Q-Box

Respiratory Function Test

PRELIMINARY

The new body plethismograph from COSMED for the modern respiratory physiopathology

- Static Lung Volumes (TLC, FRC, RV)
- Airways resistance and conductance
- Full Spirometry (FVC/SVC, Pre-Post)
- Large Cabin (852 liters) and adjustable height of chair and breathing valve arm
- Tests could be performed inside and outside (only spirometry) the cabin
- Lilly pneumotach
- Fully integrated with the modular laboratory Quark PFT
- Compensation chamber (option)

COSMED
Pulmonary Function Equipment

The measurement of lung volumes and resistance through the body plethismography technique is considered the Gold Standard and it has become a necessity for any high-level laboratory of respiratory pathophysiology.

Q-Box is available in two different configurations:

- Stand Alone
- Integrated w/ Quark PFT family for DLCO, CPET and additional testing

Main Features

- Q-Box is a variable-pressure body plethismograph (Constant-Volume)
- The large cabin volume (852 litres) provides comfort and ease-to-access both for adult and special population
- The cabin is made in glass and aluminium structure, with large transparent surfaces, reliable air-tight closure and easy-to-disinfect walls
- Tests can be performed both inside and outside the cabin, using a single flowmeter and the same breathing valve
- Q-Box is provided with latest-design X9 pneumotach (Lilly type) providing great accuracy at any flow.
- Spirometry or Exercise Tests can be executed with additional flowmeters (turbine flowmeter, single or multi-use pneumotach)
- Adjustable chair position and breathing valve arm guarantee comfort and quality data during testing
- Hardware includes: Calibration pump, pneumatics and loudspeaker
- A temperature probe (option) is available for monitoring thermal drift inside the cabin
- A compensation room box (option) is available for automatic compensation of pressure variations in any kind of environment.

Plethismography Testing

- Thoracic Gas Volume (TGV)
- Total Lung Capacity (TLC)
- Functional Residual Capacity (FRC)
- Residual Volume (RV)
- Resistance of Airways (RAW)
- Specific Resistance of Airways (SRAW)
- Conductance of Airways (GAW/SGAW)

Full Spirometry

COSMED spirometry software complies with the latest ATS/ERS2005 guidelines, and provides:

- Forced Vital Capacity (Pre-Post)
- Slow Vital Capacity, Ventilation profile
- Maximum Voluntary Ventilation
- Bronchial Challenge Test

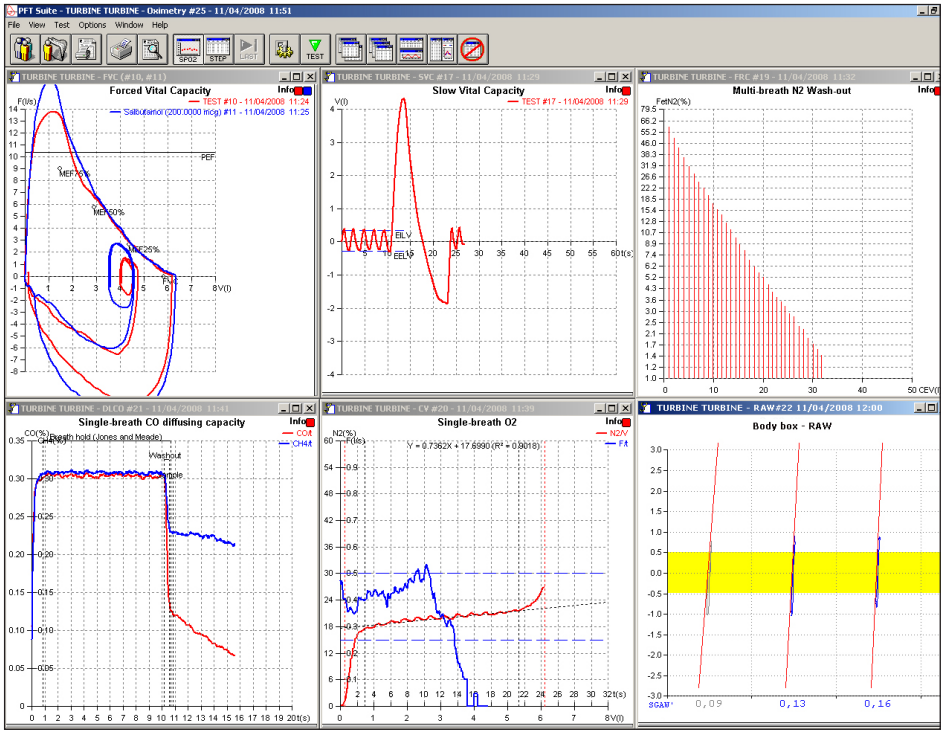
Modular & Versatile

Q-Box is a full modular equipment, it can be upgraded at any time with:

- ***DLCO Module***: Breath hold, intra-breath, membrane diffusion
- ***LV Module***: Nitrogen Wash-out, Closing Volume)
- ***Respiratory Mechanics***: MIP/MEP, P0.1
- ***CPET Module***: Cardio Pulmonary Exercise Testing & Nutritional Assessment (VO2, VCO2, REE etc.)
- ***Airway Resistance***: Rocc w/ shutter
- Integrated Pulse Oximeter; (Nonin) for Resting and Stress applications

Test of Resistance and Conductance of Airways

All respiratory function tests can also be performed outside the cabin



PC software allows full integration of results with all Quark PFT pulmonary function tests

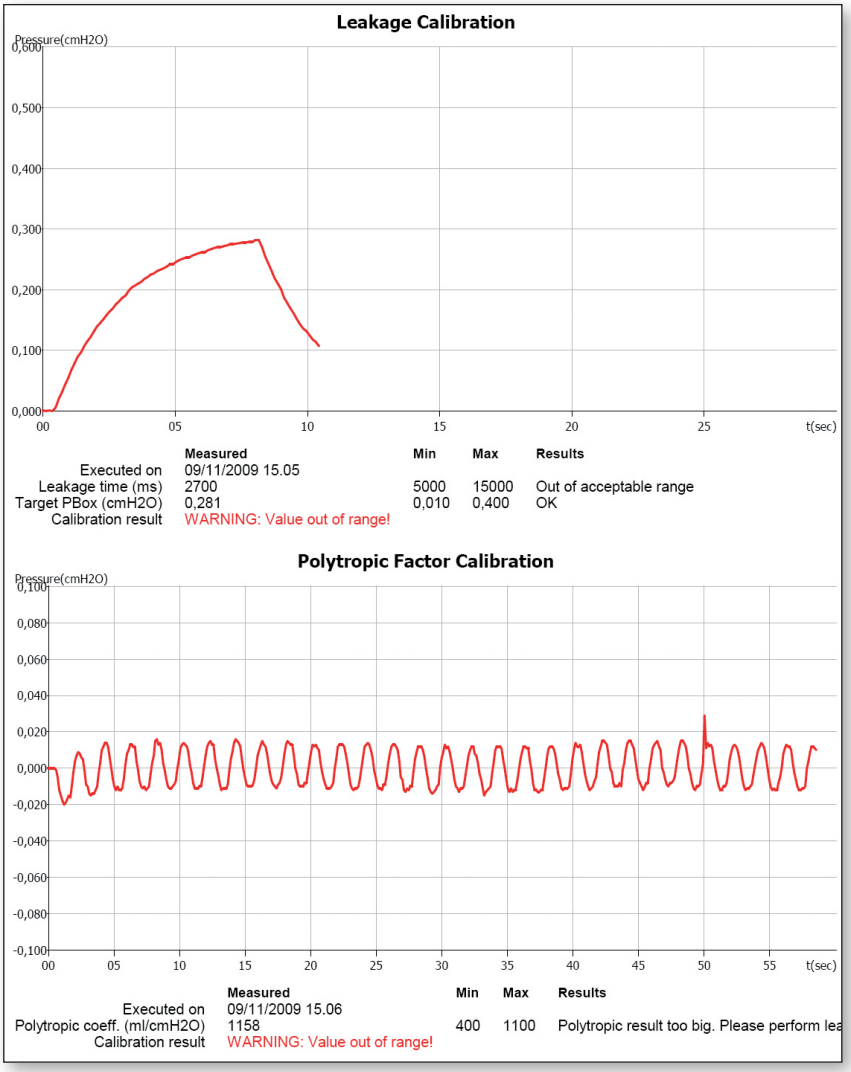
PC Software

- Compatible with Windows XP and VISTA 32 operating systems;
- Intuitive user interface
- Complete management of patient archive, diagnosis database and clinical reports
- Fully custom design and user defined plots, parameters and printout reports
- Integrated patient database between all PFT modules and products.

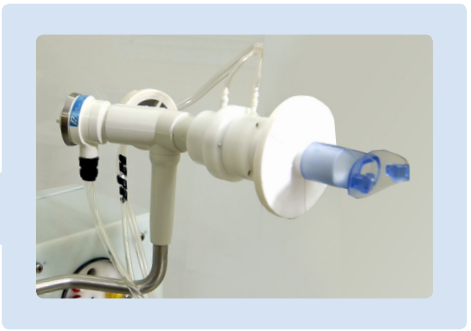
Maintenance & Calibration

All calibration procedures are automated, easy and intuitive. The calculation of the polytropic index (pressure/volume rate) is accomplished automatically through a 30 mL syringe integrated in the cabin.

Electrical and pneumatic components are designed to be easily replaced by paramedical and technical staff without the need of shipping additional components.



Adjustable height of the breathing valve arm



The new breathing valve can be easily disinfected and substituted for each patient.

Quick and safe closure system

The cabin is provided with wheels for easy transport

Technical Specification

Flowmeters:	Single Use Pneumotach	Multi-use Pneumotach	Digital Turbine
Type	Pressure transducer (Lilly)	Pressure transducer (Lilly)	Bidirectional 28 mm
Flow Range	0.04 - 16 (L/sec)	0.04 - 16 (L/sec)	0.08 - 20 (L/sec)
Accuracy	± 2%	± 2%	± 2%
Resistance	<1 cm H2O l/s @14l/s	<1 cm H2O l/s @14l/s	<0.6 cmH2O l/s @14l/s

Measured Parameters

Static Volumes Measurement
TGV, VC, IRV, ERV, RV, FRC, TLC, RV and derived parameters

Respiratory Mechanics
RAW, SRAW, GAW, SGAW

Dynamic Volumes Measurement (Spirometry)
FVC, FEV1, FEV1/FVC, FIV1, SVC, ERV, IRV, IC, EC, MVV, Bronchial Challenge (FALLFEV, PD10, PD15, PD20, etc), lung age and derived parameters

Pressure Sensors

Cabin

Type	Piezoresistive
Range	±0.5 cm H_2O
Resolution	0.05 cm H_2O
Calibration	Integrated 30 mL pump

Mouth

Type	Piezoresistive
Range	±50 cm H_2O
Resolution	0.1 cm H2O
Calibration	Automatic Zero

MIP/MEP

Type	Piezoresistive
Range	±250 cm H_2O
Resolution	Error linearity < 0.1%
Calibration	Automatic Zero

Pneumotach

Type	Piezoresistive
Range	±5 cm H_2O
Resolution	Accuracy < 0.1%
Calibration	Automatic with 3L syringe

Environmental Sensors

Temperature	0-50°C	(automatic BTPS/STPD correction)
Humidity	0-100%	(automatic BTPS/STPD correction)
Pressure	400-800 mmHg	(automatic BTPS/STPD correction)

Hardware

Dimensions	94x89x172 cm
Weight	140 kg
Internal volume	852 litres
Power supply	90-264Vac

Safety and Quality Standards

MDD (93/42 EEC);
EN 60601-1 (safety) / EN 60601-1-2 (EMC)
Complies with ATS/ERS 2005 guidelines

CE 0476

CERMET SISTEMA DI GESTIONE CERTIFICATO Reg.n. 387- M UNI EN ISO 13485:2003

CERMET SISTEMA DI GESTIONE CERTIFICATO n. 387- A UNI ISO 9001:2008

COSMED
Pulmonary Function Equipment

 Part-No.: C09009-02-93