apollo computer gauge

nano

instruction manual

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Introduction

Congratulations on your purchase of the apollo nano computerized gauge. Be sure to obey the following instructions for using this product.

- Read the instruction manual carefully until you understand its contents completely.
- Do not use this product if you have not obtained a C Card. (For details, see under DANGER).
- This computerized gauge is only for diving use. Do not use it for any other purpose.

The nano is easy to use, and offers highly advanced functions that will help make your diving safer and more enjoyable. The values used in the text and diagrams of this instruction manual are for explanatory purposes and differ from those actually used.

Items with the following headings describe scuba diving techniques and how to handle diving equipment. These sections must be completely understood, so be sure to read them with special care.

⚠ WARNING

Failure to obey the instructions under this heading may lead to accidents which result in serious injury or death.

⚠ WARNING

Failure to obey the instructions under this heading may lead indirectly to accidents which result in serious injury, death, and/or serious damage to equipment.

⚠ CAUTION

Failure to obey the instructions under this heading may lead to minor accidents and/or minor damage to equipment.

Table of contents

1. Multi-level diving

a. Bends

Humans have been breathing the air in the earth's atmosphere since they were first born. When scuba diving, we merely breathe the air which is compressed to the same pressure as the pressure in the water, so the atmosphere itself does not lead to decompression sickness. What does lead to decompression sickness, then? The cause is the shift in pressure. In particular, the cause is the decompression that occurs when moving from a location of one pressure to a location of a lower pressure.

Take, for example, a single can of carbonated beverage. In carbonated beverages, a large amount of carbonated gas is dissolved by high pressure into the original liquid. When sealed, the pressure in the can does not change and the carbonated gas remains dissolved, not fizzing and emerging from the can. However, when the seal is broken, the surrounding pressure suddenly drops and only the reduced pressure portion of the carbonated gas stays dissolved while the remainder fizzes and emerges from the can.

The same phenomenon occurs when scuba diving. The liquid from carbonated beverage is comparable to blood from the body while carbonated gas can be likened to nitrogen. If a person breathes air under pressure at certain depth for a long period of time, the body absorbs nitrogen at a level that balances with the depth. If the person rapidly surfaces, the body reaches a state like the open can of carbonated beverage. Bubbles start to form in different places in the body. These bubbles interfere with the flow of blood and adversely effect the cells, causing various symptoms. This is decompression sickness.

b. Preventing decompression symptoms

The term, "recreational diving," refers to diving in a no- decompression zone. Nevertheless, pressure changes can result in decompression symptoms. For example, after completing your dive in a non-decompression zone, you might move to higher altitudes (one extreme case would be flying in an airplane), giving ample reason to assume the possibility of decompression symptoms. Take special care when
considering going to higher altitudes (particularly by air) after a dive.

c. Concept and characteristics of the multi-level method

Traditionally, the dive tables of the U.S. Navy have been used for diving. These standards set the maximum depth at those depths and determine the length of time a person can dive without experiencing decompression according to the depth of the dive and length of dive time. The figures developed for diving operations (Figure 1) were generally adapted to recreational diving without consideration to changes in diving depths.

Recreational divers, however, rarely remain at the same depth for extended periods of diving. On the contrary, they generally move between various depths (Figure 2).

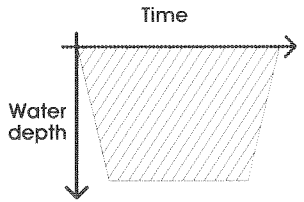


Figure 1

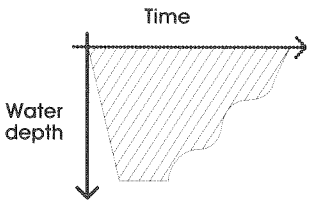


Figure 2

It has been theoretically shown by Dr. A.A. Buhlmann of Switzerland that if divers make real time calculations of the nitrogen content in their bodies and confirm that it is within no-decompression limits, their diving will be safer and more in conformity to actual diving. However, according to this theory, the no-decompression limit is different depending on the systems within the body; for example, blood, nerves, bones, internal organs and brain. It is necessary to calculate these limits repeatedly and in great detail, and to measure and compare how far each system is over the no-decompression limits. These calculations produce massive figures and require advanced computers. Micro computers with advanced functions emerged with the recent development of the semiconductor industry, making it possible to manage more processes at faster speeds even at low power. As a result, small computer gauges were developed and nano was born. For the multi-level method, nano makes computer simulations of the conditions of each system of the body based on the depth (pressure) at the time, and real time calculations are made in response to changes in water depth and even altitude changes after the dive has finished.

2. Cautions about diving using the multi-level method

Regarding the Warning and Caution Signs in This Manual

For the diver's safety, he/she should always pay strict attention to all caution and warning items regarding safety. Failure to obey these warnings to prevent dangerous situations may lead to accidents and/or diving sickness.

The figures forming the standards for multi-level calculations are determined according to a large amount of data, not all of which necessarily applies to all divers. There are always individual differences between divers. nano is developed for recreational diving, making it possible for most divers to safely dive as long as they observe the figures. However, mere observance of these figures does not guarantee the safety of all divers.

⚠ WARNING

Divers should never conduct repetitive dives that require decompression stops, push the limits for non-decompression diving, or dive in any other way that may lead to the possibility of decompression sickness.

nano warns the diver if he/she is in danger of decompression when the bargraph display enters the caution zone. When the bar graph enters the caution zone,the diver should try to begin surfacing immediately to ensure safety.

Caution zone

3. Before using nano

nano calculates decompression through the use of an algorithm developed by Mr. C. Randy Bhorer based on the research and theory of Dr. A.A. Buhlmann. nano should only be used by divers who have completed a certified scuba diving course. It should not be used by persons without scuba diving training or persons without knowledge of the possible dangers of scuba diving. Furthermore, nano should not be used until this instruction manual has been carefully read and understood.

⚠ WARNING

The nano computer may be used for decompression diving; however we recommend that recreational divers stay within no decompression limits. Additionally we do not recommend nano be used by professional divers for decompression diving.

- Decompression calculations automatically start when there are altitude shifts. Until adjustments are made to these altitudes, decompression calculations continue.

⚠ WARNING

The necessary information for safe diving is provided by a visual display warning. However, the results of the displayed decompression calculations are based on data in which water pressure is replaced by water depth. Therefore, each diver should establish a dive plan that is safe for him/herself.

- When diving becomes extremely dangerous due to reduced battery power or when the altitude exceeds the measurement range to make decompression calculations impossible, the switch to diving mode becomes impossible, serving as a warning to the diver.

⚠ WARNING

nano is designed for use by a single diver. Never lend it to another diver.

- nano is a precision electronic instrument. It could become defective if subjectedto strong impacts or vibrations, or stored at high or low temperatures.
- A special tool is needed to exchange batteries. Have this done at the shop where you made your purchase. Malfunction or damage thought to have resulted from battery exchange or removal of back lid by the customer him/herself is not subject to guarantee and therefore should be avoided.
- When exposed to direct sunlight, locked in a car or otherwise exposed to heat, the display becomes difficult to read. This does not indicate malfunction. However, this has a direct impact on the life of the functions, so nano should not be exposed to such conditions.

4. nano functions

a. nano specifications

- **Water depth measurement** : Second by second sampling
  : 0.0 m – 99.9 m (0 ft – 328 ft)
- **Diving time measurement** : 0 – 599 minutes
- **Altitude measurement** : 10 – minute sampling
  : 0 – 2400 m (0 – 7800 ft)
- **Temperature measurement** : Second by second sampling
  : -5 °C – +40 °C (23 °F – 104 °F)
- **Calendar function** : 1997 through to 2100
- **Battery save mode** : **nano will automatically shift into battery save mode 24 hours after a dive.**
- **Display of possible no-decompression dive time before diving.**
- **Display of possible remaining no-decompression dive time while diving.**
- **Surfacing speed warning**

:Water depth		Surfacing speed / Ascent rate warning
From	0.0 m (0 ft) – 5.9 m (19 ft)	=8 m (26 ft) per minute
	6.0 m (20 ft) – 17.9 m (59 ft)	=12 m (39 ft) per minute
	18.0 m (60 ft) –	=16 m (52 ft) per minute

- **Display warning when shifting to decompression diving**
- **Display of stop depth and stop time during decompression**
- **Total time to reach the surface including all decompression stops**
- **Warning against violation of decompression instructions**
- **Warning when outside of measurement range**
  : Display screen blinks Depth measurement of 100m (328ft) or deeper
  Diving time measurement of 600 minutes or more
  When decompression stop is needed at decompression stop depths of more than 15 m (49 ft).
- **Display showing residual nitrogen in body**
  : Indicated by bar graph and elimination time display.
- **Battery life display** : Indicated by; battery (CR3032) life about 7 years.
- **Battery change indicator** : " ▬ "Battery mark flashes.
- **Dive log mode** : Memory contains data for a maximum of 10 dives.
- **Time adjustment**
- **Use temperature range** : -5°C – +40 °C (23 °F – 104 °F)

b. Summary of nano functions

1. Advanced functions are easy to use

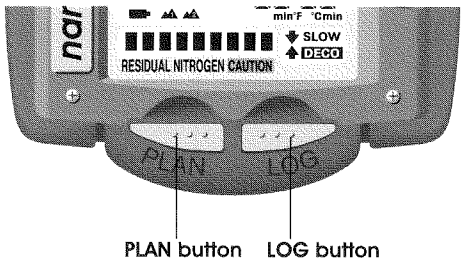
Detailed measurements can register new values every second for depth, every 10 minutes for altitude, and every minute for water temperature. Battery life about 7 years (calculated at 50 dives per year). Designed with simplicity in mind: the display is extremely easy to read. and Operations are easy to understand.

2. Excellent range of log functions

The log records a wide variety of information: date, entry time, exit time, bottom time, maximum depth, water temperature (at maximum depth and upon completion of dive), average depth, total number of dives, and data related to different cautionary messages.
The memory uses the latest technology to record data on up to 10 dives, so is useful for long dive tours.

c. nano buttons

"PLAN" and "LOG" mark the position of two selector buttons.



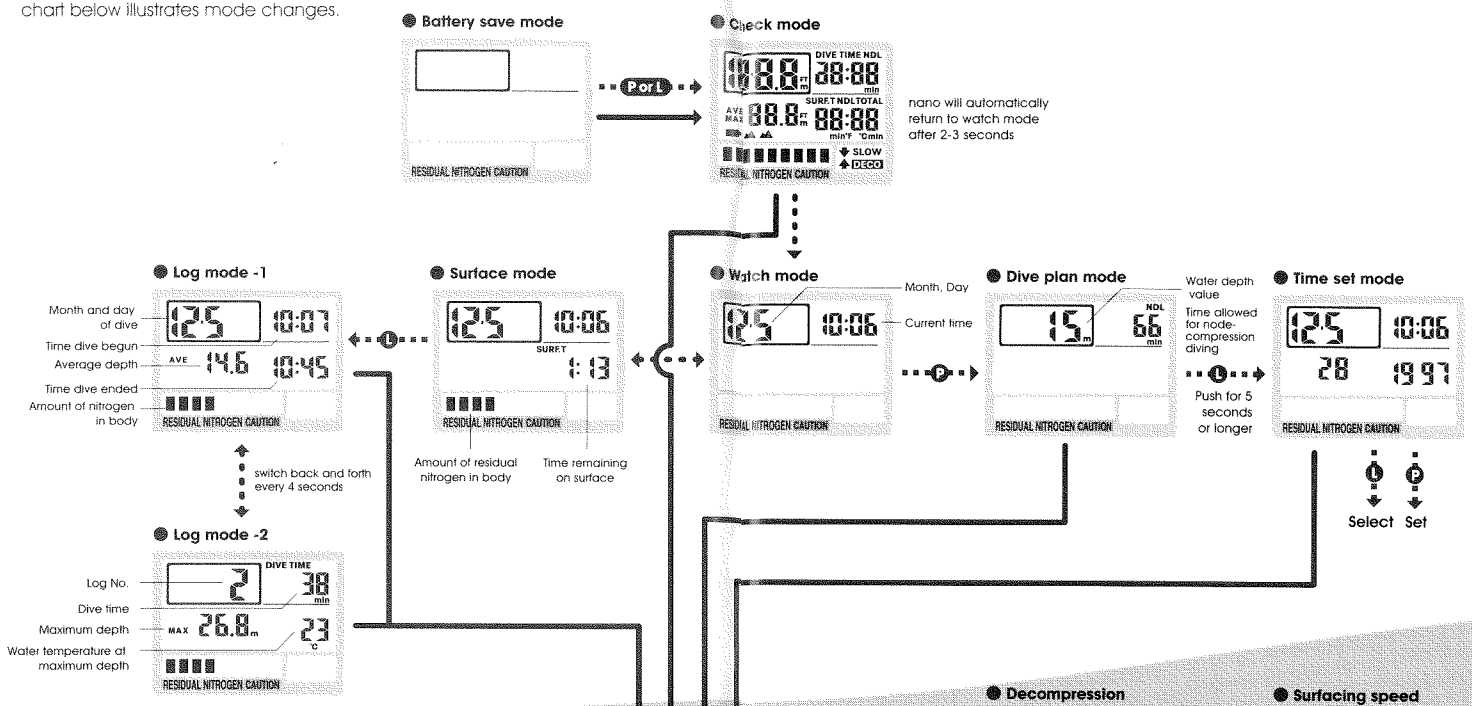
PLAN button **LOG button**

d. Changing / shifting mode

nano is equipped with 7 different modes. It will switch from one mode to another either through manual operation or automatically. Mode changes are prompted in 3 different ways: **(1) after you push button P or L; (2) when immersed in water; and (3) after a certain period of time has passed, or after needed calculations and data displays are completed.** The flow chart below illustrates mode changes.

e. Types of modes

1) Watch mode
2) Battery check mode
3) Dive plan mode
4) Log mode
5) Dive profile mode
6) Dive mode
7) Surface mode
8) Time set mode



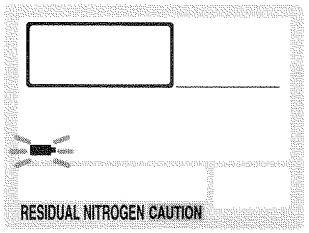
5. Battery Save mode

a. Mode function

The nano automatically shifts to battery save mode after calculating the elimination of residual nitrogen from the body. When returning from battery save mode to watch mode, push the PLAN button. The full display will light up for 3 seconds, then shift to watch mode.

b. Battery check

When battery replacement becomes urgent, the battery mark will light up. **For safety purposes, this mark will remain illuminated and nano will not switch to dive mode.**



Have battery changed

Battery life approximations (calculated at 1 hour per dive)

Number of dives per year	Battery life
50	approx. 7 years
100	approx. 4 years
200	approx. 2 years
300	approx. 1.5 years

⚠ CAUTION

Battery life values indicated here are by no means fixed -- estimates vary according to use and other factors.
Regard these values as approximations only.

WHAT TO DO

When the battery mark lights up, immediately take the nano to the store where you made your purchase to have it replaced.

⚠ CAUTION

The nano battery must be changed with special equipment.
If anyone other than an Apollo representative removes the back cover or changes the battery, damage or some unforeseen circumstance could result.

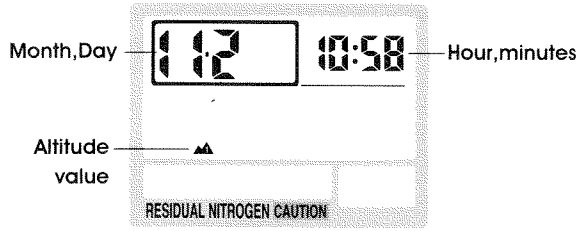
When the battery is changed, logged data, is erased, so first record all such data elsewhere.

Do not activate or dampen the water check switch inside an airplane or anywhere else where there is a dramatic pressure change.

6. Watch mode

a. Mode display

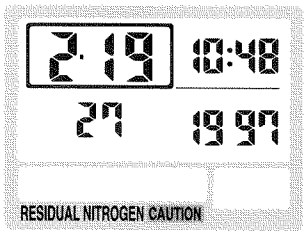
In watch mode, the display continually updates the current month, date, hour, minute and depth value. The nano will automatically switch to battery save mode if no buttons are pushed for 5 minutes.



Watch mode

b. Changing from watch mode to time set mode

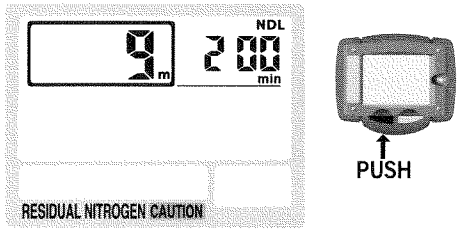
Push the PLAN button to move into dive plan mode. Hold the LOG button down for 5 seconds to shift into time set mode. (For time set mode functions, see "Time set mode," section 12 on page 29.)



Dive plan mode

c. Changing from watch mode to dive plan mode

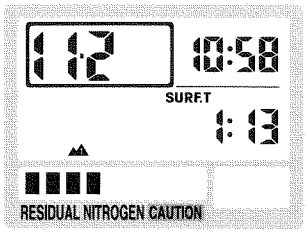
Push the PLAN button to move into dive plan mode.



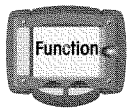
Dive plan mode

d. Switchover to surface mode caused by vertical distance changes

When vertical distance measurements cause a change in the altitude value, the mode switches automatically to surface mode, initiating decompression calculations.



Surface mode



After switching to surface mode, calculations continue until residual nitrogen in your body adapts to the altitude value achieved after vertical distance change. Time at surface will be calculated until the elimination of residual nitrogen in your body is calculated. After that, nano shifts to battery save mode.

⚠ CAUTION

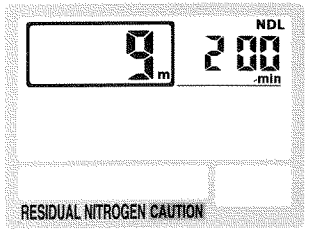
If you begin diving when in the watch mode, nano registers this change as repeated immersion.

7. Dive plan mode

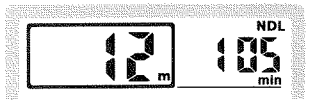
a. Mode display

When in surface mode or watch mode, push PLAN button then, nano moves into dive plan mode. This mode indicates the number of minutes you can do no-decompression diving, in accordance with your present altitude. Indications are for a depth range of from 9~48.0m [30~157ft] , in 3m [9ft] increments.The display continues for a maximum of 200 minutes.

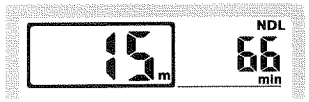
The values below are for altitude 0.



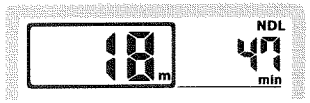
In this example, you can dive for up to 200 minutes at a depth of 9m [30ft]. (200 minutes is the maximum value displayed, even in cases where longer dives are possible.)



In this example, you can dive for up to 105 minutes at a depth of 12m [39ft].



In this example, you can dive for up to 66 minutes at a depth of 15m [49ft].



In this example, you can dive for up to 47 minutes at a depth of 18m [59ft].

Depth values are changed by pushing PLAN button. There are 14 depth values: [9m / 12m / 15m / 18m / 21m / 24m / 27m / 30m 33m / 36m / 39m / 42m / 45m / 48m] [30ft / 39ft / 49ft / 59ft / 69ft / 79ft / 89ft / 98ft / 108ft / 118ft / 128ft / 138ft / 148ft / 157ft]

⚠ WARNING

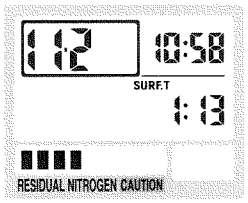
If entering dive plan mode with nitrogen remaining in the body from a previous dive, the rest time at surface and nitrogen content in the body at that point is indicated in the bar graph. Note that this is not the nitrogen content when diving is assumed to have taken place. Plan your dive within a time period shorter than the maximum possible time indicated for no decompression diving.

b. Changing display values

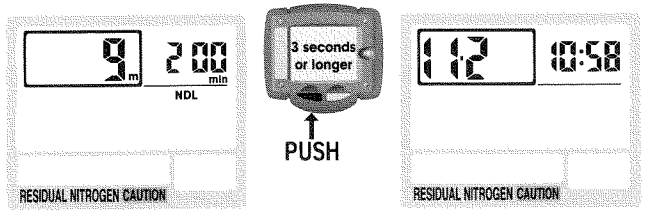
When holding down the PLAN button, depth values are indicated in the shallow to deep order. Even if the PLAN button is not pushed, the display changes in order every 4 seconds.

When holding down the PLAN button, the nano will switch to surface mode if you are resting at the surface. If you are not resting at the surface, the nano will switch to watch mode.

When in the water during dive plan mode, nano automatically shifts to dive mode.



Surface mode



Dive plan mode

Watch mode

Dive plan mode

Dive mode

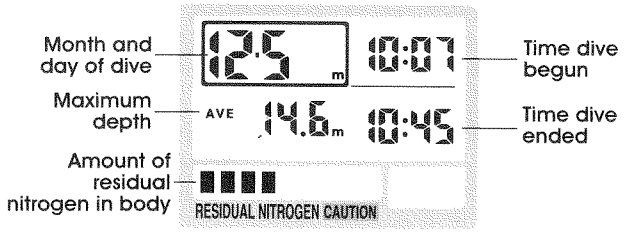
⚠ WARNING

Whether a repeated dive or high-altitude dive, nano automatically calculates time allowed for no-decompression diving based on the nitrogen remaining in the body. For safe diving, make efforts to plan a dive that offers more leeway than the time allowed for no-decompression diving.

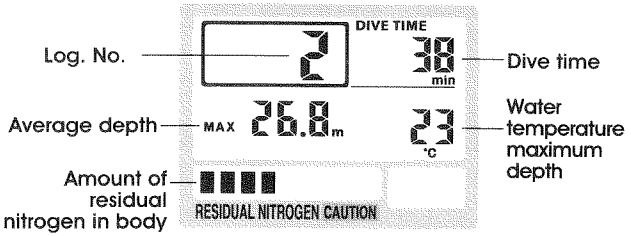
8. Log mode

a. Mode display

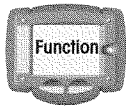
When in watch mode or surface mode, push the LOG button to move into log mode. In log mode, the following 2 displays will switch back and forth every 4 seconds.



Log mode 1



Log mode 2

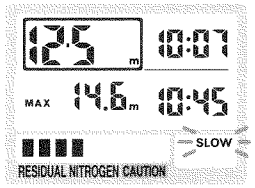


Memory can hold data on the last 10 dives. A "dive" is counted if you are under water at least 3 minutes at a depth of at least 1.5m [5ft].
Push LOG button to retrieve logged data, starting with the most recent and working back. Hold down LOG button to activate rapid increments -- the display will stop at the oldest logged data. Push the PLAN button or hold down the LOG button for 2 seconds to shift into surface mode.

⚠ CAUTION

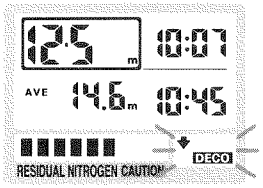
When the battery changed, all logged data (is erased, so store this information elsewhere beforehand.

b. Surfacing speed warning, failure to make indicated decompression stop alarm, and measurement range exceeded warning



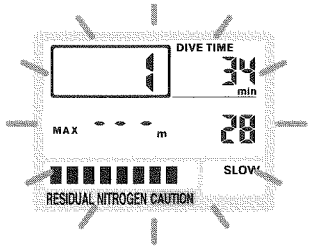
Surfacing speed warning

SLOW flashes and the warning alarm sounds. If the alarm sounds consecutively two or more times, it will be recorded in the log data.



Failure to make indicated decompression stop alarm

When DECO and the down arrow flash, the warning alarm sounds.



Measurement range exceeded warning

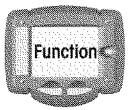
The full display flashes, the warning alarm sounds, and maximum depth is displayed on a bar graph. The nano cannot be used for at least 24 hours after returning to the surface.

⚠ WARNING

Any of the above warnings indicate the risk of an accident or decompression sickness.

c. How data is logged

Once data for 10 dives is recorded, any subsequent dive will be placed in memory, deleting logged data for the oldest dive.

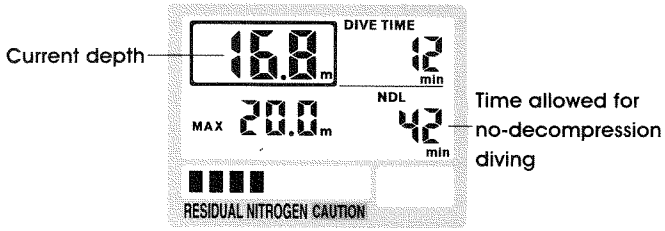


Logged data is displayed starting with data for the last dive, then working back. Any dive lasting at least 3 minutes at a depth of at least 1.5m [5ft] is instantly recorded, and available for retrieval.

9. Dive mode

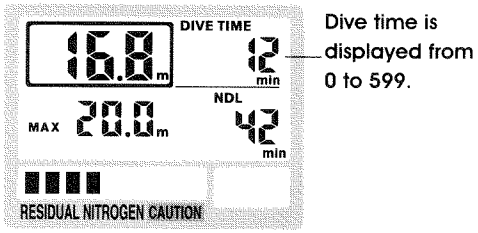
a. Current dive depth

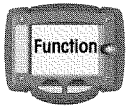
Dive depth is displayed in units of 0.0 m (0 ft) up to 99.9 m (328 ft). When the water depth is less than 1.5 m (5 ft), 0.0 m (0 ft) is displayed.



b. Dive time (bottom time) display

Dive time is displayed in units from the time the diver submerges deeper than 1.5 m (5 ft). After the diver surfaces to a depth of less than 1.5 m (5 ft) deep, the dive time measurement finishes.





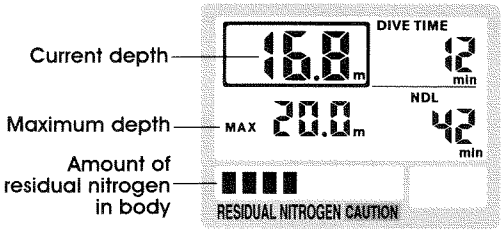
Measurements are displayed at one minute intervals up to a maximum of 599 minutes (9 hours, 59 minutes). If the dive time is under one minute, it is not recorded into the log memory as a dive.

⚠ CAUTION

If 10 minutes has not passed between dives, the interval time is added to the previous dive time and dive time measurements begin again.

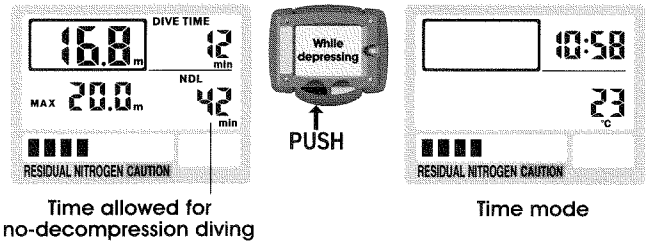
c. Maximum dive depth

For maximum dive depth, MAX and M marks are displayed.



d. Indicated time allowed for no-decompression diving

No-decompression diving time is displayed in minutes. Time mode and water temperature are displayed only while the PLAN button is depressed. Once the button is released, the nano returns to dive mode.



No-decompression dives at current depth are possible within 48 minutes.

<Display>	<Actual no-decompression dive time range>
<200MIN>	(200 minutes or more)
< 2MIN>	(2:59 - 2:00)
< 1MIN>	(1:59 - 1:00)

⚠ CAUTION

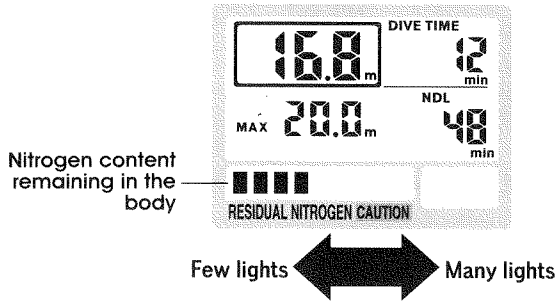
If no-decompression dive time displays 200 MIN, there is still 200 minutes or more of no-decompression dive time remaining (201 minutes or more is not displayed).

⚠ WARNING

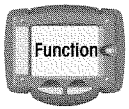
The indicated time allowed for no-decompression diving is the result of calculations made of the amount of residual nitrogen in your body. These calculations do not take into account such factors as the amount of air left in your tank. Always remain aware of how much air you have.

e. Bar graph display for nitrogen remaining in the body

The nitrogen content remaining in the body is displayed by bar graph.



he nitrogen content in the body can be visually confirmed by the bar graph. When the nitrogen content remaining in the body is low, few lights on the bar graph are lighted. When the amount is high, many lights are lighted.



This enables you to confirm the nitrogen content in your body while diving or at rest and makes it possible to plan safe dives. The display continues even after finishing your dive until the nitrogen remaining in your body is eliminated.

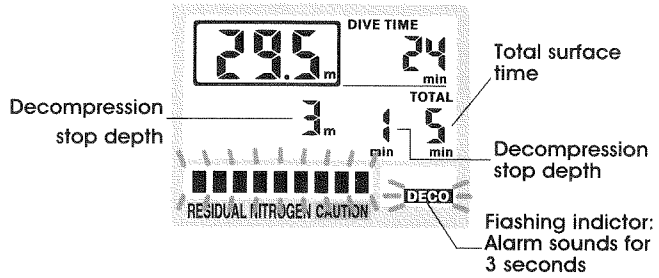
⚠ WARNING

he bar graph does not show the time for the elimination of the nitrogen remaining in the body.

f. Decompression dive mode

If you exceed the period allowed for a no-decompression dive, the "DECO" mark flashes, all 9 blocks of the bar graph are illuminated, and the alarm sounds for 3 seconds. The display then switches to decompression dive mode, indicating decompression stop depth, the decompression stop time for that depth, and total surfacing time.

Once you have followed the instructions up to the final decompression stop, the "DECO" mark, the decompression stop depth indicator and the decompression stop time indicator will disappear, and the mode will return to no- decompression diving mode.



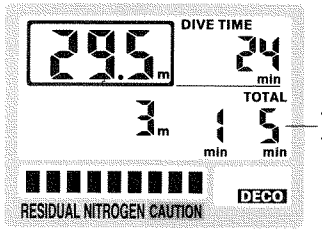
This means that at 3 m, there is a need to execute a decompression stop for one minute.

⚠ WARNING

Decompression stops should be conducted at the instructed depths and times. However, make sure to note the amount of air remaining. Never conduct a decompression stop at a depth lower than instructed.
If ocean conditions prevent you from observing the instructions for decompression depth, decompress at a depth of 1 m (3 ft) – 2 m (7 ft) deeper. In such an event, more time than usual is needed for decompression.

g. Total surfacing time display

When shifting to a decompression dive, the total amount of time to surface is indicated.



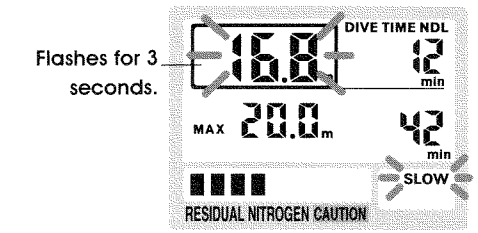
If the total surfacing time reads 5, it means that a total of 5 minutes is needed including decompression stops to surface from the current depth to the surface of the water.

⚠ WARNING

Total surfacing time indicates the total of stop time at each decompression stop point and the time to surface from the current depth to the surface of the water. Assuming correct decompression, total surface time is calculated as one minute even when it is possible to surface under one minute from the current depth. Therefore, the maximum marginal error is one minute.

h. Surfacing speed warning

Surfacing speed depends on depth, and warnings are made accordingly. If your surfacing speed exceeds that permitted by nano, the current depth indicator and "SLOW" mark will flash, and an alarm will sound for 3 seconds. The depth display will stop flashing when a safe speed is reached.



⚠ CAUTION

When the surfacing speed warning occurs twice consecutively it will be recorded as part of the log data and the log mode will be displayed. (See "Surfacing speed warning" in section b on page 18.)

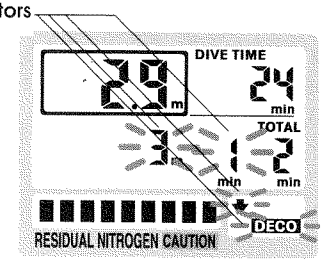
Warning standard surfacing speed

Water depth (Ocean water standard)	Surfacing speed/ Ascent rate warning
From 0.0 m (0 ft) – 5.9 m (19 ft)	=8 m (26 ft) per minute
6.0 m (20 ft) – 17.9 m (59 ft)	=12 m (39 ft) per minute
18 m(60 ft) –	=16 m (52 ft) per minute

i. Failure to make indicated decompression stop alarm

If your current depth is less than the indicated decompression stop depth, the "DECO" mark, the decompression stop time indicator and the decompression stop depth indicator will all flash, and the alarm will sound for 5 seconds.

Flashing indicators



⚠ DANGER

If these warnings are given, dive immediately to the decompression stop depth indicated.If you ignore the warnings and surface, the decompression display will continue to flash, constantly warning that you risk an onset of decompression sickness.
Warnings are given when you are in a zone shallower than the indicated decompression stop depth. These warnings will stop when you return to the indicated depth. If you fail to return to the indicated depth, warnings will continue for 5 minutes, after which the nano will stop functioning, remaining in the "failure to make indicated decompression stop alarm" status.Once in this status,nano cannot be used for 48 hours.

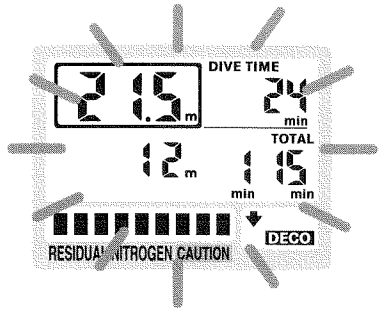
The fact that there was a failure to make an indicated decompression stop will be recorded as part of the log's data, and displayed when the log mode is accessed. (See "failure to make indicated decompression stop alarm," in section b on page 18b.)

The display will show decompression stop time and total surfacing time, but these are only value indicators.
(The nano will return to battery save mode or watch mode after 24 hours.)

j. Measurement range exceeded warning

In any of the following cases, you will have exceeded the range of measurement.
As a result, all displays will flash, and the alarm will sound for 10 seconds.

- When dive depth exceeds the measuring range (99.9 m (328 ft) or deeper)
- When dive time exceeds 599 minutes
- When decompression stop instruction depth is 15 m (49 ft) or deeper



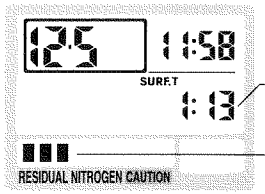
⚠ DANGER

If these warnings are given, dive immediately to the decompression stop depth indicated.If you ignore the warnings and surface, the decompression display will continue to flash, constantly warning that you risk an onset of decompression sickness.
Warnings are given when you are in a zone shallower than the indicated decompression stop depth. These warnings will stop when you return to the indicated depth. If you fail to return to the indicated depth, warnings will continue for 5 minutes, after which the nano will stop functioning, remaining in the "failure to make indicated decompression stop alarm" status.Once in this status,nano cannot be used for 48 hours.
The display will show decompression stop time and total surfacing time, but these are only value indicators.
(The nano will return to battery save mode or watch mode after 24 hours.)

10. Surface mode

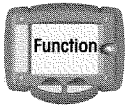
a. Mode display

The display will switch to surface mode when you rise to a depth of 1.5m or less. The display will show time on surface, the current time, residual nitrogen in your body (by bar graph), when data is outside the scope of measurement, there will be a warning.
All displayed screens will continue to flash until you have rested at the surface for at least 24 hours. At this time, the nano cannot shift into dive mode.



Time remaining on surface

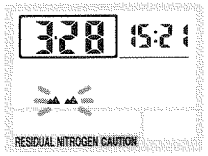
Bar graph display for nitrogen remaining in the body



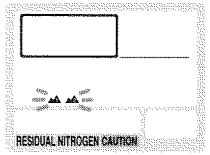
If you remain on the surface for less than 10 minutes, nano will regard this as a continuation of the previous dive.

b. Altitude value function

nano measures altitude every 10 minutes, to determine your current elevation. The altitude value is required for calculations used in the dive plan mode and the dive mode. The chart below gives approximate elevations corresponding to altitude values. Irrespective of which mode you are in, a change in altitude value is represented either by no mark, or by ▲ ▲. When you move above 2,400m [7800ft], the ▲ ▲ mark flashes, and this function becomes unavailable (but can be used again when you return below 2,400m [7800ft].). Measurements of any residual nitrogen in your body are stopped when you move above 2,400m [7800ft], but will continue, and will be displayed again, when you return below that level.
If for some reason the altitude cannot be measured, " ▲ ▲ " will be displayed as altitude value error.



Beyond altitude measurement range (2.400m [7800ft] or higher)



Altitude measurement function not in operation

Altitude value	Altitude	
no symbol displayed	approx. 0 - 800 m	[0 -2600ft]
▲ displayed	approx. 800 - 1,600 m	[2600 -5200ft]
▲ displayed	approx. 1,600 - 2,400 m	[5200 - 7800ft]

⚠ CAUTION

If "the altitude value error" is displayed when you are within an altitude that nano can register, this could indicate a malfunction. Repair by an Apollo agent may be required, so take it to the store where you bought it. When nano is inspected or repaired, (logged data) is erased, so first record all such data elsewhere. If the altitude value rises when there is no residual nitrogen in your body, nano automatically shifts to surface mode and begins decompression calculations. Beginning a dive at this time constitutes a repeated dive. Even at the same altitude level, slight changes in atmospheric pressure due to weather conditions may cause individual nano to display different altitude values. This does not mean a malfunction. However, if there is a difference of 2 or more values, this could indicate a failure.

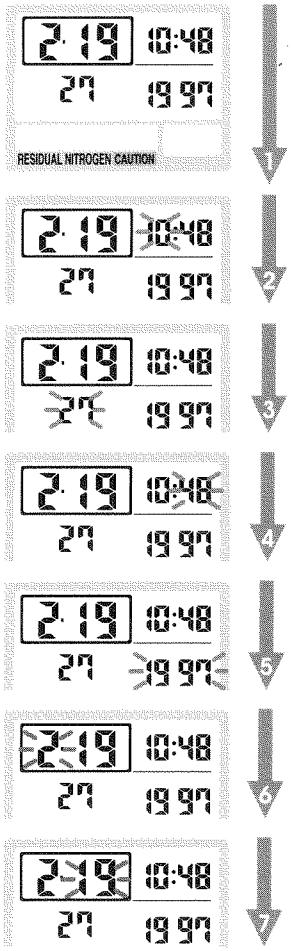
Leaving nano for long periods in places with high or low temperatures, at a high humidity or under other severe conditions may greatly affect the precision pressure sensor, resulting in measurement disparities. Never store under such conditions.

11. Time set mode

How to set time and date

Push the PLAN button to move into dive plan mode, then hold down the LOG button for 5 seconds to move into time set mode.

Settings are made in this order: seconds, minutes, hours, year, month and day.
Follow the procedures set out below.



When no need to make a change

Move on, by making the next item flash (see below).

When you want to make a change

[1] Each time you push LOG button, you advance to the next item, making it flash. Stop at the one you want to change (see phases illustrated in order at left).

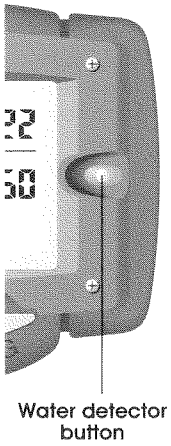
[2] Push PLAN button to change the flashing number.(If you hold down the button, numbers will advance in rapid increments.)

[3] After setting the day, return to watch mode.

These values are used merely for explanatory purposes. The actual values when using the nano will be different.

12. Care and maintenance

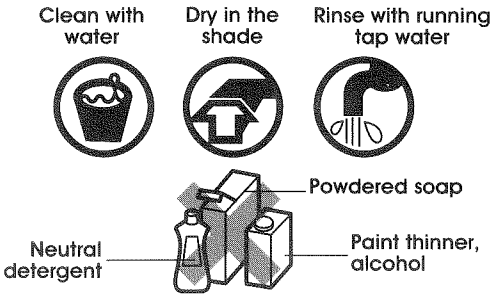
a. Cleaning



After you finish diving for the day, you must rinse nano well in running tap water. Make sure you clean the button areas especially well.
The display unit contains plastic, so never try to remove dirt with gasoline, paint thinner, alcohol or other organic solutions, and never use decorative materials like sprays, cleansers, glue or paint, since doing so could cause discoloration and changes to the surfacing and case, damaging the waterproofing. If the water detector button areas become dirty or encrusted, clean them with a soft cloth. Do not leave the unit in a bucket of water for a long time, to remove salt or other substances, since the sensor will activate the dive mode, causing the battery to run down.

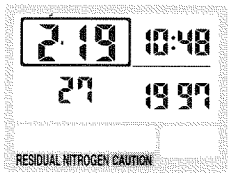
b. Storage

After cleaning with water, remove all moisture, then dry it completely by leaving it in a shady, well-ventilated area. Store in a cool, dry place. Never store with wet items.
If you put the unit in its case while wet, the sensor will activate the dive mode, and the battery will run down. Do not leave for long periods in direct sunlight or in locations that could become hot, such as a car parked in the sun. Also avoid extremely cold places.
If nano becomes hot or cold, leave it in cool water until the entire unit reaches the water temperature. If used when extremely hot or cold, the precision of water depth and temperature measurements will be negatively affected.



c. If nano does not return to battery save mode

If "aititude value error" (▲▲ ▲▲ mark flashing) are displayed for a long time and nano does not return to battery save mode, it may be damaged. Repairs by Apollo are necessary, so nano should be brought to the store where you made your purchase. Log data memory is erased during checkups and repairs. Divers should note this information in their log books in advance.



d. Battery replacement

When the battery mark lights up, immediately take the nano to the store where you made your purchase to have it replaced.

When replacing the battery, the log data memory is completely erased, so this information should be noted in a log book beforehand.

13. Cautions on use

a. A warning item of The Japan Scuba Association

⚠ DANGER

- It is extremely important that scuba divers using this product have undergone theoretical and practical training given by an internationally-recognized entity providing diving instruction. Due to safety considerations, those who have not obtained a C Card (attesting to completion of training) from an entity providing diving instruction must not use this product. (This does not apply to those using the product during training, under the supervision of an instructor attached to an entity providing diving instruction.) Amateurs lacking knowledge of basic scuba diving techniques risk serious injury or death.

(A danger item of The Japan Scuba Association)

- Never scuba dive alone. Always dive under the buddy system. Diving alone is extremely dangerous, and could lead to a serious injury or death.

(A danger item of The Japan Scuba Association)

- Please be sure to have your equipment inspected by the store where it was purchased at least once every 100 dive or at least once a year after purchase or after the last overhaul. Please have a full overhaul conducted if the inspection indicates that there is a necessity to do so. If regular inspections and the necessary overhaul repair are not implemented, there is the danger of serious injury or death resulting from improper functioning of your equipment.

(A danger item of The Japan Scuba Association)

⚠ WARNING

- Make sure you are in good physical condition before you scuba dive. If you begin to feel cold, tired or unwell, do not overexert. Stop your dive.

(A warning item of The Japan Scuba Association)

- Never take alcohol or medicine (especially a nasal spray or medicine for a cold) before scuba diving. Those who are in poor physical shape or suffer from some chronic ailment should consult a doctor before considering diving.

(A warning item of The Japan ScubaAssociation)

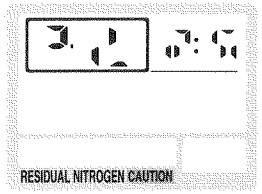
b.Danger, Writing and Caution

nano is set for a healthy diver of average strength.

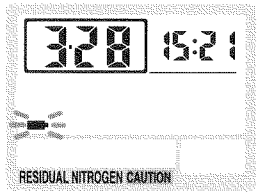
⚠ WARNING

It does not adjust to individual differences and changes in body conditions. Divers are responsible for making plans that give sufficient consideration to their physical / mental conditions and for observing general diving rules.

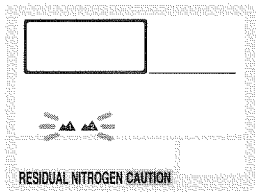
Confirm check mode before diving. Do not use if there is any abnormality or any of the following applies.



Display check/insufficient liquid crystals
(Are all the liquid crystals lighted?)



Battery warning



Altitude measurement error

⚠ WARNING

The nano is intended for recreational and non-decompression diving. It was not designed for commercial or decompression diving. We do not recommend decompression diving. Use with care, staying well within the non-decompression zone. When a decompression stop is indicated, follow the instructions with regard to depth and time span, always verifying your remaining air pressure. Never make a decompression stop at a depth shallower than indicated. When sea conditions do not permit decompressing at the indicated depth, decompress at a depth 1 ~2m [3~7ft] deeper (in which case, decompression time is longer than normal).

⚠ WARNING

nano has not been designed to control such factors as amount of remaining air. Regularly verify remaining air using the gauge, and act accordingly.

⚠ CAUTION

Never conduct pressure chamber tests using air, gas or the like, because this would cause damage.

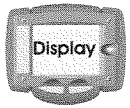
⚠ WARNING

Use nano with other gauges (including a depth gauge and diver watch) as back-ups.

⚠ CAUTION

If you do not change the battery in response to illumination of the battery mark, it may leak or break. This could be extremely dangerous.
Have the battery exchanged at a store, without delay.
When the battery is changed, all logged data, total number of dives and dive profile data will be erased, so store this information elsewhere beforehand.

14. Types of warnings



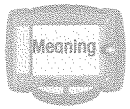
The current depth indicator and SLOW flag flashes for 3 seconds and the warning alarm sounds for 3 seconds.

This is a warning that you are exceeding the surfacing speed determined by nano's standards.

WHAT TO DO

Slow down your surfacing speed. Once you have attained a safe speed, the current depth indicator will stop flashing. If the surfacing speed warning sounds consecutively two or more times, it will be recorded in the log mode.

Decompression stop depth/time, DECO and the down arrow flash, and the warning alarm sounds for five seconds.



This is a warning that your current depth is shallower than the indicated decompression stop depth.

WHAT TO DO

Return immediately to the indicated decompression stop depth, and conduct a decompression stop, as indicated.

The measurement range exceeded warning sounds, all screen indicators flash, and the alarm sounds for 10 seconds.

This alarm sounds when the depth measurement range (99.9m) (328ft) is exceeded, when the maximum dive time (599 minutes) is exceeded, or when decompression is required and the decompression depth is below 15m (49ft).

DANGER

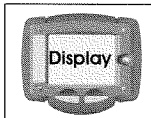
Never dive in such a way.

The measurement range exceeded warning sounds, all screen indicators flash, and the alarm sounds continuously for 10 seconds.

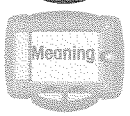
nano is emitting a measurement range exceeded warning, or is warning that you failed to make a required decompression stop.

DANGER

Never dive in such a way.



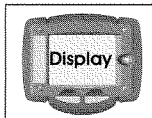
The " ▲▲ " mark flashes.



This is a signal that your altitude exceeds the altitude measurement range (i.e. over 2,400m (7,800ft)).

WHAT TO DO

The function is operable within the range of 0--2,400m (0--7,800ft). nano was not designed for diving at altitudes above 3,000m (9800ft). If the " ▲▲ " does not stop flashing even within the range of 0-2,400m (0-7,800 feet), the nano should be brought to the store of purchase for repair.



The " ▬ " mark is illuminated.

The battery is run down, and must be changed. Even if you dive you cannot get into dive mode.

WHAT TO DO

Take nano to the store where you bought it, to have the battery changed. When the battery is changed, logged data, is erased, so first record all such data elsewhere.

15. Trouble shooting

This list is to assist in making the appropriate judgment when trouble occurs with nano. When trouble occurs, read this list carefully before responding. If trouble occurs that is not included on this list, it may be necessary for Apollo to conduct repairs. Repairs should be done at the store where you made your purchase.
When parts are checked and repaired, logged data, is erased, so first record all such data elsewhere.

Problem	Data is recorded in the dive log mode even before you use the product.
Cause	Before shipping, a chamber test was conducted to ensure product quality. The test data remains in memory.
What to do	The nano can be used in this state without any problems. After 10 entries have been logged into the memory, the oldest entry will be erased with each new entry.
Problem	Screen becomes rainbow colored.
Cause	This is the effect of tension inside the screen resulting from temperature differences.
What to do	This is not a problem.
Problem	Display illumination is weak.
Cause	One possible cause is low temperature. Another cause could be a low battery.
What to do	If the cause is low temperature, returning nano to regular temperatures will solve the problem. When the battery life has been reached,replace at the store of purchase.
Problem	Does not shift to surface mode. Surface interval time is too short.
Cause	nano was stored with wet items after surfacing. As a result, nano has returned to dive mode and the post-surfacing count has stopped.
What to do	After surfacing, sufficiently dry while resting. Keep nano away from wet items.
Problem	The altitude value is off.
Cause	1) You are in a zone bordering two altitude values. 2) nano is being subjected to extreme heat.
What to do	If you are in a zone bordering two altitude values, there is no problem. If heat is the problem, cool nano by, for example, immersing it in cool water. If neither possible cause is the problem, the product could be damaged, so it may have to be repaired by an Apollo representative.Take it to the store where you bought it.
Problem	At a usable altitude level, the "altitude value error" display does not shut off.
Cause	Malfunction.
What to do	Repair by Apollo is needed. Have the battery exchanged at the store where you made your purchase.

Problem	At the surface of the water, the current water depth display does not return to 0.0m.
Cause	If nano is stored in an extremely hot or cold place an incorrect altitude level may be displayed.
What to do	Return to room temperature. If it still does not return to 0.0 m, this may indicate a malfunction. Have repairs made at the store where you made your purchase.
Problem	nano is in surface mode even though the button is not being operated.
Cause	nano automatically begins decompression calculations when altitude level changes.
Caution	**Dives that begin under these conditions constitute a repetitive dive.**
What to do	nano can be used in the same way as with ordinary repetitive dives.
Problem	You cannot button manually into the log mode, dive plan mode or dive profile mode.
Cause	This can occur when, after a dive, electricity passes between water detector button. If this is not the problem, damage is indicated.
What to do	If the water detector button area is moist, wipe it well, then try to switch into one of the modes again. If damage is indicated, the product will have to be repaired by an Apollo representative. Take it to the store where you bought it.
Problem	In dive plan mode, time allowed for no-decompression diving is indicated in the form of a bar.
Cause	This occurs when the measurement range exceeded warning has sounded, or when the ⛰ ⛰ mark is flashing because the altitude value is above 2.400m (7800ft).
What to do	If the measurement range exceeded warning has sounded, wait 24 hours -- nano functions will automatically return. If the ⛰ ⛰ mark is flashing, functions will return when you descend below 2.400m (7800ft).
Problem	The ⛰ ⛰ mark flashes.
Cause	The altitude value is above 2.400m (7800ft).
What to do	It will stop flashing when you descend below 2.400m (7800ft).
Problem	The battery mark illuminates less than 7 years following shipment.
Cause	1) nano functions have been used more often that the number of times accounted for in battery life calculations. (Of particular significance would be frequent alarms, which shorten battery life.) 2) The place where you regularly store nano is in a zone bordering two altitude values. Measurements are repeated due to pressure changes. 3) For some reason the water sensor is activated and nano remains in dive mode.
What to do	If the battery mark illuminates for a reason other than one of the 3 listed above, the product could be damaged. Take it to the store where you bought it and ask that it be checked and repaired if necessary.