

DIVE COMPUTER FEATURES	PRICE	WARRANTY	MADE IN	WEIGHT^{††}	1ST STAGE	PORTS	2ND STAGE	2ND STAGE ADJUSTMENTS	FACTORY-READY NITROX CAPABLE
OVER \$500									
AERIS Ion AT400 DVT DiveAERIS.com	\$539.95	2-year ltd.; lifetime parts	USA	2 lbs., 9 ounces	Over-balanced diaphragm	2HP 4LP	Pneumatically Balanced	Resistance knob D/PD switch	Up to 40%
AQUA LUNG Glacia ACD aqualung.com	\$665	Ltd. lifetime	France	3 lbs., 1 ounce	Over-balanced diaphragm	2HP 4LP	Pneumatically Balanced	Venturi Switch	Up to 40%
AQUA LUNG Mikron aqualung.com	\$569	Ltd. lifetime	France	1 lb., 15 ounces	Balanced Diaphragm	1HP 4LP	Pneumatically Balanced	Resistance knob	Up to 40%
DIVE RITE Jetstream RG4500 diverite.com	\$625	Ltd. lifetime	Sweden/ USA	2 lbs., 9 ounces (DIN)	Balanced Diaphragm	2HP 5LP	Upstream Servo-assisted	Sensitivity switch	Up to 40%
HOLLIS 212 DC2 HollisGear.com	\$629.50	2 years	USA	2 lbs., 12 ounces	Over-balanced diaphragm	2HP 4LP	Pneumatically Balanced	Resistance knob D/PD switch	Up to 40%
HOLLIS 212 DC1 HollisGear.com	\$629.50	2 years	USA	3 lbs.	Over-balanced diaphragm	2HP 4LP	Pneumatically Balanced	Resistance knob D/PD switch	Up to 40%
MARES Abyss 42 mares.com	\$675	Ltd. lifetime	Italy	2 lbs., 7 ounces	Balanced Diaphragm	2HP 4LP	Unbalanced [†]	N/A [†]	Up to 40%
MARES Abyss 22 mares.com	\$600	Ltd. lifetime	Italy	2 lbs., 13 ounces	Balanced Diaphragm	2HP 4LP	Unbalanced [†]	N/A [†]	Up to 40%
MARES Prestige 32 NTT mares.com	\$550	Ltd. lifetime	Italy	2 lbs., 14 ounces	Balanced Diaphragm	2HP 4LP	Unbalanced [†]	D/PD Switch	Up to 40%
OCEANIC EOS FDX10 DVT OceanicWorldwide.com	\$639.95	2-year ltd.; lifetime parts	USA	2 lbs., 10 ounces	Over-balanced diaphragm	2HP 4LP	Pneumatically Balanced	Resistance knob D/PD switch	Up to 40%
SCUBAPRO MK25/G250V scubapro.com	\$626	Ltd. lifetime	Italy	2 lbs., 12 ounces	Balanced Piston	2HP 5LP	Pneumatically Balanced	Resistance knob VIVA**	Up to 40%
SCUBAPRO MK17/G250V scubapro.com	\$595	Ltd. lifetime	Italy	2 lbs., 13 ounces	Balanced Diaphragm	2HP 4LP	Pneumatically Balanced	Resistance knob VIVA**	Up to 40%
SHERWOOD SCUBA SR1 sherwoodscuba.com	\$640	Ltd. lifetime	USA	2 lbs., 5 ounces	Balanced Piston	2HP 5LP	Pneumatically Balanced	Resistance knob	Up to 40%
UNDER \$500									
CRESSI-SUB Ellipse Black MC5 cressi.it	\$299	1 year mfg. defects/ ltd. lifetime parts	Italy	1 lb., 15 ounces	Balanced Diaphragm	1HP 3LP	Unbalanced	D/PD Switch	Up to 40%
DIVE RITE 3000 diverite.com	\$450	Ltd. lifetime	USA	3 lbs., 1 ounce	Balanced Diaphragm	2HP 4LP	Pneumatically Balanced	Resistance knob D/PD switch	Up to 40%
MARES Prestige 12 mares.com	\$400	Ltd. lifetime	Italy	2 lbs., 6 ounces	Balanced Diaphragm	2HP 4LP	Unbalanced [†]	N/A [†]	Up to 40%
TUSA RS-530 tusa.com	\$399	Ltd. lifetime	Japan	2 lbs., 7 ounces	Balanced Piston	2HP 4LP	Unbalanced	Resistance knob	Up to 40%

[†]Mares says its DFC port minimizes the intermediate pressure drop, eliminating the need for a balanced or adjustable 2nd stage
^{††}As measured by ScubaLab
^{*} Reversible Venturi System ^{**} Venturi Initiated Vacuum Assist

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BREATHING RATES AND DEPTHS

Regulators are tested at four different RMV/depth combinations (RMV stands for Respiratory Minute Volumes—basically the amount of gas that is venti-

lated through the lungs in one minute). Here are the tests and what they represent:

COLUMN A: 37.5 RMV @ 132 FSW. A

somewhat aggressive breathing rate at the maximum recreational diving depth. A physically fit recreational diver might breathe at this rate while swimming a long distance. (A relaxed diver on a drift dive will probably be breathing at 22 RMV or

less.) A diver could theoretically maintain 37.5 RMV for five minutes or longer without becoming significantly winded.

COLUMN B: 75 RMV @ 132 FSW. An extremely aggressive breathing rate at the maximum recreational diving

BREATHING SIMULATOR

ERGONOMIC PERFORMANCE

A > 37.5 RMV @ 132 fsw	B > 75 RMV @ 132 fsw	C > 62.5 RMV @ 165 fsw	D > 62.5 RMV @ 198 fsw	EASE OF BREATHING	DIFFERENT POSITIONS	DIVES DRY	BUBBLE INTERFERENCE	CLEARING BLOW/PURGE	COMFORT	ADJUSTMENTS
5	5	5	5	5	4	5	4	5	5	5
5	5	5	5	5	4	5	4	4	4	4
5	5	5	4	5	4	5	3	5	5	4
5	3	3	3	4	3	4	3	4	4	4
5	4	5	4	5	4	5	4	5	5	5
5	5	5	5	5	4	5	4	5	5	5
4	4	4	3	5	4	4	4	4	4	N/A
4	4	4	4	5	4	4	4	4	4	N/A
4	3	4	3	4	4	4	4	4	4	4
5	4	5	4	5	4	5	4	5	5	5
5	4	4	4	5	4	4	4	4	4	5
5	4	4	4	5	4	4	4	4	4	5
5	5	5	5	5	4	5	4	5	5	5
4	3	3	3	4	4	4	3	4	4	4
4	4	4	3	4	4	4	4	4	4	4
4	3	4	3	4	3	4	3	4	4	N/A
4	3	3	2	4	3	4	4	4	4	4

JOSEPH BYRD

depth. A diver in excellent condition can breathe at 75 RMV for about one minute. This test represents how a reg might perform with a single diver breathing at an extremely heavy work rate. It also serves as a loose simulation

of the stress a reg would be under if two divers were breathing off the same first stage in an air-sharing situation. Only the U.S. Navy and ScubaLab use this breathing rate to help identify the outer limits of a reg's performance.

COLUMN C: 62.5 RMV @ 165 FSW. All regs sold in the European Common Market must pass a test standard known as EN250, which uses this RMV/depth as its benchmark. For this reason, it's also the depth and breathing rate most commonly used by manufacturers to test regulators. This is a very aggressive breathing rate. A recreational diver in excellent condition chasing a bat ray through open water would probably be able to maintain 62.5 RMV for only a few minutes.

COLUMN D: 62.5 RMV @ 198 FSW. This is the U.S. Navy's Class A test depth and breathing rate, although they use a higher supply pressure than our standard 725-760 psi. We conduct this extreme test (no diver should ever breathe this aggressively at this great a depth with this little air left) to explore the outer limits of a reg's performance.

SCORING THE RESULTS

A machine as accurate as the ANSTI simulator can accurately differentiate j/l measurements to tenths and even hundredths of a point. Human divers, however, probably can't detect differences much smaller than about 0.5 j/l. So for the sake of simplicity, we translate j/l measurements into scores on a 2 to 5 scale as follows:

- 5=EXCELLENT:** A total WOB of 1.05 j/l or less.
- 4=VERY GOOD:** A total WOB of 1.06 to 1.55 j/l.
- 3=GOOD:** A total WOB from 1.56 to 2.25 j/l.
- 2=FAIR:** A total WOB of 2.26 to 3.0 j/l.

ERGONOMIC TESTS: THE HUMAN FACTOR

To gauge the ergonomic traits, the ScubaLab staff dives each regulator and rates it for user-friendliness in seven areas.

- EASE OF BREATHING:** How well a regulator delivers air in the standard swimming position.
 - DIFFERENT POSITIONS:** How the regulator breathes when the diver is in a heads-up or face-down position.
 - DRYNESS:** Does the regulator breathe wet or dry in both a normal swimming position and odd swimming positions.
 - BUBBLE INTERFERENCE:** Considered while looking down, straight ahead, up at a 45-degree angle and straight up.
 - EASE OF CLEARING:** Divided into two parts: 1) How easy it is to find and use the purge button, and the force of the purge. 2) How much effort is required to clear the regulator using the blowing method.
 - COMFORT:** Test divers rate the comfort of the mouthpiece, the feel of the second stage in the mouth, hose lengths and stiffness.
 - ADJUSTMENTS:** Are adjustments easy to find, grip and turn? Do they do their job in a reasonable manner?
- Performance is recorded using both numeric scores on a 1 to 5 scale (5=Excellent, 4=Very Good, 3=Good, 2=Fair, 1=Poor) and written comments.

