

GANSHORN
powered by **SMTEC**



EucapSys

Eucapnic voluntary hyperpnea

Innovation for asthma diagnosis

BRONCHIAL PROVOCATION WITHOUT MEDICATION

The eucapnic voluntary hyperpnea (EVH) test is an alternative method to other indirect or direct bronchial challenge tests such as exercise challenge or methacholine challenge test¹. The huge advantage of EVH is that no medication is needed. Traditionally it has been used for elite athletes² and is widely regarded as the gold standard for assessing exercise induced bronchoconstriction (EIB) among athletes³.

As EVH mimics perfectly the breathing while exercising, the provocative method is the best tool to diagnose exercise-induced airway narrowing. EucapSys is the first commercially available system which makes EVH applicable for a wide range of users. As it mixes the eucapnic gas concentration by itself, the test becomes more affordable and independent from expensive gas mixtures.



**One step protocol
saves time**



**More comfortable
for the patient**



**Drug free provocation
with dry air**



**Easy to implement
stand-alone device**



**High specificity
Fewer false positive results**



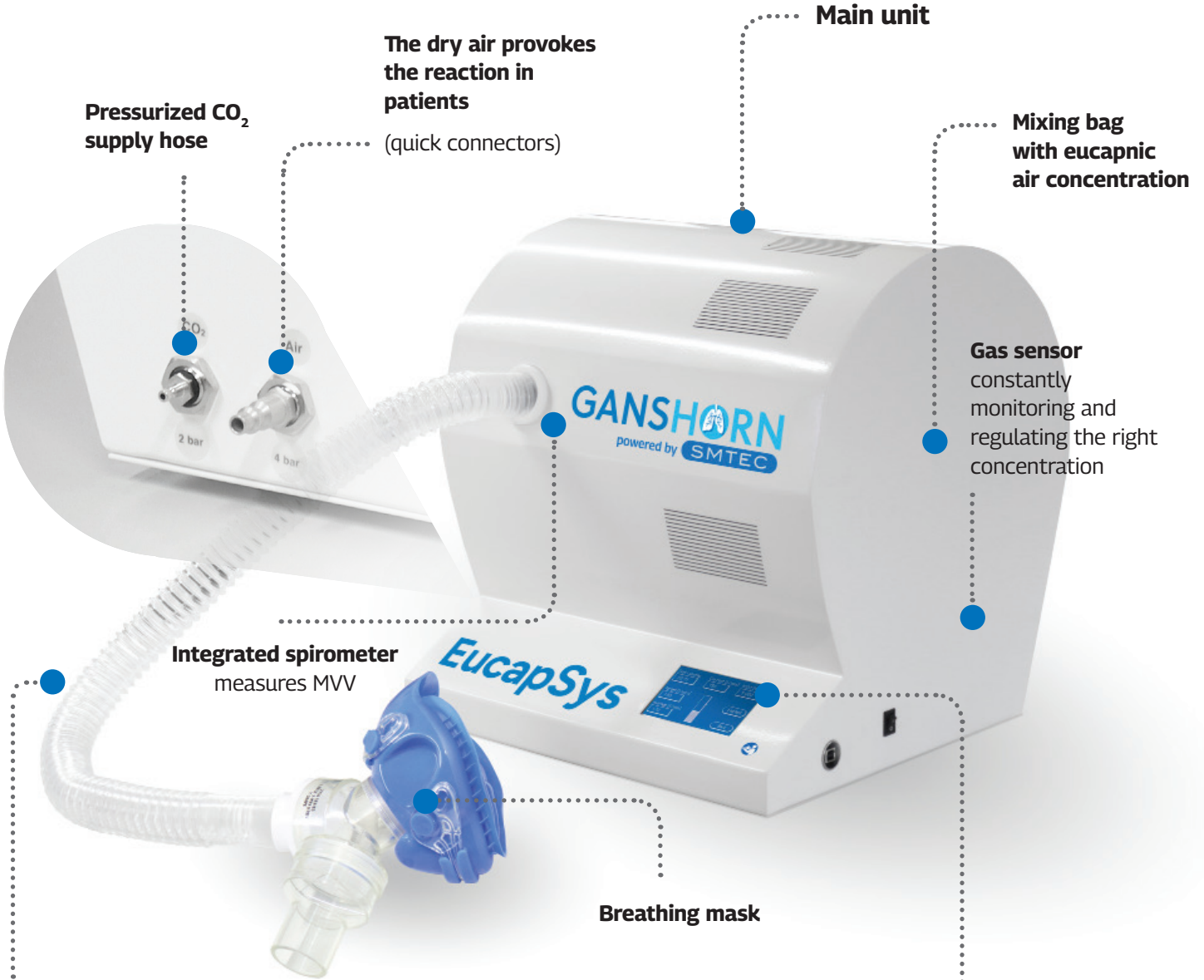
Low operating costs

1 J W Dickinson, McConell, & Whyte; Br J Sports Med; 2011; 45(14) 1126-31

2 J W Dickinson et al.; Br J Sports Med; 2006; 40:179-183

3 J H Hull et al.; Br J Sports Med; 2016; 46:1083-1093

THE EUCAPSYS

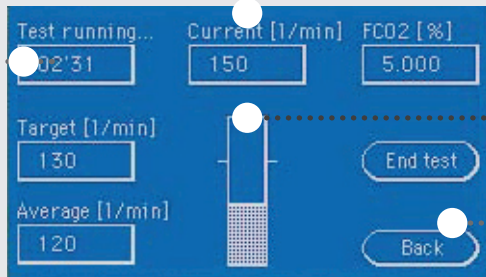


A **flexible outlet hose**, of 35 mm standard diameter, connects the mask to the device. The fitted mask must have a two-way y-shape non-rebreathing valve.

Real-time display

Parameters at a glance:

- ✓ Test duration
- ✓ Targeted MVV
- ✓ Average MVV
- ✓ Current MVV
- ✓ CO₂ fraction in %



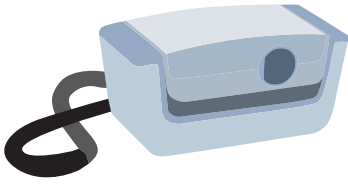
Screen size: 8 x 11 cm

Control panel

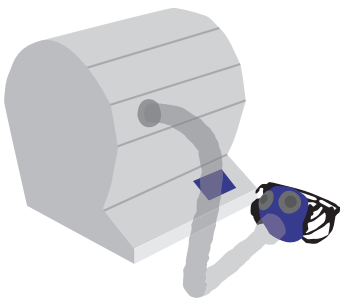
Performance visualization

Guided touch interface

MEASUREMENT PRINCIPLE

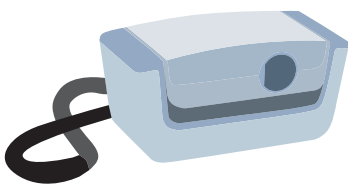
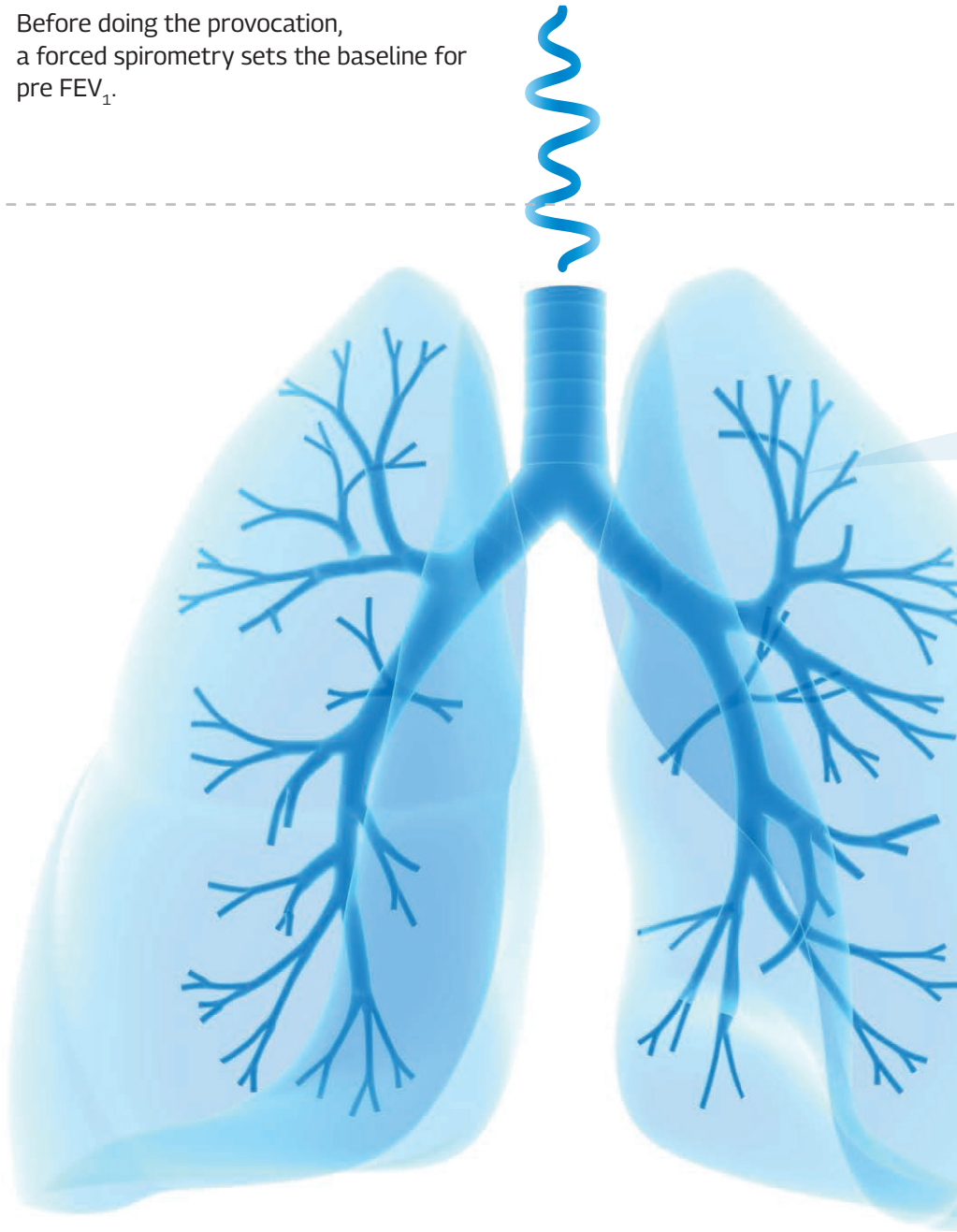


Before doing the provocation, a forced spirometry sets the baseline for pre FEV₁.



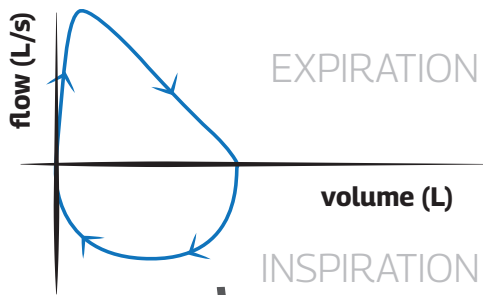
Then, a dry gas mixture enriched with 5 % CO₂ is hyperventilated at room temperature for about 6 minutes through a breathing mask.

The patient breathes faster than normally, aiming to reach a precalculated individual target, which is constantly monitored by the EucapSys.



After the provocation phase, the post measurements are carried out.

If the value falls below 10 % of the baseline FEV₁, an asthma can be diagnosed.

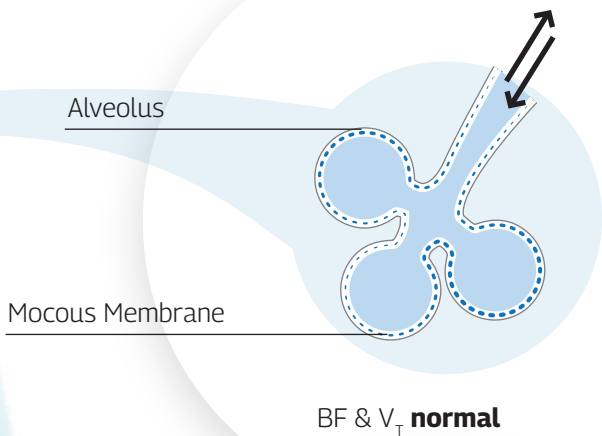


PRE spirometry test

A

1 Normal breathing

40% - 60% humidity



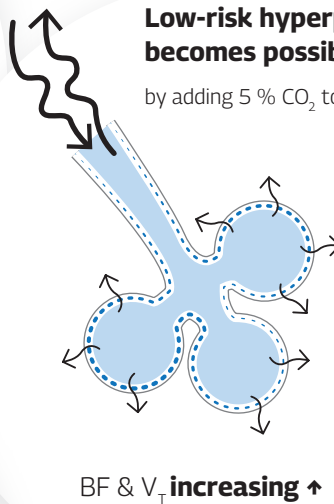
EUCAPSYS test

B

2 Low-risk hyperpnea becomes possible

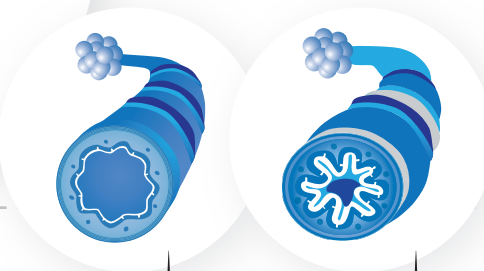
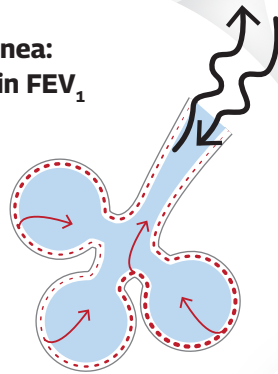
by adding 5% CO₂ to air

2



3 Hyperpnea: 30x/min FEV₁

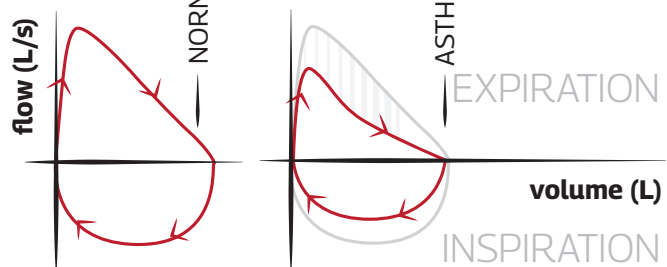
Humidity in membrane diffuses → **drying**



FEV₁ POST spirometry test

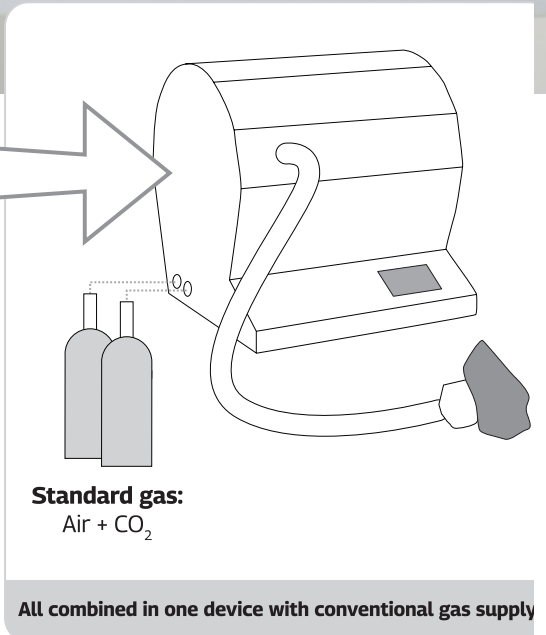
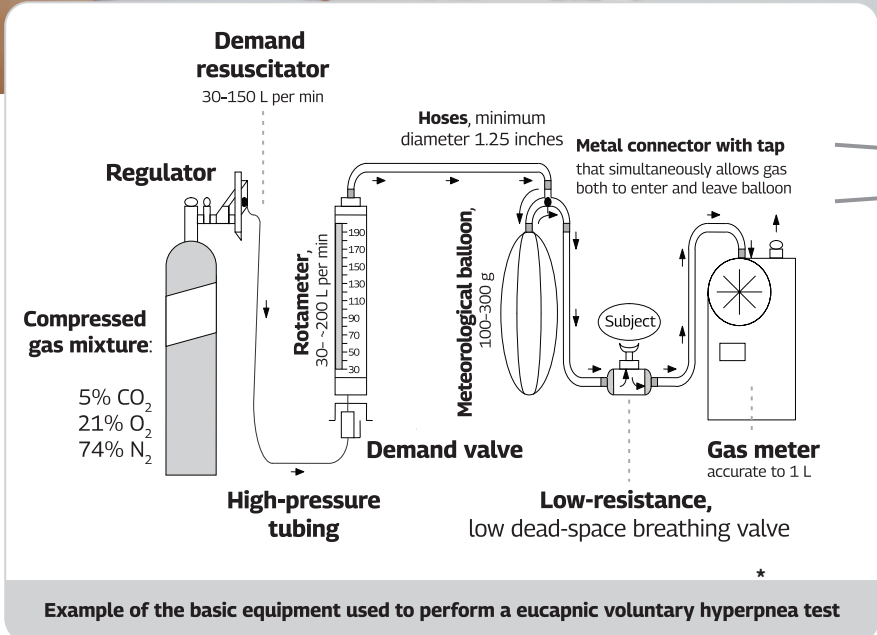
Interval for asthma severity:

mild	>= 10% to <= 20%
moderate	>= 20% to <= 30%
severe	> 30%



C

FURTHER ADVANTAGES



ECONOMICAL

The EucapSys reduces gas-related costs by **90%**. Gas supply is thus facilitated and guaranteed.

OPERATION

Using cost-efficient cylinders of pressured air and CO₂, EucapSys produces the hypercapnic mixture you need. An innovative patented technology helps to produce a hypercapnic air mixture gradually and according to your needs, for up to 200 l/min.

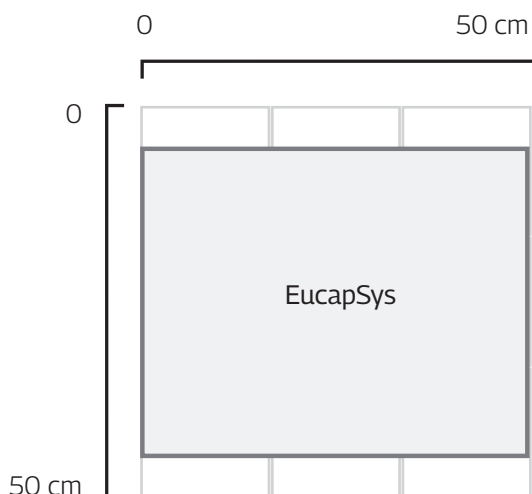
CO₂ CONTENT

Dynamically regulated at 5% in order to be isocapnic, that is equivalent to 40 mmHg of PetCO₂.

TECHNICAL DATA

Manufacturer	SMTEC (Sport & Médical Technologies) S.A.
Display	Instant display of air flow in l/min CO ₂ fraction in % test time in min/sec
Principle	in situ adjustable mixture of dry air and CO
Regular CO₂ fraction	5 %
Accuracy of CO₂ fraction	+/- 0.1 %
Production of mixture	as needed, in accordance with consumption
Air flow rate	up to 220 l/min
CO₂ supply	via a CO ₂ cylinder
Air flow control	using a syringe
Electrical supply	110 - 220 Volts
Electrical consumption	50 W peak
PCO₂ monitoring	Thermoconductivity sensor
Control electronics	by microprocessor
Weight	approx. 15 kg
Dimensions	h: 55 cm; l: 50 cm; w: 40 cm
Breathing hose	ultra-flexible, 60 cm - 180 cm long
Mouthpiece or mask	two-way y-shape non-rebreathing valve
Regulation	electronic PID-type

Dimensions



The device must be placed on a stable support, the upper part has a minimum size of: **50 cm x 50 cm** and the surface is not slippery.

Device height: **55 cm**

WHY GANSHORN?

For 40 years GANSHORN has been manufacturing a complete state-of-the-art portfolio of pulmonary function testing systems for spirometry, bodyplethysmography, diffusion, bronchial provocation and cardiopulmonary stress testing. With its technological innovations, the company has been a leader in the diagnostics market since 1982. Many of these are now perceived

as gold standards. In order to meet our high quality standards, it is important to us that all key components are made in Germany. Our devices are created in modern processes in Bavaria, from the initial idea to distribution. In the meantime GANSHORN is represented worldwide, with strong markets in Europe, Asia, North and South America.



PowerCube Body+

Bodyplethysmography



Vivatmo pro

FeNO monitoring



SpiroScout

Spirometry



tremoflo®

Airwave oscillometry



PowerCube Diffusion+

Diffusion measurement



EucapSys

EVH provocation



Provo.X

Provocation testing



Altitrainer

Hypoxic challenge testing, hypoxia training



PowerCube Ergo

Cardiopulmonary exercise testing (CPET)



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Art. Nr. **019950167** | Rev. **1.0**

The model shown may also include optional equipment which is not within the standard scope of supply. Design, equipment, and contents are subject to change without notice, as are misprints and errors.