



# 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<sub>2</sub> 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 <sup>2</sup> /251 in <sup>2</sup>
Size: (with optional flip shelf)	2527 cm <sup>2</sup> /392 in <sup>2</sup>

### Upper left Datex-Ohmeda (DO) dovetail

Dovetail length:	49 cm/19.3 in
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### Lower left Datex-Ohmeda (DO) dovetail

Dovetail length:	32 cm/12.6 in
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### Right Datex-Ohmeda (DO) dovetail

Dovetail length:	96.4 cm/38.0 in
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### Drawers (internal dimensions)

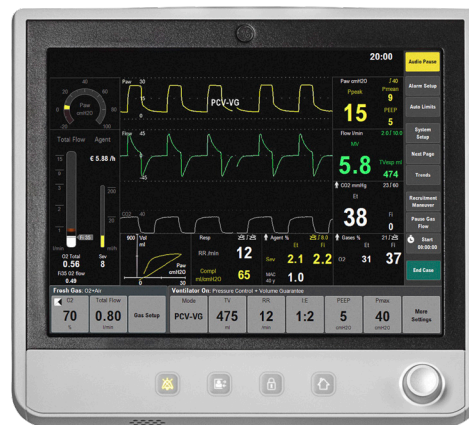
Height:	
Top and middle:	8.6 cm/3.4 in
Bottom:	13.3 cm/5.2 in
Width:	34 cm/13 in
Depth:	37 cm/14.6 in

### 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 <sub>inspired</sub> ) range:	5 to 60 cmH <sub>2</sub> O (increments of 1 cmH <sub>2</sub> O) above set PEEP
Pressure (P <sub>max</sub> ) range:	12 to 100 cmH <sub>2</sub> O (increments of 1 cmH <sub>2</sub> O)
Pressure (P <sub>support</sub> ) range:	Off, 2 to 40 cmH <sub>2</sub> O (increments of 1 cmH <sub>2</sub> O)
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 T <sub>insp</sub>

### Positive End Expiratory Pressure (PEEP)

Type:	Integrated, electronically controlled
Range:	OFF, 4 to 30 cmH <sub>2</sub> O (increments of 1 cmH <sub>2</sub> O)

### 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 <sub>2</sub> O (larger of)
PEEP delivery:	±1.5 cmH <sub>2</sub> O
Volume monitoring:	> 210 mL = better than 9% ≤ 210 mL = better than 18 mL < 60 mL = better than 10 mL
Pressure monitoring:	±5% or ±2.4 cmH <sub>2</sub> O (larger of)

### Alarm settings

Tidal volume (V <sub>TE</sub> ):	Low: OFF, 1 to 1500 mL High: 20 to 1600 mL, OFF
Minute volume (V <sub>E</sub> ):	Low: OFF, 0.1 to 10 L/min High: 0.5 to 30 L/min, OFF
Inspired oxygen (FiO <sub>2</sub> ):	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 <sub>2</sub> O above PEEP
High pressure:	12 to 100 cmH <sub>2</sub> O (increments of 1 cmH <sub>2</sub> O)

### Sustained airway pressure:

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

## VENTILATOR COMPONENTS

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### 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
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### 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

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### 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

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### 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
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Automatic compensation for atmospheric pressure variation (495 to 795 mmHg) temperature and CO<sub>2</sub>/N<sub>2</sub>O and CO<sub>2</sub>/O<sub>2</sub> 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<sub>2</sub>, O<sub>2</sub> and N<sub>2</sub>O):  
Maximum effect on readings: CO<sub>2</sub> < 0.2 vol% ; O<sub>2</sub>, N<sub>2</sub>O < 2 vol%; AA < 0.15 vol%

### Carbon dioxide (CO<sub>2</sub>)

EtCO <sub>2</sub> :	End-tidal CO <sub>2</sub> concentration
FiCO <sub>2</sub> :	Inspired CO <sub>2</sub> concentration

### CO<sub>2</sub> 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<sub>2</sub> and FiCO<sub>2</sub>

### Respiration rate (RR)

Measurement range:	4 to 100 breaths/min
Detection criteria:	1% variation in CO <sub>2</sub>

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

### Patient Oxygen (O<sub>2</sub>)

FiO <sub>2</sub> :	Inspired O <sub>2</sub> concentration
EtO <sub>2</sub> :	End-tidal O <sub>2</sub> concentration
FiO <sub>2</sub> -EtO <sub>2</sub> :	Inspired-expired difference

### O<sub>2</sub> 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<sub>2</sub> and EtO<sub>2</sub>; alarm for FiO<sub>2</sub> < 18%

### Nitrous Oxide (N<sub>2</sub>O)

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

## AIRWAY MODULES (continued)

### Anesthetic Agent (AA)

#### Isoflurane

Measurement range: 0 to 6%  
Accuracy:  $\pm(0.15 \text{ vol\%} + 5\% \text{ of reading})$

#### Sevoflurane

Measurement range: 0 to 8%  
Accuracy:  $\pm(0.15 \text{ vol\%} + 5\% \text{ of reading})$

#### Desflurane

Measurement range: 0 to 20%  
Accuracy:  $\pm(0.15 \text{ vol\%} + 5\% \text{ of reading})$

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  $P_{\text{peak}}$ ,  $PEEP_{\text{tot}}$  and  $MV_{\text{exp}}$   
Alarms for  $MV_{\text{exp}} \ll MV_{\text{insp}}$  and for  $MV_{\text{exp}}$  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**:	$\pm 6\%$ or 30 mL	$\pm 6\%$ or 4 mL

#### Minute volume

Measurement range:	2 to 20 L/min	0.1 to 5 L/min
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#### Airway pressure

Measurement range: -20 to +100 cmH<sub>2</sub>O  
Accuracy\*\*:  
Display units: cmH<sub>2</sub>O, 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 <sub>2</sub> O	1 to 100 mL/cmH <sub>2</sub> O

#### Airway resistance

Measurement range: 0 to 200 cmH<sub>2</sub>O/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 <sub>2</sub> O	
at 10 L/min:		1.0 cmH <sub>2</sub> O

## ELECTRICAL SPECIFICATIONS

### Current leakage

100/120V	< 500 $\mu$ A
220/240V	< 500 $\mu$ A

### Power

Power input: 100-120 Vac, 50/60 Hz  
220-240 Vac, 50/60 Hz  
120/220-240 Vac  $\pm 10\%$ , 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)*

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### 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

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### Auxiliary O<sub>2</sub> (optional)

Connection: 7-10 mm hose barb port

O<sub>2</sub> concentration range: 100% O<sub>2</sub>

Flow range: 0 to >10 L/min

### Auxiliary O<sub>2</sub> +Air (optional)

Connection: 7-10 mm hose barb port

O<sub>2</sub> concentration range: 100% O<sub>2</sub> only, or 21% to 100% O<sub>2</sub> with Air

Flow range for O<sub>2</sub> 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<sub>2</sub>, N<sub>2</sub>O, and Air, and contain pipeline filter and check valve. Secondary O<sub>2</sub> 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<sub>2</sub> and N<sub>2</sub>O (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<sub>2</sub> controls

Method: N<sub>2</sub>O shut off with loss of O<sub>2</sub> pressure

Supply failure alarm: < 252 kPa (36.55 psig)

O<sub>2</sub> flush: Range: 25 to 75 L/min

### Fresh gas

Flow range: 0 and 150 mL/min to 15 L/min  
Minimum total flow O<sub>2</sub> and balance gas is 150 mL/min

### Measurement accuracy

for O<sub>2</sub>, Air and N<sub>2</sub>O: ±5% of setting value, or ±20 mL/min (larger of)

O<sub>2</sub> concentration range: 21% to 100% when Air is available

O<sub>2</sub> 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<sub>2</sub>/N<sub>2</sub>O mixture.  
ALT O<sub>2</sub>, 0 to 8-15 L/min

### Materials

All materials in contact with patient breathing gases are not made from natural rubber latex.

## ENVIRONMENTAL SPECIFICATIONS

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### 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
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### 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 <sub>2</sub> O
Tactile knob indication at:	30 cmH <sub>2</sub> O and above
Adjustment range of rotation:	0.5 to 30 cmH <sub>2</sub> O (0 to 230°) 30 to 70 cmH <sub>2</sub> O (230 to 330°)

### Materials

All materials in contact with exhaled patient gases are autoclavable, except O<sub>2</sub> 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 <sub>2</sub> O (filled disposable absorber canister) 1.74 mL/cmH <sub>2</sub> O (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 <sub>exp</sub> Absorber canister Installed	P <sub>exp</sub> Absorber canister Removed
5 L/min	0.57 cmH <sub>2</sub> O	0.57 cmH <sub>2</sub> O
30 L/min	2.47 cmH <sub>2</sub> O	2.47 cmH <sub>2</sub> O
60 L/min	5.60 cmH <sub>2</sub> O	5.60 cmH <sub>2</sub> O

Note: Values include patient circuit tubing and wye piece (0.65 cmH<sub>2</sub>O 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



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**This document applies to Carestation 750 A1.**

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