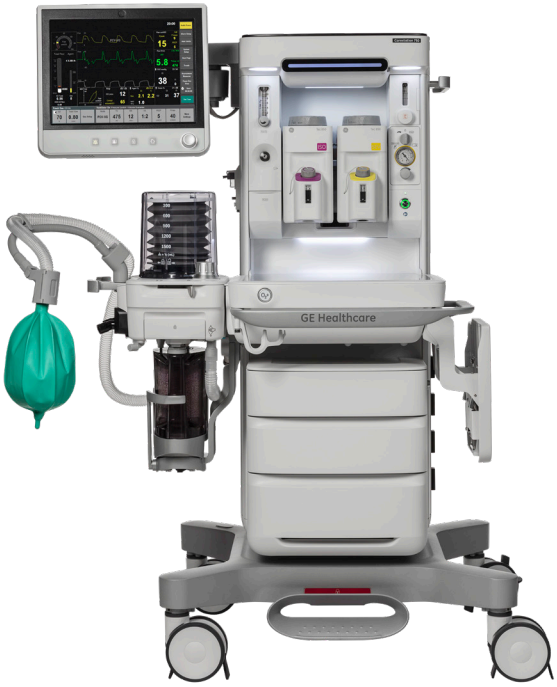
Carestation™ 750

Anesthesia Delivery System



The Carestation 750 anesthesia machine is a modern, sophisticated and easy-to-navigate anesthesia workstation. It's built on our clinically proven platform to give you the control and accuracy you need for high-quality, attentive care.

KEY FEATURES

- Modern, premium, compact design for an optimized workspace utilization
- Simple and easy-to-use 15" touchscreen ventilator display
- Intuitive user interface, inspired by the CARESCAPE™ Monitor, makes for a seamless experience in the OR
- Integrated CARESCAPE Respiratory Module
- Advanced tools to help individualize therapy
- Scalable software and hardware features: "build your own" Carestation system
- ecoFLOW software helps support clinicians in the practice of low-flow anesthesia by predicting how much O_2 is needed within the fresh gas flow
- Electronic gas mixer

VENTILATION

- Small, Compact Breathing System (CBS) specifically designed for low-flow anesthesia
- Fast gas kinetics for rapid wash-in and wash-out
- Digitally controlled, flow valve ventilator to support all patient types from neonates to adults
- Advanced ventilation options, including synchronized PCV-VG with pressure support (SIMV PCV-VG) and minimum rate ventilation (CPAP+PSV)
- Lung Protective Ventilation tools, including single-step and multi-step Lung Recruitment maneuvers to optimize clinical outcomes, while reducing workloads for clinicians
- Continual fresh gas flow with fresh gas flow compensation during mechanical ventilation

DESIGN

- Ergonomic form factor for seamless and efficient workflow and serviceability
- Innovative cable management solution to organize power cables and gas hoses and to simplify installation, cleaning and transportability
- Easy to clean surfaces
- Extendable, tiltable, swiveling display arm for flexible positioning to stay close to the patient
- Two-vaporizer configuration
- Bi-level work surface illumination
- Absorbent canister designed for ease of use and long life
- Intelligent lighting that highlights active flow controls and auxiliary ports when in use

PHYSICAL SPECIFICATIONS

Product Description

Carestation™ 750 A1 Anesthesia Delivery System

Dimensions

Height:	144 cm/56.7 in
Width:	89.1 cm/35.1 in
Depth:	81.5 cm/32.1 in
Weight:	161 kg/355 lb*

Top shelf

Weight limit:	25 kg/55 lb
Width:	41.3 cm/16.3 in
Depth:	38.8 cm/15.3 in

Work surface

Height:	83.6 cm/32.9 in
Size:	1620 cm^2 /251 in^2
Size: (with optional flip shelf)	2527 cm^2/392 in^2

Upper left Datex-Ohmeda (DO) dovetail

Dovetail length:	49 cm/19.3 in

Lower left Datex-Ohmeda (DO) dovetail

Dovetail length:	32 cm/12.6 in

Right Datex-Ohmeda (DO) dovetail

Dovetail length:	96.4 cm/38.0 in

Drawers (internal dimensions)

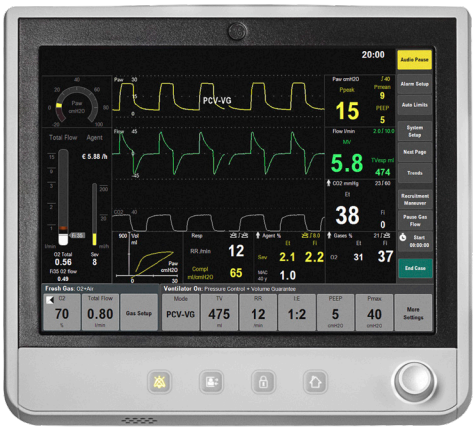
Height:	
Top and middle:	8.6 cm/3.4 in
Bottom:	13.3 cm/5.2 in
Width:	34 cm/13 in
Depth:	37 cm/14.6 in

Manual ventilation bag arm (optional)

Arm length:	39.8 cm/15.7 in
Bag arm height: (adjustable)	53 cm/20.9 in 136 cm/53.5 in

Casters

Diameter:	12.5 cm/4.9 in
Brakes:	Central Brake



VENTILATOR OPERATING SPECIFICATIONS

Modes of ventilation – included

VCV (Volume Control) Mode with tidal volume compensation

PCV (Pressure Control Ventilation)

Cardiac Bypass

Modes of ventilation – optional

PCV-VG (Pressure Controlled Ventilation-Volume Guarantee)

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

PSVPro™ Mode (Pressure Support with Apnea backup)

CPAP+PSV (Pressure Support mode)

SIMV PCV-VG

Advanced software options

Spirometry (included)

Auto alarm limits (included)

ecoFLOW

Pause Gas

Recruitment maneuver

VCV Cardiac Bypass

Ventilator parameter ranges

Tidal volume range:	5 to 1500 mL (PCV modes 5 to 1500 mL) (Volume Control, PCV-VG and SIMV volume 20 to 1500 mL)
Incremental settings:	20 to 50 mL (increments of 1 mL) 50 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)

** Excludes vaporizers, airway gas module, patient monitor.*

VENTILATOR OPERATING SPECIFICATIONS *(continued)*

Ventilator parameter ranges

Minute volume range:	Less than 0.1 to 99.9 L/min)
Pressure ($P_{inspired}$) range:	5 to 60 cmH_2O (increments of 1 cmH_2O) above set PEEP
Pressure (P_{max}) range:	12 to 100 cmH_2O (increments of 1 cmH_2O)
Pressure ($P_{support}$) range:	Off, 2 to 40 cmH_2O (increments of 1 cmH_2O)
Respiratory Rate:	4 to 100 breaths per minute for Volume Control and Pressure Control; 2 to 60 breaths per minute for SIMV, PSVPro mode and SIMV PCV-VG; 4 to 60 bpm for CPAP+PSV (increments of 1 breath per minute)
Inspiratory/ expiratory ratio:	2:1 to 1:8 (increments of 0.5) (VCV, PCV, PCV-VG)
Inspiratory time:	0.2 to 5.0 seconds (increments of 0.1 seconds) (SIMV, PSVPro and CPAP PSV)
Trigger window:	Off, 5 to 80% of Texp (SIMV, PSVPro) (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 75% (increments of 5%)
Inspiratory Pause range:	Off, 5-60% of Tinsp

Positive End Expiratory Pressure (PEEP)

Type:	Integrated, electronically controlled
Range:	OFF, 4 to 30 cmH_2O (increments of 1 cmH_2O)

Ventilator performance

Peak gas flow:	120 L/min + fresh gas flow
Flow valve range:	1 to 120 L/min
Flow compensation range:	150 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 cmH_2O (larger of)
PEEP delivery:	±1.5 cmH_2O
Volume monitoring:	> 210 mL = better than 9% ≤ 210 mL = better than 18 mL < 60 mL = better than 10 mL
Pressure monitoring:	±5% or ±2.4 cmH_2O (larger of)

Alarm settings

Tidal volume (V_{TE}):	Low: OFF, 1 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 99% High: 19 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 cmH_2O above PEEP
High pressure:	12 to 100 cmH_2O (increments of 1 cmH_2O)

Sustained airway pressure:

Mechanical ventilation ON:	P_{max} < 30 cmH_2O, the sustained limit is 6 cmH_2O P_{max} 30 to 60 cmH_2O, the sustained limit is 20% of P_{max} P_{max} > 60 cmH_2O, the sustained limit is 12 cmH_2O
PEEP and mechanical ventilation ON:	Sustained limit increases by PEEP minus 2 cmH_2O
Mechanical ventilation OFF:	P_{max} 12 to 60 cmH_2O, the sustained limit is 50% of P_{max} P_{max} > 60 cmH_2O, the sustained limit is 30 cmH_2O
Subatmospheric pressure:	Paw < -10 cmH_2O
Audio pause countdown clock:	120 to 0 seconds

VENTILATOR COMPONENTS

Flow transducer

Type:	Variable orifice flow sensor (autoclavable)
Location:	Inspiratory outlet and expiratory inlet

Oxygen sensor

Type:	Optional galvanic fuel cell or paramagnetic with Airway Module option

Ventilator screen

Display size:	15 inch
Pixel format:	1024 x 768

Battery backup

Backup power:	Battery time is 90 minutes when fully charged, which supports full system functionality and ventilation.
Battery type:	Internal rechargeable sealed lead acid

Communication ports

RS-232C compatible serial interface

Ethernet

Datex-Ohmeda device interface solutions port

USB port

VGA Output

ANESTHETIC AGENT DELIVERY

Delivery

Vaporizers:	Tec™ 6 Plus, Tec 7, Tec 820, Tec 850
Number of positions:	2
Mounting:	Tool-free installation Selectatec™ manifold interlocks and isolates vaporizers

AIRWAY MODULES

General

Supported modules:	E-sCAiO, E-sCAiOV
Size (HxWxD), excluding water trap:	112 x 37 x 205 mm/4.4 x 1.5 x 8.1 in
Weight:	0.7 kg/1.5 lb
Sampling rate:	120 mL/min ±20 mL

Automatic compensation for atmospheric pressure variation (495 to 795 mmHg) temperature and CO_2/N_2O and CO_2/O_2 collision broadening effect. Parameter display update interval typically breath-by-breath. Functional alarms for blocked sample line, D-fend™ Water Trap check and D-fend replacement.

Non-disturbing gases:

Ethanol, acetone, isopropanol, methane, nitrogen, nitric oxide, carbon monoxide, water vapor, freon R134A (for CO_2, O_2 and N_2O):

Maximum effect on readings:	CO_2 < 0.2 vol% ; O_2, N_2O < 2 vol%; AA < 0.15 vol%

Carbon dioxide (CO_2)

$EtCO_2$:	End-tidal CO_2 concentration
$FiCO_2$:	Inspired CO_2 concentration

CO_2 waveform

Measurement range:	0 to 15% (0 to 15 kPa, 0 to 113 mmHg)
Accuracy:	± (0.2 vol% + 2% of reading)

Datex-Ohmeda infrared sensor

Adjustable low and high alarm limits for $EtCO_2$ and $FiCO_2$

Respiration rate (RR)

Measurement range:	4 to 100 breaths/min
Detection criteria:	1% variation in CO_2

Adjustable low and high alarm limits for respiration rate; alarm for apnea

Patient Oxygen (O_2)

FiO_2:	Inspired O_2 concentration
EtO_2:	End-tidal O_2 concentration
FiO_2-EtO_2:	Inspired-expired difference

O_2 Measurement

Measurement range:	0 to 100%
Accuracy:	± (1 vol% +2% of reading)

Datex-Ohmeda differential paramagnetic sensor Adjustable low and high alarm limits for FiO_2 and EtO_2; alarm for FiO_2 < 18%

Nitrous Oxide (N_2O)

Measurement range:	0 to 100%
Accuracy:	± (2 vol% +2% of reading)

AIRWAY MODULES *(continued)*

Anesthetic Agent (AA)

Isoflurane

Measurement range: 0 to 6%

Accuracy: ±(0.15 vol% +5% of reading)

Sevoflurane

Measurement range: 0 to 8%

Accuracy: ±(0.15 vol% +5% of reading)

Desflurane

Measurement range: 0 to 20%

Accuracy: ±(0.15 vol% +5% of reading)

Waveform displayed

MAC value displayed (Airway Gas Option modules)

MACage value displayed (CARESCAPE modules)

Identification threshold: 0.15 vol%**

Agent mixture detection

Adjustable high and low alarm limits for EtAA, FiAA

Patient Spirometry

Pressure-volume loop

Pressure-flow 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™ Flow Sensor or Pedi-lite Flow Sensor and gas sampler with following specifications:

CARESCAPE Airway Modules

	D-lite(+)	Pedi-lite(+)
Respiration rate:	4 to 35 breaths/min	4 to 70 breaths/min
Tidal volume		
Measurement range:	150 to 2000 mL	5 to 300 mL
Accuracy**:	±6% or 30 mL	±6% or 4 mL
Minute volume		
Measurement range:	2 to 20 L/min	0.1 to 5 L/min
Airway pressure		
Measurement range:	-20 to +100 cmH_2O	
Accuracy**:	±1 cmH_2O	
Display units:	cmH_2O, mmHg, kPa, mbar, hPa	
Flow		
Measurement range:	-100 to 100 L/min	-25 to 25 L/min
I:E		
Measurement range:	1:4.5 to 2:1	
Compliance	**D-lite(+)**	**Pedi-lite(+)**
Measurement range:	4 to 100 mL/cmH_2O	1 to 100 mL/cmH_2O
Airway resistance		
Measurement range:	0 to 200 $cmH_2O/L/s$	

Sensor specifications

	D-lite/ D-lite(+)	Pedi-lite/ Pedi-lite(+)
Dead Space:	9.5 mL	2.5 mL
Resistance		
at 30 L/min:	0.5 cmH_2O	
at 10 L/min:		1.0 cmH_2O

ELECTRICAL SPECIFICATIONS

Current leakage

100/120V	< 500µA
220/240V	< 500µA

Power

Power input: 100-120 Vac, 50/60 Hz
220-240 Vac, 50/60 Hz
120/220-240 Vac ± 10%, 50-60 Hz

Power cord:

Length: 5 m/16.4 ft

Rating: 10A @ 220-240 Vac or
15A @ 100-120 Vac
10A @ 120/220-240 Vac

Inlet modules

100/120 V:

Without outlets: 2A

With outlets: 12A

220/240 V:

Without outlets: 2A

With outlets: 8A

Outlet modules (optional)

100/120 V:

4 outlets on side, from top to bottom: 3A, 2A, 2A, 1.5A, individual breakers, isolation transformer (optional)

***Typical value*

ELECTRICAL SPECIFICATIONS *(continued)*

Outlet modules (optional)

220/240 V:

4 outlets on side, from top to bottom: 1.5A, 1A, 1A, 1A, individual breakers, isolation transformer (optional)

Japan:

3 outlets on side, from top to bottom: 3A, 2A, 2A, individual breakers, isolation transformer (optional)

PNEUMATIC SPECIFICATIONS

Auxiliary O_2 (optional)

Connection:	7-10 mm hose barb port
O_2 concentration range:	100% O_2
Flow range:	0 to >10 L/min

Auxiliary O_2 +Air (optional)

Connection:	7-10 mm hose barb port
O_2 concentration range:	100% O_2 only, or 21% to 100% $O_2$with Air
Flow range for O_2 and Air:	0 and 150 mL/min to 15 L/min

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 87 psig)
Pipeline connections:	DISS-male, AS4059, S90-116, or NIST All fittings available for O_2, N_2O, and Air, and contain pipeline filter and check valve. Secondary O_2 pipeline inlet available.
Cylinder input:	Pin indexed in accordance with CGA-V-1 or DIN-477 (nut and gland); contains input filter and check valve. Large cylinder kit available for O_2 and N_2O (with DIN-477).

Note: *Maximum 3 cylinders*

Primary regulator diaphragm minimum burst pressure:	2758 kPa/400 psig
Primary regulator nominal output:	< 345 kPa/50 psig Pin indexed cylinder connections
	< 414 kPa/60 psig DIN-477 cylinder connections

O_2 controls

Method:	N_2O shut off with loss of O_2 pressure
Supply failure alarm:	< 252 kPa (36.55 psig)
O_2 flush:	Range: 25 to 75 L/min

Fresh gas

Flow range:	0 and 150 mL/min to 15 L/min Minimum total flow O_2 and balance gas is 150 mL/min

Measurement accuracy

for O_2, Air and N_2O:	±5% of setting value, or ±20 mL/min (larger of)
O_2 concentration range:	21% to 100% when Air is available
O_2 Cell accuracy:	± 2.5% full scale plus 2.5% of reading
Compensation:	Temperature and atmospheric pressure compensated to standard conditions of 20°C and 101.3 kPa
Hypoxic guard:	Electric Mixer: Provides a nominal minimum 25% concentration of oxygen in O_2/N_2O mixture. ALT O_2, 0 to 8-15 L/min

Materials

All materials in contact with patient breathing gases are not made from 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 3200 m (520 to 800 mmHg)

System storage

Temperature:	-25° to 60°C (-13° to 140°F)
Humidity:	15 to 95% relative humidity (non-condensing)
Altitude:	-440 to 4880 m (425 to 800 mmHg)
Oxygen cell storage:	-15° to 50°C (5° to 122°F) 10 to 95% relative humidity 500 to 800 mmHg

ENVIRONMENTAL SPECIFICATIONS *(continued)*

Electromagnetic compatibility

Immunity:	Complies with all applicable requirements of EN 60601-1-2
Emissions:	CISPR 11 group 1 class A
Standard compliance:	AAMI ES60601-1, CSA C22.2 #601.1, EN/IEC 60601-1, ISO 80601-2-13
European Notified Body	
CE Mark:	CE0197

BREATHING CIRCUIT SPECIFICATIONS

Carbon dioxide absorbent canister

Absorbent capacity:	Reusable canister 1370 mL Disposable canister 1400 mL

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 (15 mm ID), ROW 22 mm ID, Australia

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:	0.5 to 70 cmH_2O
Tactile knob indication at:	30 cmH_2O and above
Adjustment range of rotation:	0.5 to 30 cmH_2O (0 to 230°) 30 to 70 cmH_2O (230 to 330°)

Materials

All materials in contact with exhaled patient gases are autoclavable, except O_2 cell, and Airway Modules.
All materials in contact with patient gases are not made from natural rubber latex.

Breathing circuit parameters

Compliance:

Bag mode:	1.81 mL/cmH_2O (filled disposable absorber canister)
	1.74 mL/cmH_2O (filled reusable absorber canister)
Mechanical mode:	Automatically compensates for compression losses within the absorber and bellows assembly
Volume:	2006 mL Ventilator side
	500 mL Bag side
	1000 mL Reusable canister
	1000 mL Disposable canister

Expiratory resistance in bag mode:

Flow rate	P_{exp} Absorber canister Installed	P_{exp} Absorber canister Removed
5 L/min	0.57 cmH_2O	0.57 cmH_2O
30 L/min	2.47 cmH_2O	2.47 cmH_2O
60 L/min	5.60 cmH_2O	5.60 cmH_2O

Note: Values include patient circuit tubing and wye piece (0.65 cmH_2O at 60 L/min)

Anesthetic gas scavenging

AGSS Type	Hospital extract system required	Machine connection
High vacuum, low flow:	High vacuum 36 +/- 3 L/min @ 12 inHg (305 mmHg)	SIS evac
High vacuum, low flow:	High vacuum 25-30 L/min @ 12 inHg (305 mmHg)	DISS evac
Low vacuum, high flow:	Low vacuum 50 to 80 L/min ISO 1H	BSI 30 mm threaded
Low vacuum, low flow:	Low vacuum 25 to 50 L/min ISO 1L	12.7 mm hose barb, 25 mm hose barb, or 30 mm ISO taper
Passive:	Passive system with air break	30 mm/1.2 in M ISO taper

Product may not be available in all countries and regions.
Contact a GE Healthcare representative for more information.
Please visit www.gehealthcare.com

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This document applies to Carestation 750 A1.

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