



# EucapSys

**Eucapnic voluntary hyperpnea**

Drug free provocation with dry air

# 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 test<sup>1</sup>. The huge advantage of EVH is that no medication is needed. Traditionally it has been used for elite athletes<sup>2</sup> and is widely regarded as the gold standard for assessing exercise induced bronchoconstriction (EIB) among athletes<sup>3</sup>. As EVH

mimicries 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**

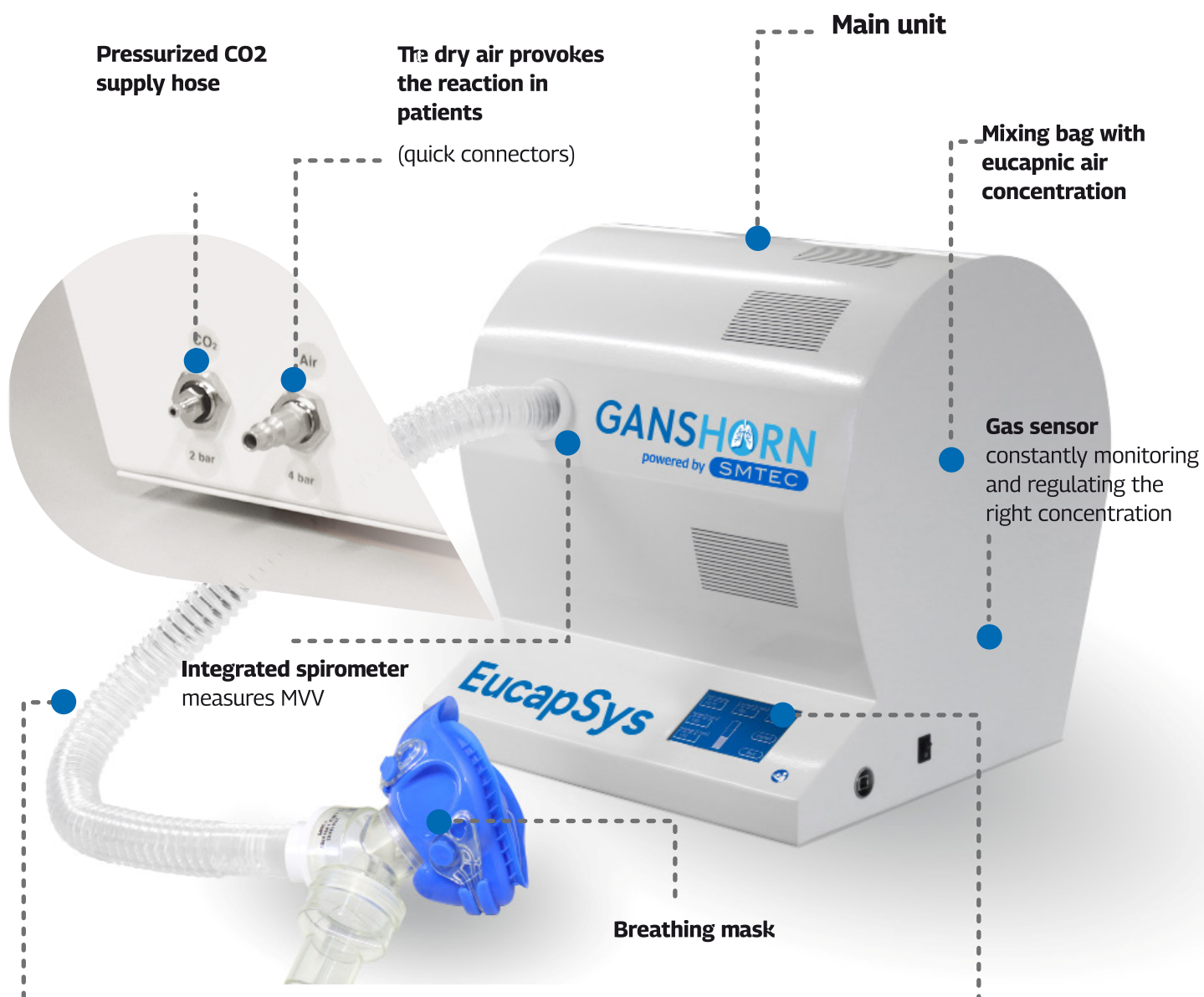
<sup>1</sup> J W Dickinson, McConell, & Whyte; Br J Sports Med; 2011; 45(14) 1126-31.

<sup>2</sup> J W Dickinson et al; Br J Sports Med; 2006; 40:179-183

<sup>3</sup> J H Hull et al; Br J Sports Med; 2016; 46:1083-1093



# THE EUCAPSYS

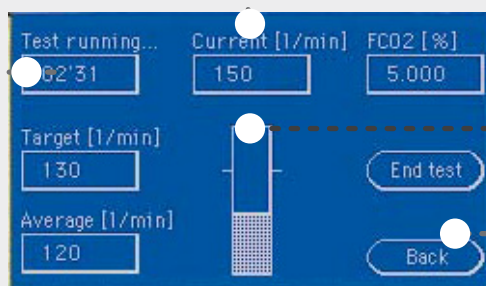


A flexible outlet hose, of 35 mm standard diameter, connects the mask to the device. The fitted mask must have a two-way y-shape non-rebreathing valve.

Real-time display

Parameters at a glance:

- ✓ Test duration
- ✓ Targeted MVV
- ✓ Average MVV
- ✓ Current MVV
- ✓ CO<sub>2</sub> fraction in %



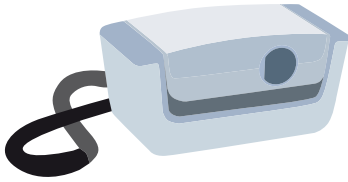
Screen size: 8 x 11 cm

**Control panel**

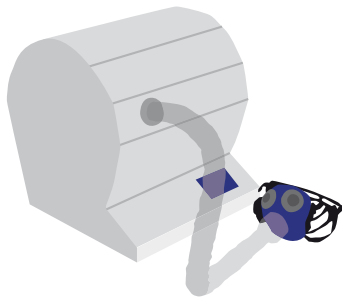
Performance visualization

Guided touch interface

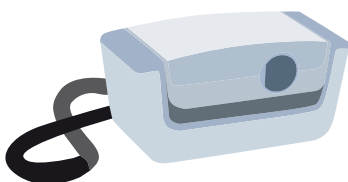
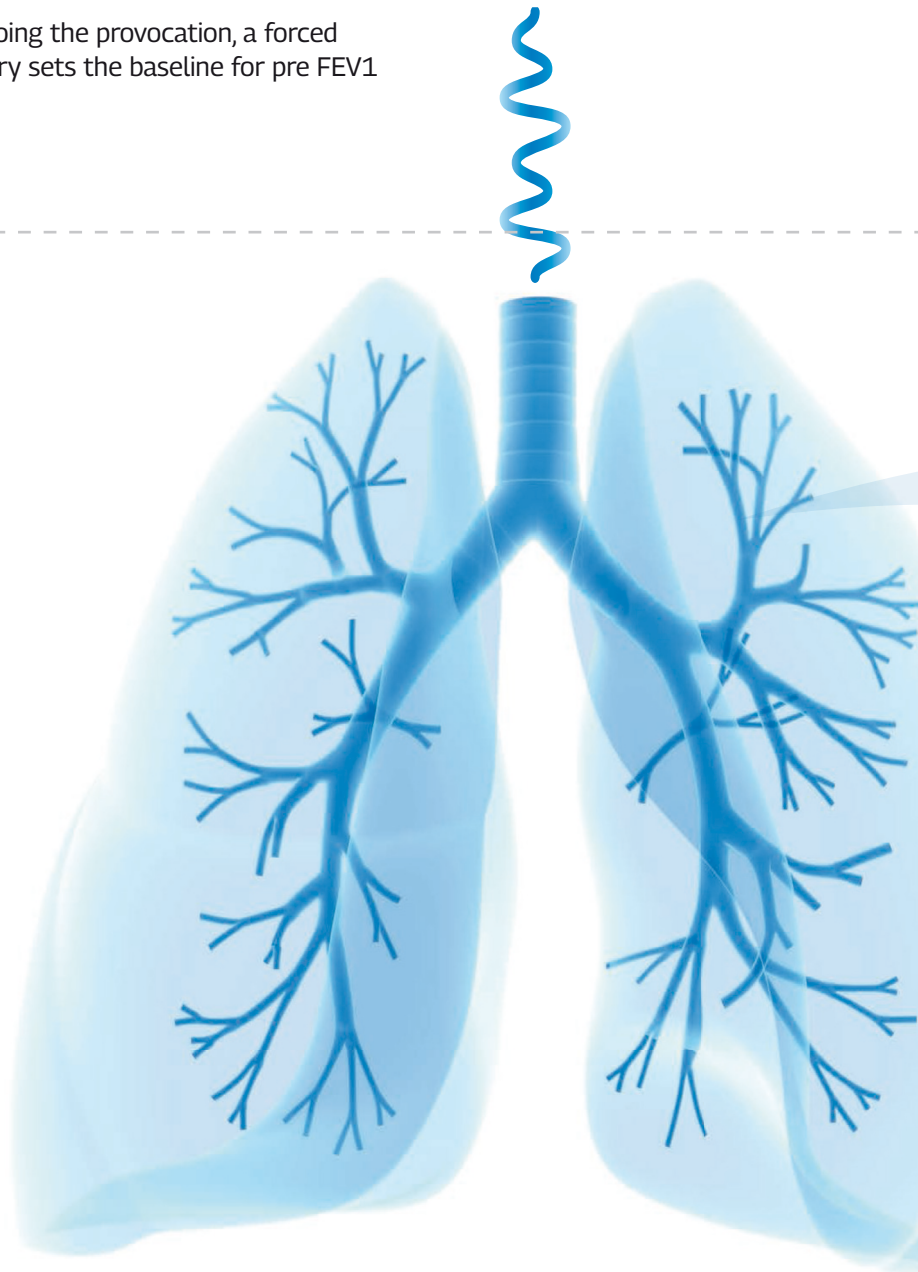
# MEASUREMENT PRINCIPLE



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

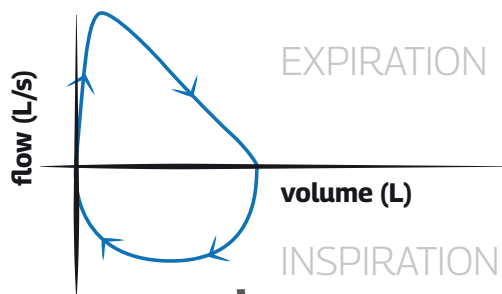


Then, a dry gas mixture enriched with 5 % CO<sub>2</sub> is hyperventilated at room temperature for about 6 minutes through a breathing mask. The patient breathes faster than normally, aiming to reach an precalculated individual target, which is constantly monitored by the EucapSys.



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

Alveolus

Mucous Membrane

BF & VT normal

3

### Hyperpnea: 30x/min FEV1

BF & VT normal

## EUCAPSYS test

B

### Low-risk hyperpnea becomes possible by adding 5 % CO<sub>2</sub> to air

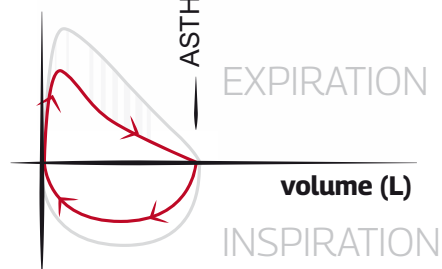
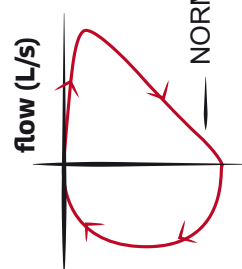
2

BF & VT increasing ↑

## FEV1 POST spirometry test

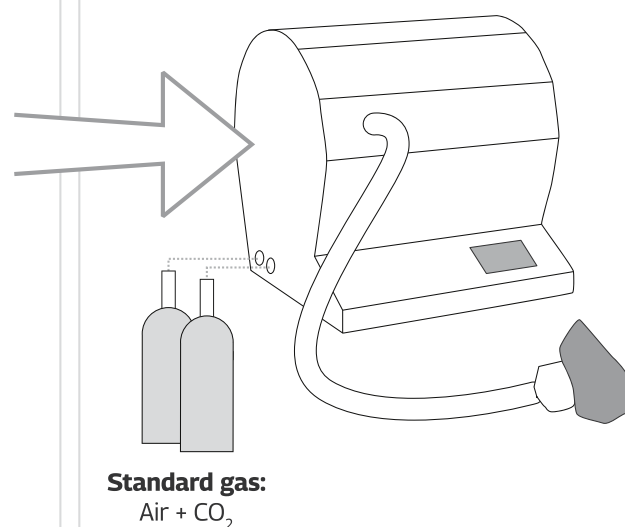
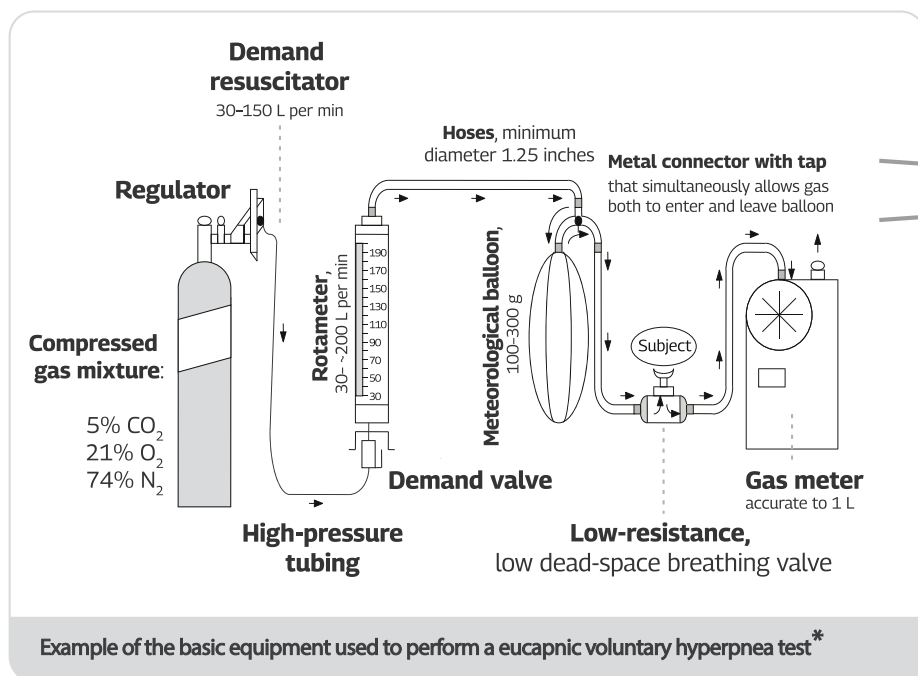
Interval for asthma severity:

mild	$\geq 10\%$ to $\leq 20\%$
moderate	$\geq 20\%$ to $\leq 30\%$
severe	$> 30\%$



C

# FURTHER ADVANTAGE



Example of the basic equipment used to perform a eucapnic voluntary hyperpnea test

\* Equipment scheme according to the article in „Breathe“ journal, September 2010, Volume 7, „Alternatives to exercise challenge for the objective assessment of exercise induced bronchospasm: eucapnic voluntary hyperpnoea and the osmotic challenge tests“, by C. Porsbjerg, J.D. Brannan



## ECONOMICAL

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

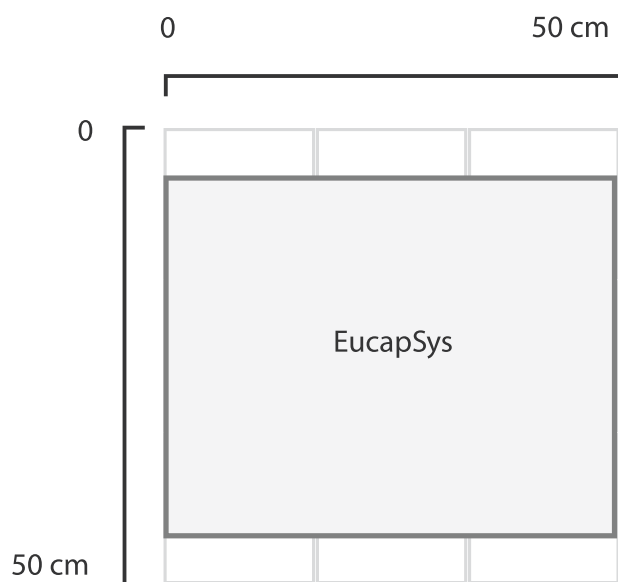
## CO<sub>2</sub> CONTENT

Dynamically regulated at 5% in order to be isocapnic, that is equivalent to 40 mmHg of PetCO<sub>2</sub>.

## OPERATION

Using cost-efficient cylinders of pressured air and CO<sub>2</sub>, 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.

## 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.



# SCHILLER

The Art of Diagnostics

## About SCHILLER

SCHILLER A. G., a company based in Switzerland, was founded by Alfred Schiller in 1974. Over the last 50 years, it has evolved into a successful Global Group with 31 subsidiaries and dealers across 30 countries. Today, SCHILLER is a world-leading manufacturer and supplier of devices for cardiopulmonary diagnostics, defibrillation and patient monitoring as well as software solutions for the medical industry.

Schiller in India was founded as a joint venture in 1997, and since then has established itself as a leader in the medical technology sector. With 450+ employees, a state-of-the-art ISO 13485-certified production centre in Puducherry, multiple R&D centres, and 17 offices across India; Schiller makes advanced healthcare equipment accessible through a network of 100 sales and service dealers across more than 45 locations. Our product range includes Critical Care, Anaesthesia, Emergency Care, Cardiology, Respiratory Diagnostics, Radiology, and Robotics.



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 high quality standards, all key components are made in Germany. All devices are created in modern processes in Bavaria, from the initial idea to distribution.

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