

GE Healthcare

Avance

Innovating with you,
shaping exceptional care



Features

- Complete patient monitoring capabilities: respiratory gas, hemodynamic and adequacy of anesthesia
- Our state of the art electronic gas mixer with pneumatic back-up control
- Four patient case configuration options and four 'pages' to enhance usability
- Age adjusted MAC

Superior Ventilation Options

- Volume Control, Pressure Control, PSVPro® (Pressure Support with Apnea backup mode), Synchronized Intermittent Mandatory Ventilation (SIMV) (Volume and Pressure), electronic PEEP, Pressure Controlled Ventilation-Volume Guaranteed (PCV-VG)
- Tidal volume compensation
- One motion from mechanical to manual mode
- Two key presses to total standby: end case
- Cardiac bypass mode

Advanced Breathing System (ABS™)

- Minimal number of parts and tube connections greatly reduces the potential for leaks and misconnects
- Ease of disassembly (no tools)
- Fully autoclavable and latex-free

Exceptional Design

- Generous storage and work surface space
- Bi-level work surface illumination
- Integrated cable and tube management
- Intuitive user interface



Physical Specifications

Dimensions

Height:	134.5 cm/52.9 in
Width:	72 cm/28.3 in
Depth:	73 cm/28.7 in
Weight:	Approximately 125 kg/275 lb

Top shelf

Weight limit:	34 kg/75 lb
Width:	66 cm/26 in
Depth:	40 cm/15.75 in

Work surface

Height:	81.7 cm/32.2 in
Size:	2640 cm ² /409 in ²

DIN rail

Side of machine:	34.5 cm/13.6 in
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Drawers (internal dimensions)

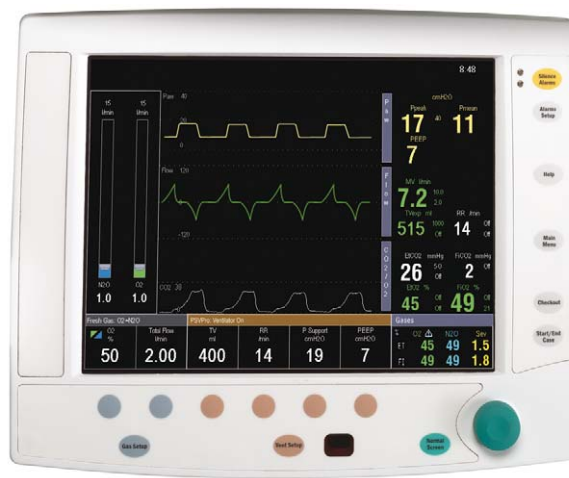
Height:	17.5 cm/6.9 in
Width:	33 cm/13 in
Depth:	26.5 cm/10.4 in

Absorber bag arm (optional)

Arm length:	30.5 cm/12 in
Bag arm height (adjustable):	87 cm/34.3 in 104 cm/40.9 in

Casters

Diameter:	12.5 cm/5 in
Brakes:	Individual locking front casters



Ventilator Operating Specifications

Modes of ventilation – standard

Volume Control with tidal volume compensation

Modes of ventilation – optional

Pressure Control

Pressure Controlled Ventilation-Volume Guaranteed (PCV-VG)

Synchronized Intermittent Mandatory Ventilation (SIMV) (volume and pressure)

PSVPro (Pressure Support with Apnea backup)

Note: CPAP can be delivered when in PSVPro mode.

Range: Off; 4 - 30cmH₂O

Ventilator 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 H ₂ O (increments of 1 cm H ₂ O) 5 to 1500 mL volume delivery
Pressure (P _{limit}) range:	12 to 100 cm H ₂ O (increments of 1 cm H ₂ O)
Pressure (P _{support}) range:	Off, 2 to 40 cm H ₂ O (increments of 1 cm H 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 5.0 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) 0.2 to 1 L/min (increments of 0.2 L/min)
Inspiration termination level:	5 to 50% (increments of 5%)
Inspiratory Pause range:	0-60%

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 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 _{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 (FiO ₂):	Low: 18 to 100% High: 19 to 100%, OFF
Apnea alarm:	<i>Mechanical ventilation ON:</i> < 5 mL breath measured in 30 seconds <i>Mechanical ventilation OFF:</i> < 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:	<i>Mechanical ventilation ON:</i> P _{limit} < 30 cm H ₂ O, the sustained limit is 6 cm H ₂ O P _{limit} 30 to 60 cm H ₂ O, the sustained limit is 20% of P _{limit} P _{limit} > 60 cm H ₂ O, the sustained limit is 12 cm H ₂ O <i>PEEP and mechanical ventilation ON:</i> Sustained limit increases by PEEP minus 2 cm H ₂ O <i>Mechanical ventilation OFF:</i> P _{limit} ≤ 60 cm H ₂ O, the sustained limit is 50% of P _{limit} P _{limit} > 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:	Optional galvanic fuel cell or paramagnetic with MGAI option
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Ventilator screen

Display size:	31 cm/12.1 inch diagonal
Pixel format:	800 (H) x 600 (V)

Battery backup

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 ports

RS-232C compatible serial interface
Ethernet
Datex-Ohmeda device interface solutions port
USB port

Anesthetic Agent Delivery

Delivery

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

Compact Airway Modules

General

M-CAiO, M-CAiOV, M-CAiOVX module software version 3.2 or higher; E-CAiO, ECAiOV, E-CAiOVX

Size (WxDxH):	75 x 215 x 112 mm/ 2.9 x 8.4 x 4.4 in
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Weight:	1.6 kg/3.7 lb
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Sampling rate:	200 mL/min ±20 mL
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Automatic compensation for atmospheric pressure variation (500 to 800 mmHg) temperature and CO₂/N₂O and CO₂/O₂ collision broadening effect. Parameter display update interval typically breath-by-breath. Functional alarms for blocked sample line, D-fend check and D-fend replacement.

Non-disturbing gases:

Ethanol, acetone, methane, nitrogen, nitric oxide, carbon monoxide, water vapor:

Maximum effect on readings:	CO ₂ < 0.2 vol %; O ₂ < 2 vol %
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Carbon dioxide (CO₂)

EtCO ₂ :	End-tidal CO ₂ concentration
FiCO ₂ :	Inspired CO ₂ concentration

CO₂ waveform

Measurement range:	0 to 15% (0 to 15 kPa, 0 to 113 mmHg)
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Accuracy:	±0.3 vol %*
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Datex-Ohmeda infrared sensor

Adjustable low and high alarm limits for EtCO₂ and FiCO₂

Respiration rate (RR)

Measurement range:	4 to 60 breaths per second
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Detection criteria:	1% variation in CO ₂
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Adjustable low and high alarm limits for respiration rate; alarm for apnea

Patient Oxygen (O₂)

FiO ₂ :	Inspired O ₂ concentration
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EtO ₂ :	End-tidal O ₂ concentration
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FiO ₂ -EtO ₂ :	Inspired-expired difference
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* Typical value

** Measurement not valid with O₂ and N₂O mixtures

O₂ waveform

Measurement range: 0 to 100 %

Accuracy: ± 2 vol %*

Datex-Ohmeda differential paramagnetic sensor

Adjustable low and high alarm limits for FiO₂ and EtO₂;
alarm for FiO₂ < 18%

Nitrous Oxide (N₂O)

Measurement range: 0 to 100%

Accuracy: ± 3 vol %*
FiN₂O > 82% alarm

Anesthetic Agent (AA)

Halothane, Isoflurane, Enflurane

Measurement range: 0 to 6%
Accuracy: ± 0.2 vol %*

Sevoflurane

Measurement range: 0 to 8%
Accuracy: ± 0.2 vol %*

Desflurane

Measurement range: 0 to 20%
Accuracy: 0 to 5% ± 0.2 vol %*
5 to 10% ± 0.5 vol %
10 to 20% ± 1 vol %*

Waveform displayed

MAC value displayed

Identification threshold: 0.15 vol %*

Agent mixture detection

Adjustable high and low alarm limits for EtAA, FiAA

Patient Spirometry™

(available in Datex-Ohmeda Anesthesia Monitor module bay)

Pressure-volume loop

Flow-volume loop

Airway pressure and flow waveforms

Adjustable low and high alarm limits for P_{peak}, PEEP_{tot} and MV_{exp}

Alarms for MV_{exp} << MV_{insp} and for MV_{exp} low. Detection through D-lite® or Pedi-lite® flow sensor and gas sampler with following specifications:

	<i>D-lite</i>	<i>Pedi-lite</i>
Respiration rate:	4 to 35 breaths/min	4 to 50 breaths/min

Tidal volume

Measurement range: 150 to 15 to
2000 mL 300 mL
Accuracy*: $\pm 6\%$ or 30 mL $\pm 6\%$ or 4 mL

Minute volume

Measurement range: 2 to 20 L/min 0.5 to 5 L/min
Accuracy*: $\pm 6\%$ $\pm 6\%$

Airway pressure

Measurement range: -20 to -20 to
+100 cm H₂O +100 cm H₂O
Accuracy*: ± 1 cm H₂O ± 1 cm H₂O
Display units: cm H₂O, mmHg, kPa, mbar, hPa

Flow

Measurement range: 1.5 to 0.25 to 25 L/min
100 L/min

I:E

Measurement range: 1:4.5 to 2:1

Compliance

Measurement range: 4 to 100 1 to 100
mL/cm H₂O mL/cm H₂O

Airway resistance

Measurement range: 0 to 40 cm H₂O/L/s

Sensor specifications

	<i>D-lite</i>	<i>Pedi-lite</i>
Dead space:	9.5 mL	2.5 mL
<i>Resistance</i>		
at 30 L/min:	0.5 cm H ₂ O	
at 10 L/min:		1.0 cm H ₂ O

Gas exchange**

(available in Datex-Ohmeda Anesthesia Monitor module bay)

VO ₂ :	Oxygen consumption
VCO ₂ :	Carbon dioxide production
Measurement range:	20 to 1000 mL/min
Respiration rate range:	4 to 35 bpm

Accuracy

FiO ₂ < 65%:	$\pm 10\%$ or 10 mL
65% < FiO ₂ < 85%:	$\pm 15\%$ or 15 mL

Detection through D-lite flow sensor or Pedi-lite flow sensor and gas sampler (see the measurement ranges and sensor specifications above).

* Typical value

** Measurement not valid with O₂ and N₂O mixtures

Electrical Specifications

Current leakage

100/120 V: < 300 μ A

Power

Power input: 100-120 Vac, 50/60 Hz
Power cord: Length: 5 m/16.4 ft
Rating: 10A @ 220 Vac or 15A @ 120 Vac

Inlet/outlet modules (100V)

System circuit breakers: 15A
Outlets (optional): 3 outlets on back, 2-2A, 1-4A individual breakers, isolation transformer standard

Pneumatic Specifications

Auxiliary common gas outlet (optional)

Connector: ISO 22 mm OD and 15 mm ID

Gas supply

Pipeline input range: 280 kPa to 600 kPa/
41 psig to 88 psig
Pipeline connections: DISS-male, DISS-female, DIN 13252, AS4059, BSPP 3/8, S90-116, or NIST
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
Primary regulator diaphragm minimum burst pressure: 2758 kPa/400 psig
Primary regulator nominal output: \leq 345 kPa/50 psig
Pin indexed cylinder and DIN cylinder connections

O₂ controls

Method: N₂O shut off with loss of 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 L/min

Alternate O₂ (safety flow)

Range: 500 mL/min minimum to 10 L/min
Indicator: Flow tube
Indicator accuracy: \pm 5% full scale

Fresh gas

Flow range: 0 and 150 mL/min to 15 L/min (minimal flow capable)
Total flow accuracy: \pm 10% or \pm 40 mL/min of setting (larger of)
O₂ flow accuracy: \pm 5% or \pm 20 mL/min of setting (larger of)
Balance gas flow accuracy: \pm 5% or \pm 20 mL/min of setting (larger of) Air/N₂O
O₂ concentration range: 25% to 100%
O₂ concentration accuracy: \pm 8% V/V for flows < 400 mL/min
 \pm 5% V/V for flows > 400 mL/min to 1 L/min
 \pm 2.5% setting for flows > 1 L/min
Electronic mixer response time: 500mS (10% to 90% flow step)
Compensation: Temperature and atmospheric pressure compensated to standard conditions of 20°C and 101.3 kPa
Hypoxic guard: Electronic

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:	-25° to 60°C/-13° to 140°F
Humidity:	10 to 95% relative humidity (non-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

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, EN/IEC 60601-1, CE 0197, EN 740

Breathing Circuit Specifications

Operational modes

Breathing circuit is circle mode; SCGO option converts to open circuit mode

Carbon dioxide absorbent canister

Absorbent capacity:	800 g
Integrated expiratory limb water reservoir	

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

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 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 disposable flow sensors, O₂ cell, and M-CAiOVX or ECAiOVX module. (Autoclavable flow sensors optional)

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

Breathing circuit parameters

Compliance:	Bag mode:	1.82 mL/cm H ₂ O
	Mechanical mode:	Automatically compensates for compression losses within the absorber and bellows assembly

Total circuit volume:	2.7 L Vent Mode 1.2 L Bag Mode
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Note: Includes Absorber volume

Expiratory resistance:	P_{exp}	P_{exp}	
	Bag Mode		Vent Mode
	Flow rate	Pressure drop	Pressure drop
	10 L/min	0.78 cm H ₂ O	0.77 cm H ₂ O
	30 L/min	1.59 cm H ₂ O	1.71 cm H ₂ O
	60 L/min	3.48 cm H ₂ O	3.88 cm H ₂ O

Note: With patient circuit and wye piece add +0.89 cm H₂O

Anesthetic gas scavenging

AGSS Type	Hospital extract system required	Machine connection
High vacuum, low flow with indicator:	High vacuum 36 L/min @ 12 in Hg (305 mmHg)	DISS evac
High vacuum, variable flow with bag indicator:	High vacuum 30 L/min extract flow @ 12 in Hg (305 mmHg)	DISS evac
Passive:	Passive or external active system with air break	30 mm/1.2 in M ISO taper

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GE Healthcare Finland Oy, a General Electric company,
going to market as GE Healthcare.

Healthcare Re-imagined

GE is dedicated to helping you transform healthcare delivery by driving critical breakthroughs in biology and technology. Our expertise in medical imaging and information technologies, medical diagnostics, patient monitoring systems, drug discovery, and biopharmaceutical manufacturing technologies is enabling healthcare professionals around the world discover new ways to predict, diagnose and treat disease earlier. We call this model of care “Early Health.” The goal: to help clinicians detect disease earlier, access more information and intervene earlier with more targeted treatments, so they can help their patients live their lives to the fullest. Re-think, Re-discover, Re-invent, Re-imagine.

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GE imagination at work