

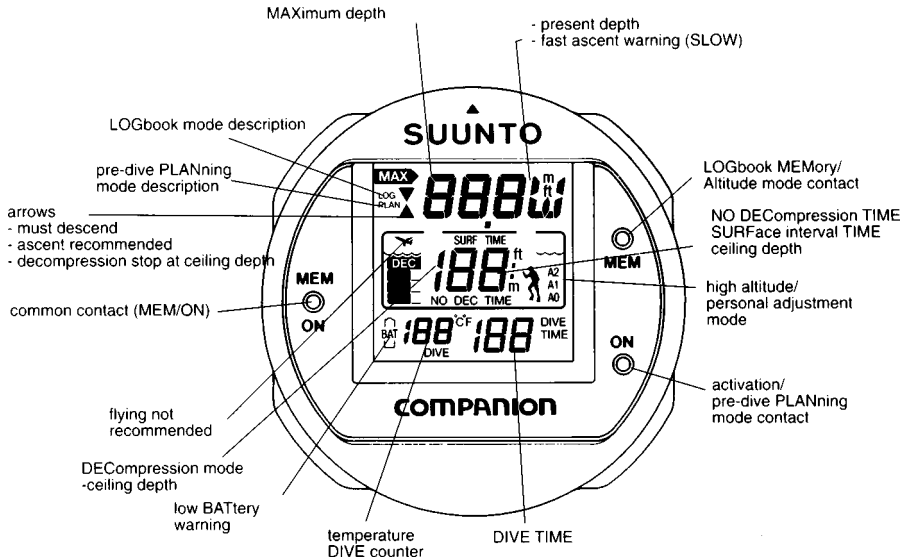
▲
SUUNTO

COMPANION



OWNER'S INSTRUCTION MANUAL

FIGURE 1 STARTUP



COMPANION is equipped with three contacts:

- common contact (MEM/ON)
- activation contact (ON)
- memory/mode contact (MEM)

ACTIVATION: touch ON- & common (MEM/ON) -contacts

PLANNING MODE: touch ON- & common (MEM/ON) -contacts once activated

LOGBOOK MEMORY MODE: touch MEM- & common (MEM/ON) -contacts

ALTITUDE MODE: keep MEM- & common (MEM/ON)
-contacts touched for about 5 seconds

RETURN FROM LOGBOOK AND ALTITUDE MODES:
touch MEM- & ON- & common (MEM/ON)
-contacts all at the same time

RETURN FROM PLANNING MODE:
wait until planning cycle is completed
(approximately 60 seconds)

▲ WARNING !

READ THIS MANUAL!

Carefully read this instruction manual in its entirety, including Section "For Your Safety". Make sure that you fully understand the use, displays and limitations of the COMPANION.

▲ WARNING !

NO DIVE COMPUTER WILL PREVENT THE POSSIBILITY OF DECOMPRESSION SICKNESS (DCS)!

All divers must understand and accept that there is no procedure or dive computer that will totally prevent the possibility of a decompression accident. For example, the individual physiological make up can vary within an individual from day to day. The dive computer cannot account for these variations. As an added measure of safety, you should consult a physician regarding your fitness to dive with the COMPANION computer.

⚠ WARNING !

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

⚠ WARNING !

NOT FOR PROFESSIONAL USE!
SUUNTO dive computers are intended for recreational use only. The demands of commercial or professional diving often expose the diver to depths and prolonged exposures including multiday exposures that tend to increase the risk of decompression sickness. Therefore, Suunto specifically recommends that the COMPANION be not used for commercial or other severe diving activity.

⚠ WARNING !

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

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⚠ WARNING !

You are advised to avoid flying anytime the computer displays the do not fly warning - indicated by an airplane. Further, the Divers Alert Network (DAN) advises as follows:

- A minimum surface interval of 12 hours would be required in order to be reasonably assured a diver will remain symptom free upon ascent to altitude in a commercial jetliner (altitude up to 2400 m [8000 ft]).
- Divers who plan to make daily, multiple dives for several days, or make dives that require decompression stops, should take special precautions and wait for an extended interval beyond 12 hours before flight.

Suunto recommends that flying be avoided until both the DAN guidelines and the COMPANION wait to fly conditions are satisfied.

FOR YOUR SAFETY

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

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

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

BACK-UP INSTRUMENTS

⚠ WARNING !

USE BACK-UP INSTRUMENTS

Make certain that you use back-up instrumentation including a depth gauge, submersible pressure gauge, timer or watch, and have access to decompression tables whenever diving with the COMPANION.

SHARING THE COMPANION

⚠ WARNING !

THE COMPANION SHOULD NEVER BE TRADED OR SHARED BETWEEN USERS WHILE IT IS IN OPERATION!

Its information will not apply to someone who has not been wearing it throughout a dive or sequence of repetitive dives. Its dive profiles must match that of the user. If it is left on the surface during any dive, it will give inaccurate information for subsequent dives.

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

HIGH ALTITUDE/PERSONAL ADJUSTMENT

More information about this is given in Section "High Altitude Dives and Personal Adjustment" (p. 26).

WARNING !

SET THE CORRECT ALTITUDE/PERSONAL ADJUSTMENT MODE!

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

WARNING !

The COMPANION is not intended for use at altitudes greater than 2400 m (8000 ft). Diving at altitudes above this limit may significantly increase the risk of DCS.

When diving at higher altitudes (above 700 m/2300 ft), it is essential that the entered altitude mode, i.e. maximum altitude limit of the COMPANION, exceeds or is equal to the altitude of the dive site. The altitude mode indicator must show either A1 or A2, depending on the altitude. More information about this is given in Section "High Altitude Dives and Personal Adjustment".

DECOMPRESSION DIVES

⚠ WARNING !

**DO NOT USE THIS INSTRUMENT TO
CONDUCT DECOMPRESSION DIVES!**

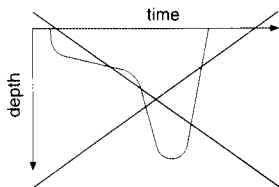
The COMPANION is not intended for decompression diving.

EMERGENCY ASCENTS

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

HIGHER RISK DIVE PROFILES

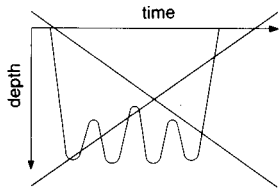
The user must understand that all decompression devices (decompression tables and/or dive computers) are based on mathematical models and that many experts are currently concerned that these models may not under certain conditions adequately describe the physiological phenomena. These conditions are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



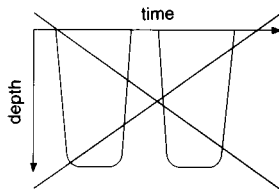
Reverse Profile

REVERSE PROFILES

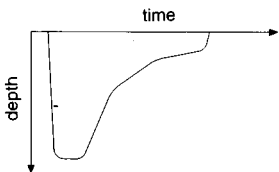
-where the diver spends the majority of the dive at shallow depths and then descends to the maximum depth shortly before surfacing.



Sawtooth Profile
Consecutive Deep Dives



Repetitive Decompression
Dive



Recommended
Profile

SAWTOOTH PROFILES

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

CONSECUTIVE DIVES

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

MULTIDAY DIVES

-repetitive dives performed for several consecutive days.

DECOMPRESSION DIVES

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

⚠ WARNING !

Dive practices which include the above described "Higher Risk Dive Profiles" are considered potentially dangerous and should be avoided even if they conform to the mathematical model.

DIVE COMPUTER LIMITATIONS

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

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

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

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

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

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

▲ WARNING !

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

INTRODUCTION; COMPANION AT A GLANCE

From figure 9 you can see the profile of the dive presented in figures 3-8.

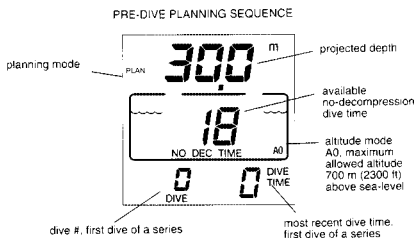


Figure 3 (A in Fig. 9)

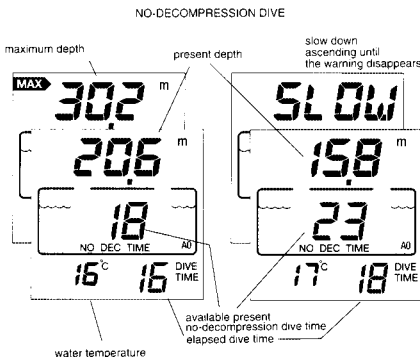


Figure 4 (B in Fig. 9)

Figure 5 (C in Fig. 9)

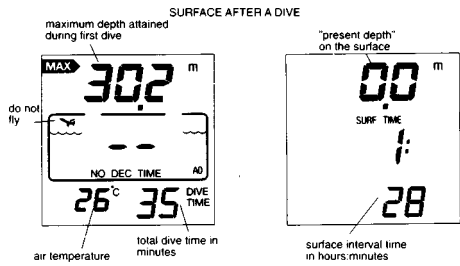


Figure 6. (D in Fig. 9)

Figure 7. (E in Fig. 9)

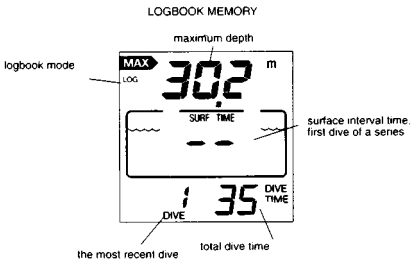


Figure 8. (F in Fig. 9)

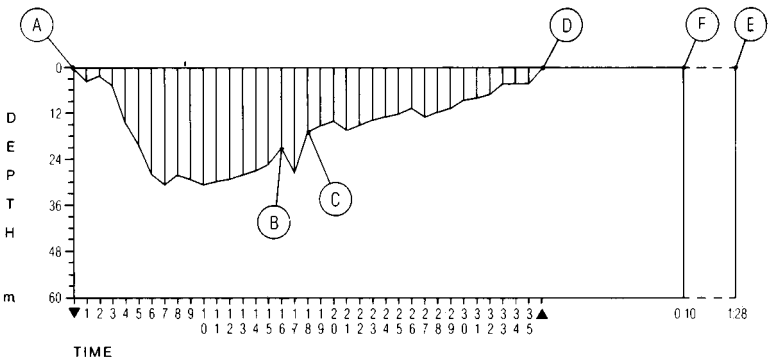


Figure 9.

OPERATING PRINCIPLES

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

The information it provides is displayed in a logical, simple fashion so that only essential data is shown at the appropriate time.

The no-decompression limits displayed by the COMPANION upon activation are slightly more conservative than those permitted by the U.S. Navy tables for most dives to a single depth. These "low-bubble" no-decompression limits have been derived from recent research, and are believed to greatly reduce the chances of decompression sickness.

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

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

Compartments and Half Times

The no-decompression limits in the U.S. Navy tables are based upon six compartments for single dives, and one compartment for surface intervals and repetitive dives. If you are familiar with table theory, you may know that they are characterized by half times (i.e. time re-

NO-DECOMPRESSION TIME LIMITS FOR VARIOUS DEPTHS

High altitude modes

	A0	A1	A2	
m (sea level)		(-1500 m [5000 ft])	(-2400 m [8000 ft])	
9	—	153	104	
12	125	89	66	
15	71	57	42	
18	52	39	30	
21	37	29	23	
24	28	23	18	
27	22	18	15	
30	18	14	11	
33	13	11	9	
36	10	9	8	
39	9	7	6	
42	7	6	5	
45	6	5	5	
ft				U.S. Navy
30	—	149	102	—
40	120	86	65	200
50	69	56	41	100
60	51	38	29	60
70	35	28	22	50
80	28	23	19	40
90	21	18	15	30
100	17	14	11	25
110	13	11	9	20
120	10	9	8	15
130	9	7	6	10
140	7	6	5	10
150	5	5	4	5

quired for 50 % equilibration to a pressure change) ranging from 5 minutes to 120 minutes. The COMPANION includes the same six compartments, plus two additional compartments for an increased range of the mathematical model. Calculations are based upon all eight compartments for all phases of diving, including surface intervals and repetitive dives. The COMPANION half times range from 2.5 to 322 minutes.

High Altitude Dives

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

Prior to making a high altitude dive, the COMPANION must be set to high altitude diving mode to take this into account. The maximum partial pressures of nitrogen allowed by the mathematical model of the COMPANION are reduced according to the lower ambient pressure. As a result the allowed no-decompression limits are considerably reduced (table 2).

Surface Intervals

The COMPANION requires a minimum surface interval of 10 minutes between dives. If a surface interval is shorter than 10 minutes, the COMPANION's dive counter and dive timer treat the next dive as a continuation of the previous dive. It adds dive times, and calculates no-decompression limits or decompression stops based on excess nitrogen absorbed on both dives. In this regard, it is similar to the U.S. Navy tables.

Depth Limits

CAUTION

SUUNTO STRONGLY RECOMMENDS THAT SPORT DIVERS SET THEIR MAXIMUM DEPTH TO 40 m (130 ft).

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

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

1. **The COMPANION uses an ascent rate of 10 m (33 ft) per minute.** It is intended to allow the gradual release of nitrogen during ascent, and reduce the chance of ‘bubbles’ forming in the diver. If you exceed 10 m (33 ft) per minute, the COMPANION asks you to slow down.
2. **The COMPANION does not calculate bottom time; it calculates dive time.** Dive time includes all the time spent below a depth of 1.8 m (6 ft) including ascent time. The U.S. Navy tables compute bottom time from the moment that you leave the surface until you begin your ascent, and do not include ascent times.
3. **The COMPANION continues to track residual nitrogen in compartments on the surface until they no longer affect no-decompression limits on subsequent dives.** This may take up to 36 hours if you have been diving heavily. The U.S. Navy tables, by comparison, assume that you are completely free of residual nitrogen 12 hours after your last dive.
4. **The COMPANION’s “low-bubble” no-decompression limits are designed to allow less excess nitrogen to build up in compartments than the U.S. Navy tables permit based on square profiles.** For example, on a first dive descending directly to 18 m (60 ft), the

U.S. Navy no-decompression limit is 60 minutes. The COMPANION's no-decompression limit for the same dive is 52 minutes (51 minutes for 60 ft).

CAUTION

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

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

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

USING THE COMPANION

This section contains instructions for operating the COMPANION, and for interpreting its displays. Each display has been carefully designed to provide all the information you need for various diving situations: **STARTUP, READY, DIVE PLANNING, DIVING and SURFACE**. In addition to these the COMPANION has a "logbook" memory.

Each of these displays shows only the data needed during that diving situation. For example, while you are on a dive, surface

interval data is irrelevant, and therefore not shown. While you are on the surface after a dive, remaining no-decompression dive time for that dive is irrelevant, and therefore replaced with information about the times available on your next dive. You'll find that the COMPANION is easy to use.

USING THE WATER CONTACTS

The COMPANION is equipped with three contacts (Figure 1):

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

Available control signals are (see Figure 10):

NOTE: IN ALL CONTACT SEQUENCES YOU WILL USE THE COMMON (MEM/ON) CONTACT.

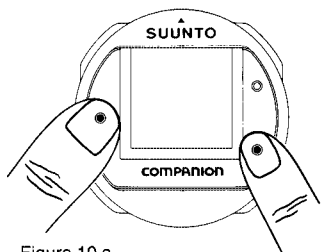


Figure 10 a.

ACTIVATION: touch ON- and MEM/ON -contacts.

PLANNING MODE: touch ON- and MEM/ON -contacts (The COMPANION must be activated first.).

LOGBOOK MEMORY MODE: touch MEM- and MEM/ON -contacts.

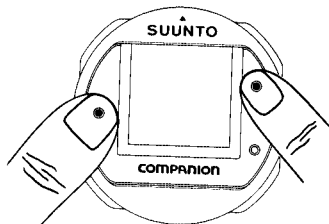


Figure 10 b.

ALTITUDE MODE SELECTION: keep MEM- and MEM/ON -contacts connected for about 5 seconds (see chapter: High Altitude Dives and Personal Adjustment).

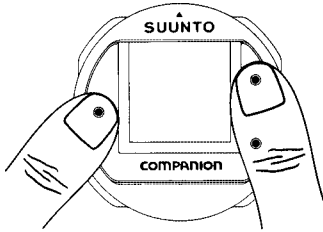


Figure 10 c.

RETURN FROM LOGBOOK MEMORY AND ALTITUDE MODE SELECTION: connect first together with your fingers MEM- and ON- and then MEM/ON -contacts.

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

As long as MEM- and MEM/ON are connected the COMPANION alternates between LOG- and Alt -displays.

The desired function is selected by breaking contact when the symbol of the desired function appears on the display (LOG for logbook memory and Alt for Altitude mode entry).

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

“Logbook” and “Altitude mode” can be deactivated by RETURN signal (= connecting all contacts at the same time) or by immersing the COMPANION in water.

“LOGBOOK” AND “ALTITUDE MODE” CAN BE ACTIVATED ONLY WHEN 10 MINUTES HAVE ELAPSED AFTER THE DIVE.

THE “DIVE PLAN” MODE CAN NOT BE DEACTIVATED, YOU MUST WAIT UNTIL THE CYCLE IS COMPLETED (approximately 60 seconds).

ACTIVATION

The COMPANION is always ready for use and will activate if submerged. It is recommended to activate the COMPANION before

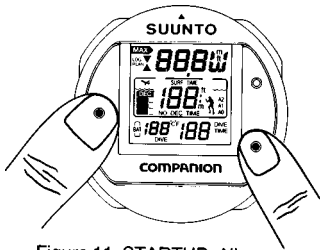


Figure 11. STARTUP, All segments on

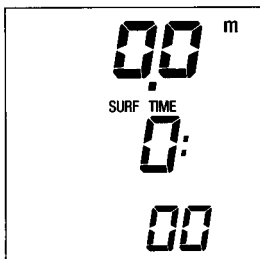


Figure 12. SURFACE TIME, display after activation before first dive. If the COMPANION is not taken on a dive, it will automatically turn off in ten minutes.

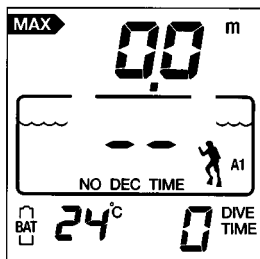


Figure 13. READY display before the first dive of a series. **Altitude mode A 1 = maximum allowed altitude 1500 m (5000 ft) above sea level.** Low battery warning (BAT) indicates that the battery is too low to operate and the COMPANION should not be used

diving by touching ON- and MEM/ON-contacts using moistened fingertips. The depth display of the COMPANION is zeroed by measuring the ambient atmospheric pressure prior to diving. During startup you can check that all display segments are on and that the low battery warning is not on.

After activation all segments of the LCD-display are visible for a few seconds (figure 11). SURFACE interval TIME (figure 12) and READY-display (figure 13) which are shown next, confirm that the activation has been completed.

At the surface, SURFACE interval TIME-display (figure 12) alternates with READY-display (figure 13).

⚠ WARNING !

When diving at higher altitudes (above 700 m/2300 ft), it is essential that the entered altitude mode, i.e. maximum altitude limit of the COMPANION, exceeds or is equal to the altitude of the dive site. The altitude mode indicator must show either A1 or A2, depending on the altitude. More information about this is given in Section "High Altitude Dives and Personal Adjustment".

If “BAT” is displayed, the COMPANION should not be used. BAT indicates that the battery is too low to ensure reliable operation of the COMPANION. If the COMPANION is stored at temperature below freezing point, the low battery warning may be displayed although the battery has enough capacity. Make sure that the low battery warning disappears before diving.

NOTE: The COMPANION may activate itself without following the above instructions. Simply holding it in your hand may make an electrical connection across the two contacts. This will have the same effect as immersing the COMPANION in water and then lifting it out. In either case, if the COMPANION is not taken on a dive after activation, it will automatically turn off in 10 minutes to conserve the batteries.

If the COMPANION is stored wet or in a wet environment, it may NOT deactivate until it is dry. This will shorten the battery life.

The COMPANION does not need to be reactivated for repetitive dives. It will remain active until it has calculated that all residual nitrogen has off gassed. This may take up to 36 hours.

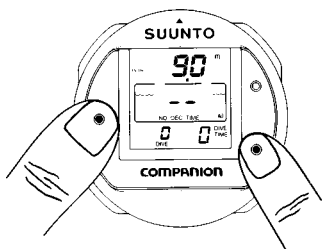


Figure 14. DIVE PLANNING: touch ON- and MEM/ON -contacts to activate the PRE DIVE PLANNING.

DIVE PLANNING

Dive planning mode is activated by touching ON- and MEM/ON -contacts (figure 14).

The DIVE PLANNING display will cycle through the no-decompression limits for various depths. Depths will appear in the Depth Indicator, and times will be shown in the center window with the notation NO DEC TIME. It takes about 60 seconds to run through the cycle. The cycle cannot be interrupted at the surface, but when diving deeper than 1.8 m (6 ft) it is automatically

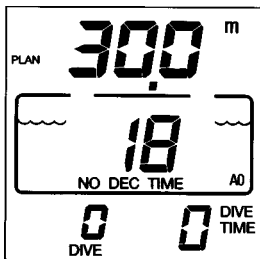


Figure 15.
DIVE PLANNING.

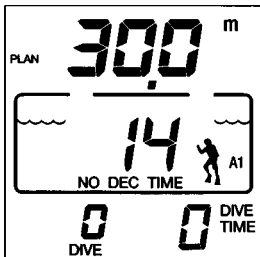


Figure 16.
Dive planning information
after activation in A1 mode

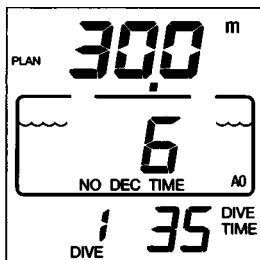
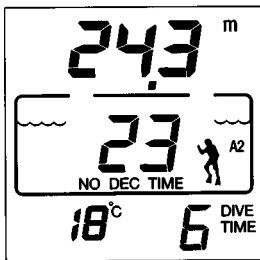


Figure 17. Dive planning
after first dive of a series



changed into the dive mode. After completing one cycle, the COMPANION will automatically return to the “ready” display. The DIVE PLANNING display cycles through depths in 3 m (10 ft) increments: 9 m (30 ft), 12 m (40 ft), 15 m (50 ft) ... 45 m (150 ft). See fig.15.

The no-decompression limits for different altitude/personal adjustment mode selections are shown on table 2 (see also fig. 16).

After diving the no-decompression times displayed in the DIVE PLANNING -mode are naturally shortened to take residual nitrogen into account, but will increase as surface interval lengthens (fig. 17).

NO-DECOMPRESSION DIVES

Any time you leave the surface and drop below 1.8 m (6 ft) you will see only the DIVING display (figures 18 and 19).

The DIVING display will remain visible until you return to depths shallower than 1.8 m (6 ft). Available no-decompression time will be shown in minutes in the center window, with the notation NO DEC TIME. Elapsed time in minutes will also be indicated by the DIVE TIME indicator.

Figure 18.
DIVING, no-decompression dive

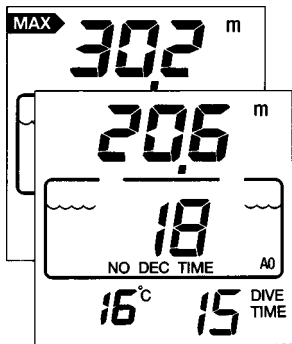


Figure 19. DIVING, no-decompression dive

Present water temperature is shown at the left lower corner of the display.

Your present depth will be shown numerically in the Digital Depth Indicator. The maximum depth reached is also shown in the same display, with notation MAX, once in every 6 seconds for 1 second (figure 19).

NOTE: When too-fast-ascent warning is on, the MAXimum depth is not shown, but the present depth display alternates with SLOW -warning.

SURFACE INTERVALS, FLYING AFTER DIVING

An ascent to any depth shallower than 1.8 m (6 ft) will cause the DIVING display to be replaced with the SURFACE display. READY -display (figure 20) is alternating with SURFACE interval TIME -display (figure 21).

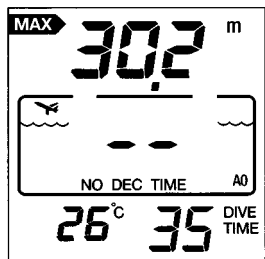


Figure 20. SURFACE, READY-display. The maximum depth of the most recent dive was 30.2 m and total dive time was 35 min. You are not allowed to fly (blinking image of an airplane). Air temperature is 26°C.

In READY -display the maximum depth of the previous dive, elapsed dive time, and temperature are shown. The no-flying caution (i.e. the blinking image of an airplane) is shown at center section of the display.

The blinking image of an airplane is a reminder that you should not fly or travel to altitudes above sea level.

The no-flying time is equivalent to the so called DESATURATION TIME. After this time the residual nitrogen is no longer affecting subsequent dives. When this time reaches zero the COMPANION will automatically deactivate itself. This may take

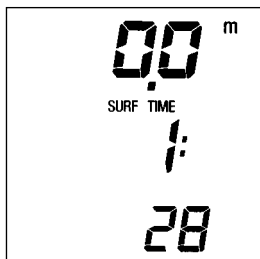


Figure 21. SURFACE TIME -display. Present depth is 0.0 m. Surface interval time shown is 1 h 28 min.

up to 36 hours after extensive diving. Research suggests that you should not fly for at least 12 hours after no-decompression dives, (see also warning on page 4). In the SURFACE -display (figure 21), you will find your surface interval in hours:minutes with the notation SURF TIME.

The COMPANION **does not display not safe to fly time.**

Until SURFACE TIME reaches 10 minutes (0:10), the COMPANION does not “know” if you are going to make a repetitive dive or continue the first dive. If you descend below 1.8 m (6 ft) before 10 minutes have passed, the DIVING display will return. DIVE number will remain unchanged, and DIVE TIME **will begin where it left off.**

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

DECOMPRESSION DIVES

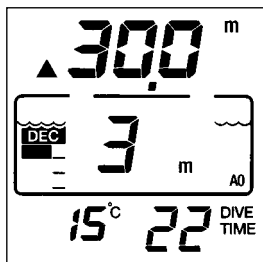


Figure 22. DECOMPRESSION DIVE. You should begin to ascend to the ceiling (decompression stop) at 3 m. Note the upward pointing arrow.

CAUTION

Suunto does not recommend decompression diving for sport divers. The COMPANION is not intended for decompression diving.

However, if through carelessness or emergency, you are forced to exceed the no-decompression limits for any dive, the COMPANION does have a provision for indicating some limited decompression information.

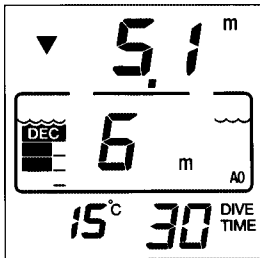


Figure 23. DECOMPRESSION DIVE. Decompression stop at 6 m. Note the downward pointing arrow: You should descend immediately to or below the ceiling.

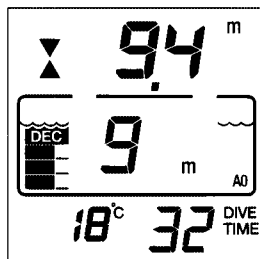


Figure 24. DECOMPRESSION DIVE. Decompression stop at 9 m. Note the two arrows pointing to each other (hour-glass).

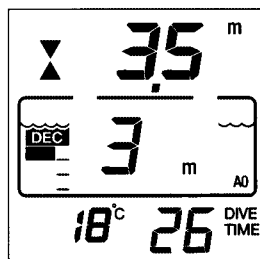


Figure 25. DECOMPRESSION DIVE. Decompression stop at 3 m. Note the two arrows pointing to each other (hour-glass).

If your dive time exceeds the NO DEC TIME indicated on the DIVING display, the display itself will change. NO DEC TIME will be replaced with DEC-bar and the digital display in the center will now indicate the ceiling depth. The ceiling in the shallowest depth to which you can safely ascend. UPWARD POINTING ARROW INDICATES THAT YOU SHOULD IMMEDIATELY START YOUR ASCENT (fig. 22).

The ceiling is also shown on the Decompression depth scale below the DEC-symbol. One, two or three segments correspond respectively to 3 m (10 ft), 6 m (20 ft) or 9 m (30 ft) ceiling depths (figures 22–24). The COMPANION does not display any decompression or ascent time.

The depth of the ceiling will depend upon your dive profile. The ceiling will be at 3 m (10 ft), when it first appears, but if you remain at depth, the ceiling will move downward and time needed for ascent to the surface (not shown by the COMPANION) will increase. Both of these factors will increase the amount of air and time required for decompression or total ascent time.

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

When you reach the ceiling, the display will show you two arrows pointing to each other (hour-glass).

If you ascend above the ceiling, a downward-pointing arrow will appear, warning you to descend immediately to or below the ceiling.

The tolerance of the ceiling depth is -0.6 m (2 ft) / +1.8 m (6 ft).

If you ascend 0.6 m (2 ft) or more above ceiling, even momentarily, the DEC-segment starts to blink after reaching the surface (and after the decompression time has counted down), and remains blinking during the following dives. This warning disappears only when the unit has deactivated itself.

Suunto recommends staying about 0.5 m (2 ft) below the ceiling to prevent the warning arrow and permanent DEC-warning from appearing.

Surfacing is allowed when the DEC-indicator and ceiling depth display have disappeared and have been replaced by NO DECompression display.

Under some conditions – e.g. if the sea surface is rough – it may be more convenient to decompress below the ceiling than exactly at the ceiling.

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

⚠ WARNING !

**THE COMPANION DOES NOT DISPLAY
THE CEILING DEPTHS DEEPER THAN 9 M (30 FT).**

You should ascend and begin the decompression immediately when the Companion shows you that the decompression is required. However if the 9 m (30 ft) ceiling is reached through carelessness or emergency, the diver must ascend to just over 9 m (30 ft) until the ceiling eventually recedes into the 6 m (20 ft) ceiling depth.

HIGH ALTITUDE DIVES AND PERSONAL ADJUSTMENT

The COMPANION can be adjusted for diving at altitude or for increasing the mathematical model. When programming the COMPANION for the correct altitude, the diver needs to select the correct altitude mode according to Table 3. As a result the COMPANION adjusts its mathematical model according to the entered altitude, giving shorter no-decompression times at higher altitudes (Table on page 13). The entered altitude/personal adjustment mode is indicated by a A0, A1 or A2. Modes A1 and A2 are shown together with a diver symbol.

TABLE 3. ALTITUDE RANGES.

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

WARNING !

SET THE CORRECT ALTITUDE/PERSONAL ADJUSTMENT MODE!

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

WARNING !

The COMPANION is not intended for use at altitudes greater than 2400 m (8000 ft). Diving at altitudes above this limit may significantly increase the risk of DCS.

Traveling to a higher elevation can temporarily cause a change in the equilibrium of dissolved nitrogen in the body with the surroundings. It is recommended that the diver allow the body conditions to stabilize over a period of at least three hours before beginning to dive at altitude.

Personal Adjustability

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

- cold exposure – water temperature less than 20 °C [68 °F]
- the diver is below average physical fitness level
- multiday or repetitive dive exposure
- diver fatigue
- dehydrated conditions
- previous history of DCS

The feature should be used to adjust the computer to intentionally introduce a factor to make it more conservative according to personal preference by entering higher altitude mode than required in table 3 (i.e. diving at sea level with the altitude/personal adjustment set at A1 or A2). The no-decompression limits are then shortened accordingly.

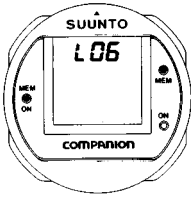


Figure 26/1.

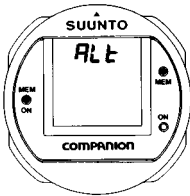


Figure 26/2.

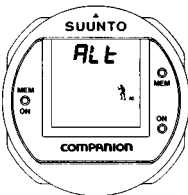


Figure 26/3.

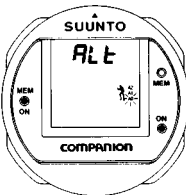


Figure 26/4.

Entering Altitude/Personal Adjustment Mode

First activate the computer normally by connecting MEM/ON- and ON-contacts if not activated. New value is entered in the following way (fig. 26):

1. Connect MEM/ON- and MEM-contacts continuously (menu selection). First the COMPANION proceeds to LOG mode (fig. 26.1) and then into Alt-mode (fig. 26.2) Release your fingers immediately at this point. Within a couple of seconds the altitude limit chosen with the image of diver becomes visible (fig. 26.3).

2. Connect MEM/ON- and ON-contacts until all three altitude modes appear. The mode chosen earlier is now blinking (fig. 26.4). Wait at least two seconds before next step but not more than four seconds.

3. Connect again continuously MEM/ON- and ON-contacts until blinking altitude mode scroll starts to blink (fig. 26.5) and desired mode starts to blink (fig. 26.5), then release your fingers. Wait until the other mode indicators disappear before next step (fig. 26.6).

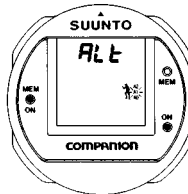


Figure 26/5.

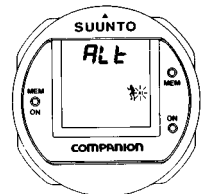


Figure 26/6.

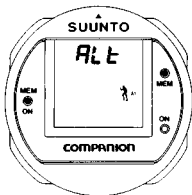


Figure 26/7.

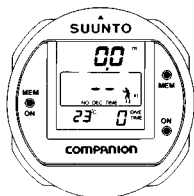


Figure 26/8.

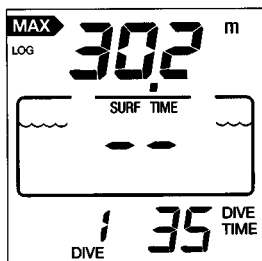
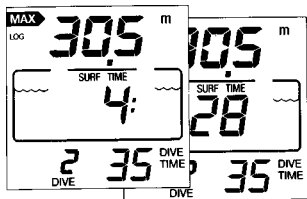


Figure 27. Contents of log book memory, the most recent stored dive ("DIVE 1").



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

4. Connect MEM/ON- and MEM-contacts to "choose" this new value (fig. 26.7). The blinking will then stop.

5. The process is ended by "RETURN" -signal (= by connecting all contacts at the same time): First connect MEM- and ON-contacts together e.g. with your right hand thumb, while keeping MEM- and ON-contacts connected, complete the "return" signal by connecting the MEM/ON -contact. The COMPANION now returns back to normal surface mode and the selected mode is stored into memory.

If something goes wrong during the procedure, go to step 5 and start again from the beginning (step 1).

All contacts must be made exactly as described. This is to ensure high degree of protection against accidental change of altitude mode.

LOGBOOK MEMORY

Logbook memory contains information about 5 most recent dives. Maximum depth, dive time and surface interval time are shown for each dive.

The data of the most recent dive is shown first with notation DIVE 1 (fig. 27).

Figure 28. Contents of log book memory, preceding dive ("DIVE 2"). Note: Hours and minutes of the SURFACE interval TIME alternate in the center display (four hours and 28 minutes [4:28]).

The dive numbering sequence for dives in *memory* does not relate to the dives displayed in the Dive Planning mode.

The data of the preceding dive is shown next (DIVE 2) (fig. 28) and so on.

Oldest dive in the memory is *shown* with notation *DIVE 5*.

The COMPANION MUST BE ACTIVATED before the logbook memory can be recalled. Logbook memory recall is activated by touching MEM- and MEM/ON-contacts until notation LOG is shown. The data of the most recent dive is then shown in the display.

The data of the preceding dive is recalled by touching again MEM and MEM/ON-contacts. Once review of all 5 dives is complete, Dive 1 would be recalled again after Dive 5 and so on.

Logbook memory mode is deactivated byt RETURN-signal (= connecting all contacts at the same time).

The dives have been stored in the memory using the so-called 10 minute rule: when the surface interval time is less than 10 minutes, the dive times are counted together and the dives are combined. Dives shorter than 2 minutes are not registered in the memory.

The memory follows the ring memory principle: the oldest data is deleted when new data is stored.

When the COMPANION is used in a console with the compass located on the reverse side, slight deviation of the compass may occur due to magnetic interference from the COMPANION's battery.

The COMPANION is equipped with a highly accurate and sensitive depth sensor. It is IMPERATIVE that you never pressure test this instrument in an air environment. If placing the COMPANION inside a pressure test chamber, BE SURE THAT THE UNIT IS COMPLETELY UNDERWATER WHILE BEING TESTED! Failure to follow this procedure may damage the depth sensor resulting in erroneous depth and/or dive time remaining readings while diving, plus voiding the warranty.

The temperature reading of COMPANION reacts slowly to temperature changes. When moving from warm air into cold water or vice versa, the correct temperature will be shown only after 5–10 minutes. THEREFORE THE TEMPERATURE READING MUST NOT BE USED TO ASSESS THE RISK OF FREEZING OF THE REGULATOR OR OTHER EQUIPMENT.

WARNINGS

COMPANION VISUAL WARNINGS

The COMPANION gives a warning in the following situations:

- Not safe to fly: flashing airplane
- No-decompression limit has been exceeded: DEC-notation with upward pointing arrow
- You ascend shallower than the ceiling: downward pointing arrow
- Omitted decompression stop or you have ascended at least 0.6 m (2 ft) above the ceiling: blinking DEC-notation at surface (and during following dives)
- Low battery warning: BAT-symbol is displayed
- High altitude mode has been entered: image of diver is shown
- Maximum ascent rate (10 m [33 ft] per minute) is exceeded: blinking SLOW in the depth display

If SLOW is still on by the time you reach 3 m (10 ft) you must stop there until it goes off. You should not surface with SLOW on. If you do surface with the SLOW warning still flashing, it will continue to flash until you begin the next dive, or until the unit deactivates itself in the normal manner.

WARNING !

IF YOU HAVE ASCENDED TOO FAST THE VALUES CALCULATED AND DISPLAYED BY THE COMPANION MAY NOT LONGER BE VALID FOR THE NEXT DIVE.

MAINTENANCE, SERVICE AND BATTERY REPLACEMENT

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

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

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

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

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

Service and Battery Replacement

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

The COMPANION uses one long life 3.0 V Lithium battery.

Battery replacement is necessary sometime after the BAT warning is displayed on the LCD. An average diver should expect a number of years (approximately 5 years if he dives e.g. less than 50 dives a year) before battery replacement becomes necessary.

TECHNICAL SPECIFICATIONS

Measures:

- Diameter: 61.5 mm (2,42 in)
- Height: 29.0 mm (1,14 in)

Depth gauge:

- Temperature compensated pressure sensor
- Depth display range: 0 to 9 m, 0 to 295 ft
- Resolution: 0.1 m (1 ft)
- Salt water calibrated (in fresh water the readings are about 3 % smaller)

Temperature display:

- Resolution: 1°C (1.5°F)
- Accuracy: ±2°C (3.6°F)

Note! Due to gel encapsulated design the temperature sensor reacts slowly to sudden temperature changes and hence it takes time to get accurate readings especially when the temperature change has been big.

- Display range: -19°C ... 99°C
-19°F ... 99°F

(0 is displayed at 100°F, 1 is displayed at 101°F and so on)

Other displays:

- Dive time: 0 to 99 min
(Displayed values start from 0 after 99 min. This doesn't affect the calculations.)
- Dive counter: 0 to 15
- No-decompression time: 0 to 199 min
- Ceiling depths: 3, 6 and 9 m
10, 20 and 30 ft

Operating Conditions:

- 0 to 2400 m (8000 ft) above sea level
- Operating temperature: 0 to 40°C (32°F to 104°F)
- Storage temperature: -20°C to 50°C (-4°F to 122°F)

Suunto recommends the unit be stored in a dry place at room temperature

- Battery life: typically about 5000 operational hours
(at 20°C [68°F])

WARRANTY

Important: Service and repair warranty registration and validation information.

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

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

If a claim under this or any other warranty appears to be necessary, return the product, freight prepaid, to your Suunto Dealer or qualified repair facility. Include your name and address, proof of pur-

chase and service registration card. The claim will be honored and the product repaired or replaced at no charge and returned in what your Suunto Dealer determines a reasonable amount of time, provided all necessary parts are in stock. All repairs made, not covered under the terms of this warranty, will be made at the owner's expense. This warranty is non-transferable from the original owner.

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

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

This warranty does not cover any representation or warranty made by dealers or representatives beyond the provisions of this warranty. No dealer or representative is authorized to make any modifications to this warranty or to make any additional warranty. For your records, please fill out the dealer information section on the next page.

TO VALIDATE YOUR WARRANTY, PLEASE RETURN THE ATTACHED CARD WITHIN 15 DAYS.

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