

# Basic Air Supply Management

A One Page “Cheat Sheet” by Peter Rothschild, PADI DM#238107 [pgr@tsandm.com]

In order to “Plan Your Dive” with regards to your air consumption, you need to know several things:

1. How much air you breathe when you dive;
2. How deep you will be diving;
3. How much air you start with; and
4. How long you plan to stay down.

For the purpose of planning a dive, you can assume:

1. How much you breathe – assume 1 cubic foot per minute as a new diver (as you dive more, that rate should come down)
2. How deep you will be diving – you get to decide (for this “Cheat Sheet” – assume 60 feet maximum depth – of course the deeper you go, the more air you breathe)
3. How much air – you know that when you start!
4. When you have #'s 1, 2 & 3 you can calculate how long you can stay down (as limited by air – NOTE No-Decompression Limits (NDL's) are different from air supply limits!)

**ONE MORE THING** – When planning a dive, you should plan on having a “Safety Reserve” which is the amount of air needed to get you AND your buddy safely to the surface while sharing air. “Safely to the surface” means ascending at 30 foot per minute and making all recommended “safety stops” to limit the possibility of DCS.

## Here is the “Cheat Sheet” Matrix

Tank Size	Tank Pressure	Safety Reserve - 0-60 Ft	Max Planned Dive Time at 60 Feet
		25 Cubic Feet	
AL 80	3000	1000 psi	18 Minutes
LP 95	2640	750 psi	23 Minutes
HP 100	3442	800 psi	25 Minutes

Here’s how the “Max Planned Dive Time” is determined for an AL80 using the 1 cubic foot per minute breathing rate assumption from above:

You start the dive with a full tank – 3000 psi (approximately 80 cubic feet of air). You want to go to 60 feet which is approximately 3 atmospheres ( $60/33 = 2 + 1=3$ ) so you know you will be breathing about 3 times as much air per breath as you do on the surface. For planning you have assumed that you breathe 1 cubic foot per minute on the surface so you plan on breathing 3 times that, or 3 cubic feet per minute at 60 feet.

A very important thing to remember is that you have a Safety Reserve of 1000 psi which is what you need to get you and your buddy safely to the surface from 60 feet – so you subtract that 1000 psi from the 3000 you have in your full tank. That gives you 2000 psi for your dive – and in an AL80, 2000 psi is 2/3’s of the total air in the tank or about 54 cubic feet of air.

You now divide that 54 cubic feet by your estimated breathing rate (3 cubic feet per minute at the depth of 60 feet) and that gives you 18 minutes of diving time at 60 feet. At the end of that time or when your pressure gauge shows you now have 1000 psi (your Safety Reserve) you must start your slow, standard ascent to the surface, making your stops, enjoying the dive.

That’s how you can Plan Your Dive to know how much time & air you have. I hope this helps.

Tank Size	Safety Reserve - 30 Ft	Useable Air - 30 Ft	S R - 60 Ft	Useable Air - 60 Ft	S R- 100 Ft	Useable Air -- 100 Ft
	Minimum 500 psi		25 Cubic Ft		40 Cubic Ft	
AL 80	500 psi	2500 psi - 62 cubic Ft	1000 psi	2000 psi - 50 cubic Ft	1600 psi	1400 psi - 35 cubic Ft
LP 95	500 psi	2140 psi - 75 cubic Ft	750 psi	1890 psi - 66 cubic Ft	1150 psi	1490 psi - 52 cubic Ft
HP 100	500 psi	2942 psi - 88 cubic Ft	800 psi	2642 psi - 79 cubic Ft	1350 psi	2092 psi - 62 cubic Ft