

Guide to getting started with Iddiag P100 training



IDIAG P100®

Background

At rest, a human being takes some 20,000 breaths a day. As the only vital skeletal muscle, the respiratory muscles work day and night. During sporting or other generally strenuous activity, however, these muscles can become fatigued and impair athletic performance and even quality of life. Various diseases may also increase this fatigue.

To train these muscles effectively, ordinary endurance training is not sufficient. The Idiag P100 can be used to train the respiratory muscles in a targeted manner, thus improving athletic performance and also reducing respiratory system complaints caused by disease.

As with any skeletal muscle, the respiratory muscles can be stimulated either through endurance training or through strength training. Comprehensive training encompasses both components, which is why we also recommend that healthy people perform both endurance and strength training. Both modalities are possible with the Idiag P100.

A differentiation can be made between three different **breathing movements**: The abdominal breathing movement, the thoracic breathing movement and the breathing movement in the neck/throat/shoulder area.

The **abdominal breathing movement** is mainly performed by the diaphragm. The diaphragm is considered the main inhalation muscle, which lowers itself in the abdominal cavity when it contracts during inhalation. This causes the abdominal cavity to expand, thereby allowing a large volume of air to be inhaled.

During inhalation, the diaphragm is supported by muscles which cause the rib cage to expand by raising the ribs. This is known as the **thoracic breathing movement**.

The **breathing movement in the neck/throat/shoulder area** comes into play if the respiratory muscles need to develop great strength, are overstrained or exhausted. The constant action of the shoulder and neck muscles during endurance training can lead to overloading of the neck area and to it suffering cramps as a result. In endurance training, this is therefore considered a compensatory mechanism and should consequently be prevented. Strength training, on the other hand, requires action from the neck and shoulder areas in order to generate the corresponding forces and pressures.

The **optimal breathing technique** consists of a combination of abdominal and chest breathing movements. The optimal breath is initiated by the diaphragm and shortly thereafter the rib cage begins to participate. This allows for maximum expansion and therefore ventilation of the lungs. During **endurance training with the Idiag P100** the breathing pattern is exactly the same, whereby breathing is forced. The focus here is on the diaphragm, which is trained correspondingly. The neck/throat/shoulder area remains loose and relaxed..

If one wishes to develop maximum pressures, as is the case with **strength training**, it is primarily the accessory respiratory muscles that are active. During **inhalation**, these are mainly the outer intercostal muscles. The diaphragm cannot exert large forces. During **exhalation** it is mainly the inner intercostal muscles and the large abdominal muscles that force air out of the lungs.

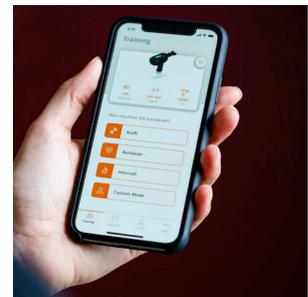
Depending on the **posture adopted**, respiratory muscle training is either made more difficult or easier. When sitting, breathing is made easier because body tension is reduced. By supporting the body on the elbows too, breathing can be made easier again.

When standing, breathing resistance increases because the upper body postural musculature is tense. This resistance is reduced by leaning the shoulder girdle against a wall, thereby making breathing easier.

First steps with the Idiag P100

Before using the Idiag P100 for the first time, please read the Quick Reference Guide and visit the instruction website at <https://www.idiag.ch/en/idiag-p100-training/> for helpful information in video form.

To harness the full potential of the Idiag P100, download the **Idiag P100sport smartphone app**, register your device and connect it to the app at least once. This activates **endurance and strength training** on the device in addition to free mode. You can run these additional modes either with or without the app.



Starting respiratory muscle training

To start training with the Idiag P100 and get to know the device, we recommend that you first train in „**free mode**“. In this mode, you can train without any specifications regarding breathing frequency or breathing depth. Free mode is therefore perfectly suited to acquiring a solid breathing technique and gaining a feeling for how the device works.

Start a training session (without the app) in free mode and place the mouthpiece into your mouth. First, begin to breathe in and out through your mouth through the device in a relaxed manner. After approx. 30 seconds, take the device out of your mouth and look at the display. It shows your breathing frequency and depth over the last 3 breathing cycles. At rest, one achieves about 15-20 breathing cycles per minute. Next, start breathing a little faster and deeper than before, so that your breathing frequency reaches approx. 25. Each time, inhale and exhale deeply enough to fill your lungs and then exhale completely again.

Now continuously increase the training duration over a period of 1-2 weeks, with the aim of being able to train for approx. 10-15 minutes without a break. Depending on your fitness level and individual progress, we recommend that you build up to this level gradually in smaller steps.

Example:

5 x 3 minutes (with a break of approx. 30 seconds between intervals).

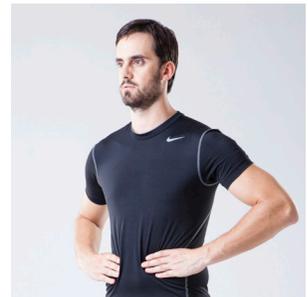
If this goes well, gradually build up your training until you can breathe for 10-15 minutes at a time.

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|-----------|--|
| 1. Goal | To lay the foundation for solid respiratory muscle endurance |
| 2. Goal | To adopt a good breathing technique |
| Frequency | 3-5 training sessions a week |

Exercises for consolidating your breathing technique for free mode and endurance training

Conscious abdominal breathing

Brace your hands under your ribs on the sides of your flanks. Inhale without the Idiag P100 so that your hands are pushed outwards as far as possible (standing or sitting). Ensure that your shoulders remain loose. You can simplify the exercise by leaning your shoulder girdle against a wall. Now apply this breathing technique using the Idiag P100.



Conscious chest breathing

Place an elastic band (e.g. Theraband) or even a cord around your chest and hold both ends with one hand in the middle of your sternum. Hold the Idiag P100 in your other hand. Now try to inhale such that your chest expands as much as possible in all directions and the elastic band or cord tightens as much as possible. Ensure that your shoulders remain loose.

Combine these two breathing movements to create an optimal breathing technique. The optimal inhalation breath is initiated by the diaphragm and shortly thereafter the rib cage begins to participate.

Endurance training

The endurance mode corresponds to free mode in terms of training, but in endurance mode you receive a target and feedback in terms of your desired breathing frequency and depth. Endurance training can therefore be considered either as a form of follow-up training to free mode or as an alternative to it.

Assessment and adjustment of the parameters

When you start a workout in endurance mode for the first time, you will be prompted to take an assessment. Based on the result of this test, the breathing depth is determined for you to continue training. If you know your approximate value from training in free mode, you can also skip the test and then enter your breathing depth manually in the settings menu.

Breathing depth test:

You will be prompted to inhale fully once and then exhale through the device at maximum volume. Your maximum breathing depth is measured during exhalation. For endurance training, the device sets the breathing depth to 60% of your maximum.

You will only be prompted to do the assessment during your first training session. If you would like to repeat the test, you can select it from the settings menu.

The value for breathing depth that is set on the basis of the test, and also the breathing frequency and the duration of training can be adjusted in the settings menu before the training session. The pre-set breathing frequency is 25 breaths per minute and the pre-set duration for an endurance training session is 15 minutes.

Controlling the intensity

The aim should be to train for 15-20 minutes per endurance training session.

Such a training session should always be intense and should fatigue you in order to set a training stimulus. This is the only way to make progress.

We recommend to complete 3-5 training sessions per week.

We recommend increasing the intensity for more strenuous endurance training as follows:

1. Increase the training duration
2. Increase breathing frequency
3. Increase breathing depth

1. Goal	To understand and implement feedback from the device.
2. Goal	To continuously adjust the training parameters so that training always remains intense.
Frequency	3-5 training sessions, each of 15-20 minutes, a week.



Tips on training

Always pay attention to breathing frequency first. As soon as you can maintain this at a good level, focus on breathing depth.

If you want to change the breathing frequency during training, you can do so by pressing the + and - buttons on the device. Pressing the respective button once changes the frequency by one breath per minute.

If the breathing depth feedback is always orange, try breathing deeper. If the colour still does not change, you should reduce the breathing depth in the settings menu. If the breathing depth feedback is always blue, increase the breathing depth in the settings menu (you are breathing deeper than prescribed).

Training can be continued with both permanent orange and permanent blue feedback. The evaluation after the training session will then show what you have achieved in reality.

The feedback from the device always refers to the measured values over the last 3 breathing cycles. This means that adjustments in your breathing always appear on the device with some delay.

Vary your posture during the training sessions. Prop yourself on your elbows, stand up, walk around – this way you will directly feel the different stresses caused by the change in posture.

Strength training

You can start strength training at the same time as endurance training. We recommend that you perform strength training before endurance training if you want to do both types of training during the same training session.

You do not need the breathing bag for strength training, because regulation of your breathing air is not necessary in this mode. However, you can leave the bag attached to the device during strength training. This prevents moisture from dripping out of the air guide.

In strength mode you have the option of training inspiration, expiration or both. Initially, we recommend that you train inspiration and expiration separately and always train both, i.e. inspiration and expiration consecutively, during one training session.

Assessment and adjustment of the parameters

Before the first strength training session, an assessment must be carried out to determine your basic individual training settings.

During the assessment for inspiration and expiration strength training, the maximum pressures you can achieve in the device by inhaling and exhaling are measured. The maximum pressure that can be achieved by expiration is often higher than the pressure that can be achieved by inspiration. This is also why two tests must be performed.

On the basis of these results, resistance thresholds are set for strength training, which you must then overcome in order to successfully complete a repetition during strength training. This threshold is set to a default value of 50% of the maximum pressure determined during the assessment.

You will only be prompted to do the assessment during your first training session. If you would like to repeat the test, you can select it from the settings menu.

Both the threshold values set on the basis of this test and the number of breaths for training can be adjusted in the settings menu before commencing training. The pre-set number of breaths is 10.

Controlling the intensity

Strength training should be intensive and should fatigue you. For this reason it is important to set and continuously adjust the training parameters accordingly.

Initially, we recommend that you perform strength training with 10 breaths against the resistance of 50% of the maximum pressure determined during the assessment. You will probably find this rather easy and not very strenuous. So you can soon increase the intensity.

We recommend increasing the intensity for more strenuous strength training as follows:

1. Increase the number of breaths up to approx. 30
2. Train 2 x daily
3. Increase the threshold

1. Goal	To understand and implement feedback from the device.
2. Goal	To continuously adjust the training parameters so that training always remains intense.
Frequency	3-5 training sessions a week

Tips on training

 If you want to change the threshold value during training, you can do this by pressing the „+“ and „-“ buttons on the device. Pressing the respective button once changes the threshold value by 5%.

Intervall Training

High intensity interval training (HIIT) is a form of training where several short and intense training sessions are performed right after each other, with short breaks in between the single intervals. Example with running: 4 x 3 minutes of fast running with 1 minute and 30 seconds of walking or easy jogging in between.

With such a training, fatigue can be evoked very rapidly, thus setting a training stimulus.

Studies show that HIIT sets a similar training stimulus as long endurance sessions with the big difference that HIIT takes much less time. Therefore, HIIT is not only effective but also very efficient.

This theory is also applicable on the respiratory muscles and the training thereof.

The interval mode of the Idiag P100 offers the unique possibility to conduct HIIT. In this mode the respiratory muscle endurance training is complemented with resistances (similar to strength training), to ensure high intensity and faster fatigue of the respiratory muscles.

Assessments and adjustment of the parameters

The interval training requires the same assessments as the endurance and strength training to individualize the training appropriately.

Therefore, the assessments of the maximum breathing depth, maximum expiratory strength and maximum inspiratory strength need to be conducted. If those values already exist, the assessments don't need to be repeated.

Attention! The settings for the interval training can only be adjusted via the smartphone app but not on the Idiag P100 itself.

The interval training can also be conducted without the app. In this case the parameters which were last set via the app, or the default parameters are used.

Per default, four 4-minute intervals with 1-minute pauses at a frequency of 25 breaths per minute and a breathing depth of 60% of the maximum at middle resistance levels are set.

In the settings in the app the individual parameters for the interval training can be set prior to the training.

First, the procedure of the interval training is defined by choosing the duration of the intervals, the duration of the pauses between the intervals and the number of intervals.

The intensity of the intervals is set via the breathing frequency, the resistance levels for inspiration and expiration and the desired breathing depth during the intervals.

The resistances can be set to low, middle, or high, whereas the resistances for inspiration and expiration can be chosen differently.

In the pauses between the intervals, either one can continue breathing through the device (without resistance and without any instructions on breathing frequency or breathing depth) or the device can be taken out of the mouth.

Controlling the intensity

To achieve the best results, the interval training needs to be exhausting and therefore the parameters require continuous adjustment according to the improved performance, so the training remains strenuous.

In interval mode, the intensity can be adjusted in different ways:

1. Longer intervals / shorter pauses
2. Higher resistances
3. Higher breathing frequency
4. Bigger breathing depth

The standard recommendation for increasing the intensity is as follows:

1. Increase interval duration stepwise (until 4 x 4 minutes at low resistance is feasible)

Example:

8 x 1 min with 30 sec pauses in between
6 x 2 min, with 1 min pauses in between
5 x 3 min, with 1 min pauses in between
4 x 4 min, with 1 min pauses in between

2. If the desired interval duration is feasible, increase the resistances (low → middle → high)
3. Increase breathing frequency (stepwise until approx. 34)
4. Reduce the breathing frequency again and in turn increase breathing depth stepwise (approx. +10%), then again increase breathing frequency

The interval mode allows for sport-specific training. In most cases the intensity is adjusted with regards to the specific type of load or to a certain weakness, which differs from this standard recommendation.

Recovery

Interval training stresses the respiratory muscles to a high extent. Therefore, the muscles require more recovery time after such trainings. Generally, we recommend the «standard» user to not conduct intensive respiratory muscle interval trainings on consecutive days.

It is important to emphasize that the recovery process is very individual and dependent on general fitness and performance levels and eventually each user must listen to the needs of their body.

In rare instances training using the ldiag P100 may cause dizziness, shortness of breath, headaches, nausea or vestibular disorders. If negative symptoms occur, training with the ldiag P100 must be stopped immediately. The user assumes full responsibility for his training. ldiag accepts no liability whatsoever for any consequences arising from training using the ldiag P100.



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