

# PowerCube Diffusion+

## Diffusion system

Long life sensors for accurate  
and precise results



# OVERVIEW

GANSHORN PowerCube Diffusion+ was the first diffusion system on the market using ultrasound technology. Its long life sensor technology is based on GANSHORN innovation and requires no maintenance. In addition, the high-speed sensor allows the user to change

the discard and sampling volume, allowing measurements to be taken on patients with up to 0.5 L VC. Precise analyzers enable the high-resolution display of wash-in curves for CO and helium. The PowerCube Diffusion+ demand valve is economical in sample gas consumption.



**Highly accurate and precise  
ultrasound flow sensor**



**Versatile, fast and compatible  
LFX software platform**



**Lowest costs per  
measurement in industry**



**Spare part  
free**



**Fast semi-automatic  
gas calibration**

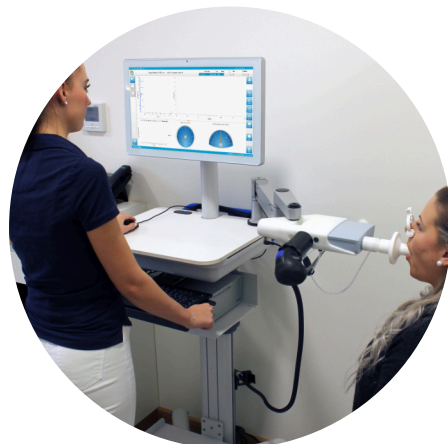


**Maintenance  
free**

## Diffusion and distribution disturbance in one measurement

The long life multigas sensor delivers highly accurate and fast CO results which ease the determination of both single breath and online diffusion procedures.

For a reliable evaluation of the diffusion capacity, PowerCube Diffusion+ determines the TLCO and helium FRC SB (ERS/ATS standards). In addition, the exhaled concentration of CO and helium is continuously displayed, allowing precise discrimination of dead space and alveolar plateau.



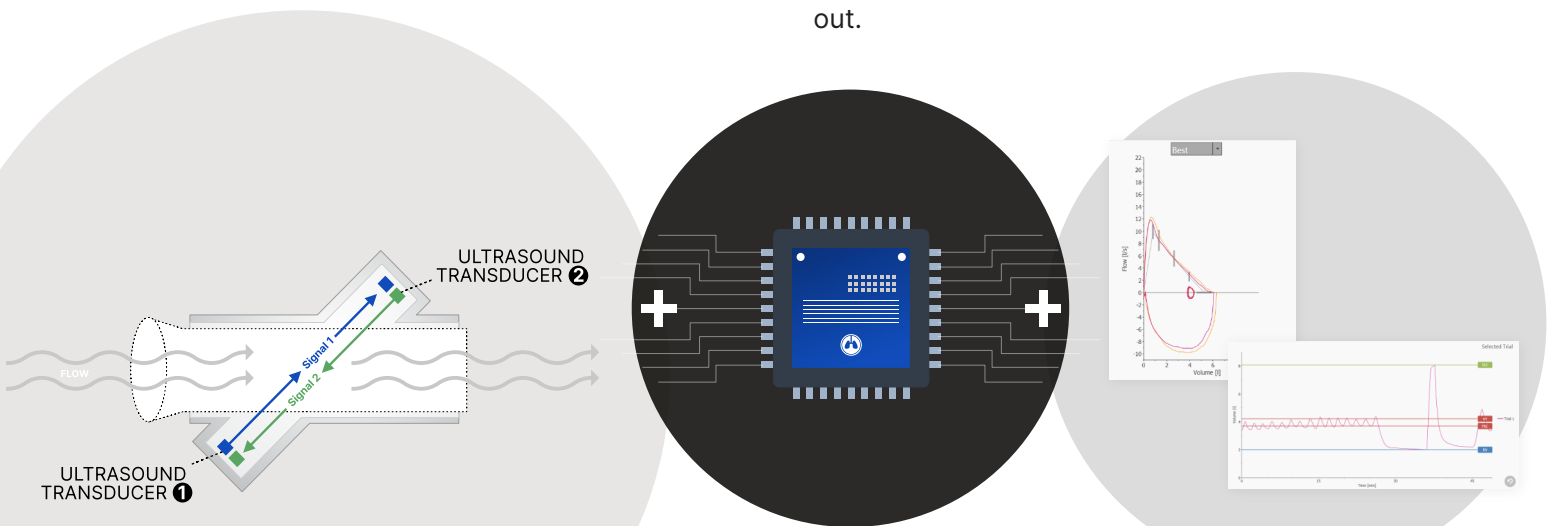


# SharpFlow

## The GANSHORN ultrasound technology

**Two diagonally opposite ultrasound transducers alternately send and receive ultrasonic waves. Without any air flow inside the breathing insert, the transit time of the ultrasound waves is the same in both directions. Any air flow inside the insert will accelerate the waves in one direction and decelerate in the other.**

The difference between the transit times of the ultrasound waves allows to calculate the flow. Flow and gas density are calculated from the measured transit times, allowing changes in the concentration of the exhaled gases to be determined directly and at the same time with the respiratory volume. All other factors like gas properties, humidity and temperature are the same for both directions and cancel each other out.



### 1 Double ultrasound signal capturing

The ultrasound measuring system captures the signal with two sensors, in both directions simultaneously, for spatially precise recording

### 2 Measurement hardware acceleration

Devices based on SharpFlow measurement technology run on a sophisticated and proven hardware logic.

### 3 High-resolution diagram rendering

Based on the multi-layered recorded values, the measurement software LFX is able to render particularly precise and sharp graphics.



#### Precision + Resolution

The high sampling resolution is a prerequisite for reliable determination of flow  
No noticeable resistance during breathing



#### No detours

No substitute parameters for flow necessary (e.g. differential pressure)  
Direct flow measurement based on digital measurement technology



#### Room climate-independent

Not affected by changing ambient conditions like temperature or humidity of breathing air

# SINGLE BREATH DIFFUSION

Precise analyzers enable the high-resolution display of wash-in curves for CO and helium. The PowerCube Diffusion+ demand valve is economical in sample gas consumption. The long life multigas sensor delivers highly accurate and fast CO results which ease the determination of both single breath and online diffusion procedures. The PowerCube Diffusion+ is available as stand alone device or integrated in PowerCube Body+.



**Single breath diffusion is a non-invasive method to determine:**

- Diffusion capacity [DLCO in mmol/min/kPa]
- Alveolar volume [VA in l]
- Total lung capacity HE [TLC HE in l]



## Diffusion & Post-Covid-Syndrome

A COVID-19 disease primarily happens in the alveoli, where the virus attacks the type II pneumocytes, which may lead to an abnormal alveolocapillary membrane and the so called Post-COVID syndrome. A diffusion test is the main measurement technique, which can detect this pathophysiology. Patients suffering from the Post-COVID syndrome complain about symptom

like shortness of breath and exhaustion, but will mostly have a normal spirometry reading. In those cases, a diffusion test is the method of choice to confirm the Post-COVID syndrome diagnosis, which is psychologically important for the patients and will be an important measure in order to observe COVID-19 rehabilitation.

**Seated** workplace



Optional medical grade **ergonomic height adjustable** trolley



- ✓ Height adjustable
- ✓ Medical All-in-One-PC with touch function
- ✓ optional with isolating transformer and external printer

For use in **body box** (optional)



# FEATURES



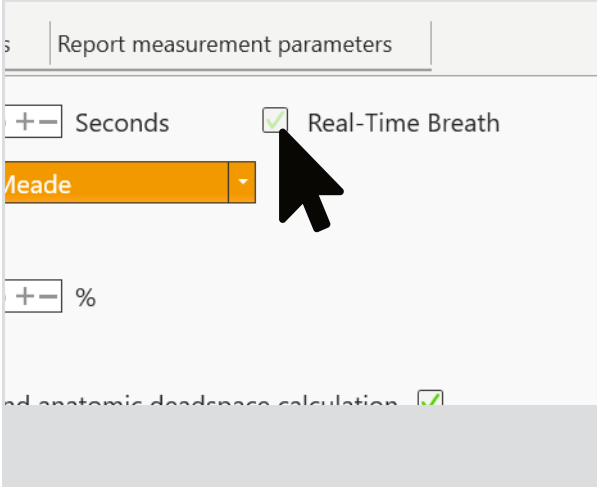
## 3D swivel arm

Flexible, height-adjustable interface



## Real-time breath

For patients that are unable to hold their breath for a prolonged period. Measurement is carried out without breath hold.



## Intelligent Demand Valve (IDV)

Secures the patient, lowers the cost per test and optimizes gas usage



## Powerful software

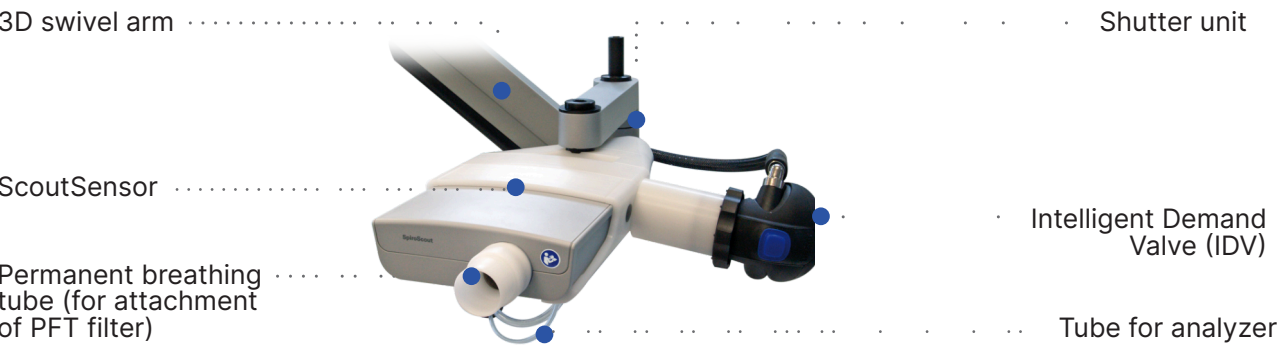
Powerful, user-friendly LFX software



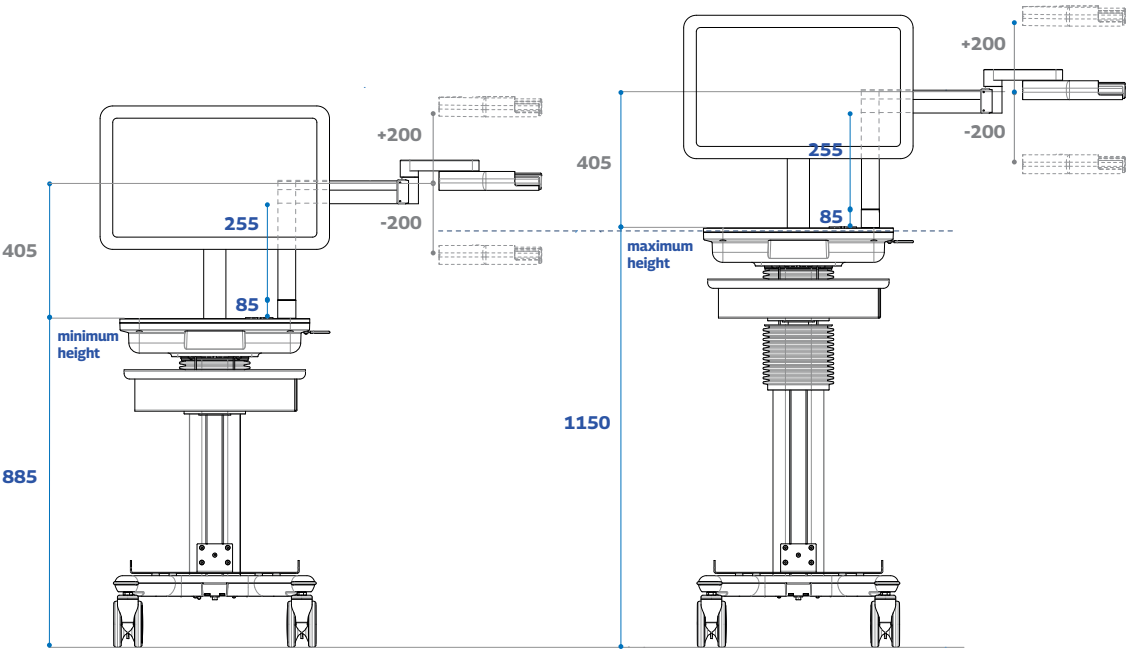
# CONFIGURATIONS

Functions	Standard	Option	Programs	Standard	Option
Single breath diffusion	✓		Microsoft SQL / MySQL	✓	
Slow spirometry	✓		XML reports	✓	
Forced spirometry	✓		Multiusers license		✓
N2 washout		✓	Worklist		✓
Provocation		✓	DICOM/GDT/HL7		✓
Rhinomanometry		✓			
MIP/MEP		✓			
SNIP		✓			

## Connectors, controls and indicators



## Workstation - Dimensions

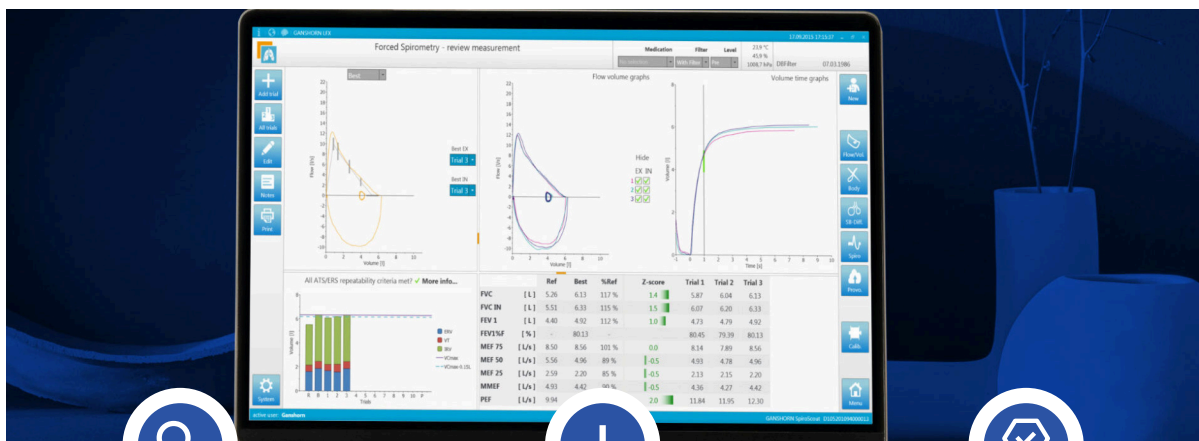




# **LFX** Software platform

The LFX software is our user-friendly interface, developed with the physiologist in mind. The patient management interface provides all the tools necessary to perform every task done in the laboratory, while remaining easy to operate. Built on state-of-the-art Windows

tools like .net, C# and SQL database, the LFX software is the future of modern respiratory diagnostics. The LFX software has built-in quality control monitoring based on ATS/ERS guidelines, which are accessible during and after the measurements are performed.



## Precision

Flow/Volume: Selection of best In/Ex curves from group of multiple trials

DLCO sample can be 0.05 l and still produce valid results

GLI, ECCS, NHANES, ATS and many more reference values available, display editable

## Efficiency

Automatic offset correction

Online BTPS correction

No volume calibration

Graphical visualisation tools for evaluation

Maneuver animations for children

## High quality

Clean and modern interface

Quality control via ATS/ERS criteria

Improved speed diagnosis

Customizable templates and reports

Comprehensive service and support

Intuitive workflow

## Connect all GANSHORN devices to one software system

Large-format displays enable quick and correct evaluation of measurements and breathing maneuvers at first glance. The use of modern Windows tools such as .NET enables platform and language-independent communication. A modern database concept that uses both Microsoft SQL and MySQL offers the perfect approach – both for general practitioners and for large hospital networks.

- HIS integration
- DICOM
- GDT communication
- Full network compatibility
- SQL Database system
- Export of PDF and raw data files

# 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+**

Body Plethysmography



## **SpiroScout**

Spirometry



## **PowerCube Diffusion+**

Diffusion measurement



## **Provo.X**

Provocation testing



## **PowerCube Ergo**

Cardiopulmonary exercise testing (CPET)



## **Vivatmo pro**

FeNO monitoring



## **tremoflo®**

Airwave oscillometry



## **EucapSys**

EVH provocation



## **Altitrainer**

Hypoxic challenge testing, hypoxia training



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