Dependable ventilation and a user-friendly design

Features the SmartVent™ ventilator

The easy-to-use SmartVent ventilator offers Pressure and Volume modes, and can ventilate neonates, trauma and compromised patients.

The Smart Vent now features SIMV (Synchronized Intermittent Mandatory Ventilation) with Pressure Support and Pressure Support with Apnea backup mode (PSVPro®), which expands the Aestiva/5’s clinical capabilities to help meet your patients’ needs. Featuring electronic PEEP, apnea backup mode and an adjustable flow trigger, both the PSVPro and SIMV modes can help simplify efforts for providing care to spontaneously breathing patients. Examples of persons who can benefit from these modes include patients with LMAs, pediatric patients and patients unable to tolerate certain anesthetic agents.

- **Pressure Control mode:** You can choose a target pressure and deliver the maximum tidal volume for the pressure selected and desired time.

- **Volume Control mode:** Delivers the tidal volume that you set, regardless of changes in the fresh gas flow and airway pressure, up to the user selectable pressure limit.

- **Low flow delivery techniques:** Optimized by the innovative compensation system, which provides more consistent delivery of set tidal volumes by automatically adjusting for changes in small system leaks, fresh gas flows, changing lung compliance or compression losses in the bellows, absorber and ventilator.

Common features

- SmartVent ventilator
- \( \text{O}_2 \) and \( \text{N}_2\text{O} \) gas delivery
- Lockable drawer
- Light strip
- Patient breathing system with circle module

Optional features, as available

- Frame style-two or three in-line vaporizers, left or right-handed, trolley or pendant-mounted
- Additional gases: \( \text{Air} \) and heliox or \( \text{CO}_2 \)
- Air-flow tube: Single or dual
- Cylinder yokes: Up to four on a two-vaporizer system, five on a three-vaporizer system
- Auxiliary common gas outlet
- Bain module
- Integrated suction (central or Venturi)
- Integrated auxiliary \( \text{O}_2 \) flowmeter
- Silicone breathing circuit kits
Physical Specifications

Dimensions

<table>
<thead>
<tr>
<th></th>
<th>2 vaporizers</th>
<th>3 vaporizers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>135.8 cm/53.4 in</td>
<td>135.8 cm/53.4 in</td>
</tr>
<tr>
<td>Width</td>
<td>75 cm/29.5 in</td>
<td>93 cm/36.6 in</td>
</tr>
<tr>
<td>Depth</td>
<td>83 cm/32.7 in</td>
<td>83 cm/32.7 in</td>
</tr>
<tr>
<td>Weight</td>
<td>136 kg/300 lb</td>
<td>154 kg/340 lb</td>
</tr>
</tbody>
</table>

Top shelves (optional)

<table>
<thead>
<tr>
<th></th>
<th>2 vaporizers</th>
<th>3 vaporizers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight limit</td>
<td>46 kg/100 lb</td>
<td>46 kg/100 lb</td>
</tr>
<tr>
<td>Width</td>
<td>47.5, 67.5 or 87.5 cm/18.7, 26.6 or 34.4 in</td>
<td></td>
</tr>
<tr>
<td>Depth</td>
<td>41 cm/16.1 in</td>
<td></td>
</tr>
</tbody>
</table>

Work surface

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>87.6 cm/34.5 in</td>
</tr>
<tr>
<td>Width</td>
<td>47 cm/18.5 in</td>
</tr>
<tr>
<td>Depth</td>
<td>31.5 cm/12.4 in</td>
</tr>
</tbody>
</table>

Folding side shelf (optional)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Height</td>
<td>87.5 cm/34.5 in</td>
</tr>
<tr>
<td>Width</td>
<td>26.5 cm/10.4 in</td>
</tr>
<tr>
<td>Depth</td>
<td>41 cm/16.1 in</td>
</tr>
<tr>
<td>Weight limit</td>
<td>11.3 kg/25 lb</td>
</tr>
</tbody>
</table>

DIN rail (optional)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Side of tabletop</td>
<td>30 cm/12 in</td>
</tr>
<tr>
<td>Side of machine</td>
<td>23.5 cm/9.25 in</td>
</tr>
</tbody>
</table>

Top drawer (1 standard)—locking (internal dimensions)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>10.5 cm/4.1 in</td>
</tr>
<tr>
<td>Width</td>
<td>38.5 cm/15.2 in</td>
</tr>
<tr>
<td>Depth</td>
<td>26 cm/10.2 in</td>
</tr>
</tbody>
</table>

Lower drawers (optional)*

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>14.5 cm/5.7 in</td>
</tr>
<tr>
<td>Width</td>
<td>38.5 cm/15.2 in</td>
</tr>
<tr>
<td>Depth</td>
<td>26 cm/10.2 in</td>
</tr>
</tbody>
</table>

Lower shelves (optional)*

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>9.2 cm/3.7 in</td>
</tr>
<tr>
<td>Width</td>
<td>20.6 cm/8.2 in</td>
</tr>
<tr>
<td>Depth</td>
<td>286 cm/11.4 in</td>
</tr>
<tr>
<td>Height</td>
<td>42.5 cm/16.75 in</td>
</tr>
<tr>
<td>Width</td>
<td>36 cm/14 in</td>
</tr>
</tbody>
</table>

Absorber arms

<table>
<thead>
<tr>
<th></th>
<th>Adjustable</th>
<th>Non-adjustable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arm length</td>
<td>305 cm/12 in</td>
<td>254 cm/10 in</td>
</tr>
<tr>
<td>Bag arm height</td>
<td>87 cm/34.3 in</td>
<td>91.5 cm/36 in</td>
</tr>
<tr>
<td>Absorber rotation</td>
<td>85°</td>
<td>85°</td>
</tr>
</tbody>
</table>

Ventilator screen

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>7.6 cm/3 in</td>
</tr>
<tr>
<td>Width</td>
<td>15.2 cm/6 in</td>
</tr>
</tbody>
</table>

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Integrated breathing system

- Helps improve patient safety and simplify cable management
- Protects components from getting disconnected or damaged
- Uninterrupted communication between the breathing circuit and the SmartVent ventilator provided by smart sensors and switches

Open architecture

- Can easily fit with existing equipment
- Configurations available with a wide variety of lower cabinet combinations of drawers and shelves, and with top shelving options that are configurable
- Configurations available with an integral dovetail rail that can be used to incorporate additional accessories

Additional features

- Built-in service diagnostics and durable components can make service support more cost-effective and easier
- It is an effective, safe unit when practicing low flow and minimal flow anesthesia, as it can minimize agent consumption, helping reduce anesthetic agent costs
- Can provide intensive care ventilation features, which can save on cost of bringing an additional ICU ventilator into your operating room

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Ventilator Operating Specifications

**Ventilation operating modes**

- **Volume Control and Pressure Control**
- **Synchronized Intermittent Mandatory Ventilation (SIMV)**
- **Pressure Support (PSVPro) with Apnea Backup ventilation** — (optional)

**Ventilator (V) parameter ranges**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Settings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tidal volume range</td>
<td>20 to 1500 mL (Volume Control and SIMV modes)</td>
</tr>
<tr>
<td></td>
<td>5 to 1500 mL (Pressure Control Mode)</td>
</tr>
<tr>
<td>Incremental settings</td>
<td>20 to 100 mL (increments of 5 mL)</td>
</tr>
<tr>
<td></td>
<td>100 to 300 mL (increments of 10 mL)</td>
</tr>
<tr>
<td></td>
<td>300 to 1000 mL (increments of 25 mL)</td>
</tr>
<tr>
<td></td>
<td>1000 to 1500 mL (increments of 50 mL)</td>
</tr>
<tr>
<td>Minute volume range</td>
<td>0 to 99.9 L/min</td>
</tr>
<tr>
<td>Pressure (P_{Inspired})</td>
<td>5 to 60 cm H₂O (increments of 1 cm H₂O)</td>
</tr>
<tr>
<td>Pressure (P_{limit})</td>
<td>12 to 100 cm H₂O (increments of 1 cm H₂O)</td>
</tr>
<tr>
<td>Pressure (P_{support})</td>
<td>Off, 2 to 40 cm H₂O (increments of 1 cm H₂O)</td>
</tr>
<tr>
<td>Rate</td>
<td>4 to 100 breaths per minute for Volume Control and Pressure Control;</td>
</tr>
<tr>
<td></td>
<td>2 to 60 breaths per minute for SIMV, PSV/Pro and SIMV–PC+PSV (increments of 1 breath per minute)</td>
</tr>
<tr>
<td>Inspiratory/expiratory ratio</td>
<td>2.1 to 1.8 (increments of 0.5)</td>
</tr>
<tr>
<td>Inspiratory time</td>
<td>0.2 to 5.0 seconds (increments of 0.1 seconds)</td>
</tr>
<tr>
<td>(SIMV and PSV Pro)</td>
<td></td>
</tr>
<tr>
<td>Trigger window</td>
<td>0 to 80% (increments of 5%)</td>
</tr>
<tr>
<td>Flow trigger</td>
<td>0.2 to 1.0 L/min (increments of 0.2 L/min)</td>
</tr>
<tr>
<td></td>
<td>1 to 10 L/min (increments of 0.5 L/min)</td>
</tr>
<tr>
<td>Inspiration termination level</td>
<td>5 to 75% (increments of 5%)</td>
</tr>
<tr>
<td>Backup mode delay</td>
<td>10 to 30 seconds (increments of 5 seconds)</td>
</tr>
</tbody>
</table>

*Lower cabinet can be configured with a variety of shelf and drawer combinations
Ventilator Operating Specifications, continued

**Positive End Expiratory Pressure (PEEP)**
- **Type:** Integrated, electronically controlled
- **Range:** OFF, 4 to 30 cm H$_2$O (increments of 1 cm H$_2$O)

**Ventilator performance**
- **Pressure range at inlet:** 240 kPa to 700 kPa/35 psig to 100 psig
- **Peak gas flow:** 120 L/min + fresh gas flow
- **Flow valve range:** 1 to 120 L/min
- **Flow compensation range:** 200 mL/min to 15 L/min

**Ventilator monitoring**
- **Expiratory minute volume range:** 0 to 99.9 L/min
- **Expiratory tidal volume range:** 0 to 1500 mL
- **O$_2$%:** 5 to 110%
- **Peak pressure:** –20 to 120 cm H$_2$O
- **Mean pressure:** –20 to 120 cm H$_2$O
- **Plateau pressure:** 0 to 120 cm H$_2$O
- **Pressure waveform sweep speed:** 4-25 breaths per minute (0 to 15 seconds)
  - 26 to 75 breaths per minute (0 to 5 seconds)
  - 75 breaths per minute (0 to 3 seconds)

**Ventilator Accuracy**
- **Delivery/monitoring accuracy**
  - **Volume delivery:**
    - > 210 mL = better than 7%
    - < 210 mL = better than 15 mL
    - < 60 mL = better than 10 mL
  - **Pressure delivery:** ±10% or ±3 cm H$_2$O
  - **PEEP delivery:** ±1.5 cm H$_2$O
  - **Volume monitoring:**
    - > 210 mL = better than 9%
    - < 210 mL = better than 18 mL
    - < 60 mL = better than 10 mL
  - **Pressure monitoring:** ±5% or ±2 cm H$_2$O
- **Alarm settings**
  - **Tidal volume (V$_t$):**
    - Low: OFF, 0 to 1500 mL
    - High: 20 to 1600 mL, OFF
  - **Minute volume (V$_E$):**
    - Low: OFF, 0 to 10 L/min
    - High: 30 to 50 L/min, OFF
  - **Inspired oxygen (FIO$_2$):**
    - Low: 18 to 100%
    - High: 18 to 100%, OFF
  - **Apnea alarm:** Mechanical ventilation ON:
    - < 5 mL breath measured in 30 seconds
  - **Mechanical ventilation OFF:**
    - < 5 mL breath measured in 30 seconds
  - **Low airway pressure:** 4 cm H$_2$O above PEEP
  - **High pressure:** 12 to 100 cm H$_2$O (increments of 1 cm H$_2$O)
  - **Sustained airway pressure:**
    - Mechanical ventilation ON:
      - P$_{max}$ < 30 cm H$_2$O, sustained limit is 6 cm H$_2$O
      - P$_{max}$ 30 - 60 cm H$_2$O, sustained limit is 20% of P$_{max}$
      - P$_{max}$ > 60 cm H$_2$O, the sustained limit is 12 cm H$_2$O
    - PEEP and mechanical ventilation ON:
      - Sustained limit increases by PEEP minus 2 cm H$_2$O
      - Mechanical ventilation OFF:
        - P$_{max}$ 60 cm H$_2$O, sustained limit is 50% of P$_{max}$
        - P$_{max}$ > 60 cm H$_2$O, the sustained limit is 30 cm H$_2$O
    - **Subatmospheric pressure:** Paw < -10 cm H$_2$O
    - **Alarm silence countdown timer:** 120 to 0 seconds

**Ventilator Components**
- **Flow transducer**
  - **Type:** Variable orifice flow sensor
  - **Dimensions:** 22 mm OD and 15 mm ID
  - **Location:** Inspiratory outlet and expiratory inlet
  - **Optional autoclavable sensor available**

- **Oxygen sensor**
  - **Type:** Galvanic fuel cell
  - **Life cycle:** Approximately 18 months (dependent on usage)

- **Anesthetic agent delivery**
  - **Vaporizers:** Tec 4, Tec 5, Tec 6 Plus, Tec 7
  - **Number of positions:** 2 or 3
  - **Mounting:** Tool-free installation Selectatec® manifold interlocks and isolates vaporizers

**Electrical Specifications**
- **Current leakage**
  - 120 V: < 300μA

- **Light package**
  - **Task light:** 12 V, 3 lamps, type 194, 270A each
  - **Goose neck (optional):** 12 V, type 1815, 200A

- **Power and battery backup**
  - **Power input:** 120 Vac, 60 Hz, 10A
  - **Backup power:** Demonstrated battery backup time under typical operating conditions is 45 minutes when fully charged
  - **Battery type:** Internal rechargeable sealed lead acid
  - **Power cord:** Length: 5 m/16.4 ft
  - **Rating:** 15A @ 120 Vac

- **Communication Port**
  - **Serial interface:** Isolated RS-232C compatible port

- **Inlet/outlet modules (120 V)**
  - **System circuit breakers:** No outlets 5A w/outlets 10A
  - **Outlets (optional):** 4 outlets on back, 3-2A, 1-3A individual breakers and 1-5A combined outlet breaker, optional isolation transformer
  - **Auxiliary outlet box (optional):** 5 NEMA outlets on dovetail-mounted box, 5-2A breakers, isolation transformer
  - **Tec 6 Plus outlet:** 1 IEC 320 located above vaporizer backbar

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GE Datex Ohmeda Aestiva 5
Anesthesia Delivery System

1800 Williamson Ct. • Louisville, Kentucky 40223 USA
800-477-2006 • 502-244-4444 • FAX: 502-244-0369

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Equipment for the way you operate
Pneumatic Specifications

Internal common gas outlet
Connector: ISO 22 mm OD and 15 mm ID

Auxiliary common gas outlet (optional)
Connector: ISO 22 mm OD and 15 mm ID

Gas supply
Pipeline input range: 240 kPa to 600 kPa/35 psig to 88 psig
Pipeline connections: DISS-male
All fittings available for O₂, N₂, O₃, CO₂, O₂/He with reduction in O₂ pressure
Cylinder input: Pin indexed in accordance with CGA-V-1; contains input filter and check valve
Primary regulator diaphragm minimum burst pressure: 2758 kPa/400 psig
Primary regulator nominal output: < 338 kPa/49 psig
Pin indexed cylinder connections

Gas power outlet (optional)
Connector: DISS indexed in accordance with CGA-V-3
Gas: Oxygen
Pressure flow characteristics: Varies with source
O₂ controls
Method: Proportionate decrease of N₂, CO₂, O₂/He with reduction in O₂ pressure
Supply failure alarm: Range: 193 kPa to 221 kPa/28 psig to 32 psig Sounds at maximum volume every 10 seconds
O₂ flush: Range: 35 to 50 L/min

Flowmeters

O₂ ranges:
Two tubes: 0.05 to 0.95 L/min and 1 to 15 L/min
Minimum O₂ flow: 50 mL/min ± 25 mL
N₂O ranges:
Two tubes: 0 to 0.95 L/min and 1 to 10 L/min
Air range:
One tube option: 1 to 15 L/min
Two tube option: 0 to 0.95 and 1 to 15 L/min (low flow tube optional)
CO₂ (optional): One tube: 0 to 0.5 L/min
Heliox range (optional): One tube: 0 to 15 L/min
Calibration:

<table>
<thead>
<tr>
<th>Percent of full scale flow</th>
<th>Accuracy (% of flowrate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>±2.9%</td>
</tr>
<tr>
<td>90</td>
<td>±2.5%</td>
</tr>
<tr>
<td>80</td>
<td>±2.6%</td>
</tr>
<tr>
<td>70</td>
<td>±2.7%</td>
</tr>
<tr>
<td>60</td>
<td>±2.9%</td>
</tr>
<tr>
<td>50</td>
<td>±3.1%</td>
</tr>
<tr>
<td>40</td>
<td>±3.4%</td>
</tr>
<tr>
<td>30</td>
<td>±4.0%</td>
</tr>
<tr>
<td>20</td>
<td>±5.0%</td>
</tr>
<tr>
<td>10</td>
<td>±8.1%</td>
</tr>
</tbody>
</table>

Calibration conditions:
* 20°C/68°F
  101.3 kPa/760 mmHg

* Different breathing circuit pressures, barometric pressures or temperatures change flowtube accuracy.

Flowmeters, continued

Hypoxic guard system
Type: Mechanical Link-25™
Range: Provides a nominal 25% concentration of oxygen in any O₂/N₂/O mixture

Environmental Specifications

System operation
Temperature: 10° to 40°C/50° to 104°F
Humidity: 15 to 95% relative humidity (non-condensing)
Altitude: –440 to 3565 m/500 to 800 mmHg

System storage
Temperature: –25° to 65°C/–13° to 149°F
Humidity: 10 to 100% relative humidity (including condensing)
Altitude: –440 to 5860 m/375 to 800 mmHg

Oxygen cell storage: –15° to 50°C/5° to 122°F
50 to 800 mmHg

Electromagnetic compatibility

Immunity: Complies with all requirements of EN 60601-1-2
Emissions: CISPR 11 group 1 class B
Approvals: UL 2601-1,
CSA C22.2 #601.1
IEC 601-1
EN 60601-1