GE Healthcare

Aestiva/5 MRI anesthesia machine

Complete your MRI suite

Features
- Validated for use in MRI environments up to 300 Gauss, active shielded 1.5T and 3T magnets
- Physically integrated magnetic field strength monitor (Gauss Alarm)
- Low overall height
- Features facilitate use in both the MRI suite and surgical OR

Superior ventilation: 7900 SmartVent™
- Volume Mode, Pressure Control Mode, Pressure Support (PSVPro®), Synchronized Intermittent Mandatory Ventilation (SIMV), electronic PEEP
- Tidal volume compensation
- One motion from mechanical to manual mode
- Two key presses to total standby: end case
- Cardiac bypass case mode

Innovative patient breathing system
- Eight integrated machine hoses/cables
- “No tools” disassembly of components
- Autoclavable and latex-free
- Responsive location of common gas outlet

Improved low flow/reduced life cycle costs
- Fresh gas flow compensation—automatically
- Smooth, fast acting fresh gas flow control
- Minimum O₂ flow of 50 mL
- Dual air flow tube for resolution of low flows
- Two scheduled maintenance checks per year
## Physical specifications

### Dimensions
- Height: 152 cm/59.8 in
- Width: 97.5 cm/38.4 in
- Depth: 83 cm/32.7 in
- Weight: Approximately 136 kg/300 lb

### Work surface
- Height: 87.5 cm/34.5 in
- Width: 47 cm/18.5 in
- Depth: 31.5 cm/12.4 in

### Drawer (1 standard) — locking (international dimensions)
- Height: 10.5 cm/4.1 in
- Width: 38.5 cm/15.2 in
- Depth: 26 cm/10.2 in

### Folding side shelf (optional)
- Height: 87.5 cm/34.5 in
- Width: 26.5 cm/10.4 in
- Depth: 31.5 cm/12.4 in
- Weight limit: 11.3 kg/25 lb

### DIN rail (optional)
- Side of tabletop: 30 cm/12 in
- Side of machine: 23.5 cm/9.25 in

### Absorber

#### Non-adjustable Adjustable
- Bag arm length: 25.4 cm/10 in 30.5 cm/12 in
- Bag arm height: 91.5 cm/36 in 87 to 104 cm/34.3 to 40.9 in
- Absorber rotation: 24° 24°

### Casters
- Diameter: 12.5 cm/5 in
- Brakes: Single foot lever locks and unlocks two front casters

### Magnetic field strength monitor (Gauss Alarm)

<table>
<thead>
<tr>
<th>Front bezel indicators</th>
<th>Green light</th>
<th>Amber light</th>
<th>Red light</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 275 Gauss</td>
<td>&lt; 275 Gauss</td>
<td>275 to 300 Gauss</td>
<td>&gt; 300 Gauss</td>
</tr>
<tr>
<td>Monitor is sampling and magnetic fringe field is</td>
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</tr>
<tr>
<td>&lt; 275 Gauss</td>
<td>275 to 300 Gauss</td>
<td>275 to 300 Gauss</td>
<td>&gt; 300 Gauss</td>
</tr>
<tr>
<td>is sounding</td>
<td></td>
<td></td>
<td>light is blinking and audio alarm is sounding</td>
</tr>
</tbody>
</table>

* Aestiva/5 MRI can be configured with only one drawer.
Ventilator operating specifications

Ventilation operating modes

Volume Control

Pressure Control

Synchronized Intermittent Mandatory Ventilation (SIMV) (optional)

Pressure Support (PSVPro) with Apnea Backup ventilation (optional)

Ventilator \( V_t \) parameter ranges

- Tidal volume range: 20 to 1500 mL (Volume Control and SIMV modes)
- Incremental settings: 20 to 100 mL (increments of 5 mL) 100 to 300 mL (increments of 10 mL) 300 to 1000 mL (increments of 25 mL) 1000 to 1500 mL (increments of 50 mL)

- Minute volume range: 0 to 99.9 L/min
- Pressure \( P_{\text{inspired}} \) range: 5 to 60 cm H\textsubscript{2}O (increments of 1 cm H\textsubscript{2}O)
- Pressure \( P_{\text{limit}} \) range: 12 to 100 cm H\textsubscript{2}O (increments of 1 cm H\textsubscript{2}O)
- Pressure \( P_{\text{support}} \) range: OFF, 2 to 40 cm H\textsubscript{2}O (increments of 1 cm H\textsubscript{2}O)
- Rate: 4 to 100 breaths per minute for Volume Control and Pressure Control; 2 to 60 breaths per minute for SIMV, PSVPro and SIMV–PC+PSV (increments of 1 breath per minute)

Inspiratory/expiratory ratio: 2:1 to 1:8 (increments of 0.5)

Inspiratory time: 0.2 to 5 seconds (increments of 0.1 seconds) (SIMV and PSVPro)

Trigger window: 0 to 80% (increments of 5%)

Flow trigger: 0.2 to 1 L/min (increments of 0.2 L/min) 1 to 10 L/min (increments of 0.5 L/min)

Inspiration termination level: 5 to 75% (increments of 5%)

Backup mode delay: 10 to 30 seconds (increments of 5 seconds)

Positive End Expiratory Pressure (PEEP)

Type: Integrated, electronically controlled

Range: OFF, 4 to 30 cm H\textsubscript{2}O (increments of 1 cm H\textsubscript{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 9999 mL

O\textsubscript{2}%: 8 to 100%

Peak pressure: –20 to 120 cm H\textsubscript{2}O

Mean pressure: –20 to 120 cm H\textsubscript{2}O

Plateau pressure: 0 to 120 cm H\textsubscript{2}O

Pressure waveform sweep speed: 2 to 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 H₂O

**PEEP delivery:**
- ±1.5 cm H₂O

**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 H₂O

**Alarm settings**

**Tidal volume (VTE):**
- Low: OFF, 0 to 1500 mL
- High: 20 to 1600 mL, OFF

**Minute volume (VE):**
- Low: OFF, 0 to 10 L/min
- High: 0 to 30 L/min, OFF

**Inspired oxygen (FiO₂):**
- 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 H₂O above PEEP

**High pressure:**
- 12 to 100 cm H₂O (increments of 1 cm H₂O)

**Sustained airway pressure:**
- Mechanical ventilation ON: Plimit < 30 cm H₂O, the sustained limit is 6 cm H₂O
- Plimit 30 - 60 cm H₂O, sustained limit is 20% of Plimit
- Plimit > 60 cm H₂O, sustained limit is 12 cm H₂O

- PEEP and mechanical ventilation ON: Sustained limit increases by PEEP minus 2 cm H₂O

- Mechanical ventilation OFF:
  - Plimit ≤ 60 cm H₂O, sustained limit is 50% of Plimit
  - Plimit > 60 cm H₂O, sustained limit is 30 cm H₂O

**Subatmospheric pressure:**
- Paw < -10 cm H₂O

**Alarm silence countdown timer:**
- 120 to 0 seconds

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**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)

**Ventilator screen**

- **Height:** 7.6 cm/3 in
- **Width:** 15.2 cm/6 in

**Anesthetic agent delivery**

**Delivery**

- **Vaporizers:** Tec 5, Tec 7
- **Number of positions:** 2
- **Mounting:** Tool-free installation Selectate® manifold interlocks and isolates vaporizers

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**NOTE:** Tec 6 Plus Vaporizers cannot be used in MRI environments.
**Electrical specifications**

**Current leakage**

120 V: < 300µA
220 V: < 500µA

**Power and battery back-up**

<table>
<thead>
<tr>
<th>Region</th>
<th>Power input</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA/Canada/Mexico:</td>
<td>120 Vac, 60 Hz, 10A</td>
</tr>
<tr>
<td>Euro:</td>
<td>220-240 Vac, 50 Hz, 6A</td>
</tr>
<tr>
<td>Italy/France/Belgium:</td>
<td>230 Vac, 50 Hz, 6A</td>
</tr>
<tr>
<td>Japan:</td>
<td>100 Vac, 50 or 60 Hz, 10A</td>
</tr>
<tr>
<td>UK:</td>
<td>240 Vac, 50 Hz, 6A</td>
</tr>
</tbody>
</table>

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: 10A @ 250 Vac or 15A @ 120 Vac

**Communication port**

Serial interface: Isolated RS-232C compatible port

**Inlet/outlet modules**

<table>
<thead>
<tr>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>220-240 V</td>
</tr>
<tr>
<td>100-120 V</td>
</tr>
</tbody>
</table>

System circuit breakers: No outlets

**Pneumatic specifications**

**Internal common gas outlet**

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, DISS-female, DIN 13252, AS4059, F90-116, or NIST (ISO 5359). All fittings available for O₂, N₂O and Air, and contain pipeline filter and check valve.

Cylinder input: Pin indexed in accordance with CGA-V-1 or DIN (nut and gland); contains input filter and check valve
Note: Maximum 2 cylinders of each gas; 4 cylinders total

Primary regulator diaphragm minimum burst pressure: 2758 kPa/400 psig

Primary regulator nominal output: ≤ 338 kPa/49 psig
Pin indexed cylinder connections
≤ 407 kPa/59 psig, DIN cylinder connections

**Gas power outlet (optional)**

Connector: DISS indexed in accordance with CGA-V-5 or Anotr

Gas: Oxygen

Pressure and flow characteristics: Varies with source
**Pneumatic specifications, continued**

### O₂ controls

**Method:** Proportionate decrease of N₂O, CO₂, He/O₂ with reduction in O₂ pressure

**Supply failure alarm range:** 193 kPa to 221 kPa/28 psig to 32 psig

**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>±2.5%</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.

### Hypoxic guard system

**Type:** Mechanical Link-25™

**Range:** Provides a nominal minimum 25% concentration of oxygen in O₂/N₂O mixture.

### Materials

All materials in contact with patient breathing gases are free of natural rubber latex.

**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

10 to 95% relative humidity 500 to 800 mmHg

**Safety and compliance**

**Immutiy:** 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

CE 0197
Breathing circuit specifications

Operational modes

Breathing circuit modules: Interchangeable circle or bain (Mapleson D)

Carbon dioxide absorbent canisters (2)

Absorbent capacity: 1.35 kg/3 lb each
Canister release: Integrated sensing mechanism, CO₂ bypass capability (optional)

Ports and connectors

Exhalation: 22 mm OD ISO 15 mm ID taper
Inhalation: 22 mm OD ISO 15 mm ID taper
Bag port: 22 mm OD

Pressure gauge

Scale range: 0 to 10 kPa/-20 to 100 cm H₂O

Bag-to-Ventilator switch

Type: Bi-stable
Control: Controls ventilator and direction of breathing gas within the circuit.

Materials

All materials in contact with exhaled patient gases are autoclavable, except standard flow sensors.
All materials in contact with patient breathing gases are free of natural rubber latex.

Breathing circuit parameters

Compliance:

Bag mode Mechanical mode
5.15 mL/cm H₂O Automatically compensates for compression losses within the absorber and bellows assembly.

Circuit volume: 5.5 L

Expiratory resistance:

<table>
<thead>
<tr>
<th>Flow rate</th>
<th>P_{esp} Pressure drop</th>
<th>P_{exp} Pressure drop</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 L/min</td>
<td>0.74 cm H₂O</td>
<td>1.00 cm H₂O</td>
</tr>
<tr>
<td>30 L/min</td>
<td>2.32 cm H₂O</td>
<td>2.36 cm H₂O</td>
</tr>
<tr>
<td>60 L/min</td>
<td>5.93 cm H₂O</td>
<td>5.26 cm H₂O</td>
</tr>
</tbody>
</table>

Integrated Adjustable Pressure Limiting (APL) valve

Range: 0.8 to 70 cm H₂O
Tactile knob indication at: 30 cm H₂O and above
Adjustment range of rotation: 0.8 to 30 cm H₂O/0 to 230°
30 to 70 cm H₂O/230 to 330°

Anesthetic gas scavenging

Type Market Hospital Machine system connection
Active low flow: US and others High vacuum 36 L/min 300 mmHg DISS evac
without flow indicator:
Active low flow Japan Adjustable Venturi with flowmeter 12.7 mm/ 0.5 in
> 30 L/min hose barb
Active high flow: UK/related Low vacuum 40 - 130 L/min 30 mm/1.2 in BSI Male threaded
Passive: Germany Venturi 50 L/min 25mm/0.98 in hose barb
Passive: Generic Passive or 30 mm/1.2 in externally attached active system M ISO taper
Passive: Sweden Venturi/Ejector > 30 L/min 12mm/0.47 in hose barb
Passive: Norway Venturi/Ejector > 30 L/min 8 mm/0.31 in hose barb
For more than 100 years, healthcare providers worldwide have relied on GE Healthcare for medical technology, services, and productivity solutions. So no matter what challenges your healthcare system faces, you can always count on GE to help you deliver the highest quality healthcare. For details, please contact your GE representative today.

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