HYPAIR COMPACT+

FLOWMETER PULMONARY FUNCTION TESTING STATION

A fast, accurate ‘One-stop’ test center
• Software guided clinical excellence
• Expansive capability (DLCO, MIP/MEP…)
• More than 10 options
• Precision engineering of the highest quality
• Low cost of operation and maintenance
• No high-cost proprietary disposables

The MediSoft factory is a state of the art modern facility with clinical research, precision engineering and computer design departments.
Hyp’Air Compact®
Flowmeter Pulmonary Function Testing Station

- Hyp’Air Compact and Exp’Air combination offer “Gold Standard” measurements

From basic to Full version, 8 optional versions & combinations

**STANDARD SPHROMETRY (SLOW AND FORCED)**

The Hyp’Air Compact® incorporates all the functions and performances needed to measure slow and forced vital capacity.

The flow is measured by the pneumotachograph and the volume is calculated by numerical integration.

Tests under bronchodilator or bronchoconstrictor are simplified by the specifically adapted software functions (comparison tables, effect-doses curves, test protocols, ...).

Additionally, incentive spirometry assists measurements with children. Post visualization and post treatment provide a convenience of use particularly appreciated: choice of graphical representation, selection of calculation points, alignment of the flow / volume curves in FRC, time evolution of measured parameters by numerical and graphical representation (deletion of poor efforts).

**FRC HE OR N2 (option)**

The Hyp’Air Compact® can be equipped with the functions necessary to the FRC measurement by the helium dilution technique in closed circuit or by the nitrogen washout method by pure O2 inspiration, in open circuit single and multi breath method.

These two techniques are fully automated and require only minimal user intervention.

- Measurement of TLC by FRC He
  - Standard method by closed circuit He dilution technique with O2 compensation and CO2 absorption
  - Measurement of TLC by Nitrogen washout.
  - The Nitrogen washout uses the accumulated volume of oxygen to wash nitrogen from the lungs as the ‘true’ FRC value.
  - On screen visualization guides the user through the full test procedure, making the understanding and quality control of the test a key feature. Importing a VC from a separate effort is possible when the subject may be unable to perform the best effort within the test.
  - The measuring circuit uses O2 and CO2 analysers by subtraction to measure the nitrogen; the patient circuit consists of an automated two-channel valve with automatic delivery of 100% O2 with a low resistance demand valve.
  - The closing volume is calculated from N2 slope during a maximal expiration.
  - For spirometry, all the software functions needed for the measurement under the best conditions are integrated in this option.
  - Special combined version ( paediatrics and adult).

**MEASUREMENT OF DIFFUSION CAPACITY DLCO (option)**

**UNIQUE** the only spirometer offering the range of 5 diffusion methods:

- Single Breath using the helium trace gas He
  - The well known technique described by J.L. Costes based on the Jones-Meadow method. Using a bag collection system the subject can be controlled for inspiratory volume, washout (closed) 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.
  - DLCO-NO (Trace gas He) NEW & EXCLUSIVE
    - Membrane diffusion and capillary blood volume (Sm & Gc) measurement.
    - Regarded as the ‘true’ diffusion characteristic and the most useful indicator of membrane thickening, this measurement is taken in a new easy-to-use. 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 favolria studies undertaken in routine practice. Additionally, this measurement can be performed in conjunction with MIP, the pulmonary blood flow and its ability to recruit from the capillary reserve can then be evaluated.
  - Single Breath using Methane trace gas (CH4)
    - Using fast gas analysis, this method offers 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.

**LETS BREATHE diffusion**

The sample is taken during a slow and constant ventilation in the range of 200 – 500 ml/min. Applying linear regressions to the data array of the exhaled gas, the alveolar concentrations are calculated. As this method requires no breath holding it will benefit greatly some subject groups.

**Steady State diffusion** Tlco ss NEW & EXCLUSIVE

Mark-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 subject’s ventilation is uniform and stabilized.

**NEP (option) EXCLUSIVE**

A new and very sensitive test that is specific and reproducible for determining the degree of inspiratory flow limitation both at rest and during exercise, particularly with subject’s known to have obstructive lung disease. The test applies a negative pressure to the mouthpiece during the expiratory phase, this allows the compi- sition of the flow volume loop with the tidal efforts when reviewed as a flow-volume loop display.

This method also allows the indirect measurement of the resistance (Rn2), and provides a good alternative to the standard screening method.

**RNT - ROS (option)**

- Measurement of the total pulmonary resistance by the method of airflow interruption (during 80 to 120 ms) at each respiratory cycle.
  - Visualization of the mouth pressure in real time with calculation point for each cycle.
  - Choice between 3 mouth pressure calculation methods.
  - Averaging of the value with rejection by “Gauss’s curve” method.
  - Automatic functions identical to the spirometry ones for test with bronchodilator and bronchoconstrictor.
  - These measurements are taken in passive mode.
  - Measurement of airway resistances by forced oscillation method, generated by a univascular pump turning at approximately 6 to 30 Hz. This method measures the impedance (Z) and the phase angle to calculate the resistance.

**VENTILATION MECHANICS (OPTION)**

- MIP - MEP : Maximum Inspiratory and Expiratory Pressure as an assessment of respiratory muscle strength, also useful for weaning subjects from ventilators, …
  - SNB : measurement of the maximal nasal inspiratory pressure using a nasal cannula. A non-invasive estimate of muscle fatigue.
  - EGV, EIP, espi-metry: end-inspiratory pressure at 0.1 second. Specific version (see datasheet)
  - Static and dynamic Compliance and Resistance : measured by intro-nosephagial balloon catheter.
  - Muscle strength study : specific version for a full and complete muscle and neural drive study

**PROVO II (OPTION)**

- Equipment for fully automated bronchouchallenge tests with automatic nebulizer. This option provides full control of products and drugs used and of test performing criteria, for bronchouchallenge testing.

**FENO (OPTION)**

- External module for the measurement of exhaled endogenous NO by the off-trace method.