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HEARTSTART MRx
MONITOR/DEFIBRILLATOR

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PRODUCT DESCRIPTION

No compromises. That's how we created the HeartStart MRx, a combination transport monitor, cardiograph, manual defibrillator, and AED. HeartStart MRx unites our industry-leading patient monitoring capabilities with our patented biphasic defibrillation therapy in one comprehensive, easy-to-use, rugged, and lightweight device, optimized to meet a variety of user needs.

With carefully arranged controls, connections, and menus, HeartStart MRx efficiently provides comprehensive diagnostic measurements without compromising critical, lifesaving therapy. Monitoring and resuscitation functions are clearly delineated, with monitoring located on one side of the device and defibrillation, pacing, and cardioversion on the other. Patient status and care data --- including numeric vital signs and up to four waves, as well as text prompts, alarms, an event timer, event markers, and battery status indicators --- are logically organized on the device's large, backlit, color display.

It is our mission to produce the finest quality medical equipment, enabling you to deliver effective care and ultimately save lives. We strive to meet the evolving needs of the healthcare community with outstanding technology and innovation, while always focusing on what's most important - positive patient outcomes. So, whether it's the long-life batteries, automated operational checks, or a data management solution, HeartStart MRx has the capabilities you need and the performance you demand - no compromises.

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Features

Standard Features

- ST/AR Basic algorithm for arrhythmia detection
- ECG monitoring through monitoring electrodes and defibrillation pads
- Synchronized cardioversion
- Adjustable ECG size and autogain
- Manual and AED operation
- SMART Biphasic waveform for defibrillation therapy
- Large 4-wave color display
- Strip chart printer
- Individual, adjustable volume of QRS beeper, voice prompts, and alerts
- Event summary
- Configuration mode
- Service mode
- Operational checks
- Automated self-tests with “ready-for-use” indicator
- Lithium ion battery with fuel gauge
- ECG out capability

Optional Features

- SpO_2 with Fourier Artifact Suppression Technology (FAST)
- Noninvasive Blood Pressure
- Microstream™ $EtCO_2$
- Noninvasive Pacing
- 12-Lead ECG with Philips interpretation algorithm
- 75 mm Printer

Standard Accessories

- AC power module
- Lithium ion battery with fuel gauge
- Hands-free multifunction electrode cable
- 3-Lead ECG cable
- Disposable monitoring electrodes
- Strip chart recorder paper
- Defibrillator test load
- Documentation CD containing Instructions for Use (User's guide), User training workbook, and Application notes
- Quick reference cards

Package

M3535A	HeartStart MRx Monitor/Defibrillator

Ordering Option Information

A01	SpO_2
A02	SpO_2 and NBP
A03	SpO_2, NBP, and $EtCO_2$
A04	$EtCO_2$
B01	External Pacing
B02	12-Lead ECG Acquisition
B04	Wider Printer
C01	Standard External Paddles
C02	Water Resistant External Paddles
C03	Data Card
C04	Carrying Case
C05	Additional Battery
C07	Barrel style Pad Cable (Replacement for Standard Pad Cable)
C15	5-Lead ECG Cable
LP1	Instructions for Use
LP2	User Training Video (English only)
LP3	User Training DVD (English only)
SM1	Service Manual (English only)
SM3	Service Training Video (English only)
W01	One-Year On-Site Warranty
W24	Five-Year Bench Warranty with Loaner (U.S. & Canada only)
WA1	Five-Year Biomed Warranty (U.S., Canada & Australia only)
W08	Three-Year Bench Warranty with Loaner (Australia & New Zealand only)

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Upgrades/Supplies/Accessories

Upgrades

M3530A	SpO_2
M3531A	NBP
M3532A	$EtCO_2$
M3533A	Pacing
M3534A	12-Lead ECG
	Option B02 - Acquisition
	Option B03 - Transmission
	Option B04 - Wider Printer
M4760A	Handle and Cap Plate (for Pads)
M5527A	External Paddles with Paddle Tray
	Option C01 - Standard Paddles
	Option C02 - Water Resistant Paddles

External Paddles

M3542A	Standard External Paddles
M3543A	Water Resistant External Paddles
M4745A	Sterilizable External Paddles

Internal Paddles

M1741A	7.5 cm Switchless
M1742A	6.0 cm Switchless
M1743A	4.5 cm Switchless
M1744A	2.8 cm Switchless
M4741A	7.5 cm Switched
M4742A	6.0 cm Switched
M4743A	4.5 cm Switched
M4744A	2.8 cm Switched
989803127121	Large Disposable Switched
989803127131	Medium Disposable Switched
989803127141	Small Disposable Switched
989803127151	Large Disposable Switchless
989803127161	Medium Disposable Switchless
989803127171	Small Disposable Switchless
M4740A	Internal Paddles Adapter Cable

Multifunction Electrode Pads

	White barrel connector
M3501A	Defib Adult, AAMI
M3502A	Defib Adult, IEC
M3503A	Defib Pediatric, IEC
M3504A	Defib Pediatric, AAMI
	Grey plug connector
M3713A	Adult Plus
M3716A	Adult Radiolucent
M3717A	Pediatric Plus
M3718A	Adult Radiotransparent/Reduced Skin
M3719A	Pediatric Radiotransparent/Reduced Skin
DP2	Self-adhesive adult electrode pads
DP6	Self-adhesive adult electrode pads

Pads Cable

M3507A	Defib Hands-free Pads Cable, barrel style
M3508A	Defib Hands-free, plug style
05-10200	Pads Adapter (use with M3507A)

ECG Monitoring Electrodes

M2202A	High-Tack Foam; 5 electrodes/pack (60 packs/case)

ECG Cables

	12-Lead Cable Set
M3525A	10-lead ECG Trunk Cable, 12-pin Connector (for 3-Lead and 12-Lead use)
M3526A	3-lead ECG Set and Plug with Snap (AAMI)
M3527A	Add 7-lead ECG Set for 12-Lead use (AAMI)
M3528A	3-lead ECG Set and Plug with Snap (IEC)
M3529A	Add 7-lead ECG Set for 12-Lead use (IEC)
M5530A	Combiner Plug for 3-wire Lead Set for use with M3526A/M3528A
M1949A	10-lead ECG Patient Trunk Cable, 12-pin ECG Input Connector (for 5-Lead and 12-Lead use)
M1968A	10-electrode Cable Set, Extremities, Grabber (use with M1976A) (AAMI)
M1976A	10-electrode Cable Set, Chest, Grabber (use with M1968A) (AAMI)
M1971A	10-electrode Cable Set, Extremities, Grabber (use with M1978A) (IEC)
M1978A	10-electrode Cable Set, Chest, Grabber (use with M1971A) (IEC)

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ECG Cables

	3-Lead Cable Set
M1500A	3-lead ECG Trunk Cable (AAMI)
M1605A	3-lead ECG Lead Set with Snaps (AAMI)
M1510A	3-lead ECG Trunk Cable (IEC)
M1615A	3-lead ECG Lead Set with Snaps (IEC)
	5-Lead Cable Set
M1520A	5-lead ECG Trunk Cable (AAMI)
M1625A	5-lead ECG Lead Set with Snaps (AAMI)
M1530A	5-lead ECG Trunk Cable (IEC)
M1635A	5-lead ECG Lead Set with Snaps (IEC)

Sync Cables

M1783A	Sync Cable 8 ft. (2.4 m)
M5526A	Sync Cable 25 ft. (7.6 m)

SpO_2 Sensors/Cables

M1191A	Reusable SpO_2 Sensor - Adult Finger 6.5 ft. (2 m)
M1192A	Reusable SpO_2 Sensor - Pediatric/Small Adult Finger
M1193A	Reusable SpO_2 Sensor - Adult Thumb
M1194A	Reusable SpO_2 Sensor - Adult Ear Clip
M1195A	Reusable SpO_2 Sensor - Infant
M1941A	SpO_2 Extension Cable, 2 m (6.5 ft.)
M1943A	Nellcor SpO_2 Sensor Adapter Cable, 1 m (use with M1903/4B)

NBP

	Interconnect Cables
M1598B	Adult Pressure 5 ft. (1.5 m)
M1599B	Adult Pressure 10 ft. (3 m)
	Reusable Blood Pressure Cuffs
40400A	Reusable NBP Cuff Kit, 3 sizes (pediatric, adult, large adult)
40400B	Reusable NBP Cuff Kit, 5 sizes (infant, pediatric, adult, large adult, thigh)
40401A	Traditional Reusable NBP Cuff - Infant
40401B	Traditional Reusable NBP Cuff - Pediatric

NBP

40401C	Traditional Reusable NBP Cuff - Adult
40401D	Traditional Reusable NBP Cuff - Large Adult
40401E	Traditional Reusable NBP Cuff - Thigh
M4552A	Antimicrobial Reusable NBP Cuff - Infant
M4553A	Antimicrobial Reusable NBP Cuff - Pediatric
M4554A	Antimicrobial Reusable NBP Cuff - Small Adult
M4555A	Antimicrobial Reusable NBP Cuff - Adult
M4557A	Antimicrobial Reusable NBP Cuff - Large Adult
M4559A	Antimicrobial Reusable NBP Cuff - Thigh
M1572A	Multi-Patient Comfort Cuffs - Pediatric
M1573A	Multi-Patient Comfort Cuffs - Small Adult
M1574A	Multi-Patient Comfort Cuffs - Adult
M1575A	Multi-Patient Comfort Cuffs - Large Adult
	Disposable Blood Pressure Cuffs
M4572A	Soft Single-Patient Disposable Cuff - Infant
M4573A	Soft Single-Patient Disposable Cuff - Pediatric
M4574A	Soft Single-Patient Disposable Cuff - Small Adult
M4575A	Soft Single-Patient Disposable Cuff - Adult
M4576A	Soft Single-Patient Disposable Cuff - Adult X-Long
M4577A	Soft Single-Patient Disposable Cuff - Large Adult
M4578A	Soft Single-Patient Disposable Cuff - Large Adult X-Long
M4579A	Soft Single-Patient Disposable Cuff - Thigh

$EtCO_2$

	Intubated Circuits
M1920A	Filter Line Set - Adult/Pediatric (25 sets/case)
M1921A	Filter H Set - Humidified Adult/Pediatric (25 sets/case)
M1923A	Filter H Set - Humidified Infant/Neonatal (yellow, 25 sets/case)
	Non-Intubated Dual Purpose Circuits (CO_2 + O_2)
M2520A	Smart CapnoLine - Pediatric
M2521A	Smart CapnoLine - Intermediate
M2522A	Smart CapnoLine - Adult

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$EtCO_2$

	Non-Intubated Single Purpose Circuits (CO_2)
M2524A	Smart CapnoLine - Pediatric
M2525A	Smart CapnoLine - Intermediate
M2526A	Smart CapnoLine - Adult

Power

M3538A	Lithium Ion Battery with fuel gauge
M3539A	AC Power Module
989803135301	2-Bay Battery Support System for Lithium Ion Batteries
989803135331	4-Bay Battery Support System for Lithium Ion Batteries
989803135341	4-Bay Battery Support System for Sealed Lead Acid and Lithium Ion Batteries

Paper

40457C	50 mm Chemical Thermal, Gray Grid (10 rolls)
40457D	50 mm Chemical Thermal, Gray Grid (80 rolls)
989803138171	75 mm Chemical Thermal, Gray Grid (10 rolls)
989803138181	75 mm Chemical Thermal, Gray Grid (80 rolls)

Color Handle

M5521A	Green and color label set
M5522A	Blue and color label set
M5523A	Yellow and color label set
M5524A	Rose and color label set
M5525A	Gray and color label set

Miscellaneous

M1781A	Test Load for use with M3507A Pad Cable
M3725A	Test Load for use with M3508A Pad Cable
M3541A	Carrying Case (includes 3 accessory pouches and shoulder strap)
M3544A	Data Card Tray
M3545A	Data Card and Tray
M3537A	Bedrail Hook mount

Specifications

General

Dimensions with pads: 12.4 in. (W) x 8.3 in. (D) x 11.7 in. (H) (31.5 cm x 21.0 cm x 29.5 cm)

Dimensions with paddles: 13.4 in. (W) x 8.3 in. (D) x 13.6 in. (H) (34.0 cm x 21.0 cm x 34.5 cm)

Weight: 13.2 lbs. (5.99 kg) including pads, pads cable, full roll of paper, and battery. Incremental weight of external standard paddles and paddle tray is 2.5 lbs. (1.1 kg). Additional battery weighs 1.6 lbs. (0.73 kg)

Defibrillator

Waveform: Biphasic Truncated Exponential. Waveform parameters adjusted as a function of patient impedance

Shock Delivery: Via multifunction defib electrode pads, or paddles

Delivered Energy Accuracy:

Selected Energy	Nominal Delivered Energy vs. Patient Impedance							Accuracy
	Load Impedance							
	25	50	75	100	125	150	175	
1J	1.2	1.3	1.2	1.1	1.0	0.9	0.8	±2J
2J	1.8	2.0	2.0	1.9	1.7	1.6	1.5	±2J
3J	2.8	3.0	3.0	3.1	3.0	2.9	2.7	±2J
4J	3.7	4.0	4.0	4.1	4.2	4.2	4.0	±2J
5J	4.6	5.0	5.1	5.1	5.2	5.2	5.0	±2J
6J	5.5	6.0	6.1	6.2	6.3	6.3	6.1	±2J
7J	6.4	7.0	7.1	7.2	7.3	7.3	7.1	±2J
8J	7.4	8.0	8.1	8.2	8.4	8.3	8.1	±2J
9J	8.3	9.0	9.1	9.3	9.4	9.4	9.1	±2J
10J	9.2	10	10	10	10	10	10	±2J
15J	14	15	15	15	16	16	15	±15%
20J	18	20	20	21	21	21	20	±15%
30J	28	30	30	31	31	31	30	±15%
50J	46	50	51	51	52	52	50	±15%
70J	64	70	71	72	73	73	71	±15%
100J	92	100	101	103	104	104	101	±15%
120J	110	120	121	123	125	125	121	±15%
150J	138	150	152	154	157	156	151	±15%
170J	156	170	172	175	177	177	172	±15%
200J	184	200	202	206	209	209	202	±15%

Charge Time: Less than 5 seconds to 200 Joules with a new, fully charged Lithium Ion battery pack at 25ºC. Less than 15 seconds when operating without a battery, using the M3539A AC power module alone at 90% rated mains voltage.

Patient Impedance Range:
Minimum: 15 Ohm (internal defibrillation); 25 Ohm (external defibrillation)
Maximum: 180 Ohm

Note: Actual functional range may exceed the above values.

Manual Mode

Manual Output Energy (Selected): 1-10, 15, 20, 30, 50, 70, 100, 120, 150, 170, 200J; maximum energy limited to 50J for internal defibrillation

Controls: On/Off Therapy Knob, Charge, Shock, Sync, Print, Mark Event, ECG Lead Select, Alarm Pause, Event Review

Energy Selection Control: Front panel therapy knob

Charge Control: Front panel button; button on external paddles

Shock Control: Front panel button; buttons on external or switched internal paddles

Synchronized Control: Front panel SYNC button

Indicators: Text prompts, audio alerts, QRS beeper, battery status, Ready For Use, external power/battery charging, Sync mode

Armed Indicators: Charging tone, charged tone, flashing shock button, and energy level indicated on display

AED Mode

AED Energy Profile: 150 Joules nominal into a 50 Ohm test load

Text and Voice Prompts: Extensive text/audible messages guide user through configured protocol

AED Controls: On/Off, Shock

Indicators: Monitor display messages and prompts, voice prompts, battery status, Ready For Use, external power/battery charging

Armed Indicators: Flashing shock button, charged tone, and voice prompts

ECG Analysis: Evaluates patient ECG and signal quality to determine if a shock is appropriate and evaluates connection impedance for proper defibrillation pad contact

Shockable Rhythms: Ventricular fibrillation and certain ventricular tachycardias, including ventricular flutter and polymorphic ventricular tachycardia

Shock Advisory Algorithm Sensitivity and Specificity: Meets AAMI DF-

ECG and Arrhythmia Monitoring

Inputs: Up to four (4) ECG waves may be viewed on display and up to 2 waves printed simultaneously. Lead I, II, or III is obtained through the 3-lead ECG cable. With a 5-lead cable, leads aVR, aVL, aVF, and V can also be obtained. Pads ECG is obtained through 2 multifunction defibrillation electrode pads.

Lead Fault: Leads Off message and dashed line appear on the display if an electrode or lead wire becomes disconnected. Lead Off indicator in wave sector.

Pad Fault: Dashed line appears on the display if a pad becomes disconnected.

Heart Rate Display: Digital readout on display from 15 to 300 bpm, with an accuracy of ±10%

Heart Rate/Arrhythmia Alarms: HR, Asystole, VFIB/VTACH, VTACH, Extreme Tachy, Extreme Brady, PVC rate, Pacer not capture, Pacer not pacing

Hands Free Defibrillation Cable Length:
M3507A = 7 ft. (2.2 m)
M3508A = 7 ft. (2.2 m)

ECG Cable Length: 9 ft. (2.7 m)

Common Mode Rejection: Greater than 90 dB measured per AAMI standard for cardiac monitors (EC 13)

ECG Size: 2.5, 5, 10, 20, 40 mm/mV, autogain

Frequency Response:

AC Line Filter: 60 Hz or 50 Hz
3-lead, 5-lead, and Pads:
Pads ECG for Display: Monitor (0.15-40 Hz) or EMS (1-30 Hz)
Pads ECG for Printer: Monitor (0.15-40 Hz) or EMS (1-30 Hz)
Leads ECG for Display: Monitor (0.15-40 Hz) or EMS (1-30 Hz)
Leads ECG for Printer: Diagnostic (0.05-150 Hz) or Monitor (0.15-40 Hz) or EMS (1-30 Hz)

12-lead:
ECG for Display: (0.05 - 150 Hz), (0.05 - 40 Hz), (0.15 - 40 Hz)
ECG for Report: (0.05 - 150 Hz), (0.05 - 40 Hz), (0.15 - 40 Hz), (0.05 - 150 Hz)

Patient Isolation (defibrillation proof):
ECG: Type CF
SpO_2: Type CF
$EtCO_2$: Type CF
NBP: Type CF
External Defib: Type BF
Internal Defib: Type CF

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Display

Size: 8.4 in. diagonal (128 mm x 171 mm)

Type: TFT Color LCD

Resolution: 640 x 480 pixels (VGA)

Sweep Speed: 25 mm/s nominal (stationary trace; sweeping erase bar) for ECG and SpO_2; 6.25 mm/s for CO_2

Wave Viewing Time: 5 seconds (ECG)

Battery

Type: 6.0 Ah, 14.8 V, rechargeable, Lithium Ion

Dimensions: 6.5 in. (H) x 3.8 in. (W) x 1.6 in. (D) (165 mm x 95 mm x 42 mm)

Weight: 1.6 lb. (0.73 kg)

Charge Time: Approximately 3 hours to 100%. Approximately 2 hours to 80%, indicated by battery gauge indicator. Charging the battery at temperatures above 45°C may degrade battery life.

Capacity: At least 5 hours of monitoring with ECG, SpO_2, and CO_2 monitored continuously and NBP measured every 15 minutes, or at least 50 200-joule shocks (on a new, fully charged battery at room temperature, 25° C). At least 3.5 hours while pacing at 180 ppm at 160 mA and monitoring as described above

Battery Indicators: Battery gauge on battery, capacity indicator on display; flashing RFU indicator, chirp, and LOW BATTERY message appears on display for low battery condition*

*Low battery condition triggered with at least 10 minutes of monitoring time and 6 maximum energy discharges remain (with a new battery at room temperature, 25° C)

Storage: Storing the battery for extended periods at temperatures above 40°C will reduce battery capacity and degrade battery life.

Thermal Array Printer

Continuous ECG Strip: The Print key starts and stops the strip. The printer can be configured to run real time or with a 10-second delay. The strip prints the primary ECG lead with event annotations and measurements.

Auto Printing: The printer can be configured to automatically print on Marked Events, Charge, Shock, and Alarm. When an alarm condition occurs, the unit prints the primary ECG wave and the alarming wave, if configured.

Reports: The following can be printed: Event Summary, 12-Lead, Operational Check, Configuration, Status Log, and Device Information

Speed: 25 or 50 mm/s with an accuracy of ± 5%

Amplitude Accuracy: ± 5% or ± 40 uV, whichever is greater

Paper Size: 50 mm (W) by 30 m (100 ft.) (L)
75 mm (W) by 30 m (100 ft.) (L)

Noninvasive Pacing

Waveform: Monophasic Truncated Exponential

Current Pulse Amplitude: 10 mA to 175 mA (5 mA increments); accuracy 10% or 5 mA, whichever is greater

Pulse Width: 40 ms with ± 10% accuracy

Rate: 30 ppm to 180 ppm (10 ppm increments); accuracy ± 1.5%

Modes: Demand or Fixed Rate

Refractory Period: 340 msec (30 to 80 ppm); 240 msec (90 to 180 ppm)

SpO_2 Pulse Oximetry

Range: SpO2: 0-100%; pulse rate: 30 to 300 bpm

Resolution: 1%

Display Update Period: 1 sec. typical numeric update rate

Accuracy with:

M1191A sensor - 1 standard deviation 70% to 100%, ± 2.5%
M1192A sensor - 1 standard deviation 70% to 100%, ± 2.5%
M1193A sensor - 1 standard deviation 70% to 100%, ± 2.5%
M1194A sensor - 1 standard deviation 70% to 100%, ± 4.0%
M1195A sensor - 1 standard deviation 70% to 100%, ± 4.0%
NELLCOR sensors - 1 standard deviation 80% to 100%, ± 3.0%

Pulse Rate Accuracy: 2% or 1 bpm (whichever is greater)

Alarm Range:

Low Limit: 50 to 99% (Adult/Pediatric)
High Limit: 51 to 100% (Adult/Pediatric)

Alarm Delay: 10 seconds

Noninvasive Blood Pressure

Pressure Range:
Systolic: 40-260 mmHg
Diastolic: 20-200 mmHg
Initial Pressure: 160 mmHg (Adult); 120 mmHg (Pediatric)
Maximum Pressure: 280 mmHg
Overpressure Safety Limits: Maximum of 300 mmHg
Cuff Inflation Time: 50 second maximum (pediatric or adult)
Accuracy: ±3 mmHg
Alarm Range:
Systolic high limit: 35 - 270 (Adult), 35 - 180 (Pediatric)
Systolic low limit: 30 - 265 (Adult), 30 - 175 (Pediatric)
Diastolic high limit: 15 - 245 (Adult), 15 - 150 (Pediatric)
Diastolic low limit: 10 - 240 (Adult), 10 - 145 (Pediatric)
Mean high limit: 25 - 255 (Adult), 25 - 160 (Pediatric)
Mean low limit: 20 - 250 (Adult), 20 - 155 (Pediatric)
Calibration Schedule: yearly or every 10,000 cycles
Auto Mode Repetition Time: 1, 2.5, 5, 10, 15, 30, 60, or 120 minutes
Measurement Time: Auto/manual mode: 30 seconds (average) @ HR > 60 bpm, 170 seconds (maximum)
Interconnect Tube Length:
M1598B Connect tubing 5 ft. (1.5 m)
M1599B Connect tubing 10 ft. (3 m)

End-Tidal Carbon Dioxide

Range: 0 to 99 mmHg
Resolution: 1mmHg (0.1kPa)
Accuracy: For values between 0 and 38 mmHg: ±2 mmHg. For values between 39 and 99 mmHg: ±5% of reading + 0.08% for every 1 mmHg (above 40 mmHg). Values read at sea level after ≥ 20 min. warm up
Alarm Range:
Low Limit: 10 to 94 mmHg (Adult/Pediatric)
High Limit: 20 to 95 mmHg (Adult/Pediatric)
Calibration Schedule: yearly or every 4,000 hours

Sample Size: 50 ml per min.

Airway Respiration Rate

Range: 0 to 150 rpm
Resolution: 1 rpm
Accuracy:
0 to 40 rpm ±1 rpm
41 to 70 rpm ±2 rpm
71 to 100rpm ± 3%
101 to 150rpm ± 5%

Alarm Range:
Low Limit: 0 to 99 rpm (Adult/Pediatric)
High Limit: 10 to 100 rpm (Adult/Pediatric)

Apnea Alarm Time: 10-40 seconds, in increments of 5

Calibration Gas for CO_2 Measurement System

Ingredients: 5% Carbon Dioxide, 21% Oxygen, 74% Nitrogen
Cylinder Size: BD
Method of Preparation: Gravimetric
Blend Tolerance: 0.03%
Accuracy: 0.03% absolute
Moisture: 10 PPM Maximum
Expiration Period: 2 years
Pressure: 144 PSIG, Volume: 10L

12-Lead ECG

Inputs: With a 10-Lead cable, leads I, II, III, aVR, aVL, aVF, V/C1-V/C6 can be obtained. All 12-Lead ECG waves can be viewed on the display simultaneously. All 12 leads can be printed on the strip chart printer in 3x4 format.
ECG Bandwidth Filters:
0.15 - 40 Hz
0.05 - 40 Hz
0.05 - 150 Hz

12-Lead ECG Transmission: Data card to a PC

Receiver Type: HeartStart Event Review Pro, TraceMaster ECG Management System Version A.04.02, and TraceMaster Vue

Patient Data Storage

Internal Event Summary: Up to 8 hours of continuous ECG waveforms and events and up to 62 megabytes of patient data

Data Card Event Summary: Up to 8 hours of continuous ECG waveforms and events and up to 62 megabytes of patient data

Environmental

Temperature: 0° C to 45°C operating, -20° to 70°C storage

Humidity: Up to 95% relative humidity

Altitude:
Operating: 0 to 15,000 ft. (0 to 4,500 m)
Storage: 0 to 15,000 ft. (0 to 4,500 m)

Shock:
Operating: Half-sine waveform, duration < 3 ms, acceleration > 145 g, 1 time on all six faces

Storage: Trapezoidal waveform, acceleration ≥ 30 g, velocity change=742 cm/s ±10% on all six faces

Vibration:
Operating: Random vibration, 0.30 grms, 5-500 Hz for ≥10 minutes/axis PSD=0.0002 g^2/Hz from 5 to 350 Hz, -6 dB/octave slope from 350 to 500 Hz

Storage: Random vibration, 2.41 grms, 5-500 Hz for ≥10 minutes/axis PSD=0.02 g^2/Hz from 5 to 100 Hz, -6 dB/octave slope from 100 to 137 Hz, 0 dB/octave slope from 137 to 350 Hz, -6 dB/octave slope from 350 to 500 Hz

Solids Resistance: IP2x

Water Resistance: Meets EN 60601-2-4. Water testing performed with cables connected to the device

EMC: Complies with the requirements of standard EN 60601-1-2:2001

Safety: Complies with the requirements of applicable safety standards

Other Considerations: Device not suitable for use in the presence of concentrated oxygen or a flammable anesthetic mixture with air, oxygen, or nitrous oxide

Mode of Operation: Continuous

AC Power Module:
Input: 100-240 VAC, 50-60 Hz, 1-0.46 A (Class 1)
Output: 18V, 5A, 90W

Battery: 14.8 V Rechargeable, Lithium Ion

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