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**Powerbreathe K5 review review | £450**

Change Currency **£ GBP** What's this?

**BikeRadar verdict**



**"It works as claimed, but it's a heavy price to pay for a marginal training gain"**



**BikeRadar Review** Manufacturer's description **User reviews**

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0 comments

By Jeff Jones, editor

Mon 20 Aug 2012, 12:00 pm BST

**The Powerbreathe K5 is a device for strengthening your breathing muscles – specifically your diaphragm and intercostal (rib cage) muscles.**

It's claimed this will give you performance benefits not by increasing your *VO2max*, but by slowing down the rate at which you reach exhaustion during intense efforts. Or, in scientific terms, reducing the *VO2 slow component of exercise*. The mechanism by which this happens is by slowing the *metaboreflex* - more on that below.

We've had a K5 on test for several months now, and despite initial skepticism we're convinced that it does work as claimed. The potential power gain depends initially on the time you're willing to spend training with it, with the caveat that you will eventually hit a plateau.

But if you're into marginal gains then a Powerbreathe is worth considering as a top-up to your other training.

**How does it work?**

All Powerbreathe products work in the same way: you train by breathing in through a mouthpiece against resistance – this is termed *inspiratory muscle training (IMT)*. The resistance is governed by a valve with a variable aperture. On the K5 you can set this either on the unit or via the Breathe-Link software that you can install on your computer. You can easily change it during your session if it's too hard or too easy.

The generally accepted training protocol if you're new to IMT is a set of 30 breaths through the device, twice a day, aiming to breathe sharply and fully and reach failure by the final one. This means the valve setting has to be carefully judged or you'll hit halfway and not be able to do any more, cutting short the usefulness of the session. It can be adjusted as you go, but in practice we found that it's better to start off too easy rather than too hard.

After four to six weeks of doing this, you will have strengthened your intercostal muscles and diaphragm quite significantly, at which point you can move onto a three times a week maintenance program to keep them strong. We found that we kept improving when we went back to twice a day, albeit far more slowly.

It's recommended that you don't do normal Powerbreathe sessions just before a race or hard training session. But you can use it to warm up at 40% of your normal intensity, or even as a post-race cool down to help relax your muscles again.

**Tracking progress to on the bike**

We found that tracking the work done in kilojoules was the best measure of progress – this is a function of the resistance, power and volume of each breath. We also regularly tested our peak inspiratory flow (PIF), which is a one-off test where you inhale as quickly and sharply as possible. From a starting point of around 100 (cm H2O 'lifted') we increased this to 225 over the course of several months. We're told that that's a very good score, indicative of strong breathing muscles.

While progress on the K5 was easy to measure, translating it to performance (increased power output) on the bike was trickier. On the device we experimented with twice a day training, maintenance and no training at all, mixing things up over the course of the season in conjunction with normal on-the-bike training.

With a reasonable degree of confidence we can say that when we were using the K5 twice a day, we could produce 5-10W extra power on the bike in max efforts between five minutes and one hour. Whenever we stopped using it for a while, the benefits seemed to disappear very quickly, and even maintenance level training didn't quite hold us at peak level.

We also found that when doing longer intervals (five to 20 minutes) we were able to control and sustain them a lot better with Powerbreathe training than without.

We've started experimenting with using the Powerbreathe to warm up before events, but we haven't done enough to determine whether it helps or not.



*The Powerbreathe K5 has a simple interface*

**The science**

It's generally accepted that breathing in enough oxygen to fuel your riding, even at high intensities, isn't an issue for cyclists. The Powerbreathe doesn't claim to increase your lung capacity per se. Rather, because it adds substantial resistance to your breathing, it strengthens your breathing muscles. You can't do this on the bike - even with hard intervals - as there's no resistance to breathing. It is thus a difficult part of your body to train on the bike.

Strengthening your breathing muscles enables them to fatigue more slowly, delaying the *muscle metaboreflex*. When your breathing muscles are working at maximum capacity to drive as much oxygenated blood into your system and equally remove as much CO2 as possible, they eventually fatigue and place their own superior prioritised need for the oxygenated blood supply. Your brain then restricts the blood supply to the legs, sends it to the breathing muscles and hence the slowdown. You feel it as ragged breathing rather than painful legs.

Delaying the metaboreflex increases either the time to exhaustion or power output for a given duration. Think of it as a little extra booster tank.

Sound tenuous? Unlike many products we've tested with 'science' behind them, there's a growing body of independent research that IMT does work as claimed for endurance athletes. If you're interested, then these abstracts might whet your appetite and there's plenty more if you bang in 'inspiratory muscle training' into Google:

[Endurance training of respiratory muscles improves cycling performance in fit young cyclists](#)

[Inspiratory muscle training improves cycling time-trial performance and anaerobic work capacity but not critical power](#)

[Effects of inspiratory muscle training on time-trial performance in trained cyclists](#)

**Is it for you?**

The top-of-the-range Powerbreathe K5 sells for £450 – that's a lot to spend on a marginal gain. You can buy cheaper Powerbreathe products, though, depending on how many features you want. The K series, all of which calculate the load and progressively alter it during each breath so you get the most bang for your buck, start at £250. At the other end of the scale, the PowerBreathe Plus series ranges from £30-£50 - these aren't able to dynamically adjust the load during a breath, but they still work for basic resistance training.

We found the Breathe-Link software (which comes with the K4 and K5) was particularly useful for feedback within a session. There's lots more info and specs on [Powerbreathe's website](#).

**What's the score with BikeRadar reviews?** You can find a [full explanation of our ratings here](#).



**Specification**

**Name:** K5 + Breathe-Link PC Software (12)  
**Built by:** POWERbreathe  
**Price:** **£450.00**

[show full Specification](#)

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