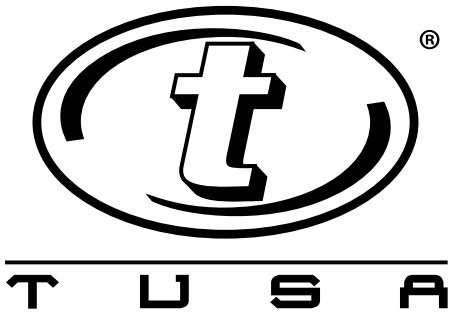
Owner's Manual

TUSA QUALITY



TUSA

ZEN
Owner's Manual Addendum

Information that follows amends that presented in the
ZEN Owner's Manual, Doc. No. 12-2931-r01.

PC INTERFACE

The special USB Interface Cable and CD described on pages 16 and 94 of the manual are components of the TUSA DataLog PC Interface system that is available as an optional accessory item that can be purchased from your authorized TUSA dealer.

The items are not supplied with the ZEN dive computer.

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Doc. No. 12-2999-r01 (7/28/09)

LIMITED TWO-YEAR WARRANTY
For details, refer to the Product Warranty Registration Card provided.

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ZEN Owner's Manual, Doc. No. 12-2931
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San Leandro, CA USA 94577

TRADEMARK NOTICE
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PATENT NOTICE
U.S. Patents have been issued, or applied for, to protect the following design features:
Data Sensing and Processing Device (U.S. Patent no. 4,882,678), Ascent Rate Indicator (U.S. Patent no. 5,156,055).

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

EN 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. The ZEN is designed to comply with this standard.

DECOMPRESSION MODEL
The program within the ZEN simulates the absorption of nitrogen into the body by using a mathematical model. This model is merely a way to apply a limited set of data to a large range of experiences. The ZEN dive computer model is based upon the latest research and experiments in decompression theory. **Still, using the ZEN, just as using the Navy (or other) No Decompression Tables, is no guarantee of avoiding decompression sickness, i.e. "the bends."** Every diver's physiology is different, and can even vary from day to day. No machine can predict how your body will react to a particular dive profile.

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NOTICE

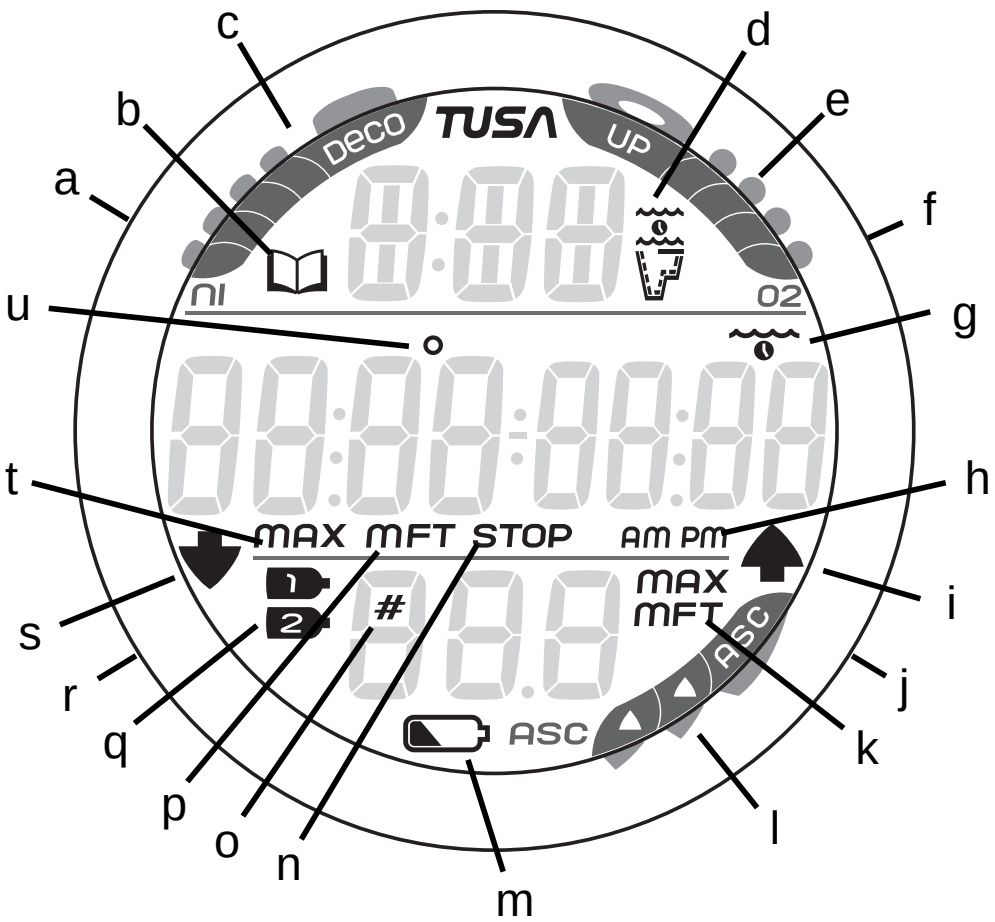
STORAGE and INITIAL ACTIVATION

ZEN watch style dive computers are placed in a Deep Sleep mode prior to being shipped from the factory. The intent is to extend storage life of the Battery for up to 7 years, before the unit is initially placed in service.

In this mode, Date and Time are updated as they normally would be. However, they are not displayed. Upon waking the ZEN up, the correct Date and USA Pacific Time will be displayed and it will be ready to operate with full functions.

To wake the ZEN up from Deep Sleep mode, simultaneously depress the upper/right (S) and lower/left (A) buttons for 2 to 3 seconds until the display comes full ON displaying the MAIN TIME screen, then release them.

△ **NOTE: Once the ZEN is brought out of the Deep Sleep mode, it can only be placed back in it by the factory.**



Components:

a. Mode (M) Button
b. Icon - Log Mode
c. NiBG (Nitrogen Bar Graph)
d. Icon - operating mode
   - Surface Interval
   - Plan NDC Time
   - No Deco Time Remaining
   - Deco Total Ascent Time
e. O2BG (O2 Bar Graph)
f. Select (S) Button
g. Icon - Stop Time Required
   - Elapsed Dive Time
h. Icon - Time of Day
i. Icon - Ascend
j. Light (L) Button
k. Icon - Depth/Max Depth
l. ASC (Ascent Rate Indicator)
m. Icon - Low Battery
n. Icon - Stop (Deep, Safety, Deco)
o. Icon - Dive #
p. Icon - Depth
q. Icon - Gas (mix)
r. Advance (A) Button
s. Icon - Descend
t. Icon - Max
u. Icon - Degrees

FULL LCD

FEATURES AND DISPLAYS

INTRODUCTION

Welcome to TUSA and thank you for choosing the ZEN !

It is extremely important that you read this Owner's Manual in sequence and understand it completely before attempting to use the ZEN as a dive computer.

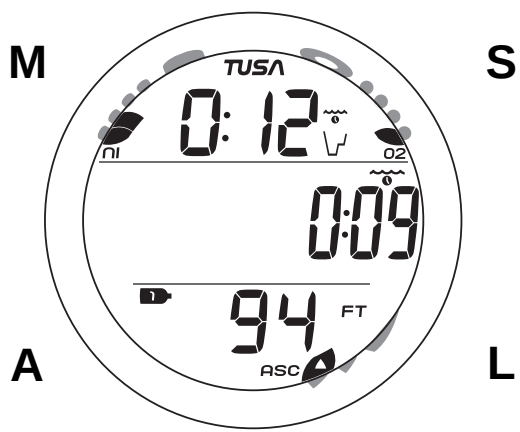
Remember that technology is no substitute for common sense, and a dive computer only provides the person using it with data, not the knowledge to use it.

CONTROL BUTTONS

The ZEN features four Control Buttons that allow you to select mode options and access specific information. They are also used to enter Settings, activate the Backlight, and acknowledge the Audible Alarm.

Throughout this manual they will be referred to as the M, S, L, and A buttons.

- Upper/Left - Mode (M) button
- Upper/Right - Select (S) button
- Lower/Right - Light (L) button
- Lower/Left - Advance (A) button



OPERATING MODE STRUCTURE

Unless it is operating in Dive Computer mode, the ZEN will be ON in the default WATCH MAIN TIME (home time) mode (Fig. 1), like a standard WATCH, until the Mode is changed.

The M button is used to access other modes that include Alternate Time, Countdown Timer, Chronograph (stop watch/lap timer), and Daily Alarm. It is also used to revert to the Local Default Time display and access dive computer modes.

The screens of the Main and Sub modes will remain on display until a button is pressed to access another screen or Mode, activate a sequence, or for 2 minutes if no button is pressed. The Chronograph remains on display as long as it is running unless another mode is accessed.

When Wet Activation is set On, the ZEN will enter selected Dive Mode upon descent to 5 FT (feet)/1.5 M (meters) for 5 seconds, regardless of what operating mode it is in.

⚠ WARNING: When Wet Activation is set OFF, the ZEN must be in Dive Surface Mode (NORM, GAUG, or FREE) prior to the first dive of a new series. Commencing a dive while in Watch modes will not activate Dive Mode unless Wet Activation is set ON.

Main Sequence
(while at home)
Main Time
Alternate Time
Countdown Timer
Chronograph
Daily Alarm

Alternate Sequence
(at a travel location)
Alternate Time
Main Time (home)
Countdown Timer
Chronograph
Daily Alarm

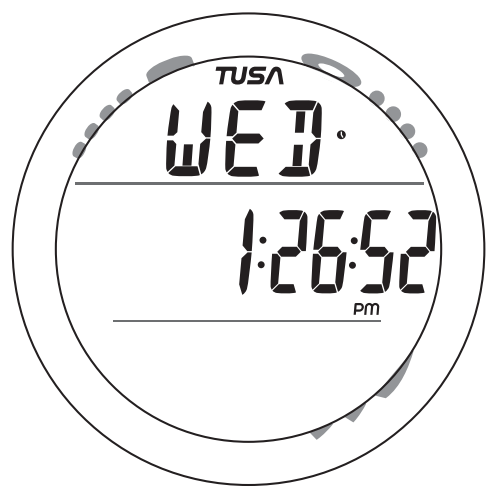


Fig. 1 - MAIN TIME

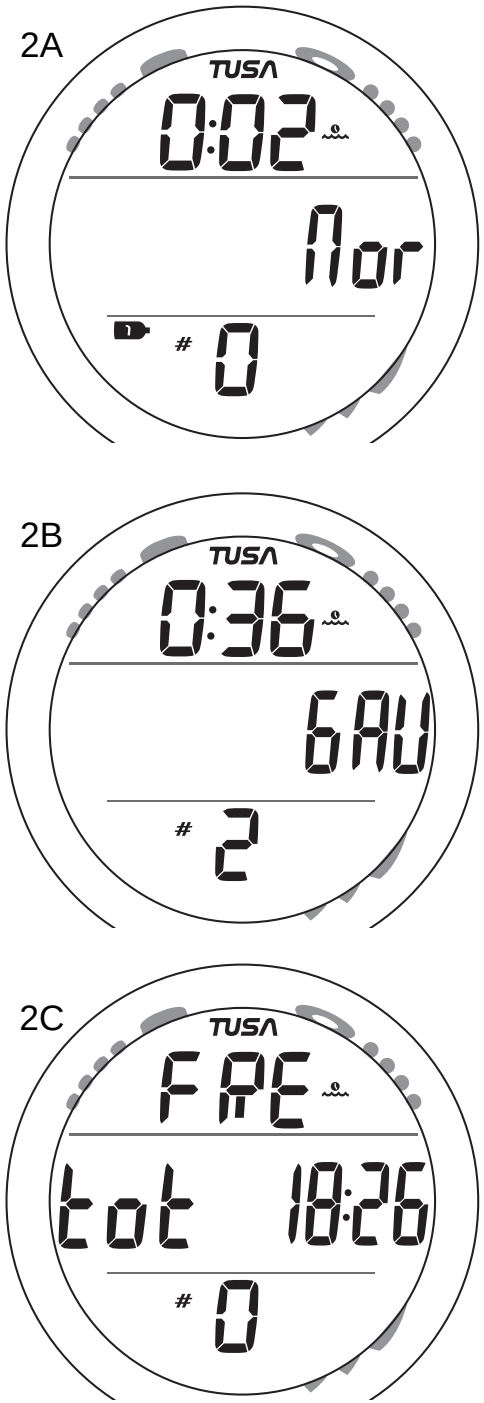


Fig. 2 - DC MODES

OPERATION AS A DIVE COMPUTER

The ZEN features 3 Dive Computer (DC) Operating Modes, NORM (Fig. 2A) which is used for Air and Nitrox dives, GAUG (Fig. 2B) used for dives in which Nitrogen-Oxygen calculations are not performed, and FREE (Fig. 2C) used for activities that do not use SCUBA.

Entering Settings and Plan Mode are only available in NORM SURF Mode which also allows access to Fly, Desat, Log, and History Modes.

GAUG Mode only allows access to Fly, Log, and History Modes.

FREE Mode only allows access to specific Free Modes.

AUDIBLE ALARM

Most warning situations that activate the Audible Alarm while operating in NORM or GAUG Mode cause the ZEN to emit 1 beep per second for 10 seconds, or until the situation is corrected, or it is acknowledged by momentarily pressing and releasing the S button (less than 2 seconds).

After being acknowledged and the situation corrected, the Alarm will sound again upon reentry into the warning situation, or entry into another type of warning situation.

FREE Dive Mode has its own set of Alarms which emit 3 short beeps either 1 or 3 times which cannot be acknowledged or set Off.

The Audible will not be active if the Alarm is Set OFF (a group A setting).

Situations that will activate the NORM/GAUG 10 second Alarm include -

- Descent deeper than the Max Depth Set Point selected.
- Dive Time Remaining at the Set Point selected.
- Elapsed Dive Time at the Set Point selected.
- High PO2 of 1.60 ATA or the Set Point selected.
- High O2 of 300 OTU (single or daily exposure).
- Nitrogen Bar Graph at the segment Set Point selected.
- NORM/GAUG Ascent Rate exceeds 60 FPM (18 MPM) when deeper than 60 FT (18 M), or 30 FPM (9 MPM) at 60 FT (18 M) and shallower.
- Entry into Decompression Mode (Deco).
- Conditional Violation (above a required Deco Stop Depth for less than 5 minutes).
- Delayed Violation (above a required Deco Stop Depth for more than 5 minutes).
- Delayed Violation (a Deco Stop Depth greater than 60 FT/18 M is required).
- Delayed Violation (Maximum Operating Depth of 330 FT/100 M is exceeded).
- A Gas Switch would expose the diver to PO2 greater than 1.60 ATA.
- Watch Daily Alarm reaches time set (disabled during Dive Modes).
- Watch Mode Countdown Timer reaches 0:00.

A single short beep (which cannot be disabled) is emitted for the following -

- Upon completion of a battery change.
- Change from Delayed to Full Violation 5 minutes after the dive.

3 short beeps (which cannot be disabled) are emitted for the following -

- NORM/GAUG Ascent Rate is 51 to 60 FPM (15.1 to 18 MPM) when deeper than 60 FT (18 M), or 26 to 30 FPM (7.5 to 9 MPM) at 60 FT (18 M) and shallower.
- FREE Dive Elapsed Dive Time Alarm (3 beeps every 30 seconds if set On).
- FREE Dive Depth Alarms 1/2/3 (set sequentially deeper) - each 3 beeps 3 times.
- FREE Dive NiBG Alarm (Caution zone, 4 segments) - 3 beeps 3 times.
- Entry into Deco during a FREE Dive (Permanent Violation) - 3 beeps 3 times.
- Free Dive Mode Countdown Timer reaches 0:00 - each 3 beeps 3 times.

During the following NORM Dive situations, the 10 second continuous tone will be followed by a 5 second steady beep that will not turn off when acknowledged -

- Ascending above a required Decompression Ceiling Stop Depth for more than 5 minutes (referred to as a Delayed Violation).
- Decompression requires a Ceiling Stop Depth of 70 FT/21 M or deeper.
- Being on the Surface for 5 minutes after a Conditional Violation (Permanent Violation).

BACKLIGHT

To activate the Backlight - press the **L** (lower/right) button.

- The Backlight will activate and illuminate the display for button depression time* plus the user set Duration time of 0, 5, or 10 seconds, for a maximum of 20 seconds. (*The Backlight will turn Off if the button is held depressed for more than 10 seconds.)
- Press the button again to activate as desired.

NOTE: Extensive use of the Backlight reduces estimated Battery life. Also, the Backlight does not operate during a Low Battery Condition or when the ZEN is connected to a PC.

POWER SUPPLY

The ZEN uses (1) 3 volt CR2430 Lithium Battery. Used as a Dive Computer, the battery should operate normally for 1 year or 300 dive hours if 2 dives are conducted during each dive period. The ZEN checks battery voltage every 2 minutes on the surface.

- If voltage of the ZEN decreases to the Warning level (2.75 volts), the Battery icon will appear on Surface display screens (fig. 3a) as an indication that the Battery should be changed prior to commencing a series of dives.
- If the ZEN's voltage decreases to the Alarm level (2.50 volts), the Battery icon will flash and the message CHG > bAt will scroll (Fig. 4a) for 5 seconds then operation will automatically revert to Main Time Mode. The ZEN would then only operate in Watch modes until the Battery becomes completely depleted.
- Low Battery conditions are not displayed during dives. If a Low Battery condition was not displayed prior to starting a Dive, and a Low Battery Condition occurs during the dive, there will be sufficient Battery power remaining to maintain operation for the remainder of that dive.

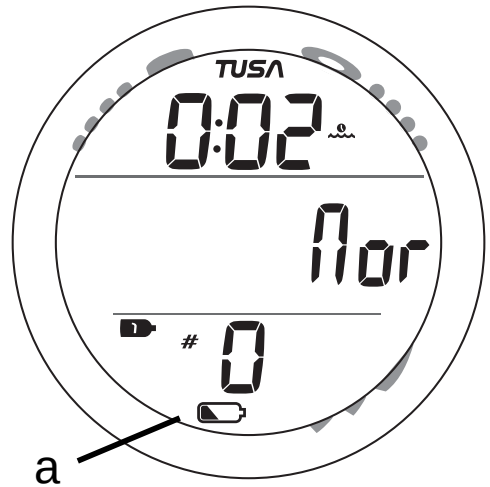


Fig. 3 - LOW BATTERY WARNING

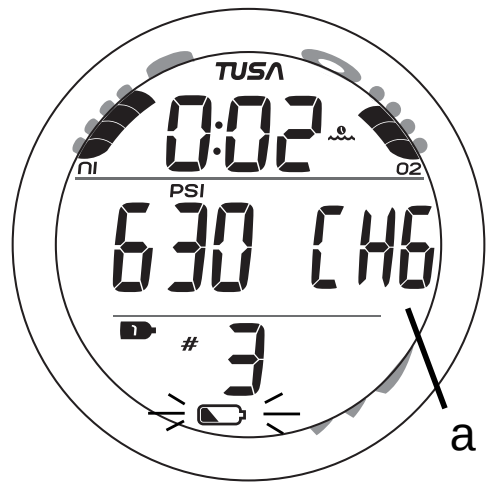


Fig. 4 - LOW BATTERY ALARM

PC INTERFACE

Interface with a PC is accomplished by connecting the ZEN to a PC USB Port using the USB Interface Cable provided. The same Cable is used for Upload and Download.

The software program is on the CD provided, together with a USB Driver. The program's Help serves as the user manual and can be printed for personal use. The Settings Upload program is used to check the ZEN's existing Settings and for entering Time, Alarm, and Dive Computer settings into the ZEN. The Data Download program is used to retrieve Data that was sampled during dives and stored in the ZEN's memory.

The ZEN checks for an External Access request once every second while in the Watch Main Time. Checks are not made if the unit is wet. For a connection to be made, the Interface Cable is clipped onto the ZEN's Data Port and plugged into a PC USB Port. To establish the connection, the PC program must be running. When the connection is made, a PC screen appears on the ZEN displaying the graphic PC and a 2 minute count-down or until completion of the Upload or Download operation.

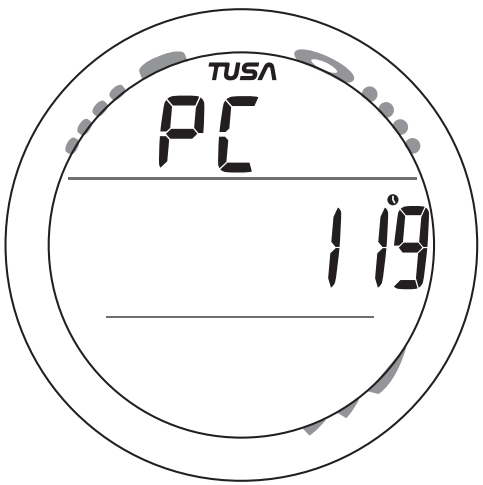


Fig. 5 - PC
(during upload/download)

- The ZEN reverts to the Watch Main Time screen after completion of the Upload or Download operation, or after the 2 minute countdown.

WATCH
FEATURES AND DISPLAYS

Fig. 6 - MAIN TIME

LOCAL DEFAULT TIME

Watch Main Time (Fig. 6) is the current Time at your home location and is normally selected as the Local Default Time.

The normal Watch screen sequence accessed with momentary presses (< 2 sec each time) of the **M** (upper/left) button is -

Main Time >> Alternate Time >> Countdown Timer >> Chronograph >> Daily Alarm

Watch Alternate Time (Fig. *7*), identified by the graphic ALt, set by Hour Differential, is the current Time at a remote travel location. Upon arrival at the location, Alternate Time can be interchanged with Main Time to make it the Local Default Time while visiting the travel location.

Fig. 7 - ALTERNATE TIME

The M button will then access the screens in this sequence -

Alternate Time >> Main Time >> Countdown Timer >> Chronograph >> Daily Alarm

While viewing Alternate Time, depressing the S button for 2 seconds will replace Main Time with Alternate Time that will then become the Local Default Time until changed.

While viewing any of the Watch Mode displays, depressing the M button for 2 seconds, or if no button is pressed for 2 minutes, operation will revert to the Watch Default Time screen selected.

MAIN TIME, information includes (Fig. 8):

> Nitrogen Bar Graph, if any after NORM/FREE dives.
> O2 Bar Graph, if any after NORM Nitrox dives.
> Daily Alarm icon (clock), if it is set On (Fig. 8a)
> Day of the Week graphic MON (or TUE, WED, THU, FRI, SAT, SUN), or the graphic WET (if the unit is wet).
> Time of Day (hr:min:sec) with AM (or PM) icon if 12 Hour Format, no icon if 24 Hour.
> Battery icon, if a Low Battery Condition exists.

- Pressing and releasing the M button momentarily and repeatedly (< 2 sec each time) will step through the Main Watch Modes.
- Depressing the M button for 2 seconds will access Dive Computer Surface Mode (NORM, GAUG, or FREE).
- Pressing and releasing the A button momentarily (< 2 sec) will access NORM/GAUG Log and History Modes.
- Depressing the A button for 2 seconds will access the ALT screen (Elev, Temp, Date) for 5 seconds.
- Pressing and releasing the S button momentarily (< 2 sec) will silence and acknowledge the Daily Alarm.
- Pressing the L button will activate the Backlight.
- Depressing the A and S buttons simultaneously for 2 seconds will access the SET TIME Menu.

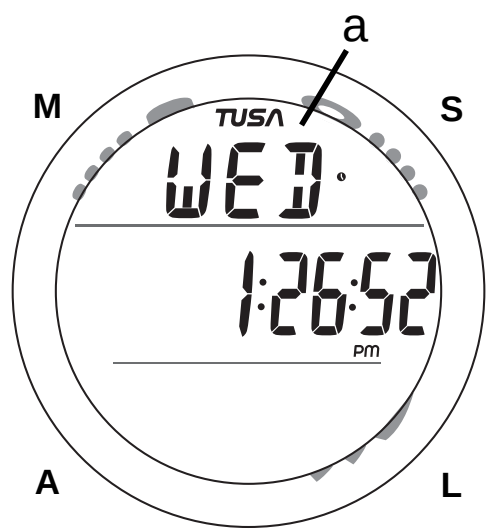


Fig. 8 - MAIN TIME

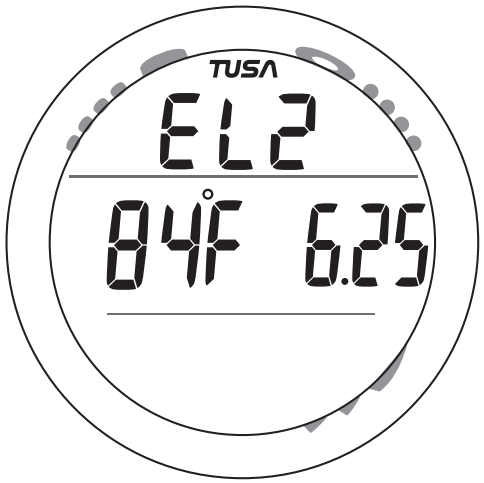


Fig. 9 - WATCH ALT

WATCH ALT DISPLAY, information includes (Fig. 9):

> Altitude graphic (EL2 to EL7), if above 3000 feet (915 meters), blank if below.
> Temperature with degrees icon and graphic F (or C)
> Date (Month.Day or Day.Month).

- After 5 seconds, operation will revert to the Watch Default Time screen.
- Pressing and releasing the A button momentarily (< 2 sec) will revert to the Watch Default Time screen.
- Pressing the L button will activate the Backlight.

SET MAIN TIME

This mode allows the Date and Time of Day to be set which will also serve as the basis for Watch Alternate Time values.

> Set screens >>> Date Format >> Hour Format >> Time >> Date
> Day of the Week is set automatically when the Date is set.
> When the ZEN is operating in Dive Computer mode, Date is displayed only to identify dives when they are accessed in the LOG Mode

- Pressing the A button repeatedly (< 2 sec each time) will step through the menu items, bypassing those that don't require setting.
- Depressing the M button at any time for 2 seconds and if no button is pressed during a period of 2 minutes, operation will revert to the Watch Default Time screen.

Set Date Format

While viewing the Watch Default Time screen, depressing the A and S buttons simultaneously for 2 seconds will access the Set Date Format screen displaying the graphic **dAtE** and the Set Point **M - D** or **D - M** flashing (Fig. 10).

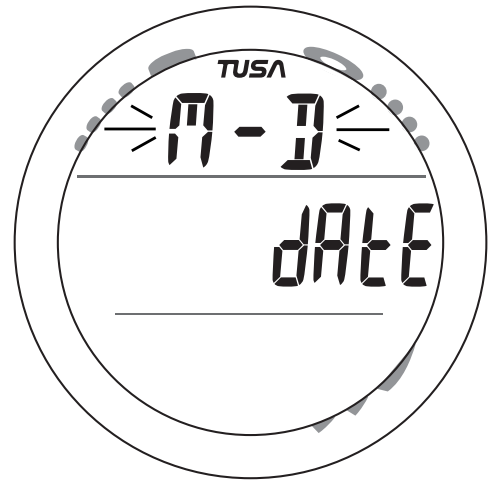


Fig. 10 - SET DATE FORMAT

> M - D means Month will be displayed to the left of Day.
> D - M means Day will be displayed to the left of Month.

- Pressing and releasing the S button momentarily (< 2 sec) will toggle between M - D and D - M.
- Pressing and releasing the A button momentarily (< 2 sec) will save the Set Point and access the Set Hour Format screen with the Set Point flashing.

Set Hour Format

The Set Hour Format screen displays the graphic **HR** with the clock icon and the Set Point **12** or **24** flashing (Fig. 11).

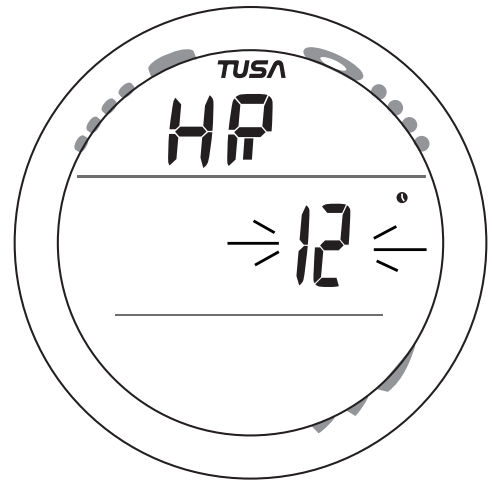


Fig. 11 - SET HOUR FORMAT

- Pressing and releasing the S button momentarily (< 2 sec) will toggle between 12 and 24.
- Pressing and releasing the A button momentarily (< 2 sec) will save the Set Point and access the Set Time screen.

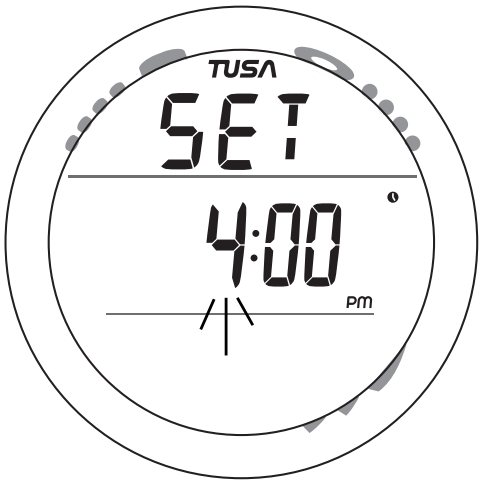


Fig. 12 - SET TIME

Set Time

Upon access, the Set Time screen displays the graphic **SET** with the clock icon and the Time of Day (hr:min) with the Hour Set Point flashing (Fig. 12).

- Depressing the S button while the Hour Set Point is flashing will scroll upward through the Set Points in 1 Hour increments at a rate of 8 per second.
- Pressing and releasing the S button momentarily and repeatedly (< 2 sec each time) will step upward through the Set Points one at a time.
- Pressing and releasing the A button momentarily (< 2 sec) will save the Hour Set Point and the Minute digits will flash.
- Depressing the S button will scroll upward through the Minute Set Points in 1 minute increments at a rate of 8 per second.
- Pressing and releasing the A button momentarily (< 2 sec) will save the Minute Set Point and access the Set Date screen.

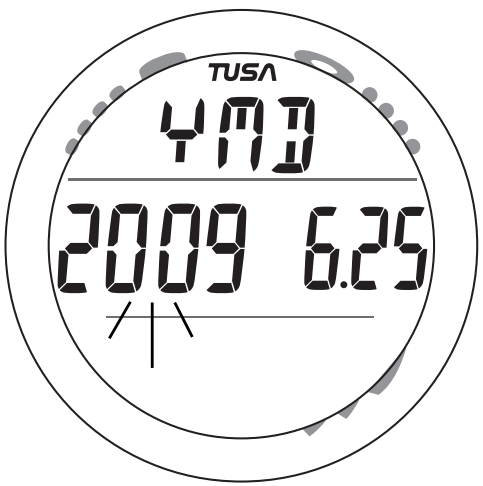


Fig. 13 - SET DATE

Set Date

Upon access, the Set Date screen displays the graphic **YMD** (meaning Date is arranged as Year Month.Day) or **YDM** (meaning Date is arranged as Year Day.Month) with the Year Set Point flashing (Fig. 13).

- Depressing the S button while the Year Set Point is flashing will scroll upward through the Set Points in 1 Year increments at a rate of 8 per second from 2008 to 2051 (with leap year corrections).
- Pressing and releasing the S button momentarily and repeatedly (< 2 sec each time) will step upward through the Year Set Points one at a time.
- Pressing and releasing the A button momentarily (< 2 sec) will save the Year Set Point and the Month digits will flash, regardless of their location on the display.
- Depressing the S button will scroll upward through the Month Set Points in 1 month increments at a rate of 8 per second.
- Pressing and releasing the S button momentarily and repeatedly (< 2 sec each time) will step upward through the Month Set Points one at a time.
- Pressing and releasing the A button momentarily (< 2 sec) will save the Month Set Point and the Day digits will flash, regardless of their location on the display.
- Depressing the S button will scroll upward through the Day Set Points in 1 Day increments at a rate of 8 per second.
- Pressing and releasing the S button momentarily and repeatedly (< 2 sec each time) will step upward through the Day Set Points one at a time.
- Pressing and releasing the A button momentarily (< 2 sec) will save the Date setting and revert to the Watch Default Time screen.

> Year will not be displayed in any mode other than Set Date.

ALTERNATE TIME

- Pressing and releasing the M button momentarily (< 2 sec) while the Watch Default Time screen is displayed will access the Watch Alternate Time screen.

Information provided includes (Fig. 14):

> Nitrogen Bar Graph, if any after NORM/FREE dives.
> O2 Bar Graph, if any after NORM Nitrox dives.
> Day of the Week graphic MON (or TUE, WED, THU, FRI, SAT, SUN).
> Clock icon, if the Daily Alarm is set On.
> Time of Day (hr:min:sec) with AM (or PM) icon.
> Graphic ALt, indicating Time as Alternate (remote).
> Battery icon, if a Low Battery condition exists.

Fig. 14 - WATCH ALT TIME

- Pressing and releasing the M button momentarily (< 2 sec) will access the Watch CDT (Countdown Timer).
- Pressing and releasing the S button (< 2 sec) will silence and acknowledge the Daily Alarm.
- Depressing the S button for 2 seconds will interchange ALT Time with Main Time making ALT Time the local Watch Default Time screen.
- Pressing the L button will activate the Backlight.
- Depressing the M button for 2 seconds will revert to the Watch Default Time screen.
- Depressing the A and S buttons simultaneously for 2 seconds will access Set ALT Time .

SET WATCH ALT TIME

- ALT TIME can be set OFF, or to an Hour based numeric time Differential ranging from + 1 through +23 through - 23 through -1 (hours).
- Once the Differential is selected and saved, values of ALT Time will be based upon the Main Time Set Points plus/ minus the Differential.

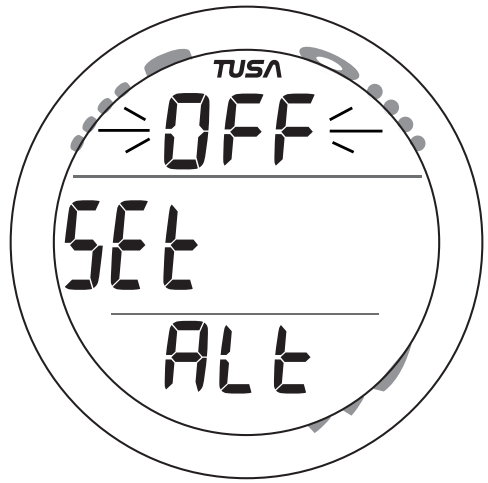


Fig. 15A - SET ALT TIME

Information displayed includes:

> Set Point graphic OFF (Fig. 15A) or numeric (Fig. 15B), flashing.

> Graphics SEt and ALt.

- Depressing the S button will scroll through the Set Points in increments of 1 Hour at a rate of 8 per second.
- Pressing and releasing the S button momentarily and repeatedly (< 2 sec each time) will step upward through the Set Points one at a time.
- Pressing and releasing the A button momentarily (< 2 sec) will save the Set Point and revert to the Watch ALT Time screen.
- Depressing the M button for 2 seconds will revert to the Watch Default Time screen.
- If no button is pressed during a period of 2 minutes, operation will revert to the Watch Default Time screen.

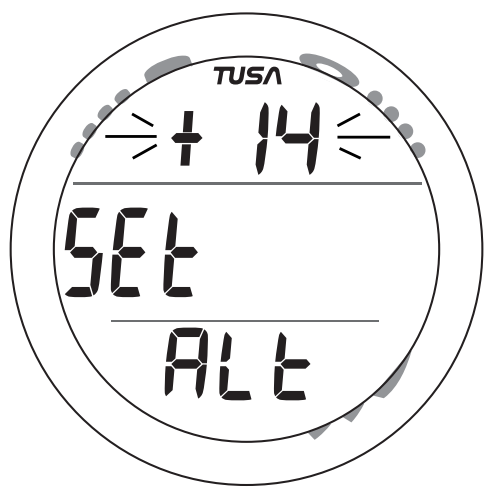


Fig. 15B - SET ALT TIME

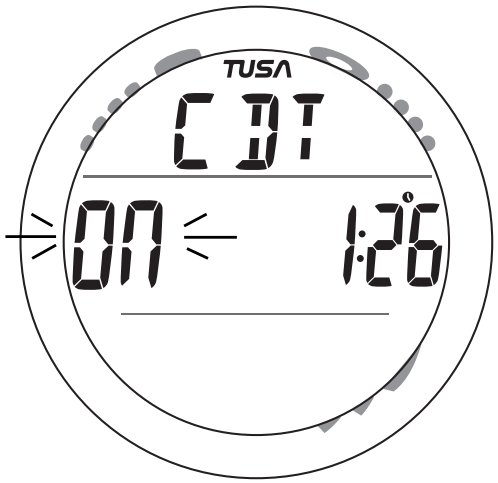


Fig. 16A - CDT STATUS (running)

WATCH CDT (COUNTDOWN TIMER)

Pressing and releasing the M button momentarily 2 times (< 2 sec each time) while the Watch Default Time screen is displayed will access the Watch CDT status screen, displaying the remaining Countdown Time (hr:min) if running (Fig. 16A), or OFF flashing and the previously set Countdown Time if the set Countdown started and has ended, or OFF (solid) and 0:00 if no time was previously set (Fig. 16B).

Once set ON, a Countdown will run in the background until it counts down to 0:00, or it is set OFF, or a Dive is made at which time it will default to OFF and the value previously set.

When a set Countdown Time reaches 0:00, the Audible Alarm will sound.

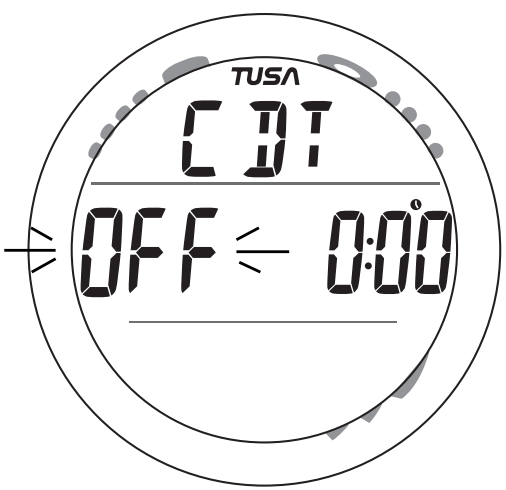


Fig. 16B - CDT STATUS (no time set)

- Pressing and releasing the S button (< 2 seconds) will toggle between ON and OFF. Note that a toggle to ON will Start the Timer if a Time has been set.
- Depressing the A and S buttons simultaneously for 2 seconds will access Set Watch CDT.
- Pressing the L button will activate the Backlight.
- Depressing the M button for 2 seconds will revert to the Watch Default Time screen.
- If no button is pressed during a period of 2 minutes, operation will revert to the Watch Default Time screen.

Set Watch CDT

Upon access, the Set CDT screen displays the graphics **CDT** and **SEt** and the CDT (hr:min) with clock icon, the Hour Set Point flashing (Fig. 17A).

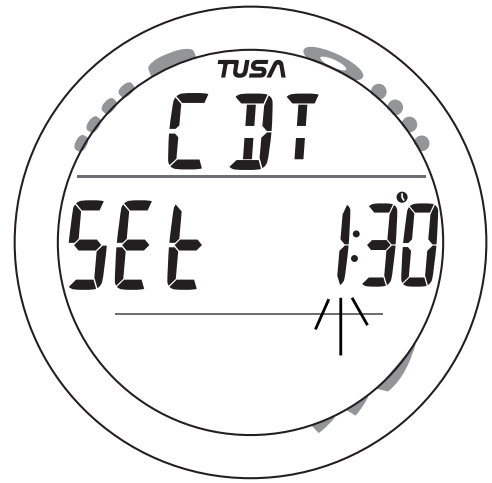


Fig. 17A - SET WATCH CDT

- Depressing the S button will scroll upward through the Hour Set Points in 1 hour increments at a rate of 8 per second.
- Pressing and releasing the S button momentarily and repeatedly (< 2 sec each time) will step upward through the set Points one at a time.
- Pressing and releasing the A button momentarily (< 2 sec) will save the Hour Set Point and the Minutes digits will flash.
- Depressing the S button will scroll upward through the Minute Set Points in 1 minute increments at a rate of 8 per second.
- Pressing and releasing the A button momentarily (< 2 sec) will save the Minutes Set Point and revert to the CDT Status screen with the graphic OFF (flashing) in place of the graphic SEt (Fig. 17B).
- Pressing and releasing the S button momentarily (< 2 sec) will toggle from OFF to ON and Start the Timer.
- Depressing the M button for 2 seconds will revert to the Watch Default Time screen.
- If no button is pressed during a period of 2 minutes, operation will revert to the Watch Default Time screen.

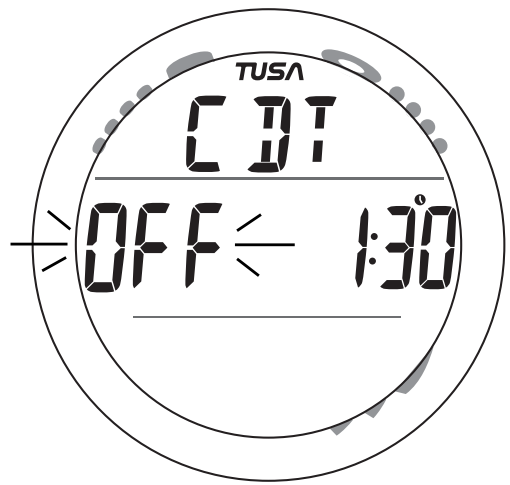


Fig. 17B - CDT STATUS
(set, ready)

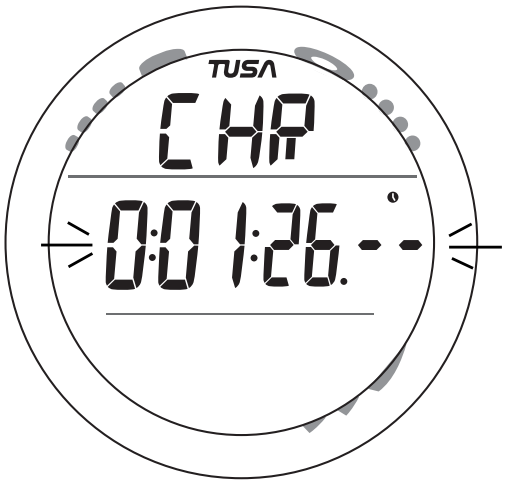


Fig. 18 - CHRONOGRAPH

Fig. 19 - LAP RECALL

CHRONOGRAPH (Stop Watch/Lap Timer)

- Pressing and releasing the M button momentarily 3 times (< 2 sec each time) while the Watch Default Time screen is displayed will access the Chronograph displaying the elapsed time if previously started or 0:00:00.00 (hr:min:sec.1/100th sec), flashing.
- Pressing and releasing the S button momentarily (< 2 sec) will Start the Timer which will begin counting up from 0:00:00.00 to 9:59:59.99 (hr:min:sec.1/100th sec) in increments of .01 (1/100th sec).
- During the first 4 seconds the 1/100th second values will be displayed after which 2 dashes (. - -) will be displayed (Fig. 18). The 1/100th values will be recorded and displayed when Laps are frozen and when later recalled.
- Subsequent pressing and releasing of the S button (< 2 sec each time) will freeze Lap Times (LAP1 through LAP9). After 9 Laps are recorded, additional Laps will replace LAP9, shift the others to lower LAP numbers, while discarding LAP1.
- If the Timer reaches 9:59:59.99 hr:min:sec.1/100 sec), it will stop and save that number as a LAP. Subsequent presses of the S button will then have no effect.
- Pressing and releasing the A button momentarily (< 2 sec) will Stop the Timer and Recall LAP #1, displaying the graphic LAP and Lap Time with the Lap # (flashing). Repeat presses will display other Laps/Times (Fig. 19).

- Depressing the A button for 2 seconds will Stop the Timer and Reset the Time to 0:00:00.00 (flashing).
- Pressing and releasing the M button momentarily (< 2 sec) will access the Daily Alarm Status screen.
- Depressing the M button for 2 seconds will revert to the Watch Default Time screen.

While the Chrono is running, it will remain on the screen until a button operation is performed. If another screen is accessed, it will then continue to run in the background. Upon descending on a dive, Chrono operation will be terminated and reset to 0:00:00.0.

DAILY ALARM

When set ON, the Daily Alarm will sound the Audible Alarm at the Time set every day.

- Pressing and releasing the M button momentarily 4 times (< 2 sec each time) while viewing the Watch Default Time screen will access the Daily Alarm Status screen.

<u>Information provided includes (Fig. 20):</u>

> Graphic AL and clock (alarm) icon
> Graphic ON (or OFF), flashing.
> Alarm Time Set Point (hr:min) with AM (or PM) icon.

- Pressing and releasing the S button momentarily (< 2 sec) will toggle between ON and OFF.
- Upon being toggled to ON, the Alarm will be set to sound every day at the Time displayed.

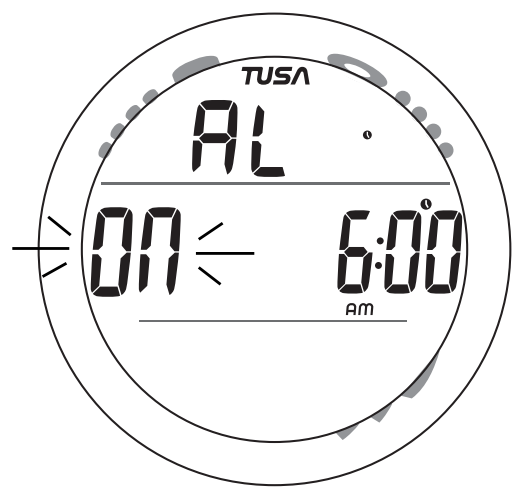


Fig. 20 - DAILY ALARM

- Depressing the A and S buttons simultaneously for 2 seconds will access Set Daily Alarm.
- Depressing the M button for 2 seconds will revert to the Watch Default Time screen.
- If no button is pressed during a period of 2 minutes, operation will revert to the Watch Default Time screen.

SET DAILY ALARM, information provided includes (Fig. 21):

> Graphics AL and SEt with clock (alarm) icon.

> Alarm Time previously set (hr:min) with the Hour Set Point flashing.

- Depressing the S button while the Hour digits are flashing will scroll upward through the Set Points in 1 Hour increments at a rate of 8 per second.
- Pressing and releasing the S button momentarily (< 2 sec) will step upward through the Set Points one at a time.
- Pressing and releasing the A button momentarily (< 2 sec) will save the Hour Set Point and the Minute digits will flash.

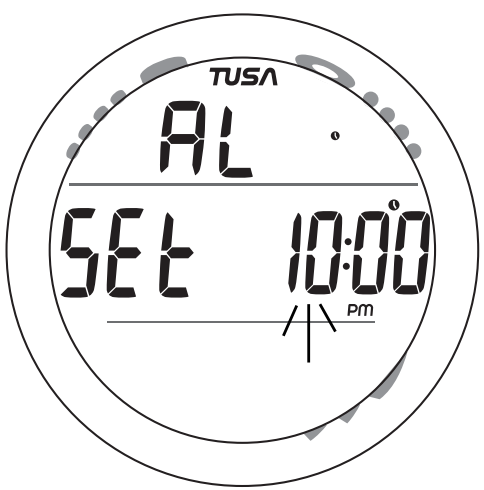


Fig. 21 - SET DAILY ALARM

- Depressing the S button while the Minute digits are flashing will scroll upward through the Set Points in 1 Minute increments at a rate of 8 per second.
- Pressing and releasing the S button momentarily (< 2 sec) will step upward through the Set Points one at a time.
- Pressing and releasing the A button momentarily (< 2 sec) will save the Set Point and revert to the Daily Alarm Status screen indicated by the graphic ON (or OFF) flashing.
- Depressing and holding the M button for 2 seconds will revert to the Watch Default Time screen.

DIVE COMPUTER FEATURES AND DISPLAYS

BAR GRAPHS

The ZEN features 3 Bar Graphs >> NiBG, O2BG, and ASC.

NiBG (Nitrogen Loading Bar Graph)

The NiBG (Fig. 22a) represents tissue loading of nitrogen, showing your relative no decompression or decompression status. As your depth and elapsed dive time increase, segments will add to the NiBG, and as you ascend to shallower depths, the segments will recede, indicating that additional no decompression time is allowed for multilevel diving.

The Nitrogen Loading Bar Graph monitors 12 different nitrogen compartments simultaneously and displays the one that is in control of your dive. It is divided into a No Decompression (normal) zone, a Caution zone (also No Decompression), and a Decompression (danger) zone.

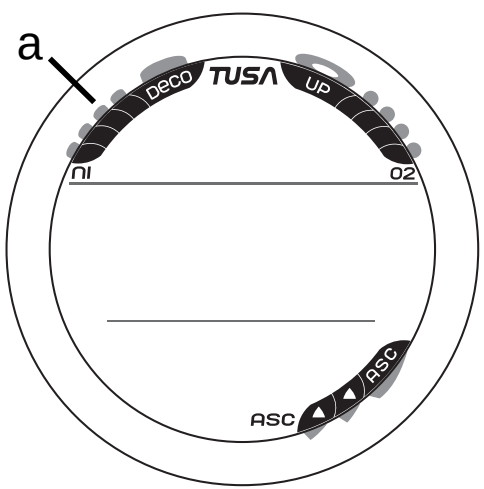


Fig. 22 - NiBG

While you cannot provide a guarantee against the occurrence of decompression sickness, you may choose your own personal zone of caution based upon age, physique, excessive weight, etc., to reduce the statistical risk.

△ NOTE: Displays associated with oxygen and the O2BG will only appear if FO2 has been set at a value other than 'Air' (e.g., a numerical value).

Oxygen Bar Graph (O2BG)

The O2BG (Fig. 23a) represents oxygen accumulation, showing the maximum of either per dive accumulated oxygen, or 24 hour period accumulated oxygen.

As your oxygen exposure (accumulation) increases during the dive, segments will add to the O2BG, and as saturation decreases, it will begin to recede, indicating that additional exposure is allowed for that dive and 24 hour period.

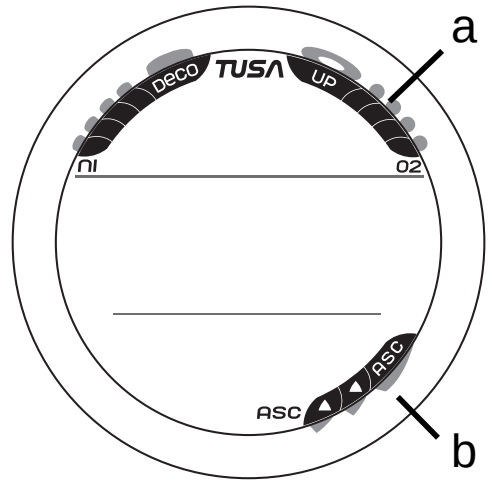


Fig. 23 - O2BG & ASC

Ascent Rate Indicator (ASC)

The ASC (Fig. 23b) provides a visual representation of ascent speed (i.e., an ascent speedometer).

The segments of the ASC represent two sets of speeds which change at a reference Depth of 60 FT (18 M). Refer to the chart for segment values.

⚠ WARNING: At depths greater than 60 FT (18 M), ascent rates should not exceed 60 feet per minute (18 meters per minute). At depths of 60 FT (18 M) and shallower, ascent rates should not exceed 30 feet per minute (9 meters per minute).

ASC values

Deeper than 60 FT (18 M)

Segments Displayed	Ascent Rate = FPM	MPM
0	0 - 20	0 - 6
1	21-50	6.5-15
2	51-60	15.5-18
3	>60	>18

60 FT (18 M) & Shallower

Segments Displayed	Ascent Rate = FPM	MPM
0	0 - 10	0 - 3
1	11-25	3.5-7.5
2	26-30	8-9
3	>30	>9

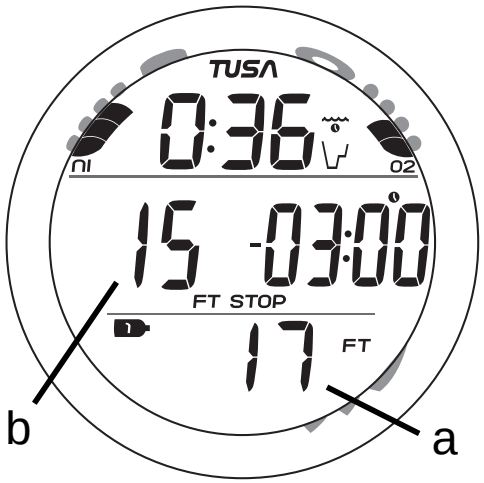


Fig. 24 - DIVE MAIN

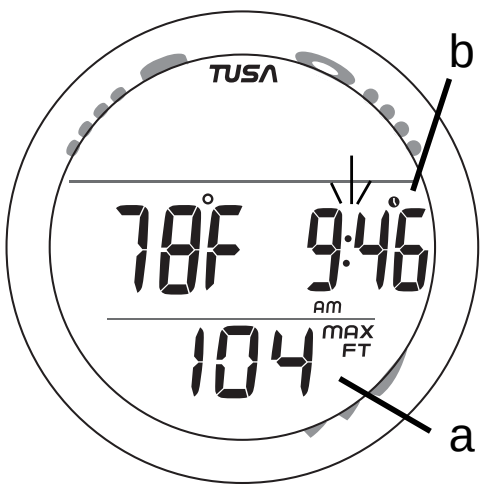


Fig. 25 - DIVE ALTERNATE

ALPHA/NUMERIC DISPLAYS

Each numeric and graphic display represents a unique piece of information. It is imperative that you understand the formats, ranges, and values of the information represented to avoid any possible misunderstanding that could result in error.

Depth

Current Depth is displayed on the Main screens (Fig. 24a) with the FT (or M) icon from 0 to 330 FT (99.9 M) in increments of 1 FT (.1 M).

Stop Depths (Deep, Safety, and Deco) are also displayed on the Main screens (Fig. 24b) when applicable.

Max Depth is displayed on Alternate screens (Fig. 25a) with the MAX and FT (or M) icons from 0 to 330 FT (99.9 M) in increments of 1 FT (.1 M).

Time and Date

Most Time displays like Time of Day (Fig. 25b) are shown in hour:minute format (i.e., 9:46 represents 9 hours and 46 minutes, not 946 minutes!). The colon that separates hr:min (min;sec) blinks once per second when the display is indicating real time (e.g., Time of Day, Elapsed Dive Time).

When Times are calculated projections such as NDC and Elapsed Dive Time (Fig. 26a/b), the colon is solid (non blinking).

FREE Dive Mode displays Times in minute:second format.

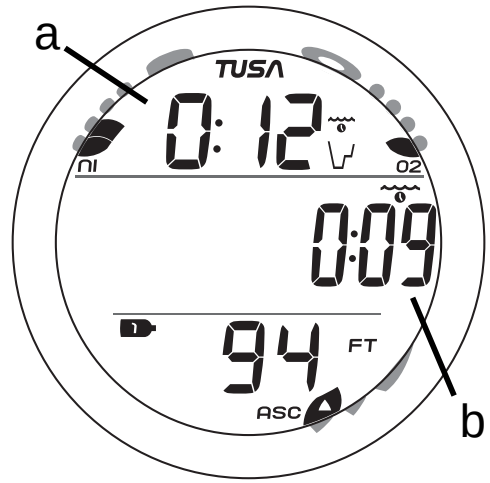


Fig. 26 - TIMES (DIVE)

Temperature and Date

Temperature and Date can be viewed by accessing an Alternate Display while on the surface in Watch or Dive Computer mode (Fig. 27a/b).

The positions of Month and Day are determined by the setting entered for Date Format, see page 21.

During dives, Temperature can be viewed on Alternate screens, Date is not displayed.

Altitude

When above the sea level range, which extends up to 3,000 feet (915 meters), Altitude is displayed on the Watch and Dive Computer Surface mode Alternate screens as EL (Elevation Level) from 2 up to 7 (Fig. 27c).

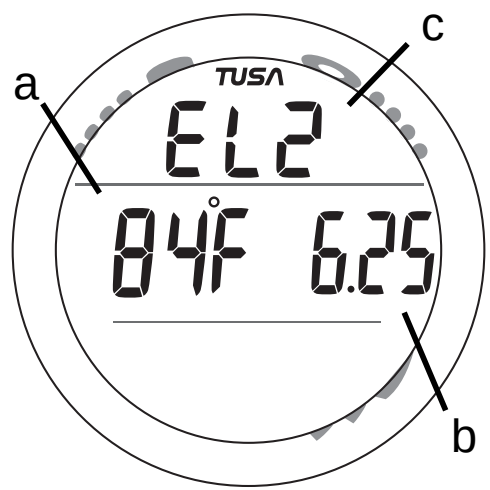


Fig. 27 - ELEV, TEMP, DATE

EL2 = 3,001 to 5,000 feet (916 to 1,525 meters)
EL3 = 5,001 to 7,000 feet (1,526 to 2,135 meters)
EL4 = 7,001 to 9,000 feet (2,136 to 2,745 meters)
EL5 = 9,001 to 11,000 feet (2,746 to 3,355 meters)
EL6 = 11,001 to 13,000 feet (3,356 to 3,965 meters)
EL7 = 13,001 to 14,000 feet (3,966 to 4,270 meters)

⚠ WARNINGS AND SAFETY RECOMMENDATIONS

- **It should not be considered that the capabilities built into the ZEN provide an implied approval or consent from TUSA for individuals to exceed the defined limits for recreational diving, as agreed on by all internationally recognized training agencies.**

- **The oxygen features of the ZEN are intended for use by recreational divers trained for Nitrox diving by an instructor certified by a recognized training agency to teach diving with Nitrox.**

- **Conducting repetitive dives using enriched nitrogen-oxygen mixtures can lead to oxygen buildup, reducing oxygen tolerance while increasing the risk of pulmonary oxygen toxicity.**

- **The ZEN provides information based upon a personal dive profile, and therefore must not be shared between divers. It is impossible for two divers to stay precisely together underwater, and your computer's dive profile tracking of previous dives will be pertinent to you only. Nitrogen and oxygen loading of a second user may be significantly different and swapping dive computers could lead to inaccurate and dangerous predictions of decompression and oxygen accumulation status.**

DIVE COMPUTER SURFACE MODES

DIVE COMPUTER (DC) OPERATING MODES

The ZEN features 3 selectable DC Operating Modes -

- NORM >> for Normal Air or Nitrox SCUBA dives
- GAUG >> for SCUBA dives with no Nitrogen/Oxygen calculations.
- FREE >> for dives with no SCUBA

SURFACE MODE

Depressing the M button for 2 seconds while the Watch Default Time screen is displayed will access the NORM, GAUG, or FREE Surface Main screen (whichever was selected).

If no dive has been taken within the past 24 hours, the NORM Surface Main screen will appear as the default display indicated by the graphic **Nor** (Fig. 28).

The Gauge and Free Surface Main screens can be accessed by subsequent 2 second presses of the M button. Their graphics (GAU, FRE) will flash indicating that they can be selected as the Operating Dive Mode.

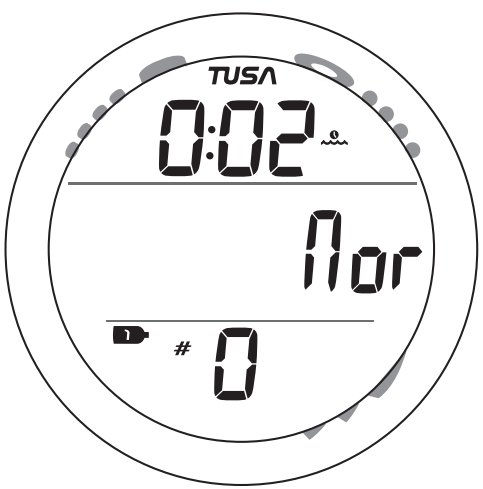


Fig. 28 - NORM SURF MAIN

> To select a Mode for diving, press/release the M button while that graphic is flashing. When the graphic becomes solid, that Mode is selected for the type of dives to be conducted.

- The operating mode selected will remain on display for 2 hours until a dive is made or another operating mode is selected.
- If a dive has been conducted within the past 24 hours, the Surface Main screen for that operating mode will be displayed.

At any time while operating in Surface Modes, the ZEN will enter Dive Mode upon descent to 5 FT (1.5 M).

- During the 2 hour pre dive surface period, if the M button is pressed/released to access Watch Mode, the DC Surface Mode must again be accessed prior to the first dive of a series (if Wet Activation is set OFF).
- When Wet Activation is set ON, the Wet Contacts will activate the selected Dive Mode regardless of what Mode the ZEN is operating in at the time of the descent.

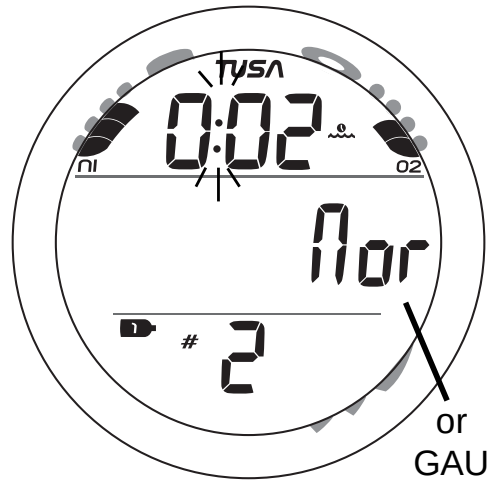


Fig. 29A - SURFACE MAIN
(2 min after NORM dive)

The ZEN will enter Post Dive Surface Mode following a dive upon ascent to 2 FT (0.6 M) for 1 second. The Surface Interval Time colon will flash during the first 10 minutes after a NORM or GAUG dive (Fig. 29A), or 1 minute after a FREE dive (Fig. 29B).

During the first 10 minutes after a dive, the Surface Main screen for that operating mode remains on display. Watch Default Time can be viewed for 5 seconds during that period by pressing and releasing the M button momentarily (< 2 sec).

When the 10 minute Surface Time has elapsed, the Watch Default Time screen will replace the DC Surface Main screen which can then be accessed by pressing the M button for 2 seconds.

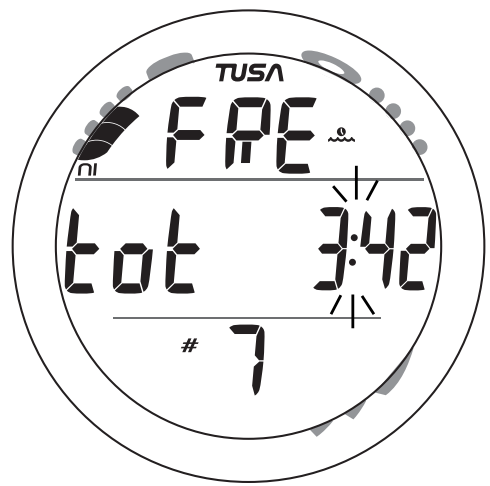


Fig. 29B - SURFACE MAIN
(3 min 42 sec after FREE dive)

NORM SURF MAIN, information provided includes (Fig. 30):

> Surface Interval Time (hr:min) with clock/wave icon
> Graphic Nor
> Tank 1 icon representing GAS 1, which is the default start Gas and default Gas 10 minutes after a dive
> Number of that dive (0 if no dive has been made yet) with # icon
> Battery icon if a Low Battery Condition exists
> NiBG, if any after a NORM or FREE dive
> O2BG, if any after a NORM Nitrox dive

- Depressing the A button for 2 seconds will access the NORM SURF ALT screen for 5 seconds.
- Pressing and releasing the A button (< 2 sec) will access Log Mode, then pressing it again will access History Mode.
- Pressing and releasing the S button (< 2 sec) will access Plan Mode, then pressing it again after dives will access the Time to Fly screen, then again the Dsat Time screen.
- Pressing the L button will activate the Backlight.
- Depressing both the A and S buttons simultaneously for 2 seconds will access the Set Menu.
- Depressing the M for 2 seconds will access the GAUG Surface Main screen, then another 2 second press will access the FREE Surface Main screen.
- Pressing and releasing the M button momentarily (< 2 sec) will revert to the Watch Default Time screen.

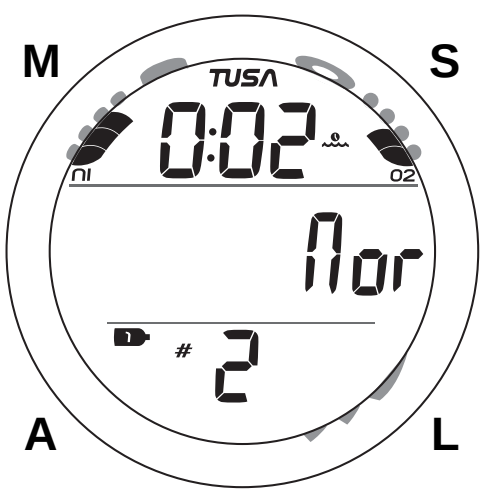


Fig. 30 - NORM SURF MAIN

NORM SURF ALT, information includes (Fig. 31):

> Altitude graphic (EL2 to EL7), if above 3000 feet (915 meters), blank if below.
> Temperature with degrees icon and graphic F (or C)
> Date (Month.Day or Day.Month).

- After 5 seconds, or pressing/releasing the A button (< 2 sec) will revert to the NORM Surface Main screen.
- Pressing the L button will activate the Backlight.

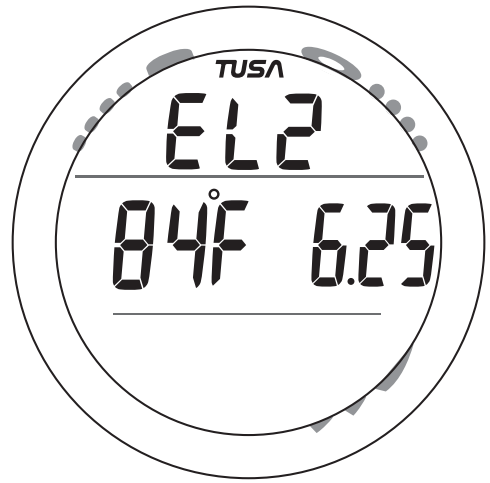


Fig. 31 - NORM SURF ALT

NORM/GAUGE SET MODES

SURF MAIN >> SET F >> SET A >> SET U >> Serial Number

Access and step through of the sequence is gained by repeated simultaneous 2 second presses of the A and S buttons.

Alarm (Set A) and Utility (Set U) Set Points can also be set/changed using the PC Interface program. FO2 (Set F) entries must be made using the push buttons.

Settings revert to the last ones entered/saved when 24 hours elapse without a dive or after a dive.

SETTING FO2 FOR NITROX DIVES

For each value of FO2, the MOD (Max Operating Depth) that can be achieved for the PO2 Alarm limit previously set will be displayed.

When the FO2 50% Default is set On and FO2 Gas 1 is set for a numerical value, 10 minutes on the surface after that dive, the FO2 for Gas 1 will be displayed as 50 and further dives will be calculated based on 50% O2 for oxygen calculations and 21% O2 for Nitrogen calculations (79% Nitrogen) unless the FO2 for Gas 1 is set before the dive.

FO2 for Gas 1 continues to reset to the FO2 50% Default after subsequent repetitive dives until 24 hours elapse after the last dive, or the FO2 50% Default is turned Off.

When the FO2 50% Default is set Off, the FO2 for Gas 1 will remain at the last Set Point for the remainder of that series of repetitive dives.

The default FO2 for Gas 1 each new dive period is AIR.

When FO2 for Gas 1 is set for AIR, the calculations are the same as when it is set to an FO2 of 21%. When FO2 for Gas 1 is set to AIR, it remains set for AIR until it is set for a numerical FO2 value (21 to 50%).

When FO2 is set only to AIR, the O2BG and PO2 values and/or warnings will not be displayed during the dive.

MODs affected by the PO2 limit set will not be displayed when FO2 for Gas 1 is set to AIR.

Internally, the ZEN keeps track of O2 so that if FO2 for Gas 1 is subsequently set for a numerical value, the O2 accumulated during previous AIR dives will be accounted for in the next Nitrox dive (during that dive period and series of repetitive dives).

Once FO2 Gas 1 is set for a numerical value (21 to 50%) and a dive is made, the AIR option is disabled until 24 hours elapse after the last dive. The AIR option will not be displayed in Set FO2 Gas 1 until a full 24 hour Surface Interval has elapsed.

If FO2 for Gas 1 is set for 21%, it will remain set for 21% for that series of dives until set for a higher numerical value.

If the FO2 50% Default is set OFF, FO2 for Gas 2 will remain at it's Set Point previously selected until it is changed. If the FO2 50% Default is set ON, FO2 for Gas 2 will Default to 50% after the dive.

The ZEN is programmed to prevent FO2 for Gas 2 from being set at values lower than the FO2 Set Point for Gas 1. Gas 2 can only be set to values equal to or higher than the FO2 Set Points of Gas 1.

When setting FO2 for Gas 2, the lowest values available will be the Set Point of Gas 1. If FO2 Gas 1 is set for 32%, FO2 Gas 2 can only be set at values from 32 to 100%.

FREE Dive Mode nitrogen calculations are only based on AIR and not affected by these FO2 Settings.

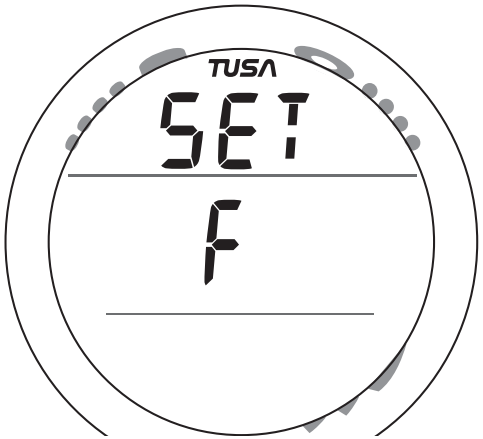
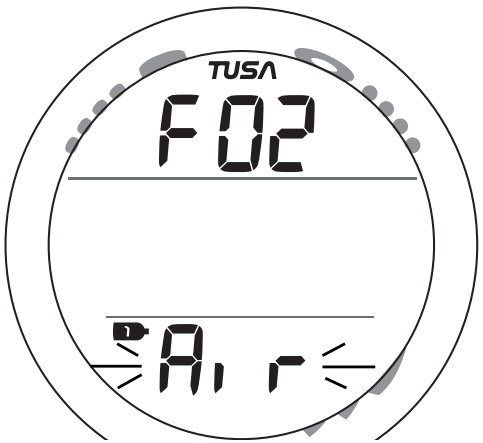


Fig. 32 - SET F



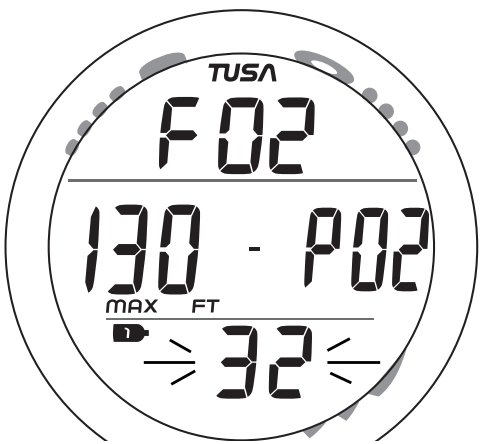


Fig. 33 - SET FO2 GAS 1

SET F GROUP (FO2)

Sequence -

Set F >> FO2 Gas 1 >> FO2 Gas 2 >> FO2 50% Default.

> Depressing the A and S buttons simultaneously for 2 seconds while the NORM (or GAUG) Surface Main screen is displayed will access the Set F screen (Fig. 32).
> Pressing and releasing the A button momentarily (< 2 sec) while SET F is displayed will access Set FO2 Gas 1.

Set FO2 Gas 1, information includes (Fig. 33):

> Graphic FO2
> Max Depth allowed for the PO2 Alarm set with MAX and FT (or M) icons and graphic - PO2, blank if Air
> Tank 1 icon representing Gas (mix) 1
> FO2 Set Point, flashing

- Depressing the S button will scroll upward through the Set Points from Air to 21 through 50% in 1% increments, at a rate of 8 Set Points per second.
- The scroll will stop when the button is released, or momentarily at 32% (even if the button is held depressed).
- Depressing the S button will resume the scroll from 32 through 50%, then stop at Air (or 21%).

- Pressing and releasing the S button momentarily and repeatedly (< 2 sec each time) will step upward through the Set Points one at a time.
- Pressing and releasing the A button momentarily (< 2 sec) will save the setting and access Set FO2 Gas 2.
- Depressing the A and S buttons simultaneously for 2 seconds will save the setting and revert to the SET F screen.
- Depressing the M button for 2 seconds, or if no button is pressed for a period of 2 minutes, operation will revert to the NORM (or GAUG) Surface Main screen.

Set FO2 Gas 2, information includes (Fig. 34):

> Graphic FO2
> Max Depth allowed for the PO2 Alarm set with MAX and FT (or M) icons and graphic - PO2, blank if Air
> Tank 2 icon representing Gas (mix) 2
> FO2 Set Point, flashing

- Depressing the S button will scroll upward through the Set Points in 1% increments, at a rate of 8 per second.
- The scroll will start at the FO2 Gas 1 Set Point and stop when the button is released, or momentarily at 50%, then 80% (even if the button is held depressed).
- Depressing the S button will resume the scroll through 100%, then stop at Air (or 21 or the Gas 1 setting).
- Pressing and releasing the S button momentarily and repeatedly (< 2 sec each time) will step upward through the Set Points one at a time.

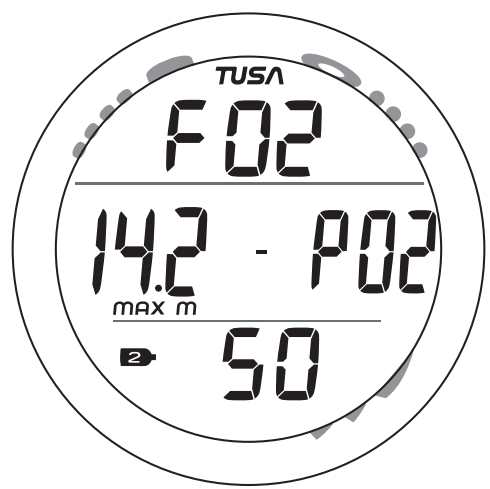


Fig. 34 - SET FO2 GAS 2

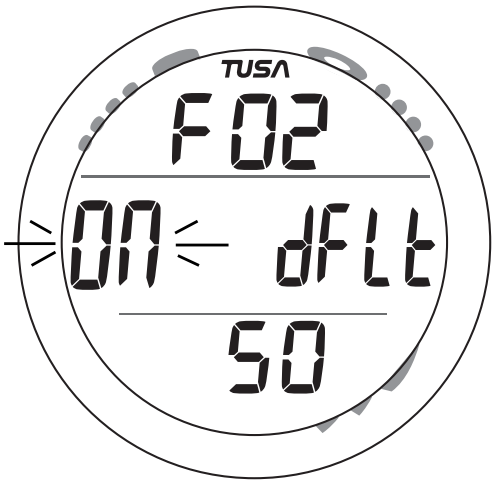


Fig. 35 - SET FO2 DEFAULT

- Pressing and releasing the A button momentarily (< 2 sec) will save the setting and access Set FO2 50% Default.
- Depressing the A and S buttons simultaneously for 2 seconds will save the setting and revert to the Set F screen.
- Depressing he M button for 2 seconds, or if no button is pressed for a period of 2 minutes, operation will revert to the NORM (or GAUG) Surface Main screen.

Set FO2 50% Default information includes (Fig. 35):

> Graphics FO2, dFLT, and 50
> Set Point graphic OFF (or ON), flashing.

- Pressing and releasing the S button momentarily (< 2 sec) will toggle between OFF and ON.
- Pressing and releasing the A button momentarily (< 2 sec) will save the setting and revert to the Set F screen.
- Depressing the M button for 2 seconds, or if no button is pressed for a period of 2 minutes, operation will revert to the NORM (or GAUG) Surface Main screen.

SET A GROUP

Sequence -
Set A >> Audible >> Depth >> EDT >> NiBG >> DTR >> PO2.

- > Depressing the A and S buttons simultaneously for 4 seconds while the NORM (or GAUG) Surface Main screen is displayed will access the Set A screen (Fig. 36).
- > Pressing and releasing the A button momentarily (< 2 sec) while SET A is displayed will access Set Audible Alarm.

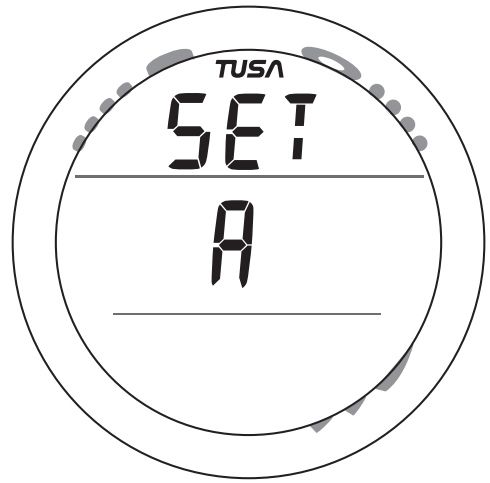


Fig. 36 - SET A

SET AUDIBLE ALARM

This option allows the Audible Alarm to be disabled. Due to there importance, some cautionary situations will cause the Audible alarm to sound even if this feature is set to OFF.

Set Audible Alarm information includes (Fig. 37):

- > Graphic AUD
- > Set Point graphic ON (or OFF), flashing.

- Pressing and releasing the S button momentarily (< 2 sec) will toggle between ON and OFF.
- Pressing and releasing the A button momentarily (< 2 sec) will save the setting and access Set Depth Alarm.

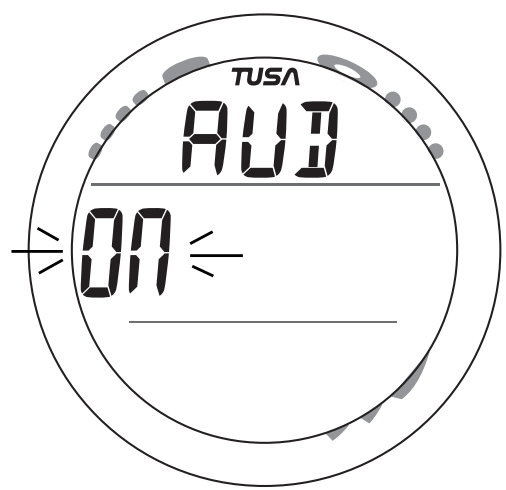


Fig. 37 - SET AUDIBLE

- Depressing the A and S buttons simultaneously for 2 seconds will save the setting and revert to the Set A screen.
- Depressing the M button for 2 seconds, or if no button is pressed for a period of 2 minutes, operation will revert to the NORM (or GAUG) Surface Main screen.

Set Depth Alarm information includes (Fig. 38):

> Graphic DEP
> Symbols MAX and FT (or M)
> Set Point value, flashing, with MAX and FT (or M) icons.

- Depressing the S button will scroll upward through the Set Points from 30 to 330 FT (10 to 100 M) in 10 FT (1 M) increments at a rate of 8 per second until it is released.
- Pressing and releasing the S button momentarily and repeatedly (< 2 sec each time) will step upward through the Set Points one at a time.
- Pressing and releasing the A button momentarily (< 2 sec) will save the setting and access Set EDT Alarm.
- Depressing the A and S buttons simultaneously for 2 seconds will save the setting and revert to the Set A screen.
- Depressing the M button for 2 seconds, or if no button is pressed for a period of 2 minutes, operation will revert to the NORM (or GAUG) Surface Main screen.

FREE Dive Mode has separate Depth Alarms.

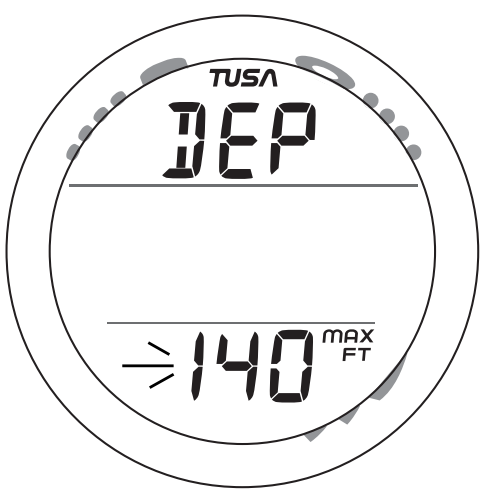


Fig. 38 - SET DEPTH ALARM

SET EDT ALARM information includes (Fig. 39):

> Graphic EDT (meaning Elapsed Dive Time).
> Set Point value (hr:min), flashing, with wave/clock icons.

- Depressing the S button will scroll upward through the Set Points from 0:10 to 3:00 (hr:min) in 5 minute (:05) increments at a rate of 8 per second.
- Pressing and releasing the S button momentarily and repeatedly (< 2 sec each time) will step upward through the Set Points one at a time.
- Pressing and releasing the A button momentarily (< 2 sec) will save the setting and access Set NiBG Alarm.
- Depressing the A and S buttons simultaneously for 2 seconds will save the setting and revert to the Set A screen.
- Depressing the M button for 2 seconds, or if no button is pressed for a period of 2 minutes, operation will revert to the NORM (or GAUG) Surface Main screen.

FREE Mode has a separate EDT Alarm.

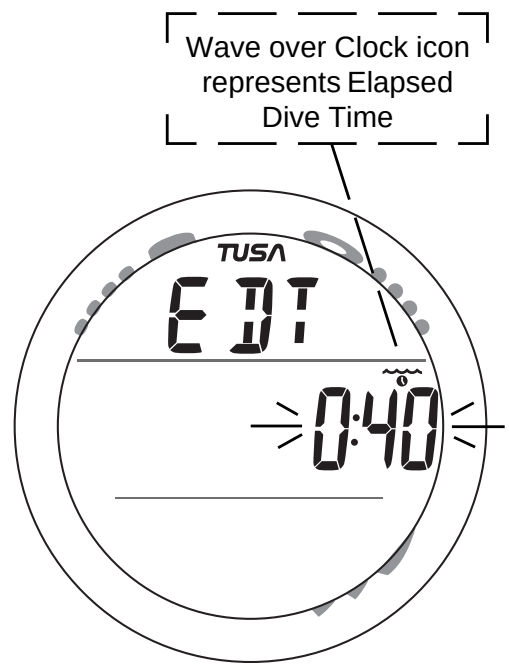


Fig. 39 - SET EDT ALARM

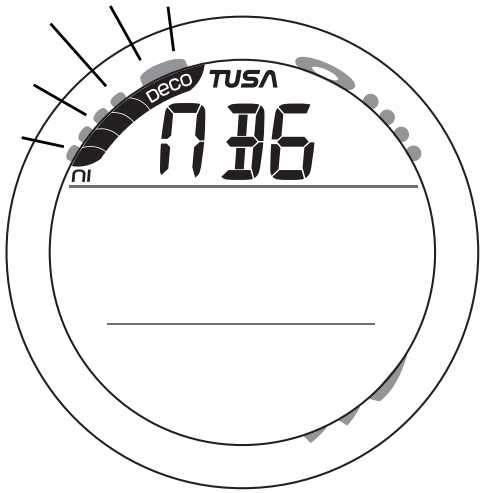


Fig. 40 - SET NiBG ALARM

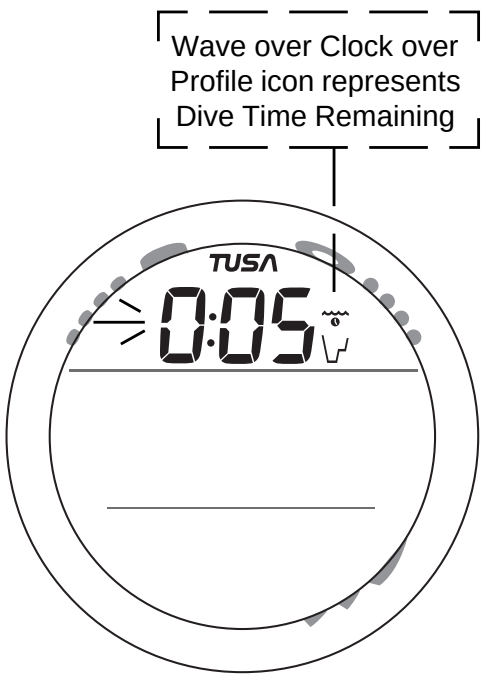


Fig. 41 - SET DTR ALARM

Set NiBG Alarm information includes (Fig. 40):

> Graphic NBG (meaning Nitrogen Bar Graph).
> NiBG Set Point (segments), flashing.

- Pressing and releasing the S button momentarily and repeatedly (< 2 sec each time) will step through the Set Point from all 5 segments (Deco) to 1 one at a time.
- Pressing and releasing the A button momentarily (< 2 sec) will save the setting and access Set DTR Alarm.
- Depressing the A and S buttons simultaneously for 2 seconds will save the setting and revert to the Set A screen.
- Depressing the M button for 2 seconds, or if no button is pressed for a period of 2 minutes, operation will revert to the NORM (or GAUG) Surface Main screen.

FREE Mode has a separate NiBG Alarm.

Set DTR Alarm information includes (Fig. 41):

> Set Point value (hr:min), flashing, with wave/clock/profile icons.

- Depressing the S button will scroll upward through the Set Points from 0:00 to 0:20 (:min) in 1 minute (0:01) increments at a rate of 8 per second.

- Pressing and releasing the S button momentarily and repeatedly (< 2 sec each time) will step upward through the Set Points one at a time.
- Pressing and releasing the A button momentarily (< 2 sec) will save the setting and access Set PO2 Alarm.
- Depressing the A and S buttons simultaneously for 2 seconds will save the setting and revert to the Set A screen.
- Depressing he M button for 2 seconds, or if no button is pressed for a period of 2 minutes, operation will revert to the NORM (or GAUG) Surface Main screen.

Set PO2 Alarm information includes (Fig. 42):

> Graphics PO2 and AtA.

> Set Point value, flashing, with MAX icon.

- Pressing and releasing the S button momentarily and repeatedly (< 2 sec each time) will step through the Set Point from 1.20 (ATA) to 1.60 (ATA) in .10 (ATA) increments.
- Pressing and releasing the A button momentarily (< 2 sec) will save the setting and revert to the Set A screen.
- Depressing the M button for 2 seconds, or if no button is pressed for a period of 2 minutes, operation will revert to the NORM (or GAUG) Surface Main screen.

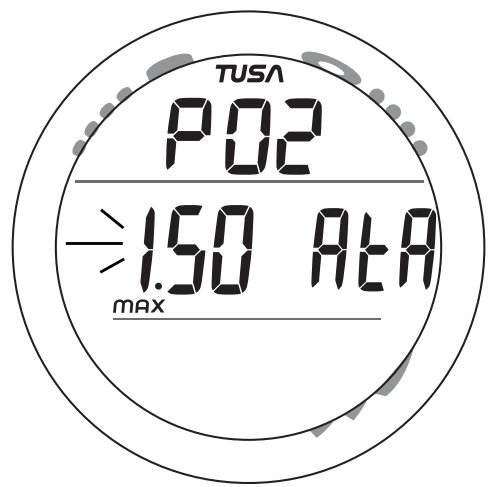


Fig. 42 - SET PO2 ALARM

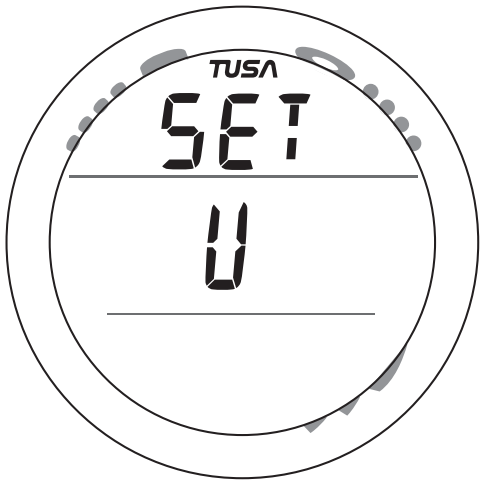


Fig. 43 - SET U

SET U GROUP (UTILITIES)

Sequence -

SET U >> Wet Activation >> Units >> Safety Stop >> Conservative Factor >> Backlight Duration >> Sampling Rate.

> Depressing the A and S buttons simultaneously for 6 seconds while the NORM (or GAUG) Surface Main screen is displayed, will access the Set U screen (Fig. 43).
> Pressing and releasing the A button momentarily (< 2 sec) while Set U is displayed will access Set Wet Activation.

Set Wet Activation information includes (Fig. 44):

> Graphics WET and ACt.
> Set Point graphic ON (or OFF) flashing.

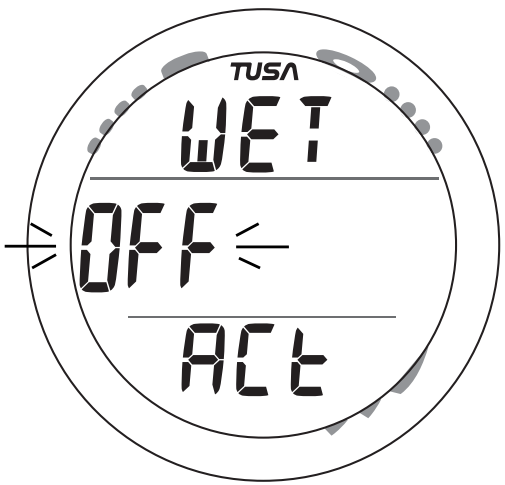


Fig. 44 - SET WET ACTIVATION

- Pressing and releasing the S button momentarily (< 2 sec) will toggle between ON and OFF.
- Pressing and releasing the A button momentarily (< 2 sec) will save the setting and access Set Units.
- Depressing the A and S buttons simultaneously for 2 seconds will save the setting and revert to the Set U screen.
- Depressing holding the M button for 2 seconds, or if no button is pressed for a period of 2 minutes, operation will revert to the NORM (or GAUG) Surface Main screen.

Set Units information includes (Fig. 45):

> Set Point icons/graphics F and FT (or C and M), flashing.

- Pressing and releasing the S button momentarily (< 2 sec) will toggle between Imperial (F, FT) and Metric (C, M).
- Pressing and releasing the A button momentarily (< 2 sec) will save the setting and access Set Deep Stop.
- Depressing the A and S buttons simultaneously for 2 seconds will save the setting and revert to the Set U screen.
- Depressing the M button for 2 seconds, or if no button is pressed for a period of 2 minutes, operation will revert to the NORM (or GAUG) Surface Main screen.

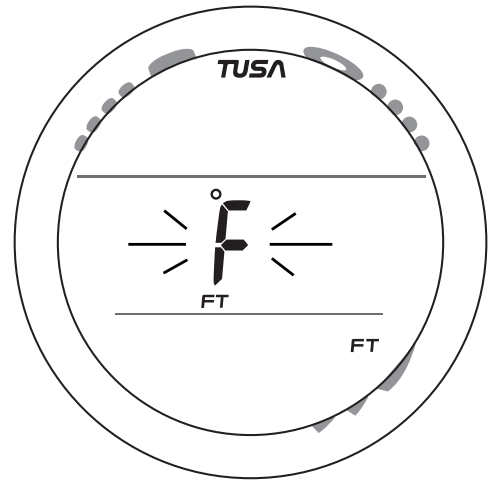


Fig. 45 - SET UNITS

Set Deep Stop information includes (Fig. 46):

> Graphic DS (meaning Deep Stop).
> Set Point ON or OFF, flashing, with STOP icon.

- Pressing and releasing the S button momentarily (< 2 sec) will toggle the Set Point between OFF and ON.
- Pressing and releasing the A button momentarily (< 2 sec) will save the setting and access Set Safety Stop.
- Depressing the A and S buttons simultaneously for 2 seconds will save the setting and revert to the Set U screen.
- Depressing the M button for 2 seconds, or if no button is pressed for a period of 2 minutes, operation will revert to the NORM (or GAUG) Surface Main screen.

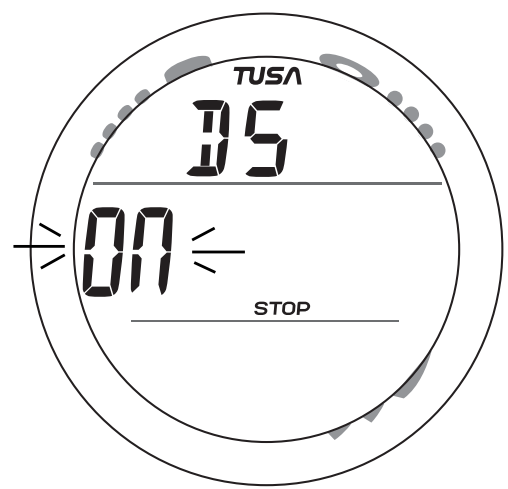


Fig. 46 - SET DEEP STOP

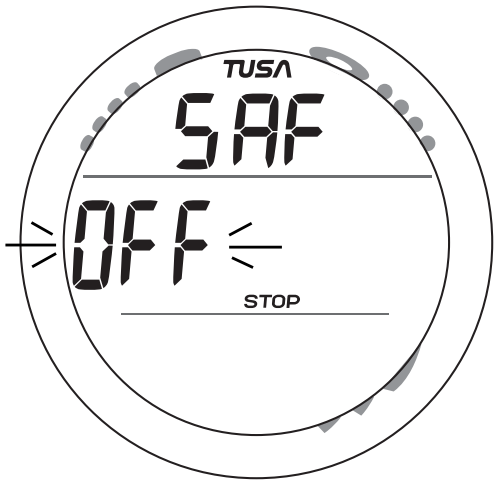


Fig. 47 - SET SAFETY STOP

Set Safety Stop information includes (Fig. 47):

> Graphic SAF (meaning Safety Stop).
> Set Point ON or OFF, flashing, with STOP icon.

- Pressing and releasing the S button momentarily (< 2 sec) will toggle the Set Point between OFF and ON.
- Pressing and releasing the A button momentarily (< 2 sec) will save the setting and access Set Conservative Factor.
- Depressing the A and S buttons simultaneously for 2 seconds will save the setting and revert to the Set U screen.
- Depressing the M button for 2 seconds, or if no button is pressed for a period of 2 minutes, operation will revert to the NORM (or GAUG) Surface Main screen.

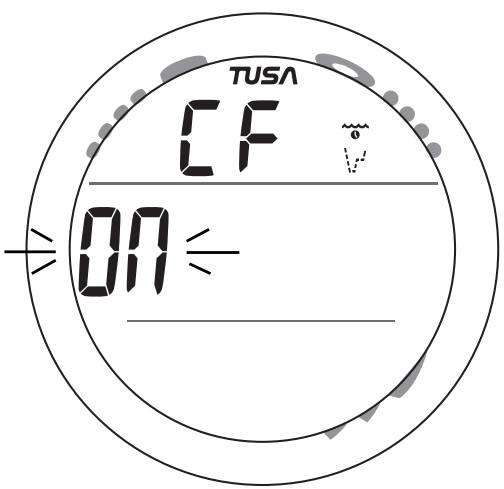


Fig. 48 - SET CONS FACTOR

Set Conservative Factor information includes (Fig. 48):

> Graphic CF (meaning Conservative Factor) with wave/ clock/profile icon.
> Set Point ON or OFF, flashing.

- Pressing and releasing the S button momentarily (< 2 sec) will toggle the Set Point between ON and OFF.
- Pressing and releasing the A button momentarily (< 2 sec) will save the setting and access Set Backlight Duration.
- Depressing the A and S buttons simultaneously for 2 seconds will save the setting and revert to the Set U screen.

- Depressing the M button for 2 seconds, or if no button is pressed for a period of 2 minutes, operation will revert to the NORM (or GAUG) Surface Main screen.

NOTE: When the Conservative Factor is set ON, the No Deco Limit times are reduced to values equivalent to those that would be available at the next higher 3000 foot (915 meter) Altitude.

Set Backlight Duration information includes (Fig. 49):

> Graphics BL and dur (meaning Backlight Duration).
> Set Point (seconds value), flashing, with clock icon and graphic SEC.

- Pressing and releasing the S button momentarily and repeatedly (< 2 sec each time) will step upward through the Set Points of 0, 5, and 10 (seconds).
- Pressing and releasing the A button momentarily (< 2 sec) will save the setting and access Set Sampling Rate.
- Depressing the A and S buttons simultaneously for 2 seconds will save the setting and revert to the Set U screen.
- Depressing the M button for 2 seconds, or if no button is pressed for a period of 2 minutes, operation will revert to the NORM (or GAUG) Surface Main screen.

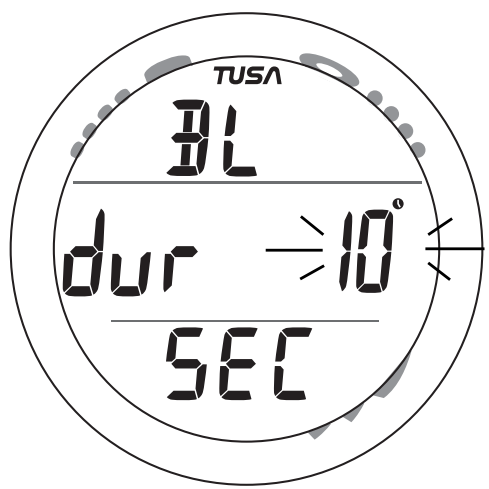


Fig. 49 - SET BACKLIGHT DURATION

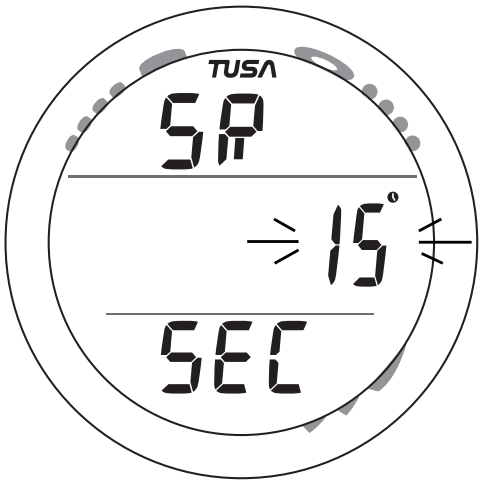


Fig. 50 - SET SAMPLING

Set Sampling Rate information includes (Fig. 50):

> Graphic SR (meaning Sampling Rate).
> Set Point (seconds value), flashing, with clock icon and graphic SEC.

- Pressing and releasing the S button momentarily and repeatedly (< 2 sec each time) will step upward through the Set Points of 2, 5, 30, and 60 (seconds).
- Pressing and releasing the A button momentarily (< 2 sec) will save the setting and revert to the Set U screen.
- Depressing the M button for 2 seconds, or if no button is pressed for a period of 2 minutes, operation will revert to the NORM (or GAUG) Surface Main screen.

SERIAL NUMBER

- Depressing the A and S buttons simultaneously for 8 seconds while viewing the NORM (or GAUG) Surface Main screen will access the Serial Number screen displaying (Fig. 51):

> Graphic SN.
> Factory programmed Serial Number.
> Firmware revision number (e.g., graphic r1A).

- Depressing the A and S buttons simultaneously for 2 seconds will revert to the Surface Main screen.

Fig. 51 - SERIAL NUMBER

- Depressing the M button for 2 seconds, or if no button is pressed for a period of 2 minutes, operation will revert to the NORM (or GAUG) Surface Main screen.

△ **NOTE: The Serial Number and Firmware Revision will be requested in the event that you contact TUSA regarding the ZEN. Enter them in the Records section provided in the back of this Manual.**

NORM PLAN MODE

TUSA strongly recommends that you review the Plan Mode dive times prior to every NORM dive to help you plan your dive as required to avoid exceeding no decompression or oxygen exposure limits. This is especially important for repetitive dives when Plan Mode indicates adjusted dive times that are available for the next dive, based on residual nitrogen or oxygen accumulation (whichever is in control) following the last dive and surface interval.

△ **NOTE: No Decompression Dive Times in Plan Mode are based on the FO2 setting for Gas 1. The FO2 setting for Gas 2 is not utilized for Plan calculations.**

- Pressing and releasing the S button momentarily (< 2 sec) while viewing the NORM Surface Main screen is displayed will access the NORM Plan Lead-in screen.

△ **NOTE: Plan Mode can only be accessed while viewing the NORM Surface Main screen.**

Plan Lead-in information includes (Fig. 52):

> Graphic FO2 with wave/clock/profile icons.
> PO2 Alarm Set Point and graphic PO2, if FO2 is set for Nitrox, blank if set for Air.
> Tank 1 icon indicating that FO2 is for Gas (mix) 1.
> FO2 Set Point for Gas 1, Air or 21 to 50.

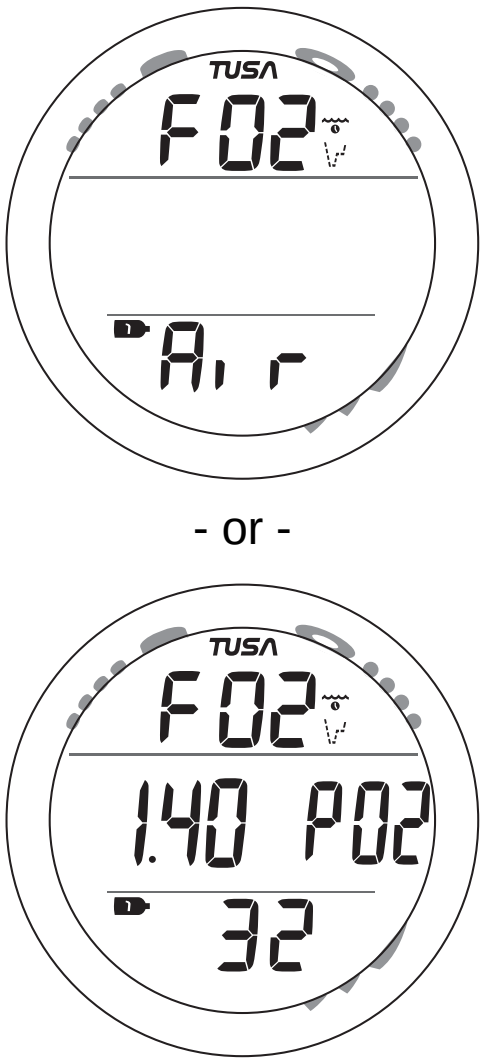


Fig. 52 - PLAN LEAD-IN

- After dives, press and release the A button momentarily (< 2 sec) to access the Time to Fly screen, then again to access the Dsat screen.
- Press and release the S button momentarily and repeatedly (< 2 sec each time) to access the first Plan Depth/Time screen and step upward through the sequence of screens.

The screens will sequence through Depths from 30 up to 190 FT (9 to 57 M), or the Max Depth that will allow theoretical No Deco Dive Time of at least 1 minute based upon the previous dive profiles in a series of repetitive dives and taking into account descent and ascent rates of 60 FPM (18 MPM).

NOTE: When the Conservative Factor is set ON, No Deco Dive times are reduced to the values of the next 3,000 foot (915 meter) higher Altitude.

Plan Depth/Time information includes (Fig. 53A/B:

> NiBG (4 No Deco segments), or full O2BG, indicating which (Nitrogen or Oxygen) is in control of calculations based on previous dives.
> Dive Time (hr:min) allowed for the Depth displayed.
> Max Depth allowed for the PO2 Alarm value set with MAX and FT (or M) icons and graphic - PO2.
> Tank 1 icon indicating Gas (mix) 1.
> Plan Depth with FT (or M) icon.

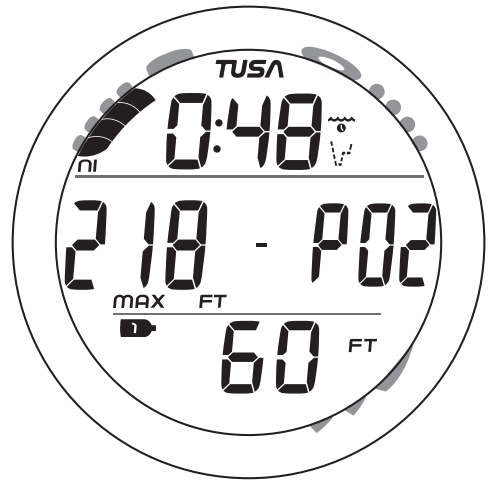


Fig. 53A - PLAN
(Imperial, Ni control)

- Press and release the S button momentarily and repeatedly (< 2 sec each time) to increase the Planned Depth in increments of 10 FT (3 M), displaying the information one screen at a time.
- Depressing the M button for 2 seconds, or if no button is pressed for a period of 2 minutes, operation will revert to the NORM Surface Main screen.

FLY MODE

Time to Fly is a counter that begins counting down 10 minutes after surfacing from a dive from 23:50 to 0:00 (hr:min).

Ten minutes after a dive, operation reverts to the Watch Default Time screen at which time the Time to Fly countdown continues in the background. Access to the Fly screen is then gained by first accessing the NORM (or GAUG) Surface Main screen.

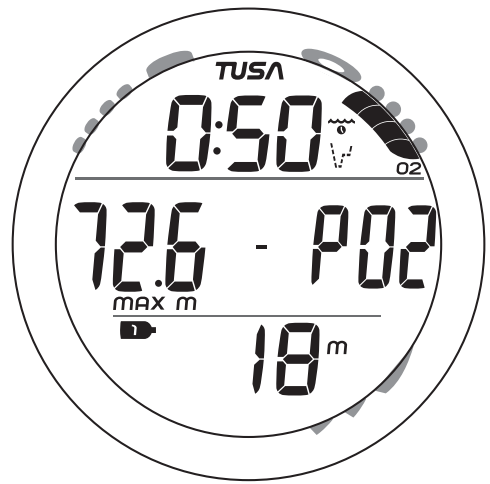


Fig. 53B - PLAN
(Metric, O2 control)

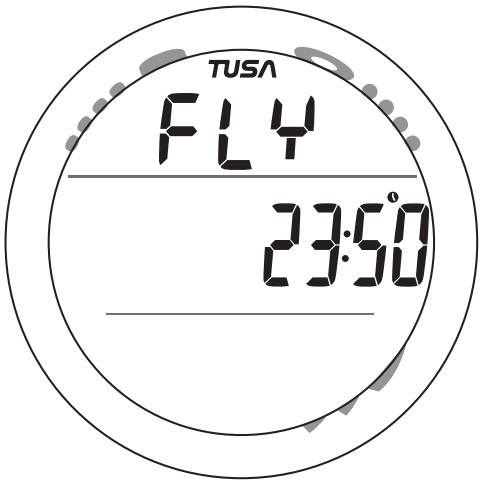


Fig. 54 - TIME TO FLY

- Pressing and releasing the A button momentarily 2 times (< 2 sec each time) while viewing the NORM Surface Main screen, or 1 time while viewing the GAUG Surface Main screen, will access Fly Mode.

NORM SURF MAIN >> PLAN >> FLY
GAUG SURF MAIN >> FLY

Time to Fly information includes (Fig. 54):
> Graphic FLY.
> Countdown Time (hr:min) with clock icon.

- If accessed from the NORM Surface Main screen, pressing and releasing the A button momentarily (< 2 sec) will access the Desat Time screen.
- If accessed from the GAUG Surface Main screen, pressing and releasing the A button momentarily (< 2 sec) will revert to the GAUG Surface Main screen.
- Depressing the M button for 2 seconds, or if no button is pressed during a 2 minute period, operation will revert to the NORM (or GAUG) Surface Main screen.
- Pressing the L button will activate the Backlight.

DESAT MODE (NORM only)

The Time to Desaturate counter provides calculated time for Tissue Desatuation at sea level taking into consideration the Conservation Factor setting. It begins counting down 10 minutes after surfacing from a dive, counting down from 23:50 max to 0:00 (hr:min).

When the Countdown reaches 0:00, which will generally occur prior to the Fly countdown reaching 0:00, the Dsat screen remains in the sequence of accessible NORM screens displaying 0:00 until the Fly counter turns Dive Computer operations Off 24 hours after a last dive.

> The SAT screen is not displayed after a Violation Dive.
> Desaturation requiring Times greater than 24 hours will display 23: - - .
> In the event that Time to Desaturate still remains at the end of 24 hours, the added time will be zeroed.
> Two hours after a dive, operation reverts to the Watch Default Time screen and the Dsat countdown continues in the background. Access to the SAT screen is then gained by first accessing the NORM Surface Main screen.

- Pressing and releasing the A button momentarily and repeatedly 3 times (< 2 sec) while viewing the NORM Surface Main screen will access the Dsat screen.

Desat Time information includes (Fig. 55):

> Graphic SAT.
> Countdown Time (hr:min) with clock icon.

- Pressing and releasing the A button momentarily (< 2 sec) will revert to the NORM Surface Main screen.
- Depressing the M button for 2 seconds, or if no button is pressed during a 2 minute period, operation will revert to the NORM Surface Main screen.
- Pressing the L button will activate the Backlight.

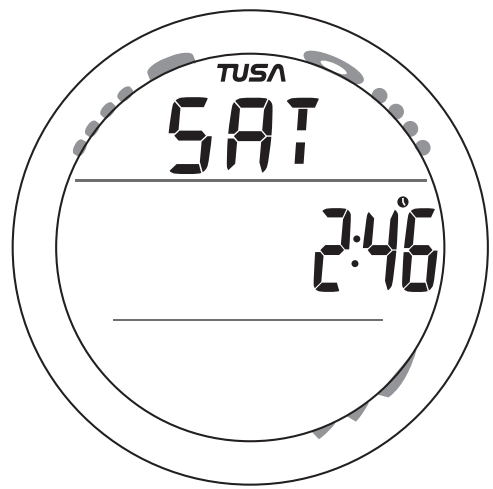


Fig. 55 - DSAT TIME

NORM/GAUG LOG MODE

Log Mode displays information from the latest 24 NORM and/or GAUG dives sequentially in reverse order (the most recent first). Log information is retained until over written by another dive. Battery removal will not affect the Log data stored for viewing.

After exceeding 24 dives, data from the most recent dive completed will be recorded in the Log and the oldest dive's data deleted.

Dives will be numbered 1 to 24 starting at #1 each time a new series of dives begins. After it shuts Off 24 hours after a dive, the first dive of the next new series will be #1.

- Log Mode can be accessed by pressing and releasing the A button momentarily (< 2 sec) while viewing the Watch Default Time, NORM Surface Main, or GAUG Surface Main screen.

> The most recent dive's Log Preview screen will be displayed.

- Depressing the S button will then scroll back through the previous dives' Preview screens at a rate of 8 per second until released.
- Pressing and releasing the S button momentarily (< 2 sec) while viewing a Preview screen will display that dive's Log Data 1 screen.
- If that was a NORM Nitrox dive, pressing and releasing the S button (< 2 sec) again will display that dive's Log Data 2 screen (O2 data).

> Log screens remain on display until further button action occurs.

- Depressing the M button for 2 seconds, or if no button is pressed during a 2 minute period, operation will revert to the NORM (or GAUG) Surface Main screen.
- Pressing the L button will activate the Backlight.

Log Preview information includes (Fig. 56):

> Log (book) icon.
> Graphic NOR (or GAU).
> Dive Mode (wave/clock/profile) icon, if NORM.
> Date (month.day or day.month) the dive was conducted.
> Time of Day the dive began (hr:min) with clock icon and AM (or PM) icon if set for 12 Hour Format.
> # icon and dive number (1 to 24) for that series.

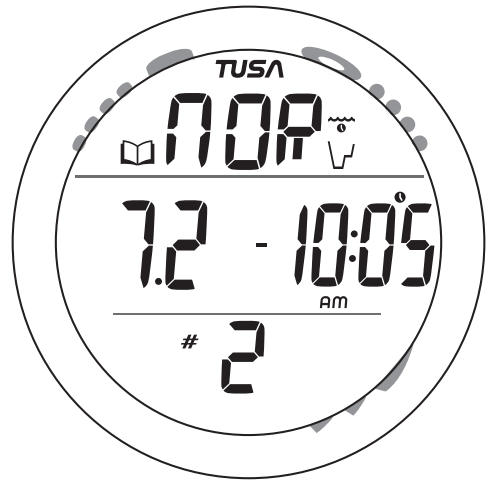


Fig. 56 - LOG PREVIEW

- Pressing and releasing the S button momentarily (< 2 sec) will access that dive's Log Data 1 screen.
- Pressing and releasing the A button momentarily (< 2 sec) while viewing the Preview screen of the most recent dive will bypass Log Mode and access the History Mode.

Log Data 1 information includes (Fig. 57):

> NiBG with the max segment flashing, others fixed up to end of dive accumulation. All flashing if Violation.
> Log (book) icon.
> Pre dive Surface Interval time (hr:min) with clock/wave icon, 10 - through 23 - for times greater than 9 hours and 59 minutes, (- : - -) if no previous dive that period.
> Temperature (minimum recorded that dive) with degrees icon and graphic F (or C).
> Elapsed Dive Time (hr:min) with wave/clock icon.

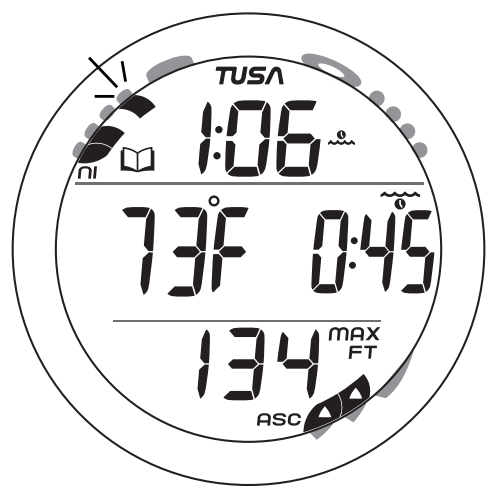


Fig. 57 - LOG DATA 1

> Max Depth with MAX and FT (or M) icons.
> ASC representing max Ascent Rate recorded for 4 seconds.

- Pressing and releasing the S button momentarily (< 2 sec) will access Log Data 2.
- Pressing and releasing the A button momentarily (< 2 sec) will revert to the NORM (or GAUG) Surface Main screen.
- Depressing the M button for 2 seconds, or if no button is pressed during a 2 minute period, operation will revert to the NORM (or GAUG) Surface Main screen.
- Pressing the L button will activate the Backlight.

Log Data 2 (only if Nitrox) information includes (Fig. 58):

> Log (book) icon.
> Graphic FO2 (at top) and FO2 Set for Gas 1 for that dive (at bottom).
> O2BG segments representing O2 accumulated at the end of the dive.
> Max PO2 achieved (ATA) with MAX icon and graphic PO2.
> Tank 1 icon representing Gas (mix) 1.

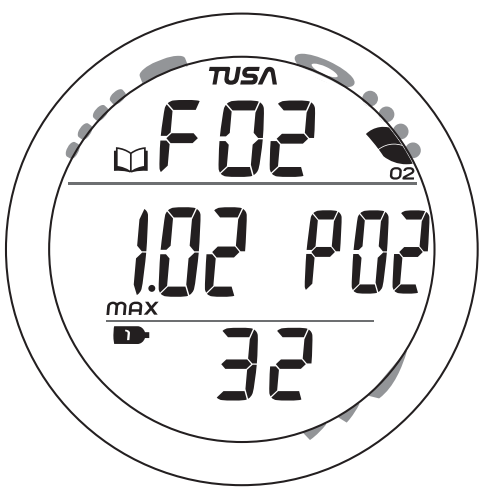


Fig. 58 - LOG DATA 2

- Pressing and releasing the S button momentarily (< 2 sec) will access the previous dive's Log Preview screen.
- Pressing and releasing the A button momentarily (< 2 sec) will revert to the NORM (or GAUG) Surface Main screen.
- Depressing the M button for 2 seconds, or if no button is pressed during a 2 minute period, operation will revert to the NORM (or GAUG) Surface Main screen.
- Pressing the L button will activate the Backlight.

HISTORY MODE

History Mode displays information for up to 999 NORM and/or GAUG Dives, 9999 Dive Hours, and the Maximum Depth achieved. History information is retained indefinitely. Battery removal will not affect the History data stored for viewing.

Fig. 59 - HISTORY 1

- History Mode can be accessed by pressing and releasing the A button momentarily 2 times (< 2 sec each time) while viewing the Watch Default Time, NORM Surface Main, or GAUG Surface Main screen.

History 1 information includes (Fig. 59):

> Graphic HIS.
> Total Elapsed Dive Time recorded up to 9999 with graphic - Hour and clock icon.
> Total number of all dives recorded up to 999 with # icon.

- Pressing and releasing the S button momentarily (< 2 seconds) button will access the History 2 screen.

History 2 information includes (Fig. 60):

> Altitude graphic SEA (or EL 2 through EL 7), max level.
> Temperature, lowest recorded with icon and graphic F (or C).
> Max EDT (hr:min) for a single dive with wave/clock icon.
> Max Depth ever recorded with MAX and FT (or M) icons.

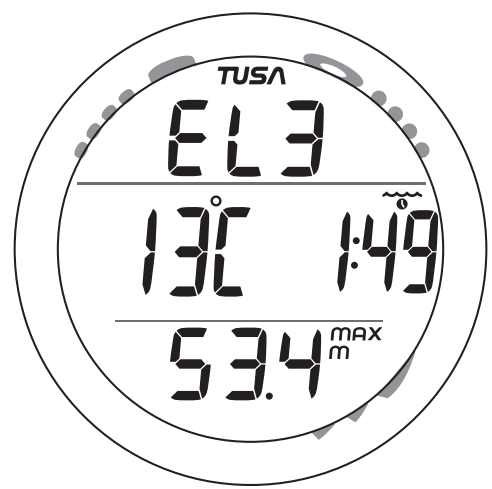


Fig. 60 - HISTORY 2

- Pressing and releasing the A button momentarily (< 2 sec) will revert to the NORM (or GAUG) Surface Main screen.
- Depressing the M button for 2 seconds, or if no button is pressed during a 2 minute period, operation will revert to the NORM (or GAUG) Surface Main screen.
- Pressing the L button will activate the Backlight.

NOTE: FREE Dives are not recorded in the viewable Log or History. The data is stored in memory for subsequent download to the TUSA PC Interface program.

WARNINGS:

Making decompression dives without the proper preparation and training will place you in an unnecessarily dangerous situation.

Existing data for making planned decompression dives is limited, and virtually non-existent for repetitive decompression diving.

Decompression diving greatly increases your risk of decompression sickness.

Special training, equipment, and support are necessary for diving deeper than the maximum recommended sport diving depth limit(s).

NORM DIVE MODES

NO DECO DIVE TIME REMAINING (NDC)

The ZEN constantly monitors No Decompression status.

NDC is the maximum amount of time that you can stay at your present Depth before entering a Decompression situation. It is calculated based on the amount of Nitrogen absorbed by hypothetical tissue compartments.

The rates each of these compartments absorb and release Nitrogen is mathematically modeled and compared against a maximum allowable Nitrogen level.

Whichever one is closest to this maximum level is the controlling compartment for that Depth. Its resulting value will be displayed as NDC (Fig. 61a) and the NiBG (Fig. 61b).

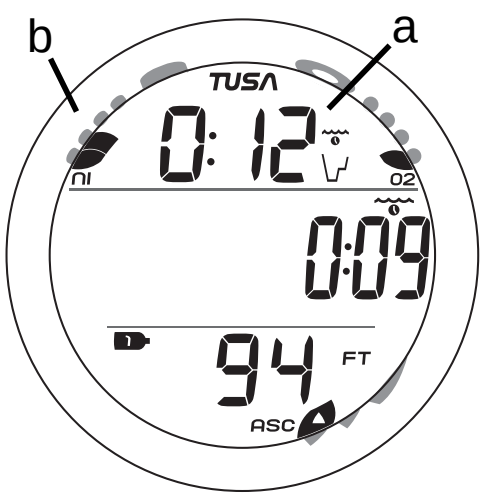


Fig. 61 - NDC (DTR)

As you ascend from Depth during a dive, the NiBG segments will recede as control shifts to slower compartments.

This is a feature of the Decompression model that is the basis for multilevel diving, one of the most important advantages that the ZEN dive computer offers.

OXYGEN ACCUMULATION

If FO2 was set for a numerical value (Nitrox), the O2BG (Fig. 62a) will add segments to represent oxygen accumulation for that dive, or 24 hour period, whichever amount is greater.

If O2 reaches 100% of the allowed limit (300 OTU), the graphic O2 will replace NDC. High O2 is described later.

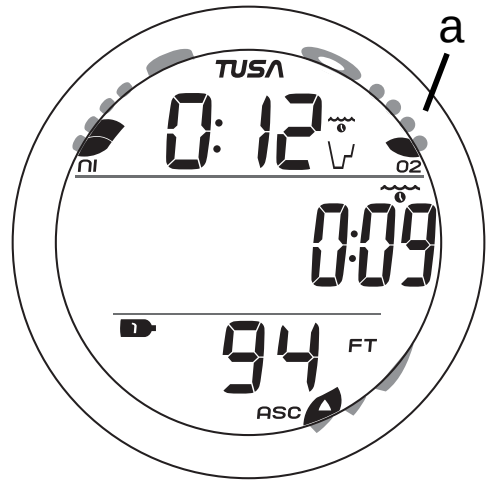


Fig. 62 - O2BG

ASCENT RATE INDICATOR (ASC)

The ASC shows how fast you are ascending. When you exceed the maximum recommended Ascent Rate for the depth you are at (see chart on page 33), all segments of the ASC will flash (Fig. 63) and the graphic SLO will flash in place of NDC (or GAU) (Fig. 63a). The flashing will stop and NDC (or GAU) restored when the audible is silenced or your Ascent Rate is slowed below the alarm value.

The Ascent Rate alarm is based upon 2 sets of speeds which change at a reference depth of 60 FT (18 M).

⚠ WARNING: At depths greater than 60 FT (18 M), Ascent Rates should not exceed 60 FPM (18 MPM). At depths of 60 FT (18 M) and shallower, Rates should not exceed 30 FPM (9 MPM).

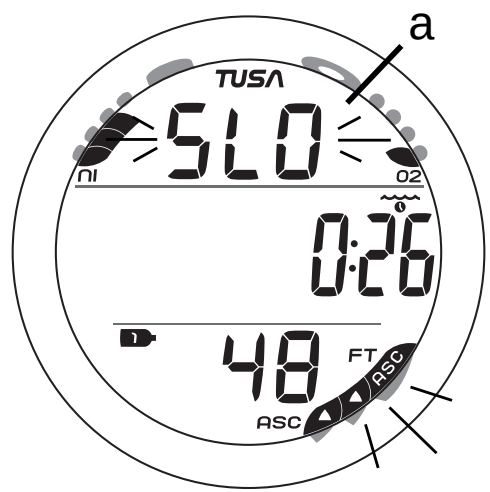


Fig. 63 - ASC

NORM NO DECOMPRESSION DIVE MODE

When the Wet Activation feature is set ON, the ZEN will enter the NORM No Decompression Dive Mode any time you descend to 5 FT (1.5 M) for 5 seconds.

When the Wet Activation feature is set OFF, the ZEN will not enter Dive Mode upon descent unless it is operating in one of the NORM Dive Computer modes (menus) at that time. Modes such as Surface Mode, Plan, Fly, etc.

NORM No Deco Main, information includes (Fig. 64) -

- > NiBG, O2BG, ASC - if applicable
- > DTR (hr:min) with NDC (wave/clock/profile) icon
- > EDT (hr:min) with Elapsed Dive Time (wave/clock) icon
- > Tank icon representing the Gas selected (1 or 2)
- > Current Depth with FT (or M) icon

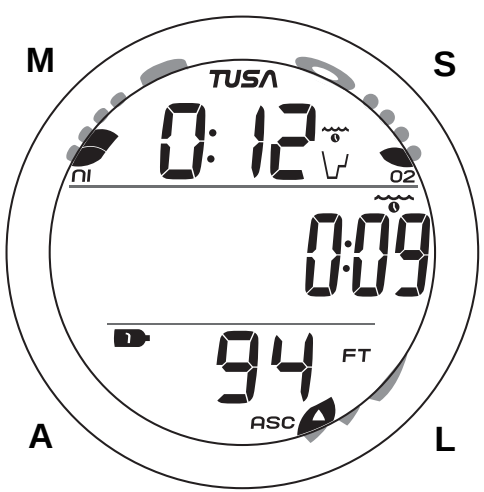


Fig. 64 - NO DECO MAIN

- Press/release the A button (< 2 sec) to view ALT 1.
- Depress the A button for 2 seconds to access the Deep Stop Preview screen, if activated.
- Press/release the S button (< 2 sec) to acknowledge alarms.
- Depress the M button for 2 seconds to access the Gas Switch Routine.
- Press the L button to activate the Backlight.

NORM No Deco ALT 1 information includes (Fig. 65) -

> Temperature with degrees icon and graphic F (or C)
> Time of Day (hr:min) with AM (or PM) and clock icons
> Max Depth with MAX and FT (or M) icons

- Press/release the A button to access ALT 2.
- Operation will revert to the Main after 5 seconds if A is not pressed.

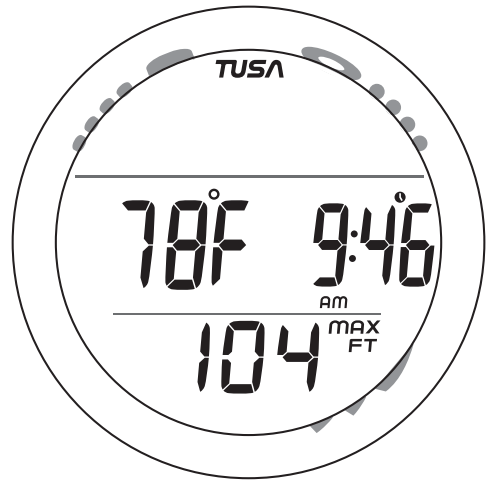


Fig. 65 - NO DECO ALT 1

NORM No Deco ALT 2 information includes (Fig. 66) -

> Graphic FO2
> PO2 (ATA) with graphic PO2
> FO2 Setting and symbol FO2
> Tank icon representing the Gas selected (1 or 2)
> FO2 set for the Gas selected (1 or 2)

- Operation will revert to the Main Display after 5 seconds or if the A button is pressed/released.

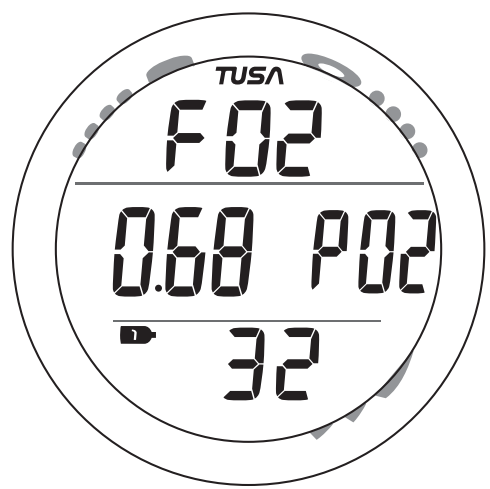


Fig. 66 - NO DECO ALT 2

NOTE: ALT screens cannot be accessed during the time when an Alarm is sounding.

Fig. 67 - DS PREVIEW

No Deco Deep Stop

On any No Deco dive in which Depth exceeds 80 FT (24 M), a Deep Stop Preview screen (Fig. 67) can be accessed that will display the graphic **DS** (meaning Deep Stop) and a recommended Stop Depth calculated to be 1/2 the Max Depth and a Stop Time of 02:00 (2 minutes) with a STOP icon. It will revert to the Main after 5 seconds.

- The intent of this screen is to suggest that a Stop should be made as indicated to help reduce tissue nitrogen loading prior to final ascent.
- The Preview screen will not be available for viewing once you ascend above the Stop Depth.

NOTE: The Deep Stop is not required and although recommended, it does not have to be taken. There is no penalty if the Stop is ignored and ascent (or other activity) is continued.

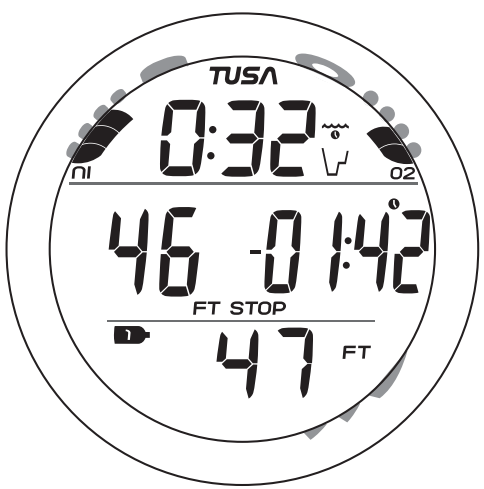


Fig. 68 - DS MAIN

Upon ascending to within 10 FT (3 M) below the calculated Stop Depth, the DS Main screen (Fig. 68) will appear displaying the calculated Stop Depth with FT (or M) and STOP icons and the Timer that counts down from 02:00 to 0:00 (min:sec) with clock icon. Also displayed will be NDC Dive Time Remaining (hr:min) with wave/clock/profile mode icon, Tank icon (Gas 1 or 2), current Depth with FT (or M) icon, and applicable bar graphs.

Press and release the A button (< 2 seconds) to access the ALT 1 screen (Fig. 69A) that displays Elapsed Dive Time, press it again to view the ALT 2 screen (Fig. 69B) that displays Temperature, Time, and Max Depth, then if a Nitrox dive press it again to view ALT 3 that displays FO2 and PO2 (Fig. 69C).

When the countdown reaches 0:00, the No Deco Main will be displayed and the Deep Stop feature will be disabled for the remainder of that dive.

In the event that you descend 10 FT (3 M) below, or ascend 10 FT (3 M) above the Stop Depth, for more than 10 seconds during the countdown, the No Deco Main will be displayed and the Deep Stop feature will be disabled for the remainder of that dive.

> If you return to within the +/- 10 FT (3 M) range during the 10 seconds, the Deep Stop Main will reappear with the countdown still in progress.

The Deep Stop feature will be disabled, and it's screens not displayed, for the remainder of that dive, if you enter Deco or High O2 (80%), or descend deeper than 190 FT (63 M).

During High PO2 (=> Alarm Set Point), the DS screen information will be replaced with High PO2 information.

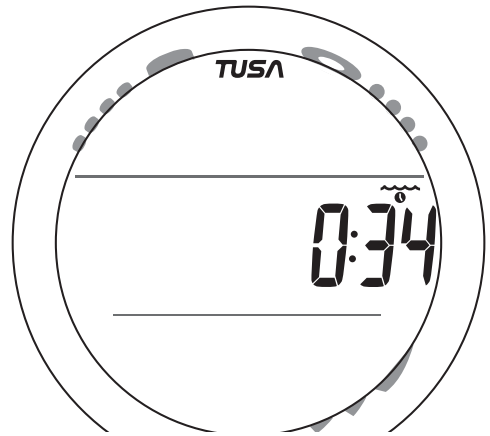


Fig. 69A - DS ALT 1

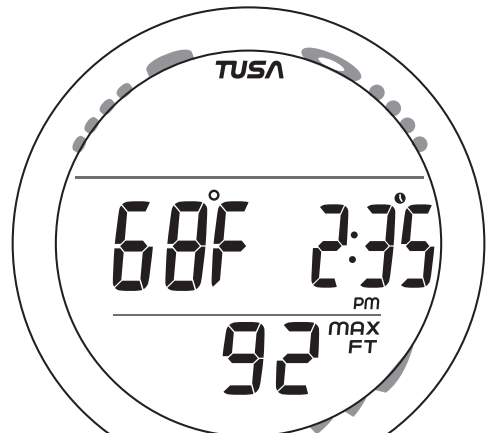


Fig. 69B - DS ALT 2

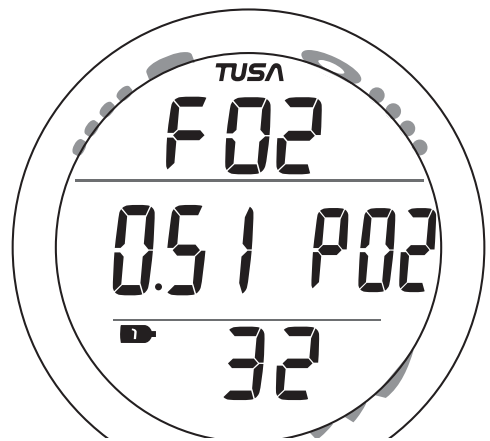


Fig. 69C - DS ALT 3

No Deco Safety Stop (Fig. 70)
Upon ascending to 20 FT (6 M) on any No Deco dive in which Depth exceeded 30 FT (9 M), a Safety Stop screen will appear displaying a recommended Stop at 15 FT (4.5 M) with a Count-down Timer that counts down from 03:00 to 0:00 (min:sec).

The Safety Stop will be displayed until the countdown times out, or you descend below 30 FT (9 M) during the countdown, or you surface during the countdown.

- Like the Deep Stop, there is no Penalty for surfacing prior to completing the Safety Stop.
- There is no Preview screen associated with the Safety Stop.

Safety Stop Main display information includes NDC Dive Time Remaining (hr:min) with wave/clock/profile mode icon, Stop Depth (15 FT or 4.5 M), STOP icon, Countdown Timer (min:sec) with clock icon, Tank icon (Gas 1 or 2), Current Depth with FT (or M) icon, and applicable bar graphs.

- Press and release the A button to access the ALT displays which are similar to those previously described for the Deep Stop (page 73).

Fig. 70 - SAFETY STOP MAIN

CAUTIONARY MODES

DECOMPRESSION

Decompression mode activates when theoretical No Decompression time and depth limits (NDLs) are exceeded.

Upon Entry into Decompression, the Audible Alarm will sound until acknowledged or for 10 seconds. While the audible is sounding, the UP Arrow icon, Stop Bar icon, and full NiBG will flash to alert you.

Deco Entry information includes (Fig. 71)

> Full NiBG (flashing until the audible is silenced), O2BG and ASC if applicable
> TAT** (hr:min) with Deco mode icon (wave/clock/profile/stop bar), stop bar flashing until the audible is silenced
> Stop Depth required with FT (or M) and STOP icons
> Stop Time (hr:min) required clock icon
> Tank icon representing the Gas selected (1 or 2)
> Current Depth with FT (or M) icon

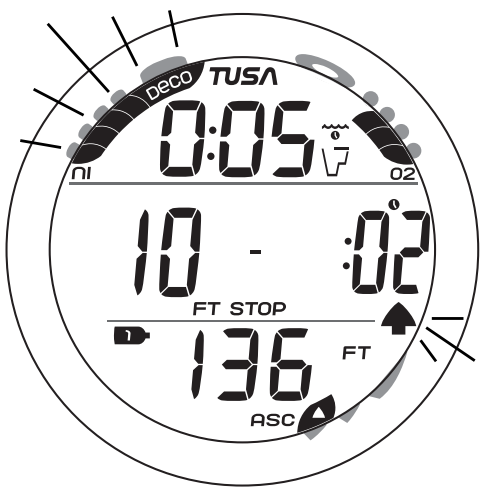


Fig. 71 - DECO ENTRY

> The UP Arrow icon will flash until you ascend to within 10 FT (3 M) below the Stop Depth indicated, then it will be blank.

- Press/release the S button to acknowledge/silence the Audible Alarm.
- Depress the L button to activate the Backlight.

**TAT represents Total Ascent Time which includes time required for all deco stops plus vertical ascent time to the surface.

NOTE: Upon entry into Deco, the Deep Stop and Safety Stop features are disabled for the remainder of that dive, even when the Deco obligation is complete and No Deco status is regained.

Managing Decompression Stops

To fulfill your decompression obligation, you should make a safe controlled Ascent to a depth slightly deeper than, or equal to, the Stop Depth indicated and decompress for the Time indicated.

The amount of decompression credit time that you receive is dependent on Depth, with slightly less credit given the deeper you are below the Stop Depth indicated.

Deco Stop Main information includes (Fig. 72) -

- > Full NiBG (solid), O2BG if applicable
- > TAT (hr:min) with Deco mode icon (Stop bar solid)
- > Stop Depth with FT (or M) and STOP icons
- > Stop Time (hr:min) with clock icon
- > Tank icon (Gas 1 or 2)
- > Current Depth with FT (or M) icon

- Press and release the A button (< 2 sec) to view ALT screens which are similar to those previously described for the Deep Stop (page 73).
- Depress the M button for 2 seconds to access the Gas Switch Routine.
- Press the L button to activate the Backlight.

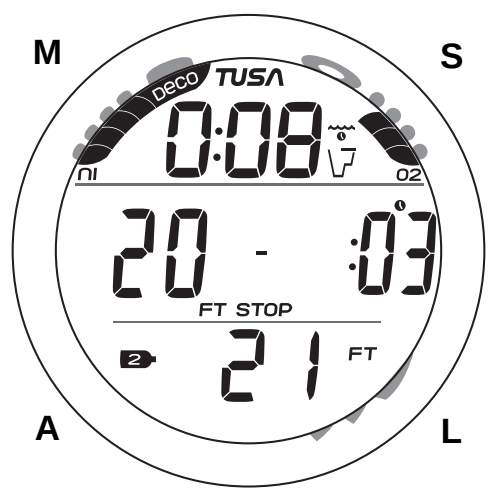


Fig. 72 - DECO STOP MAIN

CONDITIONAL VIOLATION (CV)

If you ascend shallower than the calculated Deco Ceiling Depth, the Audible Alarm will sound and no off gassing credit will be given, until you descend below the Ceiling Depth.

If you descend below the required Ceiling before 5 minutes have elapsed, operation will continue to function in Deco and off gassing credit will resume.

CV Main information includes (Fig. 73) -

- > Full NiBG (solid), O2BG if applicable
- > TAT (hr:min) with Deco mode icon (stop bar flashing)
- > Stop Depth with FT (or M) icon and STOP icon (flashing)
- > Stop Time (hr:min) with clock icon
- > Down Arrow icon (flashing)
- > Tank icon (Gas 1 or 2)
- > Current Depth with FT (or M) icon

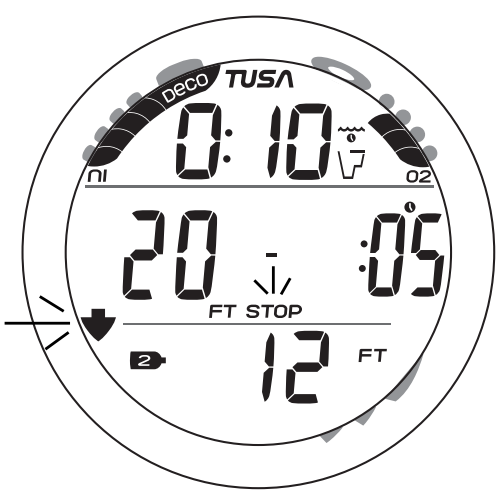


Fig. 73 - CV MAIN

- Press and release the A button (< 2 sec) to view ALT screens which are similar to those previously described for the Deep Stop (page 73).
- Depress the M button for 2 seconds to access the Gas Switch Routine.
- Press the L button to activate the Backlight.

NOTE: Upon entry into the following Violation modes, the Alarm will sound, even if Set OFF. When these events occur, the Alarm cannot be acknowledged (silenced) by pressing the S button.

DELAYED VIOLATION #1 (DV1)

If you remain above the required Deco Ceiling Depth for more than 5 minutes, the full NiBG will flash until you descend below the required Stop Depth.

This is a continuation of a Conditional Violation.

DV1 Main information includes (Fig. 74) -

- > Full NiBG (flashing), O2BG if applicable
- > TAT (hr:min) with Deco mode icon (stop bar flashing)
- > Stop Depth with FT (or M) icon and STOP icon (flashing)
- > Stop Time (hr:min) with clock icon
- > Down Arrow icon (flashing)
- > Tank icon (Gas 1 or 2)
- > Current Depth with FT (or M) icon

- Press and release the A button (< 2 sec) to view ALT screens which are similar to those previously described for the Deep Stop (page 73).
- Depress the M button for 2 seconds to access the Gas Switch Routine.
- Press the L button to activate the Backlight.

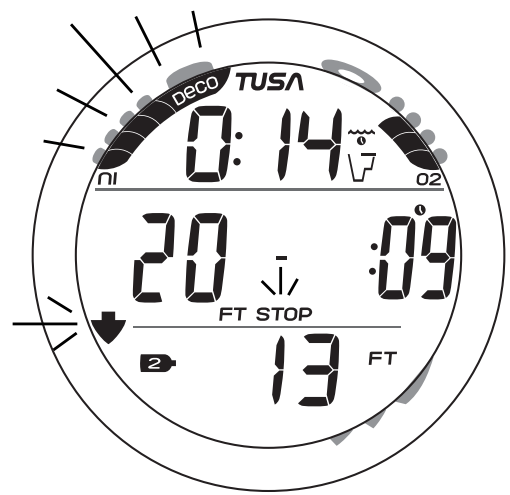


Fig. 74 - DV1 MAIN

DELAYED VIOLATION #2 (DV2)

If the Decompression obligation requires a Ceiling Depth between 60 FT (18 M) and 70 FT (21 M), the full NiBG and TAT (Total Ascent Time) digits will flash.

When this occurs, you must make a controlled ascent to just deeper than, and stay as close as possible to, 60 FT (18 M) without causing the NiBG and TAT to flash. When the Deco Stop Depth indicates 50 FT (15 M), etc., you can ascend to those Stop Depths and continue decompressing.

DV2 Main information includes (Fig. 75) -

> Full NiBG (flashing), O2BG if applicable
> TAT (hr:min) flashing with Deco mode icon
> Stop Depth with FT (or M) icon and STOP icon
> Stop Time (hr:min) with clock icon
> Tank icon (Gas 1 or 2)
> Current Depth with FT (or M) icon

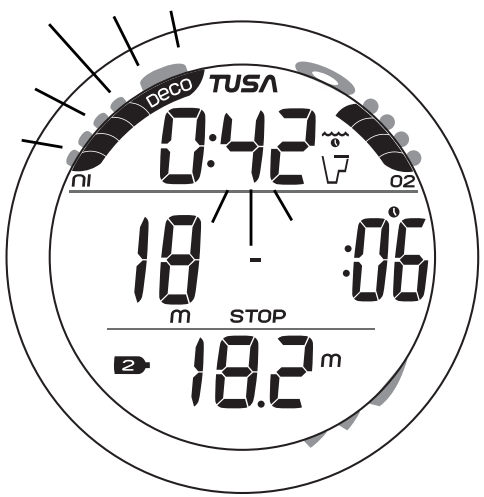


Fig. 75 - DV2 MAIN

- Press and release the A button (< 2 sec) to view ALT screens which are similar to those previously described for the Deep Stop (page 73).
- Depress the M button for 2 seconds to access the Gas Switch Routine.
- Press the L button to activate the Backlight.

DELAYED VIOLATION #3 (DV3)

If you descend deeper than the MOD (Max Operating Depth) of 330 FT (99.9 M), the Up Arrow icon will flash, and the Current Depth will only display 3 dashes (- - -) flashing signifying that you are Out of Range. Max Depth on the ALT screen will only indicate 3 dashes (- - -).

Upon ascending above 330 FT (99.9 M), the Current Depth display will be restored, however, Max Depth will only display 3 dashes for the remainder of that dive. Also, the Log for that dive will display 3 dashes as the Max Depth achieved.

DV3 Main information includes (Fig. 76) -

- > NiBG, O2BG, ASC - if applicable
- > DTR as 0:00 (hr:min) with wave/clock/profile icon
- > EDT (hr:min) with wave/clock icon
- > Tank icon representing the Gas selected (1 or 2)
- > Up Arrow icon (flashing)
- > Current Depth as 3 dashes (- - -) (flashing) with FT (or M) icon

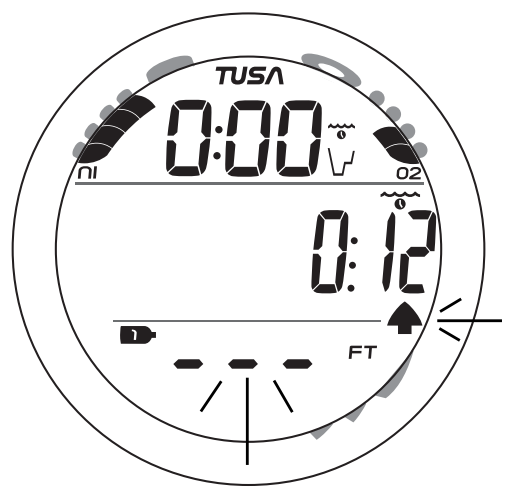


Fig. 76 - DV3 MAIN

- Press/release the A button (< 2 sec) to view ALT displays which are similar to those previously described for the No Deco (page 71).
- Press/release the S button (< 2 sec) to acknowledge alarms.
- Press the L button to activate the Backlight.

VIOLATION GAUGE MODE (VGM)

If calculations require a Deco Stop Depth greater than 70 FT (21 M), or if Deco is entered while operating in FREE Mode (described later), operation will enter Violation Gauge Mode (VGM) for the remainder of that dive and for 24 hours after surfacing. VGM turns the ZEN into a digital instrument without any nitrogen or oxygen calculations or monitoring functions or displayed information until 24 contiguous hours elapse on the surface with no dives.

VGM Main information includes (Fig. 77) -

- > Full NiBG and full O2BG, all segments flashing
- > Graphic VIO, flashing until the audible is silenced then solid
- > EDT (hr:min) with wave/clock icon
- > Tank icon representing the GAS selected (1 or 2)
- > Current Depth with FT (or M) icon
- > Up Arrow icon, flashing until on surface

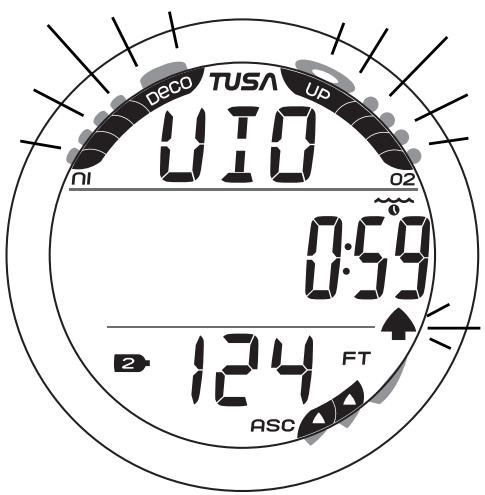


Fig. 77 - VGM MAIN

The ZEN will also enter VGM 5 minutes surfacing from a dive in which a Delayed Violation (1, 2, or 3) occurred.

Once on the surface, VGM does not allow access to the Set F, Plan, Fly, and Dsat features/screens.

The countdown timer that appears when you try to access Fly is only provided to inform you of the time remaining before normal Dive Computer operation can resume with full features and functions.

This condition is a Permanent Violation, and in the event that a dive is made during the 24 hour period, a full 24 hour surface interval must then be served before all functions are restored.

VGM Main (on surface) information includes (Fig. 78) -

> Full NiBG and full O2BG, all segments flashing
> Surface Interval Time (hr:min) with wave/clock icon
> Graphics Vio and Nor alternating
> Tank 1 icon representing Gas 1
> Dive number with # icon
> Battery icon if low battery condition

- Depressing the A button for 2 seconds will access the NORM SURF ALT screen for 5 seconds.
- Pressing and releasing the A button (< 2 sec) will access Log Mode, then pressing it again will access History Mode.
- Pressing the L button will activate the Backlight.
- Depressing both the A and S buttons simultaneously for 2 seconds will access the Set Menu.
- Depressing the M for 2 seconds will access the GAUG Surface Main screen, then another 2 second press will access the FREE Surface Main screen.
- Pressing and releasing the M button momentarily (< 2 sec) will revert to the Watch Default Time screen.

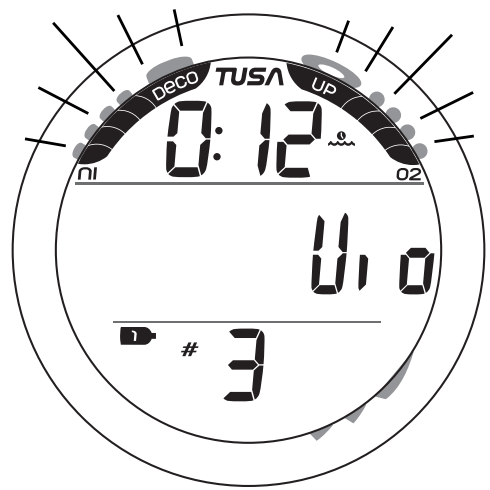


Fig. 78 - VGM MAIN (on surface)

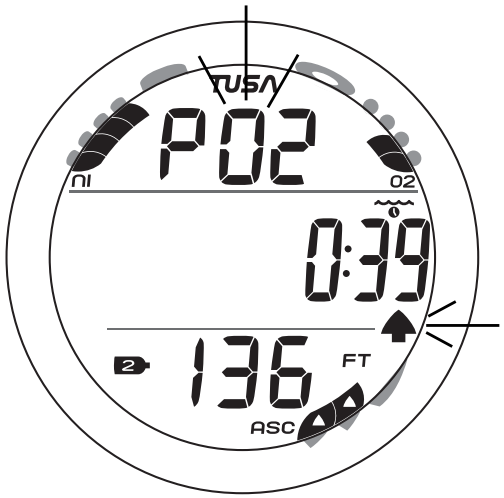


Fig. 79A - HIGH PO2 MAIN
(during audible)

alternate
w/ **PO2**

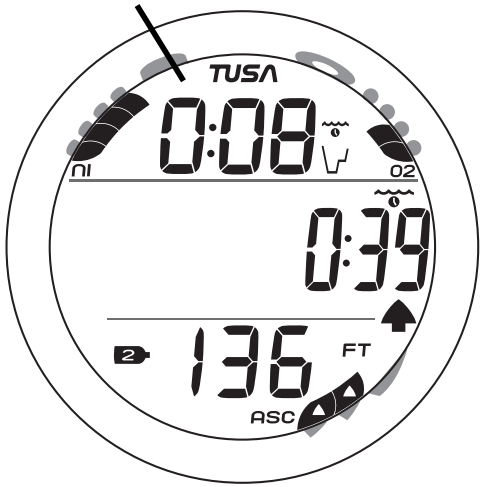


Fig. 79B - HIGH PO2 MAIN
(after audible)

HIGH PO2

When partial pressure of oxygen (PO2) becomes equal to, or greater than, 0.2 (ATA) less than the PO2 Alarm value set; the Audible will sound. Note that while in Deco, High PO2 will only alarm at 1.60.

- Press/release the S button to acknowledge/silence the alarm.

> The graphic PO2 and Up Arrow icon will be displayed flashing on the Main screen (Fig. 79A) until the audible is silenced, then the graphic PO2 will alternate with NDC time (Fig. 79B) until PO2 decreases 0.2 (ATA) below the alarm Set Point.

> The value of PO2 can be viewed on the ALT 2 screen.

- Press/release the A button to view the ALT screens.
- Depress the M button for 2 seconds to access the Gas Switch routine.
- Press the L button to activate the backlight.

If PO2 continues to increase, the value (and displayed on the ALT screen) will increase in increments of .01 (ATA).

> When PO2 reaches the Alarm Set Point, the Audible Alarm will sound again.

> The Up Arrow icon will flash on the Main screen until PO2 decreases 0.2 (ATA) below the alarm Set Point.

HIGH O2

The O2BG (Fig. 80a) represents oxygen accumulated as a result of the repetitive Nitrox dives you have conducted during that operating period. The O2BG lets you monitor how close you are coming to the limits of oxygen exposure.

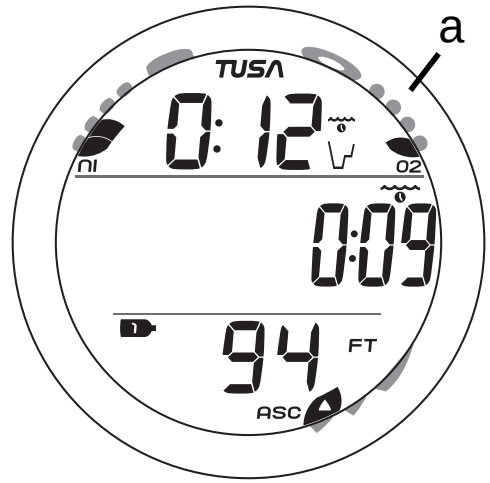


Fig. 80 - NITROX DIVE

If the theoretical amount of oxygen accumulated reaches the limit for a single exposure, or 24 hour period (300 OTU = 100%), the graphic O2 replaces NDC time and the full O2BG and Up Arrow icon will be displayed flashing (Fig. 81).

The Audible Alarm will sound. When the audible is acknowledged/silenced, the O2 graphic becomes solid until O2 decreases below 100%.

- Press/release the S button to acknowledge/silence the alarm.
- Press/release the A button to view the ALT screens.
- Depress the M button for 2 seconds to access the Gas Switch routine.
- Press the L button to activate the backlight.

Upon surfacing, operation will lock in to NORM mode until the O2BG recedes to 4 segments. Access to Watch Mode is allowed but access to GAUG and FREE is blocked.

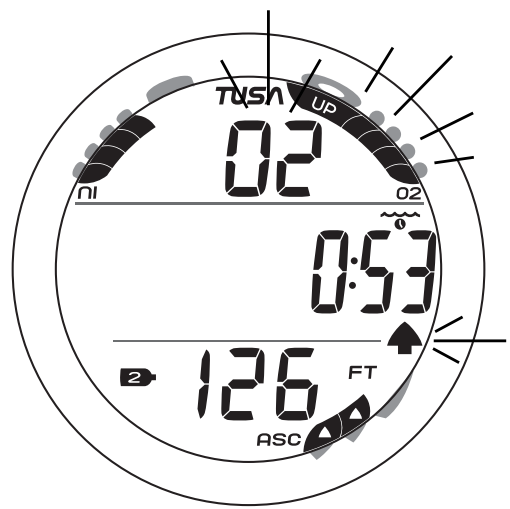


Fig. 80 - HIGH O2

⚠ WARNINGS AND SAFETY RECOMMENDATIONS

- **The percentage of oxygen (FO2) in the Nitrox mix being used must be 'set before each nitrox dive', unless the FO2 50% Default feature is set OFF (a user setting).**
- **Plan Mode provides predicted times for subsequent dives. Depending on cylinder size, breathing gas consumption, and oxygen accumulation, you may have less time available than indicated because of breathing gas quantity or other limitations.**
- **Until it has shut itself off, you must not use the ZEN at a different Altitude than the Altitude at which it was activated. Doing so will result in an error equal to the difference in barometric pressure, and possibly a false dive mode with erroneous data.**
- **To provide proper Altitude compensation, the ZEN must be manually activated at the new altitude. Dive computers, such as the ZEN cannot sense changes in barometric pressure if activated by immersion in water at higher Altitudes.**
- **Use the Caution Zone of the Nitrogen Bar Graph as a visual reference to provide a greater margin of protection between you and the No Decompression Limits.**
- **Every effort should be made to keep each of the Bar Graphs in the normal zone throughout your dives to reduce your risk of exposure to decompression sickness, oxygen toxicity, and the effects of excessive ascent rates.**

SWITCHING GAS MIXES

SWITCHING GAS MIXES (NORM only)

During NORM Dives, the FO2 calculations/displays can be switched from Gas 1 to 2.

> Switching Gas cannot be performed while on the surface.
> Every dive begins with Gas 1 and 10 minutes after surfacing from a multiple gas dive, operation defaults to the Gas 1 FO2.
> Access to Gas Switching screens can only be accomplished during the time that a NORM Dive Main screen is being displayed and cannot be performed during the time that an Alarm is sounding.

△ **NOTE: If a Switch to a new Gas mix would expose the diver to a prohibitive PO2 level of 1.60 ATA or greater, the Audible Alarm will sound and the graphics DO > NOt CHNG GAS will flash on the display (Fig. 81) until the Audible is silenced.**

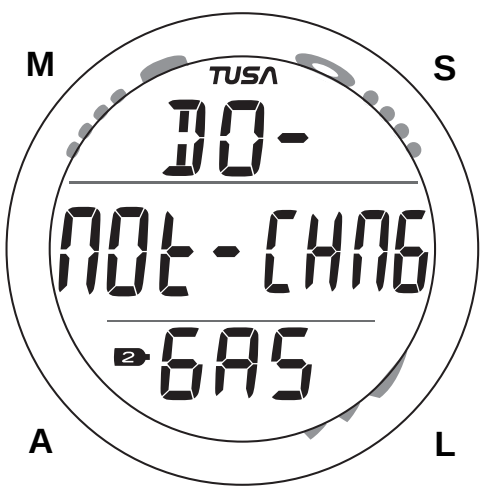


Fig. 81 - DO NOT CHANGE GAS ALARM

Due to the possibility that sufficient air may not be available in the Switch From tank to complete the dive, the Switch to the prohibitive Mix is still allowed.

> If the Switch is made to the prohibitive Mix, the High PO2 Alarm will activate.
> If in Deco the graphic PO2 will flash in place of TAT until PO2 decreases below 1.60, then TAT will be restored.

Switching of Gas Mixes can only to be performed during the time that a Gas Switch Preview screen is being displayed.

To access the Preview screens while viewing a NORM Dive Main screen.

- Depress the M button for 2 seconds to view the Gas 1 Preview screen.
- Press and release the M button momentarily (< 2 sec) while the Gas 1 Preview screens is displayed to view the Gas 2 Preview screen.
- Depress the M button for 2 seconds while viewing a Preview screen to Switch FO2 to that Gas.

> Operation will revert to the NORM Main screen after 10 seconds of no further M button action.

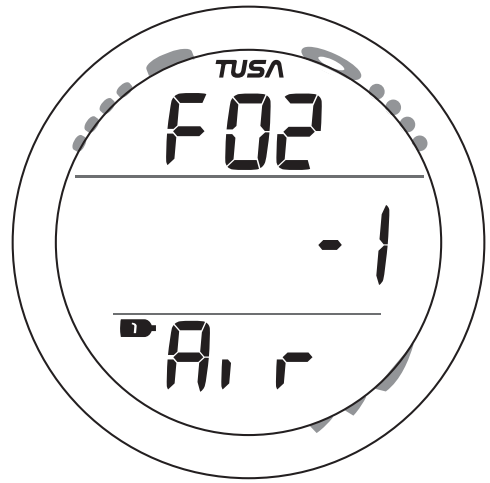


Fig. 82 - GAS 1 PREVIEW

Gas 1 Switch Preview information includes (Fig. 82) -

> Graphics FO2 and - 1
> FO2 Set Point for GAS 1 and the symbol FO2
> Tank icon representing Gas 1
> Graphic Air or FO2 value set

Gas 2 Switch Preview information includes (Fig. 83) -

> Graphics FO2 and - 2
> FO2 Set Point for GAS 1 and the symbol FO2
> Tank icon representing Gas 2
> Graphic Air or FO2 value set

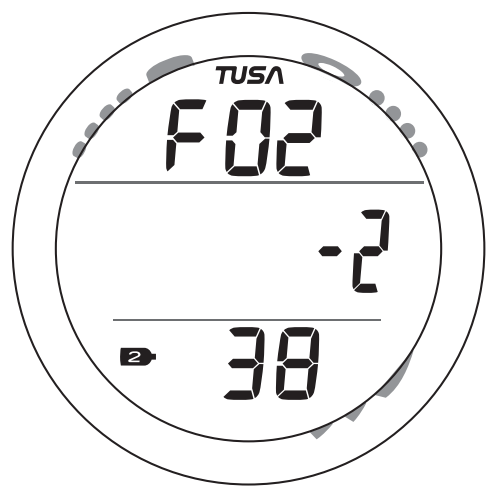
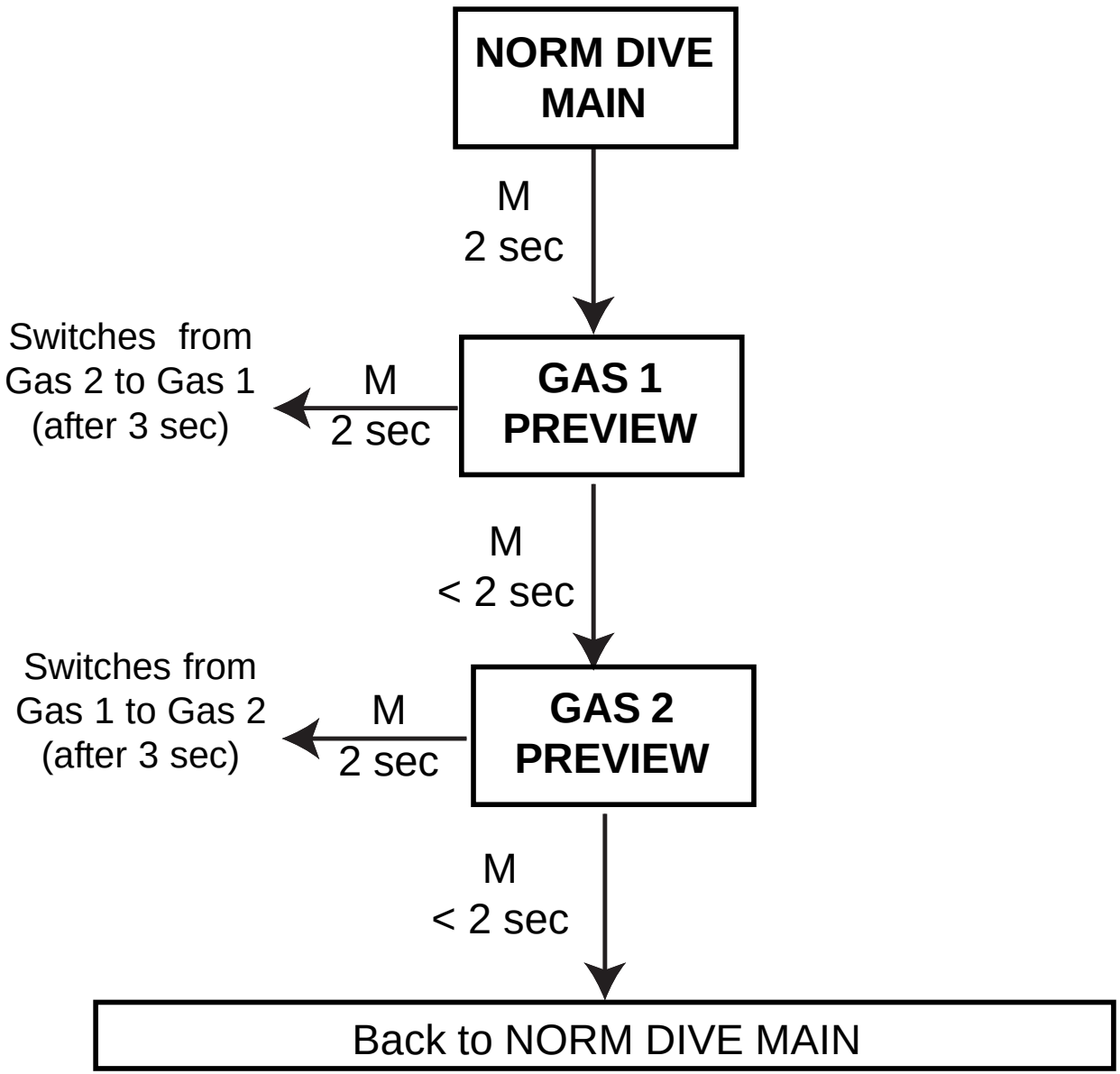


Fig. 83 - GAS 2 PREVIEW

GAS SWITCH ROUTINE



NORM POST DIVE MODES

POST DIVE FIRST 10 MINUTES ON SURFACE

When you ascend to 2 FT (0.6 M) for 1 second, the Surface Main screen will be displayed. If you descend during the first 10 minutes after surfacing (referred to as the Transition Period), time underwater will be considered a continuation of that dive. The time at the surface (if less than 10 minutes) will not be added as Dive Time.

NORM Surface Main information includes (Fig. 84) -

- > NiBG, and O2BG (if Nitrox)
- > Surface Interval Time (hr:min) with colon flashing during the first 10 minutes and clock/wave icon
- > Graphic Nor
- > Tank 1 icon representing Gas 1, default on surface
- > Number of that dive with # icon
- > Battery icon if a Low Battery condition exists, flashing if Too Low

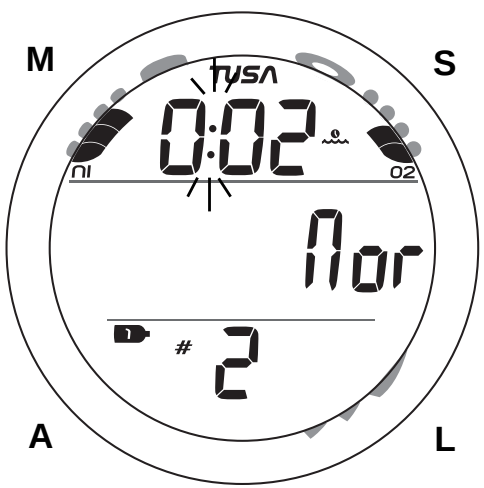


Fig. 84 - NORM SURF MAIN
(< 10 min after surfacing)

During the Transition Period, ALT displays and the Log and History can be accessed. Other modes (e.g., Plan, Fly, Sat, Set) are accessible after 10 minutes on the surface.

- Press and release the A button (< 2 sec) to access the Log Preview screen for that dive.
- Depress the A button for 2 seconds to access SURF ALT.
- Press and release the M button (< 2 sec) to access the Watch Default Time screen.
- Press the L button to activate the Backlight.

POST DIVE AFTER 10 MINUTES ON SURFACE

Once 10 minutes have elapsed, the Surface Interval time colon will stop flashing indicating that the Dive and Transition Period are completed, and a subsequent descent will be considered a new dive. Operation will revert to the Watch Default Time screen.

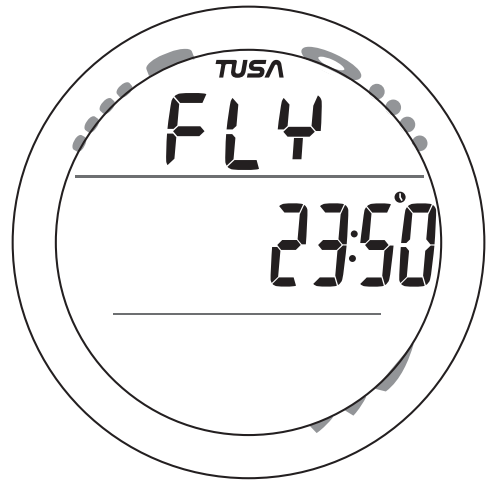


Fig. 85 - TIME TO FLY

The NORM Surface Main screen can be then be accessed by depressing the M button 2 seconds. You will then have full access to other NORM DC surface modes (e.g., Plan, Fly, Sat, Log, Hist, Set, etc.).

- Press and release the S button momentarily (< 2 sec) to access Plan Mode.

> Adjusted No Deco Limits will be displayed based on residual nitrogen and accumulated oxygen calculated to be remaining from the previous dives.

- While viewing the first Plan screen, press and release the A button momentarily (< 2 sec) to access the Time to Fly screen (Fig. 85), then press it again to access Dsat Time screen (Fig. 86).

> The Desat counter provides calculated time for tissue desaturation at sea level.

> If a Violation occurred during the dive, the Desat screen will not be displayed.

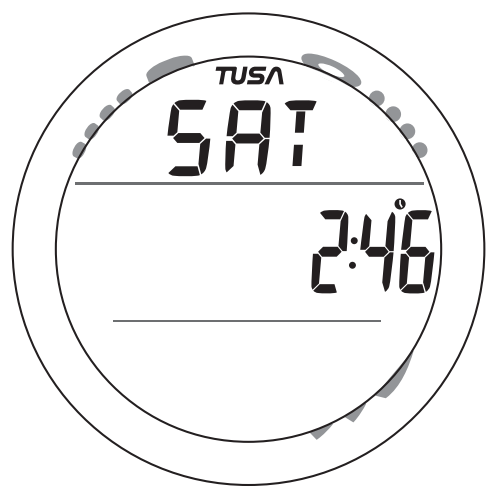


Fig. 86 - DSAT TIME

UPLOADING SETTINGS AND DOWNLOADING DATA

The ZEN is configured with a Data Port located on the back of the left side that enables it to be connected to a PC through a USB port using the special Interface Cable supplied.

A USB Driver is provided on the CD as part of the Interface System.

The Settings Upload portion of the program provided can be used to set/change the Main Time, Date, Set A group (Alarms), and Set U group (Utilities) using the same Interface System. The Set F group (FO2) and FREE Mode Alarms must be entered using the ZEN's button controls.

Information available for retrieval (DownLoad) from the ZEN to the PC Download portion of the program includes dive number, surface interval time, maximum depth, elapsed dive time, start date, start time, lowest temperature under water, sampling rate, dive profile, Set Points, NiBG, O2BG, and Gas Switching events.

The ZEN checks for the presence of an interface device connection to the Data Port once every second while in Watch Default Time mode. Checks are not made if the Wet Activation contacts are wet. Upon sensing an interface connection, the requesting device (PC) connects to the ZEN and is prepared for Upload of settings or Download of data which are then initiated using the PC program.

Prior to attempting to Download data from your ZEN or Upload Settings to it, review the HELP section of the interface program. Recommended is to print those sections of HELP that you consider appropriate for your Interface activities.

GAUGE OPERATING MODE

DIGITAL GAUGE MODE

When Digital Gauge Mode (GAUG) is selected as the operating mode, the ZEN will operate as a Digital Depth Gauge/Timer without performing nitrogen and oxygen calculations.

- To access Gauge mode while the Watch Default Time screen is displayed, press the M button 2 times (2 seconds each time), or while the NORM Surface Main screen is displayed, press the M button 1 time for 2 seconds.
- If the graphic GAU is flashing, Gauge Mode can be selected as the operating dive mode by pressing and releasing the M button momentarily (< 2 sec). The graphic GAU becomes solid and Gauge Mode is selected.
- If no Gauge dive has be conducted, pressing the M button for 2 seconds will advance to the Free Surface Main screen.

WATCH TIME >> NORM SURF >> GAUG SURF >> FREE SURF

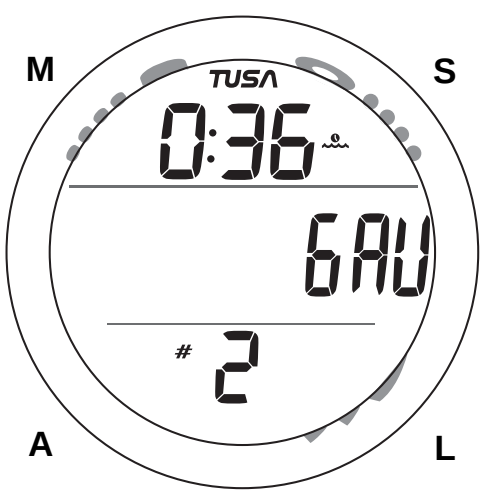


Fig. 87 - GAUG SURF MAIN

Gauge Surface Main information includes (Fig. 122) -

> Surface Interval Time (hr:min) with clock/wave icon
> Graphic GAU, flashing if not previous selected
> Number of the recent dive conducted, 0 if no dive yet that period, with # icon
> Battery icon if a Low Battery condition, flashing if Too Low

Upon descending to 5 FT (1.5 M) for 5 seconds, the ZEN will enter Gauge Dive Mode.

- Press and release the A button momentarily (< 2 sec) to access Log, then again to access History.
- Depress the A button for 2 seconds to the GAUG SURF ALT screen (Fig. 88 - Altitude, Temperature, Time of Day).
- Depress the A and S buttons simultaneously for 2 seconds to access the Set menu (F >> A >> U).
- Press and release the S button momentarily (< 2 sec) to access the Time to Fly screen, if a dive was conducted.
- Press the L button to activate the Backlight.

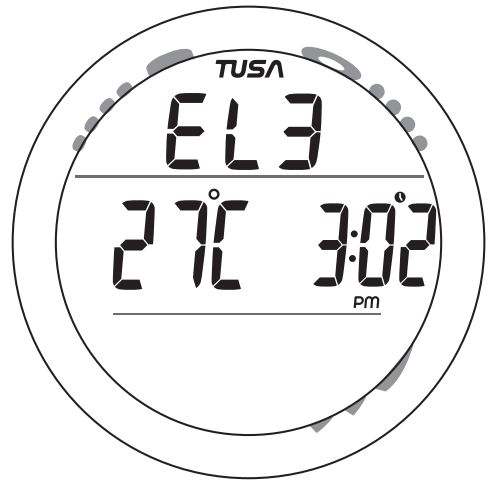


Fig. 88 - GAUG SURF ALT

△ **NOTE: Once a dive is made in Digital Gauge Mode, you must wait 24 contiguous hours after surfacing before the ZEN resets and will operate as an Air or Nitrox dive computer in NORM Mode or FREE Dive Mode.**

Gauge Dive Main information includes (Fig. 89) -

> Graphic GAU
> Elapsed Dive Time (hr:min) with wave/clock icons
> Depth and FT (or M) icon
> ASC when ascending

- Press and release the A button momentarily (< 2 sec) to access the ALT screen.
- Press and release the S button momentarily (< 2 sec) to acknowledge/silence Alarms.
- Press the L button to activate the Backlight.

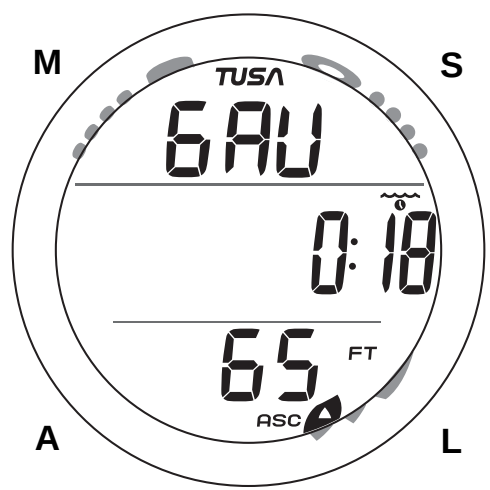


Fig. 89 - GAUG DIVE MAIN

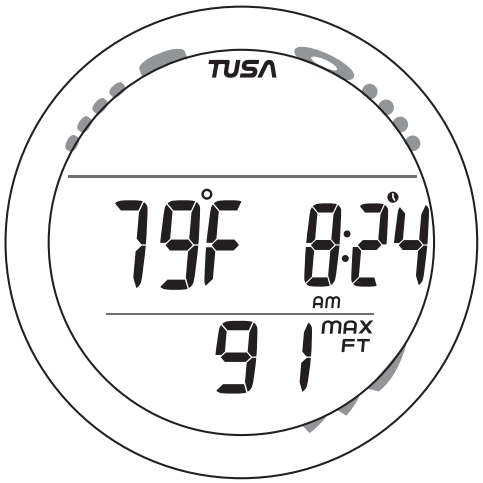


Fig. 90 - GAUG DIVE ALT

Gauge Dive ALT information includes (Fig. 90) -

> Temperature with degrees icon and graphic F (or C)
> Time of Day (hr:min) with clock and AM (or PM) icons
> Max Depth with FT (or M) and MAX icons

- The display will revert to the MAIN screen after 5 seconds or if the A button is pressed.
- Press the L button to activate the Backlight.

As in NORM Dive Mode, if you descend deeper than the MOD (Max Operating Depth) of 330 FT (99.9 M), a cautionary mode referred to as Delayed Violation 3 will be activated.

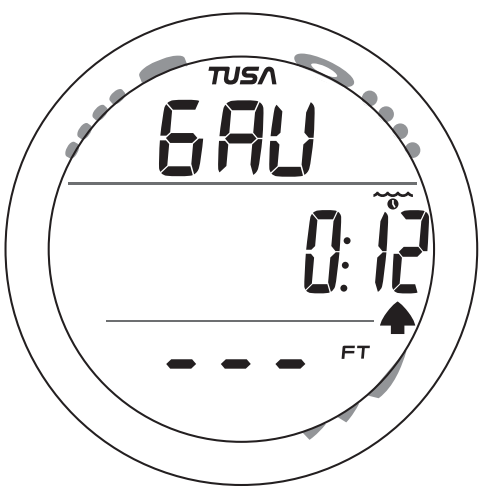


Fig. 91 - GAUG DV3 MAIN

DV3 Main information includes (Fig. 91) -

> Graphic GAU
> EDT (hr:min) with wave/clock icon
> Up Arrow icon (flashing)
> Current Depth as 3 dashes (- - -) flashing with FT (or M) icon
> ASC - if ascending

- Press and release the S button momentarily (< 2 sec) to acknowledge/silence Alarms.
- Press and release the A button momentarily (< 2 sec) to access the ALT screen.
- Press the L button to activate the Backlight.

FREE DIVE OPERATING MODE

FREE DIVE MODE

When Free Dive Mode is selected as the operating mode, the ZEN will operate with select features. Nitrogen loading is calculated based on a default FO2 of AIR and the amount remaining during 24 hours is carried over between FREE and NORM operating modes.

- To access Free Dive Operating mode while viewing the Watch Default Time screen, press the M button 3 times (2 seconds each time), or while the Gauge Surface Main screen (no Gauge dive was made), press the M button 1 time for 2 seconds.
- The graphic FRE will flash indicating that it can be selected as the operating mode.
- To select it, press and release the M button momentarily (< 2 sec). The graphic becomes solid and Free mode is selected for the dives to be conducted.

WATCH TIME >> NORM SURF >> GAUG SURF >> FREE SURF

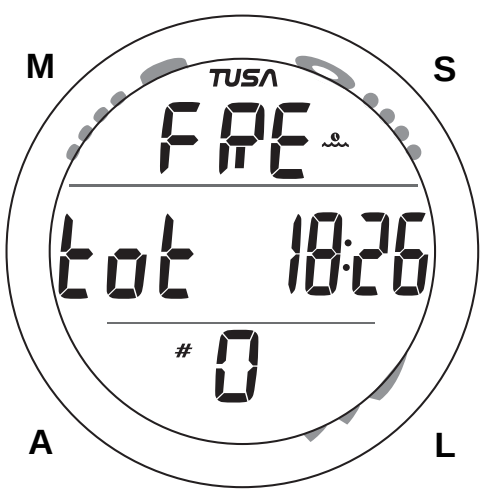


Fig. 92 - FREE SURF MAIN

Free Surface Main information includes (Fig. 92) -

> Graphic FRE
> Graphic **tot** with Total number of repetitive Free dives conducted in that series with # icon (below)
> Surface Interval after the most recent dive (min:sec to 59:59, then hr:min) with clock/wave icon (above next to FRE)
> Battery icon if a Low Battery condition exists

- Press and release the M button momentarily (< 2 sec) to access the Watch Default Time screen.
- Press the L button to activate the Backlight.

- Press and release the A button momentarily (< 2 sec) to access the Free Surface ALT 1 screen, then again ALT 2.
- Depress the A button for 2 seconds to access the FREE CDT (Count Down Timer) Status screen.
- Depress the A and S buttons simultaneously for 2 seconds to access the Set Free EDT (Elapsed Dive Time) Alarm, then Set Free Depth Alarms 1, 2, 3.

FREE Mode uses the Watch and NORM/ GAUG settings for -

>> Time/Date
>> Wet Activation
>> Units
>> Conservative Factor
>> Backlight Duration

Free Surface ALT 1 information includes (Fig. 93) -

> Surface Interval prior to the last dive conducted (min:sec) with clock/wave icons
> Graphic LASt (meaning most recent dive conducted)
> Elapsed Dive Time (min:sec) of the last dive conducted with wave/clock icons
> Max Depth of the last dive conducted with MAX and FT (or M) icons

- Press and release the A button momentarily (< 2 sec) to access the Free Surface ALT 2 screen.

> The display will revert to the Main after 5 seconds if the A button is not pressed.

- Press the L button to activate the Backlight.

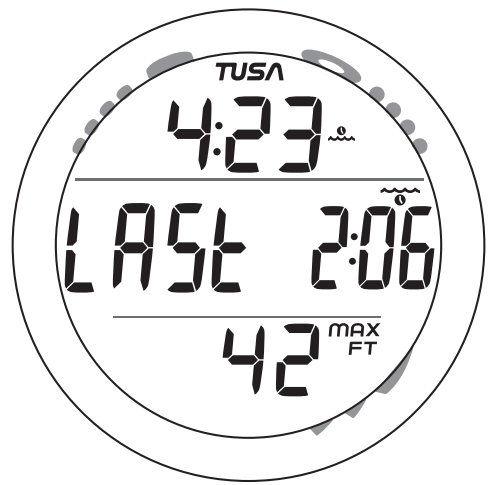


Fig. 93 - FREE SURF ALT 1

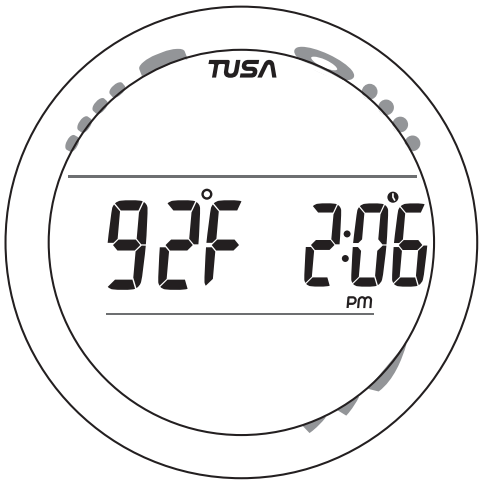


Fig. 94 - FREE SURF ALT 2

Free Surface ALT 2 information includes (Fig. 94) -

> Temperature with degrees icon and graphic F (or C)

> Time of Day with clock and AM (or PM) icons

> The display will revert to the Main after 5 seconds or if the A button is pressed/released.

- Press the L button to activate the Backlight.

FREE MODE COUNTDOWN TIMER (CDT)

After accessing the Free CDT Status screen from the Free Surface Main screen, the CDT can be started, stopped, and set.

Information and operation is similar to the Watch CDT with the Status screen, displaying the graphics CDT and ON if running with Countdown Time (hr:min) remaining (Fig. 95), or OFF flashing and the previously Countdown Time set, or OFF (solid) and 0:00 if no time was previously set.

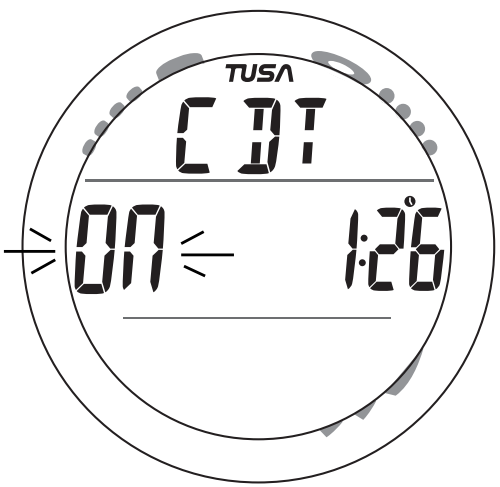


Fig. 95 - CDT STATUS
(Off, set, ready)

Once set ON, a Countdown will run in the background until it counts down to 0:00, or it is set OFF, or a Dive is made at which time it will default to OFF and the value previously set.

When a set Countdown Time reaches 0:00, the Audible Alarm will sound.

- Pressing and releasing the S button momentarily (< 2 sec) will toggle between ON and OFF. A toggle to ON will Start the CDT if a Time has been set.
- Depressing the A and S buttons simultaneously for 2 seconds will access Set Free CDT.
- Pressing and releasing the S button momentarily (< 2 sec) will revert to the Free Surface Main screen.
- If the M button is pressed for 2 seconds or if no button is pressed during a period of 2 minutes, operation will revert to the Free Surface Main screen.
- Pressing the L button will activate the Backlight.

Once the CDT has been Set and Started (by selecting ON), it will continue to run in the background while on the surface until turned OFF (stopped) or the Time reaches 0:00 at which time the Alarm will strike, the graphic CDT will be displayed, and the Timer will revert to OFF.

Upon descending to 5 FT/1.5 M (i.e., entry into Free Dive mode), CDT operation will continue, if in progress.

During a dive, the CDT can be turned OFF (stopped) and ON (started), but not Set.

Set Free CDT

Upon access, the Set CDT screen displays the graphics **CDT** and **SEt** and the CDT (min:sec) with clock icon, the Minute Set Point flashing (Fig. 96 page 104).

- Depressing the S button will scroll upward through the Minute Set Points in 1 minute increments at a rate of 8 per second.

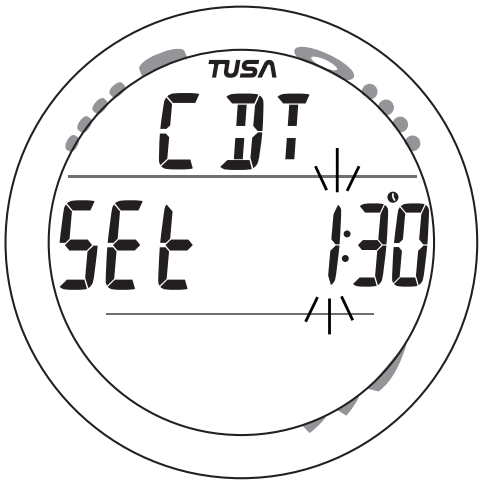


Fig. 96 - SET FREE CDT

- Pressing and releasing the S button momentarily and repeatedly (< 2 sec each time) will step upward through the Set Points one at a time.
- Pressing and releasing the A button momentarily (< 2 sec) will save the Minute Set Point and the Second digits will flash.
- Depressing the S button will scroll upward through the Seconds Set Points in 1 second increments at a rate of 8 per second.
- Pressing and releasing the A button momentarily (< 2 sec) will save the Seconds Set Point and revert to the CDT Status screen with the graphic OFF (flashing) in place of the graphic SEt (Fig. 97).
- Pressing and releasing the S button momentarily (< 2 sec) will toggle from OFF to ON and Start the Timer.
- Depressing the M button for 2 seconds, or if no button is pressed during a period of 2 minutes, operation will revert to the Free Surface Main screen.

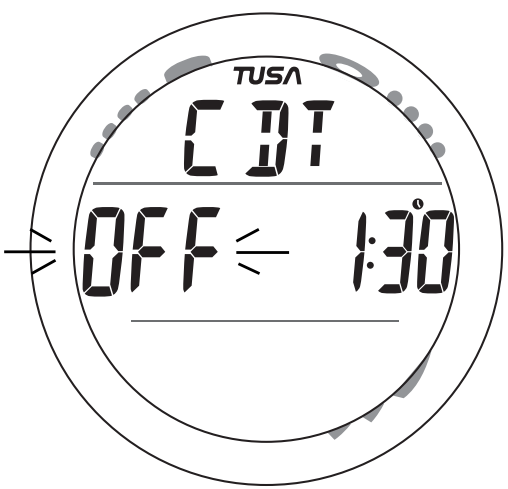


Fig. 97 - FREE CDT SET

FREE DIVE EDT (ELAPSED DIVE TIME) ALARM

The Free EDT Alarm is factory set for 30 seconds. When set ON, the Alarm will sound 3 short beeps and the graphic EDT and Time digits will flash every 30 seconds (Fig. 98).

- Depress the A and S buttons simultaneously for 2 seconds while the Free Surface Main screen is displayed, to access Set Free EDT Alarm.

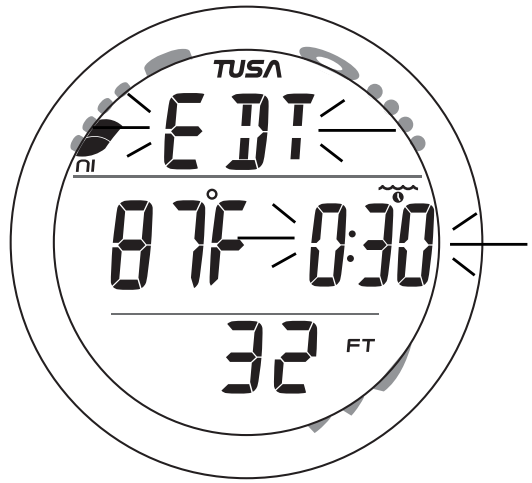


Fig. 98 - SET FREE EDT ALARM

NOTE: The FREE EDT Alarm can only be Set (turned OFF or ON) while on the Surface and can not be changed during a Dive.

Set Free EDT Alarm information includes (Fig. 99) -

> Graphics EDT, 30 with clock icon, and SEC
> Set Point OFF (or ON) flashing.

- Pressing and releasing the S button momentarily (< 2 sec) will toggle the Set Point between OFF and ON.
- Pressing the A button momentarily (< 2 sec) will accept the setting and access Set Free Depth Alarm 1.
- Depressing the M button for 2 seconds, or if no button is pressed during a period of 2 minutes, operation will revert to the Free Surface Main screen.

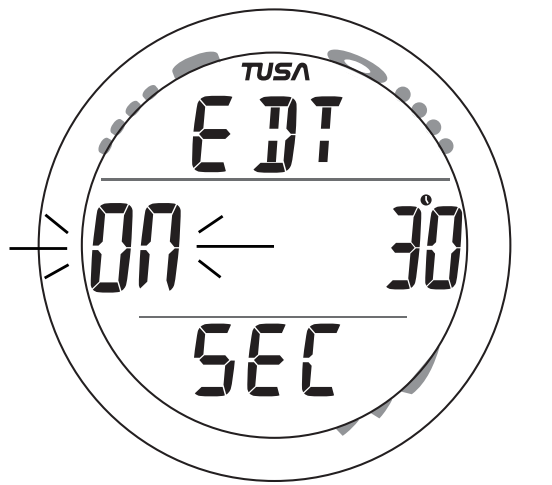


Fig. 99 - SET EDT ALARM

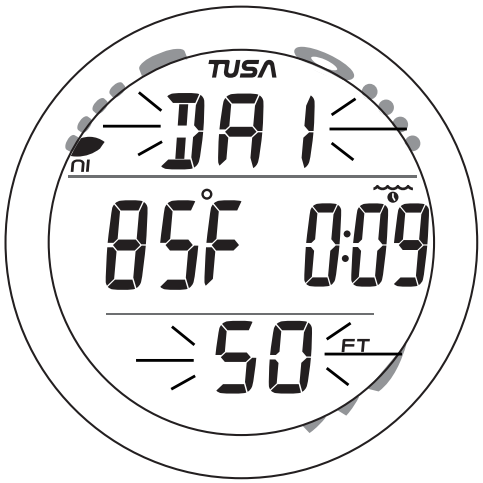


Fig. 101 - FREE DEPTH ALARM 1

FREE DIVE DEPTH ALARMS (DA)

Free Dive mode features 3 Depth Alarms (DAs) that can be Set at progressively deeper Depths and turned OFF/ON.

> If Alarm 1 is set OFF, then Alarms 2 and 3 will be disabled.
> If Alarm 2 is set OFF, Alarm 3 will be disabled.

When each alarm Depth set is reached during a dive, 3 short beeps will sound 3 times and the graphic DA1 (DA2, DA3) and Depth digits will flash (Fig. 101).

- Press and release the A button momentarily (< 2 sec) while viewing the Set Free EDT Alarm screen to access Set Free DA1 (Depth Alarm 1) screen. DA2 and DA3 similar.

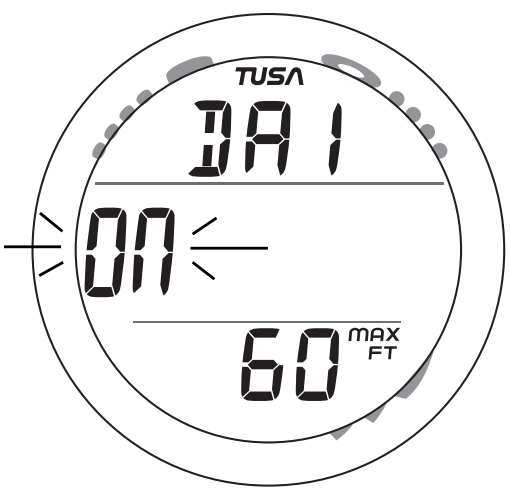


Fig. 102 - SET FREE DEPTH ALARM 1

Set Free DA1 information includes (Fig. 102) -

> Graphic DA1
> Set Point OFF (or ON) flashing
> Depth Set Point digits flashing if ON is selected, with MAX and FT (or M) icons

- Pressing and releasing the S button momentarily (< 2 sec) will toggle the Set Point between OFF and ON.

- Pressing and releasing the A button momentarily (< 2 sec) will accept the ON/OFF setting, and if OFF is selected operation will revert to the Free Surface Main screen, or if ON is selected the Depth digits will flash allowing them to be set (Fig. 103).
- Depressing and holding the S button will scroll upward through the Depth Set Points from 30 to 330 FT (10 to 100 M) in increments of 10 FT (1 M) at a rate of 8 Set Points per second until it is released.
- Pressing and releasing the S button momentarily and repeatedly (< 2 sec each time) will step upward through the Set Points one at a time.
- Pressing and releasing the A button momentarily (< 2 sec) will accept the setting, and access Set DA2 (or DA3); or after setting DA3, operation will revert to the Free Surface Main screen.
- Depressing the M button for 2 seconds, or if no button is pressed during a period of 2 minutes, operation will revert to the Free Surface Main screen.

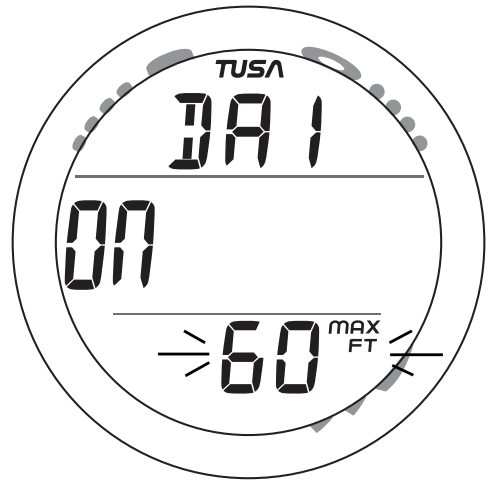


Fig. 103 - SET DA1 VALUE

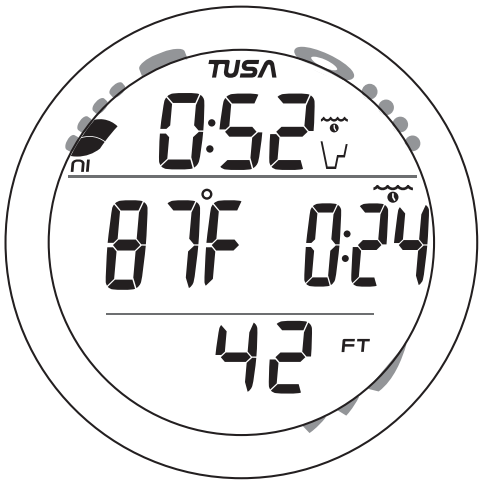


Fig. 104 - FREE DIVE MAIN

Free Dive Main information includes (Fig. 104) -

> NiBG, if any Nitrogen remaining from NORM or FREE dives conducted within the previous 24 hours
> NDC Time (min:sec) with wave/clock/profile icons
> Temperature with degrees icon and graphic F (or C)
> Elapsed Dive Time (min:sec) with wave/clock icons
> Current Depth with FT (or M) icon

- Press and release the A button momentarily (< 2 sec) to access ALT 1 (Free CDT Status).
- Press the L button will activate the Backlight.

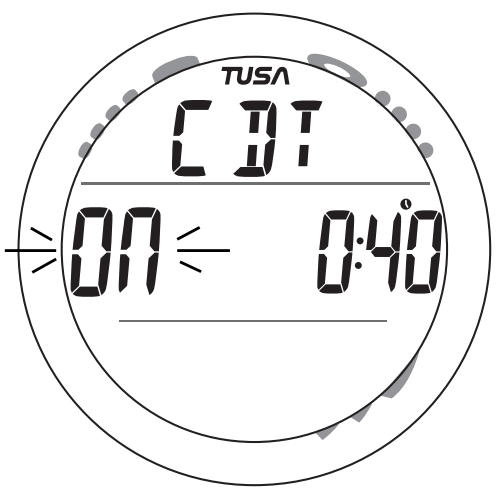


Fig. 105 - FREE DIVE ALT 1

Free Dive ALT 1 (CDT) information includes (Fig. 105) -

> Graphics CDT, and ON (or OFF) flashing
> CD Time (min:sec) with the colon flashing and clock icon, if ON and a CD is in progress; OFF and 0:00 with the colon flashing if it was running and no time remains. If OFF, the CD Time previously set will be displayed with the colon solid, indicating that it is set and ready to Start.

- Press and release the A button momentarily (< 2 sec) to toggle the CDT ON/OFF (Start/Stop).
- Press and release the A button momentarily (< 2 sec) to access ALT 2.
- If no button is pressed during a period of 10 seconds, operation will revert to the Main.

Free Dive ALT 2 information includes (Fig. 106) -

> Time of Day with clock and AM (or PM) icons
> Max Depth with MAX and FT (or M) icons

> The display will revert to the Main after 5 seconds or if the A button is pressed/released.

- Press the L button to activate the Backlight.

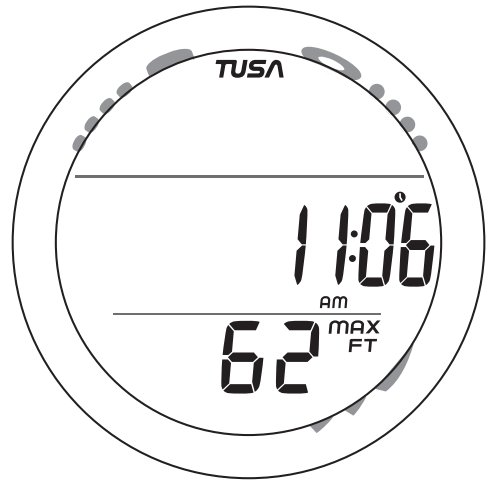


Fig. 106 - FREE DIVE ALT 2

FREE DIVE ALARMS

Free Dive alarms sound 3 short beeps (1 or 3 times) as an indication that an event is occurring and as a reminder to view the display to identify an event.

As the audible sounds, a graphic identifying the event will flash in place of NDC Time.

Free Dive alarms are separate and unaffected by NORM/GAUG mode alarm settings, and the Alarms that occur in those modes are separate and unaffected by Free Dive alarms.

Free CDT Alarm

When the Free CDT decreases to 0:00 (min:sec), 3 short beeps will sound 3 times during which the graphic CDT will flash (Fig. 107), then NDC will be restored.

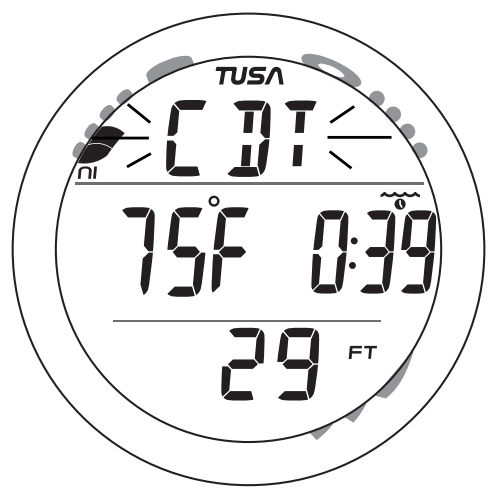


Fig. 107 - FREE CDT ALARM

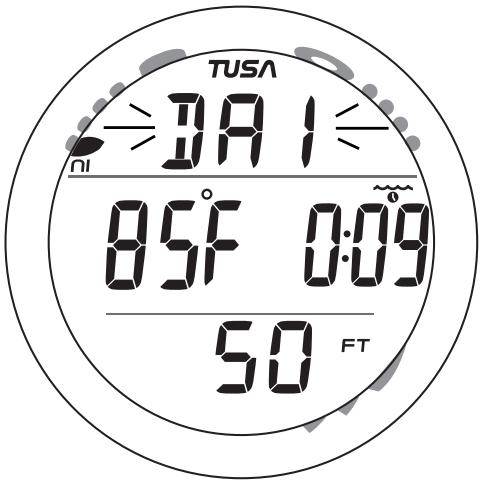


Fig. 108 - FREE DEPTH AL 1
(DA2 & DA3 similar)

Free Depth Alarms

When Depth reaches the Free Depth Alarm 1 Set Point, 3 short beeps will sound 3 times during which the graphic DA1 will flash (Fig. 108), then NDC will be restored.

The audible and flashing graphic will be repeated when Depth reaches the DA 2 and DA 3 Set Points, if set ON.

If Ascent is made above a Free Depth Alarm Set Point and then a descent is made below it, the respective Alarm (DA) will reset and sound again.

Free EDT Alarm

When the Free EDT Alarm is set ON, 3 short beeps will sound during which the graphic EDT will flash (Fig. 109), then NDC will be restored.

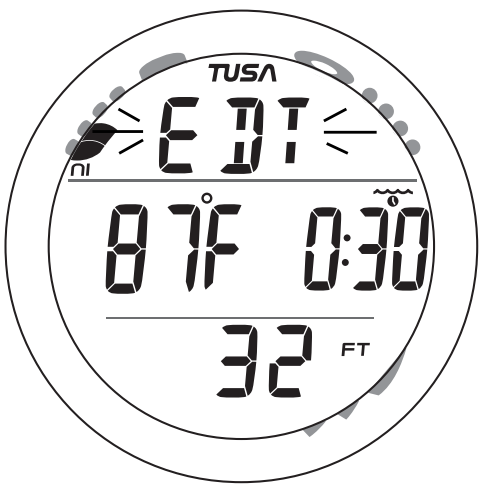


Fig. 109 - FREE EDT ALARM

The Free EDT Alarm is factory set to repeat every 30 seconds, when it is set ON prior to the dive.

Free NiBG Alarm

While operating in Free Dive mode, residual Nitrogen remaining from the Free Dives and any previous NORM SCUBA Dives conducted within 24 hours is displayed as the NiBG.

When Nitrogen loading increases to the Caution level, 3 short beeps will sound 3 times; and 4 NiBG No Deco segments, the Up Arrow icon, and the graphic NBG (in place of NDC) will be displayed (flashing) (Fig. 110).

After the beeps, the flashing will continue until the NiBG recedes to 3 segments at which time the NDC will be restored and the Up Arrow icon will be removed.

In the event that Nitrogen loading increases to the Deco level, operation will enter Violation Gauge Mode for 24 hours.

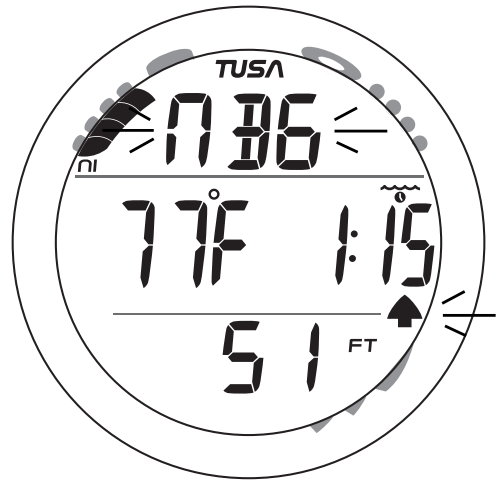


Fig. 110 - FREE NiBG ALARM

Entry into Deco (Violation)

Upon entry into Deco, 3 short beeps will sound 3 times, the full NiBG and full O2BG will be displayed with all segments flashing, and the graphic VIO will be displayed flashing (Fig. 111).

Upon surfacing, the Up Arrow icon will be removed, then after 10 minutes the NiBG and O2BG will be removed.

The graphic VIO will then alternate with FRE for 24 hours during which dive computer operation will lock into Violation Gauge Mode. Access to Watch Mode will be allowed, but access to NORM or GAUG will be blocked.

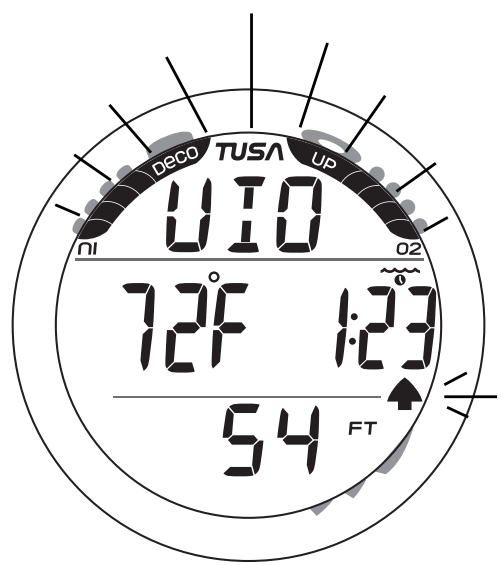


Fig. 111 - FREE DIVE DECO

ADDITIONAL INFORMATION PERTAINING TO FREE DIVE MODE

Although breathing apparatus is not utilized for Free Dive activities, nitrogen tissue loading remains a factor. Nitrogen loading is calculated based upon a fixed FO2 of AIR. Since a user has the option of alternating between NORM (SCUBA) and Free Dive activities within a 24 hour period, nitrogen calculations and the displayed value of NDC Time are carried over from one operating mode to the other, which permits the user to maintain awareness of nitrogen absorption and off gassing status.

The mathematical model currently used in the ZEN is based on no decompression/decompression multilevel repetitive dive schedules. This algorithm does not take into account the physiological changes associated with the high pressures that competitive type Free diving can expose a diver to.

⚠ WARNINGS:

- **Ensure that you know which Operating Mode is selected (NORM, GAUG, or FREE) prior to commencing any dive.**
- **Conducting Free dives within a 24 hour period after conducting SCUBA dives, combined with the effects of multiple rapid Free Dive ascents, increases your risk of decompression sickness. Such activities may result in accelerated entry into decompression which could cause serious injury or death.**
- **Combining competitive type Free dive activities that involve multiple descents/ ascents with activities utilizing SCUBA during the same 24 hour period is not recommended. Presently, there is no data relating to such activities.**
- **It is highly recommended that anyone planning to become involved in competitive type Free Dive activities obtain proper instruction and training from a recognized Free Diving trainer. It is imperative that the physiological affects be understood and the diver is physically prepared.**

REFERENCE

CARE AND CLEANING

Protect your ZEN from shock, excessive temperatures, exposure to chemicals, and tampering. Protect the lens against scratches with an instrument lens protector.

- Soak and rinse the ZEN in fresh water at the end of each day of diving, and check to ensure that the areas around the Low Pressure (Depth) Sensor (Fig. 112a), PC Interface Data Port (Fig. 112b), and Buttons are free of debris or obstructions.
- To dissolve salt crystals, use lukewarm water or a slightly acidic bath (50% white vinegar/50% fresh water). After removal from the bath, place the ZEN under gently running fresh water and towel dry before storing.
- Transport your ZEN system cool, dry, and protected.

INSPECTIONS AND SERVICE

Your ZEN should be inspected annually by an Authorized TUSA Dealer who will perform a factory prescribed function check and inspection. To keep the product warranty in effect, this inspection must be completed one year after purchase (+/- 30 days).

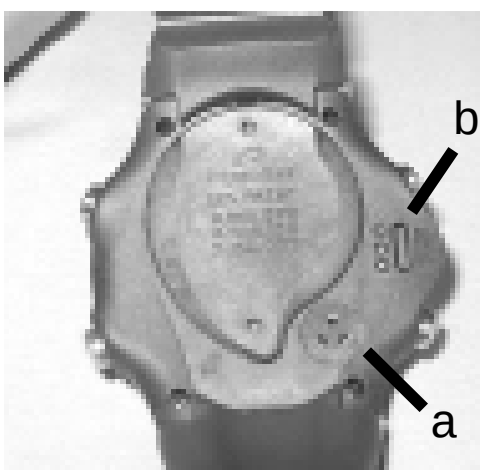


Fig. 112 - ZEN CASE BACK

TUSA recommends that you continue to have an inspection performed every year to ensure it is working properly. The costs of annual inspections are not covered under the terms of the 2 year limited warranty.

<u>To Obtain Service:</u>
Take your ZEN to an Authorized TUSA Dealer.

BATTERY REPLACEMENT

NOTE: The procedures that follow must be closely adhered to. Damage due to improper Battery replacement is not covered by the product's warranty.

The Battery Compartment should only be opened in a dry and clean environment with extreme care taken to prevent the entrance of moisture or dust.

As an additional precautionary measure, to prevent formation of moisture in the Battery Compartment, it is recommended that the Battery be changed in an environment equivalent to the local outdoor temperature and humidity (e.g., do not change the Battery in an air conditioned environment then take it outside during a hot sunny day).

Inspect the Buttons, Lens, and Housing to ensure they are not cracked or damaged. If there is any sign of moisture in the ZEN, DO NOT attempt to use it for diving (NORM, GAUG, or FREE) until it receives proper factory service by TUSA.

NOTE: When the old battery is removed, settings calculations for repetitive dives will be retained in non volatile memory for subsequent operations.

CAUTION: Damage due to improper Battery replacement is not covered by the product's warranty.

Fig. 113A - BATTERY HATCH REMOVAL (Tool)

Fig. 113B - ALTERNATE HATCH REMOVAL

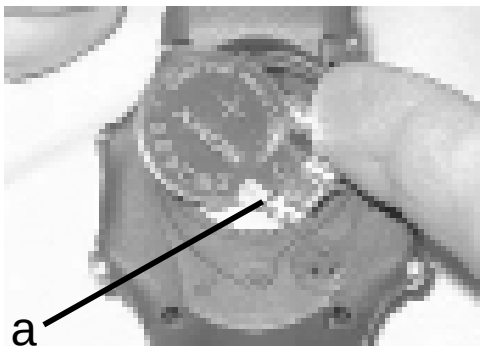


Fig. 114 - BATTERY REMOVAL

Battery Removal

- Locate the Battery Compartment on the back of the unit.
- Rotate the Battery Hatch clockwise 10 degrees using the special Battery Hatch Tool provided (Fig. 113A), or - by pushing the lower portion to the left while pushing the upper portion to the right using your fingers (Fig. 113B).
- Lift the Hatch with O-ring up and away from the Housing.
- Using care not to damage the Battery Contact (Fig. 114a), slide the Battery up and out of the left side of the Battery Compartment.
- Discard the Battery according to local regulations governing disposal of Lithium batteries.

⚠ **CAUTION: DO NOT allow a metal object to short circuit the top of the Battery which is positive (+) to the negative (-) contact of the Battery Compartment.**

Inspection

- Closely check all of the sealing surfaces for any signs of damage that might impair proper sealing.
- Inspect the Buttons, Lens, and Housing to ensure they are not cracked or damaged.

- Remove the Battery Hatch O-ring and inspect it for any signs of deterioration or deformity. DO NOT use tools to remove the O-ring.
- To ensure proper sealing, O-ring replacement is highly recommended each time a Battery is replaced.
- Closely examine the Battery Hatch and Housing for any signs of damage that might prevent proper sealing.
- Closely examine the inside of the Battery Compartment for any signs of corrosion indicating entrance of moisture into the unit.

Fig. 114 - BATTERY INSTALLATION

⚠ **WARNING: If damage or corrosion is found, return your ZEN to an Authorized TUSA Dealer, and DO NOT attempt to use it until it has received factory prescribed service.**

Battery Installation

- Slide a new 3 volt type CR2430 Lithium Battery, negative side down into the cavity of the compartment. Slide it in from the left side (Fig. 114) and ensure that it slides under the contact clip on the lower/right rim of the cavity.
- Lightly lubricate the new Hatch O-ring with silicone grease and place it on the inner rim of the Battery Hatch. Ensure that it is evenly seated (Fig. 115).

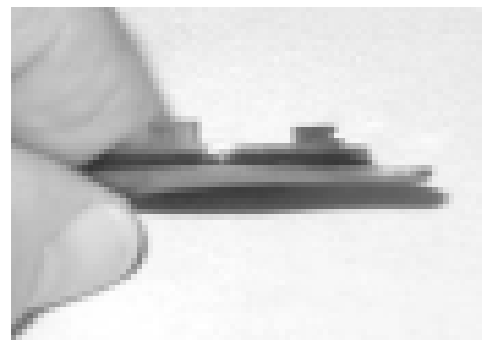


Fig. 115 - HATCH O-RING

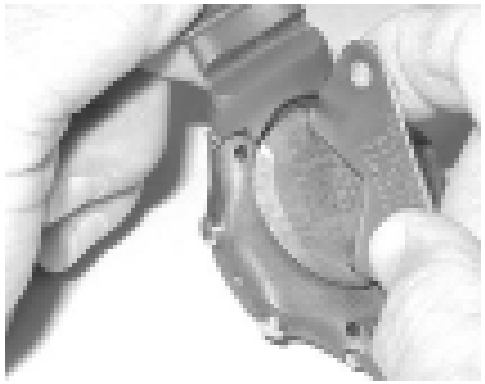


Fig. 117A - HATCH INSTALLATION

△ NOTE: The Hatch O-ring must be a genuine TUSA part that can be purchased from an Authorized TUSA Dealer. Use of any other O-ring will void the warranty.

- Carefully place the Battery Hatch (with O-ring) into position on the rim of the Battery Compartment, then press it evenly and completely down into place.
- Maintain the Battery Hatch securely in place and turn it counter clockwise 10 degrees using the Hatch tool (Fig. 117A), or by pushing the lower portion to the right while pushing the upper portion to the left using your fingers (Fig. 117B).

Testing

- Activate the unit and observe the LCD is consistently clear and sharp in contrast throughout the screen.
- Set the Watch functions.
- Verify all Set Points prior to diving.
- If any portions of the display are missing or appear dim, or if a Low Battery condition is indicated, return your ZEN to an Authorized TUSA Dealer for a complete evaluation before attempting to use it.

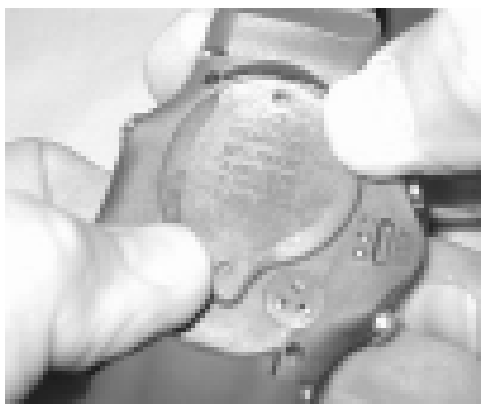


Fig. 117B - ALT HATCH INSTALLATION

ALTITUDE SENSING AND ADJUSTMENT

Prior to the first dive of a series of repetitive dives, Altitude (i.e., Ambient Pressure) is measured upon activation of Dive Surface Mode and every 15 minutes until a dive is made or operation reverts to Watch mode after 2 hours.

- > While it is operating in Watch mode after a dive, measurements are taken every 15 minutes during the 24 hour period after surfacing.
- > Measurements are only taken when the unit is dry.
- > Two readings are taken, the second reading 5 seconds after the first. The readings must be within 1 foot (30 cm) of each other to record that ambient pressure as the current Altitude.

The Mathematical Model in the ZEN accounts for the reduced No Deco Dive Times available based on National Oceanic and Atmospheric Administration (NOAA) guidelines.

When diving in high altitude waters from 3,001 to 14,000 feet (916 to 4,270 meters), the ZEN automatically adjusts to these conditions providing corrected Depth, reduced No Deco Dive Times, and reduced Oxygen Accumulation Times at Altitude intervals of 1,000 feet (305 meters).

No adjustments are made during any time that the Wet Contacts are wet.

At an elevation of 3,001 feet (916 meters), Depth Calibration automatically changes from feet of seawater to feet of fresh water. This is the first adjustment to the Algorithm.

When the Conservative Factor feature is set ON, allowable dive times are calculated based upon the next higher 3,000 foot (915 meter) Altitude. All adjustments for Altitudes greater than 11,000 feet (3,355 meters) are then made to allowable dive times for 14,000 feet (4,270 meters). If the Conservative Factor is set ON while at Sea Level, calculations are based upon an Altitude of 6,000 feet.

The ZEN will not function as a Dive Computer above 14,000 feet (4,270 meters).

PELAGIC Z+ ALGORITHM >> NDLS (HR:MIN) AT ALTITUDE (IMPERIAL)

Altitude (feet)	0 to 3000	3001 to 4000	4001 to 5000	5001 to 6000	6001 to 7000	7001 to 8000	8001 to 9000	9001 to 10000	10001 to 11000	11001 to 12000	12001 to 13000	13001 to 14000
Depth (FT)												
30	3:17	2:30	2:21	2:14	2:08	2:02	1:57	1:52	1:47	1:39	1:34	1:29
40	1:49	1:21	1:15	1:11	1:08	1:05	1:02	1:00	0:57	0:55	0:53	0:51
50	1:05	0:53	0:51	0:49	0:47	0:44	0:42	0:39	0:37	0:35	0:34	0:33
60	0:48	0:37	0:35	0:33	0:32	0:30	0:28	0:26	0:24	0:23	0:22	0:21
70	0:35	0:26	0:24	0:23	0:21	0:20	0:19	0:18	0:17	0:16	0:16	0:14
80	0:26	0:19	0:18	0:17	0:16	0:15	0:14	0:13	0:12	0:11	0:11	0:10
90	0:19	0:15	0:14	0:13	0:12	0:11	0:10	0:10	0:09	0:09	0:08	0:08
100	0:16	0:11	0:10	0:10	0:09	0:09	0:08	0:08	0:07	0:07	0:07	0:07
110	0:12	0:09	0:08	0:08	0:08	0:07	0:07	0:07	0:06	0:06	0:06	0:05
120	0:10	0:08	0:07	0:07	0:07	0:06	0:06	0:06	0:05	0:05	0:05	0:05
130	0:08	0:07	0:06	0:06	0:06	0:05	0:05	0:05	0:05	0:05	0:04	0:04
140	0:07	0:06	0:05	0:05	0:05	0:05	0:05	0:04	0:04	0:04	0:04	0:04
150	0:06	0:05	0:05	0:05	0:05	0:04	0:04	0:04	0:04	0:04	0:04	0:03
160	0:06	0:05	0:05	0:04	0:04	0:04	0:04	0:04	0:04	0:03	0:03	0:03
170	0:05	0:04	0:04	0:04	0:04	0:04	0:03	0:03	0:03	0:03	0:03	0:03
180	0:05	0:04	0:04	0:04	0:03	0:03	0:03	0:03	0:03	0:03	0:03	0:03
190	0:04	0:04	0:04	0:03	0:03	0:03	0:03	0:03	0:03	0:03	0:03	0:00

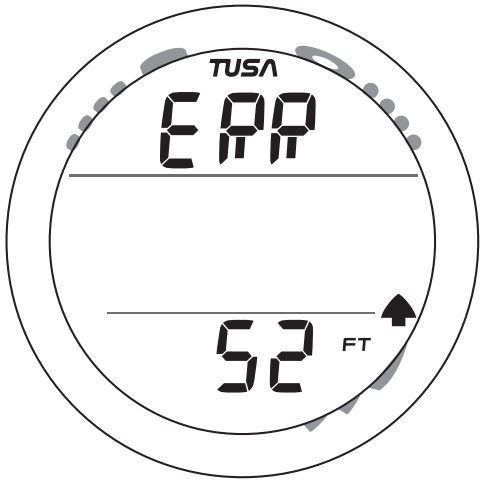
PELAGIC Z+ ALGORITHM >> NDLS (HR:MIN) AT ALTITUDE (METRIC)

Altitude (meters)	0 to 915	916 to 1220	1221 to 1525	1526 to 1830	1831 to 2135	2136 to 2440	2441 to 2745	2746 to 3050	3051 to 3355	3356 to 3660	3661 to 3965	3966 to 4270
Depth (M)												
9	3:37	2:41	2:31	2:23	2:16	2:10	2:04	1:59	1:54	1:50	1:43	1:37
12	1:55	1:27	1:21	1:15	1:12	1:08	1:05	1:03	1:00	0:58	0:55	0:54
15	1:08	0:55	0:53	0:51	0:49	0:47	0:44	0:42	0:39	0:37	0:36	0:34
18	0:50	0:39	0:37	0:35	0:33	0:32	0:30	0:28	0:26	0:24	0:23	0:22
21	0:36	0:28	0:26	0:24	0:23	0:21	0:20	0:19	0:18	0:17	0:16	0:16
24	0:27	0:20	0:19	0:18	0:17	0:16	0:15	0:14	0:13	0:12	0:11	0:11
27	0:20	0:16	0:15	0:13	0:12	0:11	0:11	0:10	0:09	0:09	0:09	0:08
30	0:16	0:12	0:11	0:10	0:09	0:09	0:09	0:08	0:08	0:07	0:07	0:07
33	0:13	0:09	0:09	0:08	0:08	0:07	0:07	0:07	0:07	0:06	0:06	0:06
36	0:10	0:08	0:07	0:07	0:07	0:06	0:06	0:06	0:05	0:05	0:05	0:05
39	0:09	0:07	0:06	0:06	0:06	0:06	0:05	0:05	0:05	0:05	0:05	0:04
42	0:08	0:06	0:06	0:05	0:05	0:05	0:05	0:05	0:04	0:04	0:04	0:04
45	0:06	0:05	0:05	0:05	0:05	0:04	0:04	0:04	0:04	0:04	0:04	0:04
48	0:06	0:05	0:05	0:04	0:04	0:04	0:04	0:04	0:04	0:03	0:03	0:03
51	0:05	0:04	0:04	0:04	0:04	0:04	0:04	0:03	0:03	0:03	0:03	0:03
54	0:05	0:04	0:04	0:04	0:04	0:03	0:03	0:03	0:03	0:03	0:03	0:03
57	0:05	0:04	0:04	0:03	0:03	0:03	0:03	0:03	0:03	0:03	0:03	0:03

OXYGEN EXPOSURE LIMITS
(from NOAA Diving Manual)

PO2 (ATA)	Max Duration Single Exposure (min)	(hr)	Max Total Duration 24 Hour Day (min)	(hr)
0.60	720	12.0	720	12.0
0.70	570	9.5	570	9.5
0.80	450	7.5	450	7.5
0.90	360	6.0	360	6.0
1.00	300	5.0	300	5.0
1.10	240	4.0	270	4.5
1.20	210	3.5	240	4.0
1.30	180	3.0	210	3.5
1.40	150	2.5	180	3.0
1.50	120	2.0	180	3.0
1.60	45	.75	150	2.0

ERROR (RESET DURING A DIVE)



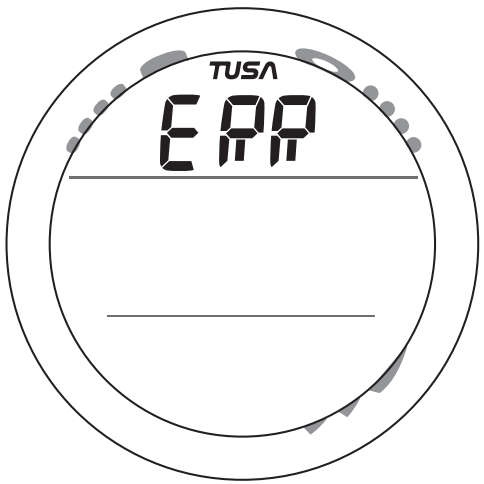
ERROR WHILE DIVING

If the ZEN shuts Off then turns On again for any reason during any Dive, the message **ERR** (Error) will be displayed with the Up Arrow icon and current Depth.

If this occurs, it is highly recommended that you terminate the dive and begin a safe controlled ascent to the surface.

Upon surfacing, and any time thereafter, when access to Dive Computer mode is attempted from Watch mode, only the graphic **ERR** will be displayed and operation will revert to Watch mode.

No dive computer functions (modes/screens) will be accessible.



SURFACE AFTER ERROR DURING A DIVE

If this occurs, the ZEN must be returned to the factory for evaluation/service prior to any further use for diving activities.

SPECIFICATIONS

CAN BE USED AS

- Watch
- Air Computer
- Nitrox Computer
- Digital Depth Gauge/Timer

DIVE COMPUTER PERFORMANCE

- Buhlmann ZHL-16c based Pelagic Z+ algorithm
- No Deco limits closely follow PADI RDP
- Decompression in agreement with Buhlmann ZHL-16c and French MN90
- No Deco Deep Stops - Morroni, Bennett
- Deco Stops (not recommended) - Blatteau, Gerth, Gutvik
- Altitude - Buhlmann, IANTD, RDP (Cross)
- Altitude corrections and O2 limits based on NOAA tables

WATCH MODES

- Default Time (selected for current location)
  > ALT (Altitude, Temp, Date)
  > Set Time, Date, Format
- Alternate Time (remote location)
  > Set by hour differential
- Countdown Timer
  > Start, Stop, Set
- Chronograph (Stop Watch/Lap Timer)
  > Start, Stop, Lap Recall, Reset
- Daily Alarm (Watch mode)
  > On, Off, Set

DIVE COMPUTER SURFACE SEQUENCE/MODES

- NORM > GAUG > FREE Surface Main
- SURF ALT (Altitude, Temp, Time)
- Plan (30 to 190 FT, 9 to 57 M) - NORM only
- Time to Fly - NORM/GAUG
- Time to Desaturate - NORM only
- Dive Log > History - NORM/GAUG
- History - NORM/GAUG
- Set > FO2, Alarms, Utilities - NORM/GAUG

NORM/GAUG SET MODES

- Set F Group (FO2 items):
  ~ Factory Settings:
  - FO2 GAS1 (Air, 21 to 50%)
    ~ Air
  - FO2 GAS2 (Air, 21 to 100%)
    ~ Air
  - FO2 Default (On/Off)
    ~ On
- Set A Group (Alarms):
  - Audible/LED Warning (On/Off)
    ~ On
  - Max Depth (30 to 330 FT, 10 to 100 M)
    ~ 330 FT
  - Elapsed Dive Time (:10 to 3:00 hr:min)
    ~ 3:00 (hr:min)
  - NiBG (1 to 5 segments)
    ~ 5 segments (Deco)
  - Dive Time Remaining (:00 to :20 min)
    ~ :20 (min)
  - PO2 (1.20 to 1.60 ATA)
    ~ 1.60 (ATA)

SPECIFICATIONS (CONTINUED)

- Set U Group (Utilities):
  - Wet Activation (On/Off) ~ On
  - Units of Measure (Imperial/Metric) ~ Imperial
  - No Deco Deep Stop (On/Off) ~ Off
  - No Deco Safety Stop (On/Off) ~ Off
  - Conservative Factor (On/Off) ~ Off
  - Backlight Duration (0, 5, 10 seconds) ~ 5 (sec)
  - Sampling Rate (2, 15, 30, 60 seconds) ~ 30 (sec)

- ZEN (Watch) Serial Number
  > Factory set ~ actual

NORM No Deco Dive Displays:
- Main - NiBG, O2BG, Dive Time Remaining, Elapsed Dive Time, Current Depth, ASC
- ALT 1 - Temperature, Time of Day (hr:min), Max Depth
- ALT 2 (if Nitrox) - Current PO2, FO2 Set Point, Gas #
- Deep Stop - NiBG, O2BG, Dive Time Remaining, Stop Depth/Time, Current Depth
- Safety Stop - NiBG, O2BG, Dive Time Remaining, Stop Depth/Time, Current Depth

NORM Deco Stop Displays:
- Main - NiBG, O2BG, Total Ascent Time, Stop Depth/Time, Current Depth
- ALT 1 - Elapsed Dive Time
- ALT 2 - Temperature, Time of Day (hr:min), Max Depth
- ALT 3 (if Nitrox) - Current PO2, FO2 Set Point, Gas #

Violation Modes (displays similar to Deco) - Conditional, Delayed, and Violation Gauge

High PO2 (1.20 to 1.60 ATA)

High O2 (300 OTU per dive / 24 hr)

NORM Gas Switch Preview - Gas #, FO2 Set for Gas

SPECIFICATIONS (CONTINUED)

Digital GAUG Dive Displays:
- Main (default) - graphic GAU, Elapsed Dive Time, Current Depth, ASC
- ALT - Temperature, Time of Day (hr:min), Max Depth

FREE Dive Displays:
- Main (default) - Dive Time Remaining, Temperature, Elapsed Dive Time (min:sec), Current Depth
- ALT 1 (CDT Status) - graphic CDT, setting (On/Off), Time remaining (min:sec)
- ALT 2 - Time of Day (hr:min), Max Depth

NUMERIC DISPLAYS:	Range:	Resolution:
• Dive Number	0 to 24	1
• Current Depth	0 to 330 FT (99.9 M)	1 FT (.1 M)
• Maximum Depth	330 FT (99.9 M)	1 FT (.1 M)
• Gas 1 FO2 Set Point	Air, 21 to 50 %	1 %
• Gas 2 FO2 Set Point	Air, 21 to 100 %	1 %
• PO2 Value	0.00 to 5.00 ATA	.01 ATA
• Dive Time Remaining	0:00 to 9:59 hr:min	1 minute
• No Deco Deep Stop Time	2:00 to 0:00 min:sec	1 second
• No Deco Safety Stop Time	3:00 to 0:00 min:sec	1 second
• Deco Stop Time	0:00 to 9:59 hr:min	1 minute
• Deco Total Ascent Time	0:00 to 9:59 hr:min	1 minute
• Norm/Gaug Elapsed Dive Time	0:00 to 9:59 hr:min	1 minute
• Free Elapsed Dive Time	0:00 to 59:59 min:sec	1 second
• Surface Interval Time	0:00 to 23:59 hr:min	1 minute
• Free Surface Interval Time	0:00 to 59:59 min:sec	1 second
	1:00 to 23:59 hr:min	1 minute
• Dive Log Surface Interval	0:00 to 23:59 hr:min	1 minute
• Time to Fly	23:50 to 0:00 hr:min* (* starting 10 min after the dive)	1 minute
• Time to Desaturate	23:50 max to 0:00 hr:min* (* starting 10 min. after the dive)	1 minute
• Temperature	0 to 140°F (-9 to 60°C)	1°
• Time of Day	0:00:00 to 23:59:59 hr:min.sec	1 second

SPECIFICATIONS (CONTINUED)

• Watch Countdown Timer	23:59 to 0:00 hr:min	1 minute
• Free Countdown Timer	59:59 to 0:00 min:sec	1 second
• Chronograph	0:00:00.00 to 99:59:59.99 hr:min:sec.1/100 sec	1/100 second

- Out of Range (- - -) => 330 FT (99.9 M)
- Violation Countdown Timer 23:50 to 0:00 hr:min (after surfacing)

BAR GRAPHS

Nitrogen Bar Graph	segments
• No Deco Normal zone	3
• No Deco Caution zone	1
• Decompression Warning zone	1

Oxygen (O2) Bar Graph:	segments
• Normal zone	3
• Caution zone	1
• Danger zone	1

Ascent Rate Indicator:	60 FT (18 M) & Shallower			Deeper than 60 FT (18 M)		
	segments	FPM	MPM	segments	FPM	MPM
	0	0 - 10	0 - 3	0	0 - 20	0 - 6
• Normal Zone	1	11 - 25	3.5 - 7.5	1	21 - 50	6.5 - 15
• Caution Zone	2	26 - 30	8 - 9	2	51 - 60	15.5 - 18
• Too Fast Zone (flashing)	3 (all)	> 30	> 9	3 (all)	> 60	> 18

SPECIFICATIONS (CONTINUED)

OPERATIONAL PERFORMANCE

Function:	Accuracy:
• Depth	±1% of full scale
• Timers	1 second per day

Dive Counter:
- NORM/GAUG displays Dives #1 to 24, FREE displays #1 to 99 (0 if no dive made yet)
- Resets to Dive #1, upon diving (after 24 hours with no dives)

NORM/GAUG Dive Log Mode:
- Stores 24 most recent NORM/GAUG dives in memory for viewing
- After 24 dives, adds 25th dive in memory and deletes the older dive

Altitude:
- Operational from sea level to 14,000 feet (4,270 meters) elevation
- Measures ambient pressure every 30 minutes in Watch Mode and when Dive Computer Mode is accessed, every 15 minutes while in NORM/GAUG/FREE Surface Modes.
- Does not measure ambient pressure when Wet.
- Compensates for Altitudes above sea level beginning at 3,001 feet (916 meters) elevation and every 1,000 feet (305 meters) higher.

Conservative Factor:
- Reduces NORM/FREE NDLs to those for the Altitude 3,000 feet (915 meters) higher.

Power:

• Battery	(1) 3 vdc, CR2430, Lithium battery
• Shelf life	Up to 7 years (when shipped from factory in Deep Sleep mode)
• Replacement	User replaceable (annual recommended)
• Use Life	1 year or 300 dive hours if (2) 1 hour dives per dive day

SPECIFICATIONS (CONTINUED)

Battery Indicator:
- Warning - icon on solid at 2.75 volts, Battery change recommended
- Alarm - icon on flashing at 2.50 volts, change the Battery

Dive Computer Mode Activation:
- Manual - push button (recommended), required if Wet Activation is set OFF.
- Automatic - by immersion in water (if set ON)
- Cannot be manually activated deeper than 4 FT (1.2 M), if Wet Activation is set OFF.
- Cannot operate as a Dive Computer at elevations higher than 14,000 feet (4,270 meters)
- Reverts to Watch Default Time if no dive is made within 2 hours after entry into a Surface Mode.
- Reverts to Watch Default Time 10 minutes after dive.

Operating Temperature:
- Out of the water - between 20 °F and 140 °F (-6 and 60 °C).
- In the water - between 28 °F and 95 °F (-2 and 35 °C).
- At extremely low temperatures, the LCD may become sluggish, but this will not affect it's accuracy. If stored or transported in extremely low temperature areas (below freezing), you should warm the unit and its battery with body heat before diving.

Storage Temperature:
- Out of the water (in storage case provided) - between 14 °F and 158 °F (-8 and 70 °C).

PC requirements:
- IBM®, or compatible, Personal Computer with Mouse, USB Port, CD drive, and printer
- Intel® Pentium 200 MHz or better microprocessor
- Microsoft® Windows® 98 Second Edition, ME, NT, 2000, XP, or Vista
- Super VGA card or compatible video graphics adaptor (256 color or greater) with a minimum 800 X 600 pixel screen area of display settings
- 20MB of available hard drive storage
- 16MB of available RAM

RESPONSIBLE COMPUTER DIVING

- **Plan each dive, and dive your plan. The ZEN was not designed to make decisions for you, only to provide you with the information you need to make responsible decisions for yourself. This begins with a dive Plan that will help you avoid a low air or decompression situation.**
- **Do not plan any dive that exceeds your training or experience level.**
- **Inspect your ZEN before every dive. If it shows any signs of damage or abnormal function, DO NOT dive with it until it has received factory prescribed service.**
- **Make a Safety Stop at 15 to 20 FT (4.5 to 6 M) at the end of every dive. It's important, don't forget it.**
- **You should make every effort to complete all of your ascents with the Nitrogen Bar Graph inside the normal No Decompression zone.**
- **If you inadvertently entered Decompression, you should not complete your ascent until the Nitrogen Bar Graph is at least inside the No Decompression Caution Zone.**
- **While you cannot provide a guarantee against the occurrence of decompression sickness, you may choose your own personal zone of caution based upon your individual age, physique, excessive weight, training, experience, etc. to reduce the statistical risk. By not pushing the limits, you can establish and adjust your personal level of conservatism and margin of safety.**

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INSPECTION / SERVICE RECORD

ZEN Serial Number: _____

ZEN Firmware Revision: _____

Date of Purchase: _____

Purchased from: _____

Below to be filled in by the Authorized TUSA Dealer:

Date	Service Performed	Dealer / Technician

TUSA QUALITY

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