GE Healthcare

Aestiva/5 anesthesia machine

More than superior ventilation

Aestiva®/5
Two vaporizer configuration

Aestiva/5
Three vaporizer configuration

Features

Superior ventilation: 7900 SmartVent™

- Volume Mode, pressure
- 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 O_2 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 lb	Approximately 154 kg/340 lb

Top shelves (optional)

	2 vaporizer configuration	3 vaporizer configuration
Weight limit:	46 kg/100 lb	46 kg/100 lb
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 lb

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)

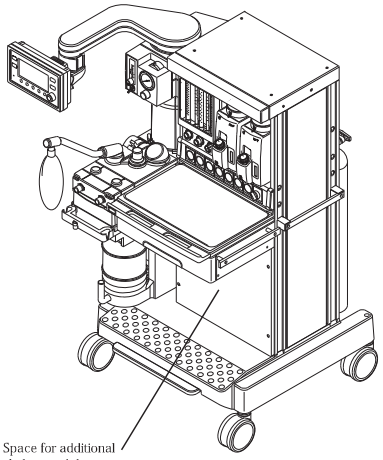
Height:	10.5 cm/4.1 in
Width:	38.5 cm/15.2 in
Depth:	26 cm/10.2 in

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



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

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 104 cm/40.9 in	91.5 cm/36 in
Absorber rotation:	85°	85°

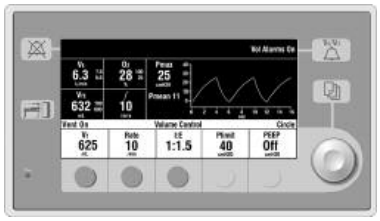
Ventilator screen

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)

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)
	5 to 1500 mL (Pressure Control Mode)
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 H_2O (increments of 1 cm H_2O)
Pressure (P_{limit}) range:	12 to 100 cm H_2O (increments of 1 cm H_2O)
Pressure ($P_{support}$) range:	Off, 2 to 40 cm H_2O (increments of 1 cm H_2O)
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 5.0 seconds (increments of 0.1 seconds) (SIMV and PSV Pro)
Trigger window:	0 to 80% (increments of 5%)
Flow trigger:	0.2 to 1.0 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_2O (increments of 1 cm H_2O)

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_2O
Mean pressure:	–20 to 120 cm H_2O
Plateau pressure:	0 to 120 cm H_2O
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:	±10% or ±3 cm H_2O
PEEP delivery:	±1.5 cm H_2O
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_2O

Alarm settings

Tidal volume (V_{TI}):	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 (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_2O above PEEP
High pressure:	12 to 100 cm H_2O (increments of 1 cm H_2O)
Sustained airway pressure:	*Mechanical ventilation ON:* P_{limit} < 30 cm H_2O, the sustained limit is 6 cm H_2O P_{limit} 30 to 60 cm H_2O, the sustained limit is 20% of P_{limit} P_{limit} > 60 cm H_2O, the sustained limit is 12 cm H_2O *PEEP and mechanical ventilation ON:* Sustained limit increases by PEEP minus 2 cm H_2O *Mechanical ventilation OFF:* P_{limit} 60 cm H_2O, the sustained limit is 50% of P_{limit} P_{limit} > 60 cm H_2O, the sustained limit is 30 cm H_2O
Subatmospheric pressure:	Paw < -10 cm H_2O
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

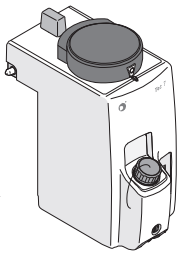
Optional autoclavable sensor available

Oxygen sensor

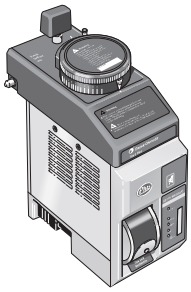
Type:	Galvanic fuel cell
Life cycle:	Approximately 18 months (dependent on usage)

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 7



Tec 6 Plus

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

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 O_2, N_2O, and Air, and contain pipeline filter and check valve.
Cylinder input:	Pin indexed in accordance with CGA-V-1; contains input filter and check valve
	Note: Maximum 5 cylinders total; one oxygen required.
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-5
Gas:	Oxygen
Pressure and flow characteristics:	Varies with source

O_2 controls

Method:	Proportionate decrease of N_2O, CO_2, O_2/He 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_2O 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 25% concentration of oxygen in any O_2/N_2O 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 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

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