

Aestiva™/5 anesthesia machine

More than superior ventilation



Aestiva™/5
Two vaporizer configuration



Aestiva™/5
Three vaporizer configuration

Features

Superior ventilation

- 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

Open systems architecture

- Lower overall height
- User configurable drawers/shelving

Innovative patient breathing system

- Eight machine hoses/cables integrated
- “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, faster acting fresh gas flow control
- Minimum O₂ flow of 50 mL
- Dual air flow tube for low flow
- 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:	87.6 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)*

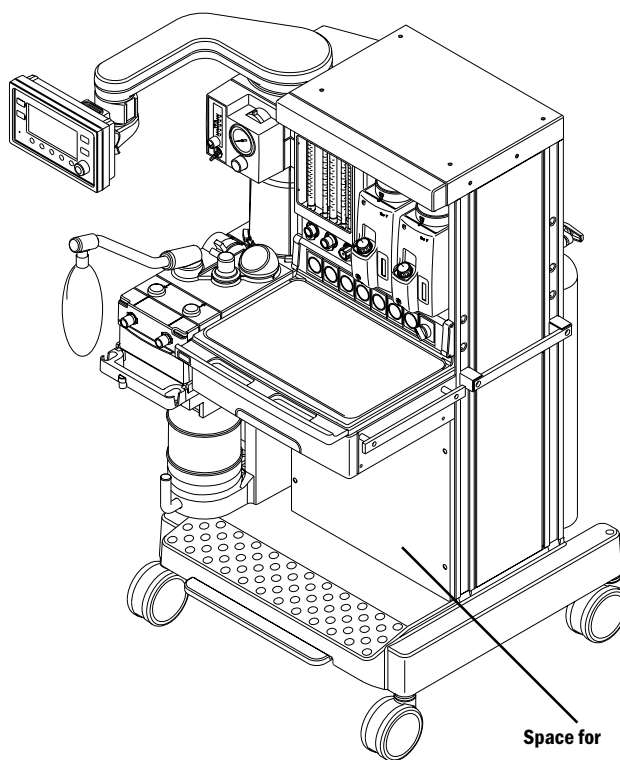
Height:	14.5 cm/5.7 in
Width:	38.5 cm/15.2 in
Depth:	26 cm/10.2 in

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 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°	85°



Space for additional shelves and drawers

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

Physical specifications, continued

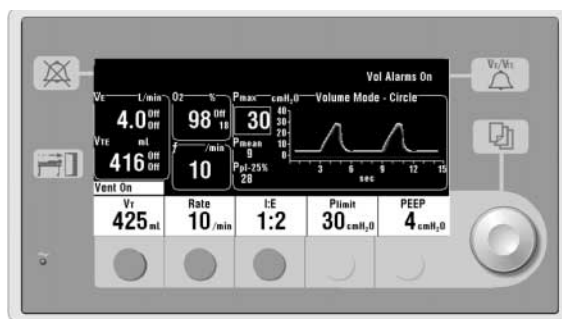
Ventilator screen

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

Casters

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

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_{Inspired}) range: 5 to 60 cm H₂O (increments of 1 cm H₂O)

Pressure

(P_{limit}) range: 12 to 100 cm H₂O (increments of 1 cm H₂O)

Pressure

(P_{support}) range: Off, 2 to 40 cm H₂O (increments of 1 cm H₂O)

Rate: 4 to 100 breaths per minute for Volume Control and Pressure Control;
2-60 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 5.0 seconds (increments of 0.1 seconds) (SIMV and PSV Pro)

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

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

Inspiration

termination level: 5 to 50% (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 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

O₂ %: 8 to 100%

Peak pressure: -20 to 120 cm H₂O

Mean pressure: -20 to 120 cm H₂O

Plateau pressure: 0 to 120 cm H₂O

Pressure waveform

sweep speed: 4 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: $\pm 10\%$ 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: $\pm 5\%$ or ± 2 cm H₂O

Alarm settings

Tidal volume (V_{TE}): Low: OFF, 0 to 1500 mL
 High: 20 to 1600 mL, OFF

Minute volume (V_E): 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:*
 P_{limit} < 30 cm H₂O, the sustained limit is 6 cm H₂O
 P_{limit} 30-60 cm H₂O,
 the sustained limit is 20% of P_{limit}
 P_{limit} > 60 cm H₂O,
 the sustained limit is 12 cm H₂O

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

Mechanical ventilation OFF:
 P_{limit} \leq 60 cm H₂O,
 the sustained limit is 50% of P_{limit}
 P_{limit} > 60 cm H₂O,
 the sustained limit is 30 cm H₂O

Subatmospheric pressure: Paw < -10 cm H₂O

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

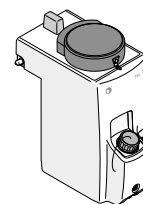
Vaporizers: Tec 4, Tec 5, Tec 6 Plus, Tec 7

Number of positions: 2 or 3

Mounting: Tool-free installation Selectatec® manifold interlocks and isolates vaporizers



Tec 6 Plus



Tec 7

Electrical specifications

Current leakage

120 V: < 300µA

220 V: < 500µA

Light package

Task light: 12 V, 3 lamps, type 194, .270A each

Goose neck (optional): 12 V, type 1815, .200A

Power and battery back-up

Power input: USA/Canada/Mexico: 120 Vac, 60 Hz, 10A
 Euro: 220-240 Vac, 50 Hz, 6A
 France/Belgium: 230 Vac, 50 Hz, 6A
 Japan: 100 Vac, 50 or 60 Hz, 10A
 UK: 240 Vac, 50 Hz, 6A

Backup power: Demonstrated battery back-up 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

	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
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 Plus 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 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; one oxygen, one other. Outboard mounted.

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 N₂O, 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

Pneumatic specifications, continued
Flowmeters

O ₂ ranges:	Two tubes – 0.05 to 0.95 L/min and 1.0 to 15.0 L/min Minimum O ₂ flow – 50 mL/min ±25 mL	
N ₂ O ranges:	Two tubes – 0 to 0.95 L/min and 1.0 to 10.0 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 mm Hg

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

Hypoxic guard system

Type:	Mechanical Link-25™
Range:	Provides a nominal 25% concentration of oxygen in any O ₂ /N ₂ O mixture

Materials

All materials in contact with patient gas 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 mm Hg

System storage

Temperature:	-20° to 70°C/-4° to 158°F
Humidity:	10 to 100% relative humidity (including condensing)
Altitude:	-440 to 5860 m/375 to 800 mm Hg
Oxygen cell storage:	-15° to 50°C/5° to 122°F 10 to 95% relative humidity 500 to 800 mm Hg

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

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 lbs 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

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 (0-230°)
30 to 70 cm H₂O (230-330°)

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 parameters

Compliance: Bag mode: 5.15 mL/cm H₂O

Mechanical mode: Automatically compensates for compression losses within the absorber and bellows assembly

Circuit volume: 5.5 L

Expiratory resistance:	Flow rate	P _{insp} Pressure drop	P _{exp} 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 mm Hg) @ 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



Datex-Ohmeda Division ▪ Instrumentarium Corp.
P.O. Box 900, FIN-00031 Datex-Ohmeda, Finland
Tel. +358 10 394 11 ▪ Fax +358 9 146 3310

www.datex-ohmeda.com

