

SAA LECTURE No E6

PERSONAL DIVE COMPUTERS



History & Development

First sports PDC was introduced in 1959 by S. O. S. of Italy

Nitrogen absorption can be expressed as a mathematical formula-an algorithm.

PDC's currently use algorithms developed Professor Buhlmann or modified US Navy tables.

PDC not a guarantee against DCI.

PDC no safer than tables.

How it Works

Dive computers continuously calculates and computes the theoretical values of nitrogen gas loading in the body.

Most follow a multi-level dive profile programme that splits dive into a series of mini dives of about three seconds duration.

Older models use decompression tables in their memory.

An internal clock determines dive time and the surface interval.

Acts as a very fast calculator.

Dive Profiles

Any ascent involves decompression.

Avoid Yo Yo or saw tooth profile divers.

Always do deepest dive first.

Dives follow profiles of different levels. Tables make no allowances for such profiles and are based on square profiles

The Instrument

Contains accurate time, pressure (depth) sensor and is programmed with an algorithm or decompression tables.

Dive information displayed on liquid crystal display.

Powered by batteries.

Pressure/touch sensitive switch turns in on.

Retains information from dive which can be recalled after the dive.

Dive log. Down-loadable preferred.

Retains information relevant to next dive.

Can be wrist mounted or fitted to a console. Some PDC's display cylinder contents and calculates air endurance.

Information Available

Before dive: Function check, battery state, dive options and cylinder pressure on some models

Whilst diving: Current depth, maximum depth reached, elapsed dive time, ascent time, ascent rate and ascent warnings, decompression stop time and depth, water temperature.

After dive: Time since surfacing/Surface Interval. Desaturation time, fly/don't fly information, dive/don't dive information, dive options, details of previous dive(s) can be recalled.

Down-loadable PDC's are recommended by the DDRC.

Correct Application& Use

Tables and computers, both accurate and safe if used correctly.

SAA/Buhlmann tables are in 3 increments and the times are rounded up to the nearest minute.

PDC's have very accurate readings.

Plan your dive, dive your plan.



PDC's can fail.

Plan must have escape options and allow for alternations in the case of an emergency of PDC failure.

Make allowances for age, lack of fitness, cold and exertion.

Remember it is a Personal Dive Computer, DON'T share it around.

Divers partnered with a buddy with a different PDC to their own or with someone using tables should dive to the most conservative option of the two readings.

Changing from PDC to the **SAA**/Buhlmann tables suspend diving for 24 hours. Leave 24 hours before using a computer. It can't take account of previous dives.

Ascent Rates

Some PDC's have an ascent rate of 10 metres per minute.

Best defence to DCI is a slow ascent and safety stop.

1 minute at 3 metres.

S low **A** scent **F** rom **E** very **D**ive.

Attitude

Changing of altitudes, leave a 24 hour adaptation period.

First dive of the day fixes the diving altitude for the next 24 hours.

Reliability

PDC's can fail, batteries go flat or fail, they can be damaged and sometimes they leak

Allow for this in you plan. Have a Back-up.

Have other instrumentation for back up. Depth gauge, watch.

Good diving planning allows for an escape plan.

If your PDC fails underwater, terminate the dive and ascend at 10 metres per minute. Stop at 3 metres for 5 minutes.

SAFETY STOP DIVE.

If a **STAGE STOP** dive was planned then the same ascent rate should be used and the next greater value of stage stops used.

This assumes that planned bottom time and maximum depth has not been exceed.

DON'T PANIC.

Suspend diving for at least 24 hours.

Problems

All PDC's can give unreliable information.

Avoid provocative dive plans.

Dive defensively to avoid DCI.

Avoid multiple deep dives in one day, with only one past 40 metres.

Don't exceed three dives in one day

PDC's do not know if you are exceeding the limitations of the **SAA** Decompression System.

USE YOUR BRAIN.

Recommended Reading

SAA Decompression System

Decompression & Computer Assisted Diving.

SAA/NAUI manual "Adventures in Scuba Diving"