

Aestiva™/5 7100 anesthesia machine

An evolution of performance
and value



*Two vaporizer configuration
shown with optional
Cardiocap™/5 monitor*



*Three vaporizer configuration
shown with two optional drawers
and Cardiocap™/5 monitor*

Features

- Low overall height
- User configurable drawers/shelving

Ventilation

- Volume and Pressure modes with electronic PEEP
- Exhaled volume, airway pressure and inspired oxygen monitoring capabilities
- Direct access to ventilator parameter settings
- Smart alarms direct user to specific problems and affected parameters
- Pressure bar graph for visual reference on a breath-by-breath basis (optional pressure waveform available)

Innovative patient breathing system

- Mechanical bag/vent switch turns the ventilator on/off
- Integrated machine hoses/cables to minimize disconnects
- “No tools” disassembly of components
- Autoclavable and latex-free

Improved low flow/reduced life cycle costs

- Fresh gas flow compensation – automatically
- Minimum O₂ flow of 50 mL
- Optional dual air flow tubes for resolution of low flows
- Two scheduled maintenance checks per year

Physical specifications

Dimensions

| | 2 Vaporizer configuration | 3 Vaporizer configuration |
|---------|----------------------------------|----------------------------------|
| Height: | 135.8 cm/53.4 in | 135.8 cm/53.4 in |
| Width: | 75 cm/29.5 in | 93 cm/36.6 in |
| Depth: | 83 cm/32.7 in | 83 cm/32.7 in |
| Weight: | Approximately 136 kg/300 lbs | Approximately 154 kg/340 lbs |

Top shelves (optional)

| | 2 Vaporizer configuration | 3 Vaporizer configuration |
|---------------|---|-------------------------------------|
| Weight limit: | 46 kg/ 100 lbs | 46 kg/100 lbs |
| Width: | 47.5, 67.5 or 87.5 cm/ 18.7, 26.6 or 34.4 in | 87.5 or 67.5 cm/ 34.4 or 26.6 in |
| Depth: | 41 cm/16.1 in | 41 cm/16.1 in |

Work surface

| | |
|---------|-----------------|
| Height: | 87.5 cm/34.5 in |
| Width: | 47 cm/18.5 in |
| Depth: | 31.5 cm/12.4 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 lbs |

DIN rail (optional)

| | |
|-------------------|-----------------|
| Side of tabletop: | 30 cm/12 in |
| Side of machine: | 23.5 cm/9.25 in |

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

| | |
|---------|-----------------|
| Height: | 10.5 cm/4.1 in |
| Width: | 38.5 cm/15.2 in |
| Depth: | 26 cm/10.2 in |

Lower drawers (optional)*

| | |
|---------|-----------------|
| Height: | 14.5 cm/5.7 in |
| Width: | 38.5 cm/15.2 in |
| Depth: | 26 cm/10.2 in |

Lower shelves (optional)*

| | | |
|----------|------------------|------------------|
| Heights: | 9.2 cm/3.7 in | 13.2 cm/5.2 in |
| | 20.6 cm/8.2 in | 24.6 cm/9.8 in |
| | 28.6 cm/11.4 in | 36 cm/14.4 in |
| Width: | 42.5 cm/16.75 in | 42.5 cm/16.75 in |
| Depth: | 36 cm/14 in | 36 cm/14 in |

Absorber bag arms

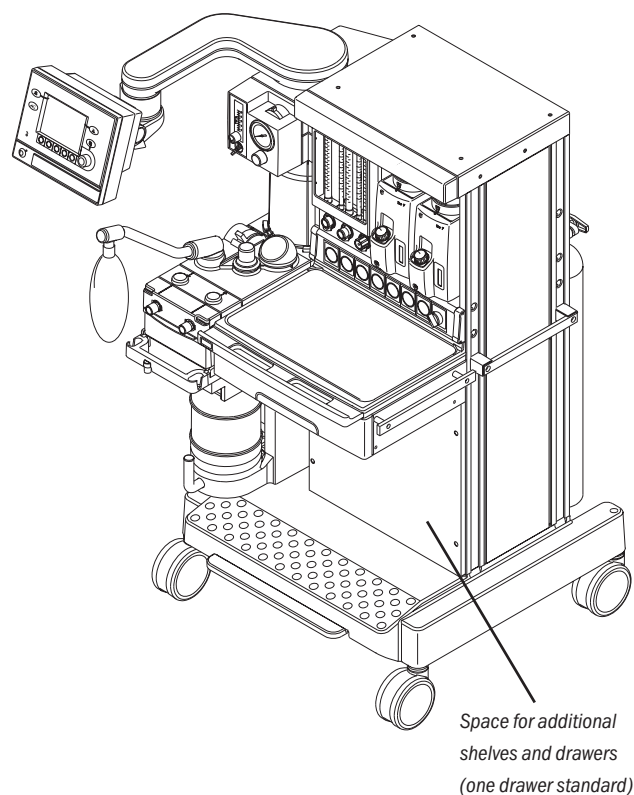
| | Adjustable | Non-adjustable |
|-----------------|-------------------|-----------------------|
| Arm length: | 30.5 cm/12 in | 25.4 cm/10 in |
| Bag arm height: | 87 cm/34.3 in | 91.5 cm/36 in |
| | 104 cm/40.9 in | |

Absorber

| | |
|-----------|-----|
| Rotation: | 85° |
|-----------|-----|

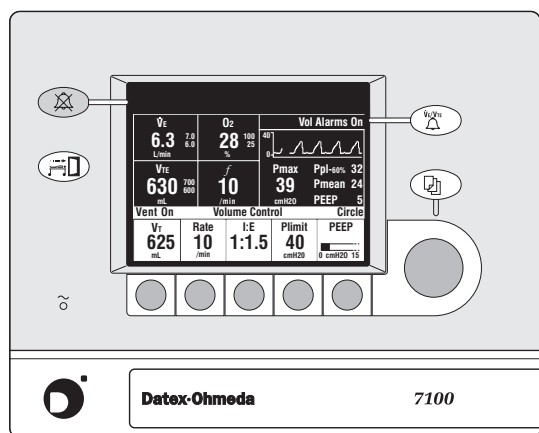
Casters

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



* Lower cabinet can be configured with a variety of shelf and drawer combinations

Ventilator operating specifications



Optional pressure waveform shown

Modes of ventilation

Volume Control Mode

With tidal volume compensation

Pressure Mode (optional)

Ventilation parameters

Tidal volume range: 45 to 1500 mL

Incremental

settings: 45 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)

Pressure

(P_{Inspired}) range: 5 to 50 cm H₂O (increments of 1 cm H₂O)
(Pressure mode)

Rate: 4 to 65 breaths per minute
(increments of 1 breath per minute)

Inspiratory/
expiratory ratio: 2:1 to 1:6 (increments of 0.5)

Inspiratory
pause adjust: 5% to 60% of inspiratory time (increments of 5%)

Positive End Expiratory Pressure (PEEP)

Type: Integrated, electronically controlled

Range: OFF, 4 to 30 cm H₂O (increments of 1 cm H₂O)

Ventilator monitored values

Tidal volume: 5 to 1500 mL, 1 mL resolution

Minute volume: 0 to 99.9 L/min, 0.1 L/min resolution

Breathing rate: 0 to 65 breaths per minute,
1 breath per minute resolution

Oxygen
percentage: 5% to 110%, 1% resolution

Airway pressure: -9 to 99 cm H₂O, 1 cm H₂O resolution

Alarm settings

Tidal volume ($V_{T\text{E}}$): Low: OFF, 5 to 1500 mL
High: 20 to 1600 mL, OFF

Minute volume (V_{E}): Low: OFF, 0.1 to 10 L/min
High: 0.5 to 30 L/min, OFF

Inspired oxygen
(FiO_2): Low: 18 to 100%
High: 21 to 100%, OFF

Apnea alarm: *Mechanical ventilation ON:*
< 5 mL breath measured in 30 seconds
Mechanical ventilation OFF:
< 25 mL breath measured in 30 seconds

Low airway
pressure: Change of 4 cm H₂O above PEEP

Pressure
(P_{limit}) range: 12 to 99 cm H₂O (increments of 1 cm H₂O)

Sustained airway
pressure: Adjustable: 6 to 30 cm H₂O

Subatmospheric
pressure: $P_{\text{aw}} < -10$ cm H₂O

Alarm silence
countdown timer: 120 to 0 seconds

Ventilator accuracy

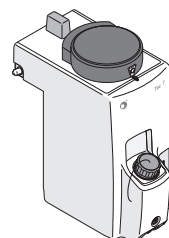
| Delivery/monitoring accuracy | |
|---|---|
| Volume delivery: | > 200 mL = better than ±10% Set TV 75 to 200 mL = better than ±20 mL < 75 mL = better than ±15 mL |
| Pressure (P _{Inspired}) delivery repeatability: | ±2 cm H ₂ O |
| PEEP delivery repeatability: | ±2 cm H ₂ O |
| Volume monitoring: | > 200 mL = better than ±10% 75 to 200 mL = better than ±20 mL < 75 mL = better than ±15 mL |
| Pressure monitoring: | Better than ±2 cm H ₂ O or ±5% of reading (whichever is greater) |

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 |
| Ventilator pneumatics | |
| Pressure range at inlet: | 240 kPa to 700 kPa/35 psig to 100 psig |
| Peak gas flow: | 70 L/min + fresh gas flow |
| Flow range: | 2 to 70 L/min |
| Flow compensation range: | 200 mL/min to 15 L/min |
| Ventilator screen | |
| Display size: | 120 mm x 92 mm |
| Display density: | 1/4 VGA standard |
| Battery back-up | |
| Backup power: | Demonstrated battery time under typical operating conditions is 90+ minutes when fully charged. Battery time under extreme conditions is 30 minutes. |
| Battery type: | Internal rechargeable sealed lead acid |
| Communication port | |
| Serial interface: | Isolated RS-232C compatible port |

Anesthetic agent delivery

| Delivery | |
|----------------------|--|
| Vaporizers: | Tec 5, Tec 6 Plus, Tec 7 |
| Number of positions: | 2 or 3 |
| Mounting: | Tool-free installation Selectatec® manifold interlocks and isolates vaporizers |



Tec 7



Tec 6 Plus

Electrical specifications

| Current leakage | |
|-----------------|--|
| 120 V: | < 300µA |
| 220 V: | < 500µA |
| Power | |
| Power input: | USA/Canada/Mexico: 120 Vac, 60 Hz Euro: 220-240 Vac, 50 Hz France/Belgium: 230 Vac, 50 Hz Japan: 100 Vac, 50 or 60 Hz UK: 240 Vac, 50 Hz |
| Power cord: | Length: 5 m/16.4 ft Rating: 10A @ 250 Vac or 15A @ 120 Vac |

| Inlet/outlet modules | | | |
|--------------------------|--|--|--|
| | 220-240 V | 120 V | 100 V |
| System circuit breakers: | No outlets 3A w/outlets 6A | No outlets 5A w/outlets 10A | No outlets 5A w/outlets 10A |
| Outlets (optional): | 4 outlets on back, 3-1A, 1-2A individual breakers and 1-3A combined outlet breaker, optional isolation transformer | 4 outlets on back, 3-2A, 1-3A individual breakers and 1-5A combined outlet breaker, optional isolation transformer | 3 outlets on back, 2-2A, 1-4A individual breakers and 1-5A combined outlet breaker, optional isolation transformer |

Electrical specifications, continued

| | | |
|----------------------------------|---|--|
| Auxiliary outlet box (optional): | 5 CEE 7/7 outlets on dovetail-mounted box, 5-2A breakers, isolation transformer | 5 NEMA outlets on dovetail-mounted box, 5-2A breakers, isolation transformer |
| Tec 6 outlet: | 1 IEC 320 located above vaporizer backbar | |

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, DISS-female, DIN 13252, AS4059, F90-116, PrEN737-6, or NIST (ISO 5359) All fittings available for O ₂ , N ₂ O, 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 5 cylinders; three inboard mounted, two outboard mounted; one oxygen, one other. |
| 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 Anatrir |
| Gas: | Oxygen |
| Pressure and flow characteristics: | Varies with source |

O₂ controls

| | |
|-----------------------|---|
| Method: | Proportionate decrease of N ₂ O, CO ₂ , He/O ₂ with reduction in O ₂ pressure |
| Supply failure alarm: | Range: 193 kPa to 221 kPa/28 psig to 32 psig Sounds at maximum volume every 10 seconds |
| O ₂ flush: | Range: 35 to 50 L/min |

Flowmeters

| | |
|-----------------------------|---|
| O ₂ ranges: | Two tubes: 0.05 to 0.95 L/min and 1 to 15 L/min Minimum O ₂ flow: 50 mL/min ±25 mL |
| N ₂ O 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) |
| CO ₂ (optional): | One tube: 0 to 0.5 L/min |
| Heliox range (optional): | One tube: 0 to 15 L/min |

| | | |
|--------------|-----------------------------------|---------------------------------|
| Calibration: | Percent of full scale flow | Accuracy (% of flowrate) |
| | 100 | ±2.5% |
| | 90 | ±2.5% |
| | 80 | ±2.6% |
| | 70 | ±2.7% |
| | 60 | ±2.9% |
| | 50 | ±3.1% |
| | 40 | ±3.4% |
| | 30 | ±4.0% |
| | 20 | ±5.0% |
| | 10 | ±8.1% |

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 O ₂ /N ₂ O 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) per IEC 68-2-3 |
| Altitude: | -440 to 3565 m/500 to 800 mmHg |

System storage

| | |
|-------------------------|--|
| Temperature: | -20° to 70°C/-4° to 158°F |
| Humidity: | 10 to 95% relative humidity (including condensing) per IEC 68-2-3 |
| 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

| | |
|------------|---|
| 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 EN/IEC 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 |

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 H ₂ O |
|--------------|--|

Bag-to-Ventilator switch

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

Integrated Adjustable Pressure Limiting (APL) valve

| | |
|----------------------------------|---|
| Range: | 0.8 to 70 cm H ₂ O |
| Tactile knob indication at: | 30 cm H ₂ O and above |
| Adjustment range of rotation: | 0.8 to 30 cm H ₂ O (0 to 230°) 30 to 70 cm H ₂ O (230 to 330°) |

Materials

All materials in contact with exhaled patient gases are autoclavable, except standard flow sensors. (Autoclavable sensors optional)

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

Breathing circuit specifications, continued

Breathing circuit parameters

| | | | |
|------------------------|------------------|---|--------------------------|
| Compliance: | Bag mode: | 5.15 mL/cm H ₂ O | |
| | Mechanical mode: | Automatically compensates for compression losses within the absorber and bellows assembly | |
| Circuit volume: | 5.5 L | | |
| Expiratory resistance: | | P_{insp} | P_{exp} |
| | Flow rate | Pressure drop | Pressure drop |
| | 10 L/min | 0.74 cm H ₂ O | 1.00 cm H ₂ O |
| | 30 L/min | 2.32 cm H ₂ O | 2.36 cm H ₂ O |
| | 60 L/min | 5.93 cm H ₂ O | 5.26 cm H ₂ O |

Anesthetic gas scavenging

| Type | Market | Hospital system required | Machine connection |
|---|------------------|---|-----------------------------------|
| Active low flow: | US and others | High vacuum 36 L/min (300 mmHg) @ 12 in Hg | DISS evac |
| Active low flow without flow indicator: | Japan | Adjustable Venturi with flowmeter > 30 L/min | 12.7 mm/ 0.5 in 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 | 25 mm/0.98 in hose barb |
| Passive: | Generic | Passive or externally attached active system | 30 mm/1.2 in M ISO taper |
| Passive: | Sweden Norway | Venturi/Ejector > 30 L/min | 12 mm/0.47 in hose barb |
| Passive: | Denmark | Venturi/Ejector > 30 L/min | 8 mm/0.31 in hose barb |



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