

Anestar • S™ Anesthesia Delivery Solution

General Description

The Anestar S is an advanced, full-featured anesthesia delivery solution, designed specifically for the Ambulatory Surgery Center market and ORs with space constraints.

The Anestar S offers the same innovative features, ergonomic design, durability and safety features as the Anestar, but in a smaller footprint with optional features, therefore reducing the total cost of ownership.

Summary of Features and Benefits

- The Anestar S offers a unique warmed breathing system (EZ-Flow™), which integrates the absorber and ventilator bellows.
 - Eliminates rainout within the breathing system
 - Climatizes airway gases
 - Reduces potential leak sites
- The fresh gas decoupled EZ-Flow breathing system allows tidal volume to be maintained independently of fresh gas flow settings. This ensures that constant tidal volumes are delivered.
- Built-in hotwire flow sensor technology eliminates the need for disposable sensors and reduces the cost of ownership.
- The IntelliVent™ (Anestar S Intelligent Ventilator) incorporates the following modes:
 - Standby
 - Manual/Spontaneous
 - Adult Controlled Mandatory Ventilation (CMV)
 - Pediatric Controlled Mandatory Ventilation (CMV)
- The IntelliVent user interface has an easy-to-use touch screen with direct access to commonly used functions. Dedicated keys provide instant access to adjustments, such as rate, volume/flow, I:E Ratio and electronic PEEP.
- Automatic compliance compensation of the system corrects for compliance changes within the breathing circuit to achieve the set tidal volume.
- The Anestar S accommodates low flow clinical practices and techniques.
- Small footprint is ideal for ORs with space constraints and Surgery Centers.



PERFORMANCE SPECIFICATIONS

PHYSICAL SPECIFICATIONS

Dimensions		Drawers (3)	
Height	1489 mm (58.6 in)	Height	150 mm (5.9 in)
Width	560 mm (22 in)	Width	190 mm (7.5 in)
Depth	730 mm (28.7 in)	Depth	340 mm (13.4 in)
Weight	95 kg (209 lbs)	Ventilator screen	
(without vaporizers or gas cylinders)		Height	87 mm (3.4 in)
Top shelf		Width	115 mm (4.5 in)
Weight limit	25 kg (55 lbs)	Casters	
Width	470 mm (18.5 in)	4 x dual-wheel 10 cm (4 in) casters.	
Depth	267 mm (10.5 in)	(2 which are locking)	
Work surface		Mounting rail (optional)	
Width	477 mm (18.8 in)	Side of Machine	483 mm (19 in)
Depth	485 mm (19 in)		
Height	910 mm (35.8 in)		

PNEUMATIC SPECIFICATIONS

Central gas supply requirements

O ₂	350 kPa +100/- 50 kPa (50.0 PSI +14.50/- 7.25 PSI)
N ₂ O	350 kPa +100/- 50 kPa (50.0 PSI +14.50/- 7.25 PSI)
Air	350 kPa +100/- 50 kPa (50.0 PSI +14.50/- 7.25 PSI)

Pipeline Connectors

O ₂	DISS threaded body as per CGA V-5
N ₂ O	DISS threaded body as per CGA V-5
Air	DISS threaded body as per CGA V-5 (Optional)

Cylinder gas supply requirements

O ₂	E-Cylinder / PIN indexed per CGA V-1
N ₂ O	E-Cylinder / PIN indexed per CGA V-1

O₂ controls

Method	Proportional increase of O ₂ with increase of N ₂ O
Supply failure alarm	Approx. 200 kPa
O ₂ flush	Range 35-50 l/min

Flowmeters

O ₂ High Range	1.5 – 10 l/min
O ₂ Low Range	.1 l/min – 1 l/min
N ₂ O High Range	1.5 – 10 l/min
N ₂ O Low Range	.1 l/min – 1 l/min
Air High Range	1.5 – 10 l/min
Air Low Range	.1 l/min – 1 l/min
Accuracy	±3% of the scale value
Accuracy Conditions	ATPD (Ambient Temperature Pressure Dry)

Hypoxic guard system

Type	"Ratio" system integrated w/automatic N ₂ O cut off when O ₂ fails
Range	Provides a minimum of 25% ± 5% concentration of oxygen in fresh gas in any O ₂ /N ₂ O mixture

Materials

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

VENTILATOR OPERATING SPECIFICATIONS

Ventilator operating modes

Spontaneous breathing	
Manual/bag	
Adult and pediatric CMV	

Numerical values for tidal volumes, breathing frequency, minute volumes

Tidal Volume Range	10 – 9999 ml
Minute Volume Range	0.1 – 99.9 liters
Rate	0 – 99 bpm
Resolution Tidal Volume	10 ml
Resolution Minute Volume	0.1 liters

Pressure monitor

Real-time waveform	
Numerical pressure values for PEEP, Pmean, Ppeak	
Pressure range	-20 – 99 cm H ₂ O
Resolution	1 cm H ₂ O

Ventilator performance ranges

Tidal volume range	Child: 40 – 400 ml Adult: 300 – 1400 ml
Incremental settings	Child: 10 ml Adult: 50 ml
Pressure range	-10 – 100 cm H ₂ O
Plateau (end insp.)	20% or 30% of insp. period

Ventilator performance ranges (cont'd)

Rate	4 – 60 bpm
Waveform sweep speed	16 seconds
I:E ratio	1:1; 1:1.5; 1:2; 1:2.5; 1:3; 1:4; 1:5
Inverse I:E ratio	2:1 and 3:1

Positive End Expiratory Pressure (PEEP)

Type	Electronically controlled
Range	3 – 15 cm H ₂ O

Ventilator performance

Pressure range at inlet	250 kPa – 600 kPa (36 psi – 87 psi)
Inspiratory flow	1 – 75 l/min

VENTILATOR ACCURACY

Delivery/monitoring accuracy

Volume delivery	± 10%
Pressure delivery	± 5%
PEEP delivery	± 1 cm H ₂ O
Volume monitoring	± 10%
Pressure monitoring	± 5% of the measured value

Alarm settings

Tidal volume	Child: 20 – 400 ml; Adult: 50 – 1400 ml
Minute volume	Child: 0.5 – 3 l Adult: 0.5 – 5 l
Inspired Oxygen	Min: 18 – 90% Max: 30 – 99%

Alarm settings (continued)

Apnea	Selectable, 15, 30, 45 or 60 seconds.
Low airway pressure	2 – 70 cm H ₂ O
High pressure	12 – 80 cm H ₂ O
Subatmospheric pressure	-2 cm H ₂ O
Sustained airway pressure	20 Seconds
Alarm silence	2 minutes

ELECTRICAL SPECIFICATIONS

Mains power supply	120 VAC 60 Hz
Current Input	12A (5A for Anestar S, 7A for auxiliary outlets)

Power and battery back-up

Power consumption	Approx. 210 VA
Power cord	captive line cord
Battery	12 v / 6.5Ah Lead Acid
Battery run time	Approx. 30 minutes
Battery Charge Time	7 hours max, if apparatus is activated
Battery Fuse	5A resettable (externally accessible)
Battery type	Internal rechargeable lead acid

Auxiliary Outlets

Type	4 x 120 volt, Hospital Grade
Fuse	10A resettable (externally accessible)

Communication port

Output serial interface	RS-232 Optical
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ENVIRONMENTAL SPECIFICATIONS

System operation

Operating Temperature	+10 – +35°C (50 – 95°F)
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System storage

Temperature	-5 – +50°C (23 – 122°F)
Humidity	15 – 95% RH, non condensing (Operating & Storage)

BREATHING CIRCUIT SPECIFICATIONS

Modular breathing system

Internal volume	Approx. 2.5 l
Absorber capacity	Approx. 1.4 l; 1.6 kg
Absorber system	Loose fill
Condensation block	Heated breathing system (35°C, 95°F)
Processing	Can be autoclaved at 134°C

System compliance	Approx. 4.5 ml/cm H ₂ O with standard hoses, is automatically compensated
Fresh gas decoupling	Automatic during inspiration, allowing constant volume ventilation

Rotation	50° max
Compliance compensation	2.0 – 9.9 ml/cm H ₂ O

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 ISO 15 mm ID taper

Materials

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

Breathing circuit parameters

Compliance compensation 2.0 – 9.9 ml/cm H₂O

Anesthetic gas scavenging

Active low flow	DISS evacuation
Oxygen sensor type:	Galvanic fuel cell

Pressure gauge

Scale range	-10 – 100 psi
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Integrated Adjustable Pressure

Limiting Valve	
Range	0 – 80 cm H ₂ O
Tactile knob indication at 10 cm H ₂ O	
Adjustable range of motion	270°

AGENCY COMPLIANCES

This machine complies with the following industry standards: UL 2601-1:1994

Safety: CSA Standard C22.2 No. 601.1-M90; CAN/CSA-C22.2 No. 601.2-13-94; EN 60601-1:1990; EN 60601-1-4:1996 / IEC 601-1-4:1996; EN 60601-1-2:1993 IEC 601-2-12:1988; IEC 601-2-13:1989

Performance: ASTM F 1161-88:1988; ASTM F 1463-93:1993

OPTIONS

The following options are available for any configuration of Anestar S:

Large Top Tray	A large top tray with a width of 695 mm (27.4 in) and a depth of 445 mm (17.5 in) is available to replace the existing tray. The tray is held in place by four screws, which are accessible from the outside of the unit. The design allows the tray to be changed by the end user.
Table Extension	A table extension is available that adds a 499 mm x 165 mm (19.6 in x 6.5 in) area to the work surface. The table extension is held in place by 3 fasteners and is to be installed by the end user.
Snake Lamp	An optional external lamp is available to illuminate the work surface. The lamp has an on/off switch and a user replaceable bulb. The lamp is not provided with power when running on battery power. This option is field installed only.
RS-232 Interface	A DB-9 connector on the rear of the Anestar S provides an output serial RS-232C interface. This option is field installed only.

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Specifications subject to change.