

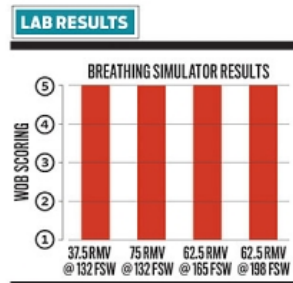
SCUBALAB 2014: Regulator Review

by Roger Roy

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SCUBAPRO MK21/S560



[\(/files/_images/201407/2014-scubalab-scubapro-mk21-s560-regulator.jpg\)](/files/_images/201407/2014-scubalab-scubapro-mk21-s560-regulator.jpg)

Photo by Carrie Garcia; Illustration by Monica Alberta

[Enlarge Photo \(/files/_images/201407/2014-scubalab-scubapro-mk21-s560-regulator.jpg\)](/files/_images/201407/2014-scubalab-scubapro-mk21-s560-regulator.jpg)

SCUBAPRO MK21/S560 - BEST BUY

MSRP: \$499

Contact: scubapro.com (<http://scubapro.com>)

Balanced-piston first stage; four lp, two hp ports

Everything about the MK21/S560's performance would lead you to expect bigger numbers after the dollar sign. Test divers liked its smooth, almost-effortless performance. The light-weight second stage is easy on the mouth, and the purge is smooth and sure. The adjustment knob turns easily and to noticeable effect. One rap was the dive/predive switch, which is effective but can be a little hard to grasp. On the breathing simulator, the reg really stood out. When it recorded excellent performance throughout our standard test regimen, we pushed into muscle-reg territory to see what it could do: Even at a torturous breathing rate, it didn't exceed test parameters for work of breathing until we hit 220 feet. No other reg in this test pulled off that feat. For delivering unmatched performance at a midrange price, the MK21/S560 is our Best Buy.

New regs are like new cars: no matter how shiny and pretty they are, you don't know what they can do until you put them to the test. That's that we do each year with the latest crop of fancy new models. We started with clinical testing on the ANSTI breathing simulator at Dive Lab in Panama City Beach, Florida. Then we spent two days with test divers conducting in-water ergonomic trials. The results here are a summary of each reg's performance on the simulator and in the water. You'll also find details about our clinical and ergo test procedures and charts breaking down each reg's performance.

HOW WE TEST

Testing was conducted on an ANSTI wet breathing simulator, which measures how much effort — “work of breathing” — it takes to move air through a regulator as it is subjected, underwater, to a precise series of depths and breathing rates. The testing was done at Dive Lab, a commercial testing facility owned by Kirby Morgan Diving Systems International. (Full disclosure: The company manufactured one of the regs in this year's test.)

Tests are performed at a high-pressure supply of 725-760 psi to conform to European test standards. Per industry practice, regs are tested in the face-forward position, and regs with breathing adjustments are set at the wide-open/no-free-flow point.

The simulator pressurizes the test chamber to simulate depths of 132, 165 and 198 feet of seawater (fsw). Each “breath” by the machine moves 2.5 liters of air through the regulator, and we do this at breathing rates of 15, 25 and 30 breaths a minute. These precisely measured volumes of air — 2.5 liters multiplied by the breathing rate — are called respiratory minute volumes (rmv).

DEPTHS AND BREATHING VOLUMES

- **37.5 rmv @ 132 fsw:** This represents the maximum recreational depth at a somewhat aggressive breathing rate.
- **75 rmv @ 132 fsw:** This simulates the potential demand at maximum recreational depth for a diver at an extremely heavy work rate or two divers buddy-breathing at a somewhat aggressive rate.
- **62.5 rmv @ 165 fsw:** This represents the European conformance standard EN250 (you've seen this stamped on your regulator). This is also the depth and breathing rate commonly used by manufacturers.

- **62.5 rmv @ 198 fsw:** This is the U.S. Navy's Class A test depth and breathing rate (although the Navy uses a higher HP supply pressure than we do).

The simulator monitors how much effort is required to “breathe” in and out, measuring the work of breathing in joules per liter (j/l). As depth and breathing rate increase (and with it, the density of the air being moved), the work gets harder. Most modern regs are able to perform at 37 rmv and 132 fsw with less than 1 j/l of work — a big improvement over regs of a generation ago.

If a reg achieves these test requirements — the toughest of which the fittest diver would be hard-pressed to keep up for more than a couple of minutes — we push it into even more-extreme conditions.

How each reg performed is found in the charts that accompany the reviews.

ERGO TEST CATEGORIES

Ease of breathing in a normal swimming position. How well does the regulator deliver air?

Ease of breathing in face-up position. How well does the regulator deliver air when looking up?

Ease of breathing in head-down position. How well does the regulator deliver air when in an inverted, head-down position?

Wetness in normal swimming position. How dry does the regulator breathe?

Wetness in head-down position. When in odd positions, how dry does the regulator breathe?

Bubble interference in swimming position. How well does the reg deflect bubbles from your field of view while swimming?

Bubble interference in vertical/stationary position. When stationary in the water, how well does the reg deflect bubbles?

Ease of clearing, the blowing method. Is it easy to clear the reg by exhaling into the mouthpiece?

Ease of clearing, the purge-button method. Is it easy to find and use the purge? How forceful is it?

Purge-button stiffness. How hard or easy is the purge button to press?

Comfort of mouthpiece. How comfortable is the mouthpiece?

Venturi-lever adjustment. Is the Venturi lever easy to find and use?

Breathing-adjustment knob. Is the adjustment knob easy to find and use? Does it do its job in a reasonable manner?

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Today's BCs are complex pieces of equipment, with a host of features, capabilities and details. Finding the right one means getting one that fits both you and your style of diving. Check out ScubaLab's review of 16 new BCs to find your perfect fit.

VIDEOS



Moving the 1,100-lb. Guardian of the Reef Statue



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(<http://www.scubadiving.com/article/news/moving-1100-lb-guardian-reef-stature-video>)

(<http://www.scubadiving.com/travel/baja-western-mexico/video-gigantic-school-rays?page=1>)

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- [Couple Killed Just Moments After Capturing Most Beautiful Moment \(VIDEO\)](http://thestir.cafemom.com/in_the_news/174000/couple_killed_just_moments_after) (http://thestir.cafemom.com/in_the_news/174000/couple_killed_just_moments_after) (*Stirring Daily*)
- [The Riskiest Behavior For Fleet Drivers?](http://www.teletrac.com/gps-tracking/topics/distracted-driving-costs/) (<http://www.teletrac.com/gps-tracking/topics/distracted-driving-costs/>) (*Teletrac*)
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Torben Kristensen · Laursens Realskole - officiel side

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