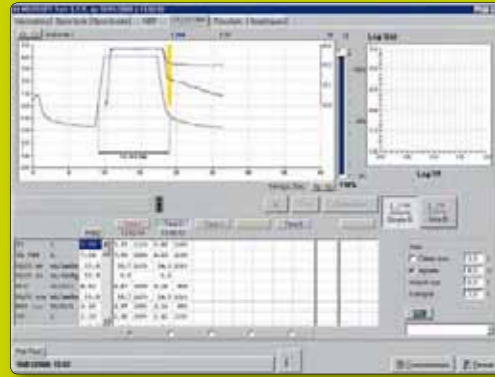
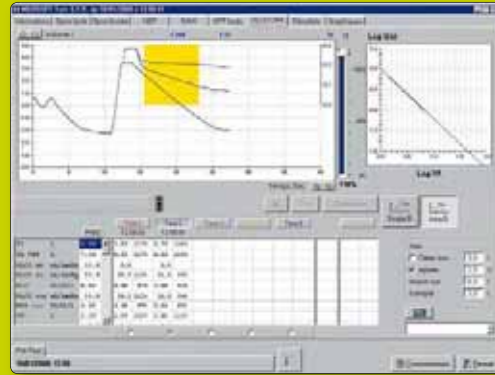


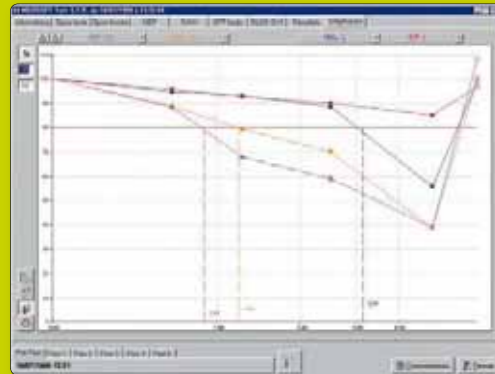
Graphic of DLCO-CH4 by single breath



Graphic of DLCO-CH4 by intrabreath



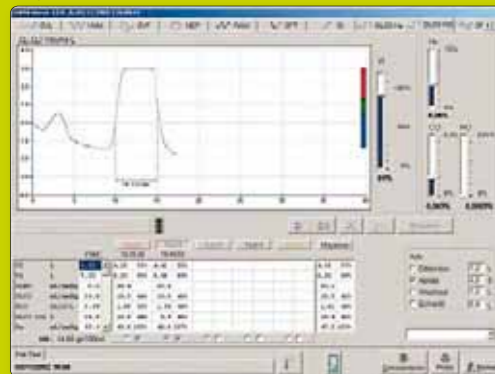
Graphic of a challenge test with dose-effect curve



Graphic of printing configuration examples



Graphic of DLCO-NO measurement



EXPAIR software

The most intuitive, userfriendly and complete software in basic version

- A sophisticated and powerful data-base function and electronic storage
- Trend Report (Historic function)
- Interpretation function
- Comment function
- Off Line input and on line data transfer
- Report designer
- Predicted value maker
- Language maker
- User calculated parameters
- Bronchial test generation
- Tests pharmacodynamiques
- Blood gases with blood chemistry analysis from manual entry
- Users Units capability
- **Measure sequecy configuration**
- Full calculation function : display of calculation points with manual correction capability
- Technical toolbox to enable diagnostic function and full program control
- Inbuilt quality control with calibration markers for performance
- Teleassistance

The MediSoft factory is a state of the art modern facility with clinical research, precision engineering and computer design departments.
ISO 13 485 : 2000



BODYBOX 5500

GENERAL SPECIFICATIONS

	Dim.	Standard	Double Door
(H x W x D) cm		176 x 87 x 71	179 x 120 x 83
Weight		± 130 kg	± 150 Kg
Internal Volume		960 Liters	± 1250 Liters
Patient chair		Pneumatic adjustment	
BodyBox closing door		Study closing and internal handfuf	
Power requirements		230/115 VAC 50/60 Hz	
Power Consumption		100 VA (module)	
Warm up Time		20 min (minimum)	

Conform to electrical safety requirements and CE 0344 certified

PATIENT VALVE

Pneumotachograph	Lilly type
Range	0,03 to 15 L/sec
Resistance	0,4 cmH ₂ O/L/sec
Relative accuracy	Error < 3%
Volume calculated by digital integration and expressed in BTPS	Integrated thermometer
Disinfection	Simple Dismantling for cold cleaning
Patient valve	Pneumatique (Tps de O/F : 30 mSec)
Dead Space	< 60 ml with pneumo.
Valve Support Arm	Movable arm with 3 joints

PRESSURE TRANSDUCERS

Piezo resistive sensors protected from overload		
Sensitivity	Resolution	Calibration
Box pres +/- 0,5 cm H ₂ O	Box Pres 0,05 cm H ₂ O	Box Pres Pompe de 30 mL intégrée
Mouth pres +/- 50,0 cm H ₂ O	Mouth Pres. & Flow 0,01 cm H ₂ O	Mouth Pres. Colonne d'eau
Mouth pres. ocll +/- 200,0 cm H ₂ O	Linearity Error < 0,1%	Pneumotachograph 1 to 3 L seringue semi. auto.
Mouth flow +/- 5,0 cm H ₂ O	Relative Accuracy Error < 0,01%	with ATS quality control criteria
Automatic compensation of the measuring element's zero drift		

GAS ANALYZERS

Helium	Thermal conductivity
Range	0 to 15% He
Relative accuracy	+/- 0,1%
Response time	10 sec (10 - 90 % Fs)
Carbone Monoxid	Chemical Fuel Cell
Range	0 to 0,350 % CO
Relative accuracy	+/- 0,1 %
Response time	+/- 20 sec. (10-90 % Fs)

GAS SUPPLY SPECIFICATIONS

Body Box	Compressed air
DLCO He option	0,3% CO, 14% He, 21% O ₂ , Qs N ₂
DLNO option	225 or 450 ppm No, Qs N ₂
DLCO CH4 option	0,3% CO, 0,3% CH ₄ , 21% O ₂ , Qs N ₂

VOLUMETRIC BODYBOX (OPTION)

Pneumotachograph	double Grid Type Lilly
Range	0,01 to 15 L/sec
Resistance	0,1cm H ₂ O/L/sec
Relative accuracy	Error < 3%

AMBIENT CONDITIONS

Temp. 10 - 40°C	Relative humidity 25 to 95 % non
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OPTIONS

- Volumetric Bodyplethymograph
- Integrated DLCO He or CH4 (Dem. valve or insp. bag)
- MIP/MEP, SNIP, PO-1, NEP, Rint
- Satic et dynamic Compliance
- Integrated automatic nebuliser.
- External compensation Box
- Computer integration trolley with electrical insulator transformer
- TFT monitor support
- Heating pneumotachograph
- Integrated barometer
- **Double Door for wheel chair access**
- Medisoft network
- Data transfert & reception (HL7,...)
- automatic backup function

OPTIONAL GAS ANALYZERS

Multigas analyser	Infrared spectrometer (CO, CH4, CO2)
Range	0 to 0,350%
Relative accuracy	+/- 0,1 %
Response time	< 0,1 sec (10 - 90% FS)
Nitric oxid	Chemical fuel cell
Range	0 - 450 ppm
Relative accuracy	+/- 0,1 %
Response time	< 10 sec (10 - 90 % Fs)

ANALYSER CALIBRATION

Automatic and rapid calibration with quality control
Pressure regulator 0 - 8 Bars / 15 m² / h

COMPUTER INTERFACE

Type	Rs 232 Serial interf. & USB
Conversion	12 & 16 bit.
Acq. frequency	100 Hz /channels (3500 Hz Multigas)
Transmission speed	115,200 baud
Isolation	System fully isolated by optical infrared
Computer	Pc Pentium, monitor 17" & Hp Deskjet
Operating system	Windows® XP PRO

MEASURED AND CALCULATED PARAMETERS

- RAW (Insp. exp. tot.), SRAW, GAW, SGAW, ...
- VGT, CV, VRI, VRE, VR, CPT, ...
- Slow Spirometry : VC, CV, VRE, VRI, CI, CE
- Foced Spirometry : VEMS, VIMS, CVF, VEMS/CVF, VEMS/CI, DP, D25, D50, D75, DEM, VMM, ...
- Tbronchodilation and challenge test, dose-response curves, reactivity threshold, ...
- V Comp., P Alv. (option)
- DLCO : VA, DLCO / VA, ... DLCO - NO : Dm, Vc, ... (option)
- Compliance stat./dyn., RL stat./dyn., CL stat./dyn., EL dyn., W vis. (option)
- MIP/MEP, SNIP, PO-1, ... (option)
- NEP, R_{NEP}, Lim. débit exp. ... (option)

BODYBOX 5500[®]

BAROMETRIC AND VOLUMETRIC (option)
BODYPLETHYSMOGRAPH

BODYBOX and Exp'Air combination offer :

- "Gold-standard" measurement
- A fast, accurate "One-stop" test center
- Software guided clinical excellence
- Expansive capability (DLCO, MIP/MEP, ...)
- Precision engineering of the highest quality
- Low cost of operation and maintenance
- No high-cost proprietary disposables



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Medisoft s.a. reserves the right to change and improve the above specifications without prior notice.



CARDIO-RESPIRATORY INSTRUMENTATION

BODYBOX 5500

Barometric and volumetric (option) bodyplethysmograph :

► The perfect unit for :

- Pulmonary function analysis with both children and adults
- Ventilatory mechanics
- Bronchodilatory studies and
- Hypersensitivity research (challenge tests)

From basic to Full version, 8 optional versions & combinations

For those centers unfamiliar with plethysmography, the technique is often misunderstood and considered to be difficult to use. Quite the contrary! The Body Box 5000 series is incredibly easy to operate and the patient comfort is given by :

- An ergonomic chair
- Comfortable box volume
- The largest windows area
- A double door version for wheel chair access
- A simple Quality control procedure is provided with each equipment.



RAIRWAYS RESISTANCE and CONDUCTANCE (RAW & GAW)

The airways resistance can be measured easily and quickly, the subject establishes a resting FRC level of tidal breathing and the operator can then select to collect flow against box data for analysis, the test can be performed at both resting ventilation and with the panting method. The correlation between methods is excellent.

When the operator is satisfied with the quality of the captured data the occlusion valve can be operated to set the actual thoracic gas volume at which the measurements are made. This is essential for a meaningful measurement of the Sgaw.

The software control allows for manual fitting of the slope to the data, selection and de-selection of efforts for the mean and operator controls over the Tidal volume minimum and maximum also the Vital capacity minimum and maximum points as well as adjustment of the FRC level.



THORACIC GAS VOLUME, TOTAL LUNG CAPACITY AND LUNG SUB-DIVISIONS

The test calls for the subject to achieve a stable FRC level, then the operator can select occlusion mode, the powerful software then closes the valve at an end tidal point and the resulting tangent of the mouth pressure verse the box pressure is the thoracic gas volume (TGV,FRC). As subjects change the FRC level during the effort the software monitors the baseline shift and then adds or subtracts the volume difference from the measured thoracic gas volume to show the 'True FRC' as the TGV.

A full vital capacity effort then allows the calculations of the lung sub-divisions relating to the TGV measurement. Complete control over reported parameters and information. Selection of data, movement of the tidal volume, vital capacity and FRV levels as well as deletion of poor efforts.

Five sets of measurements can be recorded at the same or different times to identify improvements in patient measurements. Three different occlusion mode can be selected:
1. Insp. cycle - 2. Complete cycle - 3. Multiple cycles



PERITHORACIC AND THORACIC COMPRESSION (OPTION)

This test demonstrates the degree of thoracic compression, the method simultaneously measures the flow volume characteristic measured at the lips with the subject breathing from outside the cabin through the wall and the corresponding flow volume characteristic measured by the thoracic displacement through the cabin wall.

The Thorax is normally free moving provide the respiratory muscles are performing correctly, whilst the loop presented at the lips is characteristic of all the resistance and compliance characteristics of the lung and bronchial tree. This is a clear indicator of flow limitation and also muscular force (alveolar pressure) throughout a forced manoeuvre.



SLOW AND FORCED SPIROMETRY

The Body Box 5500 allows the full measurement of spirometry with facilities for multiple level spirometer as with bronchial challenge.

Additionally incentive spirometry assist the measurements of children. After the study is made the operator has a wide range of functions to allow different views (flow volume, Volume time [FEV1] and Volume time [FEV1] 10 second view), Selection of the calculation points, overlay of efforts, deletion of poor effort. Trend graphing and dose response curves.



MEASUREMENT OF DIFFUSION CAPACITY DLCO (OPTION)

UNIQUE - the only body plethysmograph offering the range of 5 diffusion methods.

Single Breath using the helium trace gas He

The most well known technique as described by J.E. Cotes based on the Jones Meade method. Using a bag collection system the

subject can be controlled for inspiratory volume, washout (discard) volume and Sample volume. This method has proven repeatability and the method was the same as that used to collect the predicted values we use today.

Single Breath using Methane trace gas (CH4)

Using fast gas analysis, this method collects the exhaled breath directly as a high resolution data array, this has the advantage that post test analysis can be performed aligning the start of sample onto the alveolar plateau after the clearances of all the dead spaces, a sample as low as 50 ml can be used to calculate the diffusion. This can overcome the volume limitation of other systems and methods.

Intra Breath diffusion

The sample is taken during a slow and constant exhalation in the range of 200 – 500 ml/sec. Applying linear regressions to the data array of the expiratory gas, the alveolar concentrations are calculated. As this method requires no breath holding phase it is of great benefit with some subject groups.

Steady State diffusion Tlco ss New

Medi-soft has taken a new look at this method, using fast gas technology and replacing the older bulky instrumentation this is a "NEW" method for a new age of diffusion measurement. Requiring minimal subject effort, this method is especially helpful for obtaining measurements with children and reluctant subjects. Performed at a steady state breathing condition the measurement is valid as soon as the subjects ventilation is uniform and stabilized.

DLCO-NO (trace gas He) NEW & EXCLUSIVE

Membrane diffusion and capillary blood volume (Dm & Qc) measurement.

Regarded as the 'True' diffusion characteristic and the most useful indicator of membrane thickening, this measurement takes on a new lease of life, the powerful Exp'Air software makes the calculations painless, the combination of NO and CO follows the work of Prof. Guenard of Bordeaux. Simple to perform and rapid results add this test to the list of favorite studies undertaken in routine practice.

Additionally this measurement can be performed in conjunction with NEP, this then allows the evaluation of pulmonary blood flow and its ability to recruit from the capillary reserve.



NEP (OPTION) EXCLUSIVE

A new and very sensitive test that is specific and reproducible for determining the degree of expiratory flow limitation both at rest and exercise, particularly with subject's known to have obstructive lung disease. The test applies a negative pressure to the mouth-piece during the expiratory phase, this permits the comparison of the flow volume loop with the tidal efforts when reviewed as a flow volume loop display. This method allows in addition to measure indirectly the resistance (RNep) this provides a good alternate at the standard method for screening.



MECHANICS OF VENTILATION METHODS (OPTION)

Mouth pressures
MIP – MEP the maximal inspiratory and expiratory pressures as an assessment of respiratory muscle strength, also useful for weaning subjects from ventilators etc.

SNIP

Using a nasal canular the voluntary inspiratory nasal pressure can be measured in repeated efforts. A non-invasive estimate of muscle fatigue.

Occlusion pressures

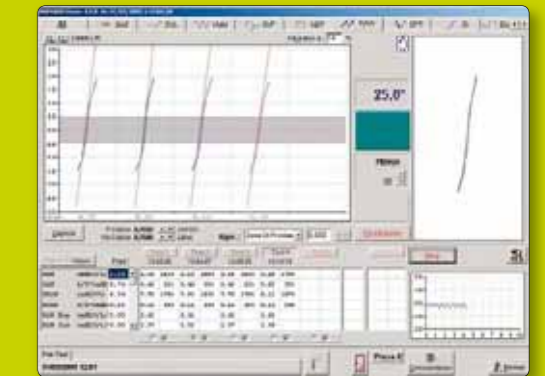
PO-1 the inspiratory pressure in response to an occlusion at 0.1 seconds.

A measurement of respiratory drive.

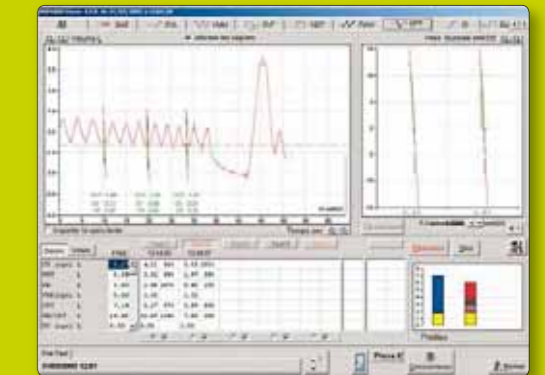
Static and Dynamic Compliance and Resistance

The use on an oesophageal balloon catheter inserted into the subject allows the measurements of both static and dynamic compliance. The components on compliance and resistance are fundamental to the mechanics of the lung

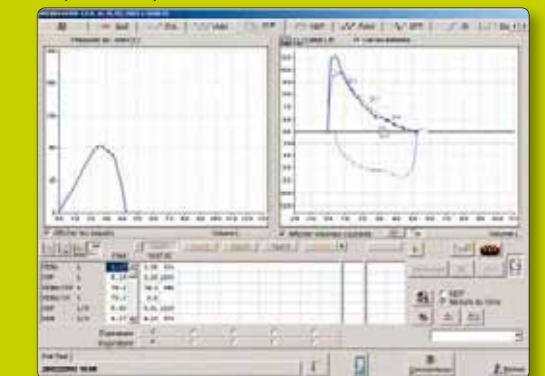
Graphic of resistance and conductance measurement



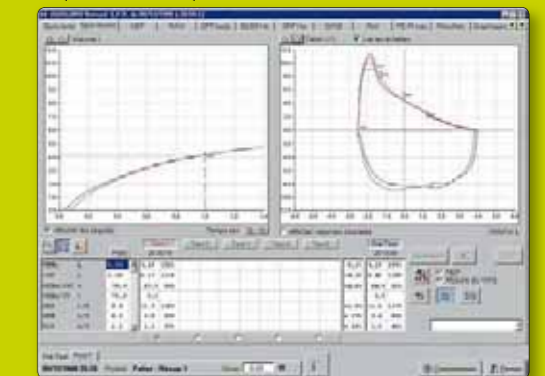
Graphic of TGV and TLC measurement



Graphic of compression volume and Alv.P. measurement



Graphic of forced expiration measurement



Graphic of NEP measurement

