The Ultima Series™ cardiorespiratory diagnostic systems offer maximum flexibility to configure both pulmonary function testing (PFT) and gas exchange systems. Simply select the product that best meets your needs, or talk to our product sales representative for more info.

**TESTING CAPABILITIES**

<table>
<thead>
<tr>
<th>PULMONARY FUNCTION TESTS:</th>
<th>PF/PF RTD</th>
<th>PFX</th>
<th>CPX</th>
<th>CARDIO₂</th>
<th>CCM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spirometry (FVC, SVC, MVV)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Respiratory mechanics (MIP/MEP)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Diffusing capacity</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Nitrogen washout</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Single breath N₂</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Arterial blood gases (ABG manual entry)</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ECG/HEART RATE CONFIGURATIONS:</th>
<th>PF/PF RTD</th>
<th>PFX</th>
<th>CPX</th>
<th>CARDIO₂</th>
<th>CCM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated 12-lead ECG</td>
<td>-</td>
<td>O</td>
<td>-</td>
<td>✓</td>
<td>-</td>
</tr>
<tr>
<td>Heart rate TTL interface</td>
<td>-</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Heart rate (wireless chest strap)</td>
<td>-</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GAS EXCHANGE TESTS:</th>
<th>PF/PF RTD</th>
<th>PFX</th>
<th>CPX</th>
<th>CARDIO₂</th>
<th>CCM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct fick cardiac output</td>
<td>-</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Indirect fick cardiac output (NICO)</td>
<td>-</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Exercise capacity (O₂ and CO₂)</td>
<td>-</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Nutrition assessment: REE/RMR (O₂ and CO₂)</td>
<td>-</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>

✓ standard  O optional
ADVANCED DIGITAL ELECTRONICS
We offer the latest technology and sensors for unparalleled performance and reliability.
- Automated monitor continuously adjusts analyzers.
- Automatic gas calibration saves testing time.
- Interface to wide array of external peripheral devices.

PREVENT® FLOW SENSOR AND DIRECTCONNECT™ METABOLIC FLOW SENSOR FOR SIMPLICITY AND ACCURACY
Our proprietary design saves time between patients and provides maximum infection control while meeting or exceeding ATS/ERS standards and specifications.
- Eliminates warm-up or recalibration between patients.
- Contains no moving parts or electronics for cost-effective testing.
- Options to use with a filter, sterilize or discard (preVent® flow sensor only).

EASY-TO-USE BREEZESUITE™ CARDIORESPIRATORY DIAGNOSTIC SOFTWARE
Our powerful BreezeSuite cardiorespiratory diagnostic software provides simple, one-button testing.
- Ease of use allows operator to focus on patient’s effort.
- Timely prompts guide the operator through the entire testing process.
- Powerful Microsoft® SQL database provides flexibility in accessing, manipulating and reporting data.
- Automated quality-assurance program notifies operator to ensure results comply with ATS/ERS acceptability criteria.

OPTIONAL BREEZECONNECT™ HL7 INTERFACE SOFTWARE
- Network capability to connect other cardiorespiratory systems.
- Electronic medical record interface using latest HL7 standards with either unidirectional or bidirectional capability.
- Flexible access allows physicians to view and interpret patient results from any location on the facility’s network.

GAS REQUIREMENTS
ULTIMA™ CARDIO®, CPX®, CCM™
- Calibration gas: 5% CO₂, 12% O₂, bal N₂ (6-8 psi)
- Reference gas (recommended): 21% O₂, bal N₂ (6-8 psi)

SPECIFICATIONS
ULTIMA MODULE
- H x W x D: 14 x 13 x 14 in (35.5 x 33 x 35.5 cm)
- Weight: 26.5 lbs (12 kg)

PATIENT INTERFACE ADJUSTMENT (PF ARM)
- Vertical extension: 17 in (43 cm)
- Horizontal extension: 14 in (35.5 cm)
- Radius: 180°

PREVENT® FLOW SENSOR
- Bidirectional Pitot tube flow sensor
  - Range: ±18 L/s
  - Accuracy: ±3% or 50 mL, whichever is greater
  - Resistance: <1.5 cm H₂O @ 14 L/s
  - Dead space: 39 mL

DIRECTCONNECT™ METABOLIC FLOW SENSOR
- Bidirectional Pitot tube flow sensor
  - Patent number: 5,038,773
  - Accuracy: ±3% or 10 mL, whichever is greater
  - Resolution: 2.4 mL/s
  - Range: 0–40 L/min
  - Application range: 100–2000 mL
  - Tidal volume range: 100–2000 mL

POWER REQUIREMENTS
- 100-240 V/50-60 Hz

O₂ ANALYSIS
- Type: Galvanic
  - Range: 0-100%
  - Response: (10-90%) <130 ms
  - Accuracy: ±1%

CO₂ ANALYSIS
- Type: Non-dispersive infrared (NDIR)
  - Range: 0-15%
  - Response: (10-90%) <130 ms
  - Accuracy: ±0.1% (0-10% CO₂)

DIFFUSION ANALYSIS: RTD™ REAL-TIME DIFFUSION
- Analysis time: <1 sec
  - Range: CO, 0-0.35%; CH₄, 0-0.35%
  - Accuracy: CO, ±0.003%; CH₄, ±0.003%
  - Linearity: <1% full scale
  - Resolution: CO, 0.0005%; CH₄, 0.00005%

GAS CHROMATOGRAPHY
- Analysis time: <120 sec
  - Range: Ne, 0-0.5%; CO, 0-0.3%
  - Accuracy: 0.03 units full scale or 0.03%
  - Linearity: 0.5% full scale

GAS SAMPLE
- Proprietary gas-drying sample circuit