Fig. 4.23. Setting Altitude adjustment. Press scroll buttons to change altitude mode.

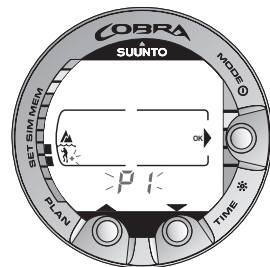


Fig. 4.24. Setting Personal adjustment. Press scroll buttons to change personal mode.

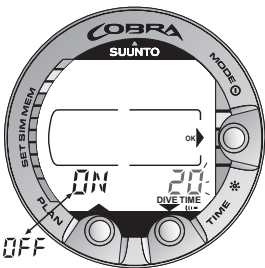


Fig. 4.25. Setting Dive Time Alarm. Press scroll buttons to change alarm on/off and to set dive time value.

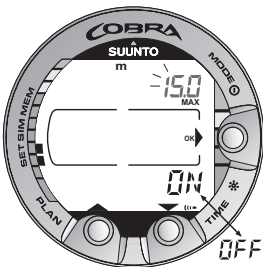


Fig. 4.26. Setting Maximum Depth Alarm. Press scroll buttons to change alarm on/off and to set maximum depth value.



Fig. 4.27. Setting Oxygen Percentage and Partial Pressure. The equivalent maximum depth is displayed as 32.8 m [107 ft]. Press scroll buttons to change oxygen percentage and to set oxygen partial setting value.

### 4.3.1.2. DIVE TIME ALARM SETTING [2 D ALARM]

The instrument has one Dive Time Alarm Setting, which can be used for several purposes to add to your diving safety. The alarm can be set, for example, to your planned bottom time.

To enter the Dive Time Alarm Setting Mode select MODE- 3 SET- 1 SET DIVE- 2 d ALARM. The Dive Time alarm can be set on or off and the time from 1 to 999 minutes.

### 4.3.1.3. MAXIMUM DEPTH ALARM SETTING [3 MAX DPTH]

You can set one depth alarm in the dive computer.

To enter the Maximum Depth Alarm Setting select MODE- 3 SET- 1 SET DIVE- 3 MAX DEPTH .

The depth alarm is set to 40 m [131 ft] at the factory, but you are able to adjust it according your personal preference or switch it off. The depth range can be set from 3.0 m to 100 m [9 ft to 328 ft] (Fig. 4.26.).

### 4.3.1.4. NITROX/OXYGEN SETTINGS [4 NITROX]

If set to the Nitrox mode, the correct oxygen percentage of the gas in your cylinder must always be entered into the computer to ensure correct nitrogen and oxygen calculations. Also, in Nitrox mode, the oxygen partial pressure limit must be set. When in the Nitrox Setting mode the equivalent allowed maximum depth based on the chosen setting will also be displayed.

To enter the Nitrox/Oxygen Setting Mode select MODE- 3 SET- 1 SET DIVE- 4 NITROX. The default oxygen percentage ( $O_2\%$ ) setting is 21% (air) and oxygen partial pressure ( $PO_2$ ) setting 1.4 bar (Fig. 4.27.).

### 4.3.2. SETTING TIME [2 SET TIME]

To enter the Time Setting Mode select MODE- 3 SET- 2 SET TIME. The Time Setting mode has three options: 1 Time, 2 Date and 3 Daily Time Alarm.

#### 4.3.2.1. ADJUSTING TIME [1 ADJ TIME]

To enter the Time Setting Mode select MODE- 3 SET- 2 SET TIME- 1 AdJ TIME. After entering this mode you are able to select between 12 h and 24 hour time formats and set the correct time by using the **SMART** (MODE) and scroll buttons (Fig. 4.28.).

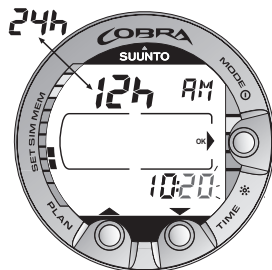


Fig. 4.28. Adjusting Time.

#### 4.3.2.2. ADJUSTING DATE [2ADJ DATE]

To enter the Date Setting Mode select MODE- 3 SET- 2 SET TIME- 2 AdJ DATE. After entering this mode you are able to set the correct year, month and day in this order (Fig. 4.29.).

**NOTE! The day of the week is automatically calculated in accordance with the date. The date can be set within the range of Jan 1, 1990 to Dec. 31, 2089.**

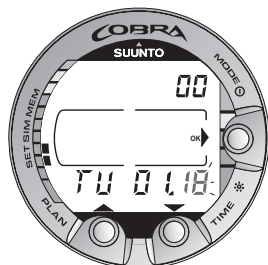


Fig. 4.29. Adjusting Date.

#### 4.3.2.3. ADJUSTING DAILY ALARM [3 T ALARM]

You can set one daily alarm in the dive computer. When the daily alarm activates, the time symbol blinks for 1 minute and the alarm sounds for 24 seconds. The alarm is given at the preset time each day. Press any button to stop the audible alarm, after it has activated.

To enter the Daily Alarm Setting Mode to adjust the alarm select MODE- 3 SET- 2 SET TIME- 3 T ALARM. After entering this mode you are able to set the desired alarm time (Fig. 4.30.).

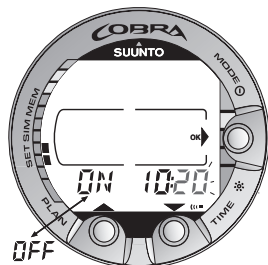


Fig. 4.30. Adjusting Daily Alarm.

### 4.3.3. SETTING PREFERENCES

#### [3 SET PREF]

To enter the Setting Preferences Mode select MODE- 3 SET- 3 SET PREF. The Setting Preferences mode has three options: 1 Light, 2 Units and 3 Model.

#### 4.3.3.1. BACKLIGHT SETTING [1 LIGHT]

In the Backlight Setting mode the backlight can be turned off or on and the on time can be set to be 5 to 30 seconds (Fig. 4.31.).

To enter the Backlight Setting Mode select MODE- 3 SET- 3 SET PREF- 1 LIGHT.

**NOTE! When the backlight turned OFF, it does not illuminate when an alarm is given.**

#### 4.3.3.2. DIVE COMPUTER UNITS SETTING [2 UNITS]

To enter the Dive Computer Units Setting mode, select MODE- 3 SET- 3 SET PREF- 2 UNITS. This will enable you to choose between metric and imperial units (Fig. 4.32.).

#### 4.3.3.3. DIVE COMPUTER MODEL SETTING [3 MODEL]- AIR/NITROX/GAUGE

In the Dive Computer Model Setting mode the dive computer can be set to be an AIR computer, NITROX computer or a depth GAUGE with a timer (Fig. 4.33.).

To enter the Dive Computer Model Setting mode select MODE- 3 SET- 3 SET PREF- 3 MODEL.

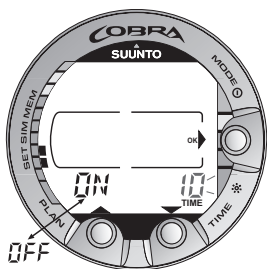


Fig. 4.31. Setting Backlight On Time. Press scroll buttons to change backlight on/off and to set time value.

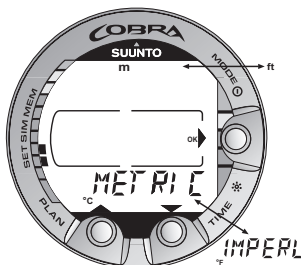


Fig. 4.32. Setting Metric/Imperial units.

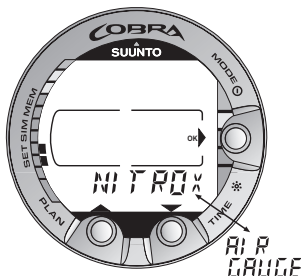


Fig. 4.33. Setting Dive Computer model.

## **5. CARE AND MAINTENANCE**

This Suunto dive computer is a sophisticated precision instrument. Though designed to withstand the rigors of scuba diving, you must treat it with proper care and caution as any other precision instrument.

### **5.1. IMPORTANT INFORMATION**

#### **DEPTH SENSOR**

The built-in depth sensor is a sophisticated precision component. Keep the area around the depth sensor clear from dirt, sand, dust or other substances. Rinse the device thoroughly with fresh water and dry it with a soft towel. Never use pins, needles or other objects to clean the depth sensor (Fig. 2.3.).

#### **WATER CONTACTS AND PUSH BUTTONS**

Contamination or dirt on the water contacts/connector or push buttons may prevent the automatic activation of the Dive Mode and cause problems during data transfer. Therefore, it is important that the water contacts and push buttons are kept clean. If the water contacts are active (AC-text remains on display) or the Dive Mode activates on its own, there is probably contamination or invisible marine growth that may create an unwanted electric current between the contacts. It is important that the dive computer is carefully washed in fresh water after the day's diving is completed. The contacts can be cleaned with fresh water and, if necessary, a mild detergent and a soft brush. Sometimes it might be necessary to remove the instrument from the protective boot for cleaning.

## 5.2. CARE OF YOUR DIVE COMPUTER

- NEVER try to open the case of the dive computer.
- Service your dive computer every two years or after 200 dives (whichever comes first) by an authorized dealer or distributor. This service will include a general operational check, replacement of the battery, and water resistance check. The service requires special tools and training. Therefore, it is advisable to contact an authorized Suunto dealer or distributor for biennial service. Do not attempt to do any service that you are not sure about how to do.
- Should moisture appear inside the case or battery compartment, have the instrument checked immediately by your Suunto dealer or distributor.
- Should you detect scratches, cracks or other such flaws on the display that may impair its durability, have it replaced immediately by your Suunto dealer or distributor.
- Wash and rinse the unit in fresh water after every use.
- Protect the unit from shock, extreme heat, direct sunlight, and chemical attack. The dive computer cannot withstand the impact of heavy objects like scuba cylinders, nor chemicals like gasoline, cleaning solvents, aerosol sprays, adhesive agents, paint, acetone, alcohol etc. Chemical reactions with such agents will damage seals, case and finish.
- Store your dive computer in a dry place when you are not using it.
- The dive computer will display a battery symbol as a warning when the power gets too low. When this happens, the instrument should not be used until the battery has been replaced (see also section 3.1.1. "Activation and Prechecks").
- Periodically check the hose for cracks or other signs of deterioration. Replace hose if any damage is found.



## 5.3. MAINTENANCE

The instrument should be thoroughly rinsed with fresh water, then dried with a soft towel after each dive. Make sure that all salt crystals and sand particles have been flushed out.

Check the display and the transparent battery compartment cover for possible moisture or water. **DO NOT** use the dive computer, 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 dive computer in pressurized air.

## 5.4. WATER RESISTANCE INSPECTION

Ensure the water resistance of the device. Always check the water resistance of the battery compartment when replacing the battery. Moisture inside the device or battery compartment will seriously damage the unit.

Check the transparent battery compartment cover and the display for any sign of leaks. If you find moisture inside your dive computer, there is a leak. A leak must be corrected without delay, as moisture will seriously damage the unit, even beyond repair. Suunto does not take any responsibility for damage caused by moisture in the dive computer, if the instructions of this manual are not carefully followed.

In case of a leak, immediately take the dive computer to an authorized Suunto dealer or distributor. Only an authorized Suunto dealer or distributor should do service activities.

## 5.5. BATTERY REPLACEMENT

**NOTE!** It is imperative that the change is made in a proper manner to avoid any leakage of water into the battery compartment or computer. When in doubt, it is advisable to contact an authorized Suunto dealer for battery replacement.

**NOTE!** When the battery is changed, all nitrogen and oxygen uptake data is lost. Therefore, before changing the battery, the no-flying time shown by the computer should have reached zero. Otherwise, wait for 48 hours or preferably even 100 hours before you dive again.

## **CAUTION!**

Defects caused by improper battery installation are not covered by the warranty.

All history and profile data, as well as the altitude, personal and alarm settings, will remain in the dive computer memory after the battery change. However, the clock time and time alarm setting is lost. In the Nitrox mode, the nitrox settings revert back to default settings (21% O<sub>2</sub>, 1.4 bar PO<sub>2</sub>).

When working with the battery compartment, cleanliness is extremely important. Even the smallest dirt particles may cause a leakage when you dive.

## **BATTERY KIT**

The battery kit includes a 3.0 V coin type lithium cell battery and a lubricated O-ring. When handling the battery do not make contact with both of the poles at the same time. Do not touch the surfaces of the battery with your bare fingers.

## **TOOLS REQUIRED**

- A Philips screwdriver.
- Soft cloth for cleaning.
- Needlenose pliers or small screwdriver for turning securing ring.

## **BATTERY REPLACEMENT**

The battery and the buzzer are located in the back of the instrument in a separate compartment. Console and battery compartment parts are shown in Fig. 5.1. and Fig. 5.2. To change the battery, follow the procedure below:

1. Unscrew the four screws at the back of the elastomer console and remove the back cover of the console.
2. Thoroughly rinse and dry the computer.
3. Open the securing ring of the battery compartment lid by pushing it down and rotating it clockwise. You may use a pointed nose pliers or a small screwdriver as an aid to rotate. Put the pliers ends into the holes of the securing ring or the screwdriver onto the side of the right tooth on the ring (Fig. 5.3.) and turn the ring clockwise. Care should be taken not to damage any of the parts.
4. Remove the ring.

5. Carefully remove the lid with the beeper attached to it. The lid can be removed by pressing with your finger on the outermost edge of the lid while at the same time pulling with your nail at the opposite side. Do not use sharp metal objects as they might damage the O-ring or the sealing surfaces.
6. Remove the O-ring and the battery retainer.
7. Carefully remove the battery. Do not damage the electrical contacts or the sealing surface.

Check for any traces of flooding, particularly between the beeper and the lid, or for any other damage. In case of a leak or any other damage, bring the dive computer to an authorized Suunto dealer or distributor for check and repair.

8. Check the condition of the O-ring; a defective O-ring may indicate sealing or other problems. Dispose the old O-ring, even if it seems to be in good condition.
9. Check that the battery compartment, battery holder and lid are clean. Clean with soft cloth if necessary.
10. Check the polarity of the battery: the "-" mark should point toward the bottom of the compartment and the "+" mark upwards. Gently insert the new battery in the battery compartment
11. Reinstall the battery retainer in its correct position.
12. Check that the new lubricated O-ring is in good condition. Put it in the right position in the battery compartment. Be very careful not to get any dirt on the O-ring or its sealing surfaces.
13. Carefully press the lid onto the battery compartment with your thumb, while making sure that the O-ring is not at any point protruding out at the edge.
14. Put your other thumb through the locking ring. Press this thumb firmly against the lid and release the other one. Make sure that the lid is pressed completely down!
15. Note the correct orientation of the locking ring. Turn the locking ring counterclockwise with your free thumb and fingers until it snaps into its locked position.

16. The dive computer should now activate it's timekeeping mode and show time 18:00 [6:00 PM] and date SA 01,01. Activate the instrument. Check that:
  - All display segments work.
  - The low battery warning is off.
  - The buzzer beeps and backlight works.
  - All the settings are correct. Reset current time, date and other settings, if necessary.
17. Reassemble computer into the console. The instrument is now ready for use.

## CAUTION!

Check after the first dives for possible moisture under the transparent battery compartment lid, indicating a leak.

Cobra console,  
end piece  
K5606

Cobra display  
shield V5850

Cobra console,  
front K5607



CB-71 with  
SK-7 compass  
5517

Cobra case

Console screw  
(3,5 x 16mm)  
K5609

Cobra console,  
back K5608



Securing  
Ring  
V5844

Battery  
Compartment  
Lid with  
buzzer  
V5843

O-Ring  
K5664

Battery  
Retainer  
V5842

Battery  
K5597

Fig. 5.1. Console parts. The code after the name stands for spare part order number.

Fig. 5.2. Battery compartment parts. The code after the name stands for spare part order number.

## 5.6. DISPLAY SHIELD REPLACEMENT

Unscrew the four screws at the back of the console and remove the back cover. Remove the computer and the display shield. Install new display shield and reinstall computer and console back.

## 5.7. COMPASS ATTACHMENT

Unscrew the four screws at the back of the console and remove the back cover. Replace the console end part with compass. Reassemble console.



Fig. 5.3. Opening of securing ring.

## 6. TECHNICAL DESCRIPTION

### 6.1. OPERATING PRINCIPLES

#### NO-DECOMPRESSION LIMITS

The no-decompression limits displayed by the dive computer for the first dive to a single depth (see Table 6.1. and Table 6.2.), are slightly more conservative than those permitted by the U.S. Navy tables.

TABLE 6.1. NO-DECOMPRESSION TIME LIMITS (MIN) FOR VARIOUS DEPTHS (M) FOR THE FIRST DIVE OF A SERIES



















Depth [m]	Personal Mode / Altitude Mode								
	P0/A0 	P0/A1 	P0/A2 	P1/A0 	P1/A1 	P1/A2 	P2/A0 	P2/A1 	P2/A2 
9	--	163	130	163	130	96	130	96	75
12	124	89	67	89	67	54	67	54	45
15	72	57	43	57	43	35	43	35	29
18	52	39	30	39	30	25	30	25	21
21	37	29	23	29	23	20	23	20	15
24	29	24	19	24	19	16	19	16	12
27	23	18	15	18	15	12	15	12	9
30	18	14	12	14	12	9	12	9	7
33	13	11	9	11	9	8	9	8	6
36	11	9	8	9	8	6	8	6	5
39	9	8	6	7	6	5	6	5	4
42	7	6	5	6	5	4	5	4	4
45	6	5	5	5	5	4	5	4	3

TABLE 6.2. NO-DECOMPRESSION TIME LIMITS (MIN) FOR VARIOUS DEPTHS [FT] FOR THE FIRST DIVE OF A SERIES

Depth [ft]	Personal Mode / Altitude Mode								
	P0/A0 	P0/A1 	P0/A2 	P1/A0 	P1/A1 	P1/A2 	P2/A0 	P2/A1 	P2/A2 
30	--	160	127	160	127	93	127	93	73
40	120	86	65	86	65	53	65	53	43
50	69	56	41	56	41	34	41	34	28
60	50	38	29	38	29	25	29	25	20
70	36	29	23	29	23	20	23	20	15
80	28	23	19	23	19	15	19	15	11
90	22	18	15	18	15	11	15	11	9
100	17	14	11	14	11	9	11	9	7
110	13	11	9	11	9	7	9	7	6
120	10	9	8	9	8	6	8	6	5
130	9	7	6	7	6	5	6	5	4
140	7	6	5	6	5	4	5	4	4
150	6	5	4	5	4	4	4	4	3

## 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. It is recommended that you acclimate to the new altitude by waiting at least three hours before making a dive.

Before high altitude diving, the instrument must be set to the Altitude Adjustment mode to adjust the calculations for the new altitude. The maximum partial pressures of nitrogen allowed by the mathematical model of the dive computer are reduced according to the lower ambient pressure.

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

## SURFACE INTERVALS

The dive computer requires a minimum surface interval of 5 minutes between dives. If a surface interval is shorter than 5 minutes, the next dive is treated as a continuation of the previous dive.

## **6.2. REDUCED GRADIENT BUBBLE MODEL, SUUNTO RGBM**

The Suunto Reduced Gradient Bubble Model (RGBM) is a modern algorithm for predicting both dissolved and free gas in the tissues and blood of divers. It was developed in a co-operation between Suunto and Bruce R. Wienke BSc, MSc, PhD. It is based on both laboratory experiments and diving data, including data from DAN.

It is a significant advance on the classical Haldane models, which do not predict free gas (microbubbles). The advantage of Suunto RGBM is additional safety through its ability to adapt to a wide variety of situations. Suunto RGBM addresses a number of diving circumstances outside the range of just dissolved gas models by:

- Monitoring continuous multiday diving
- Computing closely spaced repetitive diving
- Reacting to a dive deeper than the previous dive
- Adapting for rapid ascents which produce high micro-bubble (silent-bubble) build-up
- Incorporating consistency with real physical laws for gas kinetics.

### **SUUNTO RGBM ADAPTIVE DECOMPRESSION**

The SUUNTO RGBM algorithm adapts its predictions of both the effects of micro-bubble build-up and adverse dive profiles in the current dive series. It will also change these calculations according to the personal adjustment you select.

The pattern and speed of decompression at the surface is adjusted according to micro-bubble influence.

Also on repetitive dives adjustment may be applied to the maximum allowable nitrogen overpressure in each theoretical tissue group.

Depending on circumstances Suunto RGBM will adapt the decompression obligations by doing any or all of the following:

- Reducing no-decompression stop dive times
- Adding Mandatory Safety Stops
- Increasing decompression stop times
- Advising an extended surface interval (Diver Attention symbol).



## DIVER ATTENTION SYMBOL - ADVICE TO EXTEND SURFACE INTERVAL

Some patterns of diving cumulatively add a higher risk of DCI, e.g. dives with short surface intervals, repetitive dives deeper than earlier ones, multiple ascents, substantial multiday diving. When this is detected in addition to adapting the decompression algorithm Suunto RGBM will in some circumstances also advise, with the Diver Attention Symbol (review page 33) that the diver extend the surface interval

### 6.3. OXYGEN EXPOSURE

The oxygen exposure calculations are based on currently accepted exposure time limit tables and principles. In addition to this the dive computer uses several methods to conservatively estimate the oxygen exposure. These include for example:

- the displayed oxygen exposure calculations are rounded to the next higher whole percentage value
- for recreational scuba diving, the recommended upper limit of 1.4 bar  $PO_2$  is used as a default
- the CNS% limits up to 1.4 bar are based on 1991 NOAA Diving Manual limits, but the limits higher than 1.4 bar are significantly shortened
- the OTU monitoring is based on the long-term daily tolerance level and the recovery rate is reduced.

Oxygen related information displayed by the dive computer is also designed to ensure all warnings and displays in the appropriate phases of a dive. E.g. the following information will be shown before and during a dive, when the computer is set in Nitrox mode:

- the selected  $O_2\%$
- the color-coded OLF% bar graph for either CNS% or OTU%
- audible alarms are given and the OLF bar graph starts to blink when the 80% and 100% limits are exceeded
- the blinking of the bar graph stops, when the  $PO_2$  is below 0.5 bar
- audible alarms are given and the actual  $PO_2$  value blinks when it exceeds the preset limit
- in dive planning the maximum depth according to the  $O_2\%$  and maximum  $PO_2$  selected.

## 6.4. TECHNICAL SPECIFICATION

Dimensions and weight:

- Diameter: width 73mm [2.85in], length 165mm [6.50in].
- Thickness: 35mm [1.40in].
- Weight: 210g without hose [7.4 oz].

Depth Gauge:

- Temperature compensated pressure sensor.
- Salt water calibrated, in fresh water the readings are about 3% smaller (calibrated complying with prEN 13319).
- Maximum depth of operation: 80 m [262 ft] (complying with prEN 13319).
- Accuracy:  $\pm 1\%$  of full scale or better from 0 to 80 m [262 ft] at 20°C [68°F] (complying with prEN 13319).
- Depth display range: 0 ... 150 m [492 ft].
- Resolution: 0.1 m from 0 to 100 m [1 ft from 0 to 328 ft].

Cylinder Pressure Gauge

- Rated working pressure: 300 bar [4000 psi], maximum allowed pressure 360 bar [5000 psi].
- Resolution: 1 bar [10 psi].

Temperature display:

- Resolution: 1°C [1.5°F].
- Display range: -9 ... +50°C [-9 ... +122°F].
- Accuracy:  $\pm 2^\circ\text{C}$  [ $\pm 3.6^\circ\text{F}$ ] within 20 minutes of temperature change.

Calendar Clock:

- Accuracy:  $\pm 25$  s/month (at 20°C [68°F]).
- 12/24 h display.

Other displays:

- Dive time: 0 to 999 min, counting starts and stops at 1.2 m [4 ft] depth.
- Surface time: 0 to 99 h 59 min.
- Dive counter: 0 to 99 for repetitive dives.
- No-decompression time: 0 to 199 min (- - after 199).
- Ascent time: 0 to 99 min (- - after 99).
- Ceiling depths: 3.0 to 100 m [10 to 328 ft].
- Air time: 0 to 99 min (- - after 99).

Displays only in Nitrox mode:

- Oxygen%: 21 - 50.
- Oxygen partial pressure display: 1.2 - 1.6 bar depending on the limit setting.
- Oxygen Limit Fraction: 1 - 110% with 10% resolution (bar graph).

Logbook/Dive Profile Memory:

- Recording interval: 20 seconds (the recording interval can be set to 10s, 30s or 60s with the optional PC-interface unit and software), records the maximum depth of each interval.
- Memory capacity: approximately 36 hours of diving with 20 seconds recording interval.
- Depth accuracy: 0.3 m [1 ft].

Operating Conditions

- Normal altitude range: 0 to 3000 m [10000 ft] above sea level.
- Operating temperature: 0°C to 40°C [32°F to 104°F].
- Storage temperature: -20°C to +50°C [-4°F to +122°F].

It is recommended that the instrument be stored in a dry place at room temperature.

**NOTE! Do not leave the dive computer in direct sunlight!**

Tissue Calculation Model

- Suunto RGBM algorithm (developed by SUUNTO and Bruce R. Wienke, BS, MS and PhD).
- 9 tissue compartments.
- Tissue compartment halftimes: 2.5, 5, 10, 20, 40, 80, 120, 240 and 480 minutes (on gassing). The off gassing halftimes are slowed down.
- Reduced gradient (variable) "M" values based on diving habit and dive violations. The "M" values are tracked up to 100 hours after a dive.
- The EAN and oxygen exposure calculations are based on recommendations by R.W. Hamilton, PhD and currently accepted exposure time limit tables and principles.

## Battery

- One 3 V lithium battery: CR 2450 (K5597) and O-ring 1,78 mm x 31,47 mm 70 ShA (K5664).
- Battery storage time (shelf life): Up to three years.
- Replacement: Every two years or more often depending on dive activity.
- Life expectancy at 20°C [68°F]:
  - 0 dives/y -> 3 years
  - 100 dives/y -> 2 years
  - 400 dives/y -> 1 year

The following conditions have an affect on the expected battery lifetime:

- The length of the dives.
- The condition in which the unit is operated and stored (e.g. temperature/ cold conditions). Below 10°C [50°F] the expected battery lifetime is about 50-75% of that at 20°C [68°F].
- The use of the backlight and audible alarms.
- The quality of the battery (some lithium batteries may exhaust unexpectedly, which cannot be tested in advance).
- The time the dive computer has been stored until it gets to the customer. The battery is installed into the unit at the factory.

**NOTE! Low temperature or an internal oxidation of the battery may cause the battery warning even though the battery has enough capacity. In this case, the warning usually disappears when the Dive Mode is activated again.**

## 7. WARRANTY

**NOTE!** The warranty arrangements are different in different countries. The dive computer packaging contains information regarding the warranty benefits and requirements applicable to your purchase.

This Suunto dive computer 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:

The dive computer should be serviced or repaired only by an authorized Suunto dealer or distributor.

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 distributor 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 or distributor 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.

Battery replacement is not covered by this warranty.

This Instruction Manual should be kept with your dive computer.

## 8. GLOSSARY

<b>Air Time</b>	The amount of dive time remaining, based on a calculation of cylinder pressure and ambient pressure and present air consumption.
<b>Altitude dive</b>	A dive made at an elevation greater than 300 m [1000 ft] above sea level.
<b>Ascent rate</b>	The speed at which the diver ascends toward the surface.
<b>ASC RATE</b>	Abbreviation for ascent rate.
<b>Ascent time</b>	The minimum amount of time needed to reach the surface on a decompression stop dive.
<b>ASC TIME</b>	Abbreviation for ascent time.
<b>Ceiling</b>	On a decompression stop dive the shallowest depth to which a diver may ascend based on computer nitrogen load.
<b>Ceiling Zone</b>	On a decompression stop dive the zone between the ceiling and the ceiling plus 1.8 m [6 ft]. This depth range is displayed with the two arrows pointing toward each other (the "hour glass" icon).
<b>CNS</b>	Abbreviation for Central Nervous System toxicity.
<b>Central Nervous System Toxicity</b>	Toxicity caused by oxygen. Can cause a variety of neurological symptoms. The most important of which is an epileptic-like convulsion which can cause a diver to drown.
<b>CNS%</b>	Central Nervous System toxicity limit fraction. Also note Oxygen Limit Fraction
<b>Compartment</b>	See "Tissue group".
<b>DAN</b>	Divers Alert Network.
<b>DCI</b>	Abbreviation for decompression illness.
<b>Decompression</b>	Time spent at a decompression stop or range before surfacing, to allow absorbed nitrogen to escape naturally from tissues.
<b>Decompression range</b>	On a decompression stop dive the depth range, between the floor and ceiling, within which a diver must stop for some time during ascent.
<b>Decompression illness</b>	Any of a variety of maladies resulting either directly or indirectly from the formation of nitrogen bubbles in tissues or body fluids, as a result of inadequately controlled decompression. Commonly called "bends" or "DCI".

<b>Dive series</b>	A group of repetitive dives between which the dive computer indicates some nitrogen loading is present. When nitrogen loading reaches zero the dive computer deactivates.
<b>Dive time</b>	Elapsed time between leaving the surface to descend, and returning to the surface at the end of a dive.
<b><math>\Delta P</math></b>	Delta P, describing the Cylinder Pressure drop during the dive; difference in tank pressure between beginning and end of dive.
<b>EAD</b>	Abbreviation for equivalent air depth.
<b>EAN</b>	Abbreviation for enriched air nitrox.
<b>Enriched Air Nitrox</b>	Also called Nitrox or Enriched Air = EANx. Air that has some oxygen added. Standard mixes are EAN32 (NOAA Nitrox I = NN I) and EAN36 (NOAA Nitrox II = NN II).
<b>Equivalent Air Depth</b>	Nitrogen partial pressure equivalent table.
<b>Floor</b>	The deepest depth during a decompression stop dive at which decompression takes place.
<b>Half-time</b>	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.
<b>HP</b>	Abbreviation for high pressure (= cylinder pressure).
<b>Multi-level dive</b>	A single or repetitive dive that includes time spent at various depths and whose no-decompression limits are therefore not determined solely by the maximum depth attained.
<b>NITROX</b>	In sports diving refers to any mix with a higher fraction of oxygen than standard air.
<b>NOAA</b>	United States National Oceanic and Atmospheric Administration.
<b>No-decompression time</b>	The maximum amount of time a diver may remain at a particular depth without having to make decompression stops during the subsequent ascent.
<b>No-decompression dive</b>	Any dive which permits a direct, uninterrupted ascent to the surface at any time.
<b>NO DEC TIME</b>	Abbreviation for no-decompression time limit.
<b>OEA = EAN = EANx</b>	Abbreviation for Oxygen Enriched Air Nitrox.
<b>OLF</b>	Abbreviation for Oxygen Limit Fraction.
<b>OTU</b>	Abbreviation for Oxygen Tolerance Unit.

## **Oxygen Tolerance Unit**

Is used to measure the Whole-Body-Toxicity.

## **Oxygen Limit Fraction**

A term used by SUUNTO for the values displayed in the Oxygen Toxicity bargraph. The value is either the CNS% or the OTU%.

## **O<sub>2</sub>%**

Oxygen percentage or oxygen fraction in the breathing gas. Standard air has 21% oxygen.

## **Oxygen partial pressure**

Limits the maximum depth to which the used Nitrox mixture can safely be used. The maximum partial pressure limit for enriched air diving is 1.4 bar. The contingency partial pressure limit is 1.6 bar. Dives beyond this limit have the risk for immediate oxygen toxicity.

## **PO<sub>2</sub>**

Abbreviation for oxygen partial pressure.

## **RGBM**

Abbreviation for Reduced Gradient Bubble Model.

## **Reduced Gradient Bubble Model**

Modern algorithm for tracking both dissolved and free gas in divers.

## **Repetitive dive**

Any dive whose 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.

**Whole-Body Toxicity** Another form of oxygen toxicity, which is caused by prolonged exposure to high oxygen partial pressures. The most common symptoms are irritation in the lungs, a burning sensation in the chest, coughing and reduction of the vital capacity. Also called Pulmonary Oxygen Toxicity. See also OTU.









# ▲ SUUNTO

## TWO YEAR WARRANTY

This product is warranted to be free of defects in material and/or workmanship to the original owner for the above noted period (does not include battery life). Keep a copy of the original purchase receipt and make sure to get this warranty card stamped at the place of purchase. The warranty originates from the date of purchase.

All warranties are limited and are subject to the restrictions given in the instruction manual. This warranty does not cover the damage to the product resulting from improper usage, improper maintenance, neglect of care, alteration, improper battery replacement or unauthorized repair.

Model of  
Computer:

Serial  
number:

_____									
_____									
_____									
_____									

Date of purchase\_\_\_\_\_

Place of purchase/Store name\_\_\_\_\_

Store City\_\_\_\_\_ Store Country\_\_\_\_\_

Store stamp with date of purchase

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Name\_\_\_\_\_

Address\_\_\_\_\_

City\_\_\_\_\_ Country\_\_\_\_\_

Telephone\_\_\_\_\_ E-mail\_\_\_\_\_

Signature

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