Innocor® CO
Non-Invasive Measurement Of Cardiac Output
By Inert Gas Rebreathing

- Quick test (30 seconds)
- Suitable in children and adults at rest and during exercise
- Compact and portable design with integrated test gas cylinder
- FDA and Health Canada approved, CE marked

innovision
Unique gas exchange solutions
www.innovision.dk
Method

Innocus® employs the analytical principle of Inert Gas Rebreathing (IGR). During a rebreathing test Innocus® measures the relative levels of two inert gases over a few respirations (about 5-6 breaths or 15-20 s). One of the gases is blood soluble (0.5% nitrous oxide, N₂O) and the other is insoluble (0.1% sulphur hexafluoride, SF₆). N₂O is absorbed at a rate which is proportional to the blood flow through the lungs. SF₆ is used to determine the lung volume and to account for incomplete mixing and changing lung volume. Innocus® utilizes a photoacoustic infrared gas analyser for simultaneous measurement of N₂O, SF₆ and CO₂, combining fast response with unmatched sensitivity, accuracy and stability. There is no requirement for daily calibration. Innocus® is validated in an impressive number of papers covering diverse conditions in health and disease, children and adults, and rest and exercise. As an option, Innocus® combines cardiac output and metabolic measurements in a cardiopulmonary exercise test using true breath-by-breath gas exchange analysis.

Parameters

- **Hemodynamic**
  - CO: Cardiac output
  - CI: Cardiac index
  - SV: Stroke volume
  - SI: Stroke index
  - PBF: Pulmonary blood flow
  - Vl: Lung volume (FRC)
  - HR: Heart rate
  - SpO₂: Arterial oxygen saturation

- **Derived hemodynamic**
  - SvO₂: Mixed venous oxygen saturation
  - A-V O₂ diff: Arterio-venous O₂ saturation difference
  - VO₂: Oxygen uptake
  - VO₂/kg: Oxygen uptake per kg
  - Shunt: Intrapulmonary shunt fraction

- **CPET parameters**
  - Optional

Technical Specifications

- **Gas analyser (Photoacoustic spectroscopy)**
  - Components and ranges: N₂O 0-2.5%, SF₆ 0-0.5%, CO₂ 0-10%
  - Signal-to-noise ratio: >1000 @ half-scale (N₂O and SF₆)
  - >400 @ half-scale (CO₂)
  - Sampling frequency: 100 Hz
  - Sample flow rate: 120 ml/min
  - Rise time (10-90%): <200 ms

- **Oxygen sensor (Laser diode absorption spectroscopy)**
  - Range: 0-100%
  - Accuracy after calibration: ±1.5% rel.
  - Signal-to-noise ratio: >500 @ 21% O₂
  - Sampling frequency: 100 Hz
  - Sample flow rate (same flow as above): 120 ml/min
  - Rise time (10-90%): <170 ms

- **Flowmeter (Differential pressure pneumotachometer)**
  - Range (Standard size): ±15 l/s
  - Flow accuracy: ±1% rel. or ±20 ml/s
  - Volume accuracy: ±1% rel. or ±50 ml
  - Sampling frequency: 100 Hz

- **Rebreathing valve (Pneumatic, with silicone valve insert)**
  - Dead space, Standard/Compact (rebreathing): 50/11 ml

- **Gas supply**
  - Gas composition: 5% N₂O, 1% SF₆, 94% O₂
  - Cylinder capacity: 18 litres (0.15 l @ 124 bar & 21°C)
  - Approx. number of tests (at rest): 75

- **Pulse oximeter**
  - Oxygen saturation range: 0-100%
  - Pulse rate (HR) range: 40-240 BPM

- **Mechanical**
  - Size: 35 x 29 x 26 cm (W x H x D)
  - Weight (depending on configuration): 8 kg

- **Electrical**
  - Power supply: 100-120V / 200-240V, 50/60 Hz
  - Power consumption: 30 W nom., 50 W max.
  - Protection: Class I type BF according to IEC 60601-1

- **Environmental**
  - Operating temperature: -10 - 40°C
  - Operating pressure: 525 - 800 mmHg