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 your product sales representative for more info.

### TESTING CAPABILITIES

<table>
<thead>
<tr>
<th>PF</th>
<th>PFX</th>
<th>CPX</th>
<th>CARDIO₂</th>
<th>CCM</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="" /></td>
<td><img src="image2.png" alt="" /></td>
<td><img src="image3.png" alt="" /></td>
<td><img src="image4.png" alt="" /></td>
<td><img src="image5.png" alt="" /></td>
</tr>
<tr>
<td>PULMONARY FUNCTION TESTS:</td>
<td><img src="image6.png" alt="" /></td>
<td><img src="image7.png" alt="" /></td>
<td><img src="image8.png" alt="" /></td>
<td><img src="image9.png" alt="" /></td>
</tr>
<tr>
<td>Spirometry (FVC, SVC, MVV)</td>
<td><img src="image10.png" alt="" /></td>
<td><img src="image11.png" alt="" /></td>
<td><img src="image12.png" alt="" /></td>
<td><img src="image13.png" alt="" /></td>
</tr>
<tr>
<td>Respiratory mechanics (MIP/MEP)</td>
<td><img src="image14.png" alt="" /></td>
<td><img src="image15.png" alt="" /></td>
<td><img src="image16.png" alt="" /></td>
<td><img src="image17.png" alt="" /></td>
</tr>
<tr>
<td>Diffusing capacity</td>
<td><img src="image18.png" alt="" /></td>
<td><img src="image19.png" alt="" /></td>
<td><img src="image20.png" alt="" /></td>
<td><img src="image21.png" alt="" /></td>
</tr>
<tr>
<td>Nitrogen washout</td>
<td><img src="image22.png" alt="" /></td>
<td><img src="image23.png" alt="" /></td>
<td><img src="image24.png" alt="" /></td>
<td><img src="image25.png" alt="" /></td>
</tr>
<tr>
<td>Single breath N₂</td>
<td><img src="image26.png" alt="" /></td>
<td><img src="image27.png" alt="" /></td>
<td><img src="image28.png" alt="" /></td>
<td><img src="image29.png" alt="" /></td>
</tr>
<tr>
<td>Arterial blood gases (ABG manual entry)</td>
<td><img src="image30.png" alt="" /></td>
<td><img src="image31.png" alt="" /></td>
<td><img src="image32.png" alt="" /></td>
<td><img src="image33.png" alt="" /></td>
</tr>
<tr>
<td>ECG/HEART RATE CONFIGURATIONS:</td>
<td><img src="image34.png" alt="" /></td>
<td><img src="image35.png" alt="" /></td>
<td><img src="image36.png" alt="" /></td>
<td><img src="image37.png" alt="" /></td>
</tr>
<tr>
<td>Integrated 12-lead ECG</td>
<td><img src="image38.png" alt="" /></td>
<td><img src="image39.png" alt="" /></td>
<td><img src="image40.png" alt="" /></td>
<td><img src="image41.png" alt="" /></td>
</tr>
<tr>
<td>GAS EXCHANGE TESTS:</td>
<td><img src="image42.png" alt="" /></td>
<td><img src="image43.png" alt="" /></td>
<td><img src="image44.png" alt="" /></td>
<td><img src="image45.png" alt="" /></td>
</tr>
<tr>
<td>Direct fick cardiac output</td>
<td><img src="image46.png" alt="" /></td>
<td><img src="image47.png" alt="" /></td>
<td><img src="image48.png" alt="" /></td>
<td><img src="image49.png" alt="" /></td>
</tr>
<tr>
<td>Indirect fick cardiac output (NICO)</td>
<td><img src="image50.png" alt="" /></td>
<td><img src="image51.png" alt="" /></td>
<td><img src="image52.png" alt="" /></td>
<td><img src="image53.png" alt="" /></td>
</tr>
<tr>
<td>Exercise capacity (O₂ and CO₂)</td>
<td><img src="image54.png" alt="" /></td>
<td><img src="image55.png" alt="" /></td>
<td><img src="image56.png" alt="" /></td>
<td><img src="image57.png" alt="" /></td>
</tr>
<tr>
<td>Nutrition assessment: REE/RMR (O₂ and CO₂)</td>
<td><img src="image58.png" alt="" /></td>
<td><img src="image59.png" alt="" /></td>
<td><img src="image60.png" alt="" /></td>
<td><img src="image61.png" alt="" /></td>
</tr>
</tbody>
</table>

### SPECIFICATIONS

#### ULTIMA SYSTEM
- Workspace: W x D: 24 x 21 in (70 x 53.3 cm)
- Base: W x D: 25 x 31 (63.5 x 78.7 cm)
- Height: 49 in (124.5 cm)

#### PATIENT INTERFACE ADJUSTMENT (PF ARM)
- Horizontal extension: 26" in (66.5 cm)
- Radius: 110°

#### PREVENT® FLOW SENSOR
- Bidirectional Pitot tube flow sensor
- Range: ±18 L/s
- Accuracy: ±3% or 50 mL, whichever is greater
- Resistance: <1.5 cm H₂0 @ 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%) <180 ms
- Accuracy: ±1%

#### CO₂ ANALYSIS
- Type: Non-dispersive infrared (NDIR)
- Range: 0-15%
- Response: (10-90%) <180 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, 0.0005%

#### GAS SAMPLE
- Proprietary gas-drying sample circuit

#### GAS REQUIREMENTS*

**ULTIMA PF/ULTIMA PFX**
- Calibration gas: 5% CO₂, 12% O₂, bal N₂ (5-7 psi)
- DLco mix (135 psi) 0.3% CO, 0.3% CO₂, 21% O₂, bal N₂
- 99.95% O₂ (135 psi)

**ULTIMA CARDIO₂/CPX/CCM**
- Calibration gas: 5% CO₂, 12% O₂, bal N₂ (5-7 psi)
- Reference gas (recommended): 21% O₂, bal N₂ (5-7 psi)

*Can accommodate up to three 25" x 4.5" cylinders
ULTIMA SERIES™ CARDIORESPIRATORY DIAGNOSTIC SYSTEMS OFFER MAXIMUM FLEXIBILITY TO CONFIGURE BOTH PULMONARY FUNCTION AND GAS EXCHANGE SYSTEMS TO MEET YOUR DIAGNOSTIC NEEDS

THE ULTIMATE ALL-IN-ONE SYSTEM

It’s not often that a system is introduced in the cardiorespiratory diagnostics industry. In today’s market, a medical system can’t just look nice, it has to be able to improve patient care with intuitive, easy-to-use technology which also optimizes functional design.

The Ultima Series cardiorespiratory diagnostic systems can perform both pulmonary function tests (PFT) and metabolic tests conveniently and accurately in a single device, with absolutely none of the compromise that are sometimes found in combined systems.

UNIQUE SYSTEM DESIGN

The Ultima Series cardiorespiratory diagnostic system’s all-in-one design allows for maximum testing comfort for the technician and patient while utilizing the latest technology for unparalleled performance and reliability.

- Fully adjustable desktop allows for expansive personal workspace whether the technician is sitting or standing
- Room to room portability with gas tanks
- BreezeSuite Scheduler allows for automatic warm-up so the system is always ready for testing

OPTIMAL TEST SPECIFIC GAS SAMPLING

Test specific sampling optimizes each of the gas sample pathways (pulmonary function and metabolic) for accurate results. Lab efficiency is increased with test specific sample lines because the technologist does not need to change the sample line or recalibrate flow between tests.

PREVENT® FLOW SENSOR AND DIRECTCONNECT™ METABOLIC FLOW SENSOR FOR SIMPLICITY AND ACCURACY

Our proprietary flow sensors save time between patients and provides maximum infection control while meeting or exceeding ATS/ERS standards and specifications.

- Eliminates warm-up or flow recalibration between patients
- Simple snap-in setup contains no moving parts or electronics for cost-effective testing
- Options to use with a filter (PFT), sterilize or discard

ULTIMA PF™ PULMONARY FUNCTION SYSTEM

Offers complete pulmonary function testing. The Ultima PF System can also be upgraded to include complete exercise and nutritional assessment, providing future expansion of testing capabilities.

- Single system testing for pediatric through adult patients
- Compact and versatile pulmonary function platform
- Powerful diagnostic tool for the clinician

ULTIMA CPX™ METABOLIC STRESS TESTING SYSTEM

Provides true breath-by-breath metabolic analysis for complete assessment of functional capacity and cardiorespiratory diagnostics.

- Testing capabilities including Exercise Capacity, Direct Fick Cardiac Output and Spirometry
- Fully adjustable system for both rest and exercise
- Powerful diagnostic tool for the clinician

ULTIMA CCM™ INDIRECT CALORIMETER

Cost-effective management of mechanically ventilated patients reducing the number of vent days and time spent in the ICU

- Optimizes nutritional needs of thermal injury and trauma patients
- Assesses outcomes of critically ill patients providing cost effective health care delivery

ULTIMA™ CARDIO,® GAS EXCHANGE ANALYSIS SYSTEM

Combines MGC Diagnostics leading gas-exchange technology with the premier Mortara® ECG. The results is an all-in-one, easy-to-use, “gold standard” metabolic stress-testing system.

- Fast-responding oxygen and carbon dioxide sensors acquire data on a discreet breath-by-breath basis, providing continuous analysis and display of data.
- Simplified testing and data interpretation
- Optional wireless ECG and thermal printer

Models

- Ultima PFX® Pulmonary Function / Stress Testing System
- Ultima PF® Pulmonary Function System
- Ultima CPX® Metabolic Stress Testing System
- Ultima CCM® Indirect Calorimeter
- Ultima Cardio,® Gas Exchange Analysis System

Ultima Series™ Cardiorespiratory Diagnostic Systems

www.mgcdiagnostics.com

Ultima Series™ Cardiorespiratory Diagnostic Systems

www.mgcdiagnostics.com
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 your product sales representative for more info.

### Testing Capabilities

<table>
<thead>
<tr>
<th>Test Category</th>
<th>PF</th>
<th>PFX</th>
<th>CPX</th>
<th>Cardio</th>
<th>CCM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulmonary Function Tests</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<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>
<tr>
<td>ECG/Heart Rate Configurations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Integrated 12-lead ECG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gas Exchange Tests</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<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></td>
<td></td>
<td></td>
<td></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></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Specifications

**Ultima System**
- Workspace: W x D: 24 x 21 in (70 x 53.3 cm)
- Base: W x D: 25 x 31 (63.5 x 78.7 cm)
- Height: 49 in (124.5 cm)

**Patient Interface Adjustment (PF ARM)**
- Horizontal extension: 26” in (66.5 cm)
- Radius: 110°

**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: D,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%): <180 ms
- Accuracy: ±1%

**CO₂ Analysis**
- Type: Non-dispersive infrared (NDIR)
- Range: 0-15%
- Response (10-90%): <180 ms
- Accuracy: ±0.1% (0-10% CO₂)

**Diffusion Analysis: RTD™ Real-Time Diffusion**
- Analysis time: <1 sec
- Range: CO₂, 0-0.35%; CH₄, 0-0.35%
- Accuracy: CO₂ ±0.033%; CH₄ ±0.003%
- Linearity: <1% full scale
- Resolution: CO₂, 0.0005%; CH₄, 0.0005%

**Gas Sample**
- Proprietary gas-drying sample circuit

**Gas Requirements**
- **Ultima PF/Ultima PFX**
  - Calibration gas: 5% CO₂, 12% O₂, bal N₂ (5-7 psi)
  - DLco mix (135 psi) 0.3% CO₂, 0.3% CH₄, 21% O₂, bal N₂
  - 99.95% O₂ (135 psi)
- **Ultima Cardio/CPX/CCM**
  - Calibration gas: 5% CO₂, 12% O₂, bal N₂ (5-7 psi)
  - Reference gas (recommended): 21% O₂, bal N₂ (5-7 psi)
- *Can accommodate up to three 25” x 4.5” cylinders*